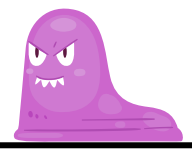
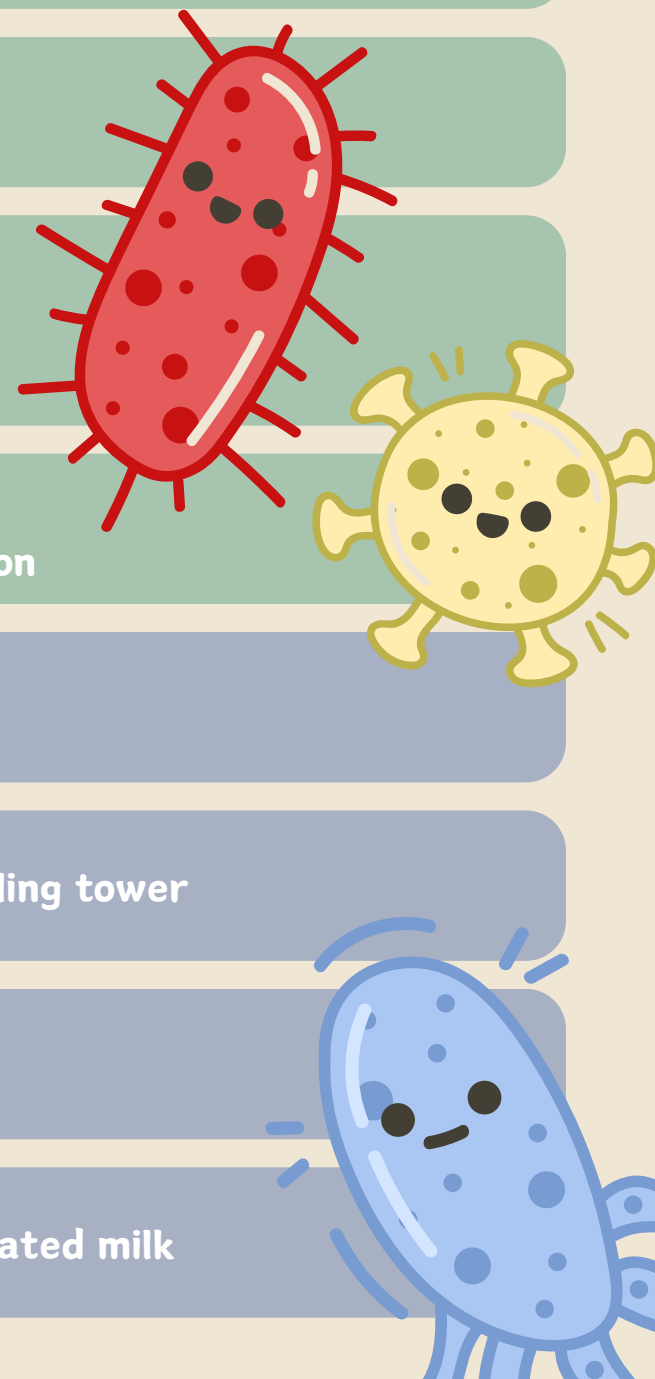
What is pneumonia?

AN ACUTE LOWER RESPIRATORY TRACT INFECTION OF THE LUNG PARENCHYMA	
Community acquired pneumonia (CAP)	Acquired in community, or **<48 hours** hospitalisation
Hospital acquired pneumonia (HAP)	Acquired after hospitalisation for **>48 hours**

	Typical pneumonia	**Atypical pneumonia**
Clinical presentation	• Sudden onset of fever • Productive cough • Pleurisy • SOB 	• Gradual onset of fever • Dry cough • Myalgia • Headache • Sore throat 
Gram stain	Organism stained 	Organism not stained (no cell well/viral cause) 
CXR	Lobar infiltrate, segmental	Patchy or interstitial infiltrates
Treatment with penicillin	Most respond to penicillin	Poor response to penicillin

What causes pneumonia?

	Organisms	Keywords
Typical pneumonia	Streptococcus pneumoniae	• Commonest bacterial cause of CAP in adults • Asplenism • Rusty sputum
	Klebsiella pneumoniae	• Alcoholics • Red currant jelly sputum
	Haemophilus influenzae	• COPD • Asplenism
	Staphylococcus aureus	• Recent influenza • IVDU • Cavitations
	Pseudomonas aeruginosa	• Cystic fibrosis • ICU / on ventilation
Atypical pneumonia	Mycoplasma pneumoniae	• Young adults
	Legionella pneumophila	• Contaminated cooling tower
	Chlamidophila psittaci	• Pigeon / turkey
	Coxiella burnetti (Q fever)	• Cattle / contaminated milk



Does every pneumonia patient need admission?

