



The New York State “Get Smart Campaign” aims to bring attention to the global concerns about antibiotic resistance and appropriate prescribing of antibiotics in outpatient healthcare settings. To assist in improving the appropriate use of antibiotics, the NYSDOH has compiled a collection of educational tools for use by healthcare providers in family practice, internal medicine, emergency departments, pediatrics and urgent care clinics.

According to CDC, each year in the United States, at least 2 million people become infected with bacteria that are resistant to antibiotics and at least 23,000 people die as a direct result of these infections. Every time a provider takes the correct action (i.e., not prescribing antibiotics for viral infections), they can make a difference in combating antibiotic resistance worldwide.

This toolkit includes timely CDC clinical guidance sheets on appropriate treatment for pediatric and adult patients. There is also a link to worksheets that help with “academic detailing” where healthcare colleagues share information one-on-one or in small groups with peers. Additionally, the New York “Get Smart Campaign” is seeking to enlist the help of providers to serve as community opinion leaders, who will set an example about appropriate antibiotic prescribing.

For more information or to receive hard copies of these materials and a provider outpatient Power Point slide deck, please contact Mary Beth Wenger, Project Coordinator of New York’s “Get Smart Campaign” at [marybeth.wenger@health.ny.gov](mailto:marybeth.wenger@health.ny.gov) or at (518)-474-1036.

Get Smart Campaign website:  
<http://www.cdc.gov/getsmart/>

Get Smart Facts:  
<http://www.cdc.gov/getsmart/community/about/index.html>



“Warning: Antibiotics Don’t Work for Viruses Like Colds and the Flu” poster for download:

<http://www.cdc.gov/getsmart/community/materials-references/print-materials/adults/p-healthy-adult-color.pdf>

Get Smart Social Media Messages:

<http://www.cdc.gov/getsmart/community/materials-references/social-media.html>

Link to Academic Detailing Sheets for small group or one-on-one educational sessions:

<http://www.cdc.gov/getsmart/community/materials-references/print-materials/hcp/index.html>

Get Smart recommended research articles:

<http://www.cdc.gov/getsmart/community/materials-references/research-articles.html>

Get Smart Continuing Education and curriculum opportunities:

<http://www.cdc.gov/getsmart/community/for-hcp/continuing-education.html>

#### **CDC Clinical Guidance Recommendations**

Adult recommendations (PDF is available in the introductory section as the “Quick Reference Table”):

<http://www.cdc.gov/getsmart/community/for-hcp/outpatient-hcp/adult-treatment-rec.html>

Pediatric recommendations (PDF is available in the introductory section as the “Quick Reference Table”):

<http://www.cdc.gov/getsmart/community/for-hcp/outpatient-hcp/pediatric-treatment-rec.html>

# CAREFUL ANTIBIOTIC USE

Stemming the tide of antibiotic resistance: Recommendations by CDC/AAP to promote appropriate antibiotic use in children.<sup>1,2</sup>

