



Anatomy
434

Nose, Nasal Cavity, Paranasal sinuses, and Pharynx

Objectives

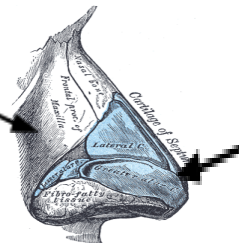
- Describe the boundaries of the nasal cavity.
- Describe the nasal conchae and meati.
- Demonstrate the openings in each meatus.
- Describe the paranasal sinuses and their functions
- Describe the pharynx and its parts.

New terms

Term	Definition
<i>conchae</i>	<i>any part resembling a shell</i> (نتوء)
<i>meatus</i>	<i>a passage ,it is a groovelike part</i> (لخود)
<i>recess</i>	<i>a hollow chamber or a depression</i> (تجويف)
<i>sinus</i>	<i>an air cavity within a bone</i> (تجويف هوائي)
<i>septum</i>	<i>a dividing wall within a structure</i> (حاجز)
<i>mucosa</i>	<i>the moist membrane lining many structure and cavity.</i>
<i>Pharynx</i>	(بلعوم)
<i>larynx</i>	<i>the organ responsible for the production of the voice</i> (حنجرة)
<i>apertures</i>	(فتحه او ثقب)

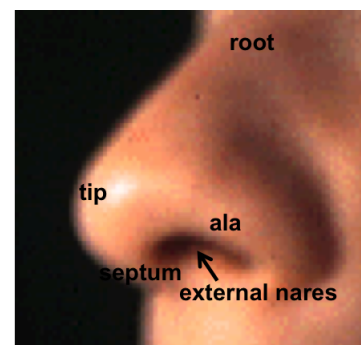
Nose and Nasal Cavity

Is Formed above by:
Bony skeleton.



Formed below by :plates
of hyaline cartilage

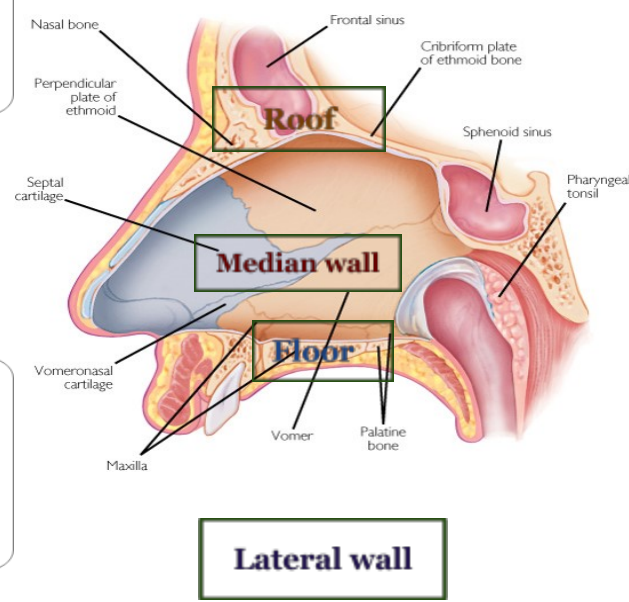
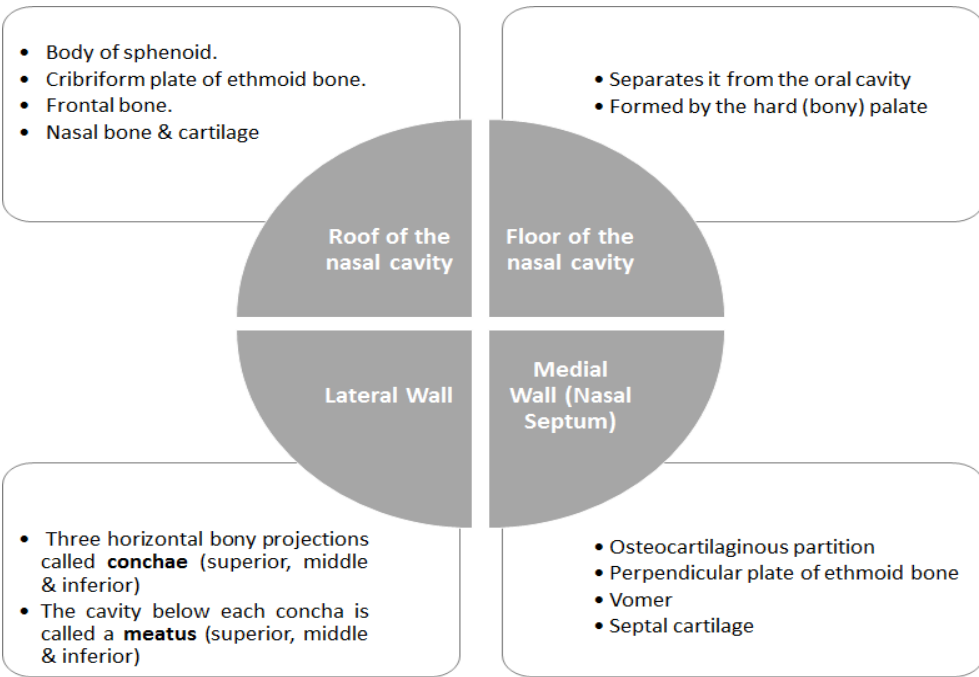
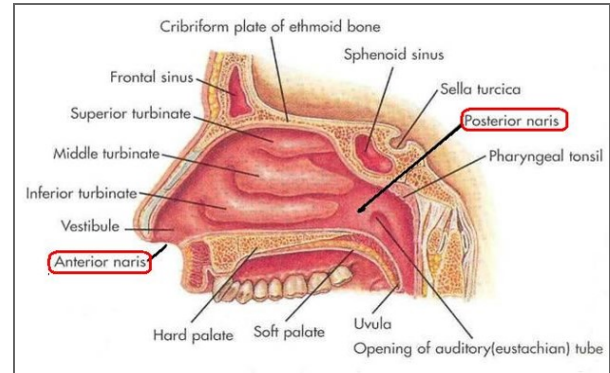
external (anterior) nares nostrils, lead to the **nasal cavity**.



