

وَقُلْ رَبِّ زِدْنِي عِلْمًا



# RESPIRATORY SYSTEM

## HAYAT BATCH



SUBJECT : Pharmacology

LEC NO. : Lecture 6

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<b>Respiratory Tract Infections</b>	
<b>Upper Respiratory Tract Infection (URTI)</b>	Common cold, pharyngitis, epiglottitis, otitis media, etc.
<b>Lower Respiratory Tract Infection (LRTI)</b>	Pneumonia, lung abscess, bronchiolitis, bronchitis
<b>Symptoms</b>	Shortness of breath, weakness, fever, coughing, fatigue
<b>Antibiotics</b>	First-line treatment for pneumonia. Not effective or indicated for parasitic infections. Acute bronchitis typically resolves on its own. Vaccines available for many pathogens.

Disease	Symptoms	Pathogens (common)	Pharmacotherapy
<b>Bronchitis</b> inflammation of the bronchi (medium and large airways)  Antibiotics بالعادة ما يستعملها في bronchiolitis ولا bronchitis لأنها mainly viral	Acute: cough ( $\leq 3$ weeks), wheezing, shortness of breath, chest pain. Mainly it's viral - بتركه لحاله بدون مضاد حيوي If it's bacterial - think about antibiotic	Primarily viral (parainfluenza and influenza), could be bacterial infection (Mycoplasma)	Acute: Paracetamol and nonsteroidal anti- inflammatory drugs (NSAIDs). Antibiotics should generally not be used.
	Chronic: productive cough that lasts for three months or more per year for at least two years.		Chronic: Quit smoking, vaccinations, rehabilitation, and inhaled bronchodilators and steroids.
<b>Bronchiolitis</b>  Complications: dehydration and aspiration pneumonia • No diagnostic test are required	Fever, cough, runny nose, wheezing, and breathing problems.	Mainly viral (RSV)  (admission $\Leftarrow$ child don't feed properly)	No specific treatment, home care is sufficient. Hospital admission for oxygen, support with feeding, or intravenous fluids. No clear evidence for antibiotics, antivirals, bronchodilators, or nebulized epinephrine?!

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common acute inflammatory respiratory infection that affects the alveoli and distal bronchial tree

# Pneumonia

A common acute inflammatory respiratory infection that affects the alveoli and distal bronchial tree of the lungs.

## Classification by Site of Acquisition

Usually Caused by no strong strains of bacteria

1. Community-acquired pneumonia (CAP)

Affects the alveoli and distal bronchial tree of the lungs

2. Hospital-acquired pneumonia (HAP)

Acquired within 48 hours of hospital admission.

3. Aspiration pneumonia

Pulmonary consequences due to entry of gastric or oropharyngeal fluids, or exogenous substances.

## Classification by Etiology

1. Atypical pneumonia

Caused by "atypical" bacterial pathogens such as Legionella, Mycoplasma pneumoniae, and Chlamydia pneumoniae.

2. Aspiration pneumonia

Results from entry of gastric or oropharyngeal fluids, or exogenous substances into lower airways.   
 which may contain bacteria

3. Chemical pneumonitis

Independent of bacterial infection

Caused by aspiration of substances (e.g., acidic gastric fluid) leading to inflammatory reaction.

## Pathogens & Risk Factors

Bacteria, viruses, fungi, and parasites

more common

less commonly

## Signs and Symptoms

Pulmonary:

The causative agent may not be isolated in about half of cases despite careful testing

Commonly associated with predisposing factors like smoking, immunodeficiency, and chronic diseases. chronic obstructive pulmonary disease, sickle cell disease (SCD), asthma, chronic kidney disease, liver disease, and biological aging.   
 asplenia

Cough (with or without sputum), dyspnea, pleuritic chest pain, tachypnea, increased work of breathing, adventitious breath sounds.   
 rate of breathing

Systemic:


Fever, chills, fatigue, malaise, chest pain, tachycardia, leukocytosis or leukopenia.

