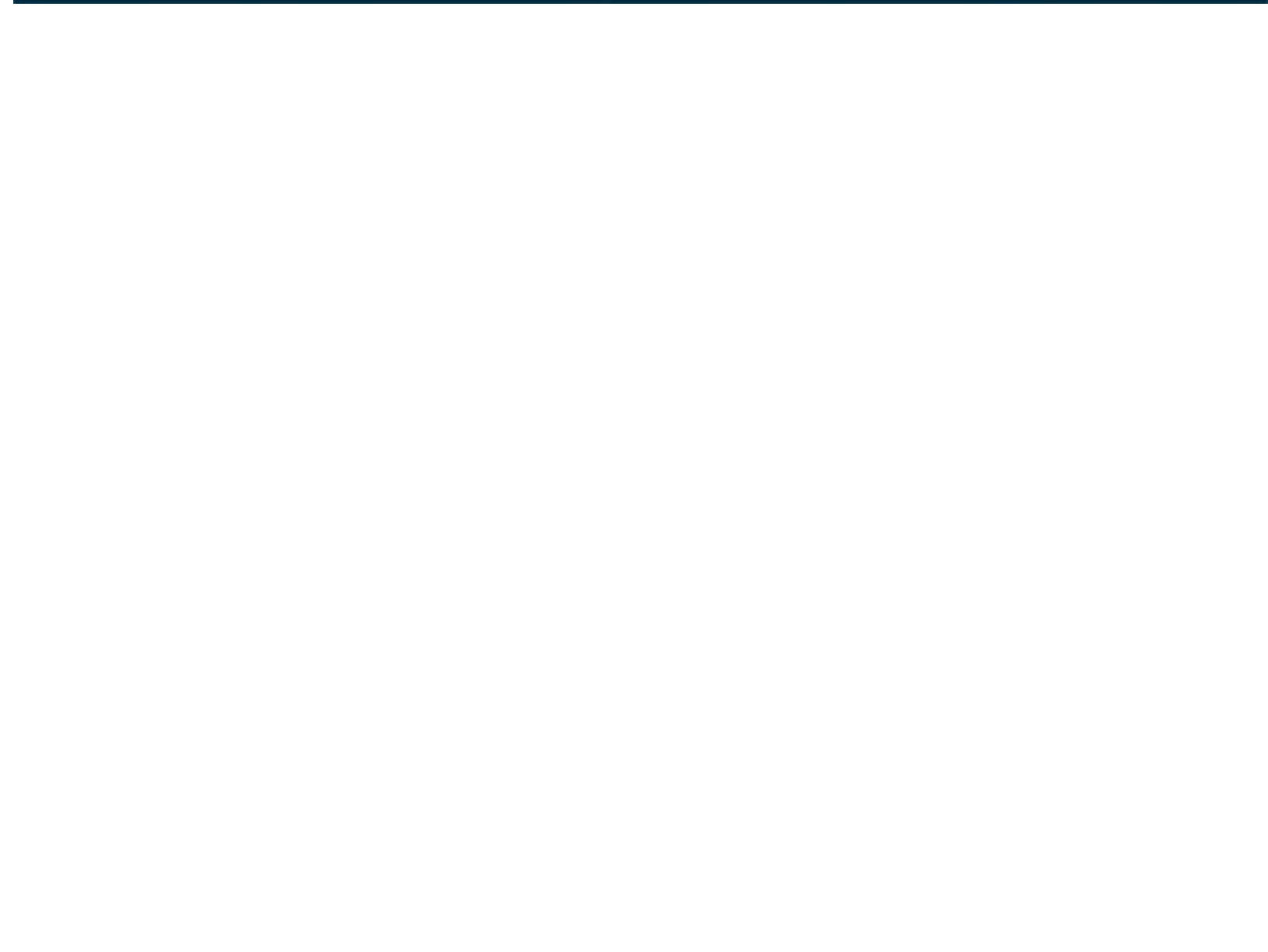


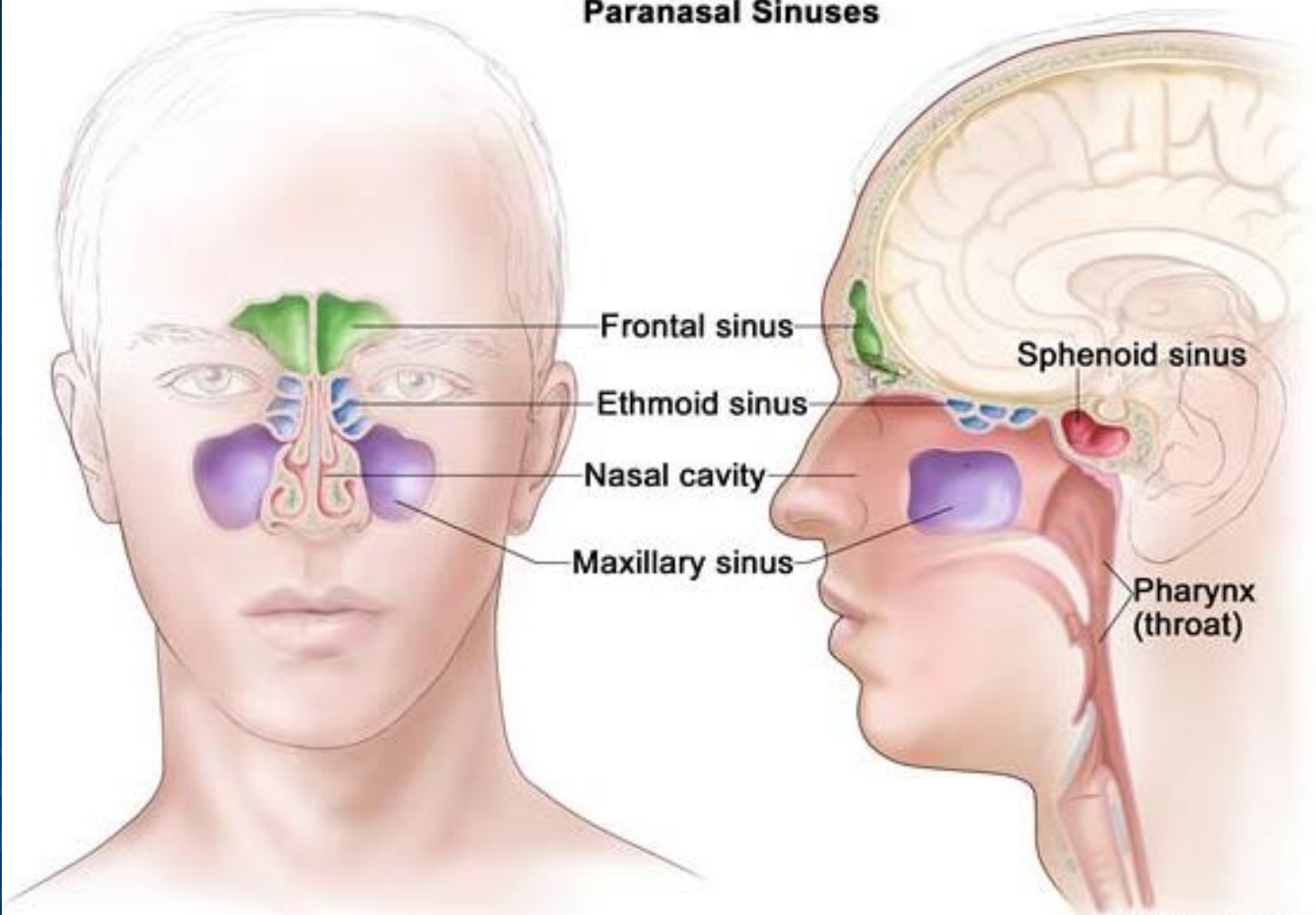
# Rhinosinusitis

**Tareq Mahafza**

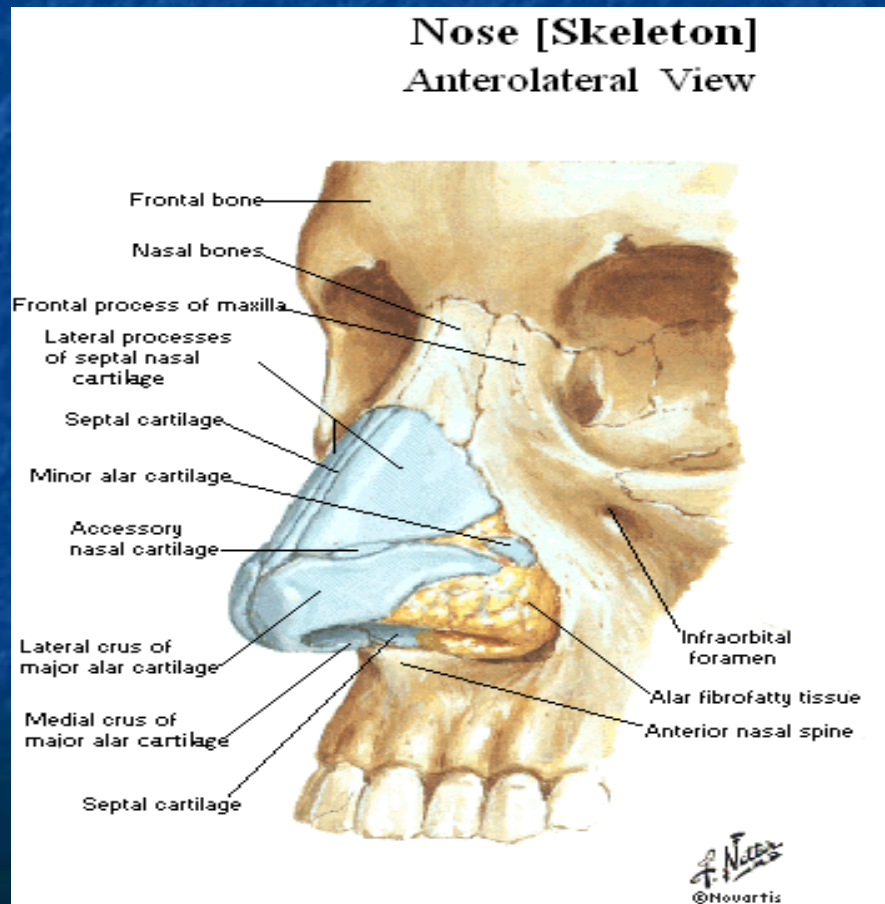
**Professor of Otolaryngology,  
University of Jordan**



