Treatment of Respiratory Bacterial Infections

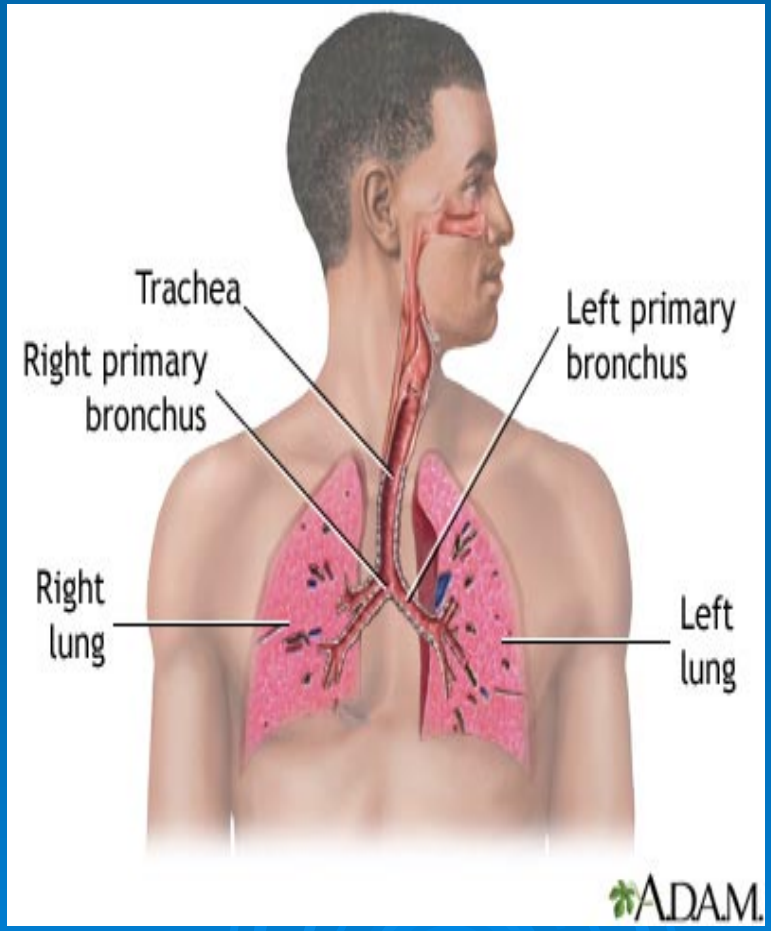
Dr Mohammed Al-Sbou
Professor of Clinical Pharmacology
Mutah University- Faculty of Medicine

Introduction

- Infections of upper & lower RT are major cause of morbidity & mortality

Patients at risk:

- at extremes of age
- with pre-existing lung diseases
- with immune suppression

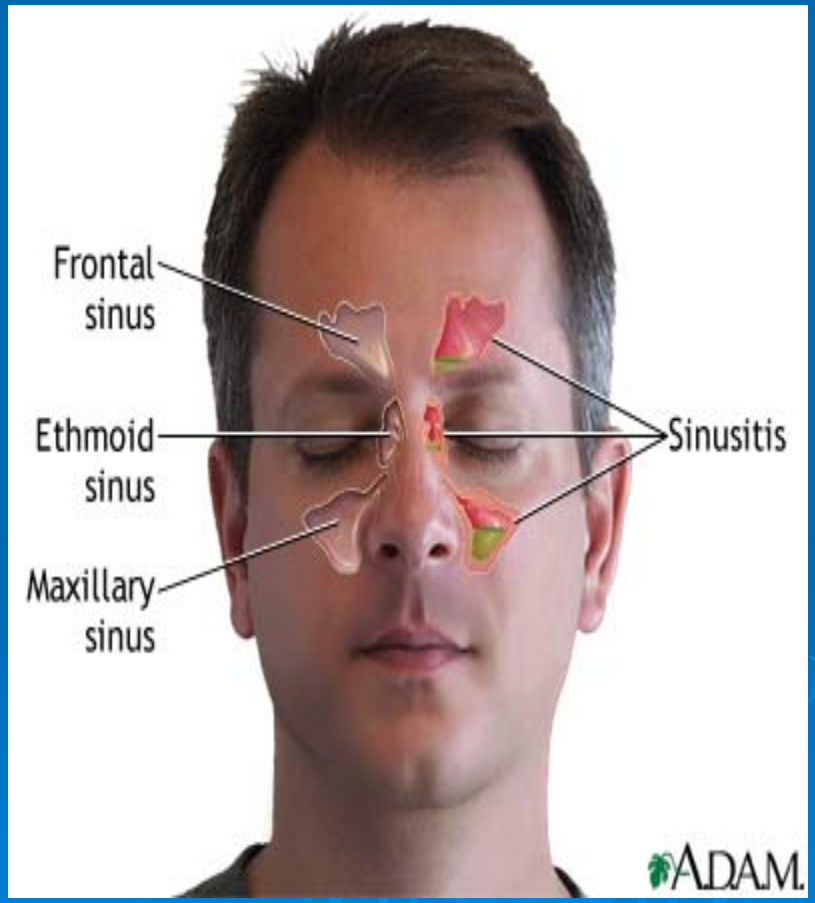


- Viruses are most frequent causes of URTIs (common cold, sore throat, influenza)
- Bacterial infection is the usual cause of (acute tonsillitis, otitis media, community- and hospital-acquired pneumonia)

- Infections of Paranasal Sinuses & Ears: (sinusitis, otitis media)
- Infections of the throat
- Infections of bronchi, lungs & pleura: (bronchitis, pneumonias)

Infections of Paranasal Sinuses & Ears

- Common infecting organisms:
  Streptococcus pneumonia
  Streptococcus pyogenes
  Haemophilus influenza
  Manifestations:
  - Acute sinusitis
  - Chronic sinusitis
  - Otitis media



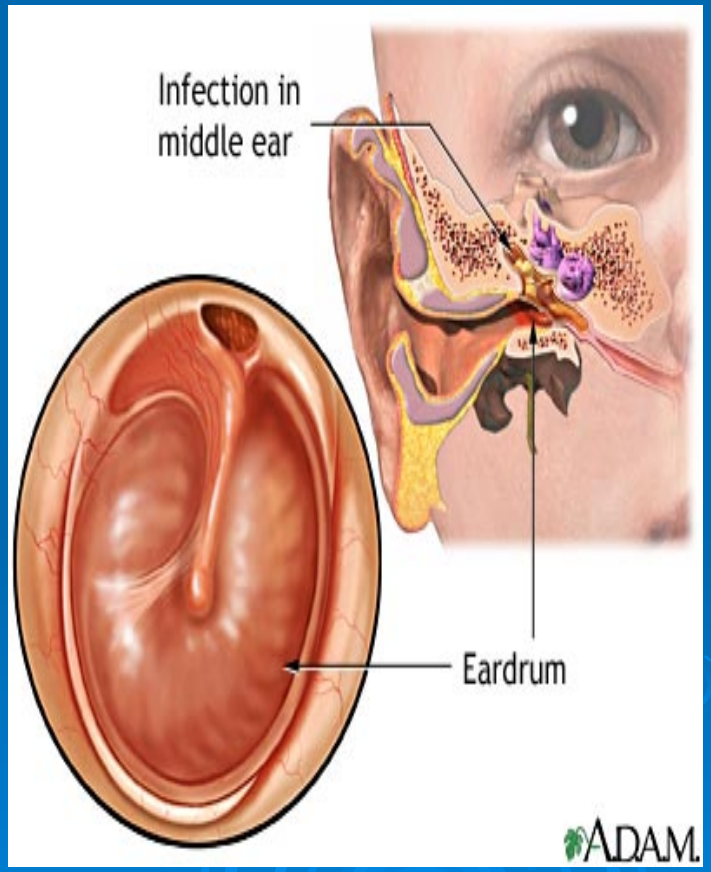
Left-sided maxillary sinusitis

Treatment of sinusitis

- Use **nasal decongestants** to open edematous obstructed passages **(ephedrine, xylometazoline)**
- Choice of antibiotic therapy includes oral **amoxicillin** or **co-amoxiclav** or **doxycycline** when antibiotic therapy is indicated & necessary
- **In chronic sinusitis**, any anatomical abnormalities (polyp, nasal septum deviation) should be corrected & antibiotics are given according to results of culture & sensitivity

Otitis Media (OM)

- Mild cases normally viral, resolve spontaneously, only, analgesia
- Bulging, inflamed tympanic membrane (eardrum) indicates bacterial OM
- Treatment: amoxicillin or Co-amoxiclav



Infections of the Throat

- Pharyngitis is usually viral
- More serious cases due to Streptococcus pyogenes (group A beta-haemolytic), which is usually sensitive to benzylpenicillin
- Bacterial pharyngitis & tonsillitis present with fever, sore throat & difficulty of swallowing

- Useful drugs include benzylbenicillin, phenoxymethylpenicillin, erythromycin or clarithromycin, or cephalexin

