

Principles of Appropriate Antibiotic Use for Treatment of Acute Bronchitis in Adults

Vincenza Snow, MD; Christel Mottur-Pilson, PhD; and Ralph Gonzales, MD, MSPH, for the American College of Physicians—American Society of Internal Medicine*

In this guideline, evidence is presented and specific recommendations are made about how clinicians can differentiate between bacterial and viral causes of acute bronchitis and about when the use of antibiotics in acute bronchitis is beneficial. The numbers in square brackets are cross-references to the numbered sections in the accompanying background paper, "Principles of Appropriate Antibiotic Use for Treatment of Acute Bronchitis in Adults: Background," which is part 2 of this guideline (see pages 521-529).

ACUTE BRONCHITIS

Acute bronchitis is a clinical diagnosis, usually referring to an acute respiratory tract infection in which cough, with or without phlegm, is a predominant feature. The American College of Chest Physicians defines acute cough illness, in contrast to chronic or persistent cough, as lasting less than 3 weeks. As one might expect, there is frequent overlap in how clinicians assign each diagnosis. For example, some clinicians diagnose acute bronchitis only when productive cough is present; others insist on the presence of purulent sputum [1.1].

Acute upper respiratory tract infection accounted for approximately 70% of primary diagnoses in adults presenting for an ambulatory office visit with a chief symptom of cough. Asthma and pneumonia were the next most common diagnoses, assigned to 6% and 5% of patients, respectively. Previously undiagnosed asthma is a consideration in patients presenting with an acute cough illness. However, in the setting of acute cough (<2 to 3 weeks' duration), the diagnosis of asthma is difficult to establish because of transient bronchial hyperresponsiveness (and abnormal results on spirometry),

which many patients with uncomplicated acute bronchitis will have. Since pneumonia is the third most common cause of acute cough illness and potentially the most serious, the primary diagnostic objective should be to exclude the presence of pneumonia [1.1-1.3].

Diagnosis

An evidence- and quality-based review of four prospective studies evaluating the accuracy of history and physical examination in diagnosing radiographic pneumonia concluded that absence of abnormalities in vital signs (heart rate \geq 100 beats/min, respiratory rate \geq 24 breaths/min, or oral temperature \geq 38 °C) and chest examination (focal consolidation—for example, rales, egophony, and fremitus) sufficiently reduces the likelihood of pneumonia to the point where further diagnostic testing is usually not necessary. Cough lasting longer than 3 weeks exceeds the case definition for "acute bronchitis"; such patients should be considered to have persistent cough or chronic cough illness. Irwin and colleagues have developed a well-defined approach to the adult with persistent cough that begins with chest radiography (1) [1.3, 1.4].

As in community-acquired pneumonia, microbiological studies of uncomplicated acute bronchitis identify a pathogen in the minority of cases, ranging from 16% to 40%. This variability is most likely due to the epidemic nature of agents that produce uncomplicated acute bronchitis and to limitations in viral and bacterial identification techniques. In epidemiologic studies, respiratory viruses, particularly influenza, appear to cause the majority of cases of uncomplicated acute bronchitis when an agent is sought by culture, antibody serology,

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For author affiliations and current addresses, see end of text.

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or polymerase chain reaction. Specific viruses most frequently associated with acute bronchitis include those that produce primarily lower respiratory tract disease (influenza B, influenza A, parainfluenza 3, and respiratory syncytial virus), as well as viruses that more commonly produce upper respiratory tract symptoms (corona virus, adenovirus, and rhinoviruses) [2.1].

Unless bacterial superinfection is present (defined as pneumonia with an infiltrate on chest radiography), antibiotic treatment does not affect the clinical course of viral respiratory infection. To date, only *Bordetella pertussis*, *Mycoplasma pneumoniae*, and *Chlamydia pneumoniae* (TWAR) have been established as nonviral causes of uncomplicated acute bronchitis in adults. As a group, these agents are associated with 5% to 10% of total cases of uncomplicated acute bronchitis in adults. No evidence indicates that *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Moraxella catarrhalis* produce acute bronchitis in adults without underlying lung disease. Since Gram stain and culture of sputum do not reliably detect *M. pneumoniae*, *C. pneumoniae*, or *B. pertussis*, these tests are not recommended in the evaluation of patients with uncomplicated acute bronchitis [2.2].

Treatment

On the basis of the microbiology of acute bronchitis, it should not be surprising that randomized, placebo-controlled trials have failed to support a role for antibiotic treatment. By the mid-1990s, published reviews of randomized, placebo-controlled trials had concluded that routine antibiotic treatment of acute bronchitis does not have a consistent impact on duration or severity of illness or on potential complications, such as development of pneumonia. Consistent with these conclusions, the U.S. Food and Drug Administration removed uncomplicated acute bronchitis (and secondary bacterial infections of acute bronchitis) as an indication for randomized, controlled trials of antimicrobial therapy in 1998. Since then, three meta-analyses have been published; all reported no impact of antibiotic treatment on illness duration, activity limitation, or work loss, and all concluded that routine antibiotic treatment of adults with acute bronchitis is not justified [3.0, 3.1].