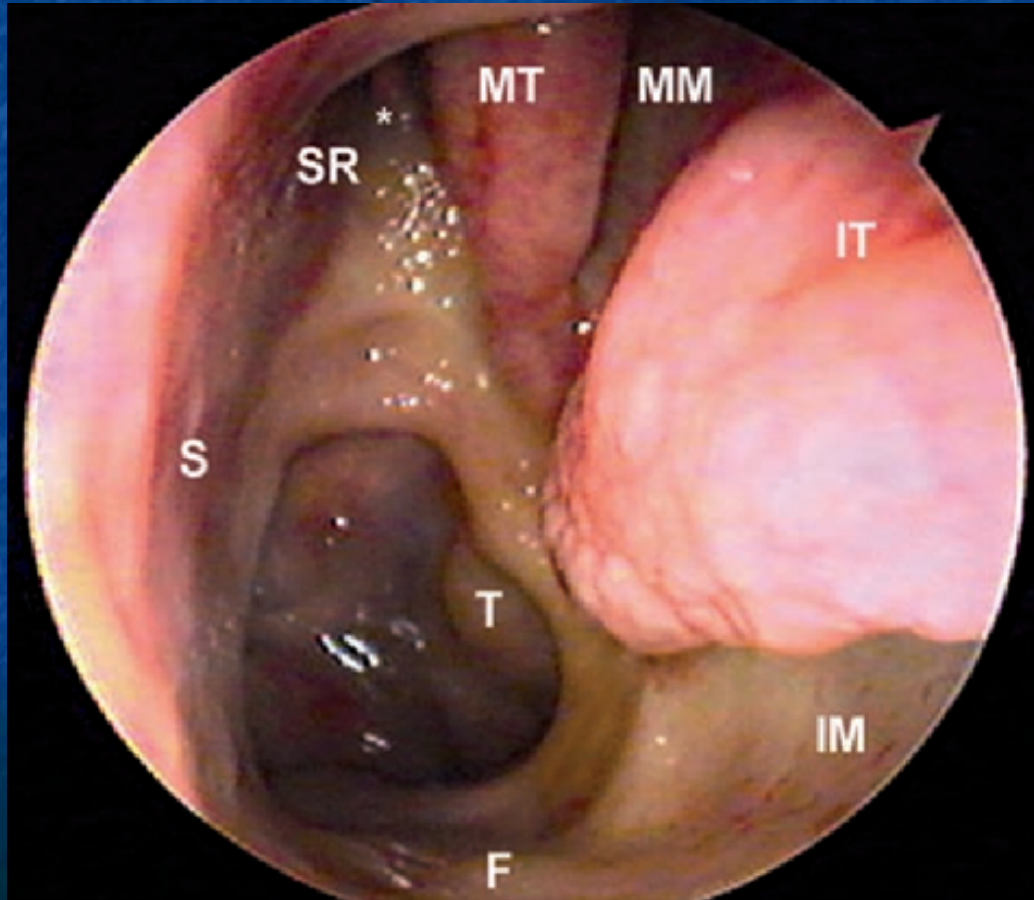
## Paranasal Sinuses



# Anatomy of External Nose

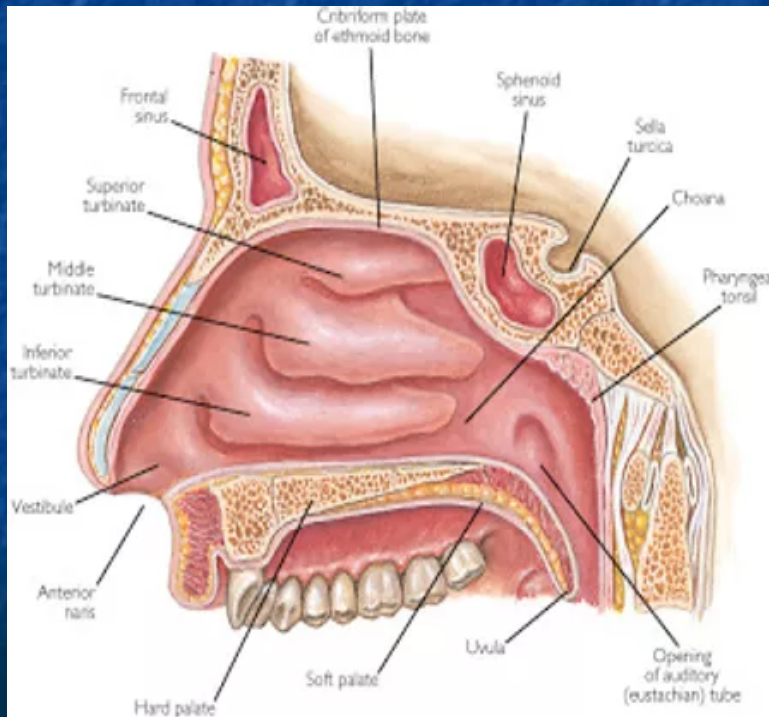


# Posterior opening of the nose (choana)

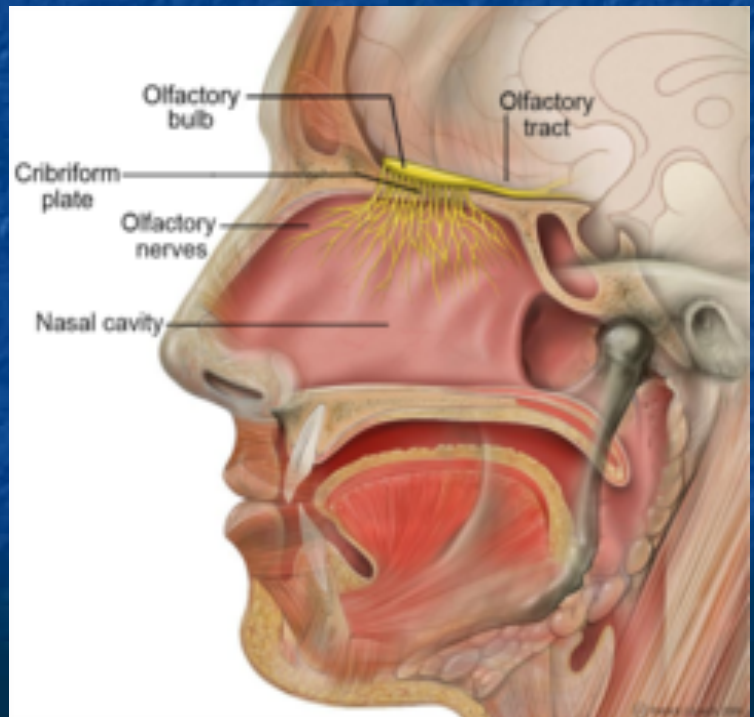


# Nasal Anatomy

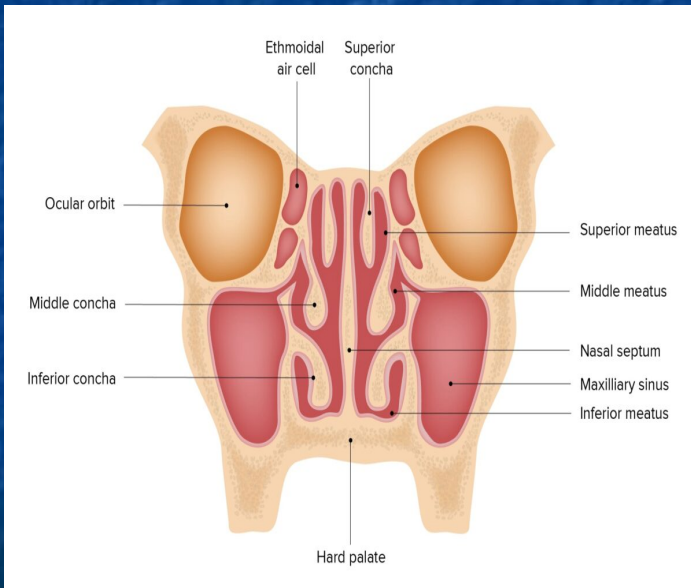
## Lateral wall



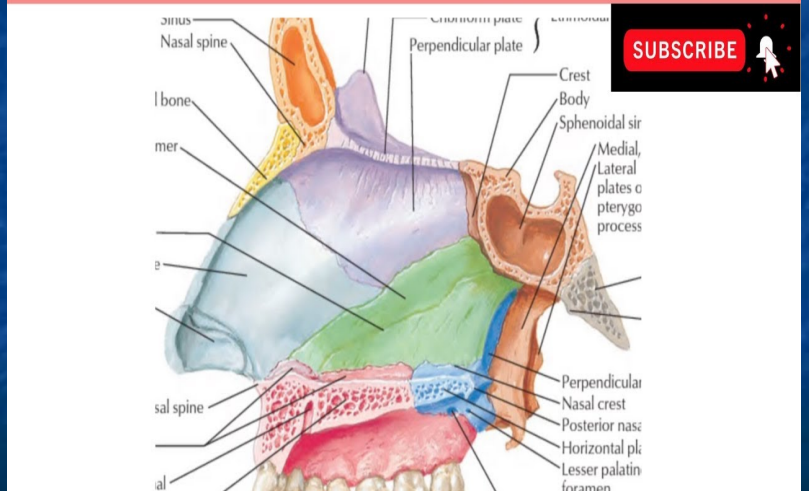
## Medial wall



# Medial wall (nasal septum)



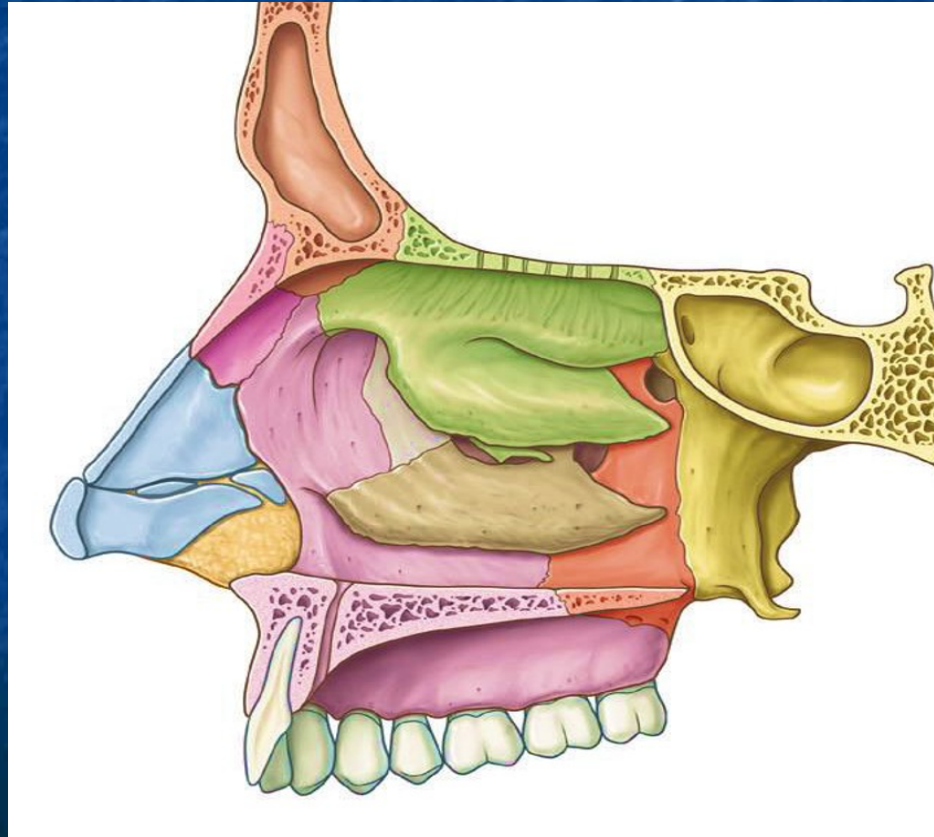
## Medial Wall of Nasal Cavity / Nasal Septum



