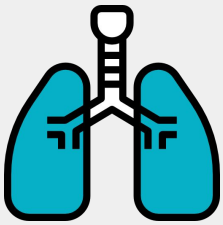
Community Acquired Pneumonia



Objectives :

- ★ List the 3 most common organisms of CAP .
- ★ Be able to triage patients appropriately based on the pneumonia severity index (PSI) .
- ★ Identify 3 criteria for clinical stability and discharge.

The risk factors and the most likely organisms associated with them are very important

See dr's cases in page 9 (VERY IMPORTANT)

Editing file

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Important
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Community Acquired Pneumonia

◀ Definition

- Lower respiratory tract infection in a non-hospitalized person associated with symptoms of acute infection **with or without** new opacity on chest radiograph.
- Acute infection of the pulmonary parenchyma acquired outside of a health care setting.

◀ Classes of pneumonia

1. CAP (the most common)
   1. Typical CAP
   2. Atypical CAP
2. Health care associated:
   1.**hospital acquired** → role of 2 (2 **days** after admission or 2 **weeks** after discharge)
   2.**ventilator associated**
3. Aspiration[1] pneumonia
4. Pneumonia in immunocompromised.

★ Types & Microbiology of CAP

➔ Streptococcus pneumoniae (pneumococcus) and respiratory viruses are the most frequently detected pathogens in patients with CAP.

Typical CAP (60% - 70%)	**Atypical CAP (30%- 40%)**	
Typical[2] bacteria:	**Atypical[3] bacteria:**	**Respiratory viruses:**
Strept .pneumoniae **(most common bacterial cause)** Particularly among young adults. Also the most common cause of pneumonia in injection drug users.	Legionella spp [4](contaminated water, air, ventilation systems)	Influenza A and B viruses
Haemophilus influenzae (the most common in smokers and COPD)	Mycoplasma pneumoniae (After trauma/splenectomy/in HIV)	Rhinoviruses
Moraxella catarrhalis	Chlamydia pneumoniae (joints pain, headache, sinusitis)	Para influenza viruses
Staphylococcus aureus (Particularly after a recent influenza infection)	Chlamydia psittaci (birds)	Adenoviruses
Group A streptococci Streptococcus pyogenes	Coxiella burnetii (farmers)	Respiratory syncytial virus
Aerobic gram-negative bacteria e.g. Pseudomonas aeruginosa (associated with cystic fibrosis) & Klebsiella pneumoniae		Human metapneumovirus
★ Anaerobes (associated with aspiration) Bacteroides, Prevotella, Fusobacterium, Peptostreptococcus Most commonly seen in alcoholic patients presenting with "current jelly sputum" (Klebsiella pneumonia is aerobic but it is often seen in aspiration lobar pneumonia in alcoholics)		Coronaviruses (e.g. COVID-19 or Middle East respiratory syndrome coronavirus)
		Human bocaviruses

1- A type of pneumonia that occurs as a result of oropharyngeal secretions and/or gastric contents aspiration. The inhalation of foreign material into the respiratory tract after instrumentation of the upper airways or esophagus (e.g., upper GI endoscopy) or secondary to vomiting and regurgitation of gastric contents.
2- Related to Streptococcus pneumoniae, classical symptoms (fever, cough, SOB, chest pain) as well as classical radiological findings (opacity on CXR)
3- Presents with unclassical symptoms and chest x ray eg. **Legionella (GI symptoms, headache and chest pain, malaise)** causes Legionnaires + history of travel is important (molds in air conditioning of hotels). Diagnostic test is serum/urine antigen.
4- Most common cause of atypical pneumonia.

Risk factors

Older age:

- The risk of CAP rises with age.
- The annual incidence of hospitalization for CAP among adults ≥65 years old
- Due to chronic diseases and comorbid conditions[1]
- They lose the elasticity of cilia in the airways → inability to clear the airways

Chronic comorbidities:[2]

- COPD, chronic lung disease (eg, bronchiectasis, asthma), chronic heart disease (particularly CHF), stroke (because stroke will affect cough reflex), diabetes mellitus, malnutrition and immunocompromising conditions.
- **COPD + smoking** are associated with **Haemophilus influenzae**. **(Possible exam Q)**
- **Bronchiectasis** : most likely gram -ve bacteria such as **pseudomonas** , and they will have Colonization.

Viral respiratory tract infection: [3]

- Viral respiratory tract infections can lead to primary viral pneumonias and also predispose to secondary bacterial pneumonia
- **MERS** and **COVID19** pneumonia + influenza A&B and H1N1
- Patients usually firstly present as **upper respiratory tract infection**. After couple of days, they will get **secondary pneumonia** with its classical symptoms.