- the **nasal cavity** extends from the external (anterior) nares to the posterior nares (choanae).
- Divided into right & left halves by the nasal septum.

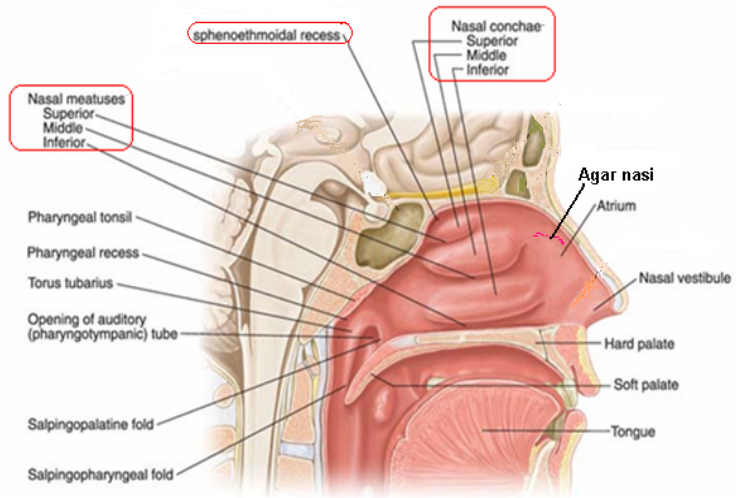
Each half has a:

1. Roof
2. Lateral wall
3. Medial wall (septum)
4. Floor.



Lateral wall

- 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.**



Nasal mucus

Olfactory :It is delicate and contains olfactory nerve cells.

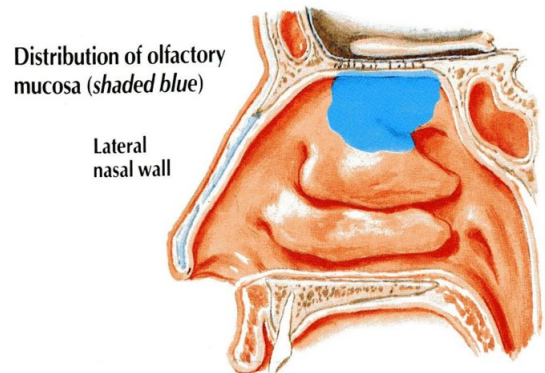
- It is present in the upper part of nasal cavity(
roof, lateral wall)

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.



Respiratory mucus

What's respiratory mucosa?