Follicular Tonsillitis

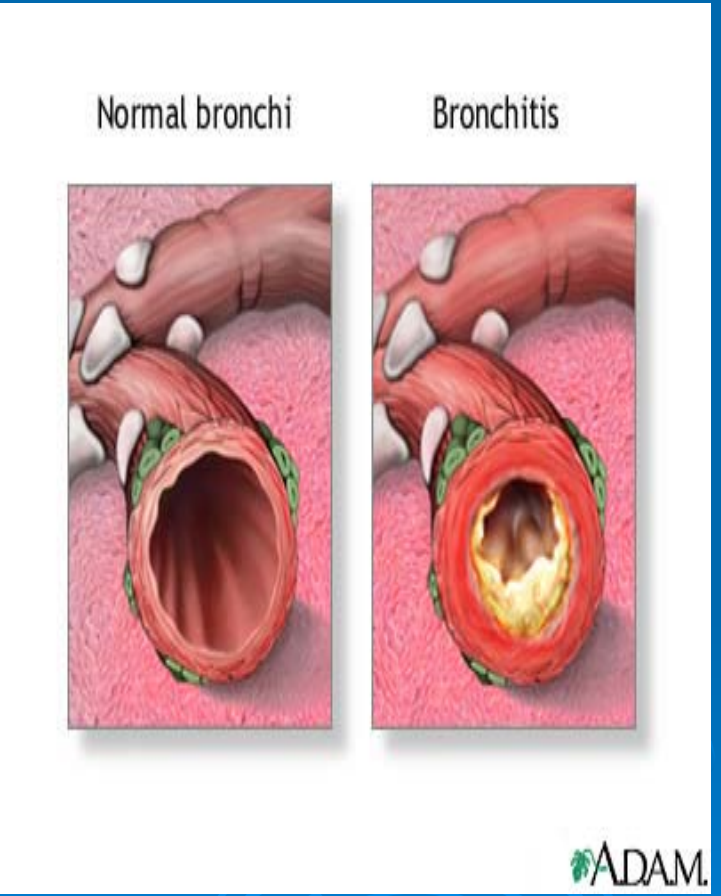
Infections of the throat

- Treatment is to be continued for 10 days to prevent late complications as rheumatic fever

Infections of bronchi, lungs

Acute bronchitis

- Most cases are viral
- Bacterial: Causative organisms include S. pneumoniae & H. influenzae
- Manifestations fever, pain, irritation in throat & trachea, cough & expectoration
- Amoxicillin, tetracycline or co-trimoxazole is used if it is necessary



Chronic bronchitis

- Usually occurs in chronic smokers & presents with chronic cough & expectoration
- Suppressive chemotherapy is needed during colder months for patients with **recurrent acute exacerbations**
- Antibiotics must be taken at the first sign of a chest infection. Choice of drugs is similar to that used in acute bronchitis

Pneumonias (lung infection)

- Clinical context in which a pneumonia develops is highly suggestive of the likely organism(s) involved and hence the choice of antibiotics

