



Choosing Wisely® Recommendation Analysis: Prioritizing Opportunities for Reducing Inappropriate Care

ANTIBIOTIC USE FOR ACUTE BRONCHITIS

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Evidence Justification

American Academy of Pediatrics

Antibiotics should not be used for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis).

The American Academy of Pediatrics recommend against the use of antibiotics for viral respiratory illnesses, including bronchitis. This recommendation extends into the adult population, the American Academy of Family Physicians also advising against the use of antibiotics in patients with acute bronchitis (Zoorob et al., 2012). We focused this analysis on acute bronchitis as the National Committee for Quality Assurance (NCQA) has performance measures in place that score health plans on their avoidance of antibiotics in this population. Below we summarize the reasoning provided by the specialty society to justify the inclusion of this service within the Choosing Wisely lists. Based on this rationale, we assign this service into one of five evidentiary categories of “wasteful” services arising from the evidence on its benefits, risks, and costs (Gliwa, 2014).

Specialty Society Rationale

Acute bronchitis is a widespread respiratory illness in the United States and is one of the most common reasons individuals visit a physician each year (Albert et al., 2010). Symptoms of bronchitis include cough and typically last no longer than three weeks. Physicians have used antibiotics to effectively treat bacterial infections since they first became available in the 1940s. However, the vast majority of acute bronchitis infections are caused by viruses and are therefore unresponsive to antibiotics. Clinical guidelines recommend against the routine use of antibiotics for acute bronchitis except in cases of pertussis where reducing transmission is a concern, or in patients who are at a heightened risk for pneumonia, particularly the elderly. The Healthcare Effectiveness Data and Information Set (HEDIS) has enacted quality measures since 2005 that state that prescribing rates of antibiotics for acute bronchitis should be near 0% (NCQA, 2014).

Clinical data suggest only marginal clinical improvements with antibiotics compared to the risk of adverse events caused by this treatment. A meta-analysis examining the impact of antibiotic use on outcomes for patients with acute bronchitis demonstrated that antibiotics achieved a reduction in cough symptoms (number needed to treat = 5.6) but no improvement in patient activity level or quality of life (Smucny, 1998). Routine antibiotic use can expose patients to unnecessary harms including antibiotic resistance or dangerous side effects, such as allergic reactions or Clostridium difficile infection. Five percent of children have allergies to antibiotics, and antibiotics are the most common cause of emergency department visits for adverse drug events in children (American Academy of Pediatrics, 2012; CDC, 2013). Antibiotic resistance is also a serious issue, with over two million Americans becoming sick each year with antibiotic-resistant infections, of which over 20,000 die as a result (CDC, 2013).

Routine antibiotic use can also lead to increased health care costs. Though most antimicrobial medications are available in inexpensive generic formulations, some commonly used antibiotics for bronchitis, like azithromycin, are more costly. Moreover, the costs associated with treating infections that are antibiotic resistant are significant and can cost as much as \$29,000 per person (American Academy of Pediatrics, 2012).

Table 1. “Wasteful Care” Evidence Category

1. Insufficient evidence to evaluate comparative benefit for any indication
2. Insufficient evidence to evaluate comparative benefit for use beyond the boundaries of established indications, frequency, intensity, or dosage
3. Adequate evidence demonstrating equivalent benefit with higher risk, higher cost, or both
4. Adequate evidence demonstrating a small comparative benefit not large enough to justify the higher risk to patients, higher cost, or both
5. Adequate evidence demonstrating improved comparative benefit, lower risk, lower cost, or both when using the intervention

Source: Gliwa and Pearson, 2014

Current Use and Variation in Practice

- *Estimated population affected: 5,300,000– 7,400,000*
- *Estimated number of avoidable outpatient prescriptions: 11 million*
- *Excess Cost of Practice: \$1 billion – \$2 billion*

In spite of explicit guidelines, quality measures, and extensive education campaigns to reduce rates of unnecessary antibiotic use, many patients continue to receive antimicrobial medications without a clear clinical indication. A recent study using data from the National Ambulatory Medical Care Survey to determine antibiotic prescription rates among adults found that among 3,153 acute bronchitis visits in primary care and emergency room settings between 1996 and 2010, physicians prescribed antibiotics in 70% of all cases (Barnett and Lindner, 2014). Authors also found that rates of antibiotic prescribing increased during the 15-year study period. Other studies show similar findings, estimating that between 50% and 90% of patients with acute bronchitis are prescribed antibiotics (Gonzalez et al., 1997; Gonzalez et al., 2005; Nyquist et al., 1998; Kroening-Roche, et al., 2012; Eversten et al., 2010).

