

Community Acquired Pneumonia in Adults

Definition

- **Community acquired pneumonia (CAP):** acute infection acquired in community or within 48 hours of admission to hospital.

Most Common Organisms

- **Most common bacterial pathogens:** *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae* and *Legionella pneumophila*.
- **If post-influenza, alcoholism, COPD or nursing home:** *Enterobacteriales (Enterobacteriaceae)*, *Staphylococcus aureus*
- **Viruses** can be a causative pathogen or may also be present in the setting of a co-infection.

Diagnostic Considerations

- Differential diagnoses: acute exacerbation of COPD, acute bronchitis, heart failure, and pulmonary embolism
- Infiltrate on chest radiograph with supportive clinical findings:
 - Symptoms include new onset fever, cough, sputum production, dyspnea, tachypnea, pleuritic chest pain
 - Physical findings consistent with signs of air space disease (e.g. crackles, bronchial breath sounds)
 - If no infiltrate on initial x-ray, patients should be reassessed within 48 to 72 hours if a high clinical suspicion of pneumonia remains
- **Risk stratify using clinical judgement or the CRB-65 score:**

CRB-65		
Criteria		Points
Confusion: new onset based on a specific mental test, or disorientation to person, place or time		1
Respiratory rate 30 breaths or more per minute		1
Low Blood pressure: systolic less than 90 mm Hg OR diastolic less than 60 mm Hg		1
Age <u>65</u> years old or greater		1
Score	Risk of Mortality	Suggested Management
0	Less than 2%	Outpatient
1-2	About 9%	Consider hospital assessment ± admission
Greater or equal to 3	Greater than 19%	Hospital admission

Microbiological Testing

- **Legionella urinary antigen:** Consider in severe CAP (requiring ICU admission) or if patient is associated with a local Legionella outbreak
- **Sputum culture:** if high severity CAP or copious sputum production
- **Blood cultures:** (2 sets) if high severity CAP or sepsis syndrome.
- Depending on clinical context and local epidemiology, consider investigations for atypical pathogens and viruses (e.g. influenza, SARS-CoV-2)

Management Considerations

- **Empiric coverage of atypical bacteria** (e.g. *Legionella*, *Mycoplasma*):
 - Outpatient setting: not routinely recommended
 - Non-ICU hospitalization: benefit is unclear and there is risk of adverse effects, especially in patients with a predisposition for QTc prolongation from macrolides and multiple adverse effects from fluoroquinolones (i.e. levofloxacin)
 - ICU patients: coverage for *Legionella* is routinely recommended (see below)
 - Clinical features favouring “atypical” bacteria (*Mycoplasma* or *Chlamydophila*): gradual onset and presentation, absence of septic shock, non-lobar pneumonia, family cluster, cough persisting more than 5 days without acute clinical deterioration, absence of sputum production, and normal or minimally elevated white-cell count.
- **Aspiration pneumonia**
 - Antimicrobial prophylaxis at the time of aspiration is not beneficial. Provide supportive care and reassess in 48 hours for signs and symptoms of pneumonia
 - See Health PEI Adult Chemical Pneumonitis and Aspiration Pneumonia guideline for background information and management considerations.
- **Respiratory Fluoroquinolones**
 - In order to reduce increasing fluoroquinolone resistance and prevent adverse events (e.g., QT interval prolongation), use of a respiratory fluoroquinolone should be reserved for when cephalosporins or penicillins cannot be used.

IV-to-PO Conversion

- **Evaluate for IV-to-PO conversion within 48 hours** of initiating treatment.
- Consider oral antibiotics when patient is clinically improving (i.e. tolerating oral intake, hemodynamically stable, afebrile for at least 24 hours) – [see Health PEI IV-to-PO Guideline](#) for more details.

Duration

- Usual duration of therapy: **5 days**
- Longer treatment duration may be required in certain circumstances (e.g. extrapulmonary infections, empyema, lack of clinical improvement)
- Infections caused by *P. aeruginosa*, resistant Gram-negative bacteria or *S. aureus* require at least 7 days; Infectious Diseases or Medical Microbiology consultation should be considered.
- Azithromycin dosing and duration of therapy depends on its indication for use:
 - When using 500 mg IV/PO once daily in non-critically ill patients, 3 days of therapy is adequate.
 - When using in patients that are critically ill, 5 days of therapy is adequate.
 - In patients with infections caused by *Legionella*, longer durations may be required

Prevention

- Review patient vaccine record to ensure they are up to date with all eligible vaccinations

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Empiric Treatment

Setting	Preferred Empiric Regimen	Alternate Empiric Regimen
Outpatient	amoxicillin 1000 mg PO q8h* OR doxycycline 100 mg PO q12h	Penicillin allergy: doxycycline 100 mg PO q12h OR cefuroxime axetil 500 mg PO q12h* When above options cannot be used: levofloxacin 750 mg PO q24h* [§]
Inpatient (Non-ICU)	amoxicillin 1000 mg PO q8h* OR ampicillin 2 g IV q6h* OR cefuroxime axetil 500 mg PO q12h* OR ceftriaxone 1 g IV q24h	Penicillin allergy: cefuroxime axetil 500 mg PO q12h * OR ceftriaxone 1 g IV q24h When above options cannot be used: levofloxacin 750 mg IV/PO q24h* [§]
	+/- Atypical coverage: if strong suspicion of atypical pathogens and if not receiving a fluoroquinolone: <ul style="list-style-type: none"> • doxycycline 100 mg PO q12h^α OR • clarithromycin 500 mg PO q12h* OR • azithromycin 500 mg PO/IV q24h[§] x 3 days 	
ICU	ceftriaxone 1 IV q24h PLUS one of: <ul style="list-style-type: none"> • azithromycin 500 mg IV q24h OR • levofloxacin 750 mg IV/PO q24h*[§] (preferred if <i>Legionella</i> isolated) 	
Consider risk factors for the following when treating CAP requiring hospitalization:		Regimen Adjustment
MRSA: Prior respiratory isolation or known/suspected colonization with MRSA		ADD vancomycin IV to empiric regimen (see Health PEI Firstline app or IV manual for dosing)
Pseudomonas: [Prior respiratory isolation of <i>Pseudomonas</i> OR recent hospitalization] AND receipt of parenteral antibiotics in the last 90 days		SWITCH TO Piperacillin/tazobactam* 4.5 g IV q6h +/- Atypical coverage

*Dose adjustment required in renal impairment

[§] Special authorization required from PEI Pharmacare

^α Preferred if prolonged QT

References:

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6. Practice Point: Duration of Antibiotic Therapy for Common Infections. Association of Medical Microbiology and Infectious Disease Canada. <https://www.ammi.ca/Content/Duration%20of%20Therapy%20nov%2024.pdf>. Accessed August 3, 2022
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