Health PEI

ANTIMICROBIAL STEWARDSHIP SUBCOMMITTEE

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:** *Enterobacterales (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 **B**lood pressure: systolic less than 90 mm Hg OR diastolic less than 60 mm Hg	1
Age **65** 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: • 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:** • azithromycin 500 mg IV q24h **OR** • levofloxacin 750 mg IV/PO q24h*§ (preferred if *Legionella* 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 *Pseudomonas* **OR** recent hospitalization] **AND** receipt of parenteral antibiotics in the last 90 days	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:

1. Mandell LA, Wunderink RG, Anzueto A, Bartlett JG, Campbell D, Dean NC, Dowell SF, File TM Jr., Musher DM, Niederman MS, Torres A and Whitney CG. Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults. Clinical Infectious Diseases 2007; 44:S27–72
2. Metley JP *et al*. Diagnosis and Treatment of Adults with Community-Acquired Pneumonia – An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. Am J Respir Crit Care Med. 200(7): 45-67
3. Nova Scotia Health Authority – Antimicrobial Stewardship Handbook. Community Acquired Pneumonia. https://library.nshealth.ca/c.php?g=709478&p=5250029. Accessed Mar 3, 2024
4. Horizon Health Network – Anti-infective stewardship committee. Firstline: Community acquired pneumonia
5. National Institute for Health and Care Excellence. Pneumonia (community-acquired): antimicrobial prescribing. NICE Guideline (NG138). Published September 16, 2019. https://www.nice.org.uk/guidance/ng138. Accessed August 3, 2022.
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
7. RxFiles Academic Detailing Program. (n.d.). *Community-acquired pneumonia (CAP) - Adult*. RxFiles. Retrieved January 13, 2025, from https://www.rxfiles.ca/RxFiles/uploads/documents/members/ABX-CAP.pdf