

and the right antibiotic prescribed. If a patient is not improving with appropriate antibiotics, it is important for the clinician to reassess for other causes of symptoms rather than defaulting to a longer duration of antibiotic therapy; a longer duration should be considered the exception and not the rule. These best practice advice statements may not apply to patients with complicated anatomy (such as bronchiectasis) or recent history of resistant bacterial infections.

## COPD EXACERBATION AND ACUTE UNCOMPLICATED BRONCHITIS

*Best Practice Advice 1: Clinicians should limit antibiotic treatment duration to 5 days when managing patients with COPD exacerbations and acute uncomplicated bronchitis who have clinical signs of a bacterial infection (presence of increased sputum purulence in addition to increased dyspnea, and/or increased sputum volume).*

### Rationale

Acute uncomplicated bronchitis, defined as an acute respiratory infection with a normal chest radiograph, is typically a self-limited infection of the large airways, usually caused by a virus (29). The ACP has previously recommended against initiating antibiotic treatment in patients with bronchitis unless pneumonia is suspected (9). In COPD, however, antibiotics are recommended if there is a high pretest probability of a bacterial cause; this best practice advice focuses on available data on short-course antibiotics in this patient population. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommends treating COPD exacerbations with antibiotics in patients who have clinical signs of a bacterial infection (presence of increased sputum purulence in addition to increased dyspnea, and/or increased sputum volume) (18). The choice of antibiotic should be based on effective treatment of the most commonly reported bacterial pathogens (*Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Moraxella catarrhalis*) and may include an aminopenicillin with clavulanic acid, a macrolide, or a tetracycline (18, 19, 30). Although the GOLD report recommends 5 to 7 days of antibiotics for COPD exacerbations in general, a separate meta-analysis (21 randomized controlled trials [RCTs];  $n = 10\,698$  patients) that focused specifically on short-course antibiotic use in acute exacerbations of chronic bronchitis and COPD showed no difference in clinical improvement between groups that included patients receiving short-course antibiotics (mean, 4.9 days) versus long treatment (mean, 8.3 days) (19). Subanalysis of different antibiotic classes likewise showed no difference between duration groups (19).

## COMMUNITY-ACQUIRED PNEUMONIA

*Best Practice Advice 2: Clinicians should prescribe antibiotics for community-acquired pneumonia for a minimum of 5 days. Extension of therapy after 5 days of antibiotics should be guided by validated measures of clinical*

*stability, which include resolution of vital sign abnormalities, ability to eat, and normal mentation.*

### Rationale

This article defines CAP as pneumonia in nonimmunocompromised patients presenting with fever, productive cough with purulent sputum, dyspnea, and pleuritic chest pain. Antibiotic recommendations for empirical therapy should cover common pathogens, such as *S pneumoniae*, *H influenzae*, *Mycoplasma pneumoniae*, and *Staphylococcus aureus*, and atypical pathogens, such as *Legionella* species, and typically include amoxicillin, doxycycline, or a macrolide for healthy adults or a  $\beta$ -lactam with a macrolide or a respiratory fluoroquinolone in patients with comorbidities. Current evidence based on meta-analyses and RCTs supports use of shorter-duration antibiotics in the treatment of CAP. Highlighting this body of evidence, the 2019 Infectious Diseases Society of America (IDSA)/American Thoracic Society (ATS) guideline for the treatment of CAP recommends a minimum of 5 days of antibiotics but qualifies this recommendation to include validated measures of clinical stability, such as resolution of vital sign abnormalities, ability to eat, and normal mentation (20). These guidelines were based on moderate-quality evidence, including 3 meta-analyses and multiple RCTs.

A 2018 meta-analysis included in the IDSA/ATS guideline clearly defined short-course antibiotics for the treatment of CAP (31). It assessed 21 studies of CAP, of which 19 were RCTs, and concluded that short-course treatment ( $\leq 6$  days) was as effective as longer treatment, with fewer serious adverse events (risk ratio, 0.73 [95% CI, 0.55 to 0.97]) and lower mortality (risk ratio, 0.52 [CI, 0.33 to 0.82]) (31). Despite evidence supporting shorter durations, a retrospective cohort study evaluated data from 6481 patients admitted with CAP to 43 Michigan hospitals from 2017 to 2018 and showed that nearly two thirds of patients received antibiotics for longer than the shortest effective duration consistent with the guidelines outlined by IDSA (15). Antibiotics prescribed at discharge accounted for 93% of prescriptions that had excess duration, and each additional day carried a 5% increased risk for antibiotic-associated adverse events without any benefits.

Further evidence supporting shorter antibiotic use came from a recent multicenter noninferiority RCT, which randomly assigned 312 patients with CAP who were at day 5 of their antibiotic regimen to follow the IDSA/ATS guidelines for clinical stability outlined earlier if no further fever occurred for 48 hours or to receive antibiotics for a duration determined by the clinician (32). There were no significant differences in clinical success at day 10 or 30 and no difference in CAP symptom scores at day 5 or 10 despite high rates of severe pneumonia in both groups. The researchers were able to safely limit antibiotic treatment to 5 days in 70% of patients in the intervention group.