

# NOSE 1: NOSE ANATOMY

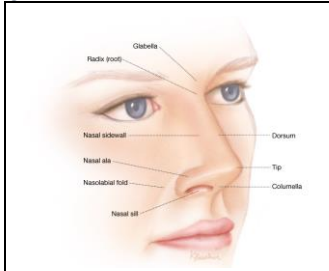
This file contains slides and notes of Dr.Saud Alromeih,,, ENJOY 😊

## External Nose anatomy:

### General overview:

- Pyramidal in shape
- Root is up, and base is down
- Consist of :(skin, Musculature, osteocartilignous, frame work)

### Surface anatomy:

	☒ Dorsum	<b>*INFO for whom interested in rhinoplasty:</b> Ala and columella contribute to form the tip of the nose, in rhinoplasty if we want to make the tip smaller, we excise the sill
	☒ Tip	
	☒ Columella	
	☒ Side walls	
	☒ Ala	
	☒ Sill	

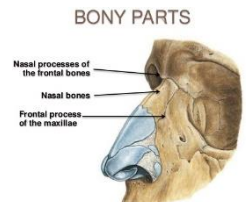
### Skin:

- The skin covers the nasal bones and upper lateral cartilage is thin and freely mobile.
- The skin over the alar cartilages is thick and adherent and contains many sebaceous gland.

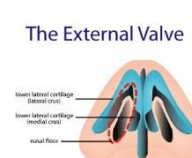
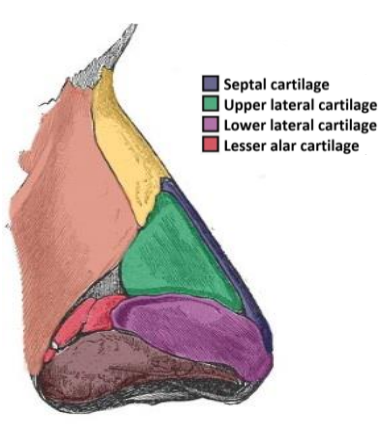
**Osteocartilaginous framework:** upper one third is bony and lower two thirds are cartilaginous.

### →The bony part:

- knowing the nasal bones are extremely important, because if one of them fractured, and u didn't fix it you will end up having deformed nose **محد يبغى شكل خشمه مطعوج, وعلى فكره هي اكثر وحده معرضه للكسر (صمخه باب, طاح على وجهه)**
- What are these bones? Consist of 2 nasal bones that meets in the midline and rest between the frontal bone superiorly **النظاره عليه النظاره** and the **frontal process of the maxillary bone** inferolateral (also the frontal process of the maxilla easily get fractured).



### →The cartilaginous part:

Upper lateral cartilage	Lower lateral cartilage (alar cartilage)	
الدكتور قال ماعليكم من المعلومات هذي - Between the nasal bones and the alar cartilage - Fuses in the midline with septal cartilage - Part of the <u>internal</u> nasal valve	- U- shaped - <u>Medial crus</u> forms the columella and <u>lateral crus</u> forms the ala ( <b>forming the tip of the nose</b> ) - <u>Lateral crus</u> overlaps the upper lateral cartilage on each side.	
<b>Septal cartilage *the most important*</b> - <b>AKA:</b> quadrangular cartilage <b>مهم مهم مهم</b> - <b>Why it's important?</b> <b>support the nasal dorsum and the tip of the nose</b> (if affected u will end up having saddle nose) - separates the 2 nasal cavities. - It's <u>part</u> of nasal septum.	<b>Lesser alar cartilage</b> - AKA sesamoid cartilages - 2 or more small cartilages - Above and lateral to the alar cartilage Interconnected by the adjacent perichondrium and periosteum.	

