Trinity Health

Inpatient Guidelines for the Treatment of Pneumonia – November 2023

Diagnosis of Pneumonia requires ≥ 2 clinical signs/symptoms and at least one radiographic criteria as listed below:

≥ 2 Clinical Signs or Symptoms PLUS Radiographic Criteria (CXR or CT)

≥ 2 Clinical Signs or Symptoms

- Cough
- Sputum
- Dyspnea or tachypnea
- Hypoxia
- Exam finding (i.e. rales, crackles, etc.)
- Fever or hypothermia
- WBC >10,000 or < 4,000/mcl or >15% bands

Radiographic Criteria (CXR or CT)

Definitely Positive

- Air space density/opacity/disease
- Bronchopneumonia
- Cavitation
- Ground glass
- Infection
- Infiltrate
- Loculations
- Nodular airspace disease
- Pleural effusion
- Pneumonia
- Tree in bud

Equivocal:

- "cannot rule out pneumonia"
- "atelectasis vs. pneumonia"

HMS-Preferred empiric treatment for CAP includes:
- Ampicillin-Sulbactam PLUS Azithromycin, Clarithromycin, or Doxycycline

- Ceftriaxone or Cefotaxime PLUS Azithromycin, Clarithromycin, or Doxycycline

Alternative but HMS Non-Preferred treatment

Infection	Antimicrobial Therapy§	Duration	Comments

Community-acquired pneumonia (CAP)[1]
 	
With NO recent hospitalization (3 months) AND no prior respiratory isolation of *Pseudomonas aeruginosa* or MRSA (within 1 year)
	Ceftriaxone 1g IV Q24h
	PLUS
	Azithromycin 500 mg IV/PO X5 days **OR** doxycycline 100mg IV/PO Q12h (if macrolide intolerance/allergy)
		5 days initial duration*
		7 days for complicated pneumonia*
		
		Complicated pneumonia: structural lung disease, mod/severe COPD, confirmed staphylococcus or pseudomonas, and/or immunosupression[4]
		
		*Longer durations of therapy may be indicated, depending upon clinical response
		
		5 days if afebrile with <2 signs of clinical instability on days 3-5
		
		Signs of Clinical Instability:
		• Arterial O_2 sat ≤ 90%
		• HR ≥ 100 bpm
		• RR ≥ 24 breaths/min
		• BP ≤ 90 mmHg
		• Altered mental status (vs. baseline)
			• Anaerobic coverage for aspiration pneumonia is not routinely warranted unless:
			  ○ Lung abscesses
			  ○ Empyema
			• β-lactam substitution for patients with severe delayed immunologic reactions or organ-specific reactions β-lactam allergy (e.g. DRESS, SJS, AIN) **OR** a severe cephalosporin allergy where structurally dissimilar antibiotic is unavailable (see cross-reactivity chart): Levofloxacin 750 mg[1] IV/PO Q24h
			• Consider doxycycline as an alternative to azithromycin in patients at high risk for QTc prolongation
			  ○ QTc prolongation (>500ms)
			  ○ Hypokalemia
			  ○ Hypomagnesemia
			  ○ Significant bradycardia
			  ○ Uncompensated heart failure
			  ○ Patients receiving class IA or class III antiarrhythmic drugs
			• Non-severe CAP**: Do not routinely obtain respiratory OR blood cultures OR *Legionella* urinary antigens
			• Severe CAP**: Obtain respiratory culture AND blood cultures AND *Legionella* urinary antigens
			• Patients should be switched from IV to PO when they are hemodynamically stable,

5 days of therapy for Uncomplicated CAP patients

Signs of clinical instability impacting determination for therapy duration

§ Prior to confirmation of pathogen
1. Refer to antibiotic dosing tables for dose adjustments in renal dysfunction.

Reviewed/ Approved by: Antimicrobial Subcommittee: 2011; 10/2016, 9/2018; 1/2019; 9/2018, 4/2019; 7/2020, 6/2023; P & T Committee 2011, 12/2016, 7/23; Last updated 11/2023
Contributors: Curtis Collins, PharmD, Anu Malani, MD

improving clinically, and able to tolerate PO medications.

- Total duration (IV plus PO step down) described in previous column
- Options for PO step down therapy should target isolated pathogen. Options for PO step-down if no sputum cultures drawn or if no pathogen identified on respiratory/blood culture(s):
    - Amoxicillin/clavulanate 875mg Q12h[1] PLUS/MINUS azithromycin
    - Amoxicillin 1g Q8h[1] PLUS/MINUS azithromycin
    - Cefdinir 300mg Q12h[1] PLUS/MINUS azithromycin
    - Cefuroxime 500mg Q12h[1] PLUS/MINUS azithromycin
    - PO stepdown for patients with severe delayed immunologic reactions or organ-specific reactions β-lactam allergy (e.g. DRESS, SJS, AIN) **OR** penicillin or cephalosporin allergy where structurally dissimilar antibiotic is unavailable: Levofloxacin 750mg Q24h[1]

§ Prior to confirmation of pathogen
1. Refer to antibiotic dosing tables for dose adjustments in renal dysfunction.

Reviewed/ Approved by: Antimicrobial Subcommittee: 2011; 10/2016, 9/2018; 1/2019; 9/2018, 4/2019; 7/2020, 6/2023; P & T Committee 2011, 12/2016, 7/23; Last updated 11/2023
Contributors: Curtis Collins, PharmD, Anu Malani, MD