

Community Acquired Pneumonia (CAP): Duration of Antibiotic Therapy in Hospitalized Adults

Key Messages

- Three (3) days is sufficient to treat patients with CAP who meet clinical stability criteria
- Clinical stability criteria for discontinuation of antibiotics after 3 days of therapy in CAP include:
 1. Temperature $\leq 37.8^{\circ}\text{C}$ on day 3 of therapy ***AND***
 2. No CAP-associated sign of clinical instability on day 3 of therapy:
 - i. Systolic blood pressure < 90 mmHg
 - ii. Heart rate > 100 beats/minute
 - iii. Respiratory rate > 24 breaths/minute
 - iv. Oxygen saturation $< 90\%$ on room air (or on baseline home oxygen)
- Patients who are afebrile with no more than one CAP-associated sign of clinical instability by day 5 of therapy are also considered clinically stable and can have antibiotics discontinued.
- Patients who fail to meet clinical stability by day 5 of therapy should be evaluated for potential complications pneumonia as well as alternative etiologies for their respiratory or infectious syndrome.

The Rationale

- Based on multiple randomized controlled trials (RCTs) and meta-analyses of randomized controlled trials (RCTs), the 2019 American Thoracic Society (ATS)/Infectious Diseases Society of America (IDSA) guidelines recommend 5 days of antibiotic therapy for CAP provided the patient achieves clinical stability before stopping therapy. However, even shorter durations may be possible in many patients.
- A 2021 placebo-controlled RCT showed that clinical cure with 3 days of beta-lactam therapy was non-inferior to 8 days of beta-lactam therapy in hospitalized patients with moderate-severe CAP who achieved clinical stability by day 3. An older 2006 placebo-controlled RCT in mild-moderate hospitalized CAP similarly showed equivalence between 3 days and 8 days of therapy. Patients with complications of pneumonia (e.g., lung abscess or pleural infection) were excluded from these trials as longer treatment is indicated. Evolution of radiographic findings is expected in CAP and should not be the sole reason for extending antibiotics.
- Duration of therapy has not been as well studied in patients with CAP admitted to critical care units. While clinical stability criteria have not been validated in the critically ill CAP population, the underlying rationale is still applicable. The existing evidence does not suggest benefit in more than 7 days of therapy. Seven days is also the recommended duration of therapy for MRSA and *Pseudomonas* pneumonia in the 2019 ATS/IDSA CAP guidelines.

The Solution

- We recommend a minimum 3 days therapy for hospitalized CAP of any severity provided the patient meets clinical stability criteria before stopping therapy. In the absence of complications, treatment for CAP should not extend beyond 7 days.

References

1. Bugs & Drugs. <https://www.bugsanddrugs.org/>.
2. Dinh A, Ropers J, Duran C, et al. Discontinuing β -lactam treatment after 3 days for patients with community-acquired pneumonia in non-critical care wards (PTC): a double-blind, randomised, placebo-controlled, non-inferiority trial [published correction appears in *Lancet*. 2021 Jun 5;397(10290):2150]. *Lancet*. 2021;397(10280):1195-1203. doi:10.1016/S0140-6736(21)00313-5
3. el Moussaoui R, de Borgie CA, van den Broek P, et al. Effectiveness of discontinuing antibiotic treatment after three days versus eight days in mild to moderate-severe community acquired pneumonia: randomised, double blind study. *BMJ*. 2006;332(7554):1355. doi:10.1136/bmj.332.7554.1355
4. Furlan L, Erba L, Trombetta L, et al. Short- vs long-course antibiotic therapy for pneumonia: a comparison of systematic reviews and guidelines for the SIMI Choosing Wisely Campaign. *Intern Emerg Med*. 2019;14(3):377-394. doi:10.1007/s11739-018-1955-2
5. Metlay JP, Waterer GW, Long AC, 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*. 2019;200(7):e45-e67. doi:10.1164/rccm.201908-1581ST
6. Tansarli GS, Mylonakis E. Systematic Review and Meta-analysis of the Efficacy of Short-Course Antibiotic Treatments for Community-Acquired Pneumonia in Adults. *Antimicrob Agents Chemother*. 2018;62(9):e00635-18. Published 2018 Aug 27. doi:10.1128/AAC.00635-18
7. Uranga A, España PP, Bilbao A, et al. Duration of Antibiotic Treatment in Community-Acquired Pneumonia: A Multicenter Randomized Clinical Trial. *JAMA Intern Med*. 2016;176(9):1257-1265. doi:10.1001/jamainternmed.2016.3633