Impaired airway protection: Aspiration[4]

(Exam Q)

- Conditions that increase risk of macroaspiration of stomach contents and/or microaspiration of upper airway secretions predispose to CAP, such as loss/alteration in consciousness (eg, due to **stroke**, **seizure**, anesthesia, drug (opioids) or alcohol use) or **dysphagia** due to **esophageal lesions** or dysmotility, **achalasia**, uncontrolled **GERD**, **vomiting**, Parkinson's, cerebral palsy, neuromuscular disorders, old age.
- Usually caused by **anaerobes**.

Smoking and alcohol overuse:

- Smoking, alcohol and opioid use are key modifiable behavioral risk factors for CAP .

Other lifestyle factors:

- Other factors that have been associated with an increased risk of CAP include crowded living conditions (eg, prisons, homeless shelters, **Hajj**) associated with staph aureus, residence in low-income settings, and exposure to environmental toxins (eg, solvents, paints, or gasoline)

1- immobility leads to poor ventilation of the lungs, which increases the risk of bacterial colonization and infection
2- Most importantly are patients with interstitial lung disease, those patient get streptococcal like others.
3- Uncommon compared to bacterial pneumonia but if it happened it will be more severe.
4- Young lady with classical symptoms of pneumonia but with uncontrolled seizure.

Signs, symptoms and diagnosis

Clinical symptoms

- **Cough**[1] (productive or non-productive) sometimes with haemoptysis
- **Fever** which, if swinging, may indicate empyema ,Chills /Rigors[2]
- **Dyspnea**[3] (due to the inflammation and mucus formation. These will narrow the airway)
- **chest pain** may be experienced, commonly pleuritic in nature and due to inflammation of the pleura; a pleural rub may be heard early on in the illness
- **Fatigue/Myalgia** (because the body tries to fight an infection)
- **extrapulmonary manifestation** (meningitis, bacteremia (septic shock), reactive arthritis (after hepatitis A infection) **(Exam Q)**
- **Gastrointestinal** (Common in viral infections and **Legionella**)

In the elderly, CAP can present with confusion or non-specific symptoms such as recurrent falls. CAP should always be considered in the differential diagnosis of sick elderly patients, given their frequently atypical presentation.

Physical exam (Exam Q)

- Dullness[4] to percussion of chest
- Crackles[5] on auscultation
- Increase in vocal and tactile fremitus[5]
- Bronchial breath sounds[6]
- Egophony ("E" to "A" changes)[7]

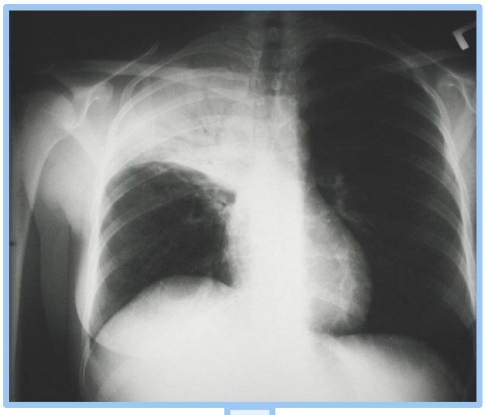
Diagnosis - labs

Intervention	Comments
CXR	All patients with suspected CAP should have chest radiograph PA and lateral CXR required to confirm the diagnosis. In classical pneumonia: clinical features and CXR are enough to diagnose.
Sputum Gram stain and antimicrobial sensitivity	(not sensitive, in 100 patient with CAP only <7% will have positive stain)
Blood cultures x 2	marker of severity (negative unless the pt develop septicemia)
Serum/ urine antigen	(**Legionella** antigen) Urinary antigen assay for Legionella in selected patients .This test is very sensitive. The antigen persists in the urine for weeks (even after treatment has been started)
organ dysfunction	such as renal dysfunction, liver dysfunction, and/or thrombocytopenia . important especially for evaluating patient with known hepatic or renal disease
PCR	For influenza, COVID-19 swab
Other tests:	Leukocyte count ,Inflammatory markers, (ESR), (CRP),procalcitonin[8] ,CBC MERS-CoV, very important nowadays to do swab for COVID-19

1- Typical CAP usually presents with greenish productive cough while atypical CAP usually presents with unproductive cough
2- What is the difference between chills and rigors? A chill is a sensation of cold occurring in most fevers. A rigor is a profound chill with piloerection associated with teeth chattering and severe shivering, and it's usually caused by pyelonephritis and dental abscess.
3- Common but if it's progressing that is a bad sign. Patient may develop complications such as: pleural effusion, ARDS, or respiratory failure.
4- Dullness is caused by the consolidation (solid or pus) while in pleural effusion or fluid accumulation you will hear stony dullness.
5- Not very common.
6- Indicative of consolidation.
7- common in the ER (you will not hear it usually in admitted patients after treatment with antibiotics)
8- Is a substance produced by many types of cells in the body in response to bacterial infections