Inflammatory Markers:

Elevated ESR, CRP, and procalcitonin, with the latter being largely specific to bacterial infections (will cause inflammation)   
 erythrocyte sedimentation rate   
 C-reactive protein   
 inflammatory markers

culture ال هي شرط اساسي للتشخيص بس بدون التشخيص بيصير ال pneumonia بشكل عام تشخص clinically ال chest x ray ... هي بتشل confirm وال culture لتحديد antibodie المناسب بس غالبًا بتحسّن ال patient قبل ما تطلع نتيجة ال culture   
 إذا اجاني مريض بالطوارئ وفحصته وشخصته pneumonia يعطيه empirical therapy لحد ما اعمل culture ويجهز , ال culture شرط اساسي للتشخيص بس عادي بدونه بصير (لك مل للتشخيص وليس مشخص) ال & ال tools such as X-rays and confirmation بس ال pneumonia بشكل عام تشخص clinically



Aspect	Details
Community-acquired pneumonia (CAP)	
Epidemiology	WHO estimates that lower respiratory tract infection is the most common infectious cause of death in the world.
Signs and Symptoms  <ul style="list-style-type: none"> <li>Choice of antibiotics are usually empirical.</li> </ul> <p>مجرد ما شخصتها ببلش ما بستتى ال culture إذا طلعت  النتيجة compatible مع ال antibiotic التي يستخدمه بكل فيه  إذا لا بغيره عال sensitive</p>	1. Fever or hypothermia 2. Sweats, rigors or chills 3. Cough, sputum production 4. Pulmonary lesions observed on radiographic examination 5. Nonspecific symptoms are common, including loss of appetite, fatigue, and confusion.
Management	1. Oxygen 2. Analgesia for chest pain 3. Antibiotics (IV or oral) 4. Steroids (could be considered in severe pneumonia)
Empirical Therapy	- Start ASAP with <b>Empirical therapy</b> broad-spectrum antibiotics - De-escalation to narrow and target antibiotics as appropriate - Duration: 7-10 days, but shorter courses (3-5 days) may be effective for certain types of pneumonia and may reduce the risk of antibiotic resistance <p><small>Current guidelines recommend continuing until the AB course is completed</small></p>
Adjunctive Therapy	adjunctive therapy - Corticosteroid therapy might benefit those with severe CAP and a high inflammatory response
First-line Antibiotics	Amoxicillin OR macrolide (azithromycin or clarithromycin) OR Doxycycline <p><small>penicillin allergy →</small></p>
Antibiotic Regimen for High-risk Patients <p>Patients &gt;65, with comorbidities such as chronic heart, lung, liver, or renal disease; diabetes mellitus; alcoholism; malignancy; asplenia; immunosuppression, prior antibiotics within 90 days:</p> <p>hospitalized patient            Ampicillin/sulbactam OR ceftriaxone + azithromycin or doxycycline            Alternative: Fluoroquinolone (Levofloxacin or Moxifloxacin)</p> <p><small>ex problem with ceftriaxone + penicillin allergy</small></p>	First: amoxicillin/clavulanate + macrolide OR doxycycline Alternative: cefuroxime + macrolide OR doxycycline Duration of therapy: minimum of 5 days, should be afebrile for at least 48 hours, clinically improving (based on symptoms and vital signs) <p><small>combination Penicillin allergy</small></p>
Treatment of hospitalised patient	Ampicillin/sulbactam OR ceftriaxone + azithromycin or doxycycline Fluoroquinolone (Levofloxacin or Moxifloxacin)

هون قفسو ابو لو يدي اوقف الدواء عن المريض بعد الخمس ايام لازم الشيك انو او يومين ما عنديو لا ايجت عليه حرارة فطر جكالك انو فعلا ما على حرارة من يومين خمس بوقف العلاج