CURB-65 score

Estimates mortality of community-acquired pneumonia to help determine inpatient vs. outpatient treatment

C confusion +1

U rea > 7mmol/L (plasma) +1

R respiratory rate >30 +1

B lood pressure +1
Systolic < 90 mmHg or diastolic < 60mmHg

65 age >65 +1

Score	
0-1	Treat as outpatient
2	Admit to hospital
3+	Often require ICU care

📌 Mortality rates increase with increasing score

Investigations for Pneumonia

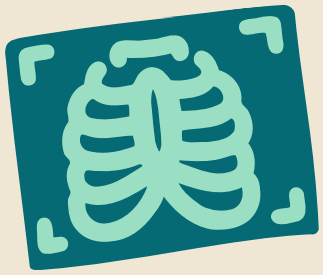
Bloods

Full blood count	• Very high or low WCC • Neutrophil leucocytosis → bacteria
Urea & electrolytes	• Urea > 7 mmol/L • Hyponatremia
Blood culture	• Bacteremia
Serology	• Acute & convalescent titres for Mycoplasma, Chlamydia, Legionella & viral infections
Arterial blood gas	• To assess ventilatory failure or acidosis if SaO2 <93% or when severe clinical features

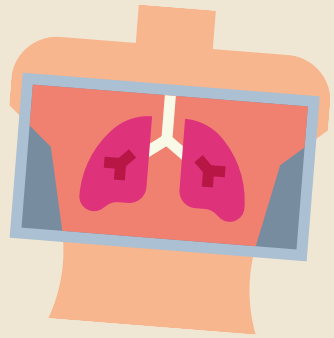
Sputum	Gram stain, culture, and antimicrobial sensitivity
Oropharyngeal swab	PCR for Mycoplasma and other atypical pathogens
Urine	Pneumococcal and/or Legionella antigen
Chest X ray	PA and lateral chest radiographs

Not compulsory for outpatients (mild cases). Empiric antibiotic therapy is generally successful, and knowledge of the infecting pathogen does not usually improve outcomes.

See next page for more info on chest X-ray!



CXR in Pneumonia

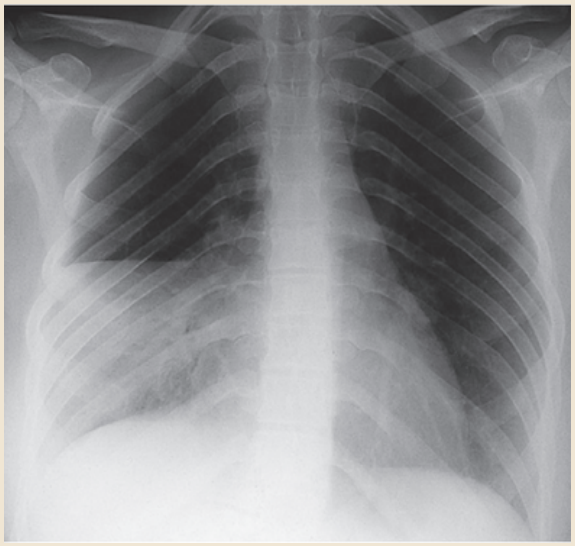


Look for

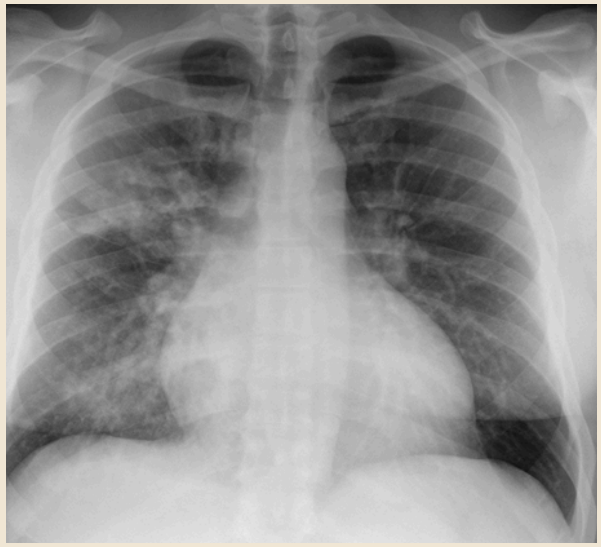
Evidence of new pulmonary consolidations

