Guidelines for the Use of Antibiotics in Acute Upper Respiratory Tract Infections

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To help physicians with the appropriate use of antibiotics in children and adults with upper respiratory tract infection, a multidisciplinary team evaluated existing guidelines and summarized key practice points. Acute otitis media in children should be diagnosed only if there is abrupt onset, signs of middle ear effusion, and symptoms of inflammation. A period of observation without immediate use of antibiotics is an option for certain children. In patients with sinus infection, acute bacterial rhinosinusitis should be diagnosed and treated with antibiotics only if symptoms have not improved after 10 days or have worsened after five to seven days. In patients with sore throat, a diagnosis of group A beta-hemolytic streptococcus pharyngitis generally requires confirmation with rapid antigen testing, although other guidelines allow for empiric therapy if a validated clinical rule suggests a high likelihood of infection. Acute bronchitis in otherwise healthy adults should not be treated with antibiotics; delayed prescriptions may help ease patient fears and simultaneously reduce inappropriate use of antibiotics. (Am Fam Physician 2006;74:956-66, 969.

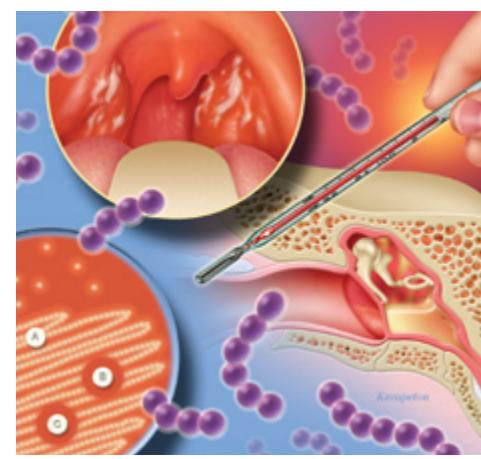

ILLUSTRATION BY JOHN W. KARAPELOU

▶ **Patient information:** A handout on when to use antibiotics, written by the authors of this article, is provided on page 969.

The Centers for Disease Control and Prevention (CDC) estimates that more than 100 million antibiotic prescriptions are written each year in the ambulatory care setting.[1] With so many prescriptions written each year, inappropriate antibiotic use will promote resistance. In addition to antibiotics prescribed for upper respiratory tract infections with viral etiologies, broad-spectrum antibiotics are used too often when a narrow-spectrum antibiotic would have been just as effective.[2] This misuse of antibiotics has led to the development of antibiotic-resistant bacteria.

In one study, up to 50 percent of parents had a previsit expectation of receiving an antibiotic prescription for their children, and one third of physicians perceived an expectation for a prescription.[3] Because of these expectations and the time constraints on physicians, prescribing an antibiotic may seem preferable to explaining why an antibiotic is unnecessary. However, researchers have found no association between receiving an antibiotic prescription and satisfaction with the office visit. What does impact satisfaction is whether patients understood their illness after the visit and whether they felt that their physician spent enough time with them.

Increased antibiotic resistance is not inevitable. For example, Finland demonstrated the success of a nationwide effort to reduce antibiotic resistance following an increase in erythromycin resistance among patients with group A streptococci in the early 1990s.[4] Nationwide recommendations were developed for the appropriate use of macrolide antibiotics; these efforts led to a reduction in the use of macrolides and a subsequent decrease in the rate of erythromycin resistance.

This article presents guidelines that were developed by the Alliance Working for Antibiotic Resistance Education (AWARE) Project, with support from the California

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	*Evidence rating*	*References*
Clinical criteria that assist in the diagnosis of acute otitis media include the abrupt onset of signs and symptoms, the presence of middle ear effusion, and signs or symptoms of middle ear inflammation.	C	6
A period of observation is appropriate for select children with acute otitis media and nonsevere symptoms.	C	6
A diagnosis of acute bacterial rhinosinusitis should be considered in patients with symptoms of a viral upper respiratory infection that have not improved after 10 days or that worsen after five to seven days.	C	7
Treatment of sinus infection with antibiotics in the first week of symptoms is not recommended.	C	7
Amantadine (Symmetrel) and rimantadine (Flumadine) should not be used for the treatment of influenza because of widespread resistance.	A	23
Acute bronchitis in otherwise healthy adults should not be treated with antibiotics.	A	14
Telling patients not to fill an antibiotic prescription unless symptoms worsen or fail to improve after several days can reduce the inappropriate use of antibiotics.	B	24, 25

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, see page 906 or http://www.aafp.org/afpsort.xml.