It is thick, ciliated **highly vascular** and contains **mucous glands & goblet cells**.

It lines the **Lower part** of the **nasal cavity**.

it's function:is to **moisten**, **clean** and **warm** the inspired air.

The air is **moistened** by the secretion of numerous **serous glands**.

The air 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**.

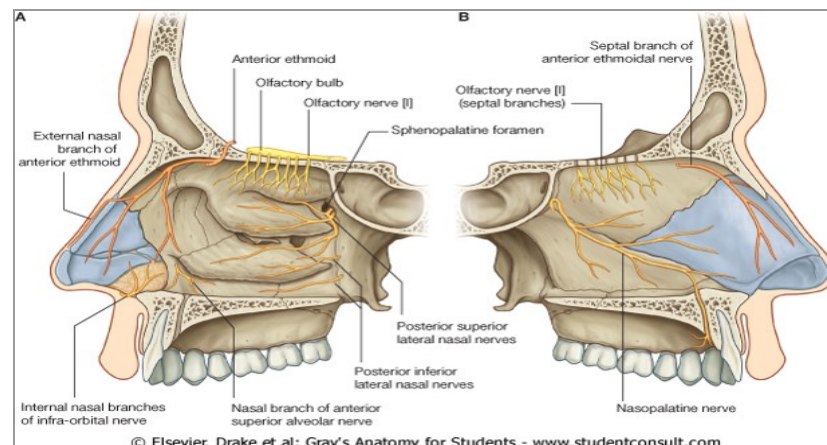
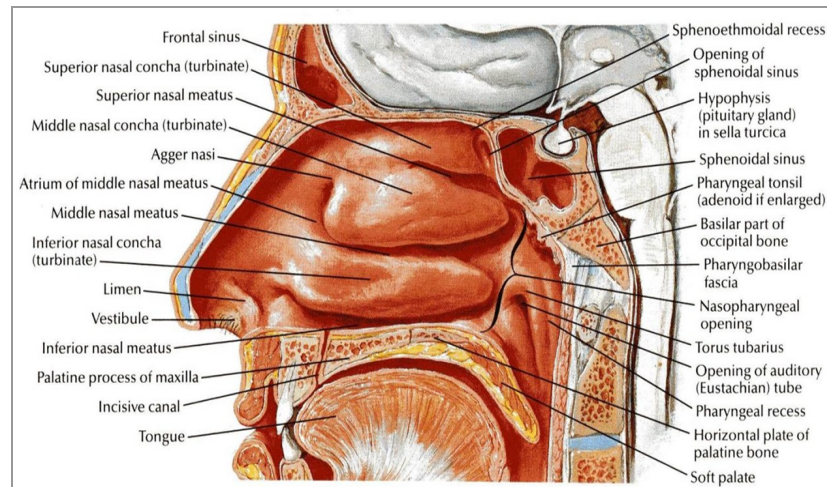
The Vestibule(الفراغ) is lined by **Skin**.

Nerve supply:

Olfactory mucosa supplied by **olfactory nerves**.

Nerves of **general sensation** are derived from:

- **ophthalmic** & • **maxillary nerves**. & • **Autonomic fibers**.



Blood supply:

Arterial supply:

Branches of the,

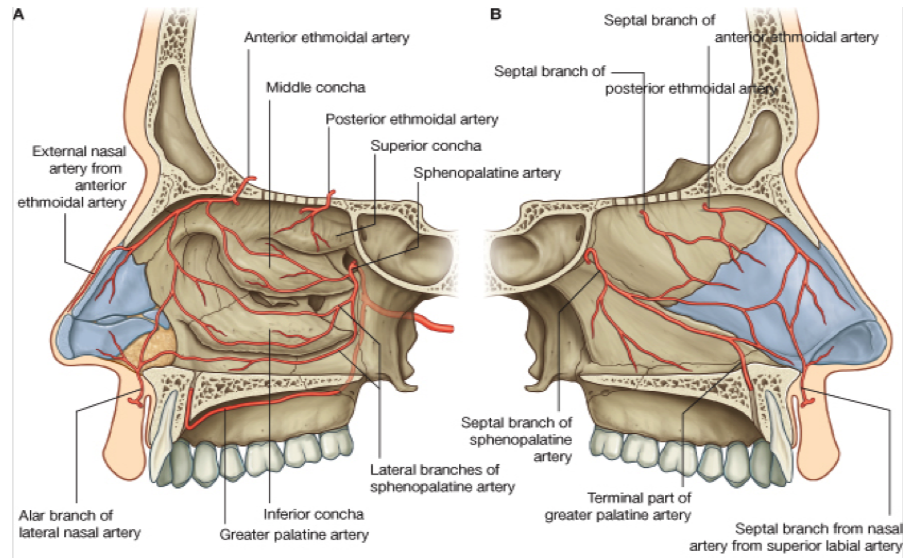
- maxillary
- facial
- ophthalmic arteries