## PEDIATRIC APPROPRIATE TREATMENT SUMMARY

DIAGNOSIS	CDC/AAP Principles of Appropriate Use												
Otitis Media	<ol style="list-style-type: none"> <li>Classify episodes of otitis media (OM) as acute otitis media (AOM) or otitis media with effusion (OME). Only treat <i>certain children</i> with proven AOM.</li> <li>A certain diagnosis of AOM meets three criteria: <ul style="list-style-type: none"> <li>History of acute onset of signs and symptoms</li> <li>Presence of middle ear effusion</li> <li>Signs or symptoms of middle-ear inflammation</li> </ul> <p><b>Severe illness</b> is moderate to severe otalgia or fever <math>\geq 39C</math>.  <b>Non-severe illness</b> is mild otalgia and fever <math>&lt; 39C</math> in the past 24 hours.</p> </li> <li>Children with AOM who should be treated as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Age</th> <th style="width: 45%;">Certain Diagnosis</th> <th style="width: 40%;">Uncertain Diagnosis</th> </tr> </thead> <tbody> <tr> <td>&lt; 6 mo</td> <td>Antibacterial therapy</td> <td>Antibacterial therapy</td> </tr> <tr> <td>6 mo to 2 y</td> <td>Antibacterial therapy</td> <td>Antibacterial therapy if severe illness; observation option* if nonsevere illness</td> </tr> <tr> <td><math>\geq 2</math> y</td> <td>Antibacterial therapy if severe illness; observation option* if nonsevere illness</td> <td>Observation option*</td> </tr> </tbody> </table> </li> <li>Don't prescribe antibiotics for initial treatment of OME: <ul style="list-style-type: none"> <li>Treatment may be indicated if bilateral effusions persist for 3 months or more.</li> </ul> <p>* If decision is made to treat with an antibacterial agent, the clinician should prescribe amoxicillin for most children.</p> </li> </ol>	Age	Certain Diagnosis	Uncertain Diagnosis	< 6 mo	Antibacterial therapy	Antibacterial therapy	6 mo to 2 y	Antibacterial therapy	Antibacterial therapy if severe illness; observation option* if nonsevere illness	$\geq 2$ y	Antibacterial therapy if severe illness; observation option* if nonsevere illness	Observation option*
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Rhinitis and Sinusitis	<p><b>Rhinitis:</b></p> <ol style="list-style-type: none"> <li>Antibiotics should not be given for viral rhinosinusitis.</li> <li>Mucopurulent rhinitis (thick, opaque, or discolored nasal discharge) frequently accompanies viral rhinosinusitis. It is not an indication for antibiotic treatment unless it persists without improvement for more than 10-14 days.</li> </ol> <p><b>Sinusitis:</b></p> <ol style="list-style-type: none"> <li>Diagnose as sinusitis only in the presence of: <ul style="list-style-type: none"> <li>prolonged nonspecific upper respiratory signs and symptoms (e.g. rhinorrhea and cough without improvement for <math>&gt; 10-14</math> days), or</li> <li>more severe upper respiratory tract signs and symptoms (e.g. fever <math>&gt; 39C</math>, facial swelling, facial pain).</li> </ul> </li> <li>Initial antibiotic treatment of acute sinusitis should be with the most narrow-spectrum agent which is active against the likely pathogens.</li> </ol>												
Pharyngitis	<ol style="list-style-type: none"> <li>Diagnose as group A streptococcal pharyngitis using a laboratory test in conjunction with clinical and epidemiological findings.</li> <li>Antibiotics should not be given to a child with pharyngitis in the absence of diagnosed group A streptococcal infection.</li> <li>A penicillin remains the drug of choice for treating group A streptococcal pharyngitis.</li> </ol>												
Cough Illness and Bronchitis	<ol style="list-style-type: none"> <li>Cough illness/bronchitis in children rarely warrants antibiotic treatment.</li> <li>Antibiotic treatment for prolonged cough (<math>&gt; 10</math> days) may occasionally be warranted: <ul style="list-style-type: none"> <li>Pertussis should be treated according to established recommendations.</li> <li><i>Mycoplasma pneumoniae</i> infection may cause pneumonia and prolonged cough (usually in children <math>&gt; 5</math> years); a macrolide agent (or tetracycline in children <math>\geq 8</math> years) may be used for treatment.</li> <li>Children with underlying chronic pulmonary disease (not including asthma) may occasionally benefit from antibiotic therapy for acute exacerbations.</li> </ul> </li> </ol>												

### When parents demand antibiotics...

- Provide educational materials and share your treatment rules to explain when the risks of antibiotics outweigh the benefits.
- Build cooperation and trust:
  - Don't dismiss the illness as "only a viral infection"
  - Give parents a realistic time course for resolution
  - Explicitly plan treatment of symptoms with parents
  - Prescribe analgesics and decongestants, if appropriate

1. Dowell SF, Editor. Principals of judicious use of antimicrobial agents for children's upper respiratory infections. Pediatrics. Vol 1. January 1998 Supplement.

2. American Academy of Pediatrics and American Academy of Family Physicians, Subcommittee on Management of Acute Otitis Media. Diagnosis and management of acute otitis media. Pediatrics 2004;113:1451-1.



