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# Do Antibiotics Improve Outcomes for Patients Hospitalized with COPD Exacerbations?

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## Q/ Do antibiotics improve outcomes for patients hospitalized with COPD exacerbations?

### EVIDENCE-BASED ANSWER

**A** | YES. Antibiotic use reduced mortality and treatment failure in patients hospitalized with acute exacerbations of chronic obstructive pulmonary disease (COPD) (strength of recommendation [SOR]: A, systematic reviews of ran-

domized controlled trials [RCTs]).

Giving antibiotics early to hospitalized patients decreased the need for later ventilation and readmission within 30 days for exacerbation of COPD (SOR: B, a retrospective cohort study).

### Evidence summary

A systematic review of 4 RCTs with a total of 356 patients found that antibiotic therapy reduced mortality more than placebo in moderately to severely ill hospitalized patients with COPD. Short-term mortality (7 days after treatment to 18 months after hospital discharge) decreased by 77% with antibiotic use in acute exacerbations of COPD (number needed to treat [NNT]=8; 95% confidence interval [CI], 6-17).

This same Cochrane review and a meta-analysis of 4 hospital-based trials with 321 patients evaluated failure to improve, deterioration, or death during the study period.<sup>1,2</sup> The results favored treatment with antibiotics over placebo (NNT=3; 95% CI, 3-5).

### Don't wait to give antibiotics

A large retrospective cohort study of 84,621 hospitalized patients compared outcomes in patients given antibiotics for acute exacerbations of COPD during their first 2 days in the hospital with patients treated later or not at all.<sup>3</sup> Outcomes assessed included need for later ventilation and readmission within 30 days for acute exacerbations of COPD.

The study included patients 40 years or older with a principal diagnosis, based on ICD 9 codes, of acute exacerbation of COPD, emphysema, or respiratory failure paired with a secondary diagnosis of COPD with acute exacerbation or emphysema. Patients who had been admitted directly to the intensive care unit were excluded, as were patients with other bacterial infections, such as pneumonia or cellulitis, for which they might receive antibiotics.

Early administration of antibiotics delayed the need for subsequent ventilation when compared with no antibiotics or antibiotics given later (1.07% vs 1.80%;  $P<.001$ ; NNT=137). Giving antibiotics early also lowered readmission rates for acute exacerbations of COPD (7.91% vs 8.79%;  $P<.001$ ; NNT=114), improved mortality rates (1.04% vs 1.59%;  $P<.001$ ; NNT=182), and decreased treatment failure (9.77% vs 11.75%;  $P<.001$ ; NNT=51).

### Recommendations

The recommendations of the Global Initiative for Chronic Obstructive Lung Disease

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(GOLD), updated in 2008, call for antibiotics to be given to patients with 2 or more of the cardinal symptoms of acute exacerbations of COPD (shortness of breath, increased sputum production, and sputum purulence). Patients with severe exacerbations who require a ventilator should also receive antibiotics.<sup>4</sup>

The Primary Care Consensus Guidelines from 2004, consistent with the GOLD recommendations, state that a newer macrolide, extended-spectrum cephalosporin, or doxycycline is appropriate for moderately severe exacerbations. High-dose amoxicillin/clavulanate or a respiratory fluoroquinolone should be given for severe exacerbations.<sup>5</sup> **JFP**

## References

1. Ram FSF, Rodriguez-Rosin R, Granados-Navarrete A, et al. Antibiotics for exacerbation of chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2006;(2): CD004403.
2. Russo RL, D'Aprile M. Role of antimicrobial therapy in acute exacerbations of chronic obstructive pulmonary disease. *Ann Pharmacother.* 2001;35:576-581.
3. Rothenberg M, Pekow P, Lahti M, et al. Antibiotic therapy and treatment failure in patients hospitalized for acute exacerbations of chronic obstructive pulmonary disease. *JAMA.* 2010;303:2035-2042.
4. Global Initiative for Chronic Obstructive Lung Disease. Global Strategy for the Diagnosis, Management and Prevention of Chronic Obstructive Pulmonary Disease. NHLBI/WHO workshop report. Bethesda, Md: National Heart, Lung and Blood Institute; April 2001. Updated December 2009. Available at: <http://www.goldcopd.com>. Accessed July 1, 2011.
5. Brunton S, Carmichael P, Colgan R, et al. Acute exacerbation of chronic bronchitis: a primary care consensus guideline. *Am J Manag Care.* 2004;10:689-696.

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