These arteries make a rich *anastomosis* in the region of the *vestibule*, and anterior portion of the septum.

Venous Drainage:

drain into the:

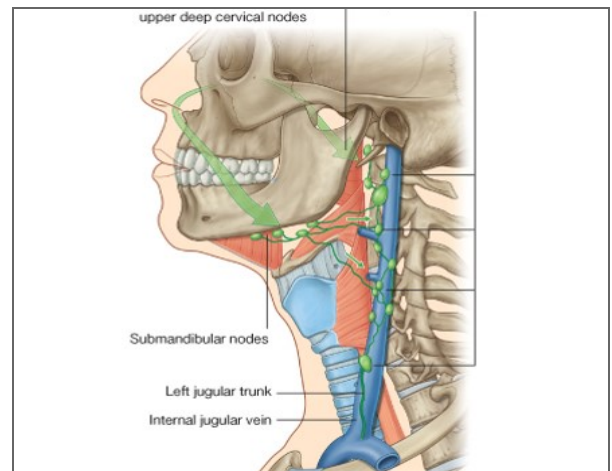
- facial
 - ophthalmic
- spheno-palatine veins.



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.



Paranasal Sinuses

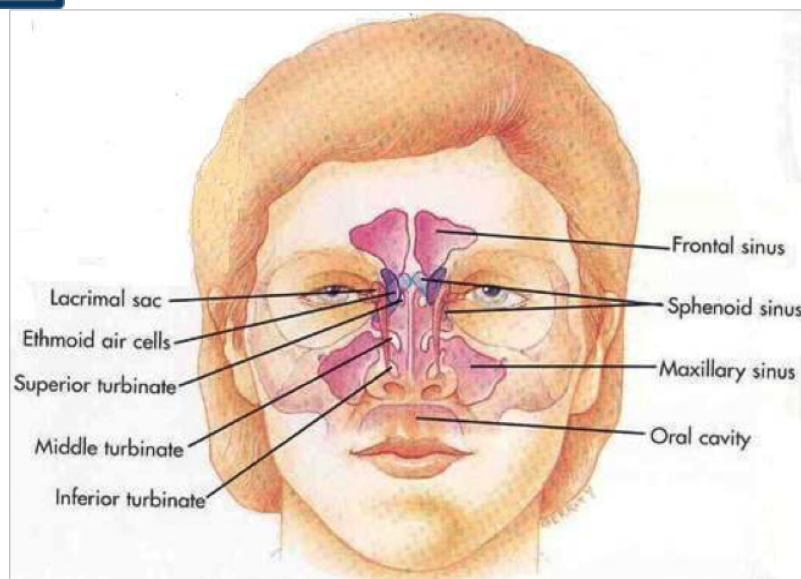
They are **Air-filled cavities** located in the bones around the nasal cavity: **ethmoid, sphenoid, frontal bones & maxillae.**

Lined by respiratory mucosa which is continuous with the mucosa of the nasal cavity.

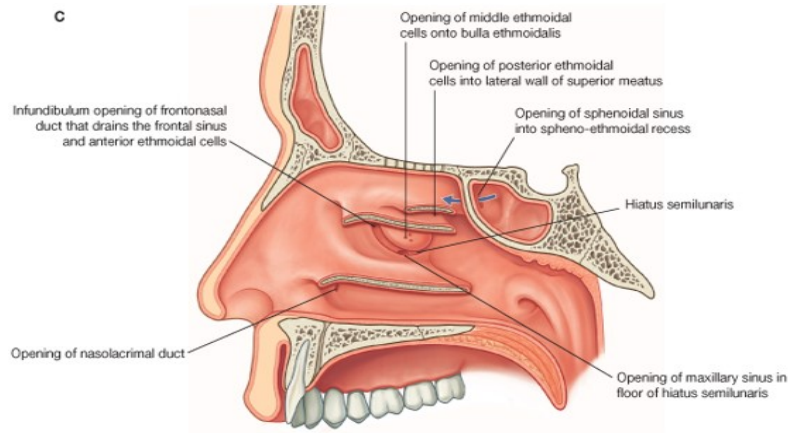
& Drain into the nasal cavity.