Medical Association Foundation. This project began in January 2000. More than 80 organizations are partners in the AWARE Project (http://www.aware.md). The work group is composed of practicing physicians, academic physicians, pharmacists, and nurses. No one from the pharmaceutical industry was involved in the development of the compendia.

Given the breadth of this topic, the focus of this article is on the appropriate use of antibiotics and not on the use of adjunctive treatments such as antitussives, decongestants, and inhalers, although they play an important role in disease management and symptomatic relief. The guidelines discussed here address the care of otherwise healthy patients without major comorbidities in the outpatient setting.

Guideline Development Process

A work group was formed in late 2001 to provide overall direction in the development of clinical practice materials and resources. The process began with a literature search for each respiratory tract infection. Next, the practice guidelines developed for each disease by the leading medical organizations were compiled. Members of the work group then prioritized the reference articles and guidelines to be included in the review process. The compendia are shown in *Tables 1 and 2*.[5]

Early treatment of sinus infection with antibiotics is not recommended unless symptoms are prolonged and worsening significantly.

Otitis Media in Children

The American Academy of Family Physicians (AAFP)/American Academy of Pediatrics (AAP) guideline for otitis media in children focuses on three major points: accurate diagnosis, an assessment of pain, and judicious use of antibiotics with an option for watchful waiting in select patients.[6]

ACCURATE DIAGNOSIS

Three elements must be met to confirm the diagnosis of acute otitis media. The first element is the recent, usually abrupt onset of signs and symptoms of middle ear inflammation and effusion. The second element is the presence of middle ear effusion as indicated

TABLE 1

Clinical Practice Guidelines Compendium: Children with URI

Illness/pathogen	*Indications for antibiotic treatment*
Otitis media *Streptococcus pneumoniae*, nontypeable *Haemophilus influenzae, Moraxella catarrhalis*	**When to treat with an antibiotic:** recent, usually abrupt onset of signs and symptoms of middle ear inflammation and effusion *and* Presence of middle ear effusion that is indicated by any of the following: bulging of the tympanic membrane, limited or absent mobility of tympanic membrane, air fluid level behind the tympanic membrane, otorrhea *and* Signs or symptoms of middle ear inflammation as indicated by distinct erythema of the tympanic membrane *or* Distinct otalgia (discomfort clearly referable to the ear[s] that interferes with or precludes normal activity or sleep) **When not to treat with an antibiotic:** otitis media with effusion
Acute bacterial sinusitis *S. pneumoniae,* nontypeable *H. influenzae, M. catarrhalis*	**When to treat with an antibiotic:** diagnosis of acute bacterial sinusitis may be made with symptoms of viral URI (nasal discharge or daytime cough not improved after 10 days, severe illness with fever, purulent nasal discharge, facial pain) not improving after 10 days or that worsen after five to seven days. Diagnosis may include some or all of the following symptoms or signs: nasal drainage, nasal congestion, facial pressure or pain (especially when unilateral and focused in the region of a particular sinus), postnasal discharge, hyposmia, anosmia, fever, cough, fatigue, maxillary dental pain, ear pressure or fullness. **When not to treat with an antibiotic:** nearly all cases of acute bacterial sinusitis resolve without antibiotics. Antibiotic use should be reserved for moderate symptoms not improving after 10 days or that worsen after five to seven days, and severe symptoms.
Pharyngitis *Streptococcus pyogenes*, routine respiratory viruses	**When to treat with an antibiotic:** *S. pyogenes* (group A streptococcal infection). Symptoms and signs: sore throat, fever, headache, nausea, vomiting, abdominal pain, tonsillopharyngeal erythema, exudates, palatal petechiae, tender enlarged anterior cervical lymph nodes. Confirm diagnosis with throat culture or rapid antigen testing; negative rapid antigen test results should be confirmed with throat culture. **When not to treat with an antibiotic:** respiratory viral causes, conjunctivitis, cough, rhinorrhea, diarrhea uncommon with group A streptococcal infection
Nonspecific cough illness/bronchitis >90 percent of cases caused by routine respiratory viruses <10 percent of cases caused by *Bordetella pertussis, Chlamydia pneumoniae,* or *Mycoplasma pneumoniae*	**When to treat with an antibiotic:** presents with prolonged unimproving cough (14 days); should clinically differentiate from pneumonia. Pertussis should be reported to public health authorities. *C. pneumoniae* and *M. pneumoniae* may occur in older children (unusual in those younger than five years). **When not to treat with an antibiotic:** nonspecific cough illness
Bronchiolitis/nonspecific URI >200 viruses, including rhinoviruses, coronaviruses, adenoviruses, respiratory syncytial virus, enteroviruses (coxsackieviruses and echoviruses), influenza viruses, and parainfluenza virus	**When not to treat with an antibiotic:** sore throat, sneezing, mild cough, fever (generally less than 102°F [39°C], for less than three days), rhinorrhea, nasal congestion; self-limited (typically five to 14 days)

