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Antibiotic Resistance Education

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Oregon Alliance Working for Antibiotic Resistance Education (AWARE)

Overuse of antibiotics for treatment of predominantly viral upper respiratory tract infections continues to be commonplace. For example, national guidelines state that antibiotics for acute uncomplicated bronchitis are rarely warranted.[1, 2] Yet national data indicate that antibiotics were prescribed to 67% of adults with acute bronchitis in 2005.[3] Locally, 61% of Oregon Medicaid patients diagnosed with bronchitis in 2003 received antibiotics.[4] Nationally, acute respiratory tract infections other than pneumonia account for 50% of antibiotic prescribing to adults and 75% of antibiotic prescribing to children.[5]

The most common argument for reducing unnecessary antibiotic use concerns the need to limit the increasing prevalence of antibiotic-resistant bacteria. A more important point is that systematic reviews 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.[6,7] A recent analysis of 3.4 million respiratory tract infection visits in the UK estimated that the number of respiratory tract infections (excluding pneumonia) needed to treat with antibiotics to prevent 1 complication was > 4,000.[8]

This is a marginal benefit, especially in the context of the risks associated with antibiotic use. Depending on the antibiotic, 5%-25% of patients develop antibiotic-associated diarrhea, 2% a skin reaction and 0.02% will have an anaphylactic reaction.[9] A recently-published study examining drug-related adverse events seen in emergency departments (ED) found that over 140,000 ED visits annually in the 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.[10]

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, infections that do require antibiotic therapy can often be treated with narrow-spectrum drugs.[11]

Acute Otitis Media (AOM)

Episodes of otitis media are generally classified as AOM or otitis media with effusion (OME). In the absence of signs and symptoms of acute infection (acute onset, erythema of the tympanic membrane, and ear pain), OME does not require antibiotic treatment. The 2004 American Academy of Pediatrics and American Academy of Family Physicians AOM guidelines recommend that many episodes do not require 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 with AOM must be treated with antibiotics for one child to benefit. These guidelines call for an "observation" option, in which antibiotic therapy is deferred in favor of symptomatic management.[12]

The decision to observe or treat is based on the certainty of diagnosis, the child's age, and the severity of illness (Table 1). In cases where antibiotics are required, 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*, and children over the age of 5 can be given a short course (5-7 days) of antibiotics, which is less likely to cause resistance and has been shown to be as effective as a 10-day course. In cases where amoxicillin has failed, amoxicillin-clavulanate is the recommended second-line agent.

Table 1. AOM Treatment Guidelines

Age	Certain Diagnosis	Uncertain Diagnosis
< 6 mo	Antibiotics	Antibiotics
6 mo - 2 yr	Antibiotics	Antibiotics if severe*; otherwise observe
≥ 2 yr	Antibiotics if severe*; otherwise observe	Observe

***Severe=severe otalgia or fever >39˚C**

Cough/Bronchitis

Cough or bronchitis is principally caused by viruses. Bacterial pneumonia can typically be ruled out by the presence of normal vital signs and chest exam. Other than for pneumonia confirmed by chest x-ray, antimicrobials 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.[7]

Sinusitis

Sinusitis is rarely bacterial in origin and seldom requires antimicrobial treatment. Antimicrobial treatment of sinusitis should be limited to cases with prolonged nonspecific upper respiratory signs and symptoms (i.e., rhinorrhea and cough) for more than 10 days, or patients with recent onset of more severe signs and symptoms (i.e., fever > 39˚C, facial swelling, facial pain).[13] Treatment of sinusitis is similar to treatment of AOM, with high-dose amoxicillin being the first-line choice.

Pharyngitis

Although a wide range of infectious agents can cause pharyngitis, the only common bacterium 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 pharyngitis cases, it is important to have a laboratory-confirmed diagnosis before treating pharyngitis with antibiotics. Four symptoms are 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.[9] Even if all 4 symptoms are present, a patient has only a 40%-60% chance of having GAS pharyngitis, so if 2-4 of these signs are present, a rapid antigen test should be obtained. If fewer than 2 signs are present, supportive care alone is sufficient. A 10-day course of penicillin remains the preferred treatment.[14] Other considerations to take into account when treating acute GAS pharyngitis are that children must complete 24 hours of antibiotic therapy before returning to school or child care, routine treatment of asymptomatic household contacts is unnecessary, and a follow-up throat culture is not recommended unless symptoms persist.