Functions:

1. **Lighten the skull.**
2. **Act as resonant chambers for speech.**
3. **Air conditioning:**The respiratory mucosal lining helps in warming, cleaning and moistening the incoming air.



Spheno ethmoidal recess	sphenoidal sinus
Superior meatus	posterior ethmoidal sinus
Middle meatus	middle ethmoidal, maxillary, frontal & the anterior ethmoidal sinuses
Inferior meatus	nasolacrimal duct.



[Here's a video for the anatomy of the nose](#)

Pharynx

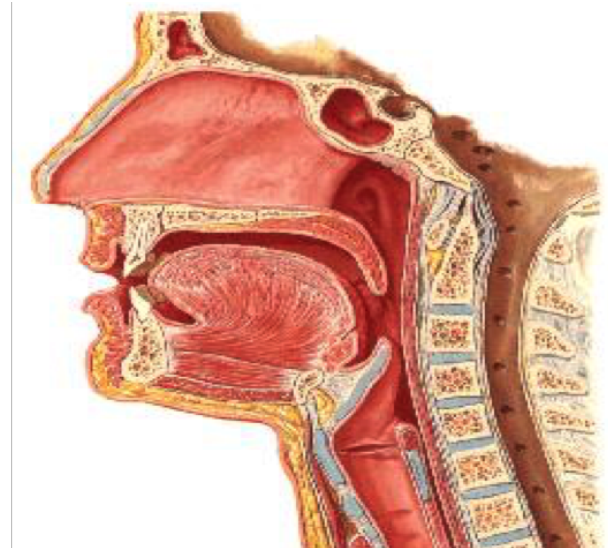
IS a Muscular tube lying **behind** the **nose, oral cavity & larynx**.

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

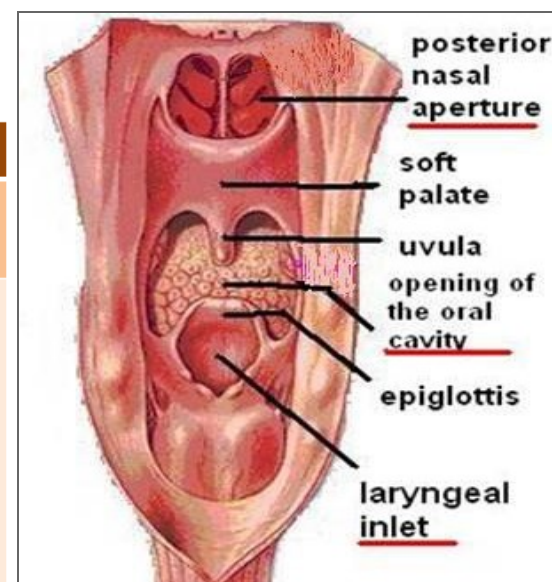
The anterior wall is deficient and shows (from above downward):