NOTE: *This guideline summary is intended for physicians and health care professionals to consider in managing the care of their patients for acute respiratory tract infections. Although the summary describes recommended courses of intervention, it is not intended as a substitute for the advice of a physician or other knowledgeable health care professionals. These guidelines represent best clinical practice at the time of publication, but practice standards may change as more knowledge is gained.*

URI = upper respiratory infection; TMP-SMX = trimethoprim/sulfamethoxazole.

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Treatment	*Antibiotic*
Age group Younger than six months: antibiotics Six months to two years: antibiotics if diagnosis certain; antibiotics if diagnosis uncertain and severe illness Older than two years: antibiotics if diagnosis certain and severe illness **Analgesics and antipyretics** Always assess pain. If pain is present, treatment to reduce pain Oral: ibuprofen or acetaminophen (may use acetaminophen with codeine for moderate-severe pain) Topical: benzocaine	**First-line therapy** High-dosage amoxicillin (80 to 90 mg per kg per day) If severe illness or additional coverage desired: high-dosage amoxicillin/clavulanate (Augmentin; 80 to 90 mg per kg per day of amoxicillin component) **Alternative therapy** Nonanaphylactic penicillin-allergic: cefdinir (Omnicef), cefpodoxime (Vantin), or cefuroxime (Ceftin) Severe penicillin allergy: azithromycin (Zithromax) or clarithromycin (Biaxin) Unable to tolerate oral antibiotic: ceftriaxone (Rocephin)
Usual antibiotic duration: 10 days Failure to respond after 72 hours of antibiotics: reevaluate patient and switch to alternate antibiotic. Fiberoptic endoscopy or sinus aspiration for culture may be necessary.	**First-line therapy** Amoxicillin (80 to 90 mg per kg per day) **Alternative therapy** Amoxicillin/clavulanate (80 to 90 mg per kg per day of amoxicillin component), cefpodoxime, cefuroxime, cefdinir, ceftriaxone For beta-lactam allergy: TMP-SMX (Bactrim, Septra), macrolides, clindamycin (Cleocin)
Group A streptococcal infection: Treatment reserved for patients with positive rapid antigen test or throat culture	**First-line therapy** Penicillin V (Veetids), penicillin G benzathine (Bicillin LA) **Alternative therapy** Amoxicillin, oral cephalosporins, clindamycin, macrolides
Treatment reserved for *B. pertussis, C. pneumoniae, M. pneumoniae*	Macrolides (tetracyclines for children older than eight years)
Adequate fluid intake; may advise rest, over-the-counter medications, humidifier	None

by bulging of the tympanic membrane, limited or absent mobility of the tympanic membrane, air fluid level behind the tympanic membrane, or otorrhea. The final element to be considered is the presence of signs or symptoms of middle ear inflammation as indicated by erythema of the tympanic membrane or otalgia.[6]

