

Antibiotic Resistance

Oregon Alliance Working for Antibiotic Resistance Education (AWARE)

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Overuse of antibiotics for treatment of predominantly viral upper respiratory infections continues to be commonplace among clinicians. Although national guidelines state that antibiotics for acute bronchitis are rarely warranted, for example, US physicians prescribed antibiotics to 77% of adults with acute bronchitis in 1995, to 59% of adults in 2000, and to 67% of adults in 2005.¹ Although we have less local data, we do know that 61% of Oregon Medicaid patients diagnosed with bronchitis in 2003 received antibiotics. Nationally, acute respiratory tract infections other than pneumonia account for 50% of antibiotic prescribing to adults and 75% of antibiotic prescribing to children, making appropriate treatment of upper respiratory tract infections a top priority if we are to reduce unnecessary courses of antibiotics.²

Although the typical arguments raised for reducing unnecessary antibiotic use have to do with increases in antibiotic resistance, a more important point is that antibiotics rarely have any benefit when used for the treatment of many respiratory infections. Systematic reviews from the Cochrane Collaboration have found marginal to no benefit of antibiotics for treatment of the common cold, acute otitis media in children, maxillary sinusitis, sore throat, and acute bronchitis. A recent analysis of 3.4 million respiratory tract infection visits from the United Kingdom General Practice Research Database estimated that the number of respiratory tract infections (excluding pneumonia) needed to treat with antibiotics to prevent one complication was > 4,000 cases.³

This is quite a marginal benefit, especially if taken in the context of the risks associated with antibiotic use. Depending on the antibiotic, 5%-25% of patients will develop antibiotic-associated diarrhea, 2% will develop a skin reaction and 1 in 5000 patients will have an anaphylactic reaction. A recently-published article looking at drug-related adverse events seen in emergency departments found that over 140,000 emergency department (ED) visits annually in the United States (US) are attributable to antibiotic use—that means for every outpatient antibiotic prescription given in the US, the recipient has a 1 in 1000 chance of requiring a trip to the ED.⁴

Guidelines for Judicious Use of Antibiotics

The primary goal of judicious antibiotic use is to withhold antibiotics unless they are truly indicated, and when indicated, to use the most appropriate drug and dose. For the most part, the only upper respiratory tract infections that routinely require antibiotics are otitis media and laboratory-confirmed group A streptococcal (GAS) pharyngitis. The good news is that both of these can still be treated with narrow-spectrum drugs, and the

new emphasis is on using high-dose regimens that are more likely to be effective against drug-resistant organisms.⁵

Acute Otitis Media (AOM)

In 2004 the American Academy of Pediatrics and the American Academy of Family Physicians published new guidelines recommending that not every episode of AOM requires antibiotic therapy, given that placebo-controlled trials over the past 30 years have consistently shown that most children do well without antibiotics and do not have an increased risk of adverse sequelae. Between 7 and 20 children must be treated with antibiotics for one child to benefit. The guidelines describe the "observation option," deferring antibiotic therapy in favor of symptomatic management.⁶

Episodes of otitis media should be classified as AOM or middle ear effusion (MEE). MEE by itself, without any of the signs and symptoms of acute infection (acute onset, erythema of the tympanic membrane, and ear pain), does not require treatment.

The decision to observe or treat is based on the certainty of diagnosis, the child's age, and the severity of the child's illness (Table 1). In cases where antibiotics are prescribed, amoxicillin remains the treatment of choice. High dose amoxicillin (80-90 mg/kg/day) is more likely to be active against drug-resistant *Streptococcus pneumoniae* (SP), and children over the age of 5 years can be given a short course (5-7 days), which is less likely to cause resistance and has been shown to be just as effective as a 10-day course. In cases where amoxicillin has failed, amoxicillin-clavulanate is the recommended second-line agent.⁷

Table 1: AOM Treatment Guidelines: Observation Option

Age	Certain Diagnosis	Uncertain Diagnosis
< 6 mo	antibiotics	antibiotics
6 mo - 2 y	antibiotics	antibiotics if severe*, otherwise observe
=>2 y	antibiotics if severe*, otherwise observe	Observe