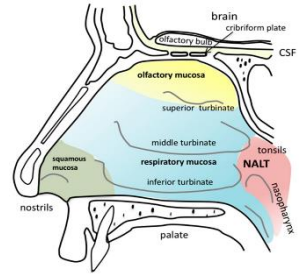
# Internal Nose anatomy:

## General overview:

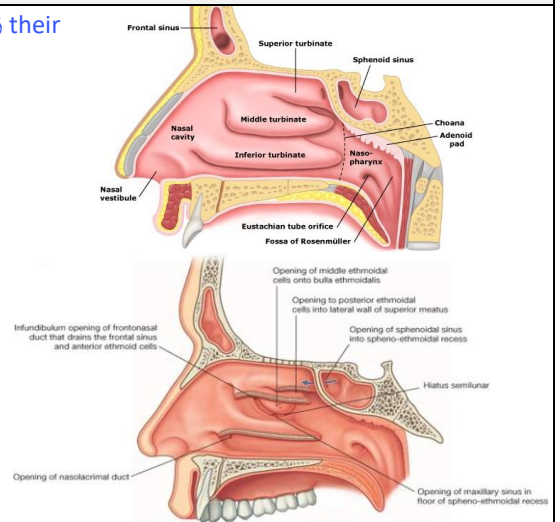
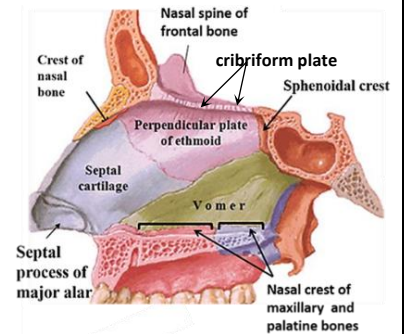
- Divided into 2 nasal cavities by nasal septum.
- Communicates with the exterior through the nostrils(naris) and with the nasopharynx through the choana(posterior nasal aperture)
- Each cavity consists of a skin lined portion called the vestibule and a mucosa lined portion, the nasal cavity proper.

## Lining:

- **Vestibular المدخل:** forms the anterior and inferior part of the nasal cavity, lined by skin (No mucosa!), contains sebaceous gland, hair follicles and hair called **VIBRISAE (EXAM)** خلونا نتفق على شي مهم ألى وهو ان الشعر يكون بس بالمدخل موب جوا الأنف تمام! فلما تيجي انفكشن للبيصيات الشعر (Furuncles) فإنها بس تكون برى بالمدخل لا يمكن تدخل جوا
- **Olfactory region:** upper 1/3 of the nasal cavity contains mucous membrane rich in the neuro-epithelium
- **Respiratory region:** mucous membrane which are highly vascular and contain erectile tissue – lined by pseudostratified ciliated columnar epithelium rich in goblet cells. Submucosa is rich in serous and mucous secreting glands.

