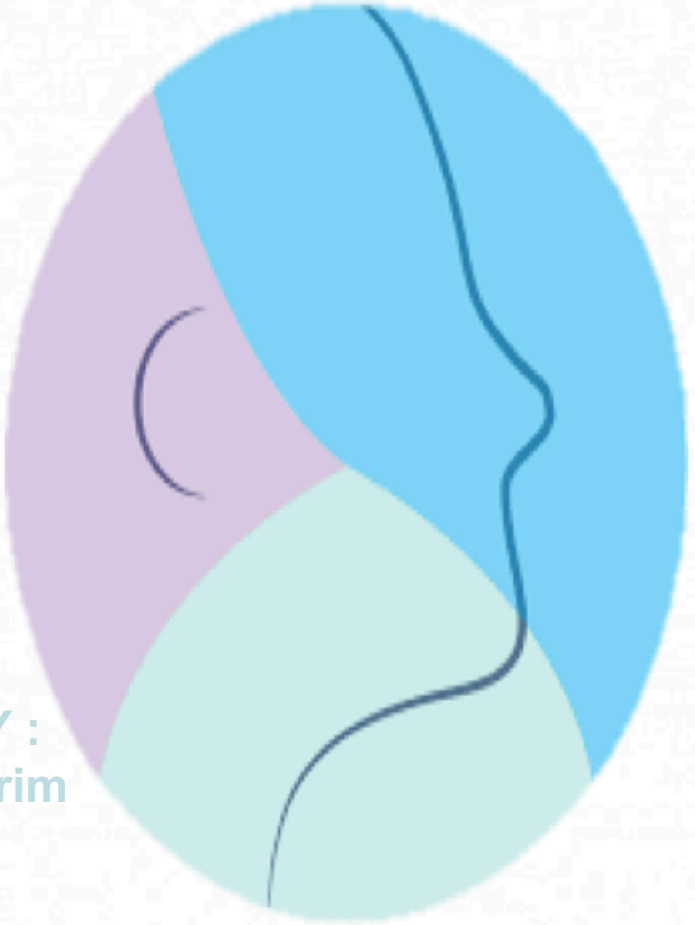
Upper Respiratory Tract Diseases

Supervised by: Dr. Haytham Alsaif



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5 months ago …..

At the pharmacy

Objectives

Rhinosinusitis, Pharyngitis, and Otitis Media:

- Etiology
- Risk factors
- Relevant microbiology & virology
- Important of historical clues and clinical findings
- How to differentiate between viral & bacterial etiology
- Diagnostic tests and imaging
- Management (symptomatic, antibiotic choice, antiviral therapy)
- Prevention and complications

Allergic Rhinitis:

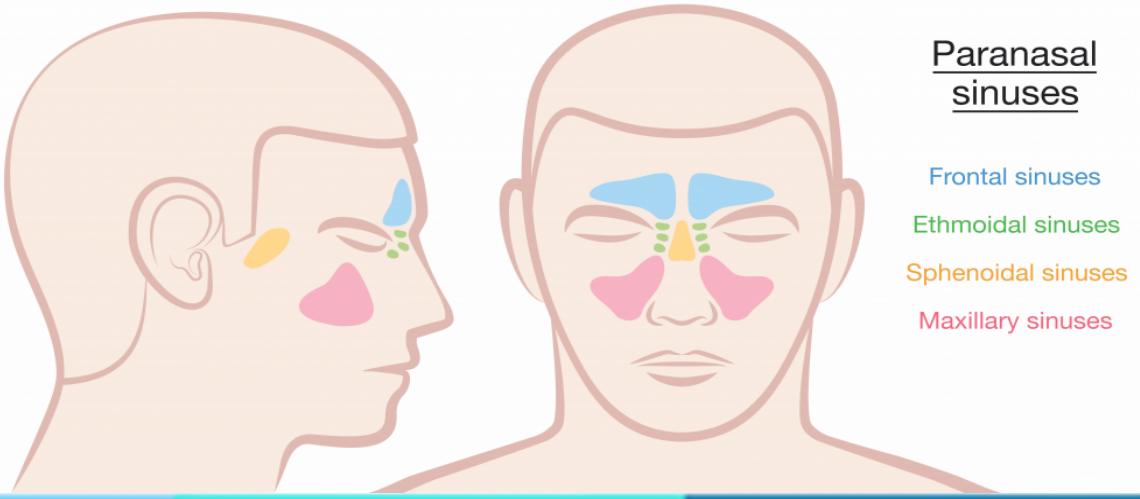
- Definition & classification
- Assessment of severity & triggers
- Allergy testing
- Allergic rhinitis treatment

Rhinosinusitis

Reem labani

A healthy sinus:

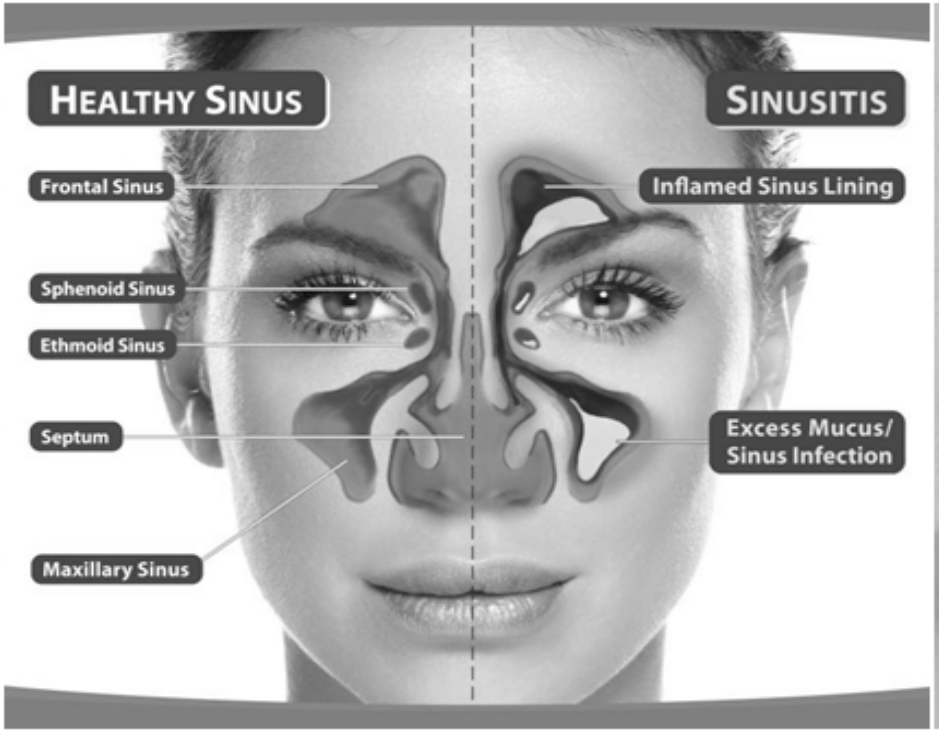
- **Is filled with air.**
- **Produces mucus** which usually drains through small **channels** into the nose .
- These channels become **blocked** when the sinus linings become **inflamed**.
- The sinus will be **filled** with fluid, germs can grow and cause an **infection**.

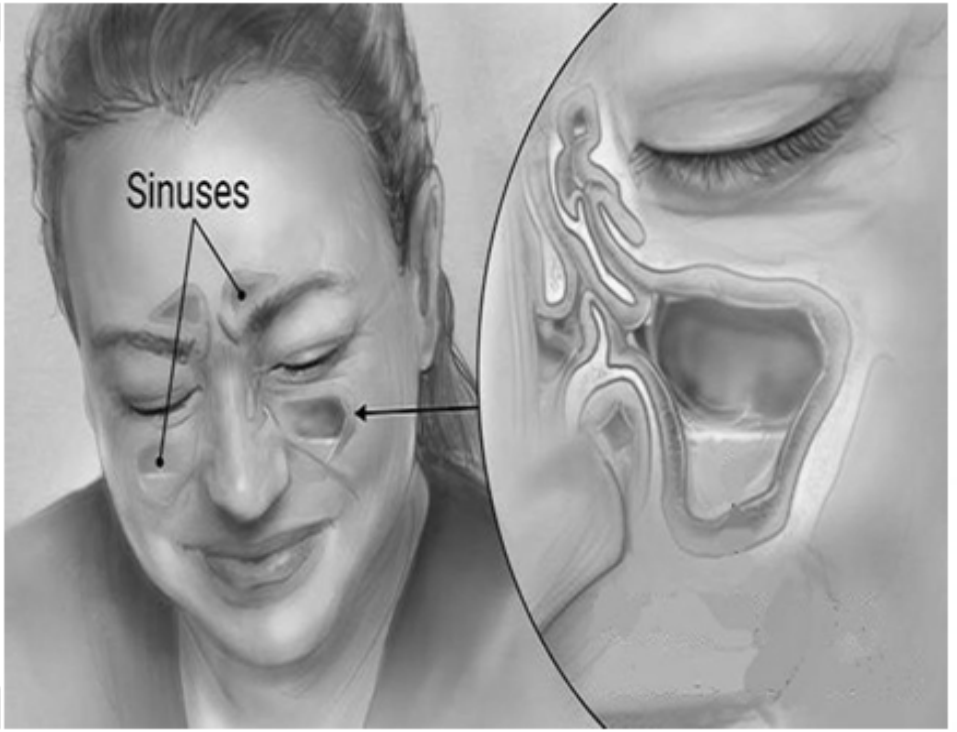


Definition

Sinusitis AKA Rhinosinusitis refers to:

- Inflammation of nasal passages and sinus cavities.