## Pediatric Treatment Recommendations

Antibiotic prescribing guidelines establish standards of care, focus quality improvement efforts, and improve patient outcomes. The table below summarizes the most recent principles of appropriate antibiotic prescribing for children obtaining care in an outpatient setting for the following six diagnoses: acute rhinosinusitis, acute otitis media, bronchiolitis, pharyngitis, common cold, and urinary tract infection.

Condition	Epidemiology	Diagnosis	Management
Acute rhinosinusitis <sup>1, 2</sup>	90–98% of sinusitis cases are viral, and antibiotics are not guaranteed to help even if the causative agent is bacterial.	<p>Halitosis, fatigue, headache, decreased appetite, but most physical exam findings are non-specific and do not distinguish bacterial from viral causes.</p> <p>A bacterial diagnosis may be established based on the presence of <b>one</b> of the following criteria:</p> <ul style="list-style-type: none"> <li>• Persistent symptoms without improvement: nasal discharge or daytime cough &gt;10 days.</li> <li>• Worsening symptoms: worsening or new onset fever, daytime cough, or nasal discharge after initial improvement of a viral URI.</li> <li>• Severe symptoms: fever <math>\geq 39^{\circ}\text{C}</math>, purulent nasal discharge for at least 3 consecutive days.</li> </ul> <p>Imaging tests are no longer recommended for uncomplicated cases.</p>	<p>If a bacterial infection is established:</p> <ul style="list-style-type: none"> <li>• Amoxicillin or amoxicillin/clavulanate remain first-line therapy.</li> <li>• For children with a non-type I hypersensitivity to penicillin, a combination of clindamycin and a third-generation cephalosporin (cefixime or cefpodoxime) may be appropriate.</li> <li>• Recommendations for treatment of children with a history of type I hypersensitivity to penicillin vary.<sup>1, 2</sup></li> <li>• In children who are vomiting or who cannot tolerate oral medication, a single dose of ceftriaxone can be used.<sup>1</sup></li> <li>• For further recommendations on alternative antibiotic regimens, consult the American Academy of Pediatrics<sup>1</sup> or the Infectious Diseases Society of America<sup>2</sup> guidelines.</li> </ul>

Condition	Epidemiology	Diagnosis	Management
Acute otitis media (AOM) <sup>3-5</sup>	<ul style="list-style-type: none"> <li>AOM is the most common childhood infection for which antibiotics are prescribed.</li> <li>4-10% of children with AOM treated with antibiotics experience adverse effects.<sup>4</sup></li> </ul>	<p>Definitive diagnosis requires either</p> <ul style="list-style-type: none"> <li>Moderate or severe bulging of tympanic membrane (TM) or new onset otorrhea not due to otitis externa.</li> <li>Mild bulging of the TM AND recent (&lt;48h) onset of otalgia (holding, tugging, rubbing of the ear in a nonverbal child) or intense erythema of the TM.</li> </ul> <p>AOM should not be diagnosed in children without middle ear effusion (based on pneumatic otoscopy and/or tympanometry).</p>	<ul style="list-style-type: none"> <li>Mild cases with unilateral symptoms in children 6-23 months of age or unilateral or bilateral symptoms in children &gt;2 years may be appropriate for watchful waiting based on shared decision-making.</li> <li>Amoxicillin remains first line therapy for children who have not received amoxicillin within the past 30 days.</li> <li>Amoxicillin/clavulanate is recommended if amoxicillin has been taken within the past 30 days, if concurrent purulent conjunctivitis is present, or if the child has a history of recurrent AOM unresponsive to amoxicillin.</li> <li>For children with a non-type I hypersensitivity to penicillin: cefdinir, cefuroxime, cefpodoxime, or ceftriaxone may be appropriate choices.</li> <li>Prophylactic antibiotics are not recommended to reduce the frequency of recurrent AOM.</li> <li>For further recommendations on alternative antibiotic regimens, consult the American Academy of Pediatrics guidelines.<sup>3</sup></li> </ul>