TABLE 2
Clinical Practice Guidelines Compendium: Adults with URI

Illness/pathogen	*Indications for antibiotic treatment*
Acute bacterial sinusitis *Streptococcus pneumoniae*, nontypeable *Haemophilus influenzae, Moraxella catarrhalis*, mainly viral pathogens	**When to treat with an antibiotic:** diagnosis may be made in adults with symptoms of a viral upper respiratory infection that have not improved after 10 days or that worsen after five to seven days. Diagnosis may include some or all of the following: nasal drainage, nasal congestion, facial pressure or pain (especially when unilateral and focused in the region of a particular sinus), postnasal discharge, hyposmia, anosmia, fever, cough, fatigue, maxillary dental pain, ear pressure or fullness. **When not to treat with an antibiotic:** nearly all cases resolve without antibiotics. Antibiotic use should be reserved for moderate symptoms that are not improving after 10 days or that worsen after five to seven days, and severe symptoms.
Pharyngitis *Streptococcus pyogenes*, routine respiratory viruses	**When to treat with an antibiotic:** *S. pyogenes* (group A streptococcus infection). Symptoms of sore throat, fever, headache. Physical findings include fever, tonsillopharyngeal erythema and exudates, palatal petechiae, tender and enlarged anterior cervical lymph nodes, and absence of cough. Confirm diagnosis with throat culture or rapid antigen testing before using antibiotics; negative rapid antigen test results may be confirmed with throat culture. **When not to treat with an antibiotic:** most pharyngitis cases are viral in origin. The presence of the following is uncommon with group A streptococcal infection and points away from using antibiotics: conjunctivitis, cough, rhinorrhea, diarrhea, and absence of fever.
Nonspecific cough illness/ acute bronchitis *Bordetella pertussis, Chlamydia pneumoniae, Mycoplasma pneumoniae*	**When to treat with an antibiotic:** antibiotics not indicated in patients with uncomplicated acute bacterial bronchitis. Sputum characteristics not helpful in determining need for antibiotics. Treatment is reserved for patients with acute bacterial exacerbation of chronic bronchitis and COPD, usually smokers. In patients with severe symptoms, rule out other more serious conditions (e.g., pneumonia). **When not to treat with an antibiotic:** 90 percent of cases are nonbacterial. Literature fails to support use of antibiotics in adults without history of chronic bronchitis or other comorbid condition.
Nonspecific upper respiratory infection Viral	**When not to treat with an antibiotic:** Antibiotics not indicated; however, nonspecific upper respiratory infection is a major etiologic cause of acute respiratory illnesses presenting to primary care physicians. Patients often expect treatment. Attempt to discourage antibiotic use and explain appropriate treatment.
Influenza Influenza virus	**When not to treat with an antibiotic:** antibiotics not indicated. For acute treatment, supportive and symptomatic care is the standard. Characterized by abrupt onset of constitutional and respiratory signs and symptoms such as fever, myalgia, headache, rhinitis, severe malaise, nonproductive cough, and sore throat. The incubation period for influenza is one to four days, with an average of two days. Adults typically are infectious from the day before symptoms begin through approximately five days after onset of illness.

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URI = upper respiratory infection; TMP-SMX = trimethoprim/sulfamethoxazole; COPD = chronic obstructive pulmonary disease.

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PAIN ASSESSMENT

Effective therapies for the pain of otitis media include acetaminophen and ibuprofen. Topical agents such as benzocaine, home remedies such as oil, and the application of heat or cold also may be helpful. Symptomatic relief is important to maximize patient comfort and to minimize sick days.