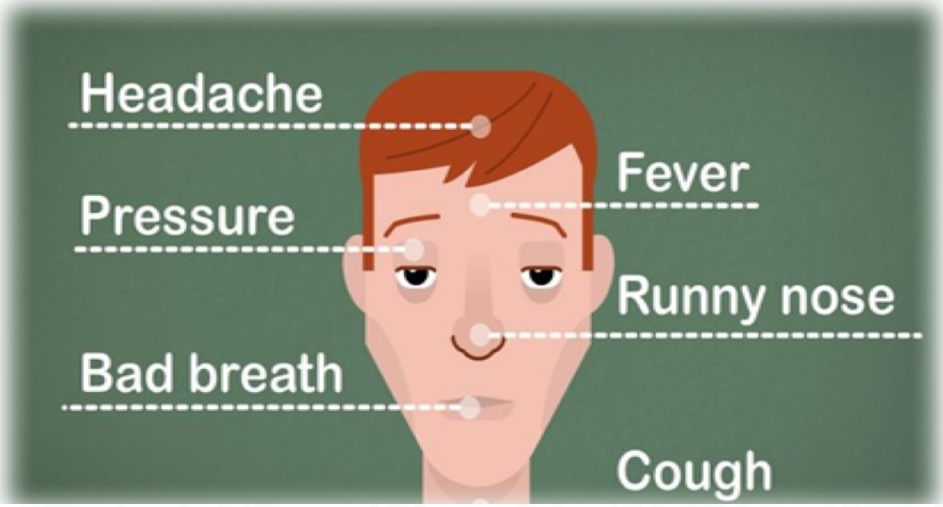


Pathophysiology:

- Obstruction of sinus drainage pathways (sinus ostia).
- Ciliary impairment.
- Altered mucus quantity and quality.

Clinical features:

- Pain and tenderness around cheeks, eyes or forehead.
- Nasal Congestion.
- Nasal Discharge.
- Hyposmia.
- Fever.
- Postnasal Drip.
- Cough.
- Fatigue.
- Halitosis.
- Sinus Headache.
- Toothache.
- Otalgia.



Classification

Depending on duration:

- **Acute** Sinusitis: <4 wks.
- **Subacute** Sinusitis: Between 4-12 wks.
- **Chronic** Sinusitis: > 12 wks.
- **Recurrent** acute Sinusitis: diagnosed when infection occurs 2-4 times/year.

Depending on etiology:

1- Non-infectious:

- **Nasal obstruction**
  (nasal polyps, tumors, mucus plug, septal deviation).
- **Primary ciliary dyskinesia.**
- Patients with **immune deficiency or hyper inflammatory disease** such as Wegener's disease.
- **Cystic fibrosis.**
- **Irritants**

2- Infectious:

Viral:

- Rhinovirus
- **Influenza virus**
- Parainfluenza virus
- Common cold

Bacterial*:

- S. pneumonia
- H. influenzae
- M. catarrhalis

Fungal:

- Aspergillus

* **Nosocomial** bacterial sinusitis may develop in patients in the **ICU**, particularly in those with prolonged **intubation**.

Influenza Virus

Types of **influenza viruses**

Family of Influenza virus is Orthomyxoviridae

Type A	**antigenically highly variable** and is responsible for most cases of ***epidemic*** influenza.
Type B	may exhibit **antigenic changes** and sometimes causes **epidemics**.
Type C	**antigenically stable** and causes only mild illness in immunocompetent individuals, N**o epidemic**. *Not in the vaccine!*

Spread of influenza:

- **Contact:**
  - Direct (e.g. shaking hands)
  - Indirect (contaminated items)
- **Droplet** transmission (unprotected sneeze or cough) **travel up to 6 ft.**
- **Airborne** transmission

You may be able to pass on the flu to someone else before you know you are sick! as well as while you are sick.

* What is the incubation period of influenza? **1-7 days**

Diagnostic tests for influenza

Rapid Influenza Diagnostic Tests (RIDTs):

- Antigen detection tests
- Quick results
- **Sensitivity 62.3%**
- **Specificity 98.2%**
- a -ve result does NOT exclude a diagnosis of influenza in a patient with suspected influenza.

RT-PCR and Viral culture:

- More **accurate** but takes **longer** time.
- When influenza is suspected and **antiviral treatment** is indicated, antiviral treatment should begin **as soon as possible and should not wait** for the results of testing.

How to **prevent influenza?**

- Good hygiene.
- Avoid contact with sick people.
- **Vaccination**.

Influenza vaccine

- **The influenza vaccine is recommended for whom?**
  Everyone **six months** and older who do not have **contraindications**.
- **What are the contraindications to the influenza vaccine?**
  A previous **severe allergic reaction** to influenza vaccine.
- **What is the frequency of influenza vaccination?**
  Yearly.
- **What does the influenza vaccine contain?**
  3-4 strains (it changes from season to season).
- **When should the influenza vaccine be offered?**
  Flu season (It takes about 2 weeks for the antibodies to develop in the body)
- **Which food allergy you should ask about before giving the vaccine?**
  Egg.

Egg allergy and Influenza vaccine

ACIP recommendations for persons with a history of egg allergy:

who have experienced
only hives
after exposure to egg

should receive **any** of the recommended influenza vaccines

who have had reactions to egg involving
symptoms other than hives (e.g., angioedema, respiratory distress)
OR who required **epinephrine**

may receive the **cell culture–based** or recombinant influenza vaccines

How to Differentiate Between Common Cold and Influenza?

- It is difficult to differentiate between them based on symptoms alone.
- In general, the flu is **worse** than the common cold.
- Flu can have very serious associated complications (such as pneumonia, bacterial infections, or hospitalizations).

Other **viruses' families** that can cause **common cold**:

- Rhinoviruses
- **Coronaviruses**
- Adenoviruses.
- Human respiratory syncytial virus (in adults)
- Parainfluenza viruses

When should you suspect & test for **MERS-CoV** in someone with acute rhinosinusitis?

- History of **exposure** to a confirmed or suspected MERS-CoV in the 14 days prior to onset of symptoms.
- History of **contact** with camels or camel products in the 14 days prior to onset of symptoms.
- Unexplained **acute febrile** (≥38°C) illness, body aches, headache, diarrhea, or nausea/vomiting, with or without respiratory symptoms, AND leukopenia & thrombocytopenia.

How to Differentiate between **Bacterial & Viral** Rhinosinusitis?

the infection is probably bacterial if any of the following are true:

- Onset with persistent symptoms or signs compatible with acute rhinosinusitis, lasting for **≥10 days** without any evidence of clinical **improvement** (strong, low-moderate).
- Onset with severe symptoms or signs of high fever (**≥39_C**) and purulent nasal discharge or facial pain lasting for at least **3–4 consecutive days** at the beginning of illness.
- Onset with worsening symptoms or signs characterized by the new onset of fever, headache, or increase in nasal discharge **following** a typical viral **URTI** that lasted 5–6 days and were **initially improving** (‘‘double sickening’’)

How many viral Rhinosinusitis are **complicated by bacterial infection?**

From **0.5%-2%.**

How to **Diagnose** Rhinosinusitis?

Hx

PODS

- Pain (site)
- Obstruction (uni/bi)
- Discharge*
- Smell disorder

Other: Fever, Fatigue, Headache, Earache.

* Thickness, Consistency, Color, Amount, Frequency.

PE

- **Tenderness** overlying sinuses.
- **Hyponasality**.
- Purulent nasal **secretions**.
- **Erythema** (facial, Mucosal).
- Oral cavity examination.

Investigations

- CBC, ESR (nonspecific).
- Culture (if life threatening).
- CT (when Rx failed).
- MRI (for complications).
- Fiberoptic endoscopy (structural lesion).

How to **Diagnose** Rhinosinusitis?

- **Cultures of Nasal Secretions**

not routinely done but should be obtained in the following cases:

  - Patients in **ICU** or that are **immunocompromised**.
  - Children **not responding** to appropriate medical management.
  - Patients with **complications** of sinusitis.

