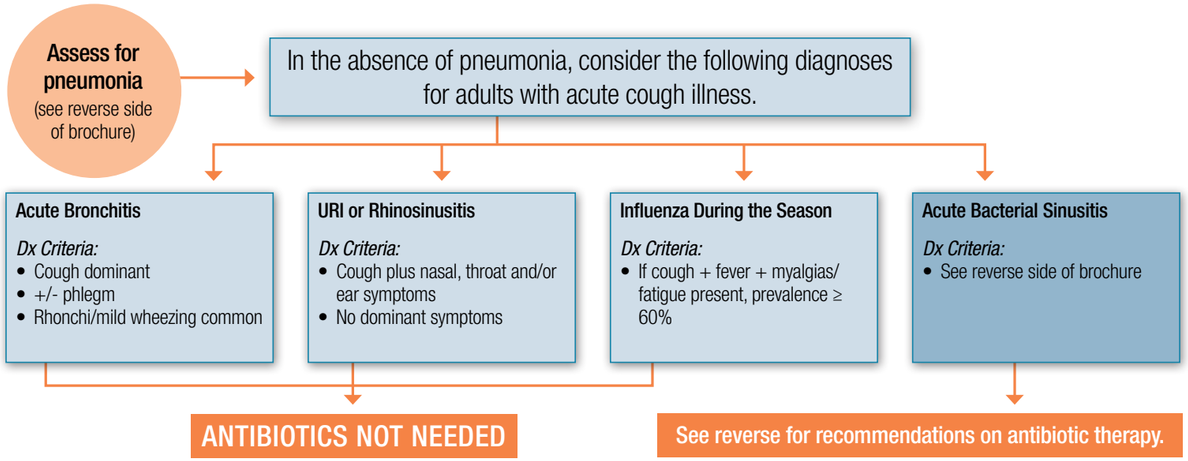
Evidence-Based Management of Acute Respiratory Tract Infections

Repeated studies and meta-analyses have demonstrated no significant benefit from antibiotics in otherwise healthy persons. Antibiotic administration is associated with allergic reactions, C. difficile infection and future antibiotic resistance in the treated patient and the community.



**Adapted from Gonzales R, et al. A cluster randomized trial of decision support strategies for reducing antibiotic use in acute bronchitis. Jama Intern Med. Published online, January 14, 2013. doi:10.1001/jamainternmed.2013.1589*

Educate and Advise Patients

Most patients want a diagnosis, not necessarily antibiotics. Explain to the patient that most bronchitis is a viral illness, and coughs are either viral or reactive airway disease. It is important to emphasize that antibiotics may have serious side effects and may create resistance to antibiotics in the patient or their family. This strategy is associated with equal or superior patient satisfaction.

Set appropriate expectations for the duration of symptoms, e.g., cough may last for up to four weeks.

Give symptomatic relief such as codeine-based cough suppressants, NSAIDS, multi-symptom OTC medications, and possibly bronchodilators if there is any bronchospasm.

Caution patients regarding symptoms (such as high fevers and shortness of breath) that indicate more severe disease.

Reserve the use of quinolones when treating acute bacterial sinusitis, acute bacterial exacerbation of chronic bronchitis, and uncomplicated urinary tract infections for patients who do not have alternative treatment options.

Recommend Vaccination

- Influenza vaccination for all persons >6 months of age, particularly older and younger patients and those with concomitant significant illnesses.
- Pneumococcal vaccination for those with concomitant significant illnesses and all persons ≥65 years old without a pneumococcal vaccine history. Refer to the CMA Foundation's Adult Vaccine Schedule for recommended intervals between the pneumococcal conjugate vaccine (PCV13) and pneumococcal polysaccharide vaccine (PPSV23).
- Pertussis immunization for all pregnant women of any age with each pregnancy, between 27 and 36 weeks (but CAN be given at any time). Prompt vaccination is recommended for those who have or will have close contact with an infant <12 months of age (e.g., parents, grandparents, childcare providers, and healthcare practitioners). For all others vaccinate once during the routine every-10-year tetanus booster.

FOR MORE INFORMATION OR ADDITIONAL MATERIALS, VISIT WWW.AWARE.MD.

Community Acquired Pneumonia:

1. Mandell LA, et al. Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on Management of Community-Acquired Pneumonia in Adults. CID. 2007;44:S27-72.
2. Drugs for Community-Acquired Bacterial Pneumonia. *Med Lett Drugs Ther.* 2007;49(1266):62-64.
3. Kobayashi M, et al. Intervals between PCV13 and PPSV23 vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR.* 2015;64(34):944-7.