Condition	Epidemiology	Diagnosis	Management
Pharyngitis <sup>4, 6</sup>	<ul style="list-style-type: none"> <li>Recent guidelines aim to minimize unnecessary antibiotic exposure by emphasizing appropriate use of rapid antigen detection test (RADT) testing and subsequent treatment .</li> <li>During the winter and spring, up to 20% of asymptomatic children can be colonized with group A beta-hemolytic streptococci (GAS), leading to more false positives from RADT-testing and increases in unnecessary antibiotic exposure.</li> <li>Streptococcal pharyngitis is primarily a disease of children 5-15 years old and is rare in preschool children.</li> </ul>	<ul style="list-style-type: none"> <li>Clinical features alone do not distinguish between GAS and viral pharyngitis.</li> <li>Children with sore throat plus 2 or more of the following features should undergo a RADT test: <ol style="list-style-type: none"> <li>absence of cough</li> <li>presence of tonsillar exudates or swelling</li> <li>history of fever</li> <li>presence of swollen and tender anterior cervical lymph nodes</li> <li>age younger than 15 years</li> </ol> </li> <li>Testing should generally not be performed in children younger than 3 years in whom GAS rarely causes pharyngitis and rheumatic fever is uncommon.</li> <li>In children and adolescents, negative RADT tests should be backed up by a throat culture; positive RADTs do not require a back-up culture.</li> </ul>	<ul style="list-style-type: none"> <li>Amoxicillin and penicillin V remain first-line therapy.</li> <li>For children with a non-type I hypersensitivity to penicillin: cephalexin, cefadroxil, clindamycin, clarithromycin, or azithromycin are recommended.</li> <li>For children with an immediate type I hypersensitivity to penicillin: clindamycin, clarithromycin, or azithromycin are recommended.</li> <li>Recommended treatment course for all oral beta lactams is 10 days.</li> </ul>
Common cold or non-specific upper respiratory tract infection (URI) <sup>4,7</sup>	<ul style="list-style-type: none"> <li>The course of most uncomplicated viral URIs is 5 to 7 days. Colds usually last around 10 days.</li> <li>At least 200 viruses can cause the common cold.</li> </ul>	<ul style="list-style-type: none"> <li>Viral URIs are often characterized by nasal discharge and congestion or cough. Usually nasal discharge begins as clear and changes throughout the course of the illness.</li> <li>Fever, if present, occurs early in the illness.</li> </ul>	<ul style="list-style-type: none"> <li>Management of the common cold, nonspecific URI, and acute cough illness should focus on symptomatic relief. Antibiotics should not be prescribed for these conditions.</li> <li>There is potential for harm and no proven benefit from over-the-counter cough and cold medications in children younger than 6 years. These substances are among the top 20 substances leading to death in children &lt;5 years old.</li> <li>Low-dose inhaled corticosteroids and oral prednisolone do not improve outcomes in non-asthmatic children.</li> </ul>