- **Imaging**

*should not be obtained for patients who meet diagnostic criteria **unless you suspect**:*

  - **Complication** (orbital, intracranial, or soft tissue involvement.
  - **Alternative diagnosis** (malignancy, other noninfectious causes of facial pain).

Who are the candidates for **antiviral therapy**?

- children **< 2** years.
- adults **> 65** years.
- persons with **chronic diseases:**
  - Pulmonary (e.g. asthma).
  - Cardiovascular (except hypertension alone).
  - Renal.
  - Hepatic.
  - Hematological (including SCA).
  - Metabolic disorders (including DM).
  - Neurological and neurodevelopmental conditions (e.g. CP, epilepsy, stroke).
- Persons with **immunosuppression** (caused by medications or by HIV infection).
- **Pregnant** or **postpartum** women (Oral oseltamivir is the preferred agent)
- Persons **< 19** years who are receiving long-term **aspirin** therapy.
- Persons who are morbidly **obese** (i.e. BMI > 40).

Acute **Viral** Rhinosinusitis **(AVRS) Rx:**

- **Supportive care.**

AVRS may not completely resolve within 10 days but is expected to **improve**.

Acute **Bacterial** Rhinosinusitis **(ABRS) Rx:**

- **Observation.**

Antibiotics should be started depending on the patient **follow up**:

Acute **Bacterial** Rhinosinusitis (ABRS) Rx:

Good follow up (immunocompetent)

- Observation
- Symptomatic management:
  - Analgesics
  - Antipyretics
  - SNI
  - INCS
  - Decongestants
  - Antihistamine

Stable symptoms

(after 7 days)

- Observation
- Symptomatic management

OR*

- Antibiotics

Worsening/ failure to improve

(after 10 days)

- Start **antibiotics**

1st line: **amoxicillin** ± clavulanate

* Depending on the pt. Presentation, Comorbidities and social factors.

When do we consider the Rx for ABRS a **failure**?

If the patient **worsens or fails to improve** with the initial management option by **7 days** after diagnosis, **reassess** the patient to:

- **confirm ABRS**
- exclude **other causes** of illness
- detect **complications**.

If ABRS is **confirmed:**

- **antibiotic** therapy should be started.
- If the patient was initially managed with an antibiotic, the clinician should **change the antibiotic**.

Prevention:

- Sinus hygiene.
- Hydration (to keep nasal secretions thin).
- Saline nasal sprays (keep the nasal passages moist, helping in removal of infectious agents).
- Smoking cessation.
- Allergen avoidance.

Allergic Rhinitis

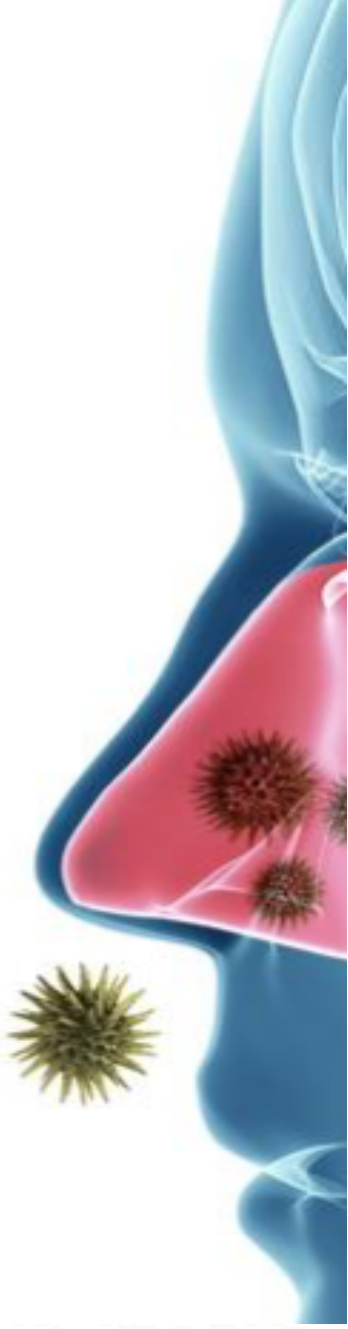
Amal Aseeri

Allergic Rhinitis

Definition:

- AR is an **inflammatory** condition of the nasal mucosa, characterised by **nasal pruritus, sneezing, rhinorrhoea, and nasal congestion**.

- AR is mediated by an **IgE**-associated response to ubiquitous indoor and/or outdoor **environmental allergens**.



Traditional classification

- **Seasonal** e.g. cyclic pollens.
- **Perennial** e.g. dust mites

Duration of symptoms

- **Intermittent** (<4 days or <4 wks)
- **Persistent** (>4 days & >4 wks)

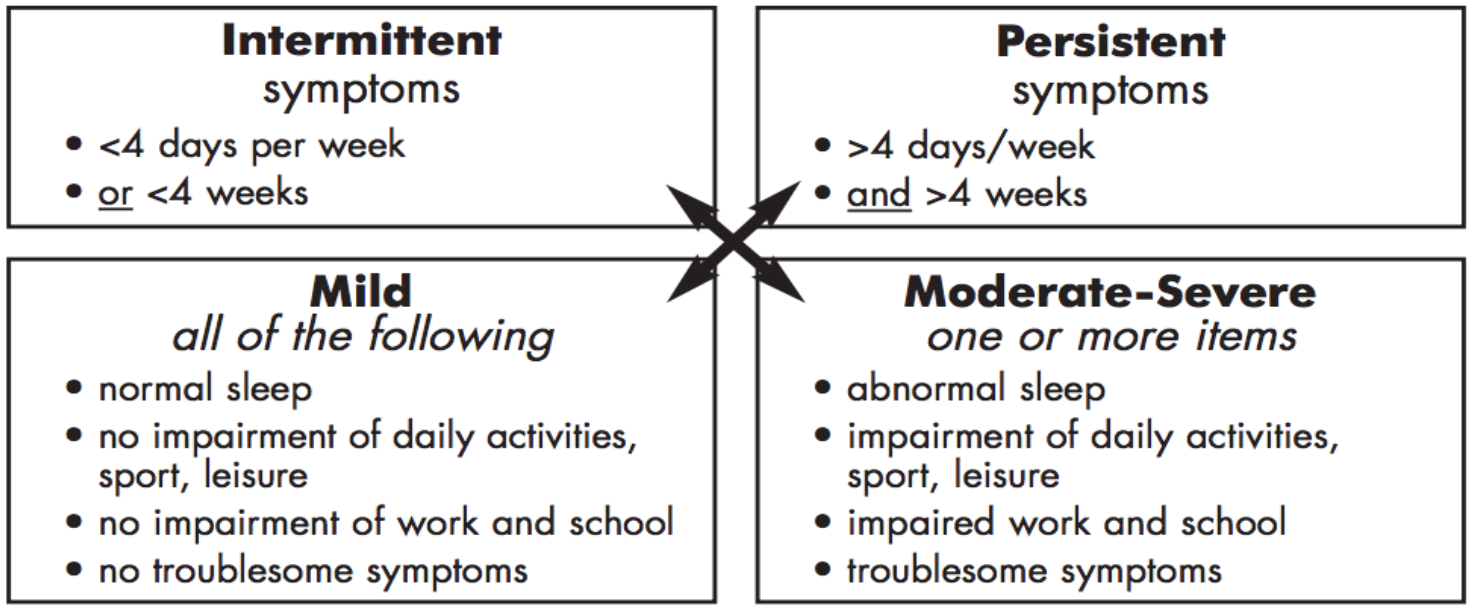
Severity

- **Mild** (lack of impairment of work or school)
- **Moderate/severe** (affect sleep or impair school or work activities)

Assessment of **severity**

- Sleep disturbance
- Impairment of daily activities
- Impairment of school or work
- Troublesome symptoms.

ARIA severity Classification:



Common triggers

Common triggers

In our region:

Indoor:

- Animal dander (**cats,** goat, camel)
- **Dust mites** (D. farinae, D. pteronyssinus)
- **Cockroaches** (P. americana, B. germanica)
- Fungi (A. fumigatus, Cladosporium spp.)