Aspect	Details
<b>Hospital-acquired pneumonia (HAP)</b>	
Pathogens	Bacteria > virus.
Non-MDR	Piperacillin-tazobactam
MDR	Meropenem
Risk Factors	<p>MDR ← - Ventilatory support for HAP- Septic shock- Intravenous (IV) antibiotic use within the previous 90 days</p>
<b>Atypical pneumonia</b>	
Definition	Any type of pneumonia not caused by one of the pathogens most commonly associated with the disease.
Clinical Features	<p>- No response to common antibiotics such as beta-lactams (penicillin)- No signs and symptoms of lobar consolidation-            * Absence of leukocytosis</p>
Pathogens & Treatment	<p>- <b>Mycoplasma pneumoniae</b>: doxycycline<sup>of</sup>, macrolide-  <b>Chlamydia pneumoniae</b>: doxycycline<sup>of</sup>, macrolide,  <sup>of</sup> fluoroquinolones- <b>Legionella spp.</b>: macrolide +/- rifampicin</p>
<b>Aspiration pneumonia</b>	
Definition	Relatively large amount of material inhaled from the stomach or mouth entering the lungs
Clinical Features	Fever, cough, increased respiratory rate, foul-smelling sputum, hemoptysis
Risk Factors	Decreased level of consciousness, problems with swallowing, alcoholism, tube feeding, poor oral health
Treatment	<p>- CAP: ampicillin-sulbactam or fluoroquinolone (high risk: add clindamycin)- HAP: vancomycin + piperacillin-  <b>Tazobactam</b></p>
<b>Viral pneumonia</b>	
Antiviral Medications	<p>These are of most benefit if they are started within 48 hours of the onset of symptoms</p> <p>SARS coronavirus, adenovirus, hantavirus, and parainfluenza virus.</p> <p>- No specific antiviral medications recommended for community-acquired viral pneumonias- <b>Influenza A</b>: rimantadine, amantadine- <b>Influenza A or B</b>: oseltamivir, zanamivir, peramivir</p>
Antibiotics in Viral Pneumonia	<p>Some experts recommend antibiotics due to the possibility of a complicating bacterial infection.</p>

يعطي ال antibiotics عشان إذا دخلت بكتيريا مع ال virus اقتر الخصى منها وما يتقادم الوضع

CAP	<ul style="list-style-type: none"> <li>❖ Patients without comorbidities: Amoxicillin <b>OR</b> A macrolide (azithromycin or clarithromycin) <b>OR</b> Doxycycline</li> <li>❖ Patients with comorbidities: amoxicillin/clavulanate + macrolide or doxycycline ^^&gt; <ul style="list-style-type: none"> <li><b>Alternative:</b> cefuroxime + macrolide <b>OR</b> doxycycline</li> </ul> </li> <li>❖ <u>hospitalized patient</u> : <ul style="list-style-type: none"> <li>Ampicillin/sulbactam <b>OR</b> ceftriaxone + azithromycin or doxycycline</li> <li><b>Alternative:</b> Fluoroquinolone (Levofloxacin or Moxifloxacin)</li> </ul> </li> </ul>
HAP	<ul style="list-style-type: none"> <li>• <b>NO MDR:</b> Piperacillin-tazobactam</li> <li>• <b>MDR:</b> Meropenem</li> </ul>
Atypical	<ul style="list-style-type: none"> <li>➢ Mycoplasma : doxycycline or macrolide</li> <li>➢ Chlamydothila : doxycycline, macrolide, fluoroquinolones.</li> <li>➢ Legionella: macrolide +/- rifampicin.</li> </ul>
Aspiration	<p>Depends on the setting in which aspiration occurred:</p> <p>CAP: ampicillin-sulbactam or fluoroquinolone (high risk: add clindamycin)</p> <p>HAP: : vancomycin + piperacillin-tazobactam</p>
Viral	<p>No specific antiviral medications are recommended</p> <p>Influenza A: rimantadine or amantadine</p> <p>Influenza A or B may be treated with oseltamivir, zanamivir or peramivir.</p>