Nonspecific URI:

1. Gonzales R, et al. Principles of Appropriate Antibiotic Use for Treatment of Acute Respiratory Tract Infections in Adults: Background, Specific Aims and Methods. *Ann Intern Med.* 2001;134:479-86.
2. Gonzales R, et al. Principles of Appropriate Antibiotic Use for Treatment of Acute Respiratory Tract Infections in Adults: Background. *Ann Intern Med.* 2001;134:490-94.
3. Institute for Clinical Systems Improvement. Health Care Guideline: Diagnosis and Treatment of Respiratory Illness in Children and Adults. Available at: www.icsi.org. Revised January 2013. Accessed August 2014.

Acute Bacterial Sinusitis:

1. The Sinus and Allergy Health Partnership. Antimicrobial Treatment Guidelines for Acute Bacterial Rhinosinusitis. *Otolaryngol Head Neck Surg.* January, Supplement 2004;130:1-45.
2. Chow AW, et al. IDSA Clinical Practice Guideline for Acute Bacterial Rhinosinusitis in Children and *Adults. Clin Infect Dis.* 2012;54(8): e72-e112.
3. Snow V, et al. Principles of Appropriate Antibiotic Use for Acute Sinusitis in Adults: Background. *Ann Intern Med.* 2001;134:498-505.
4. Slavin RG, et al. The Diagnosis and Management of Sinusitis: A Practice Parameter Update. *J Allergy Clin Immunol.* 2005;116:S13-47.

Pharyngitis:

1. Wessels MR. Clinical Practice. Streptococcal Pharyngitis. *NEJM.* 2011; 364:648-55.
2. Gerber GA, et al. Prevention of Rheumatic Fever and Diagnosis and Treatment of Acute Streptococcal Pharyngitis. *Circulation.* 2009;119:1541-1551.

Nonspecific Cough Illnesses/Acute Bronchitis/Pertussis:

1. Gonzales R, et al. Principles of Appropriate Antibiotic Use for Treatment of Acute Respiratory Tract Infections in Adults: Background, Specific Aims and Methods. *Ann Intern Med.* 2001;134:479-86.
2. Gonzales R, et al. Principles of Appropriate Antibiotic Use for Treatment of Uncomplicated Acute Bronchitis: Background. *Ann Intern Med.* 2001;134:521-29.
3. Hooton T. Antimicrobial Resistance: A Plan of Action for Community Practice. *AFP.* 2001;63:1034-39.
4. Wenzel RP, et al. Acute Bronchitis. *NEJM.* 2006;355:2125-30.
5. Centers for Disease Control and Prevention. Recommended antimicrobial agents for the treatment and postexposure prophylaxis of pertussis: 2005 CDC guidelines. *MMWR* 2005;54(No. RR-14):1-16.

Cellulitis and Abscesses:

1. Stevens DL, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections: 2014 Update by the Infectious Diseases Society of America. *Clin Infect Dis* 2014; 59 (2): e10-e52.
2. Swartz MA., Cellulitis. *N Engl J Med* 2004; 350:904-912
3. Liu, et al. Clinical Practice Guidelines by the Infectious Diseases Society of America for the Treatment of Methicillin-Resistant Staphylococcus Aureus Infections in Adults and Children. *Clin Infect Dis* 2011; 52:1-38.

Guidelines Reviewed:

American Academy of Allergy, Asthma & Immunology (AAAAI)
American Academy of Family Physicians (AAFP)
American Academy of Otolaryngology – Head and Neck Surgery
American College of Physicians (ACP)
Centers for Disease Control and Prevention (CDC)
Infectious Diseases Society of America (IDSA)
Institute for Clinical Systems Improvement (ICSI)
Infectious Diseases Society of America / American Thoracic Society (IDSA/ATS)

ADULT

Acute Infection Guideline Summary

2016-17

Supporting Organizations

Alameda Alliance for Health
Anthem Blue Cross
CalOptima
Care1st Health Plan
Health Net of California
Health Plan of San Joaquin
Inland Empire Health Plan
Kern Health System
L.A. Care Health Plan
Molina Healthcare of California

Endorsing Organizations

American Academy of Pediatrics, California District
California Academy of Family Physicians
California Pharmacists Association
Urgent Care Association of America
Urgent Care College of Physicians