SUBSCRIBE

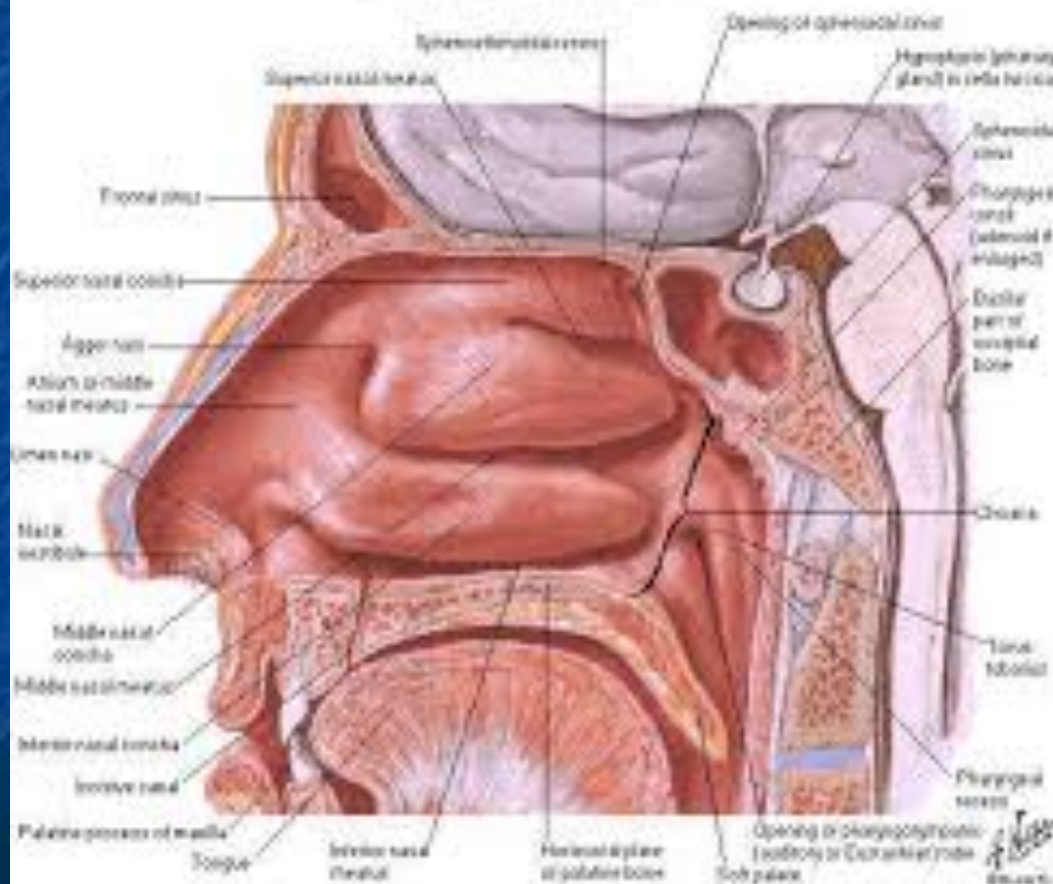


# Lateral wall of the nose



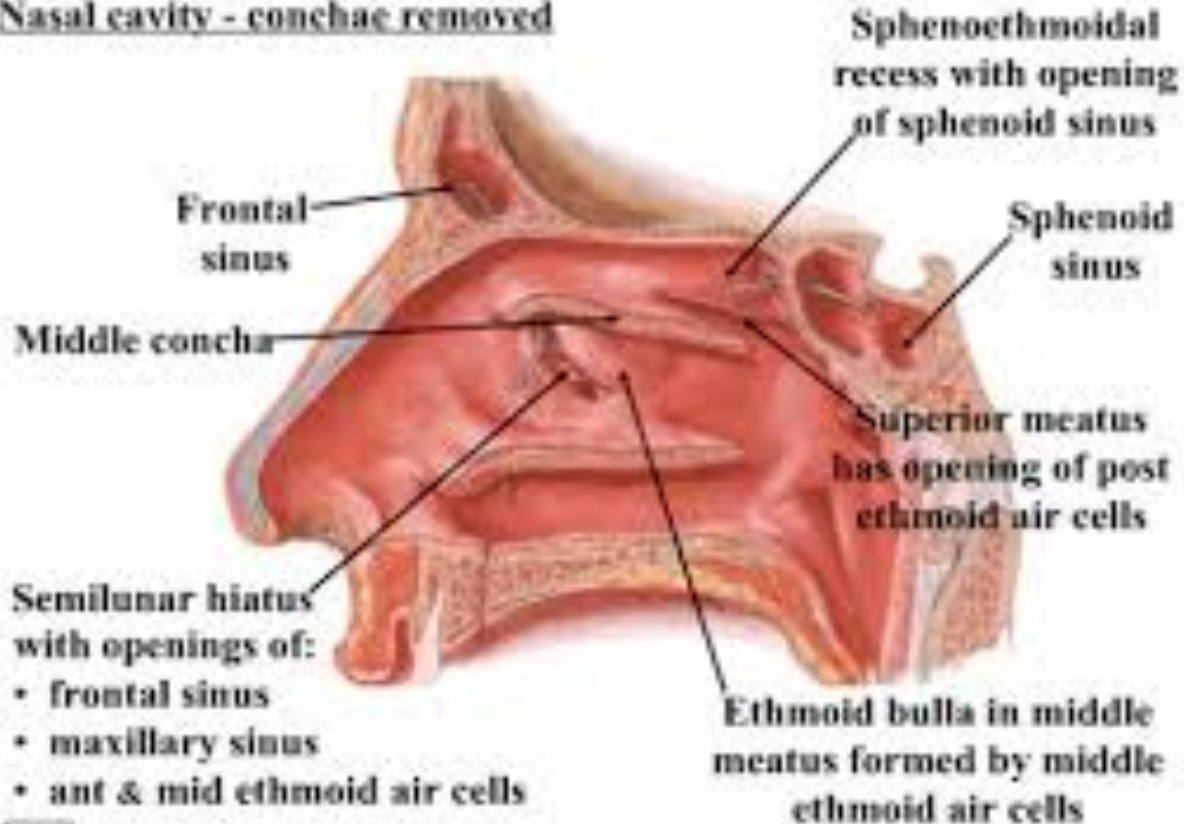


## Lateral Nasal Wall

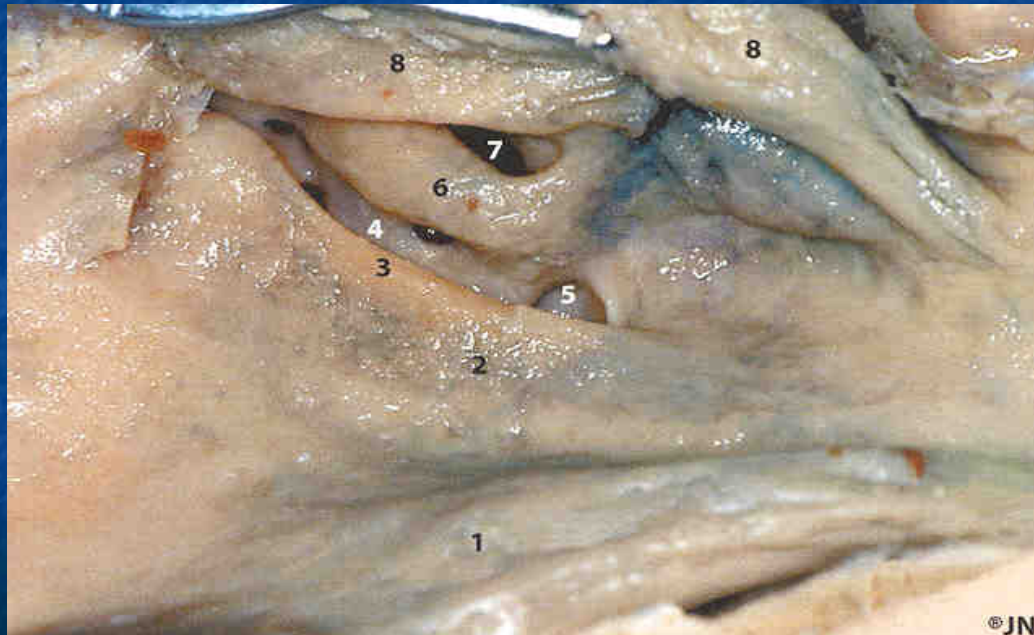


# Drainage of sinuses

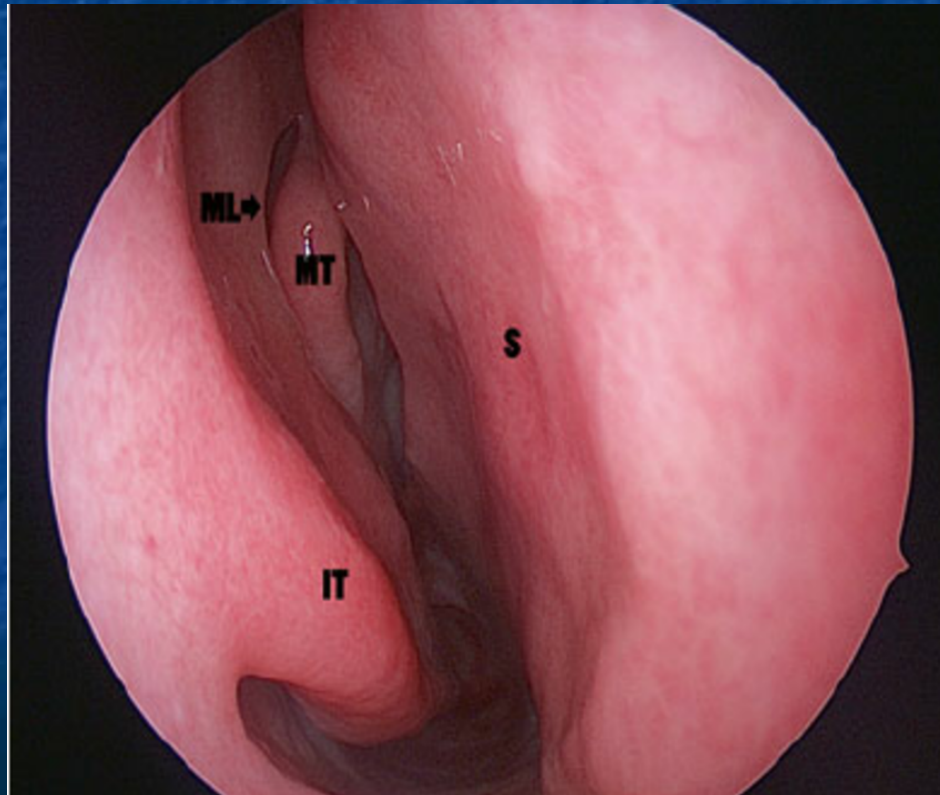
Nasal cavity - conchae removed



