

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:

- Collect blood/sputum for cultures *and* nasopharyngeal swab for respiratory viruses (RT-PCR)
- For severe pneumonia (eg bilateral) send urine for legionella antigen and **consult ID**

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

- *Streptococcus pneumoniae* (20-60%)
- *Atypicals*: *Mycoplasma* (20%); *Chlamydia* 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)

EMPIRIC TREATMENT

Outpatient Management	If previously healthy: Doxycycline 100 mg po BID x 5d <i>or</i> Azithromycin 500 mg po daily on day 1, then 250 mg po daily on days 2-5
	If significant co-morbidities ¹ or received antibiotics in past 3 months: Amoxicillin 1g po TID + Doxycycline 100 mg po BID x 5d <i>or</i> Amoxicillin 1g po TID x 5d + Azithromycin 500 mg po d1, then 250 mg po d2-5
Admission to ward	Ceftriaxone 2 g iv q24h x 5 days + doxycycline 100 mg po BID x 5 days <i>If po not tolerated:</i> <i>Replace doxycycline with Azithromycin 500 mg iv q24h x 5 days</i>
	If severe β-lactam allergy²: Moxifloxacin ³ 400 mg po/iv q24h x 5d (avoid if received quinolone in past 3 months; consider ID consult)
Admission to ICU	Ceftriaxone 2 g iv q24h + Azithromycin 500 mg po/iv q24h x 7 days
	If macrolide contraindicated or received in past 3 months: Ceftriaxone 2 g IV q24h + Moxifloxacin ³ 400mg po/iv q24h
	If severe β-lactam allergy²: Moxifloxacin ³ 400 mg iv q24h + Vancomycin 25 mg/kg iv x 1 (loading dose) then 15 mg/kg iv q12h (consult pharmacy for dose adjustment)

ADDITIONAL NOTES

¹ In the majority of penicillin-allergic patients, ceftriaxone IV can be given safely. Consider consulting Allergy and ID to clarify patient's allergy status.

² Significant co-morbidities:

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

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

DATA ON RESISTANCE FOR *S. PNEUMONIAE* (MUHC):

Penicillin: 12%; clindamycin 13%; ceftriaxone 3%; moxifloxacin 1%

DURATION of treatment

- Antibiotics can safely be discontinued after **5 days** if afebrile for ≥ 48 hours and hemodynamically stable (ie: HR ≤ 100 beats/min; RR ≤ 24 breaths/min; SBP ≥ 90 mm Hg; oxygen saturation $\geq 90\%$)
- 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, Gram negative organisms)

PO Step Down Consideration

Consider stepping IV beta-lactam down to cefuroxime 500 mg po BID to complete treatment if patient is afebrile for ≥ 48 hours, can tolerate PO, WBC trending downwards and has no more than 1 sign of CAP-associated sign of clinical instability (HR ≤ 100 beats/min; RR ≤ 24 breaths/min; SBP ≥ 90 mm Hg; oxygen saturation $\geq 90\%$)

Once an organism is isolated in blood and/or sputum, therapy should be targeted to specific organism

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

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