

Wyoming Drug Utilization Review

Antibiotics for Respiratory Tract Infections

WRITTEN BY WYATT PENFOLD, PHARM D

Respiratory Tract Infections

Acute upper respiratory tract infections (ARTI) are the most common reason for both ambulatory care visits and antibiotic prescriptions. Acute uncomplicated bronchitis, pharyngitis, rhinosinusitis, and the common cold are commonly seen ambulatory care visit ARTI. These infections are either viral or bacterial, but the use of prescription antibiotics does not decrease length of infection, nor severity of symptoms (1).

Antibiotic resistance strengthened by inappropriate antibiotic prescribing for ARTI is “an urgent public health threat” (1). Substantial mortality (23,000 deaths), cost (\$30 billion), and adverse drug reactions are attributed to antibiotic resistance and inappropriate prescribing (1).

The largest number of medication related adverse events are due to antibiotics. Antibiotics are implicated in 1 of every 5 visits to the emergency department for adverse drug reactions. For example, potentially life-threatening *Clostridium difficile* diarrhea can be the result of antibiotic treatment. “Nearly 500,000 infections and 29,300 deaths in the United States...” (1) occur each year from *Clostridium difficile* infections, resulting in an additional \$1 billion in extra medical costs. It is estimated that 50% of antibiotic prescriptions in community settings may be unnecessary or inappropriate, contributing to more than \$3 billion in excess costs (1).

Acute Uncomplicated Bronchitis

Prescriptions for antibiotics are used in more than 70% of ambulatory care visits for acute uncomplicated bronchitis. “Acute uncomplicated bronchitis is defined as a self-limited inflammation of the airways (bronchi) with a cough lasting up to 6 weeks” (1). Mild constitutional symptoms and sputum production may or may not be present.

It is important to determine how likely a patient’s bronchitis is bacterial as compared to viral. “More than 90% of otherwise healthy patients presenting to their outpatient providers with acute cough have a syndrome caused by a virus” (1). Differentiating between viral and non viral can be difficult. Changes in sputum (color and texture) are due to sloughing mucosal epithelial cells and inflammatory cells and do not signify bacterial infection (1).

Additionally, “acute bronchitis must be distinguished from pneumonia.”¹ For adults younger than 70 years, immunocompetent and healthy, pneumonia is an unlikely diagnosis without: fever (oral temperature of >38°C or 100.4° F), tachycardia (>100 bpm), tachypnea (respiratory rate >24 breaths/min), and chest examination abnormalities .

Routine antibiotic treatment for acute uncomplicated bronchitis is not recommended in the absence of pneumonia. Treatments were compared in a randomized, placebo-controlled trial comparing antibiotics (amoxicillin-clavulanic acid), NSAIDs (ibuprofen), and a placebo; no differences were found in the number of

WY-DUR Manager
Aimee Lewis, PharmD, MBA

WY-DUR Board Members
Robert Monger, MD, Chair
Scot Schmidt, PharmD, Vice
Chair

Hoo Feng Choo, MD
W. Joseph Horam, MD
Paul Johnson, MD
Scott Johnston, MD
Chris Mosier, RPh
Garrett Needham, RPh
Patrick Yost, MD
Kristen Lovas, PharmD
Melinda Carroll, PharmD
Alissa Aylward, PA

WY-DUR Board Ex-Officios
Donna Artery, PharmD
James Bush, MD
Cori Cooper, PharmD
Melissa Hunter, PharmD

WY-DUR Program Assistant
Meghan Monahan

WY-DUR
University of Wyoming
School of Pharmacy
Dept. 3375
1000 E. University Ave
Laramie, WY 82071
307-766-6750
www.uwyo.edu/DUR

Edited by
Aimee Lewis, PharmD, MBA
Meghan Monahan

days required for cough resolution (1).