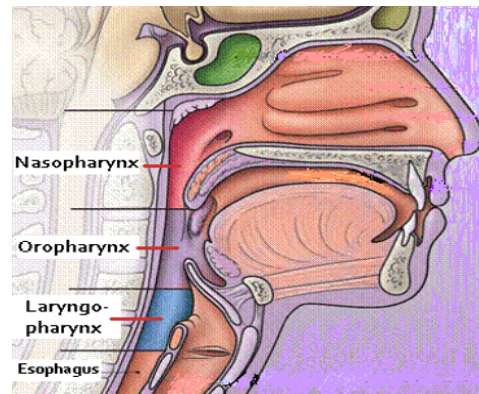
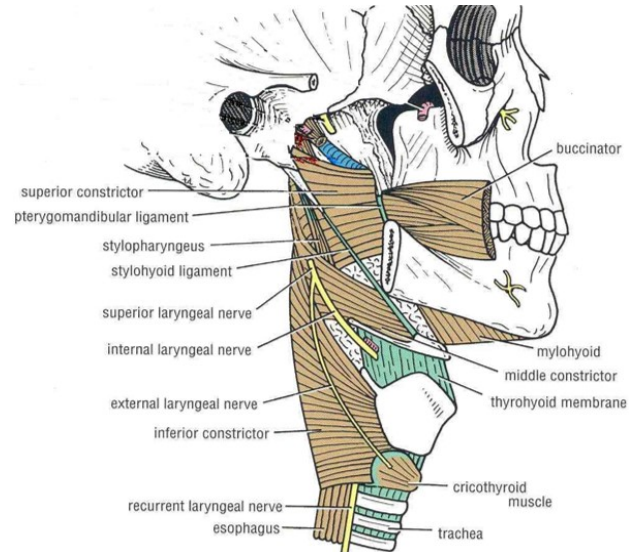
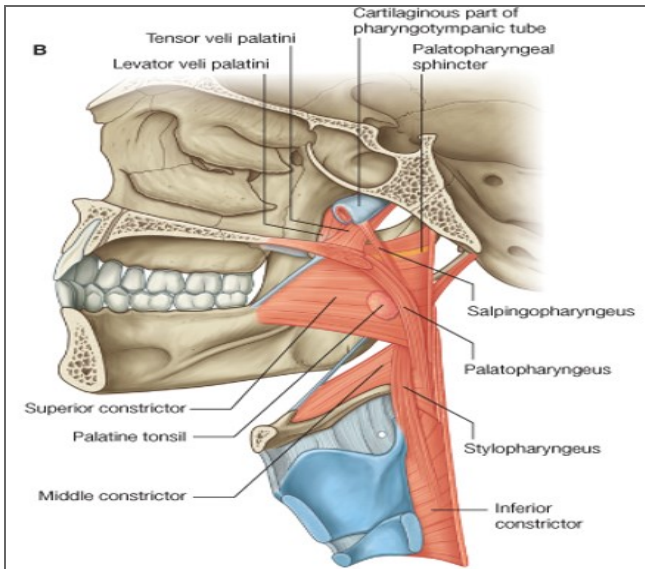
- Posterior nasal apertures.
- Opening of the oral cavity.
- Laryngeal inlet.

The muscles arranged in circular and longitudinal layers:



Circular (Constrictor) Muscles			Longitudinal Muscles		
Superior constrictor	Middle constrictor	Inferior constrictor	Stylopharyngeus	Salpingopharyngeus	Palatopharyngeus
<p>The three muscles overlap each other. Functions: •Propel the bolus of food down into the esophagus. •lower fibers of the inferior constrictor (Cricopharygeus) act as a sphincter, preventing the entry of air into the esophagus between the acts of swallowing.</p>			<p>Function: Elevate the larynx & pharynx during swallowing</p>		





#Pharynx is divided into three parts:

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

Nasopharynx

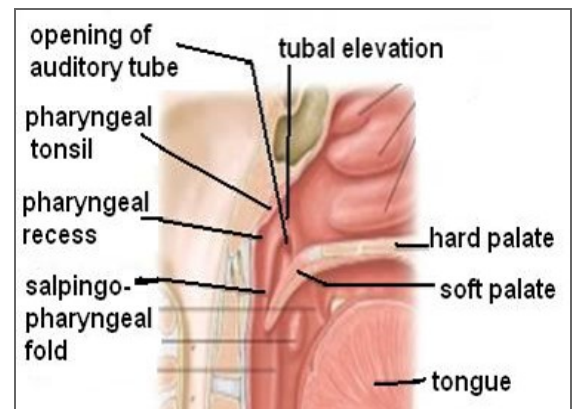
It Extends from the base of skull to the soft palate.

It communicates with the nasal cavity through **posterior nasal apertures**.

Pharyngeal tonsils (adenoids) 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.
- **Salpingopharyngeal fold** (raised by salpingo-pharyngeus muscle).