Condition	Epidemiology	Diagnosis	Management
Bronchiolitis <sup>8</sup>	<ul style="list-style-type: none"> <li>Bronchiolitis is the most common lower respiratory tract infection in infants.</li> <li>It is most often caused by respiratory syncytial virus but can be caused by many other respiratory viruses.</li> </ul>	<ul style="list-style-type: none"> <li>Bronchiolitis occurs in children &lt;24 months and is characterized by rhinorrhea, cough, wheezing, tachypnea, and/ or increased respiratory effort.</li> <li>Routine laboratory tests and radiologic studies are not recommended, but a chest x-ray may be warranted in atypical disease (absence of viral symptoms, severe distress, frequent recurrences, lack of improvement).</li> </ul>	<ul style="list-style-type: none"> <li>Usually patients worsen between 3-5 days, followed by improvement.</li> <li>Antibiotics are not helpful and should not be used.</li> <li>Nasal suctioning is mainstay of therapy.</li> <li>Albuterol can be trialed but should only be dispensed if there is a documented improvement. Only 1 in 4 children with bronchiolitis will have any response to albuterol.</li> <li>Nebulized racemic epinephrine has also shown some benefit in bronchiolitis.</li> <li>There is no evidence to support routine suctioning of the lower pharynx or larynx (deep suctioning).</li> <li>There is no role for corticosteroids, ribavirin, or chest physiotherapy in the management of bronchiolitis.</li> </ul>
Urinary tract infections (UTIs) <sup>8, 9</sup>	<ul style="list-style-type: none"> <li>UTIs are common in children, affecting 8% of girls and 2% of boys by age 7.</li> <li>The most common causative pathogen is <i>E. coli</i>, accounting for approximately 85% of cases.</li> </ul>	<ul style="list-style-type: none"> <li>In infants, fever and or strong-smelling urine are common.</li> <li>In school-aged children, dysuria, frequency, or urgency are common.</li> <li>A definitive diagnosis requires both a urinalysis suggestive of infection and at least 50,000 CFUs/mL of a single uropathogen from urine obtained through catheterization or suprapubic aspiration (NOT urine collected in a bag).</li> <li>Urinalysis is suggestive of infection with the presence of pyuria (leukocyte esterase or ≥5 WBCs per high powered field), bacteriuria, or nitrites.</li> <li>Nitrites are not a sensitive measure for UTI in children and cannot be used to rule out UTIs.</li> </ul> <p>Urine testing for all children 2-24 months with unexplained fever is no longer recommended.</p>	<ul style="list-style-type: none"> <li>Initial antibiotic treatment should be based on local antimicrobial susceptibility patterns. Suggested agents include TMP/SMX, amoxicillin/clavulanate, cefixime, cefpodoxime, cefprozil, or cephalexin.</li> <li>Duration of therapy should be 7 to 14 days.</li> <li>Antibiotic treatment of asymptomatic bacteriuria in children is not recommended.</li> </ul> <p>Antibiotic prophylaxis to prevent recurrent UTIs is not recommended.</p> <p>Febrile infants with UTIs should undergo renal and bladder ultrasonography during or following their first UTI. Abnormal imaging results require further testing.</p>



## References

1. Wald ER, Applegate KE, Bordley C, et al. [Clinical practice guideline for the diagnosis and management of acute bacterial sinusitis in children aged 1 to 18 years](#). *Pediatrics*. 2013;132(1):e262-80.
2. Chow AW, Benninger MS, Brook I, et al. [IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults](#). *Clin Infect Dis*. 2012;54(8):e72-e112.
3. Lieberthal AS, Carroll AE, Chonmaitree T, et al. [The diagnosis and management of acute otitis media](#). *Pediatrics*. 2013;131(3):e964-99.
4. Hersh AL, Jackson MA, Hicks LA, et al. [Principles of judicious antibiotic prescribing for upper respiratory tract infections in pediatrics](#). *Pediatrics*. 2013;132(6):1146-54.
5. Coker TR, Chan LS, Newberry SJ, et al. [Diagnosis, microbial epidemiology, and antibiotic treatment of acute otitis media in children: A systematic review](#). *JAMA*. 2010;304(19):2161-9.
6. Shulman ST, Bisno AL, Clegg HW, et al. [Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America](#). *Clin Infect Dis*. 2012;55(10):e86-102.
7. Fashner J, Ericson K, Werner S. [Treatment of the common cold in children and adults](#). *Am Fam Physician*. 2012;86(2):153-9.
8. American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. [Diagnosis and management of bronchiolitis](#). *Pediatrics*. 2006;118(4):1774-93.
9. Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management, Roberts KB. [Urinary tract infection: Clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months](#). *Pediatrics*. 2011;128(3):595-610.
10. White B. [Diagnosis and treatment of urinary tract infections in children](#). *Am Fam Physician*. 2011;83(4):409-15.

# CAREFUL ANTIBIOTIC USE

Make promoting appropriate antibiotic use part of your routine clinical practice

## PRACTICE TIPS

When parents ask for antibiotics to treat viral infections:

■ **Explain that unnecessary antibiotics can be harmful.**

Tell parents that based on the latest evidence, unnecessary antibiotics CAN be harmful, by promoting resistant organisms in their child and the community.

■ **Share the facts.**

Explain that bacterial infections can be cured by antibiotics, but viral infections never are.

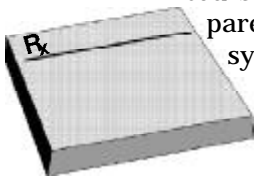
Explain that treating viral infections with antibiotics to prevent bacterial infections does not work.

