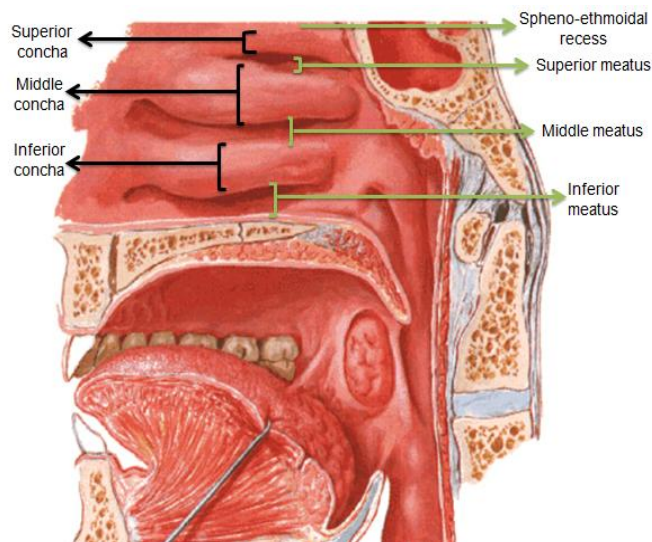




- **Anatomy of nasal cavity and sinuses:**

• **Nasal cavity:**

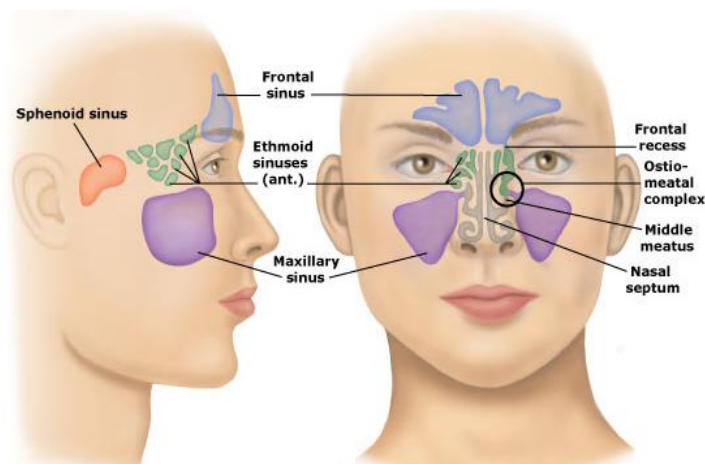
- ✓ It extends from nostrils to nasopharynx. The area between the nasal cavity and the nasopharynx is called: Choanae.
- ✓ Each nasal cavity has a:
  - ❖ *Floor:* consisting of soft and hard palate
  - ❖ *Roof:* olfactory mucosa (olfactory receptors are located at the apex of each nasal cavity).
  - ❖ *Lateral wall:* which has 3 projections know as conchae (superior, middle and inferior) and underlying meatuses (air channels formed by the conchae: sphenothmoidal recess, superior meatus, middle meatus and inferior meatus).
  - ❖ *Medial wall:* that is the nasal septum (separating the nasal cavity into two cavities), septal cartilage, perpendicular plate of ethmoid vomer bones.



- ✓ The nasal cavity is lined by pseudostratified columnar ciliated epithelium.
- ✓ What is the function of cilia? → to get rid of small particles and foreign bodies by moving them into nasopharynx so we swallow them. If there is improper function of cilia (e.g. Kartagener syndrome; cystic fibrosis) → blockage will occur with accumulation of debris, microbes and secretions (this will predispose patient to infection/inflammation and more blockage).

• **Paranasal sinuses:**

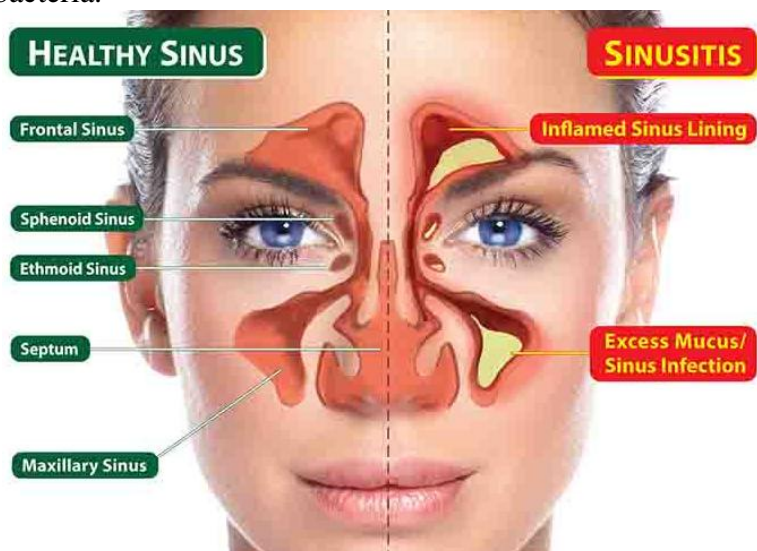
- ✓ The paranasal sinuses are air-containing sacs in the skull bones lined by respiratory mucosa.
- ✓ The frontal, maxillary and anterior ethmoid sinuses drain into the: middle meatus.
- ✓ The sphenoid and posterior ethmoid sinuses open at the: superior meatus.
- ✓ The nasolacrimal duct and Eustachian tube (auditory tube) open into the: inferior meatus.