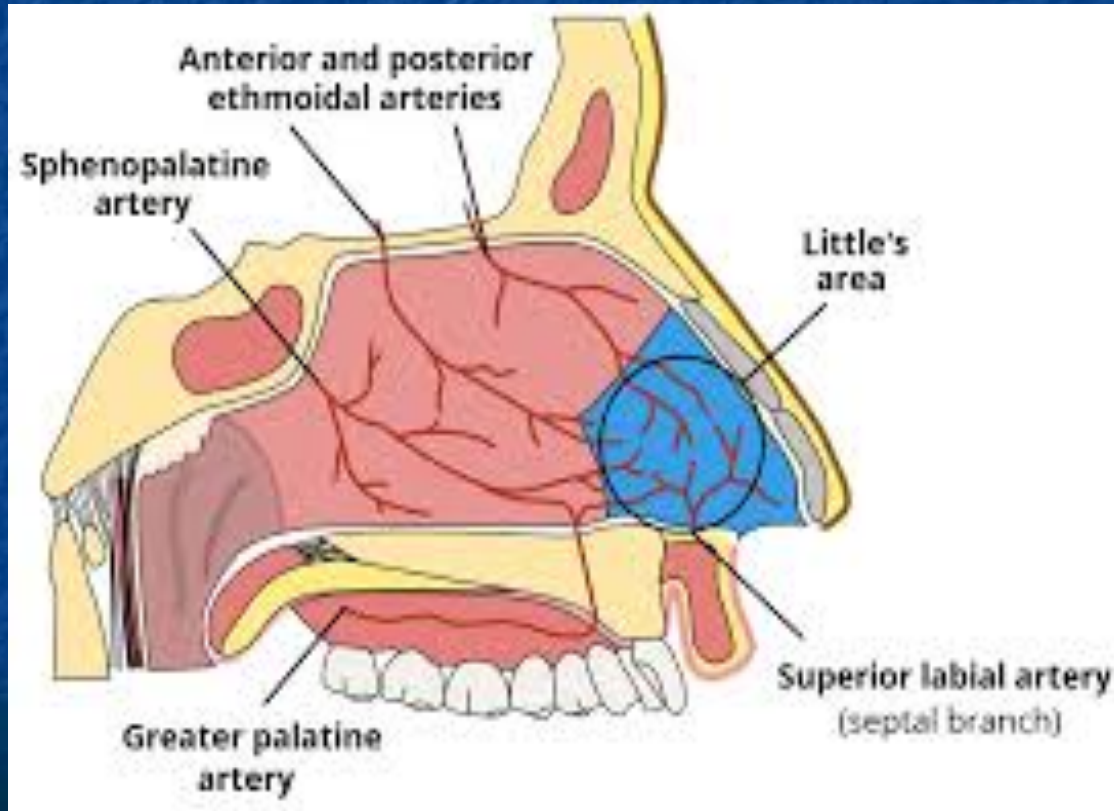
# Cadaveric view of sinuses drainage into middle meatus



# Endoscopic view of normal nasal cavity



# Nasal blood supply



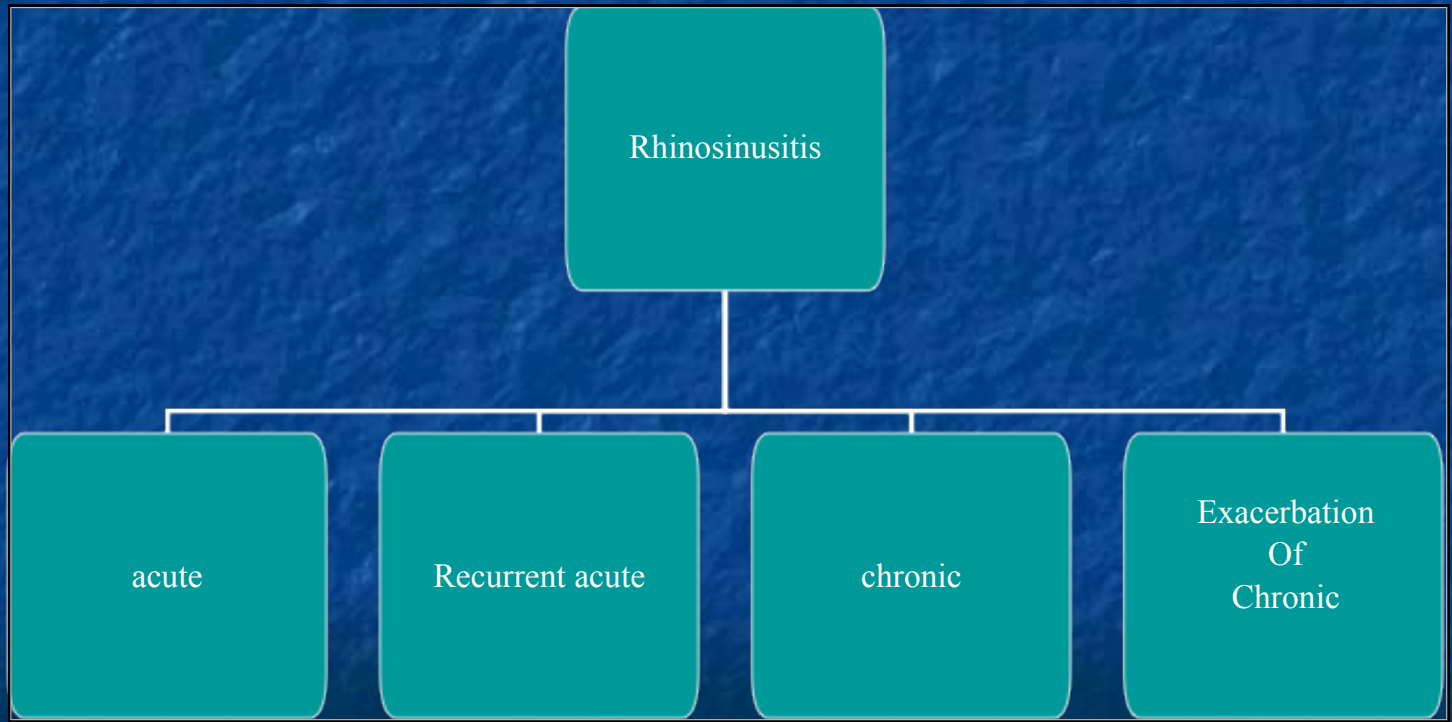
# Functions of the nose

- Breathing
- Air conditioning of inspired air
- Protection of lower airway
- Ventilation and drainage of p.n.s