Diagnosis

◀ Radiologic evaluation[1]



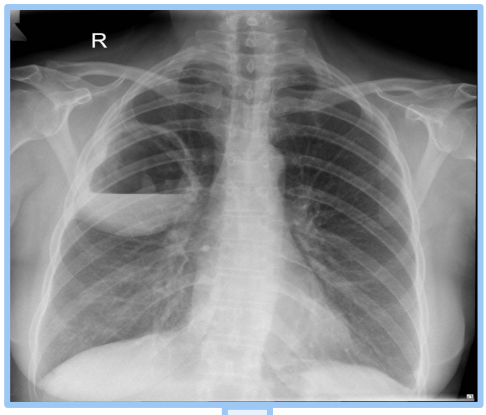
Consolidation

Classical finding in pneumonia

Opacity (semi rounded white area) cause by either:

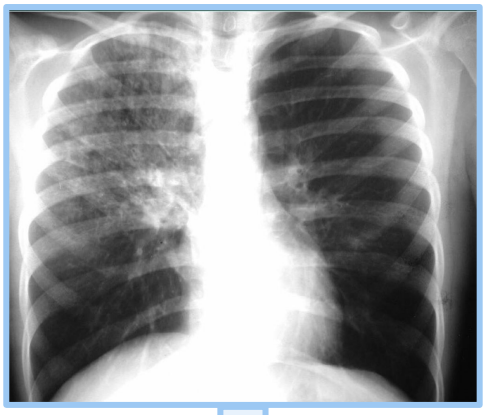
A. Mass
B. Consolidation

usually caused by streptococcus pneumoniae



Cavity

Air fluid level : it's the line between the puss and normal lung tissue(air) in a cavity
When we see a cavity it's either anaerobes or staph
In the upper zone: most likely staph
In the lower zone : anaerobes
Why ? Anything will enter to the lung will go most likely to the right because of the early bifurcation of the right bronchus and to the lower zone by gravity.
That's why when we see a cavity in the right lower zone we will think about an organism associated with aspiration



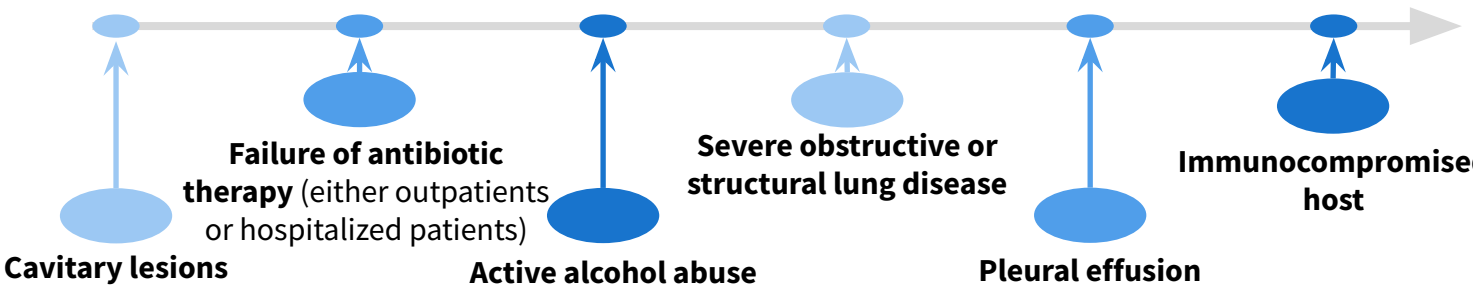
Interstitial Infiltrates

Comes with crackles

Usually appears in atypical organisms

(especially viral which gives bilateral infiltrate)