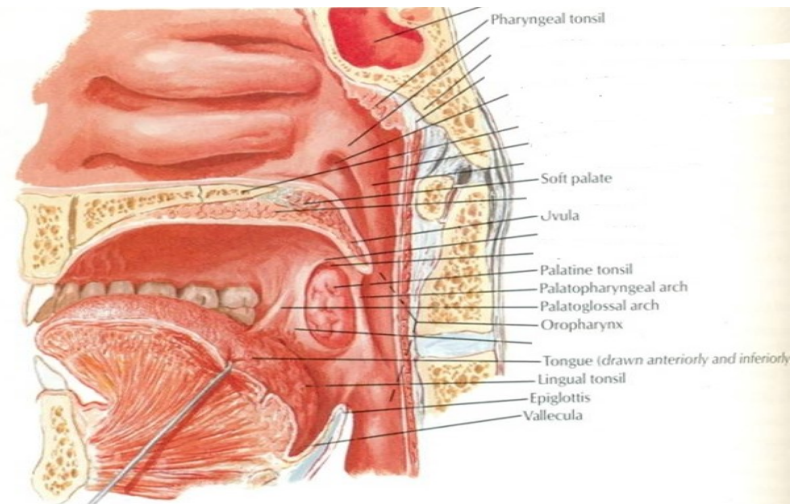
Oropharynx

it 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 and laterally by fibrous tissue (capsule).

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

palatine tonsils Relations:

Anteriorly: palatoglossal arch

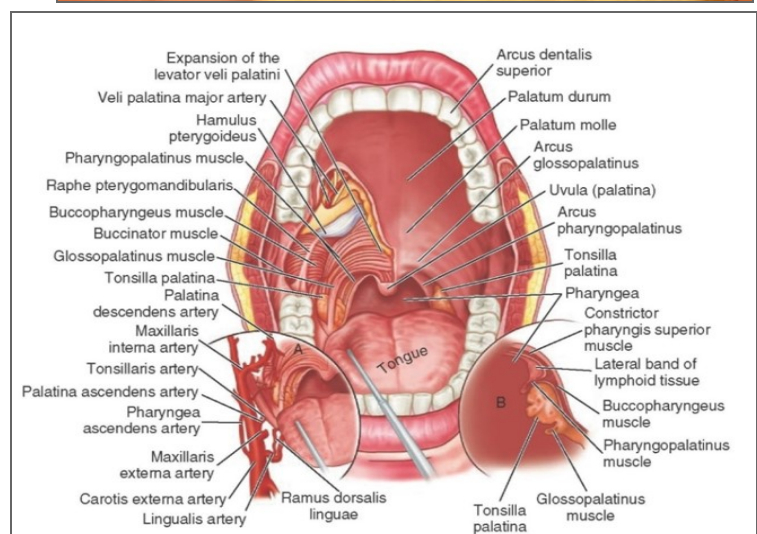
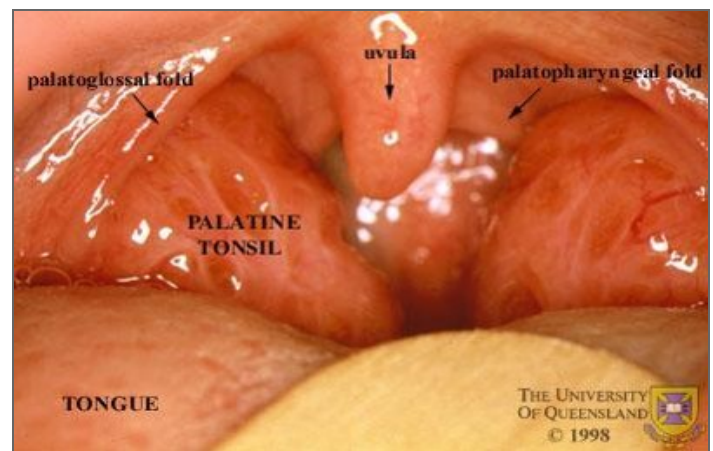
Posteriorly: palatopharyngeal arch

Superiorly: soft palate

Inferiorly: posterior 1/3 of the tongue.