■ **Build cooperation and trust.**

Convey a sense of partnership and don't dismiss the illness as "only a viral infection".

■ **Encourage active management of the illness.**

Explicitly plan treatment of symptoms with parents. Describe the expected normal time course of the illness and tell parents to come back if the symptoms persist or worsen.



■ **Be confident with the recommendation to use alternative treatments.**

Prescribe analgesics and decongestants, if appropriate.

Emphasize the importance of adequate nutrition and hydration.

Consider providing "care packages" with non-antibiotic therapies.

Create an office environment to promote the reduction in antibiotic use.

■ **Talk about antibiotic use at 4 and 12 month well child visits.**



The AAP Guidelines for Health Supervision III (1997) now include counseling on antibiotic use as an integral part of well-child care.

■ **Start the educational process in the waiting room.**

Videotapes, posters, and other materials are available.

([www.cdc.gov/ncidod/dbmd/antibioticresistance](http://www.cdc.gov/ncidod/dbmd/antibioticresistance))

■ **Involve office personnel in the educational process.**

Reinforcement of provider messages by office staff can be a powerful adjunct to change patient attitudes.

■ **Use the CDC/AAP pamphlets and principles to support your treatment decisions.**

Provide information to help parents understand when the risks of using antibiotics outweigh the benefits.

# Adult Appropriate Antibiotic Use Summary

Diagnosis	CDC Principles of Appropriate Antibiotic Use
<b>Upper respiratory infections, not otherwise specified</b>	<ol style="list-style-type: none"> <li>The diagnosis of nonspecific upper respiratory tract infections or acute rhinopharyngitis should be used to denote acute infection that is typically viral in origin, and in which sinus, pharyngeal, and lower airway symptoms, although frequently present, are not prominent.</li> <li>Antibiotic treatment of nonspecific upper respiratory infections in adults does not enhance illness resolution or prevent complications, and is therefore not recommended.</li> <li>Purulent secretions in the nares and throat (commonly reported and seen in patients with an uncomplicated, upper respiratory tract infection) neither predict bacterial infection nor benefit from antibiotic treatment.</li> </ol>
<b>Acute pharyngitis</b>	<ol style="list-style-type: none"> <li>Group A beta hemolytic streptococcus (GABHS) is the etiologic agent in approximately 10% of adult cases of pharyngitis. The large majority of adults with acute pharyngitis have a self-limiting illness, which would do well with supportive care only.</li> <li>The benefits of antibiotic treatment of adult pharyngitis are limited to those patients with GABHS infection. All patients with pharyngitis should be offered appropriate doses of analgesics, antipyretics and other supportive care.</li> <li>Limit antibiotic prescriptions to those patients with the highest likelihood of GABHS.               <ol style="list-style-type: none"> <li>Clinically screen all adult patients with pharyngitis for the presence of the 4 Centor criteria: (1) history of fever, (2) tonsillar exudates, (3) no cough, and (4) tender anterior cervical lymphadenopathy (lymphadenitis).</li> <li>Do not test and do not treat patients with none or only one of these criteria. These patients are unlikely to have GABHS infection.</li> <li>Test patients with 2 or more criteria using a rapid antigen test. Limit antibiotic therapy to patients with a positive test.</li> </ol> </li> <li>Throat cultures are not recommended for the routine primary evaluation of adults with pharyngitis, nor for the confirmation of negative rapid antigen tests. Throat cultures may be indicated as part of investigations of outbreaks of GABHS disease, for monitoring the development and spread of antibiotic resistance, or when pathogens such as gonococcus are being considered.</li> <li>The preferred antibiotic for treatment of acute GABHS pharyngitis is penicillin, or erythromycin for a penicillin-allergic patient.</li> </ol>
<b>Rhino-sinusitis</b>	<ol style="list-style-type: none"> <li>Most cases of acute rhinosinusitis diagnosed in ambulatory care are due to uncomplicated viral, upper respiratory tract infections.</li> <li>Bacterial and viral rhinosinusitis are difficult to differentiate on clinical grounds. The clinical diagnosis of acute bacterial rhinosinusitis should be reserved for patients with rhinosinusitis symptoms lasting 7 days or more and who have maxillary facial/tooth pain or tenderness (especially when unilateral) and purulent nasal secretions. Patients who have rhinosinusitis symptoms for less than 7 days are unlikely to have a bacterial infection.</li> <li>Sinus radiographs are not recommended for diagnosis in routine cases.</li> <li>Acute bacterial rhinosinusitis resolves without antibiotic treatment in the majority of cases. Symptomatic treatment and reassurance is the preferred, initial management strategy for patients with mild symptoms. Antibiotic therapy should be reserved for patients meeting the criteria for the clinical diagnosis of acute bacterial rhinosinusitis who have moderately severe symptoms, and for those with severe rhinosinusitis symptoms—especially those with unilateral face pain—regardless of duration of illness. Initial treatment should be with the most narrow-spectrum agent that is active against likely pathogens <i>Streptococcus pneumoniae</i> and <i>Haemophilus influenzae</i>.</li> </ol>
<b>Bronchitis</b>	<ol style="list-style-type: none"> <li>The evaluation of adults with an acute cough illness, or with presumptive diagnosis of uncomplicated acute bronchitis, should focus on ruling out pneumonia. In the healthy, non-elderly adult, pneumonia is uncommon in the absence of vital sign abnormalities or asymmetrical lung sounds, and chest radiography is usually not indicated. In patients with cough lasting 3 weeks or longer, chest radiography is warranted in the absence of other known causes.</li> <li>Routine antibiotic treatment of uncomplicated bronchitis is not recommended, regardless of duration of cough. In the unusual circumstance when pertussis infection is suspected, a diagnostic test should be performed and antimicrobial therapy initiated.</li> <li>Patient satisfaction with care for acute bronchitis is most dependent on the doctor-patient communication rather than on whether or not an antibiotic is prescribed.</li> </ol>