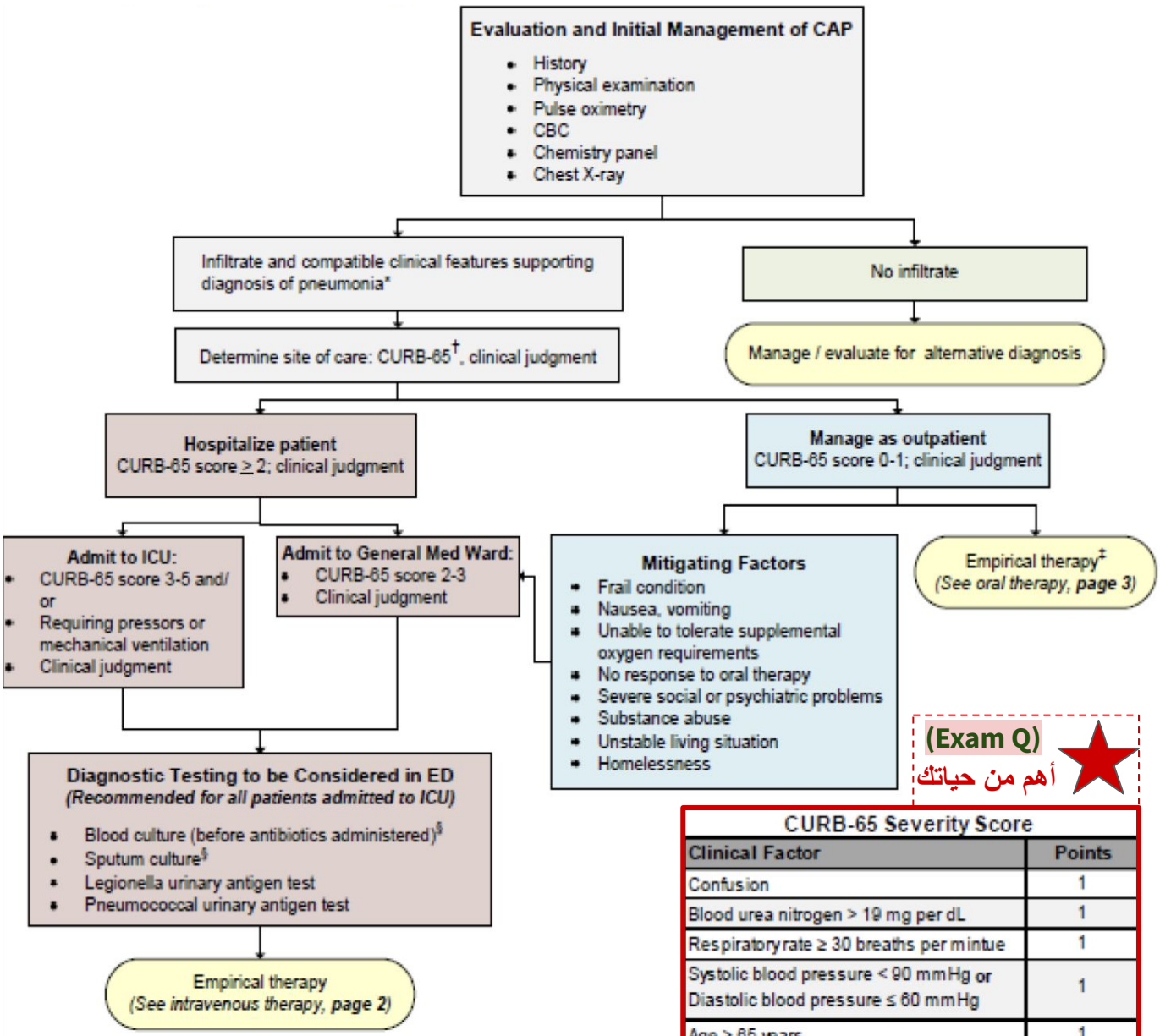
◀ Intensive care unit admission



1-About the most likely organisms in relation to radiological findings : it's just a clinical information not a rule!
Causes (of cavitary mnemonic CAVITY:
C: Cancer. finding)A: Autoimmune (Rheumatoid Arthritis, wegener's) V: Vascular (AV malformation)
I: Infection (Staph., TB) T: Trauma (Pneumatocele) Y: Young (Congenital infected cyst) (from 437 team)

Evaluation and Initial Management of Community-Acquired Pneumonia (CAP)

- After assessment of CAP (Clinical, PE, Radiological, Labs) what is the **next best step** in management?
  - Allocate the pt based on the CURB-65 criteria



(Exam Q) أهم من حياتك

CURB-65 Severity Score

Clinical Factor	Points
Confusion	1
Blood urea nitrogen > 19 mg per dL	1
Respiratory rate ≥ 30 breaths per mintue	1
Systolic blood pressure < 90 mm Hg or Diastolic blood pressure ≤ 60 mm Hg	1
Age ≥ 65 years	1
Recommendations	**CURB-65 Score**
Low risk, consider home treatment	0
	1
Short inpatient hospitalization or closely supervised outpatient treatment	2
Severe pneumonia; hospital and consider admitting to intensive care unit	3
	≥ 4

* Compatible clinical features include but are not limited to: fever, hypothermia, rigors, sweats, new cough with / without sputum production, change in color of secretions, chest discomfort, or onset of dyspnea.
† See CURB-65 Severity Scores in boxes on the right.
‡ Obtain cultures as clinically indicated.
§ If culture cannot be obtained, DO NOT delay antibiotic administration.