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Illness	Indications for Antibiotic Treatment in Adults	Pathogen	Antimicrobial Therapy	Antibiotic	Guidelines Reviewed
Outpatient Community Acquired Pneumonia	***When NOT to Treat with an Antibiotic as an Outpatient:*** Consider inpatient admission if PSI score >90, CURB-65 ≥2, unable to tolerate orals, unstable social situation, or if clinical judgment so indicates. ***When to Treat with an Antibiotic as an Outpatient:*** Perform chest x-ray (CXR) to confirm the diagnosis of pneumonia. Evaluate for outpatient management. Consider pre-existing conditions, calculate Pneumonia Severity Index (PSI ≤90 for outpatient management) or CURB-65 (0 or 1 for outpatient management). Visit www.idsociety.org for more information. Sputum gram stain and culture are recommended if active alcohol abuse, severe obstructive/structural lung disease, or pleural effusion. Pneumococcal vaccination should be done following current ACIP recommendations which have been recently updated. Selective use of PCV 13 (conjugated pneumococcal vaccine) is now recommended in some situations for adults in conjunction with regular pneumococcal vaccine (PPSV23).	*Streptococcus pneumoniae* *Mycoplasma pneumoniae* *Haemophilus influenzae* *Chlamydophila pneumoniae*	**Empiric Therapy:** Healthy with no recent antibiotic use risk factors: macrolide*; consider doxycycline Presence of co-morbidity or antibiotic use within 3 months Respiratory quinolone ß-lactam plus a macrolide* (or doxycycline as an alternative to the macrolide). **Antibiotic Duration:** • Quinolones – 5 days • All other regimens – 7 days	**Antibiotic Choice:** • Macrolide (azithromycin or clarithromycin)* • Doxycycline (alternative to macrolide) **With Comorbidities:** **ß-Lactam Alternatives:** (to be given with a macrolide* or doxycycline) • High dose amoxicillin or amoxicillin-clavulanate • Cephalosporins (cefpodoxime, cefuroxime) **Other Alternative:** • Respiratory quinolone (moxifloxacin, levofloxacin 750mg QD)*	IDSA, ATS, ICSI
Nonspecific URI	***When NOT to Treat with an Antibiotic:*** Antibiotics not indicated; however, nonspecific URI is a major cause of acute respiratory illnesses presenting to primary care practitioners. Patients often present expecting some treatment. Attempt to discourage antibiotic use and explain appropriate non-pharmacologic treatment.	**Viral**	**Not indicated**	Not indicated.	AAFP, ACP, CDC, ICSI
Acute Bacterial Sinusitis	***When NOT to Treat with an Antibiotic:*** Nearly all cases of acute sinusitis resolve without antibiotics. Antibiotic use should be reserved for moderate symptoms that are not improving after 10 days, or that are worsening after 5-7 days, and severe symptoms.	**Mainly viral pathogens**	**Not indicated** **Antibiotic Duration:** 5 to 7 days Failure to respond after 72 hours of antibiotics: Re-evaluate patient and switch to alternate antibiotic.	**Antibiotic Choice:** • Amoxicillin-clavulanate (875 mg/125 mg po bid) **Alternatives**: • Amoxicillin-clavulanate (high dose 2000 mg/125 mg po bid), doxycycline, respiratory quinolone (levofloxacin, moxifloxacin)* **For ß-Lactam Allergy:** • Doxycycline, respiratory quinolone (levofloxacin, moxifloxacin)*	AAAAI, AAFP, AAO, ACP, CDC, IDSA
	When to Treat with an Antibiotic: Diagnosis of acute bacterial sinusitis may be made in adults with symptoms of acute rhinosinusitis (nasal obstruction or purulent discharge, facial fullness or pain, fever, or anosmia) who have any of the three following clinical presentations: Symptoms lasting >10 days without clinical improvement. Severe illness with high fever (>39°C [102.2° F]) and purulent nasal discharge or facial pain for >3 consecutive days at the beginning of illness Worsening symptoms or signs (new onset fever, headache or increase in nasal discharge) following typical URI that lasted 5-6 days and were initially improving.	*Streptococcus pneumoniae* Nontypeable *Haemophilus influenzae*			
Pharyngitis	***When NOT to Treat with an Antibiotic:*** Most pharyngitis cases are viral in origin. The presence of the following is uncommon with Group A Strep, and point away from using antibiotics: conjunctivitis, cough, rhinorrhea, diarrhea, and absence of fever.	Routine respiratory viruses	**Group A Strep:** Treatment reserved for patients with positive rapid antigen detection or throat culture. **Antibiotic Duration:** 10 days	**Antibiotic Choice:** • Penicillin V, benzathine penicillin G, amoxicillin **Alternatives:** • Oral cephalosporins **For ß-Lactam Allergy:** • Azithromycin*, clindamycin, clarithromycin*	ACP, AAFP, CDC, IDSA, ICSI