# Adult Treatment Recommendations

Antibiotic prescribing guidelines establish standards of care and focus quality improvement efforts. The table below summarizes the most recent recommendations for appropriate antibiotic prescribing for adults seeking care in an outpatient setting.

Condition	Epidemiology	Diagnosis	Management
Acute rhinosinusitis <sup>1,2</sup>	<ul style="list-style-type: none"> <li>About 1 out of 8 adults (12%) in 2012 reported receiving a diagnosis of rhinosinusitis in the previous 12 months, resulting in more than 30 million diagnoses.</li> <li>Ninety–98% of rhinosinusitis cases are viral, and antibiotics are not guaranteed to help even if the causative agent is bacterial.</li> </ul>	<ul style="list-style-type: none"> <li>Diagnose acute <u>bacterial</u> rhinosinusitis based on symptoms that are:               <ul style="list-style-type: none"> <li><b>Severe (&gt;3-4 days)</b>, such as a fever <math>\geq 39^{\circ}\text{C}</math> (<math>102^{\circ}\text{F}</math>) and purulent nasal discharge or facial pain;</li> <li><b>Persistent (&gt;10 days) without improvement</b>, such as nasal discharge or daytime cough; or</li> <li><b>Worsening (3-4 days)</b> such as worsening or new onset fever, daytime cough, or nasal discharge after initial improvement of a viral upper respiratory infections (URI) lasting 5-6 days.</li> </ul> </li> <li>Sinus radiographs are not routinely recommended.</li> </ul>	<p>If a bacterial infection is established:</p> <ul style="list-style-type: none"> <li>Watchful waiting is encouraged for uncomplicated cases for which reliable follow-up is available.</li> <li>Amoxicillin or amoxicillin/clavulanate is the recommended first-line therapy.</li> <li>Macrolides such as azithromycin are not recommended due to high levels of <i>Streptococcus pneumoniae</i> antibiotic resistance (~40%).</li> <li>For penicillin-allergic patients, doxycycline or a respiratory fluoroquinolone (levofloxacin or moxifloxacin) are recommended as alternative agents.</li> </ul>
Acute uncomplicated bronchitis <sup>3-5</sup>	<ul style="list-style-type: none"> <li>Cough is the most common symptom for which adult patients visit their primary care provider, and acute bronchitis is the most common diagnosis in these patients.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation should focus on ruling out pneumonia, which is rare among otherwise healthy adults in the absence of abnormal vital signs (heart rate <math>\geq 100</math> beats/min, respiratory rate <math>\geq 24</math> breaths/min, or oral temperature <math>\geq 38^{\circ}\text{C}</math>) and abnormal lung examination findings (focal consolidation, egophony, fremitus).</li> <li>Colored sputum does not indicate bacterial infection.</li> <li>For most cases, chest radiography is not indicated.</li> </ul>	<p>Routine treatment of uncomplicated acute bronchitis with antibiotics is not recommended, regardless of cough duration.</p> <p>Options for symptomatic therapy include:</p> <ul style="list-style-type: none"> <li>Cough suppressants (codeine, dextromethorphan);</li> <li>First-generation antihistamines (diphenhydramine);</li> <li>Decongestants (phenylephrine); and</li> <li>Beta agonists (albuterol).</li> </ul>
Common cold or non-specific upper respiratory tract infection (URI) <sup>6,7</sup>	<ul style="list-style-type: none"> <li>The common cold is the third most frequent diagnosis in office visits, and most adults experience two to four colds annually.</li> <li>At least 200 viruses can cause the common cold.</li> </ul>	<ul style="list-style-type: none"> <li>Prominent cold symptoms include fever, cough, rhinorrhea, nasal congestion, postnasal drip, sore throat, headache, and myalgias.</li> </ul>	<ul style="list-style-type: none"> <li>Decongestants (pseudoephedrine and phenylephrine) combined with a first-generation antihistamine may provide short-term symptom relief of nasal symptoms and cough.</li> <li>Non-steroidal anti-inflammatory drugs can be given to relieve symptoms.</li> <li>Evidence is lacking to support antihistamines (as monotherapy), opioids, intranasal corticosteroids, and nasal saline irrigation as effective treatments for cold symptom relief.</li> </ul> <p>Providers and patients must weigh the benefits and harms of symptomatic therapy.</p>