Management

Table 2: Oral Therapy

Patient Population	Antibiotic	Recommended Dosing	Notes
Previously Healthy and No Recent Antibiotic Therapy	azithromycin **or** doxycycline	500 mg PO Q24 hrs. 100 mg PO Q12 hrs.	If comorbidities, consider moxifloxacin as an alternative.
Antibiotic Therapy in Past 3 Months ***If previous therapy known, use an alternative agent***	amoxicillin / clavulanate **or** amoxicillin (high dose) **or** cefdinir	2000/125 mg PO Q12 hrs.* 1 g PO Q8 hrs.* 300 mg PO Q12 hours*	High dose amox/clav targets drug-resistant S. pneumoniae (DRSP). Patients with co-morbidities or recent antimicrobial therapy are at risk of DRSP.
	Plus (+) either azithromycin **or** doxycycline	500 mg PO Q24 hrs. 100 mg PO Q12 hrs.	
	OR monotherapy levofloxacin	750 mg PO Q24 hrs.*	
Suspected Aspiration	amoxicillin / clavulanate **or** clindamycin	2000/125 mg PO Q12 hrs.* 300–450 mg PO Q6 hrs.	High dose amox/clav targets drug-resistant S. pneumoniae (DRSP). Patients with co-morbidities or recent antimicrobial therapy are at risk of DRSP.

* Dose should be adjusted for renal function.

Note: Patients presenting from the community with any of the following health care exposures are at risk for MRSA and

Patient Population	Antibiotic	Recommended Dosing	Notes
Non-ICU Patient *without Pseudomonal* Risk	ceftriaxone **Plus (+)** azithromycin	2 g IV Q24 hrs.* 500 mg IV Q24 hrs.	If < 65 years of age and no risk factors for drug-resistant pneumococcus, azithromycin is appropriate at discharge.
	OR monotherapy levofloxacin	750 mg IV Q24 hrs.**	
ICU Patient *without Pseudomonal* Risk	cefriaxone*	2 g IV Q24 hrs.	If documented severe β-lactam allergy, use levofloxacin plus aztreonam (2 g IV Q8 hrs.**) as an alternative.
	Plus (+) either azithromycin **or** levofloxacin	500 mg IV Q24 hrs. 750 mg IV Q24 hrs.**	
ICU and Non-ICU Patients *with Pseudomonal* Risk* **	piperacillin / tazobactam **or** cefepime	4.5 g IV Q8 hrs.** 2 g IV Q8 hrs.**	If documented severe β-lactam allergy, use aztreonam plus levofloxacin with tobramycin (7 mg/kg IV Q24 hrs.**) as an alternative.
	Plus(+) tobramycin **and** azithromycin	7 mg/kg IV Q24 hrs.** 500 mg IV Q24 hrs.	
Suspected Aspiration****	ampicillin / subactam **or** ertapenem	3 g IV Q6 hrs.** 1 g IV Q24 hrs.**	Ertapenem should be used in patients with penicillin allergies.
Suspected MRSA Pneumonia	**Add** vancomycin	15-20 mg/kg Q12 hrs.**	Consider loading dose of 25 mg/kg.

*Ceftriaxone 1 g IV Q24 hrs. is adequate for patients weighing < 80 kg.

Doctor's Notes

How to manage a patient with CAP?

First allocate the patient using CURB-65 score:

- Score **0 or 1** = **send home** with **azithromycin for 3-5 days**
- Score **2**= **admit to hospital** and treat with **ceftriaxone + azithromycin**
- Score **3** or more: **ICU** and treat with **Tazocin (Piperacillin/tazobactam)** also called piptaz.

Special conditions:

- If the history is suggestive of **aspiration pneumonia** **(even if the patient was not hospitalized)** : **clindamycin** is the drug of choice
- Risk of **staph**: **vancomycin**
- **bronchiectasis:** gm -ve like **pseudomonas**, start them on **levofloxacin** or **ciprofloxacin**.

