

# Empiric management of Community-Acquired Pneumonia (CAP)



## INITIAL CONSIDERATIONS:

Diagnosis: demonstrable infiltrate by chest radiograph or other imaging technique

If severity of illness or co-morbidities warrants hospitalization:

- Exclude covid-19
- Collect blood cultures if hemodynamically unstable, fever, severe pneumonia (eg multilobar)
- Collect sputum cultures *and* nasopharyngeal swab for respiratory viruses (RT-PCR) if productive cough and severe disease (eg multilobar)
- For severe pneumonia (eg multilobar) send urine for legionella antigen and **consult ID**
  - o Legionella should also be excluded if significant GI symptoms, hepatitis, altered mental status, summer/fall season

## MOST COMMON BACTERIAL ORGANISMS (in majority of cases, no pathogen identified)

- *Streptococcus pneumoniae* (20-60%)
- *Atypicals*: *Mycoplasma* (20%); *Chlamydophila sp* (4-6%); *Legionella* (rare, severe)
- *H. influenzae* (3-10%); *Moraxella sp* (in COPD)
- *S. aureus* or *Gr A streptococcus* (post-influenza)
- *Respiratory viruses* (influenza, RSV and Adenovirus in 10-30% of adults with LRTI during winter)

## DATA ON SUSCEPTIBILITY OF *S. PNEUMONIAE* at MUHC:

Penicillin IV: 97%

Ceftriaxone 99%

Clindamycin 84%

Moxifloxacin 99%

## DURATION of treatment

- Antibiotics can safely be discontinued after **5 days** if
  - o patient afebrile for  $\geq 48$  hours and clinically stable (defined as no more than one of: HR  $\geq 100$  beats/min; RR  $\geq 24$  breaths/min; SBP  $\leq 90$  mm Hg; oxygen saturation  $\leq 90\%$  on room air)
  - o a fluoroquinolone was used
- Discontinue antibiotics after a *maximum* of 7 days for hospitalized patients.
- Longer duration of treatment may be required for certain organisms (*S. aureus* or *Gr A strep*, *Legionella*, anaerobes, certain Gram-negative organisms)

## EMPIRIC PHARMACOLOGIC MANAGEMENT

<b>Outpatient Management</b>	<p><b>Cefuroxime 500mg po BID + Doxycycline 100 mg po BID x 5d</b></p> <p><b>If severe hypersensitivity reaction to <math>\beta</math>-lactam<sup>2</sup>:</b> Moxifloxacin<sup>3</sup> 400 mg po q24h x 5d (avoid if received quinolone in past 3 months)</p> <p><b>If NO significant comorbidities<sup>1</sup></b>, can replace amoxicillin + doxycycline with: Azithromycin 500 mg po x1 d1, then 250 mg po daily d2-5</p>
<b>Admission to ward</b>	<p><b>Ceftriaxone 2 g iv q24h x 5 days + doxycycline 100 mg po BID x 5 days</b></p> <p><i>If po not tolerated:</i> Replace Doxycycline with Azithromycin 500 mg iv q24h x 5 days</p> <p><i>If several features of Legionella:</i> Replace Doxycycline with Azithromycin 500 mg PO q24h x 7 days</p> <p><b>If severe hypersensitivity reaction to <math>\beta</math>-lactam<sup>2</sup>:</b> Moxifloxacin<sup>3</sup> 400 mg po/iv q24h x 5d (avoid if received quinolone in past 3 months; consider ID consult)</p>
<b>Admission to ICU</b>	<p><b>Ceftriaxone 2 g iv q24h + Azithromycin 500 mg po/iv q24h x 7 days</b></p> <p><b>If macrolide contraindicated or received in past 3 months:</b> Ceftriaxone 2 g IV q24h + Moxifloxacin<sup>3</sup> 400mg po/iv q24h</p> <p><i>If patient is known MRSA colonized and critically ill or has necrotizing pneumonia, ADD:</i> Vancomycin 25 mg/kg iv x 1 (loading dose) then 15 mg/kg iv q12h (consult pharmacy for dose adjustment)</p> <p><b>If severe hypersensitivity reaction to <math>\beta</math>-lactam<sup>2</sup>:</b> Moxifloxacin<sup>3</sup> 400 mg iv q24h Add Vancomycin<sup>4</sup> 25 mg/kg IV x 1 (loading dose) then 15 mg/kg IV q12h <b>ONLY if high risk for MRSA, or known to be colonized/infected</b></p>
<b>Aspiration Pneumonia – (Community-acquired)</b>	<p><b>Outpatient or inpatient AND able to safely take oral medication:</b> <b>Amoxicillin/Clavulanate 875/125mg po q12h x5-7 days</b></p> <p>Unable to safely take oral medication: <b>Ceftriaxone 2 g iv q24h x 5-7 days</b></p> <p>If severe periodontal disease, necrotizing pneumonia or lung abscess <b>Ceftriaxone 2g IV q24h + Metronidazole 500mg IV/po q8h – consult ID for duration</b></p> <p><b>If severe hypersensitivity reaction to <math>\beta</math>-lactam<sup>2</sup>:</b> Moxifloxacin<sup>3</sup> 400 mg po/iv q24h x 5-7d (avoid if received quinolone in past 3 months; consider ID consult)</p> <p><b>If aspiration in hospital or &lt;5days after discharge from hospital:</b> see HAP/VAP guidelines</p>

## ADDITIONAL NOTES

<sup>1</sup> Significant co-morbidity:

- Chronic heart, lung, liver or kidney disease
- Immunocompromised state
- Diabetes

<sup>2</sup> In the majority of penicillin-allergic patients, ceftriaxone IV can be given safely. Consider consulting Allergy and ID to clarify patient's allergy status.

<sup>3</sup> No outcome benefit to administering Moxifloxacin IV rather than PO for patients admitted with CAP; po should be first choice when possible.

<sup>4</sup> Vancomycin: consult pharmacy for dose adjustment; D/C if isolate S to moxifloxacin

## PO Step Down Consideration

Step down ceftriaxone IV to cefuroxime 500 mg po BID to complete treatment IF: patient is afebrile for  $\geq 48$  hours, can tolerate PO, and has no more than 1 sign of CAP-associated sign of clinical instability (HR  $\leq 100$  beats/min; RR  $\leq 24$  breaths/min; SBP  $\geq 90$  mm Hg; oxygen saturation  $\geq 90\%$  on room air)

**If an etiological agent (microorganism) is isolated in blood and/or sputum, consider targeted treatment.**

## REFERENCES

- 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, 2019. <https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>
- British Thoracic Society Guidelines: Prim Care Resp J 19:21, 2010
- Wunderink RG et al, NEJM 2014 Feb 6:370(6):543-51
- Madell L.A. et al, N Engl J Med 2019; 380:651-663

Version 3.0 updated by Luke Harrison, Tilman Schober, Francois Bourdeau, Todd Lee, Makeda Semret  
Approved by ASP committee on November 17, 2021; Revision approved on October 10, 2021;  
Approved by MUHC P&T committee November 17, 2021; Revision approved on January 26 2022