Pharyngitis <sup>8,9</sup>	<ul style="list-style-type: none"> <li>• Group A beta-hemolytic streptococcal (GAS) infection is the only common indication for antibiotic therapy for sore throat cases.</li> <li>• Only 5–10% of adult sore throat cases are caused by GAS.</li> </ul>	<ul style="list-style-type: none"> <li>• Clinical features alone do not distinguish between GAS and viral pharyngitis; a rapid antigen detection test (RADT) is necessary to establish a GAS pharyngitis diagnosis</li> <li>• Those who meet two or more Centor criteria (e.g., fever, tonsillar exudates, tender cervical lymphadenopathy, absence of cough) should receive a RADT. Throat cultures are not routinely recommended for adults.</li> </ul>	<ul style="list-style-type: none"> <li>• Antibiotic treatment is NOT recommended for patients with negative RADT results.</li> <li>• Amoxicillin and penicillin V remain first-line therapy due to their reliable antibiotic activity against GAS.</li> <li>• For penicillin-allergic patients, cephalexin, cefadroxil, clindamycin, or macrolides are recommended.</li> <li>• GAS antibiotic resistance to azithromycin and clindamycin are increasingly common.</li> <li>• Recommended treatment course for all oral beta lactams is 10 days.</li> </ul>
Acute uncomplicated cystitis <sup>10, 11</sup>	<ul style="list-style-type: none"> <li>• Cystitis is among the most common infections in women and is usually caused by <i>E. coli</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Classic symptoms include dysuria, frequent voiding of small volumes, and urinary urgency. Hematuria and suprapubic discomfort are less common.</li> <li>• Nitrites and leukocyte esterase are the most accurate indicators of acute uncomplicated cystitis</li> </ul>	<p>For acute uncomplicated cystitis in healthy adult non-pregnant, premenopausal women:</p> <ul style="list-style-type: none"> <li>• Nitrofurantoin, trimethoprim/sulfamethoxazole (TMP-SMX, where local resistance is &lt;20%), and fosfomycin are appropriate first-line agents.</li> <li>• Fluoroquinolones (e.g. ciprofloxacin) should be reserved for situations in which other agents are not appropriate.</li> </ul>

## References

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