Extra

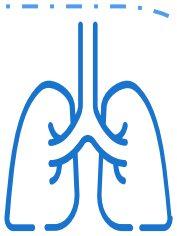
General management

Oxygen	-Supplemental oxygen should be administered to maintain saturations between 94% and 98%
Intravenous fluids	-These are required in hypotensive patients showing any evidence of volume depletion and hypotension.
Antibiotics	-The first dose of antibiotic should be administered within 1 hour of identifying any high-risk criteria and treatment should not be delayed while investigations are awaited. -The antibiotic regimen should be adjusted specifically once culture and sensitivity results are available.
Analgesia	-Simple analgesia, such as paracetamol or an NSAID, helps treat pleuritic pain, thereby reducing the risk of further complications due to restricted breathing because of pain

Prophylaxis of recurrent pneumonia

- Pneumococcal and influenza virus vaccine

Complications of pneumonia



- Severe pneumonia in certain patients can lead to septic shock and eventually acute kidney injury (AKI) or liver failure.
- Meningitis (especially in Hajj)
- Infective endocarditis
- Hepatitis
- Reactive arthritis
- Para-pneumonic effusion
- Empyema
- Retention of sputum causing lobar collapse
- Deep vein thrombosis and pulmonary embolism
- Pneumothorax, particularly with Staphylococcus aureus
- Suppurative pneumonia/lung abscess
- ARDS, renal failure, multi-organ failure
- Ectopic abscess formation (Staph. aureus)
- Hepatitis, pericarditis, myocarditis, meningoencephalitis
- Arrhythmias (e.g. atrial fibrillation)
- Pyrexia due to drug hypersensitivity

❖ **Case 1:** "عندي احساس ان السيناريو مهم"

A 35 year old male, presents with fever and cough. He was well until 3 days earlier, when he suffered the onset of nasal stuffiness, mild sore throat, and a cough productive of small amounts of clear sputum. Today, he decided to seek physician assistance because of an increase in temperature to 38.3°C and spasms of coughing that produce purulent secretions. On one occasion, he noted a few flecks of bright red blood in his sputum. The patient has no history of familial illness, hospitalizations.

- **What questions will you ask first?**
  - If anyone around the patient has experienced the same symptoms → suspect COVID-19.
  - Pattern of fever (continuous (for +24hrs), intermittent, remittent (as in malaria).
  - Other associated symptoms?

❖ **Case2:**

University student presented with cough, fever, shortness of breath. Examination revealed dullness, bronchial breathing, and consolidation in his x-ray.

- **What is the most likely organism?** Strept .pneumoniae
- What are the extrapulmonary manifestation of Streptococcus pneumonia ? Meningitis, bacteremia (septic shock), reactive arthritis. (When a patient has hepatitis A and he developed arthritis later on we call it reactive arthritis)
- **What if history of smoking was added to the scenario?** Haemophilus influenzae
- **What if parkinson's disease was mentioned in the scenario?** Anaerobes (also applicable for any risk of aspiration pneumonia e.g. seizures/anesthesia)

❖ **Case3:**

A 50 years old patient presented to ED complaining of cough and fever. The patient has a recent travel history to Malaysia

- **What is the most likely organism?** Legionella
- **What is the next step?** Urine antigen test

Cases

◀ Case study 1:

- A 68 y/ male presented to the ED with SOB and productive coughing for 2 days. Reports poor oral intake since onset due to nausea and intermittent vomiting. His wife had similar symptoms 1 week ago which improved with an unknown antibiotic. Patient is requesting to go home with antibiotic. He previously had tongue swelling and skin rash with use of augmentin. Reports good health otherwise. Denies chest pain, swelling of extremities, or diarrhea.
- **His vital signs are** :
  T 38.5 C, P 76, BP 128/82, spO2 94%, RR 16. Patient is alert and oriented. Crackles were heard over left lower lung field. Labs showed WBC 14, BUN 20 mg/dL. Chest X-ray had a consolidation in left lower lobe.

- **What is the best way to further manage this patient?**

A. Send home with oral azithromycin
B. Send home with oral levofloxacin
C. Admit to medicine floor with iv levofloxacin
D. Admit to medicine floor with iv ceftriaxone and azithromycin
E. Admit to ICU with iv ceftriaxone and iv azithromycin

Answer: C

Doctor's notes:

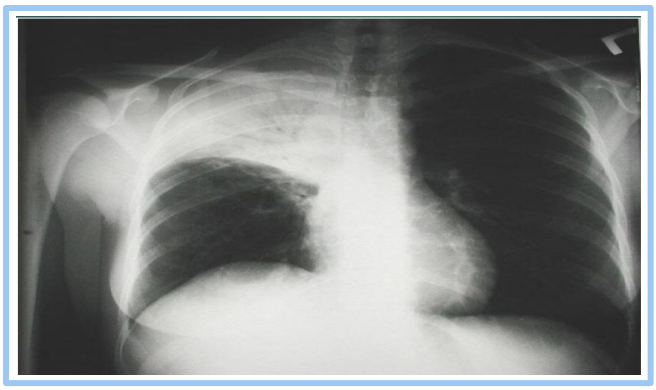
First Allocate the patient by **CURB-65** Severity Score:
C: Confusion (Absent) = 0
U: BUN (20 mg/dl) = 1
R: RR (Does not meet criteria) = 0
B: BP (Does not meet criteria) = 0
65: Age (68 years old) = 1
Overall score= **2** (**inpatient admission**)