Evidence of complications e.g. abscess / pleural effusion

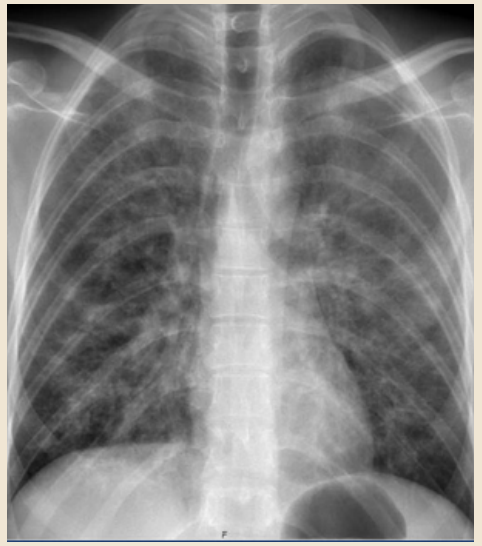
Lobar Pneumonia



Bronchopneumonia



Interstitial pneumonia



CXR FINDINGS

Pneumonia of the right middle lobe

- Opacification beneath horizontal fissure
- Loss of normal contrast between right heart border and lung
- Lobar/segmental consolidation
- Air bronchograms

Bronchopneumonia of both lungs

- Patchy and segmental shadowing over both lung fields
- Coalescing areas of consolidation
- Bilateral and asymmetric
- Predominantly basal distribution

Interstitial pneumonia

- Reticular pattern
- Predominantly central distribution

MOST COMMON ORGANISM INVOLVED

- Streptococcus pneumoniae (most common)
- Klebsiella pneumoniae
- Legionella

- Mycoplasma pneumoniae
- Chlamydia
- Staphylococcus aureus
- Pseudomonas

- Viruses
- Pneumocystis jirovecii
- Mycoplasma

Management of Pneumonia

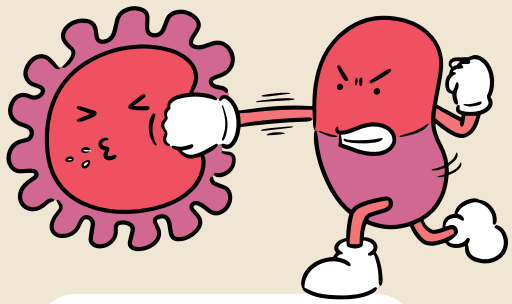
1. Oxygen

Target 94-98%
(COPD patients 88-92%)

2. IV Fluids

If anorexia,
dehydration, or shock

3. Empirical antibiotics



	Typical coverage		Atypical coverage
Low severity	**Amoxicillin (oral)** *If allergic, use* **Doxycycline / clarithromycin (oral)**	**or**	**Doxycycline (oral)** *If not well tolerated, use* **Clarithromycin (oral)**
Moderate severity	**Benzylpenicillin (IV)** *If allergic, use* **Ceftriaxone / cefotaxime (IV)** *If severely allergic, use* **Moxifloxacin (IV)**	**+**	**Doxycycline (oral)** *If not well tolerated, use* **Clarithromycin (oral)**
High severity	**Ceftriaxone/Cefotaxime (IV)** *If severely allergic, use* **Moxifloxacin (IV)**	**+**	**Azitromycin (IV)**

*Suspect typical / atypical pathogens based on epidemiology or clinical presentation

Ref: eTG

TEST YOUR KNOWLEDGE!

A 55-year-old male presents to the emergency department with a 3-day history of fever, productive cough, and shortness of breath.
On examination, he appears acutely unwell, with a temperature of 38.9°C, increased respiratory rate, and decreased breath sounds over the right lower lobe. Chest X-ray reveals consolidation in the right lower lobe.
The patient reports coughing up rust-coloured sputum.
Laboratory tests show an elevated white blood cell count.

Which of the following organisms is most likely responsible for this patient's pneumonia?

A) Staphylococcus aureus

B) Streptococcus pneumoniae

C) Haemophilus influenzae

D) Klebsiella pneumoniae

REFERENCES

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