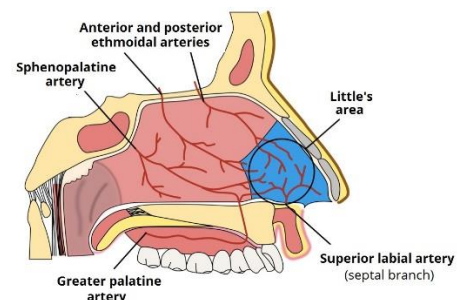


Medial wall	
<ul style="list-style-type: none"> <li>- Formed by the nasal septum</li> <li>- <b>The nasal septum Consists of:</b> <ul style="list-style-type: none"> <li>▪ <b>Perpendicular plate of ethmoid bone</b> مهم مهم مهم</li> <li>▪ <b>Vomer</b> مهم مهم مهم</li> <li>▪ <b>Large quadrangular cartilage(AKA septal cartilage)</b> مهم مهم مهم</li> <li>▪ <b>Minor contribution of:</b> [not imp ماتهمني ابد بس في حال احد استعدلكم] crests of nasal bones, nasal spine of the frontal bone, anterior nasal spine of maxilla, rostrum of the sphenoid bone, crests of the palatine and maxillary bones.</li> </ul> </li> </ul>	
<b>Roof</b>	<b>Floor</b>
formed by the nasal bones, frontal bones, ethmoid(cribriform plate) and sphenoid bones	Formed by the palatine process of the maxilla(anterior ¾) and the palatine bones (posterior ¼)
Lateral wall	
<ul style="list-style-type: none"> <li>- Marked by bony projections called <b>turbinates or chonchae</b> (their زي الستائر نازله ) jobs are to increase the surface area, and protect the sinuses)</li> <li>- Inferior, middle, superior and sometimes supreme turbinates.</li> <li>- Below each turbinates is the corresponding meatus</li> <li>- <b>Nasal Meatus:</b> What are the things that drain in ... meatus? <ul style="list-style-type: none"> <li>▪ <b>Superior meatus:</b> runs in the posterior 1/3 of the nasal cavity – <b>posterior ethmoid cells drain in the superior meatus.</b></li> <li>▪ <b>Middle meatus:</b> runs in the posterior half of the nasal cavity – <b>anterior ethmoid cells, maxillary and frontal sinus drain eventually in the middle meatus.FISS</b></li> <li>▪ <b>Inferior meatus:</b> Runs along the whole length of the nasal cavity – <b>Nasolacrimal duct opens in its anterior part</b> احفظوها صم صم عشان كذا تلاحظين لما تتكلمين ينزل أسود من خشمك, احياناً يجيني مريض مرعوب طلع من خشمه مخاط اخضر فاقع! ولما أسأله القاه قد راح للعيون وحططوا بعينه فوريسن</li> </ul> </li> <li>- <b>Spheno- ethmoid recess:</b> Lies behind superior turbinate – Receives the sphenoid sinus ostium</li> </ul>	



## Blood supply (EXTERMLY IMPORTANT):

- From branches internal and external carotid artery.
- **Little's area:** مهمه مهمه اهم من حياتي
  - Anterior ethmoid artery from ICA
  - Septal branch of superior labial artery from ECA
  - Sphenopalatine artery from ECA
  - Greater palatine artery from ECA



## 2 commonly asked questions in any exam:

- 1)The most common side of nasal bleeding is the little's area because it's very rich in blood supply (4 anastomoses)
- 2)What are these 4 arteries

## Nerve supply:

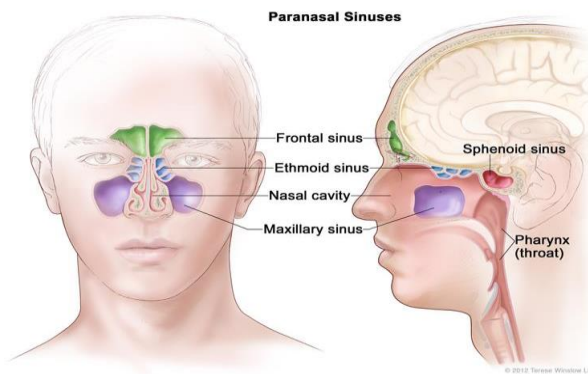
- Olfactory nerve
- Common sensation
- Autonomic supply

Olfactory nerve	Common sensation	
<p>Arranges in 12 – 20 nerves and passes through the cribriform plate and end in the olfactory bulb</p> <p>مره مهم تعرف هالمعلومه بحياتكم, لانه اذا احد انخبط على خشمه ثم صار يشتكي انه مايشم!! هذا معنا الكريبريفورم بليت انكسر! بسرعه إلحقوا عليه لايدخل للبيرن ويجيه منجائيس</p> <p><b>The most common injured CN is olfactory nerve!!!</b></p>	<p><b>مايحتاج تعرفونها</b></p> <ul style="list-style-type: none"> <li>Anterior ethmoidal nerves: anterior and superior part of the nasal cavity</li> <li>Branches of the sphenoidal ganglion: posterior 2/3 of the nasal cavity.</li> <li>Branches of infraorbital nerve: supply the nasal vestibule</li> </ul>	
Autonomic supply		
<p><b>Parasympathetic:</b> comes from the greater superficial petrosal nerve (branch of facial nerve) and travel through the <b>vidian nerve</b>, causes vasodilatation and increases nasal secretions.</p> <p><b>Sympathetic:</b> comes from the DEEP petrosal nerve → join the parasympathetic to form the vidian nerve. causes vasoconstriction and decreases nasal secretions.</p> <p>✧ <b>Just know that the autonomic supply to the nose is vidian nerve (EXAM Q)</b></p>		

## lymphatic drainage: **NOT IMPORTANT** مالها أي قيمة

- **Drains in:** the submandibular lymph nodes, retropharyngeal lymph nodes and upper jugular lymph nodes.