Treatment	*Antibiotic*
Antibiotic duration: 10 days Failure to respond after 72 hours of antibiotics: reevaluate patient and switch to alternate antibiotics	**First-line therapy** Amoxicillin **Alternative therapy** Amoxicillin/clavulanate (Augmentin), cefpodoxime (Vantin), cefdinir (Omnicef), respiratory quinolones (gatifloxacin [Tequin], levofloxacin [Levaquin], moxifloxacin [Avelox]) For beta-lactam allergy: TMP-SMX (Bactrim, Septra), doxycycline (Vibramycin), azithromycin (Zithromax), clarithromycin (Biaxin)
Group A streptococcal infection, antibiotic duration: 10 days	**First-line therapy** Penicillin V (Veetids), penicillin G benzathine (Bicillin LA) **Alternative therapy** Amoxicillin, macrolides (erythromycin preferred in patients allergic to penicillin), oral cephalosporins, clindamycin (Cleocin)
Uncomplicated: not indicated	Chronic bronchitis and COPD: amoxicillin, TMP-SMX, or doxycycline Other (*B. pertussis, C. pneumoniae, M. pneumoniae*): erythromycin or doxycycline
Not indicated	None
Antibiotics not indicated, but patients often expect treatment.	Antiviral medications available for acute relief of symptoms and for prevention in some cases

Prescription pads with a preprinted checklist of suggestions for symptomatic relief of upper respiratory infection symptoms can help reduce inappropriate use of antibiotics.

ANTIBIOTIC THERAPY VS. WATCHFUL WAITING

The AAFP/AAP guideline introduces the option of watchful waiting in select patients with uncomplicated acute otitis media. The decision is based on the patient's age, illness severity, and the certainty of the diagnosis. Severe illness is defined as moderate to severe otalgia or temperature greater than 102°F (39°C) in the past 24 hours, whereas nonsevere illness is defined as mild otalgia and temperature less than 102° F.

A period of watchful waiting with close clinical follow-up is an option for children six months to two years of age with nonsevere symptoms and an uncertain diagnosis. It is also an option for older children with nonsevere symptoms, regardless of the certainty of diagnosis. For all other children, antibiotics are recommended.

If an antibiotic is prescribed, first-line therapy for patients with nonsevere illness is high-dosage amoxicillin (80 to 90 mg per kg per day). Patients with nonsevere illness in whom amoxicillin therapy has failed should switch to high-dosage amoxicillin/clavulanate (Augmentin; 80 to 90 mg per kg per day of the amoxicillin component). For patients with symptoms of severe infection, first-line therapy is high-dosage amoxicillin/clavulanate (80 to 90 mg per kg per day for the amoxicillin component). Alternative therapies for patients allergic to penicillin are shown in *Table 1*.[5]

Otitis media with effusion is defined as fluid in the middle ear space but without the symptoms of an acute infection; antibiotic therapy is not required. Otitis media with effusion may be caused by a viral upper respiratory infection or may be a consequence of acute otitis media. If the diagnostic criteria for acute otitis media are absent, patients who have otitis media with effusion should be observed.

Acute Bacterial Rhinosinusitis

Upper respiratory infections and acute bacterial rhinosinusitis in adults and children often have similar symptoms. The main pathogens are identical to those that cause acute otitis media: *Streptococcus pneumoniae*, nontypeable *Haemophilus influenzae*, and *Moraxella catarrhalis*. A diagnosis of acute bacterial rhinosinusitis may be made in children and adults with symptoms of a viral upper respiratory infection that have not improved after 10 days or that worsen after five to seven days.[7] Patients may have some or all of the following symptoms: nasal drainage, nasal congestion, facial pressure or pain, postnasal drainage, hyposmia or anosmia, fever, cough, fatigue, maxillary dental pain, and ear pressure or fullness. Because many of these signs and symptoms are nonspecific, accurate diagnosis of acute bacterial rhinosinusitis is challenging. A validated clinical decision rule for adults that combines several symptoms is shown in *Table 3*.[8]

The Sinus and Allergy Health Partnership issued guidelines targeting patients with mild to moderate disease.[7] Treatment of sinus

TABLE 3
Berg Prediction Rule for Acute Bacterial Rhinosinusitis

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infection with antibiotics during the first week of symptoms is not recommended because the infection typically is not bacterial at that point. Treatment is reserved for patients who have symptoms for more than 10 days or who experience worsening symptoms.