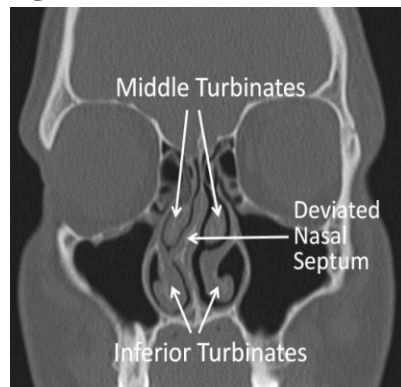


- **Sinusitis:**

- **Definition:** it is the inflammation of paranasal sinuses caused by viruses (most common) or bacteria.



- **What are the causes of sinusitis?**
  - ✓ Infection: rhinogenic (most common), dental origin, from blood (rare!) or by trauma.
  - ✓ Allergy (e.g. allergic rhinitis).
  - ✓ Anatomical obstruction (most commonly due to deviated nasal septum).
  - ✓ Hormonal effect.
- **What are the risk factors predisposing the patient to get sinusitis?**
  - ✓ Upper Respiratory Tract Infections (URTIs) → as viruses are the most common organisms causing sinusitis).
  - ✓ Nasal dryness.
  - ✓ Allergic rhinitis.
  - ✓ Anatomic variations (e.g. CT-scan showing deviated nasal septum).
  - ✓ Immunodeficiency.
  - ✓ Hormonal factors.
  - ✓ Inhalation of irritants.
  - ✓ Mechanical ventilation.



- **What are the clinical features of a patient presenting with sinusitis?**
  - ✓ There are major criteria and minor criteria (notice that presence of 2 major criteria is required for diagnosis of sinusitis OR 1 major + 2 minor criteria):

Major criteria	Minor criteria
<ul style="list-style-type: none"> <li>• Facial pain/ pressure</li> <li>• Nasal obstruction</li> <li>• Hyposmia or anosmia</li> <li>• Presence of purulent nasal discharge and post-nasal drip</li> </ul>	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Headache</li> <li>• Halitosis</li> <li>• Dental pain</li> <li>• Cough (notice that it is considered as a major criteria in pre-school children but not in adults).</li> </ul>

- **Classification of sinusitis depends on DURATION:**
  - ✓ Acute: up to 4 weeks (it is enough to diagnose acute sinusitis with history and examination of the nose. Notice that when patient is not responding to usual treatment and you suspect the presence of complications → CT-scan and other investigations such as nasoscope are required).
  - ✓ Subacute: 4 weeks – 12 weeks (90 days).
  - ✓ Chronic: > 12 weeks.



- ✓ Recurrent acute: which means that patient gets recurrent sinusitis that resolves in less than 4 weeks with patient being normal in periods between the attacks.
- **Usual course of common cold:**
  - ✓ Patient encounter the virus at day 1; clinical features reaching peak at day 3-5; patient recovers by day 6-7. Once this course exceeds 7 days, you have to consider and differentiate this condition from acute bacterial sinusitis thus starting your patient on antibiotics to prevent complications such as: orbital infection or formation of abscess.
  - ✓ Notice that any child presenting with fever  $\geq 38.3$  C for more than 3 days, with purulent rhinorrhea and being sick → must be started on ANTIBIOTICS.
- **Remember that:**
  - ✓ Ethmoid sinus is present since birth and has a thin separation from the eyes known as (lamina papyracea).



- ✓ Frontal and sphenoid sinuses are not found after birth until the age of 6-8 years.
- **Management:**
  - ✓ Most common bacterial organisms causing sinusitis are:
    - ❖ S.pneumoniae.
    - ❖ H.influenzae.
    - ❖ Morexella catarrhalis.Therefore, amoxicillin + clavulanic acid is given (if it is given in proper dose 40 mg/kg and proper duration 10 days-2 weeks → it is going to cover H.influenzae and Morexella catarrhalis).
  - ✓ If patient is not responding to this usual treatment, double the dose to 90 mg/kg or give him a 2<sup>nd</sup> generation cephalosporin.
  - ✓ If patient has allergy to penicillin/cephalosporin, administer him a macrolide such as clarithromycin.
  - ✓ You might also prescribe decongestants to the patient (e.g. Otirvin) but it must only be used for 5 days to avoid rhonirrhea medicamentosa.
  - ✓ Patient is advised to wash the nose with normal saline thus enhancing the movement of cilia and allowing decongestants to work by removing the blockage.
  - ✓ If patient has chronic sinusitis:
    - ❖ You must address the cause by further investigations such as CT-scan or nasoscope (e.g. deviated nasal septum).
    - ❖ If the problem is anatomical or masses are present → surgery is your primary option.
    - ❖ Otherwise, surgery is kept as the last option after failure of maximum medical management with long-term antibiotics and topical/systemic steroids.