*Severe=severe otalgia or fever>39°

Cough/Bronchitis

Cough illness or bronchitis is principally caused by viruses. Pneumonia can typically be ruled out by the presence of normal vital signs and chest exam (if there is any doubt, obtain a chest x-ray(CXR)). Other than for CXR-confirmed pneumonia, antimicrobial agents are not effective in treating cough, do not prevent bacterial complications, and generally should not be used in patients who have had a cough for less than 3 weeks.⁸

Sinusitis

Similar to bronchitis, sinusitis is rarely bacterial in origin and rarely requires specific treatment. Antimicrobial treatment of sinusitis should be limited to cases with prolonged nonspecific upper respiratory signs and symptoms (i.e. rhinorrhea and cough without improvement) for more than 10 days, or patients with the recent onset of more severe upper respiratory tract signs and symptoms (i.e. fever > 39.0° C, facial swelling, facial pain).⁹ Treatment for sinusitis is quite similar to treatment of AOM, with high-dose amoxicillin being the first-line choice. More details for treatment of upper respiratory tract infections are available at:

<http://www.oregon.gov/DHS/ph/antibiotics/provider.shtml> .

Pharyngitis

Although a wide range of infectious agents can cause pharyngitis, the only common bacterium causing pharyngitis that requires treatment is group A streptococcus (GAS; other streptococci have not been linked to the development of acute rheumatic fever). Since GAS is only responsible for 5%-15% of cases of pharyngitis, it is important to have laboratory confirmation before treating pharyngitis with antibiotics. Four symptoms can be used to predict which patients with sore throats are likely to have GAS pharyngitis: 1) tonsillar exudate; 2) tender anterior cervical lymph nodes; 3) no cough; and 4) fever. Even if all 4 symptoms are present, a patient only has a 40%-60% chance of having GAS pharyngitis, so if 2-4 of these signs are present, obtain a rapid antigen test. A 10-day course of penicillin remains the preferred treatment.¹⁰ If fewer than 2 signs are present, provide supportive care only.

Other considerations to take into account when treating acute GAS pharyngitis are that children need to complete 24 hours of antibiotics before returning to school or child care, routine treatment of asymptomatic household contacts is not necessary, and a follow-up throat culture is not recommended unless symptoms persist.

Patient Satisfaction and Antibiotic Use

Physicians frequently prescribe antibiotics for upper respiratory infections when they believe patients expect it, but receiving a prescription for antibiotics is not in and of itself associated with increased patient satisfaction. In one study by Hamm, Hicks, and Bemben, 113 patients with respiratory infections were given questionnaires before and after medical office visits. Sixty-five percent of the 113 patients with respiratory infections expected antibiotics going into the doctor's office. However, results showed that no association was found between receipt of a prescription for antibiotics and patient satisfaction. Patient satisfaction did, however, correlate with the patients' report that they understood the illness and that the physician spent enough time with them.¹¹

Health care professionals play an integral role in the appropriate use of antibiotics. Therefore, to address the issue of antibiotic

resistance and the proper use of antibiotics, both community and clinician education in combination are needed. The Oregon Alliance Working for Antibiotic Resistance Education (AWARE) is a statewide coalition promoting the appropriate use of antibiotics in Oregon by both educating the public and supporting health care providers in making judicious prescribing decisions. The three areas that we are currently focusing on are:

- Raising awareness about the need to use antibiotics appropriately to parents of young children through one-on-one trainings, use of mass media, and placement of educational materials in clinicians' offices
- Training personnel who routinely provide health education messages to parents of young children to discuss the importance of appropriate use of antibiotics
- Assisting clinicians in reducing the inappropriate use of antibiotics through dissemination of professional guidelines and provision of patient educational materials

To learn more about the Oregon AWARE Program or to become a coalition member, please call us at: 971-673-1111 or go to our web site: www.healthoregon.org/antibiotics .

Free antibiotic education materials are also available through the AWARE program at:

www.oregon.gov/DHS/ph/antibiotics/pubs.shtml .

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