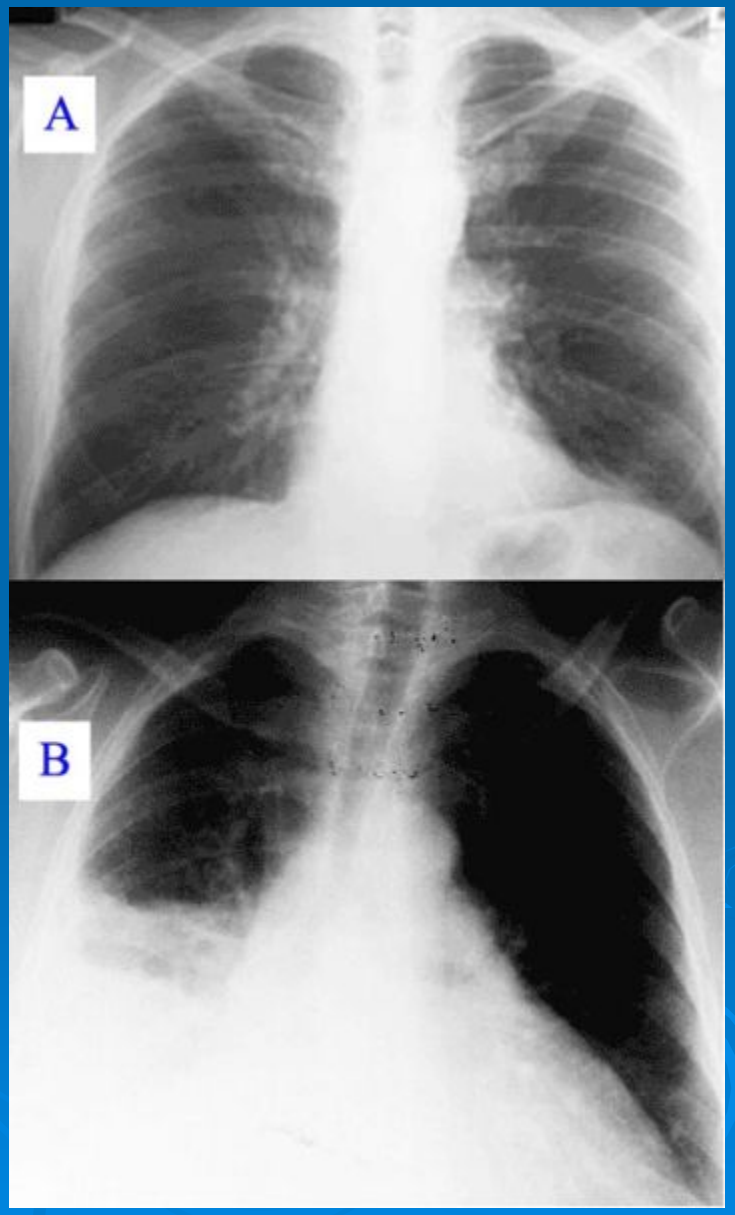
- Community-acquired pneumonia (CAP)
- Atypical pneumonia
- Hospital-acquired Pneumonia
- Pneumonia following influenza
- Pneumonia in patients with chronic lung disease
- Pneumonia in Immunocompromised Patients

Community-Acquired Pneumonia (CAP)

- Is usually caused by **Streptococcus pneumoniae** (pneumococcus)
- presents with high fever, pleuritic chest pain & cough
- **Benzylpenicillin** IV or **amoxicillin** orally are drugs of choice
- In penicillin allergic patients, **erythromycin or clarithromycin, azithromycin**
- In seriously ill patients use benzylpenicillin with **ciprofloxacin** (H.influenzae & atypical pathogens)
- In penicllin-resistant pneumococci infections, **cefotaxime (claforan)** IV (3d G)

A : Normal chest x-r

B : Abnormal chest x-ray with shadowing from pneumonia in right lung (white area)



Atypical pneumonia

- Usually presents with high fever & respiratory manifestations
- Common in young adults
- Caused by atypical pathogens **Mycoplasma pneumoniae**, rarely **chlamydia, psittacosis, legionella**
- Choices include **tetracycline, erythromycin or clarithromycin** given orally may be for **3 weeks**

Hospital-acquired Pneumonia (nosocomial)

- Refers to pneumonia occurs after 2 days of hospital admission, postoperatively, on mechanic ventilators
- Causative organisms include staph. aureus, pseudomonas aeruginosa & H. influenzae
- 3ed generation CS e.g. cefotaxime plus aminoglycoside e.g. gentamicin
- **Ciprofloxacin or vancomycin** may be necessary (in Methicillin resistant S. aureus; MRSA)

Hospital-acquired pneumonia

Predisposing factors:

- Reduced host defenses against bacteria: diabetes, corticosteroid treatment
- Bacteria introduced into lower RT: endotracheal intubation, tracheostomy, infected ventilators, nebulizers

Pneumonia following influenza

- Is usually caused by Staph.aureus
- Best guess therapy should include flucloxacillin

Pneumonia in Patients with Chronic Lung Disease

- **Mixed** infection with H. influenzae & S. pneumoniae is common
- Amoxicillin or trimethoprim or ciprofloxacin are reasonable choices

Pneumonia in Immunocompromised Patients

- Pneumonia is common in AIDS patients or following immunosuppressive therapy
- S. aureus & S. pneumoniae are common pathogens but others like fungi, pneumocystis carinii should be kept in mind
- Choice of therapy includes an **aminoglycoside with cefotaxime**

Pneumonia in Immunocompromised Patients

- In P. aeruginosa give an anti-pseudomonal penicillin like piperacillin
- For Pneumocystis carinii penumonia in AIDS give co-trimoxazole orally or IV

General Remarks

- Antimicrobials are prescribed only if there is high suspicion of bacterial RTI e.g. purulent sputum
- A reasonable "best guess" choice is started with according to possible organism & diagnosis
- When results of specimen e.g. sputum (culture & sensitivity) are known, then treatment is adjusted accordingly