For children, treatment options include high-dosage amoxicillin, high-dosage amoxicillin/clavulanate, cefpodoxime (Vantin), cefuroxime (Ceftin), cefdinir (Omnicef), or ceftriaxone (Rocephin). Trimethoprim/sulfamethoxazole (TMP-SMX; Bactrim, Septra), macrolides, or clindamycin (Cleocin) is recommended if the patient has a history of type I hypersensitivity reaction to beta-lactam antibiotics. Type I immunoglobulin E–mediated reactions can lead to anaphylaxis and angioedema.

For adults, treatment options include high-dosage amoxicillin, high-dosage amoxicillin/clavulanate, cefpodoxime, cefdinir, gatifloxacin (Tequin), levofloxacin (Levaquin), and moxifloxacin (Avelox). TMP-SMX, doxycycline (Vibramycin), azithromycin (Zithromax), or clarithromycin (Biaxin) is recommended if the patient has a history of type I hypersensitivity reaction to beta-lactam antibiotics.

If the patient does not respond to antimicrobial therapy after 72 hours, he or she should be reevaluated and a change in antibiotics should be considered. Diagnostic evaluations such as computed tomography, fiberoptic endoscopy, or sinus aspiration also may be necessary for patients who experience a treatment failure.

Acute Pharyngitis

Most patients with sore throat from an infectious cause have a virus. Symptoms that suggest a viral etiology for sore throat include conjunctivitis, cough, coryza, and diarrhea. Group A beta-hemolytic streptococcus (GABHS) pharyngitis accounts for 15 to 30 percent of pharyngitis cases in children and approximately 10 percent in adults.[9] The AWARE guideline recommends rapid antigen testing or throat culture for any patient with suspected GABHS pharyngitis and antibiotic therapy only if the patient tests positive for GABHS.

An evidence-based guideline sponsored by the American College of Physicians (ACP) and the CDC provides a somewhat different approach to antibiotic use and laboratory testing in adults with acute tonsillopharyngitis.[10] It recommends that physicians stratify the risk of GABHS pharyngitis using a validated clinical prediction rule such as that provided in *Table 4*.[11]

Using the strep score, GABHS pharyngitis can be ruled out clinically in low-risk patients and no further testing is needed. Moderate-risk patients need rapid antigen testing to confirm the diagnosis before therapy is initiated, whereas empiric therapy can be considered for high-risk patients. According to the ACP/CDC guideline, a throat culture is rarely indicated in the primary evaluation of adult patients. Throat culture is recommended only in an outbreak situation as a method of epidemiologic study and for patients in whom gonococcal disease is possible.[10]

TABLE 4
Strep Score for Group A Beta-Hemolytic Streptococcus Pharyngitis

Symptom	*Points*
Fever	+ 1
Absence of cough	+ 1
Cervical adenopathy	+ 1
Tonsillar exudates	+ 1
Patient's age	
< 15 years	+ 1
15 to 45 years	0
> 45 years	– 1
Total score:	_____

Score	*Probability of strep (%)*	*Action*
– 1 or 0	1	No further testing or treatment
1, 2, or 3	10 to 35	Rapid antigen testing; treatment based on result
4 or 5	51	Consider empiric treatment or rapid antigen testing

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Penicillin, in a 10-day course of penicillin V (Veetids) or a single dose of parenteral penicillin G benzathine (Bicillin LA), remains the treatment of choice for GABHS pharyngitis. However, amoxicillin is an acceptable alternative because of taste and the increased likelihood of compliance. Alternative antimicrobials include first- or second-generation cephalosporins, clindamycin, or macrolides. A meta-analysis published since the AWARE guidelines were compiled found a small benefit to treatment with cephalosporins over penicillin in patients with GABHS pharyngitis.[12]