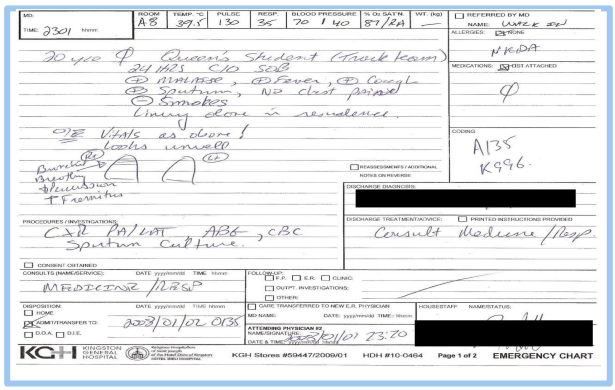
- Based on the score we will **exclude A,B and E**
- The patient has augmentin allergy so we will avoid ceftriaxone (due to cross reactivity).The **answer is C**, if the patient doesn't have augmentin allergy the **answer is D.**

Cases

◄ Case study 2:

- 20 years old female, Queen's student on the track team, came to the hospital complaining of 24 hours of SOB, has fever, malaise, cough and sputum, but no chest pain. She is a non-smoker. She lives alone in residence.
- **Her vitals signs are :** Temperature 39.5◦C, Pulse 130 bpm, RR: 35, BP: 70/40 ,% Oxygen Saturation: 87/RA (Room Air)
- **On examination:** she Looks unwell, Bronchial breathing heard in Upper Rt, dullness on percussion, and Increased fremitus
- **Procedures and Investigations are:** CXR (PA/LAT),ABG, CBC, and Sputum Culture]





- **What are the features of Jane's history that suggest which organisms are most likely to be responsible for her presentation?**

She has CAP, and the most common most likely organism is streptococcus pneumoniae, and she doesn't seem to have the risk factors related to the other organisms.

- **What additional information from her history would you like to know and why?**

Look for any risk factors in the patient from what was mentioned before.

- **What are the features of Jane's physical examination that indicate pneumonia?**

Bronchial breathing (means consolidation), increased fremitus (tactile and vocal).

- **What are signs of pleural involvement? Does she have any?**

Decreased tactile fremitus ,stony dullness, decreased or absent bronchial breathing.
No, she doesn't have any.

- **What are signs of serious sepsis? Does she have any?**

Fever, hypotension, tachycardia, tachypnea, oxygen desaturation[1].
Yes she have.

- **Bonus: What are examples of extra-pulmonary infection that may complicate pneumonia?**

Meningitis, pericarditis, reactive arthritis[2], and hepatits and AKI (acute kidney injury)
Most dangerous? Infective endocarditis (high mortality if present) esp staph aureus

- **Where should Jane be managed?**

CURB-65 Severity Score: C: Confusion (Absent) = 0 , U: BUN (30 mg/dl) = 1 , R: 35 = 1 , B: BP 70/40 = 1 , 65: Age (20 years old) = 0
Overall score= 3
where to manage her?

- In ICU, stabilize the patient (ABC..) and start broad spectrum antibiotics.

1- normal is >92%
2-reactive or septic arthritis and the favourite place is the knee (causing swelling in the knee)

Summary

Types	• **Typical :** S.pneumoniae (most common bacterial cause) • **Atypical :** legionella spp contaminated water source , air conditioning.
Viruses	Very important causes especially in children. 1. Coronaviruses 2. Influenza A and B viruses
Clinical signs and symptoms	• Cough (if productive rusty colored sputum) • Fever, Chills • Dyspnea • Fatigue • Gastrointestinal (Legionella) → history of travel • Dullness to percussion • Crackles on auscultation • Bronchial breath sounds • Egophony ("E" to "A" changes) • Increased vocal tactile fremitus
Risk factors	• Older age • Chronic comorbidities (smoking + COPD = Haemophilus influenzae) • Viral respiratory tract infection • Impaired airway protection Aspiration → anaerobes • Smoking and alcohol overuse • Other lifestyle factors

Diagnosis

- All patients with suspected CAP should have chest radiograph
- Urinary and serum antigens specific for legionella
- Leukocyte count
- Sputum Gram stain

Evaluation :

CURB-65	Clinical Feature	Points
C	Confusion	1
U	Urea > 7 mmol/L	1
R	RR ≥ 30	1
B	SBP ≤ 90 mm Hg OR DBP ≤ 60 mm Hg	1
65	Age > 65	1

