



Microorganisms

Microorganisms	Elements évocateurs non spécifique
Pneumococcus (<i>Streptococcus pneumoniae</i>)	- Age > 40 ans, - Sudden onset, - General condition deterioration - High fever
<i>Haemophilus influenzae</i> <i>Moraxella catarrhalis</i>	
<i>Mycoplasma pneumoniae</i> , <i>Chlamydia pneumoniae</i>	- Frequent epidemic context - Age < 40 years - Gradual onset - Preserved general condition - Low-grade fever - No response after 48–72 hours of β-lactam treatment
<i>Legionella pneumophila</i>	- Exposure risk - Immunosuppression, comorbidities - Rapidly progressive course - Extra-respiratory symptoms - No response after 48–72 hours of β-lactam treatment

Key elements of diagnosis and management

		Outpatient	Non-severe hospitalized	Severe hospitalized
Laboratory exams	CRP	✗	✗	✗
	PCT	✗	✗	✗
	Pneumococcal urinary antigen	✗	✗	✓
	Legionella urinary antigen	✗	✓ If suggestive signs ^a	✓
	Cytobacteriological exam of respiratory sample	✗	✓ If mucopurulent secretions ^b	✓ Prefer deep respiratory samples
	Blood cultures	✗	✓ Limited indications ^c	✓
	Multiplex PCR for influenza, RSV, COVID (epidemic period)	✗	✓	✓
	Syndromic PCR	✗	Case by case	✓
Imaging	Chest ultrasound or chest X-ray	✓	✓	✓
	Low-dose chest CT	✗	✓ If diagnostic doubt	✓ If diagnostic doubt
Treatment	Antibiothérapie probabiliste de 1 ^{re} ligne	Monotherapy with β -lactams Or macrolid if suggestive of si évocateur de bactéries atypiques		Combination β -lactams + macrolides
	Duration	3 days if clinical stability at day 3 ; 5 days if stability between day 3 and 5		3 to 7 days
	Clinical evaluation at 72h	✓	✓	✓
	Corticosteroids	✗	✗	✓ (ICU only)

^a Suggestive arguments: exposure risk, no response after 48–72h of adequate treatment, immunosuppression, comorbidities, rapidly progressive course, extra-respiratory signs

^b Send rapidly to lab

^c Indications for blood cultures limited to certain situations (diagnostic doubt, immunosuppression, empiric treatment with non- β -lactam)

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Severity Criteria and Hospital Admission

Severe Community-Acquired Pneumonia (CAP): defined by at least 1 major or 3 minor criteria:

Severity criteria	
Major criteria	Minor criteria
- Septic shock - Respiratory failure requiring mechanical ventilation	- Respiratory rate ≥ 30 breaths/min $\text{PaO}_2/\text{FiO}_2 \leq 250$ - Multilobar infiltrates (≥ 2 lobes) - Plasma urea ≥ 7.14 mmol/L - Leukopenia ($\text{WBC} < 4000/\text{mm}^3$) - Thrombocytopenia ($< 100,000/\text{mm}^3$) - Hypothermia ($< 36^\circ\text{C}$) - Hypotension requiring fluid resuscitation

French Health Authority (HAS) Hospitalization Criteria
- Clinical tolerance : - Hypothermia $< 36^\circ\text{C}$ or hyperthermia $> 40^\circ\text{C}$ - Hypotension - Respiratory rate $\geq 30/\text{min}$ - Confusion - Comorbidities: congestive heart failure, cerebrovascular disease, renal or hepatic disease, COPD, hospitalization within past year, prior bacterial pneumonia - Medico-social factors: elderly isolated person, social isolation, poor treatment adherence

Comorbidities Affecting Empiric Antibiotic Choice for CAP
- Hospitalization in previous 3 months - Antibiotic therapy in previous month - Chronic alcoholism - Swallowing disorders - Severe neurological disease with aspiration risk - Active neoplasia - Immunosuppression - Severe COPD ($\text{FEV1} < 50\%$ predicted) or chronic respiratory failure (OLD or NIV) - Congestive heart failure - Hepatic failure - Chronic renal failure ($\text{GFR} < 30 \text{ ml/min}$)

Clinical Stability Criteria for Treatment Evaluation

All criteria must be met to stop antibiotics on day 3 or 5 for non-severe CAP:

Clinical Stability Criteria in Community-Acquired Pneumonia (CAP)
- Temperature $\leq 37.8^\circ\text{C}$ - Systolic blood pressure ≥ 90 mmHg - Heart rate ≤ 100 bpm - Respiratory rate $\leq 24/\text{min}$ $\text{SpO}_2 \geq 90\%$ on room air or $\text{PaO}_2 \geq 60$ mmHg on room air





Antibiotic Therapy for Non-severe CAP — Outpatient

Antibiothérapie

	1st line	Allergy/contraindication to 1st line
No comorbidities	Amoxicillin 1g three times daily	Pristinamycin 1g 3-times daily
≥1 comorbidity	Amoxicillin/clavulanate 1g/125mg 3 times daily	- Ceftriaxone 1g daily - Ou Cefotaxime 1g 3-times daily
Suspected atypical bacteria	- Azithromycin 500 mg day 1, then 250 mg daily - Or Clarithromycin 500 mg twice daily - Or Spiramycin 1,5 à 3 MUI 3-times daily	- Pristinamycin 1 g 3-times daily - O Doxycycline 200 mg daily
Suspected bacterial co-/superinfection of viral infection	Amoxicillin/clavulanate 1g/125mg TID	Pristinamycin 1 g 3-times daily
No other option	Levofloxacin 500 mg daily	

In case of failure of first-line treatment:

- Failure of 1st line treatment with β -lactams → switch to macrolides
- Failure of 1st line treatment with macrolide → switch to β -lactams

Note: no combination of the two drug classes is recommended

Antibiotic Therapy for Non-severe CAP — Hospitalized

Antibiotic therapy

	1 ^{re} intention	Allergie ou contre-indication à la première ligne
No comorbidities	Amoxicilline 1g three times daily	- Ceftriaxone 1g daily - Or Cefotaxime 1g three times daily
≥ 1 comorbidité	Amoxicillin/clavulanate 1g/125mg three times daily	- Ceftriaxone 1g /j - Or Cefotaxime 1g three times daily
Atypique	- Azithromycin 500 mg day 1, then 250 mg daily - Or Clarithromycin 500 mg twice daily - Or Spiramycin 1,5 à 3 MUI trice daily	Doxycycline 100 mg twice daily
Suspicion de co/surinfection bactérienne d'une infection virale	Amoxicillin/clavulanate 1g/125mg three times daily	Levofloxacin 500mg daily

In case of failure of first-line treatment:

- Failure of 1st line treatment with β -lactams → switch to macrolides
- Failure of 1st line treatment with macrolide → switch to β -lactams



Antibiotic Therapy for Severe CAP

Antibiotic

	1st line empiric treatment	Allergy/contraindication
1st line empiric treatment	Dual therapy: • Ceftriaxone or Cefotaxime • + Clarithromycin or Spiramycin	• Levofloxacin
Empirical treatment of suspected PVL-producing <i>S. aureus</i> CAP	Triple therapy : • Ceftriaxone ou Cefotaxime • + Clarithromycin ou Spiramycin • + Linezolid	• Ceftriaxone or Cefotaxime + vancomycine + Clindamycin • Allergy to β -lactams: Levofloxacin + Linezolid
Adapted Treatment for PVL-positive MSSA	• IV Oxacillin or Cefazolin + Clindamycin or Rifampicin	• Vancomycin + clindamycin or rifampicin • Or Linezolid
Adapted Treatment for PVL-positive MRSA	• Linezolid	• Vancomycin • + clindamycin or rifampicin

Dosages for Severe CAP in Critical Care

Drug	Dosage
Ceftriaxone	2g daily
Cefotaxime	80-100 mg/kg daily
Clarithromycine	500 mg twice daily
Clindamycine	600 mg 3-4 times/day
Spiramycine	3 MUI 3-times / day
Levofloxacin	500 mg à 1000 mg daily
Linézolide	600 mg twice daily
Rifampicine	10 mg/kg daily

Corticosteroid therapy

- Indications: only in severe CAP (per severity definition), excluding immunosuppressed patients, aspiration pneumonia, or viral superinfection
- Protocol: Hydrocortisone hemisuccinate 200 mg initiated within 24h of severe signs onset
- Re-evaluate at day 4 and taper over total duration of 8–14 days