Acute Bronchitis

Bronchitis is inflammation of the bronchial respiratory mucosa leading to a productive cough. The diagnosis is based on clinical findings, and no objective test exists. Sputum characteristics (i.e., green versus clear versus absent) are not useful in differentiating a bacterial or viral etiology.[13] More than 90 percent of cases of uncomplicated acute bronchitis have nonbacterial etiologies.[14] Therefore, antibiotics usually are not indicated for nonspecific cough illness. If pneumonia is suspected based on tachypnea, high fever, asymmetric breath sounds, or other symptoms, the diagnosis should be confirmed with chest radiography before antibiotics are prescribed.[15]

The results of recent randomized controlled trials support this recommendation. For example, in one study, patients diagnosed with acute bronchitis were randomized to treatment with azithromycin or placebo (vitamin C).[16] There was no significant difference in clinical outcomes between the groups after three or seven days.

Another study of 807 patients with acute lower respiratory tract infection, including many with fever or purulent sputum, compared treatment outcomes with an immediate antibiotic, a delayed antibiotic, or no antibiotic. No significant differences were noted between groups, and the researchers concluded that no antibiotics and delayed antibiotics were both acceptable approaches.[17] Finally, a systematic review published in 2004 found a modest benefit at best in the groups treated with antibiotics, and this was balanced by an equally great harm because of adverse effects.[18]

If the cough is prolonged for more than 10 days, a bacterial etiology should be considered.[19,20] *Bordetella pertussis*, *Mycoplasma pneumoniae*, and *Chlamydia pneumoniae* are possible causes, and macrolide antibiotics are the treatment of choice. The CDC recommends azithromycin for five days, clarithromycin for seven days, or erythromycin for 14 days in children older than one month and in adults with suspected pertussis based on recent exposure or for postexposure prophylaxis. For children younger than one month, azithromycin is recommended. TMP-SMX is an alternative for infants older than two months.[21]

Nonspecific Upper Respiratory Tract Infection

Nonspecific upper respiratory tract infection presents with symptoms that often are referred to as the common cold.[20] Causative agents include numerous viruses such as rhinoviruses, adenoviruses, respiratory syncytial viruses, parainfluenza viruses, and enteroviruses. Antibiotics are not needed in these circumstances. Treatment consists of adequate fluid intake, rest, humidified air, and over-the-counter analgesics and antipyretics.

Influenza

Influenza is characterized by the abrupt onset of fever, myalgias, headache, rhinitis, severe malaise, nonproductive cough, and sore throat. The main treatment is supportive care to relieve symptoms. Antiviral medications (i.e., amantadine [Symmetrel], rimantadine [Flumadine], oseltamivir [Tamiflu], and zanamivir [Relenza]) can decrease the duration of symptoms by approximately 24 hours but are effective only when given within the first 36 hours of illness.[22] A recent advisory from the CDC recommends that physicians no longer use amantadine or rimantadine because of widespread resistance.[23]

Practical Strategies for Reducing Inappropriate Antibiotic Use

Patients often expect an antibiotic for an acute respiratory infection; because health

care professionals strive for patient satisfaction, they may feel pressured to prescribe an unnecessary antibiotic. If the diagnosis is a viral illness, the physician needs to have a contingency plan to explain to the patient why an antibiotic will not be prescribed. Patients should be educated about the difference between bacterial and viral infections and why antibiotics will be ineffective for a viral illness. Targeted symptomatic relief can be provided with antipyretics, decongestants, antihistamines, and antitussives. Having prescription pads with a preprinted checklist of medications for symptomatic relief and patient education is useful.

Several studies have indicated that giving patients an antibiotic prescription and telling them not to fill it unless their symptoms worsen or do not improve after several days has been shown to reduce antibiotic use.[24,25] Developing an easy-access follow-up visit for patients who do not improve may alleviate some of the anxieties associated with not getting an antibiotic. An educational intervention such as instructing patients on the appropriate indications for antibiotic use can help maintain patient satisfaction without prescribing antibiotics. More information on educational materials is available at http://www.aware.md.

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