- Olfaction
- Nasal resistance
- Vocal resonance

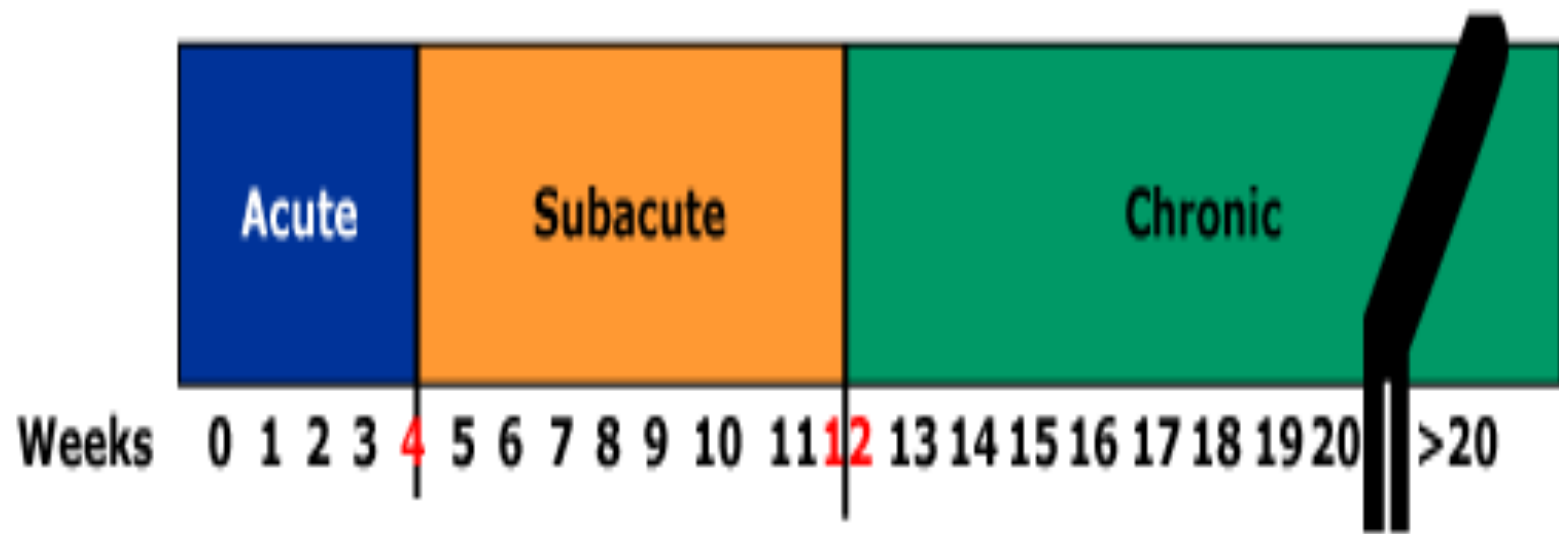
## **Physiological functions of the sinuses :**

- vocal resonance
- air conditioning
- pressure damper
- reduction of skull weight
- flotation of skull in water
- mechanical rigidity
- heat insulation.