Acute bronchitis affects an estimated 44 out of 1,000 adults annually (Macfarlane et al., 2001). Assuming that 50% to 70% of individuals over 16 with acute bronchitis are treated with an antibiotic, using U.S. census data we estimate that the affected U.S. population is between 5.3 and 7.4 million people. A 2013 IMS Institute for Healthcare Informatics study also found significant levels of overuse in this population, estimating 11 million avoidable antibiotic outpatient prescriptions for acute bronchitis annually (IMS, 2013).

The excess cost of practice associated with antibiotic use specific to acute bronchitis is not well studied. The IMS study found the costs of antibiotic use among patients with acute bronchitis to be significant, approximating \$370 million dollars annually (IMS, 2013). These calculations are for antibiotic use alone, and we note that this estimate does not consider excess costs associated with increasing rates of antibiotic resistance, which can be significant. Some analyses have estimated the annual costs of direct health care services and lost productivity associated with antibiotic resistance to be as high as \$55 billion in the U.S. (NCQA, 2014).

Sociology of Practice

We performed a literature review and conducted unstructured interviews with national clinical experts representing the fields of pediatrics and internal medicine to understand the multi-faceted influences that drive the use of antibiotics for acute bronchitis, as well as the most effective methods to reduce inappropriate use of this service. Key themes and lessons from the public literature and these conversations are summarized below.

Physicians recognized antibiotics as a significant area of overuse, despite decades of efforts from the clinical, research, and policy communities to reduce wasteful care in this area. First, physicians noted patient demand as a significant driver, as patients expect medication to reduce symptoms. Physicians also noted that many patients view antibiotic resistance as a secondary concern and place greater priority on treating their condition in the short-term. Physicians interviewed emphasized the challenge of convincing patients or parents with sick children that antibiotics will make little difference in outcomes and may cause harm and advocated for more tools and resources to facilitate these conversations. A range of informational materials from Choosing Wisely® campaign and the CDC are available to help educate patients and support physicians in discussions with their patients, but experts noted that greater efforts are needed to support the uptake of these materials in practice. Communication skills training that emphasizes how to manage patient expectations around antibiotic use, patient handouts about bronchitis and proven treatments, and “wait and see” prescriptions that provide patients with tools to monitor the worsening of symptoms and schedule a follow-up appointment as necessary were all identified as resources that may help reduce unnecessary antibiotic use (Albert, 2010). Experts also noted that linking physician bonuses to patient satisfaction may distort incentives and motivate more clinicians to prescribe antibiotics even when not clinically indicated.

Physician experience and education may also be a factor. Physicians interviewed noted that medical education previously emphasized that if a patient had any noise in the chest, then antibiotics were required. This message has shifted in mainstream medicine but experts recognized it can still be a factor in physician decision-making. Experts also advocated for more training and resources at urgent care centers, where antibiotics tend to be provided more indiscriminately. In urgent care settings, physicians may have less training on how to rule out pneumonia or lack guidance on how to speak with patients and families about antibiotic resistance and other treatment options for bronchitis. Experts recommended greater decision-support tools in these settings to help busy urgent care doctors avoid unnecessary prescribing.

Some experts interviewed felt that greater efforts should be taken at the hospital administrator and leadership level to establish an antibiotic stewardship strategy to curb unnecessary use. Since the saving opportunities associated with reducing antibiotic prescriptions are relatively low at the practice level compared to imaging and other areas of overuse, resources for its reduction are often not afforded the same priority. Leadership in integrated medical groups can be less diligent about monitoring appropriate antibiotic use and reviewing patient medical history to determine if medications were provided only when necessary. Some experts advocated that bonus payments for administrators should also be linked to quality of care in this area, to give department leadership greater incentive to implement and enforce quality measures for antibiotic prescribing. The CDC has also highlighted Antibiotic Stewardship Programs as a cornerstone of its efforts to reduce overuse of antimicrobial medications. These programs involve a commitment from clinical leadership and quality improvement managers to hold physicians accountable for overuse and appoint experts for tracking, reporting, and implementing plans to reduce unnecessary prescribing, while providing education, training, and support to staff from all relevant departments to participate in the program (CDC, 2014). The CDC has developed a core check-list and guidebook for establishing antibiotic stewardship programs to help hospitals develop a leadership strategy.

Experts also noted that there is a missed opportunity from health plans to prevent non-indicated use of antibiotics. Overuse is identifiable using existing claims codes, but payers generally do not limit access to these medications through preauthorization or other means. Since 2005, the National Committee for Quality Assurance (NCQA) has scored health plans on the avoidance of antibiotic treatment in adults with acute bronchitis. Data show that between 2006 and 2013, health plans have made little or no progress in reducing unnecessary antibiotic prescribing, the rate of inappropriate use never dropping below 70% (NCQA, 2014). Health insurers may also consider integrating incentives for curbing unnecessary antibiotic use into quality contracts, or issuing requirements for health systems to establish antimicrobial resistance stewardship programs. Some states have enacted antibiotic prescribing monitoring programs that require health plans to report on efforts to curb unnecessary use in adults and children. For example, in New York the state health department publishes a health plan comparison that shows rates of inappropriate antibiotic prescribing across different insurers. Health plans in the state issue letters to outlier physicians and have offered to reimburse clinicians for the time it takes to counsel patients on why antibiotics are unnecessary (Burns, 2014). However, in spite of these efforts many commercial plans in New York continue to fall below the national average for appropriate antibiotic prescribing for bronchitis.