The one uncommon circumstance for which evidence supports antibiotic treatment of uncomplicated acute bronchitis is suspicion of pertussis. Selected stud-

ies have identified pertussis in up to 10% to 20% of patients with cough lasting longer than 2 to 3 weeks. Unfortunately, no clinical features allow clinicians to distinguish adults with persistent cough due to pertussis, primarily because pertussis in adults with previous immunity does not lead to the classic features of whooping cough seen in patients (usually children) with primary infection. Therefore, clinicians should limit suspicion and treatment of adult pertussis to patients with a high probability of exposure to pertussis: for example, during documented outbreaks. Antimicrobial therapy of suspected pertussis in adults is recommended primarily to decrease shedding of the pathogen and spread of disease, since antibiotic treatment does not appear to improve resolution of symptoms if it is initiated 7 to 10 days after the onset of illness. Because of the public health implications, diagnostic testing in consultation with local public health officials is appropriate for surveillance purposes [3.2].

Clinicians caring for patients with uncomplicated acute bronchitis should be encouraged to discuss the lack of benefit of antibiotic treatment for uncomplicated acute bronchitis and stop prescribing for this condition as a standard of practice. Patients frequently expect to receive antibiotics for uncomplicated acute bronchitis, but this expectation appears to derive from previous episodes of uncomplicated acute bronchitis that were treated with antibiotics. Mounting evidence indicates that patient satisfaction with the office encounter for uncomplicated acute bronchitis does not depend on receipt of an antibiotic but instead is related to the patient-centered quality of the encounter (for example, believing that the provider spent enough time with them and explained the illness and treatment plan). Discussion should provide the patient with realistic expectations for the duration of cough (typically 10 to 14 days), the side effects of antibiotics and subsequent risk for carriage of resistant bacteria, and the ineffectiveness of antibiotics [4.0].

Since the most common pathogen isolated in patients with uncomplicated acute bronchitis is influenza, discussion of the recent advances in influenza therapy is warranted. The new class of anti-influenza agents, the neuroaminidase inhibitors, are active against both influenza A and B, whereas the previously available drugs amantadine and rimantadine are active only against influenza A. For any of these antiviral agents to be

effective, influenza must be diagnosed and treatment initiated within 48 hours of symptom onset. During documented influenza outbreaks, the positive predictive value of clinical diagnosis based on clinician judgment appears to be as accurate as available rapid diagnostic tests for influenza, which have reported sensitivities of 63% to 81%. Clinical diagnosis of influenza becomes much less accurate outside of outbreak periods. All of these drugs have a similar impact on the course of influenza illness: about 1 less day of illness and about one-half day sooner return to normal activities. Patients and physicians (and payers) will need to weigh the high cost of the newer drugs and the possibility of the emergence of viral resistance against the degree to which the duration of symptoms and illness is shortened [3,3].

Summary

Evaluation of adults with an acute cough illness or a presumptive diagnosis of uncomplicated acute bronchitis should focus on ruling out pneumonia. In the healthy, nonelderly adult, pneumonia is uncommon in the absence of vital sign abnormalities or asymmetrical lung sounds, and chest radiography is usually not indicated. In patients with cough lasting 3 weeks or longer, chest radiography is warranted in the absence of other known causes. Routine antibiotic treatment of uncomplicated acute bronchitis is not recommended, regardless of duration of cough. In the unusual circumstance in which pertussis is suspected, a diagnostic test should be performed and antimicrobial therapy initiated. Patient satisfaction with care for acute bronchitis is most dependent on physician-patient communication rather than on whether an antibiotic is prescribed.

RECOMMENDATIONS

Recommendation 1. The evaluation of adults with an acute cough illness or a presumptive diagnosis of uncomplicated acute bronchitis should focus on clinically ruling out pneumonia.

In the healthy, nonelderly adult, pneumonia is uncommon in the absence of vital sign abnormalities or asymmetrical lung sounds, and chest radiography is usually not indicated. In patients with cough lasting 3 weeks or longer, chest radiography is warranted in the absence of other known causes.

Recommendation 2. Routine antibiotic treatment of uncomplicated acute bronchitis is not recommended, regardless of duration of cough.

Most patients with uncomplicated acute bronchitis have a viral illness that is self-limited and will improve on its own, with or without relief of symptoms. Although relief of symptoms will not shorten duration of illness, patients can certainly benefit from such treatments as analgesic or antipyretic agents, β -agonist inhalers, antitussives, or vaporizers.

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Current Author Addresses: Drs. Snow and Mottur-Pilson: American College of Physicians-American Society of Internal Medicine, 190 N. Independence Mall West, Philadelphia, PA 19106.

Dr. Gonzales: Division of General Internal Medicine, Campus Box B-180, University of Colorado Health Sciences Center, 4200 East Ninth Avenue, Denver, CO 80262.

Reference

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