CURB-65 Score	Risk group	30-day mortality	Management
0 -1	1	1.5%	Low risk, consider home treatment
2	2	9.2%	Probably admission vs close outpatient management
3-5	3	22%	Admission, manage as severe

Management :

1- Healthy Individual with no risk factor (classified by the CURB-65 score as outpatient)	Azithromycin
2- Risk of aspiration (Anaerobes)	Clindamycin or Augmentin
3- Patient admitted but not ICU	Azithromycin + 3rd generation Cephalosporin (Ceftriaxone)
4- ICU patients (Sepsis)	Empirical treatment (Piptaz)

Lecture Quiz

Q1: 500Best: A 55-year-old man, who has never smoked and with no past medical history, has been diagnosed with right basal community-acquired pneumonia. There are minimal changes on his chest x-ray and bloods reveal a neutrophil count of 8.2 and a C-reactive protein (CRP) of 15. He has no drug allergies. Although he has a productive cough of green sputum, his respiratory rate is 16, oxygen saturations are 97 per cent on room air and his temperature is 37.4°C. You are asked to place him on treatment. Which of the following treatment options would be appropriate for this patient ?

A- Oral amoxicillin
B- Oral erythromycin
C- Intravenous ertapenem
D- Intravenous ertapenem with a macrolide (e.g. clarithromycin)
E- Intravenous tazocin

Q2:500Best: Which of the following organisms would typically be found in a patient with atypical community-acquired pneumonia ?

A- Staphylococcus aureus
B- Pseudomonas spp.
C- Streptococcus pneumonia
D- Legionella pneumophilia

Q3: 4. Which of the following conditions is not associated with an increased incidence or severity of pneumococcal pneumonia?

A- Poorly controlled hypertension
B- Diabetes mellitus
C- Renal insufficiency
D- Cirrhosis of the liver
E- Multiple myeloma

Q4: 500Best: A 54-year-old investment banker presents to accident and emergency with a 5-day history of productive cough of green sputum, fevers and feeling generally unwell. On examination, there is bronchial breathing in the left lower zone. Chest x-ray demonstrates left lower zone consolidation. What is the most likely causative organism ?

A- Mycoplasma pneumoniae
B- Klebsiella pneumoniae
C- Staphylococcus aureus
D- Haemophilus influenzae
E- Streptococcus pneumoniae

Q5: 500Best: A 67-year-old woman is admitted to accident and emergency with pyrexia (38.1°C) and a cough productive of green sputum. The observations show a pulse rate of 101, BP 80/60 and respiratory rate of 32. She is alert and orientated in space and time. Blood results reveal a WCC of 21, urea of 153 mg/dL and chest x-ray shows a patch of consolidation in the lower zone of the right lung. She is treated for severe community-acquired pneumonia. Which of the following is the correct calculated CURB-65 score?

A- 6
B- 8
C- 4
D- 0
E- 1

Q6: 500Best: Which of the following organisms, responsible for causing chronic pneumonia, is most commonly found in patients with longstanding cystic fibrosis?

A. L. pneumophila
B. S. pneumonia
C. Burkholderia cepacia
D. Pseudomonas aeruginosa
E. H. influenza

Q7: Pre-test: A 40-year-old alcoholic develops cough and fever. Sputum is fetid and examination reveals crackles in the right base. Chest x-ray, shown below, shows an air-fluid level in the superior segment of the right lower lobe.
Which of the following is the most likely etiologic agent?

A. Streptococcus pneumoniae
B. Haemophilus influenzae
C. Legionella pneumophila
D. Anaerobes
E. Mycoplasma pneumoniae

Q8: Pre-test: A 40-year-old man without a significant medical history comes to the emergency room with a 3- day history of fever and shaking chills, and a 15-minute episode of rigor. He also reports a cough productive of yellow-green sputum, anorexia, and the development of right-sided pleuritic chest pain. Shortness of breath has been present for the past 12 hours. Chest x-ray reveals a consolidated right middle lobe infiltrate, and CBC shows an elevated neutrophil count with many band forms present. Which feature would most strongly support inpatient admission and IV antibiotic treatment for this patient??

A. Recent exposure to a family member with influenza
B. Respiratory rate of 36/min
C. Recent sexual exposure to an HIV-positive patient
D. Purulent sputum with gram-positive diplococci on Gram stain
E. Signs of consolidation (bronchial breath sounds, egophony) on physical examination

Answers: Q1:A | Q2:D | Q3:A | Q4:E | Q5:C | Q6:D | Q7:D | Q8:D

Answers Explanation File!

GOOD LUCK !

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