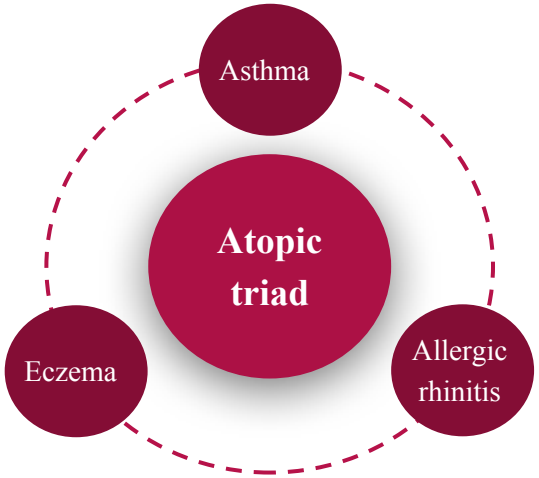
Outdoor (pollen):

- Weed
- Grass (C. dactylon, L. perenne,)
- Tree (P. juliflora, P. dactylifera)

Associated conditions:

AR can be associated with other **atopic conditions** such as:

- Asthma
- Atopic dermatitis
- Allergic conjunctivitis



Clinical signs:

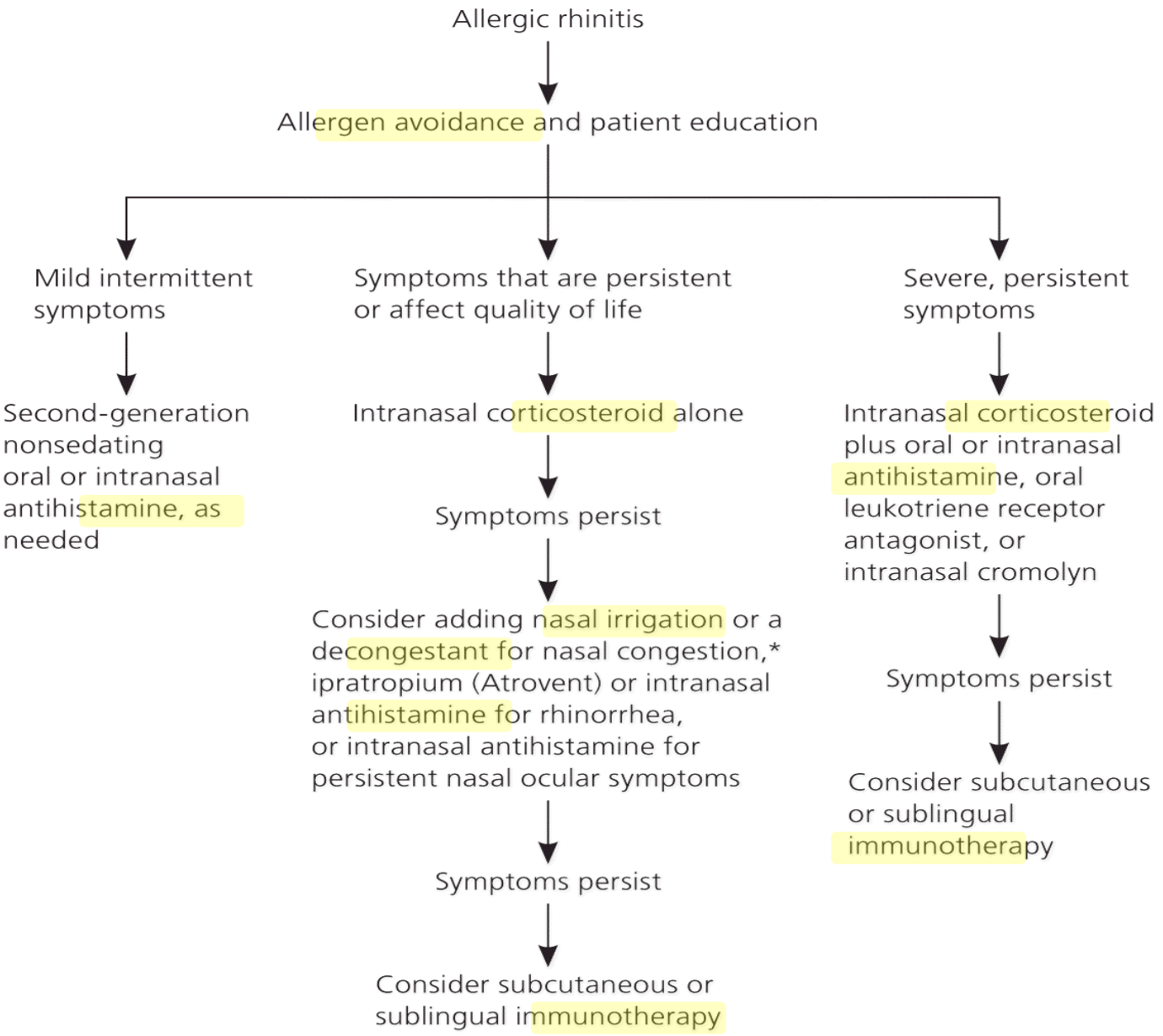
When

should we order **allergy testing?**

- when **treatment** has been **ineffective**.
- a **diagnosis** of allergic rhinitis is **uncertain**.
- identification of a certain allergen could affect therapy, or to aid in **titration of therapy.**

AR treatment

Allergen avoidance is a major principle and **first-line** therapy **for all patients** with allergic rhinitis (AR).

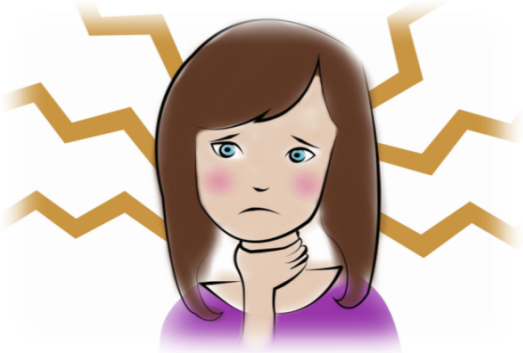


—Use of nasal decongestants for longer than three days is not recommended because of possible rebound congestion.

Pharyngitis

Sarah aljasser

Definitions



Sore Throat

A sore throat refers to pain,itchiness, or irritation of the throat.Patients may have difficulty swallowing food and liquids, and the pain may get worse when they try to swallow.

Pharyngitis

is defined as rapid onset of sore throat and inflammation or irritation of the pharynx.

Classification of pharyngitis

- Nasopharyngitis
- Retropharyngeal Abscess
- Tonsillitis:
  - Peritonsillar Abscess

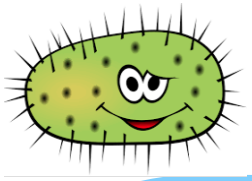
•Sore throat

•Non Infectious

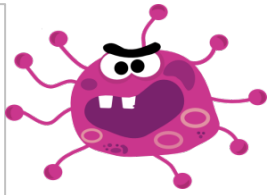
•Post-nasal drainage due to allergic rhinitis
•Sinusitis
•Gastroesophageal reflux disease
•Acute thyroiditis
•Persistent cough

•infectious

•The majority of pharyngitis is viral (50-80%) with 15-30% in children and 10% in adults due to GAS.



•Bacterial
•group A β-hemolytic streptococcus (GAS)(Most common), Chlamydia pneumoniae, Mycoplasma pneumoniae, Neisseria gonorrhoeae,



•Viral
•Most Common
•infuenza virus, parainfuenza virus, rhinovirus, coronavirus, adenovirus, respiratory syncytial virus, Epstein-Barr virus

Risk factors

- Which age group is primarily affected by GABHS pharyngitis?

In patients with sore throat, the likelihood of GABHS pharyngitis is highest in **children five to 15 years of age** (37%) and lower in younger children (24%) and adults (5% to 15%)

Clinical characteristics of bacterial and viral pharyngitis

Tonsillar exudates
fever
tender anterior cervical adenopathy

Conjunctivitis, Coryza (inflammation of the mucus membranes of the nose),Cough, Diarrhea,Hoarseness,Discrete ulcerative stomatitis
Viral exanthema

Alarming symptoms

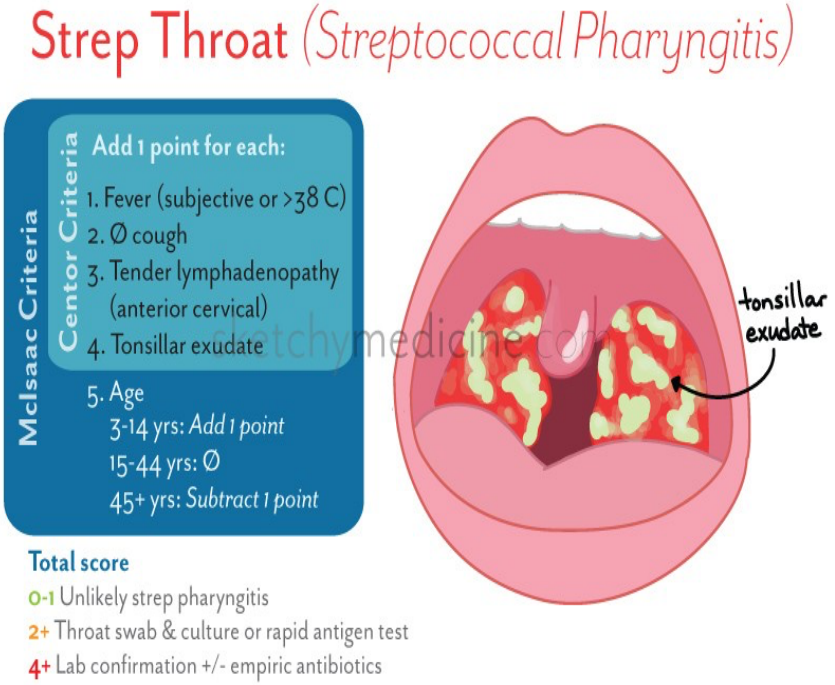
- **Drooling**
- **Respiratory distress**
- Inability to open mouth fully (trismus)
- Muffled voice
- **Stiff neck**
- Erythema of neck
- History of recent foreign body impaction or oropharyngeal procedure (trauma)
- Recent cocaine smoking
- Weight loss, **fevers**, night sweats