Further details regarding treatment of respiratory tract infections are available at http://www.oregon.gov/DHS/ph/antibiotics/provider.shtml.

Patient Satisfaction and Antibiotic Use

Previous research has shown that patient expectations can influence physician prescription of antibiotics, but receiving a prescription is not necessarily associated with increased patient satisfaction. In one study, 113 patients with respiratory infections were given questionnaires before and after medical office visits. Though 65% of the patients expected antibiotics, no association was observed between prescription of 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.[15]

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 are needed. The Oregon Alliance Working for Antibiotic Resistance Education (AWARE) is a CDC-supported, statewide coalition that promotes the appropriate use of antibiotics by both educating the public and supporting health care providers in making judicious prescribing decisions. The three primary areas of focus are:

- Raising awareness about the need to use antibiotics appropriately among parents of young children through one-on-one trainings, 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 patient educational materials

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

Free antibiotic education materials are also available through the AWARE program at: www.oregon.gov/DHS/ph/antibiotics/pubs.shtml.

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References

1. Braman SS. Chronic cough due to acute bronchitis: ACCP evidence-based clinical practice guidelines. *Chest.* Jan 2006;129(1 Suppl):95S-103S.
2. Snow V, Mottur-Pilson C, Gonzales R. Principles of appropriate antibiotic use for treatment of acute bronchitis in adults. *Ann Intern Med.* Mar 20 2001;134(6):518-520.
3. Pitts S, Niska R, Xu J, et al. *National Hospital Ambulatory Medical Care Survey:2006 emergency department summary.* . Hyattsville, MD 2008.
4. Li J, De A, Ketchum K, et al. Antimicrobial Prescribing for Upper Respiratory Infections and Its Effect on Return Visits, 2006; Atlanta, GA.
5. Steinman MA, Gonzales R, Linder JA, et al. Changing use of antibiotics in community-based outpatient practice, 1991-1999. *Ann Intern Med.* Apr 1 2003;138(7):525-533.
6. Arroll B. Antibiotics for upper respiratory tract infections: an overview of Cochrane reviews. *Respir Med.* Mar 2005;99(3):255-261.
7. Smucny J, Fahey T, Becker L, et al. Antibiotics for acute bronchitis. *Cochrane Database Syst Rev.* 2004(4):CD000245.
8. Petersen I, Johnson AM, Islam A, et al. Protective effect of antibiotics against serious complications of common respiratory tract infections: retrospective cohort study with the UK General Practice Research Database. *BMJ.* Nov 10 2007;335(7627):982.
9. Gandhi TK, Weingart SN, Borus J, et al. Adverse drug events in ambulatory care. *N Engl J Med.* Apr 17 2003;348(16):1556-1564.
10. Shehab N, Patel PR, Srinivasan A, et al. Emergency department visits for antibiotic-associated adverse events. *Clin Infect Dis.* Sep 15 2008;47(6):735-743.
11. Low D. Reducing antibiotic use in influenza: challenges and rewards. *Clin Microbiol Infect.* Apr 2008;14(4):298-306.
12. Segal N, Leibovitz E, Dagan R, et al. Acute otitis media-diagnosis and treatment in the era of antibiotic resistant organisms: updated clinical practice guidelines. *Int J Pediatr Otorhinolaryngol.* Oct 2005;69(10):1311-1319.
13. Anon JB, Jacobs MR, Poole MD, et al. Antimicrobial treatment guidelines for acute bacterial rhinosinusitis. *Otolaryngol Head Neck Surg.* Jan 2004;130(1 Suppl):1-45.
14. Centor RM, Witherspoon JM, Dalton HP, et al. The diagnosis of strep throat in adults in the emergency room. *Med Decis Making.* 1981;1(3):239-246.
15. Hamm RM, Hicks RJ, Bemben DA. Antibiotics and respiratory infections: are patients more satisfied when expectations are met? *J Fam Pract.* Jul 1996;43(1):56-62.