	When to Treat with an Antibiotic: Streptococcus pyogenes (Group A Strep) 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 detection before using antibiotics.	*Streptococcus pyogenes*			
Nonspecific Cough Illness / Acute Bronchitis / COPD	***When NOT to Treat with an Antibiotic:*** 90% of cases are nonbacterial. Literature fails to support use of antibiotics in adults without history of chronic bronchitis or other co-morbid conditions.	Mainly viral pathogens	**Uncomplicated:** Not Indicated	**Antibiotic Choice:** Not indicated **Chronic COPD:** • Amoxicillin, trimethoprim-sulfamethoxazole (TMP/SMX), doxycycline **Alternatives:** • *Chlamydophila pneumoniae, mycoplasma pneumoniae* - macrolide* (azithromycin or clarithromycin) or doxycycline	AAFP, AC, CDC
	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 severe conditions, e.g., pneumonia. Testing is recommended either prior to or in conjunction with treatment for pertussis. Testing for pertussis is recommended particularly during outbreaks and according to public health recommendations (see below).	*Chlamydophila pneumoniae* *Mycoplasma pneumoniae* *Moraxella catarrhalis*			
Pertussis	Testing for pertussis is recommended particularly during outbreaks and according to public health recommendations, particularly those at high risk – teachers, day care and healthcare workers. Persons with exposure to infants (parents, child care workers or family members) should be vaccinated and tested if they have symptoms. Vaccination per ACIP recommendations is highly encouraged to prevent outbreaks. All pregnant women should be vaccinated during every pregnancy.	*Bordetella pertussis*	Treatment is required for all cases and close contacts or as directed by health officer	**Antibiotic Choice:** • Azithromycin* **Alternatives:** • TMP/SMX	CDC
Skin and Soft Tissue Infections	***Cellulitis*** is almost always secondary to streptococcal species. Treatment can be directed narrowly. ***Abscesses*** are often secondary to Staphylococcus aureus – including methicillin-resistant Staphylococcus aureus (MRSA. The treatment is primarily drainage and this is required for larger abscesses. If surrounding cellulitis, treatment should be broadened to cover MRSA. Cultures should be obtained.	*Streptococcus pyogenes* *Staphylococcus aureus (methicillin sensitive and methicillin resistant)*	Indicated Incision and drainage. If significant associated cellulitis, add antibiotics	**Antibiotic Choice:** **Cellulitis:** Penicillin, cephalexin, dicloxacillin, clindamycin **Abscesses** (if moderate cellulitis/erysipelas or fever): doxycycline TMP/SMX	IDSA
Urinary Tract Infection	Empiric therapy for UTI may be given when urinalysis demonstrates pyuria (positive leukocyte esterase test) or >10 white blood cells (WBCs) per high-power field (25 WBCs per uL) and urine culture obtained through catheterization or suprapubic aspiration. A positive culture consists of >100,000 colony-forming units (CFUs) per mL of a uropathogen. In patients suspected of pyelonephritis, always confirm diagnosis with urine culture and susceptibility test before using antibiotics.	>50% UTIs caused by *Escherichia coli*. Other gram-negative organisms may cause infection including *Klebsiella*, *Proteus* and *Pseudomonas*. Gram-positive pathogens include *Enterococcus* and group *B Streptococcus*, as well as *Staphylococcus*.	**Antibiotic Duration:** Cystitis: 3-5 days Pyelonephritis: 5-14 days	**Antibiotic Choice:** • **Cystitis:** Nitrofurantoin (100mg bid), trimethoprim/sulfamethoxazole (TMP/SMX) • **Pyelonephritis:** fluoroquinolone* (ciprofloxacin, levofloxacin), trimethoprim/sulfamethoxazole (TMP/SMX) **Alternatives:** • **Pyelonephritis:** ceftriaxone, aminoglycoside **For ß-Lactam Allergy:** • **Cystitis:** amoxicillin-clavulanate, cefdinir, cefaclor, cefpodoxime-proxetil, fluoroquinolone • **Pyelonephritis:** Oral ß-lactam (less effective) plus initial IV ceftriaxone 1g or IV 24-hour dose aminoglycoside	IDSA

CMA FOUNDATION AWARE — Alliance Working for Antibiotic Resistance Education

**Macrolides and quinolones cause QT prolongation and have an increased risk of cardiac death; Reserve the use of quinolones when treating acute bacterial sinusitis, acute bacterial exacerbation of chronic bronchitis, and uncomplicated urinary tract infections for patients who do not have alternative treatment options.*