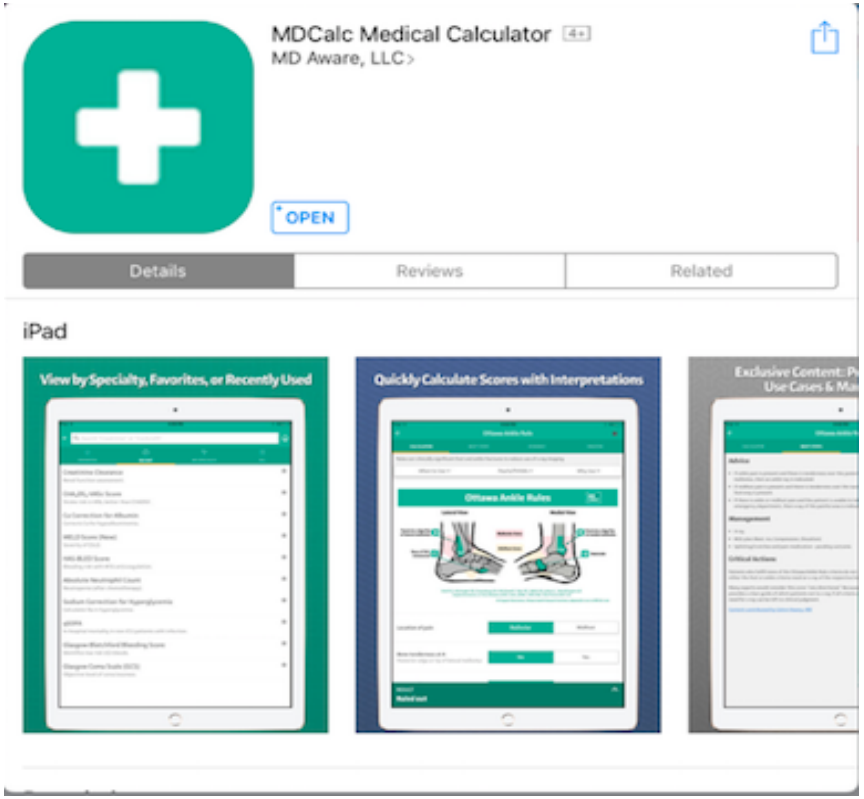
Clinical examination to diagnose group A beta-hemolytic streptococcal pharyngitis

Centor Score (Modified/McIsaac) for Strep Pharyngitis

Can't be used in <3 years old.

Symptoms onset <3 days.





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Centor Score (Modified/McIsaac)

CALCULATOR | NEXT STEPS | EVIDENCE | CREATOR

Estimates probability that pharyngitis is streptococcal, and suggests management course.

INSTRUCTIONS

Use only in patients with recent onset (≤3 days) acute pharyngitis.

When to Use | Pearls/Pitfalls | Why Use

Age range
Group A streptococcus (GAS) rare under 3

- 3-14 years +1
- 15-44 years 0
- ≥ 45 years -1

Exudate or swelling on tonsils

No 0 | Yes +1

Tender/swollen anterior cervical lymph nodes

No 0 | Yes +1

Temp > 38°C (100.4°F)

No 0 | Yes +1

Cough

- Cough present 0
- Cough absent +1

Patient with sore throat

↓

Apply streptococcal score

↓

Criteria	*Points*
Absence of cough	1
Swollen, tender anterior cervical nodes	1
Temperature > 100.4°F (38°C)	1
Tonsillar exudates or swelling	1
Age	
3 to 14 years	1
15 to 44 years	0
45 years or older	–1
Cumulative score:	_____

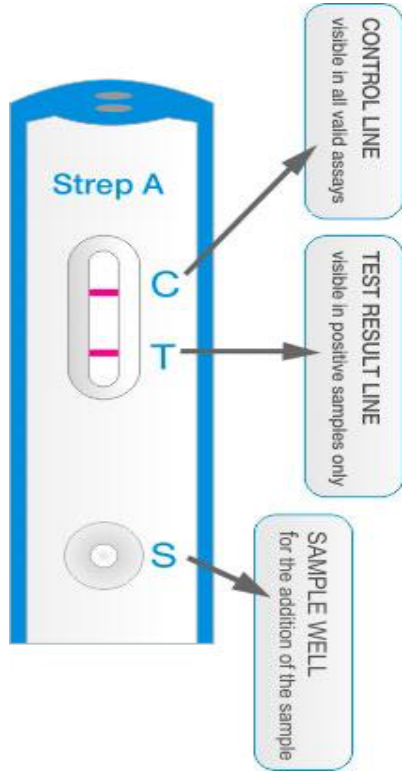
Interpretation (point/ item total and % strep)	
Antibiotic therapy	≥ _4 points (55%)
Rapid test or delayed prescription	2 or 3 (29%)
Symptomatic therapy only	≤ _1 (12%)

Diagnostic tests

- Throat swabs: Culture of a throat swab on a sheep- blood agar plate has been the **standard for the documentation of the presence of GAS pharyngitis,**A major disadvantage of throat cultures is the **delay (overnight or longer) in obtaining results**

- RADT : RADTs have been developed for the **identification of GAS pharyngitis directly from throat swabs, give immediate results**

- Backup throat cultures



Treatment

Symptomatic treatment:

- Advise analgesia and antipyretics (e.g. paracetamol and/or ibuprofen)
- NSAIDs (be aware of **GI** and **renal** side effects, **aspirin** should be avoided in **children**)
- Corticosteroids (short course for selected cases of adults with centor criteria 3-4 with bacterial pharyngitis)

Antibiotic treatment:

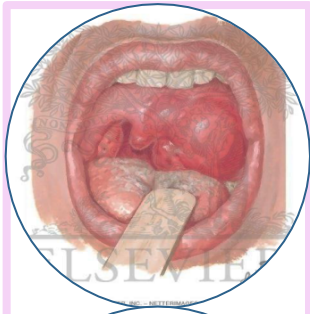
- First-line treatment for GABHS pharyngitis includes a 10-day course of penicillin or amoxicillin. •(strong, high).

- Patients allergic to penicillin can be treated with first-generation (cephalosporins) for 10 days, clindamycin or clarithromycin for 10 days, or azithromycin for 5 days antibiotics.

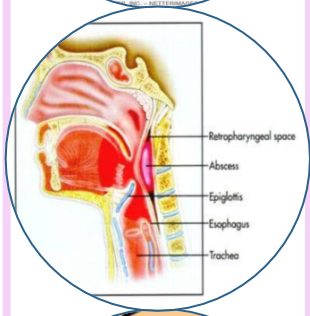
Reasons to give antibiotics immediately:

- Acute sore throat where more than 4 centor criteria are present: tonsillar exudate, tender anterior cervical lymphadenopathy/lymphadenitis, history of fever, and absence of cough
- Patient is systemically very unwell
- Symptoms and signs suggestive of serious illness and/or complications (e.g. peritonsillar abscess, peritonsillar cellulitis)
- High risk of serious complications because of pre-existing co- morbidity, e.g. significant heart, lung, renal, liver, or neuromuscular disease, immunosuppression, cystic fibrosis, and young children born prematurely

Complications



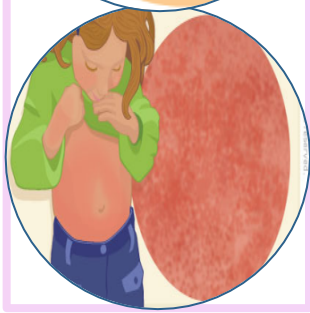
- Quinsy (peritonsillar abscess)



- Retropharyngeal abscess

- Rheumatic fever:

60% develop chronic rheumatic heart disease (70% mitral valve)
Likelihood correlates with severity of initial disease
Recurrence may occur after further streptococcal infection or be precipitated by pregnancy or combined hormonal contraception



Scarlet fever:

acute glomerulonephritis

Prevention

- Try to avoid close contact with sick people.
- If you are sick with flu-like illness, CDC recommends that you stay home for at least 24 hours after your fever is gone
- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it.
- Wash your hands often with soap and water. If soap and water are not available, use an alcohol-based hand rub.
- Avoid touching your eyes, nose and mouth.
- Clean and disinfect surfaces and objects that may be contaminated with germs like the flu.