# Classification of Rhinosinusitis





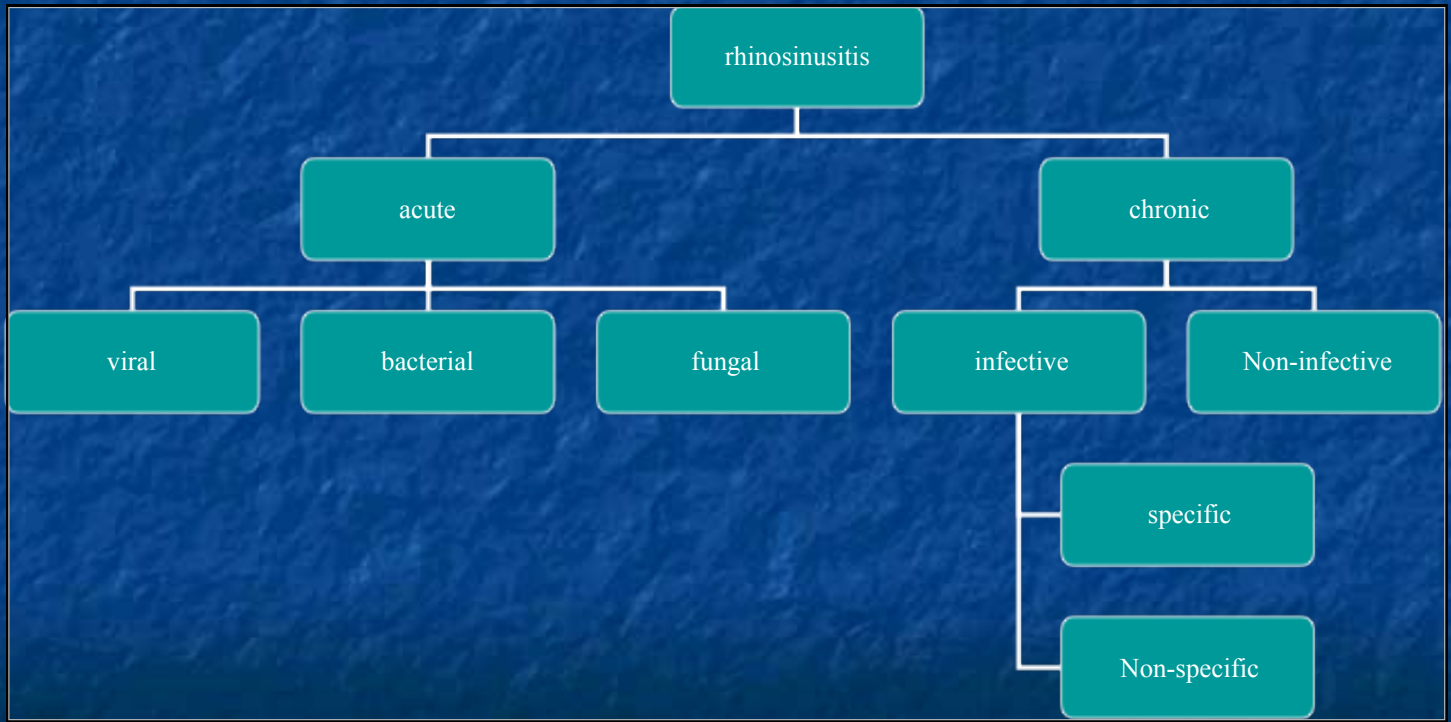


**Acute:** less than four weeks duration

**Subacute:** 4 to 12 weeks duration

**Chronic:** greater than 12 weeks duration

# Classification



# Acute Rhinosinusitis

- It is an acute inflammation of the mucous membranes of the nose and paranasal sinuses, which is lasting less than 3 months.

# epidemiology

- Upper respiratory tract infection (URTI) is the most common acute illness of the human being
- URTI composed of acute rhinosinusitis and acute pharyngitis
- In average young adult has 3-4 attacks of URTI each year, more in infants and less in old age groups

# Etiology

- **Viral agents:** rhinovirus, adenovirus, corona virus, respiratory syncytial virus, influenza virus, Para-influenza virus
- **Bacteria:** strep pneumonia, hemophilus influenza, Moraxella catarrhalis, staphylococcus and streptococcus pyogenes
- **Fungi:** aspergillus and Candida

# Acute Viral rhinosinusitis

- Clinical picture:
- Local symptoms; nasal blockage, sneezing, mucoid rhinorrhea, hyposmia, dull aching pain
- General symptoms; fever, headaches, anorexia, malaise, sore throat
- Signs; red swollen mucosa, hypersecretion

- **Diagnosis;** (clinical) no need for investigation
- **Treatment (supportive):**
  - pain killers
  - decongestants
  - adequate hydration
  - bed rest

# Acute Bacterial Rhinosinusitis (ABRS)

- 0.5-2% of viral rhinosinusitis is complicated by bacterial infection
- It is one of the most common condition encountered by primary care physician
- it is one of the most frequent reasons for antibiotic prescription



# Acute Bacterial Rhinosinusitis

- **Suspected if:**
- Rhinosinusitis persists longer than 7 days
- After 5 days symptoms got worse
- Changes in the character of disease ( - Fever very high, Nasal discharge becomes purulent, and pain becomes more intense and localized)
- \* Sinus puncture with aspiration of purulent secretions is considered the gold standard for diagnosis of **ABRS.**

# Clinical picture

- **Symptoms:**

mucopurulent nasal discharge, nasal obstruction,  
anosmia,

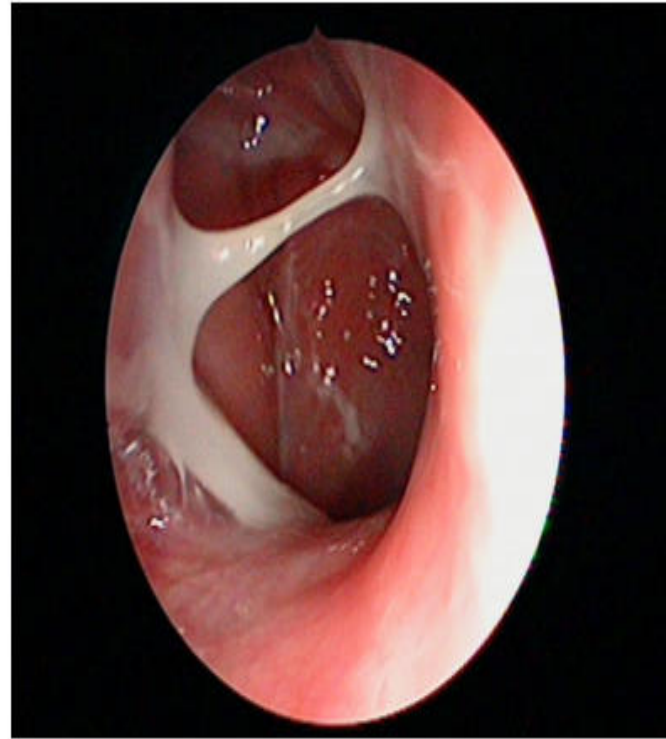
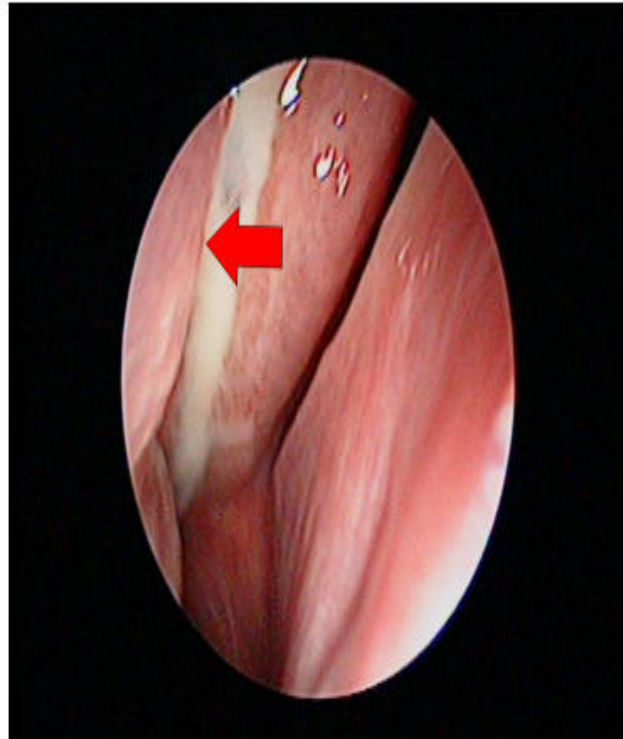
facial pain, dental pain, postnasal drip