Medially: cavity of the oropharynx

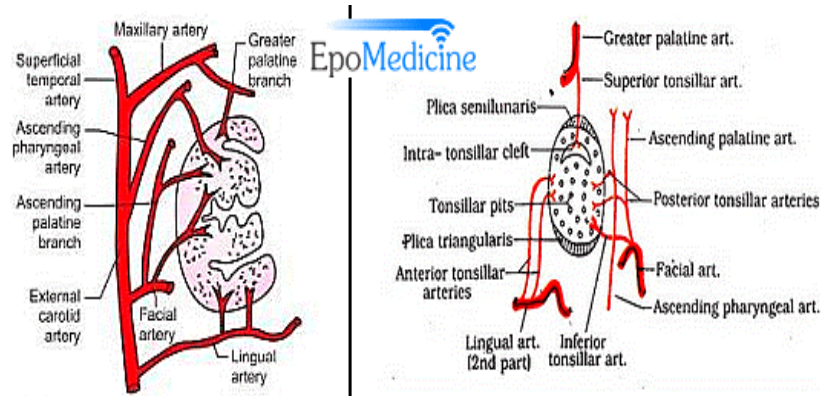
Laterally: superior constrictor of the pharynx separated from it by loose connective tissue through which descends the external palatine vein , loop of the facial artery and, the internal carotid artery which lies behind and lateral to the tonsils.



Arterial supply: tonsillar artery from the facial, lingual and greater palatine.

Venous drainage: join external palatine pharyngeal and fascial veins.

Lymphatic drainage: to the upper deep cervical (**jugulodigastric node**).



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.

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.

Nerve Supply

Sensory:

•Nasopharynx: **Maxillary nerve**

•Oropharynx: **Glossopharyngeal nerve**

•Laryngopharynx: **Vagus nerve**

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

Arterial supply:

from branches of the following arteries:

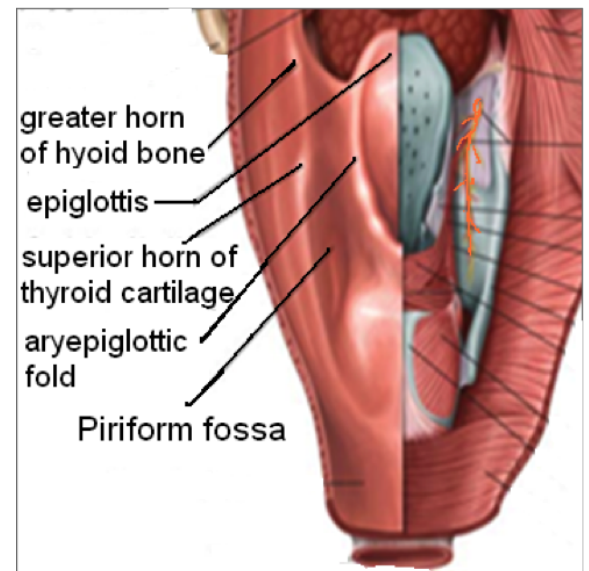
- **Ascending pharyngeal**
- **Ascending palatine**
- **Facial**
- **Maxillary**
- **Lingual**

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

lymphatics:

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

Consistency and patience are key to success !



Summery

Nasal boundaries

Roof: sphenoid(body)+ethmoid plate (cribriform)+frontal bone+nasal bone

medial: septal cartilage + ethmoid plate + vomer

Lateral: Superior(conchae & meatus) + inferior(conchae & meatus) + middle (conchae & meatus) + sphenothmoid recess

Floor: roof of oral cavity.

Nasal nerve, arteries, veins, and lymphs

nerves : olfactory, ophthalmic, maxillary, autonomic fibers

Arteries : facial, ophthalmic, maxillary

veins : facial, ophthalmic, sphenopalatine

lymphs: superior deep cervical lymph nodes, submandibular

sinuses

frontal, ethmoid, sphenoid, maxillary.

pharynx

is a muscular tube starting from skull base and continues to C6 as esophagus and passes behind larynx

divided into : nasopharynx, oropharynx, laryngopharynx

MCQs



A which of the following bone can be found in the roof of nasal cavity :

- 1- vomer
- 2- maxilla
- 3-cribriform plate of ethmoid bone
- 4- perpendicular plate of ethmoid bone

B which of the following meatus receives the nasolacrimal duct

- 1- sphenothmoidal recess
- 2- superior meatus
- 3- middle meatus
- 4- inferior meatus

C which part is for communication between larynx and pharynx

- 1- oral cavity
- 2- laryngeal inlet
- 3-epiglottis
- 4- soft palate

D- The function of circular muscles (constrictor) of pharynx is :

- 1- adduction of vocal cords
- 2- abduction of vocal cords
- 3- propel air down into esophagus
- 4- prevent food enter to respiratory tract

Done By Anatomy Team ^_^

Good luck...

Consistency and patience are key to success !