Chronic GABHS **carriers**

We recommend that GAS carriers do not ordinarily justify efforts to identify them nor do they generally require antimicrobial therapy because GAS carriers are unlikely to spread GAS pharyngitis to their close contacts and are at little or no risk for developing suppurative or non-suppurative complications (e.g. acute rheumatic fever).

Contacts of GABHS Pharyngitis

Diagnostic testing or empiric treatment of asymptomatic household contacts of patients with acute streptococcal pharyngitis is not routinely recommended

- **A 10 year old female presented with a sore throat for 2 days with cough. On examination she was febrile with a temperature of 38.2 C. her tonsils were swollen and erythematic and some exudates were seen. Neck examination showed tender anterior cervical lymph node. Apply streptococcal score for this patient:**

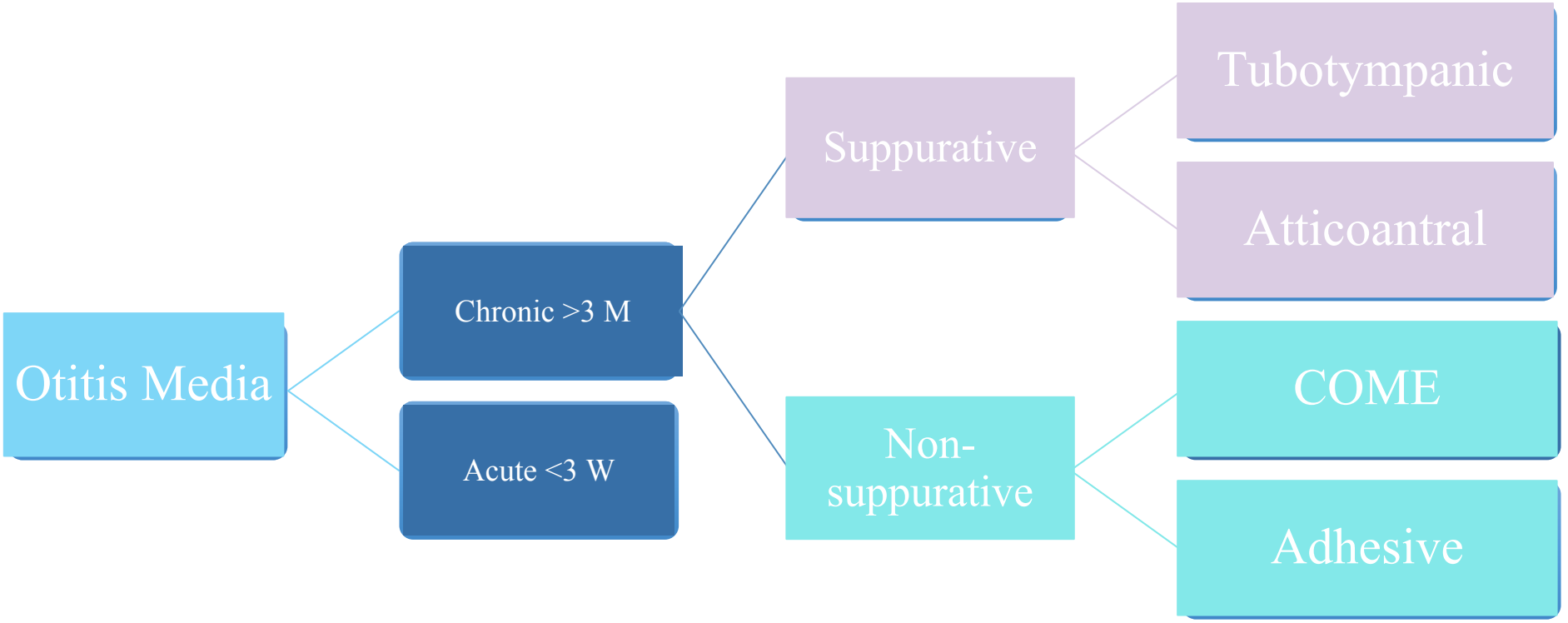
A. 5 , so we should put her on oral antibiotics
B. 4 , so we should put her on oral antibiotics
C. 3 , symptomatic therapy is indicated

- **A 25 year old collage male came to you with sore throat of 5 days that been getting worse over the past 2 days that has developed to dysphagia with referred otalgia. His temperature was 38 C and on examination you noticed trismus and swelling of the buccal mucosa however there was no palpable lymph nodes what is the next step?**

a. Antipyretic and Reassure him that it is a viral self-limiting infection and the virus should be clear by a week
b. Give the patent oral penicillin
c. Start him on IV antibiotics and refer him to ENT

Otitis Media

Daad AlOtaibi


Otitis Media
Chronic >3 M
Acute <3 W
Suppurative
Non-suppurative
Tubotympanic
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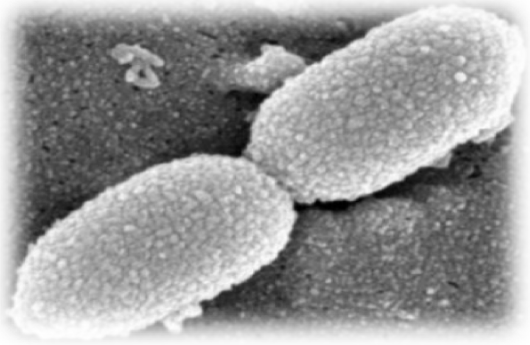
COME
Adhesive



Infectious Etiologies

The most common **bacterial** pathogens:

- Streptococcus Pneumoniae
- Haemophilus Influenzae
- Moraxella Catarrhalis

The most common **viral** pathogens:

- Rhinovirus
- Parainfluenza virus
- Influenza virus

Etiology:

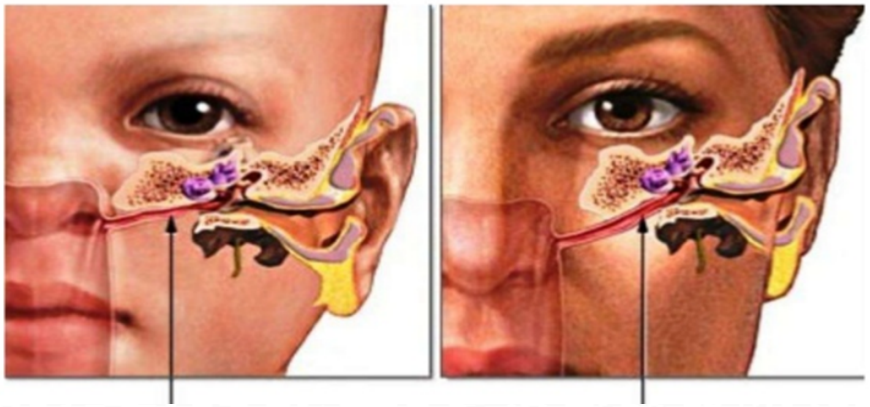
- **Eustachian tube dysfunction/obstruction/abnormality**
  - swelling of tubal mucosa (e.g. URTI)
  - obstruction/infiltration of Eustachian tube ostium.
  - inadequate tensor palati function: cleft palate (even after repair)
  - Abnormal Eustachian tube
- **Disruption of action of:**
  - cilia of Eustachian tube (Kartagener's syndrome)
  - mucus secreting cells
  - capillary network that provides humoral factors, PMNs, phagocytic cell
- **Immunosuppression/deficiency due to:**

  chemotherapy, steroids, DM, hypogammaglobulinemia, cystic fibrosis.

Risk factors of OM

- **Pediatrics:**
- Age (younger)
- No breastfeeding (supine Bottle feeding)
- Pacifier use
- Gastroesophageal reflux (GERD)
- Attending group day care

Adult vs. Child (< 7 yr)



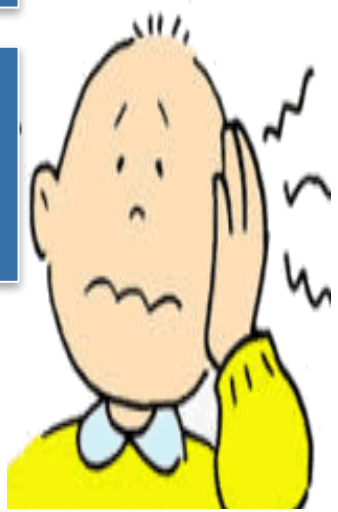
All age groups:

- Allergies
- Craniofacial abnormalities
- Exposure to environmental smoke or other respiratory irritants
- Family history of recurrent acute otitis media
- Immunodeficiency
- Upper respiratory tract infections (URTI).