General symptoms:

fever, malaise, anorexia, headaches

- **Signs:**

red swollen nasal mucosa with yellowish nasal discharge



Acute rhinosinusitis: an endoscopic view of the nose showing yellowish pus draining from one of the sinuses (*left picture*) and into the throat (*right picture*).

© Vincent Tan ENT

# Diagnosis

- **History**
- **Clinical examination**
- **Investigations:**
  - plain X-Ray**
  - laboratory**
  - Culture swabs**
  - Endoscopy**

# Plain X-ray vs CT- scan



# Treatment of Acute Bacterial Rhinosinusitis

- Antibiotics
- Analgesics/Antipyretics
- Decongestants
- Nasal douches with saline
- Bed rest

# Antibiotic therapy

- It is proved that antibiotic therapy is significantly more effective than placebo.
- More resistant forms of *Strep.pneumoniae* to penicillins are encountered yearly.
- To decrease resistant forms of microorganisms proper selection of antibiotics and postpone using the antibiotics , to which resistance occurred.

# Antibiotics

- First line treatment is by amoxicillin with clavulanic acid or second generation cephalosporin's
- Quinolones are the second choice
- If patient allergic to penicillin the alternative is erythromycin group
- Proper dose with a duration of 5-10 days



# Analgesics

- Analgesics are the corner stone of the treatment.
- Initial analgesics are the simple with adequate doses.
- Occasionally opiates (narcotics) are needed.

# Topical Decongestants:

- Phenylephrine:

- 0.125, 0.25, 0.5%, 1%

- Ephedrine:

- 0.25%

- Oxymetazoline:

- 0.5%

- **ADDICTION** with repeated use >7 days  
causing Rhinitis Medicamentosum

# Complications of rhinosinusitis

- Orbital: cellulites, abscess
- Aural: otitis media
- Facial: osteomyelitis, cellulites
- Intracranial: meningitis, cavernous sinus thrombosis
- Lower airways: laryngitis, bronchitis, pneumonia.

# Orbital Complications



# Cavernous Sinus Thrombosis



# Chronic Infective Rhinosinusitis(CRS)

- It is a chronic inflammatory process of the mucoperiosteal lining of the nose and paranasal sinuses which is lasting more than 12 weeks. *3 months*
- It is a heterogenous disease

# Epidemiology

- **Affects 14% of the adults**
- **Top 5 diagnosis associated with loss of productivity**
- **Patients with CRS have bad quality of life**
- **Very often CRS is associated with other co-morbid conditions; bronchial asthma, eczema, otitis media ....**
- **Improvement of patients with CRS will improve these conditions.**

# Predisposing Factors In Chronic rhinosinusitis (CRS)

- Septal deviation
- Large bulla ethmoidalis
- Paradoxically bent M. turbinate
- **Large Uncinate process**
- Polyps
- Allergies
- Tumors
- Cystic fibrosis
- Ciliary dyskinesia
- Trauma
- Dental infections
- Prolonged intubation



# Etiology of Chronic Rhinosinusitis

- Coagulase negative Staphylococci 50%
- Staph. Aureus 20%
- Streptococci Species 10-15%
- G(-) bacilli 5-10%
- Anaerobes 5-10%
- pseudomons
- Others

# Pathogenesis of CRS

- Causative factors (infective agents, trauma...) → damage to the cilia → decreased Ciliary functions → stagnation leads to further damage to the cilia → further stagnation with the presence of mentioned predisposing factors → vicious circle → irreversible damage CRS.
- CRS is a proliferative process remarkable for thickening of the mucosa and lamina propria, which is heavily infiltrated by eosinophils

# Clinical picture

- Symptoms:

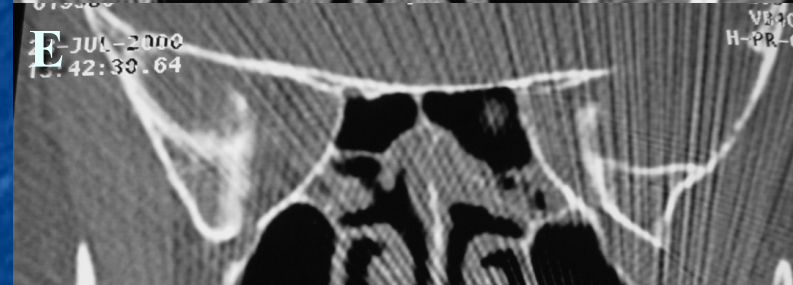
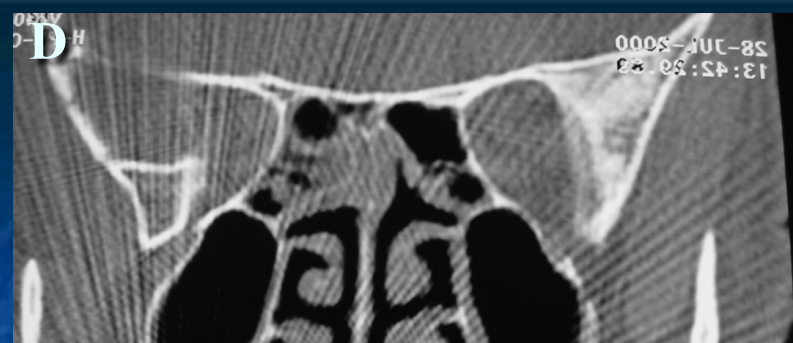
Purulent discharge, nasal obstruction, postnasal drip, hyposmia, headaches, halitosis, dental pain, malaise, cough, chronic sore throat,

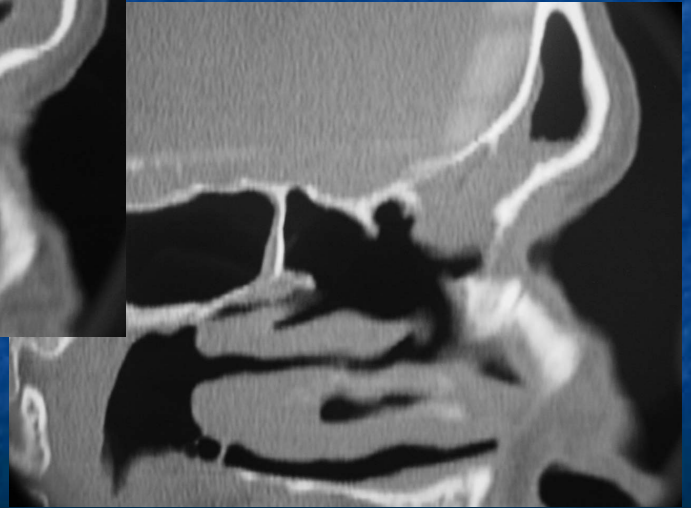
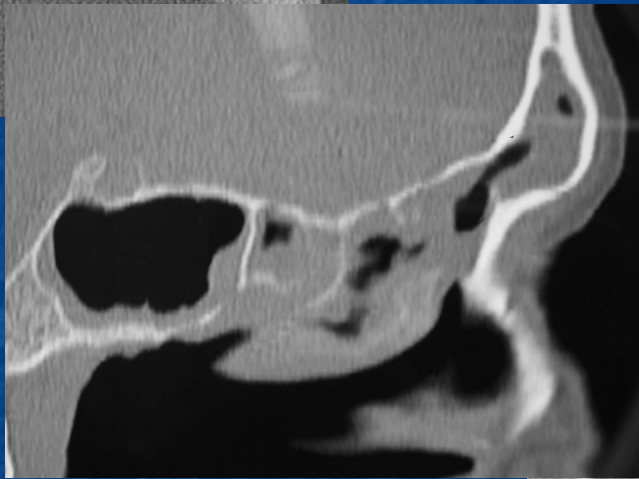
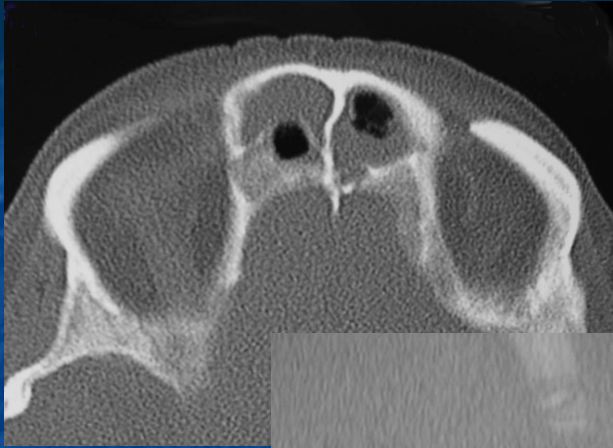
- Signs:

redness, discharge, swelling mainly over the osteomeatal complex.

# Diagnosis

- History
- Physical examination
- Investigations: Laboratory?, Radiological, Endoscopic, Culture
- The corner stone is CT scan and endoscopy.





# Treatment

- Medical :  
Antibiotics, decongestants, topical steroids,  
mucolytics, humidification, saline spray, steam,  
herbal medicine
- \* In children with refractory chronic rhinosinusitis IV  
antibiotic therapy gave a 100% improvement and  
77% excellent long term results.
- Surgical :  
conservative, old conventional, modern functional  
endoscopic sinus surgery (FESS).

# Antibiotics

- First-line
  - High dose of amoxicillin-clavulanate for 4-6 weeks  
or
  - cephalosporin second-or third-generation
- Second-line
  - respiratory quinolones
    - levofloxacin, ciprofloxin, gatifloxacin, and moxifloxacin



# Topical corticosteroids

- Improve patency of the ostiomeatal complex
  - reduction in mucosal swelling
- Inhibit both immediate and late-phase reactions to antigenic stimulation (After 7 days of treatment)
- 90% of patients with allergic rhinitis will experience improvement

# Other medications

Mucolytics,  
humidification,  
saline spray,  
steam,  
herbal medicine

# Surgical Management

## \* Treatment of predisposing factors

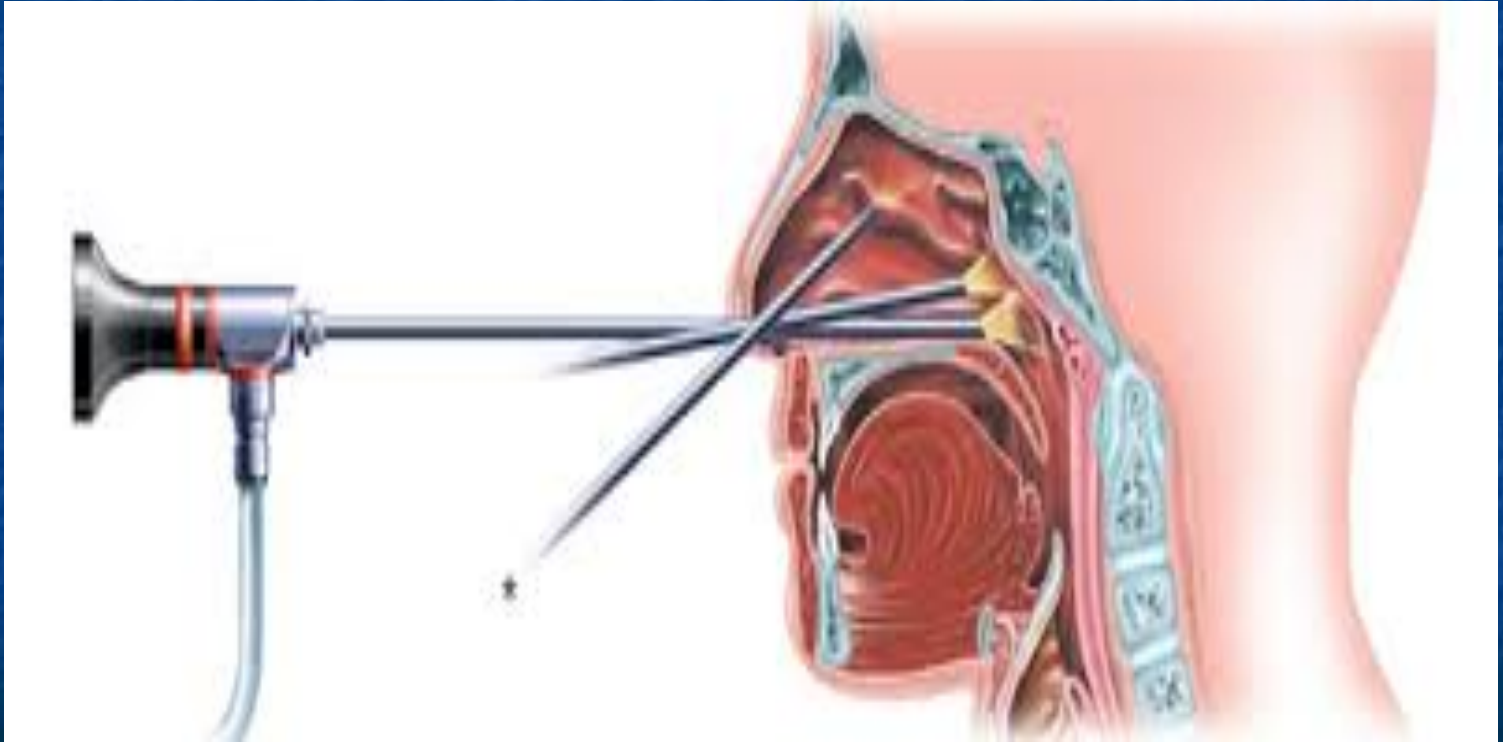
### \* Old Conventional surgeries:

- Caldwell-Luc, sphenoidectomy  
internal and external ethmoidectomies  
frontal osteoblastic flap. BAWO, Inferior antrostomy

### \* **Functional Endoscopic sinus surgery (FESS)**

- good results : 71% normal at one year, meta analysis 89% success with 0.6% complications

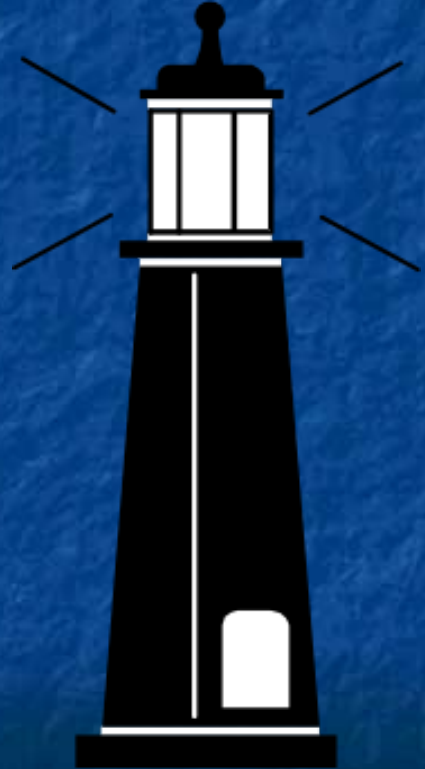
# Functional Endoscopic Sinus Surgery (FESS)



# Indications for specialist consultation

- / At least 3 yearly recurrences of adequately diagnosed and treated maxillary sinusitis
- / Paediatric maxillary sinusitis lasting more than 3 months
- / Resistant or rare pathogen
- / Intense symptoms
- / Suspected complication, e.g. periorbital or facial oedema, septic fever
- / Diagnosed or suspected immunodeficiency
- / Unusual radiological finding, e.g. bony erosion
- / Tissue fragments in sinus puncture

Questions?





Thank you for  
your attention !!