However, symptomatic relief may be achieved through the use of cough suppressants (codeine or dextromethorphan), decongestants (phenylephrine or pseudoephedrine), expectorants (guaifenesin), first-generation antihistamines (diphenhydramine), and β -agonists (albuterol). Adverse effects are minimal and unlikely, though a risk benefit conversation should take place between provider and patient (1).

Pharyngitis

Pharyngitis may be characterized by soreness or pain in the throat that is worse with swallowing, and may or may not have constitutional symptoms. It is typically benign and self-limited. Roughly 12 million ambulatory care visits are for pharyngitis, and most visits involve prescription medications (1).

Similar to acute uncomplicated bronchitis, differentiating between viral and nonviral pharyngitis is important, though most cases are viral. Common viral presentation of pharyngitis includes the symptoms: cough, sore throat, hoarseness, nasal congestion, conjunctivitis, and potentially oropharyngeal lesions (1).

The predominant bacterial pathogen in patients with nonviral pharyngitis is group A Streptococcus, which must be ruled out with a rapid antigen detection test, throat culture, or both. Symptoms of bacterial pharyngitis include: swollen tonsils, night sweats, rigors, tender lymph nodes, fever, palatal petechiae, tonsillopharyngeal exudates, and scarlatiniform rash (diffuse redness of the skin with small papules or bumps) (1).

Antibiotics are only recommended for those testing positive for streptococcal bacteria. The typical duration of antibiotic therapy is 10 days. Sore throat duration may be reduced by 1 to 2 days with antibiotic therapy in those positively diagnosed with group A strep. Antibiotics are not, however, recommended for chronic group A strep carriers (1).

While most cases of pharyngitis are viral, >60% of patients presenting with a sore throat receive antibiotics. Symptomatic relief may be obtained through analgesic therapy. NSAIDs, throat lozenges, aspirin, and acetaminophen are all options to palliate pharyngitis symptoms (1).

Acute Rhinosinusitis

Acute rhinosinusitis is another self-limiting affliction potentially caused by a virus, allergen, or other irritant. Symptoms of rhinosinusitis include facial pressure or pain, fever, cough, fatigue, ear pressure or fullness, headache, and nasal congestion. Differentiating between bacterial sources is important, though less than 2% of acute rhinosinusitis cases are complicated by bacterial infection (1,2).

The gold standard diagnostic test for bacterial rhinosinusitis is invasive (sinus puncture secretion aspiration) and rarely performed (1). Current guidelines recommend differentiating bacterial origin from viral by using signs and symptoms.² Bacterial causes are more commonly associated with: symptoms >10 days, facial pain >3 days, fever >39°C (102° F), purulent nasal discharge, or worsening symptoms after initial improvement (1). New-onset of increased nasal discharge, fever, and headache after initial improvement are suspicious for bacterial cause (1,2).

Acute rhinosinusitis, both viral and bacterial, is self-limiting. Antibiotics are more likely to cause adverse effects than they are to provide benefit (1). "The American Academy of Otolaryngology –Head and Neck Surgery emphasizes watchful waiting (without antibiotic therapy) as initial management for all patients with uncomplicated [acute bacterial rhinosinusitis] regardless of severity" (2). The 2012 IDSA guidelines recommend antibiotic therapy with amoxicillin-clavulanate as soon as bacterial rhinosinusitis is diagnosed. Doxycycline or a respiratory fluoroquinolone may also be used (1).

Acute rhinosinusitis should be managed with supportive care. Analgesics and antipyretics may be used to ease pain and diminish a fever. Symptomatic relief may be achieved using additional therapies; saline nasal irrigation, intranasal corticosteroids, antihistamines, decongestants, and mucolytics should be tailored to a patient's symptoms.

Common Cold

Considered "the most common acute illness in the United States," (1) the common cold is also benign and self-limited. This mild upper respiratory viral illness may present with symptoms such as: cough, headache, rhinorrhea, sore throat, sneezing, low-grade fever, and malaise.

The host's inflammatory response dictates which symptoms a patient will experience. The common cold can exacerbate or precipitate other complications such as otitis media, bacterial sinusitis, and asthma. While accounting for only 3% of ambulatory care visits, around 30% of antibiotic prescriptions are for a common cold (1).