Summary Statement: Drivers of Overuse and Opportunities for Improvement

Based on our research and conversations with national experts, this section synthesizes the major factors related to overuse, as well as any opportunities for improvement or existing best practices for reducing wasteful care.

Factors Related to Overuse		
<i>Patient Factors</i>	<i>Physician Factors</i>	<i>Payer Factors</i>
<ul style="list-style-type: none"> • Patient demand/lack of education on the ineffectiveness of antibiotics for viral infections, and the risks of overprescribing 	<ul style="list-style-type: none"> • Insufficient time and resources to engage patients on the risks/harms of unnecessary antibiotic use • Motivation to receive bonus payments for high patient satisfaction scores 	<ul style="list-style-type: none"> • Underutilization of preauthorization requirements or other measures to limit unnecessary use, including inclusion of incentives to reduce antibiotic use in quality contracts, and requirements for health systems to establish stewardship programs to curb overuse
Opportunities for Improvement/Current Best Practices		
Opportunities for Improvement		Current Best Practices
<ul style="list-style-type: none"> • Provide communication skills training to physicians that emphasizes how to manage patient expectations around antibiotic use • Make greater use of patient handouts about bronchitis and proven treatments, and tools that help patients monitor the worsening of symptoms and schedule a follow-up appointment as necessary • Provide additional training, education, and decision-support tools to clinicians, particularly in urgent care centers where antibiotics tend to be prescribed more indiscriminately • Implement payer policies that more actively monitor inappropriate antibiotic use and limit coverage for antimicrobial medications for bronchitis • Implement EMR systems with decision-support tools that help facilities track and monitor inappropriate prescribing 		<ul style="list-style-type: none"> • Antibiotic stewardship programs that mobilize leadership around reducing unnecessary antibiotic use and create a strategy for improvement • Score cards and reporting that compares health plans in their rates of appropriate antibiotic use • Quality incentives within fee-for-service or global budget contracts to provide adequate incentives to reduce antibiotic prescribing for bronchitis and take the time to counsel patients on appropriate antibiotic use

Summary Rating

This section synthesizes the information provided previously and presents a recommended priority ranking of whether this service is likely to represent the best opportunity for policy makers to improve practice and drive change. These rankings are based on considerations of 5 factors illustrated in the table below.

Criteria	Ranking
<i>Level of overuse</i>	★ = Limited overuse ★ ★ = Moderate overuse ★ ★ ★ = Substantial overuse
<i>Magnitude of individual patient harm</i>	★ = Limited harm ★ ★ = Moderate harm ★ ★ ★ = Substantial harm
<i>Ease of overcoming patient, clinician, and system barriers to reduce inappropriate care</i>	★ = Limited ease ★ ★ = Moderate ease ★ ★ ★ = Substantial ease
<i>Potential to leverage existing change programs and policy efforts</i>	★ = Limited potential ★ ★ = Moderate potential ★ ★ ★ = Substantial potential
<i>Amount of potential savings</i>	★ = Limited savings ★ ★ = Moderate savings ★ ★ ★ = Substantial savings

<i>Category</i>	<i>Score</i>	<i>Rationale</i>
<i>Level of overuse</i>	★★★	<ul style="list-style-type: none"> • Demonstrated level of significant overuse according to multiple studies examining pharmacy and medical claims data • Acute bronchitis is widespread and among the most common reasons for physician visits in the U.S.
<i>Magnitude of individual patient harm</i>	★★	<ul style="list-style-type: none"> • Can cause harmful side effects and antibiotic resistance, which can limit treatment options for sick patients and can even result in death
<i>Ease of overcoming patient, clinician, and system barriers to reduce inappropriate care</i>	★★	<ul style="list-style-type: none"> • Algorithms and quality measures available to identify unnecessary use with existing billing codes
<i>Opportunity to leverage existing change programs and policy efforts</i>	★★★	<ul style="list-style-type: none"> • Large range of patient education materials available through Choosing Wisely and other physician initiatives with opportunities for greater dissemination and collaboration • Consensus across clinical guidelines suggest opportunity for uniformed messaging
<i>Amount of potential savings</i>	★★	<ul style="list-style-type: none"> • Medications are generally low cost, but large population affected

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