## Paranasal sinuses anatomy:



Sphenoid sinus: <b>*important*</b>	Maxillary sinus:
<ul style="list-style-type: none"> <li>- Occupies the body of the sphenoid bone.</li> <li>- Rarely symmetrical.</li> <li>- <b>Closely related to vital structures!!!:</b> the optic nerve, internal carotid artery, cavernous sinus, V2 and vidian nerve.</li> </ul> <p>شايفين قد ايش حولها تراكيب حيويه!! وهذي للأسف اغلب الجراحين يجيبون فيها العيد اذا بغوا يسون FESS</p>	<ul style="list-style-type: none"> <li>- Largest sinus present at birth.</li> <li>- Occupy the body of the maxillary bone. <ul style="list-style-type: none"> <li>Anterior border is related to the cheek</li> <li>Posteriorly related to the infratemporal and pterygopalatine fossae</li> <li>Medial wall is related to the nasal cavity.</li> <li>Floor is related to palate (related to the teeth (يمكن المريض بحسب الألم الي انتبهوا!!! في حال انشال ضرص العقل بطريقه غير بالمقزلا بسبب اسنانه فيروح لدنتستس ويمكن العكس, انتبهوا!!! في حال انشال ضرص العقل بطريقه غير سليمه وبقي جذور الضرص ممكن ترقق الانفكشن من الضرص للمقزلاي ساينس)</li> <li>Roof is related to <b>orbital floor</b>.</li> </ul> </li> </ul>
Frontal sinus:	Ethmoid sinuses:
<ul style="list-style-type: none"> <li>- Between the anterior and posterior tables of the frontal bone in the supraorbital region.</li> <li>- Varies in size and shape, often lobulated and Asymmetrical.</li> </ul>	<ul style="list-style-type: none"> <li>- Thin walled cavities, 3 – 18 cells.</li> <li>- Present at birth</li> <li>- Anterior and posterior groups.</li> <li>- <b>Bordered by:</b> the medial wall of the orbit, the skull base (imp!!!) and middle and superior turbintes.</li> </ul> <p><b>You might hear about crista galli, what is it? The crista galli is the upper part of the perpendicular plate of the ethmoid bone, which rises above the cribriform plate.</b></p>

# Physiology:

## Nose functions: Respiration, Air conditioning, protection, nasal reflex, vocal resonance and olfaction

### → Respiration:

- **New borns are obligate nasal breather** until age of three months, we learn how to breath from our mouths it's an acquired skill it's not something you were born with.
- Choanal atresia(part of charge syndrome), newborns with choanal atresia keep crying because when they cry they can breathe from their mouths so they cry to breath. suspect choanal atresia in newborns who keep crying!! **it's a life-threatening** situation, how to diagnose it?!!! Suction catheter size 5 مسكّر 5 تدخله لخشمه اذا مشى لحلقه معناه موب مسكّر 5

### → Air conditioning:

- filtration and purification: through vibrissae and mucous secretion
- Temperature: controlled through the large area of highly vascular mucosa which is full of venous sinusoids.
- Humidification: controlled through the thickness of the nasal secretions.

### → Protection:

- Through the mucociliary mechanisms and mucous blanket.
- Enzymes and immunoglobulins: lysozymes, IgA and IgE
- Sneezing: foreign body and irritant materials initiate the sneezing reflex

### → Nasal reflex:

- Sneezing reflex
- Gustatory reflex: salivation when smelling food
- Noso-pulmonary reflex: increased pulmonary resistance associated with nasal obstruction

### → Vocal resonance:

- For phonating the constants M/N/NG