“Symptomatic therapy is the appropriate management strategy for the common cold” (1). Antibiotics are not considered effective, and only contribute to an increased risk for adverse effects. It is important to inform patients the duration of the common cold (2 weeks), as well as when to follow up with a physician should their symptoms not improve (1).

The common cold is managed symptomatically. Combinations of analgesic-antihistamine-decongestants shows significant symptom relief in up to 25% of patients.¹ Inhaled cromolyn sodium and ipratropium bromide can reduce inflammation and provide breathing relief. Analgesics may be used to provide pain relief. The use of zinc supplements may reduce the duration of symptoms if they are given less than 24 hours after the onset of symptoms. Herbal remedies and vitamins are not recommended, as data are lacking to support their use (1).

Summary

Upper respiratory tract infections are more often viral than they are bacterial. Antibiotics are prescribed excessively, increasing the risk for bacterial resistance, inflating health care costs, and putting patients at risk for adverse side effects. Antibiotics should not be used unless a bacterial infection is confirmed. Testing for bacterial infections is often invasive or costly, and differences in the signs and symptoms of the infection should be used to diagnose. Antibiotics do not always decrease the duration of bacterial infection, as most upper respiratory infections are self-limiting. Instead of treating the infection, treating symptoms and explaining why antibiotics are not being used is the best way to improve patient satisfaction. NSAIDs and acetaminophen may be used to reduce fever and pain. Decongestants, both oral and nasal, can reduce nasal congestion. Antitussives and ipratropium may be used to reduce cough and improve airway function. Heated and humidified air can alleviate a dry, raw, and irritated respiratory tract.

References:

1. Harris AM, Hicks LA, Qaseem A. Appropriate antibiotic use for acute respiratory tract infection in adults: advice for high-value care from the American College of Physicians and the Centers for Disease Control and Prevention. *Ann Intern Med.* 2016;164:425-434.
2. Rosenfeld RM, Piccirillo JF, Chandrasekhar SS, et al. Clinical practice guideline (update): adult sinusitis. *Otolaryngol Head Neck Surg.* 2015;152(2):1-39.

P&T Committee Meeting Update

The P&T Committee met for its quarterly business meeting on August 13, 2020

Meeting highlights include:

The Department of Health has asked for 9% in budget cuts. It is not currently known where those cuts will be made. Many employees currently have one furlough day per month to ease the budget crisis.

Use of telemedicine continues to grow with 1500 Medicaid clients being served and \$4 million in claims billed. In addition to COVID, Medicare and other payers coming on board contribute to the increase.

The requirement for concurrent use of Spiriva with Daliresp has been removed.

With no evidence of a difference in safety or efficacy compared to other agents in their respective classes, Dayvigo was referred to the Department of Health for cost analysis and PDL placement. Zeposia will be non-preferred. Palforzia, Oriahnn, Kynmobi, Fintepla and Rukobia will be limited to indication.

The proposed prior authorization criteria will be posted for public comment at www.uwyo.edu/DUR. Comments may be sent by email to alewis13@uwyo.edu or by mail to: Wyoming Drug Utilization Review Board, Dept. 3375,

1000 E. University Avenue,
Laramie, WY
82071

Comments should be received prior to October 31, 2020. The next P&T Committee meeting will be held November 12, 2020 in Cheyenne. An agenda will be posted approximately two weeks prior to the meeting.

Wyoming Drug Utilization Review
University of Wyoming
School of Pharmacy
Dept. 3375
1000 E. University Avenue
Laramie, WY 82071

September 2020

In This Issue

Antibiotics for Respiratory Tract Infections
P&T Committee Meeting Update

Please contact WY-DUR at 307-766-6750 to have your name added or removed from our mailing list, or if you need to update your address. The WY-DUR newsletter is also available on-line at www.uwyo.edu/DUR/newsletters.