Important Historical Clues

Symptoms associated with OM :

Otalgia	Otorrhea	Deafness	Headache
Fever	Loss of appetite	Irritability	Vomiting



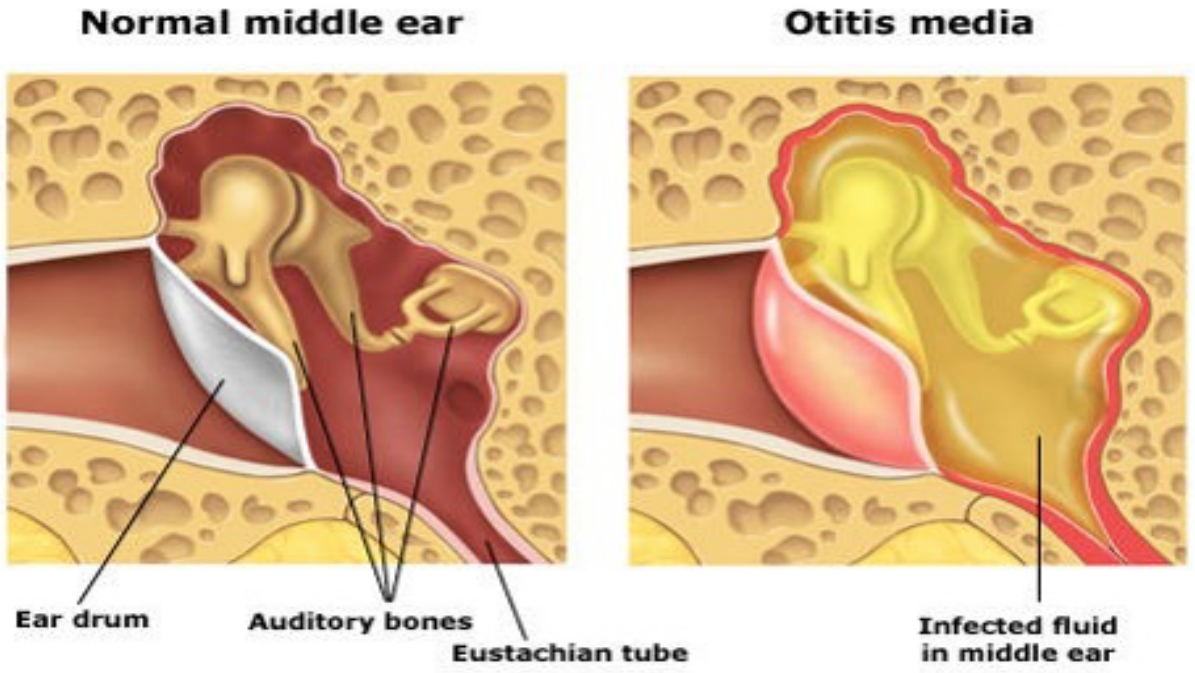
Acute otitis media

Is diagnosed in patients with

- **acute onset**
- **presence of middle ear effusion**
- **physical evidence of middle ear inflammation.**

children before school age is most common group affected

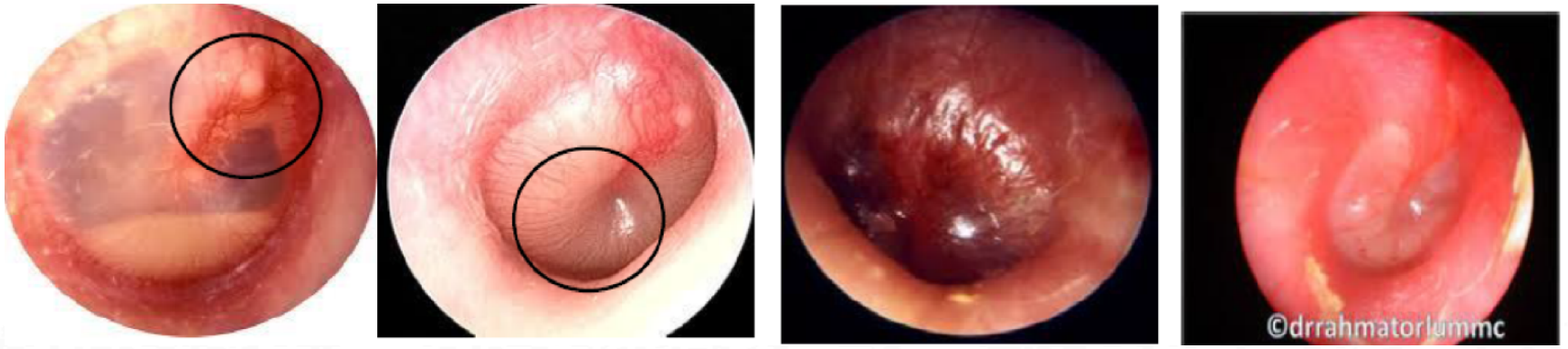
Clinical Findings



Clinical Findings

Otoscopy of TM :

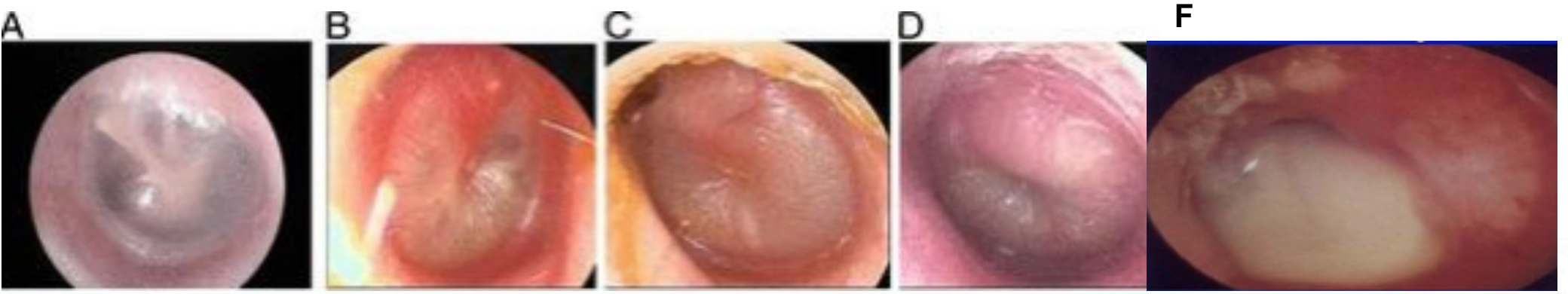
- Hyperemia / erythema.
- Marked discolouration (hemorrhagic, red, grey, or yellow).
- Bulging, pus may be seen behind tm.
- Loss of bony landmarks: handle and long process of malleus not visible.
- Loss of normal landmarks are noted.



Diagnosis of OM

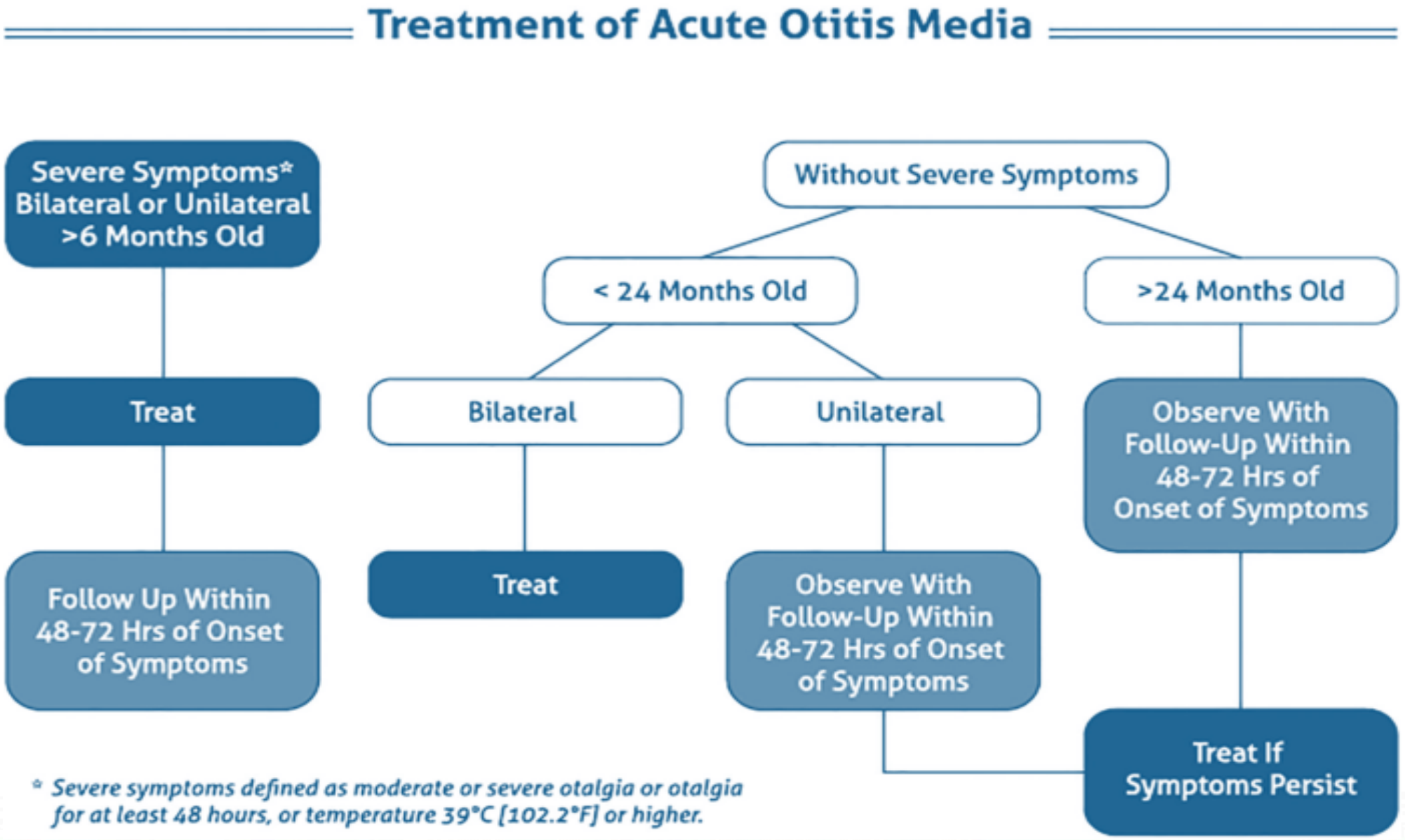
An AOM diagnosis requires:

- Moderate to severe bulging of the tympanic membrane
- New onset of otorrhea not caused by otitis externa
- Or mild bulging of the tympanic membrane associated with recent onset of Otalgia (less than 48 hours) or erythema.



Management of Acute otitis media

OBSERVATION VS. ANTIBIOTIC THERAPY



Treatment of OM

Symptomatic Treatment:

Antipyretics/analgesics

(e.g. paracetamol and/or ibuprofen)

Antibiotics Treatment:

1st line:

- High-dose **Amoxicillin**

(80-90 mg/kg/d into two doses).

- For patients who are allergic to penicillin →

Oral Cephalosporin.

If symptoms persist 48-72 hours after initiating therapy :

Re-examination:

If a bulging, inflamed tympanic membrane is observed, therapy should be **changed to a second-line agent.**

2nd line:

- For patients initially on amoxicillin → high-dose amoxicillin/clavulanic acid (Augmentin)
- For patients initially on oral cephalosporin → IM ceftriaxone, clindamycin

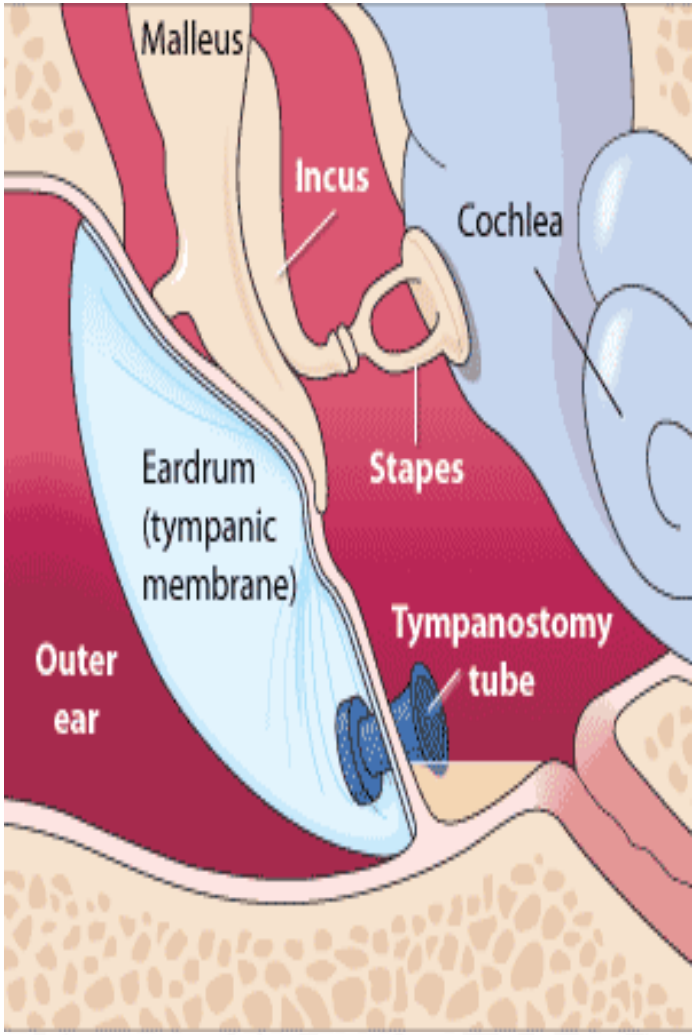
- tympanocentesis may be considered.

- What is the common side effect to antibiotic treatment of OM

Tympanostomy

Tympanostomy tubes can be considered for Recurrent OM in the following :

- Three or more episodes in six months
- Four episodes within 12 months with at least one episode during the preceding six months.



Complications Of Otitis Media

- Intratemporal
- Intracranial

Complications Of Otitis Media

Intracranial Complications

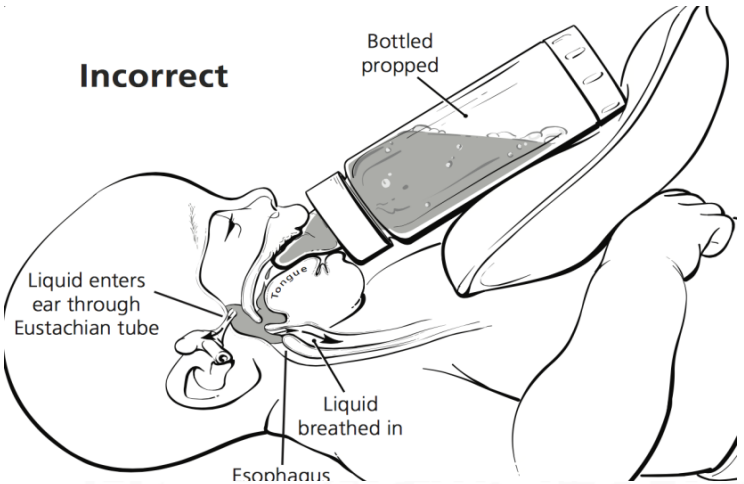
- Extradural Abscess
- Subdural Abscess
- Meningitis
- Sigmoid Sinus Thrombosis
- Brain Abscess

Intratemporal Complications

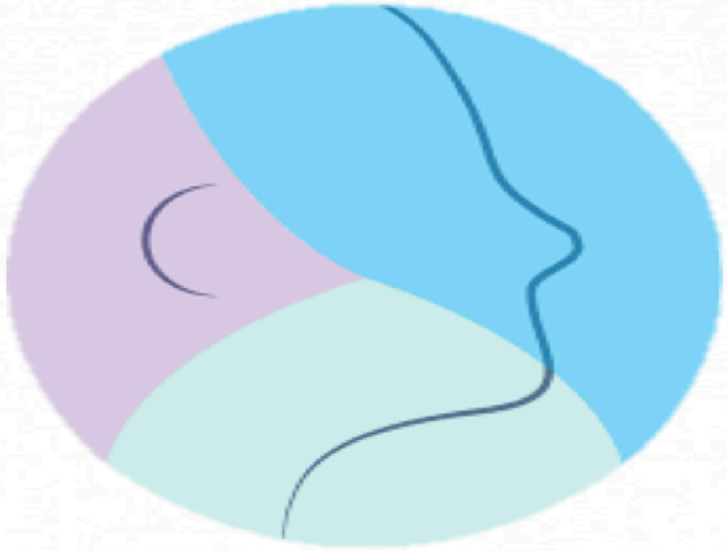
- Hearing loss and Language delay
- Mastoiditis (most common serious complication of AOM in children)
- Facial Nerve Paralysis
- Labyrinthitis
- Labyrinthine fistula

Prevention

- Parent education about risk factors.
- Check for undiagnosed allergies leading to chronic rhinorrhea
- Eliminate bottle propping and pacifiers.
- Eliminate exposure to passive smoke.
- Pneumococcal and influenza vaccine.



Test your knowledge!



Quiz

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Discussion and role play

Our patient is a 38-year-old lady, she is in the clinic today because of a runny nose and sore throat for 9 days.

On examination

- **Vital signs are:**

- BP: 135/78
- T: 36.9 C
- RR:16
- Sats 99%

On examination……

- Throat examination :

On examination :

- Otoscopy :

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Thanks!

Any questions?