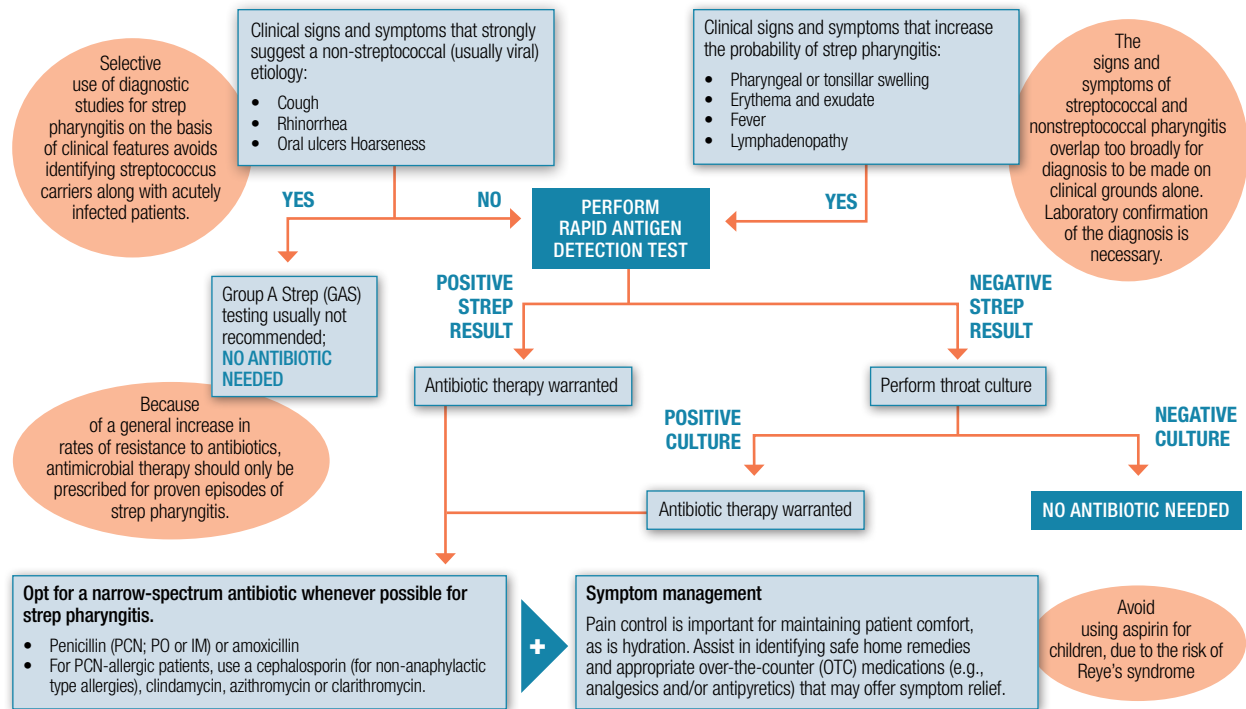


Clinician efforts to prescribe appropriately and to educate young patients and their parents/caregivers about antibiotics continue to play a vital role in decreasing resistance levels. Parents/caregivers want their children to feel better soon but often do not understand that sore throat is usually caused by a virus, will not resolve with antibiotics, and that these medications have the potential to do more harm than good.

Confirm a Streptococcal Cause of Pharyngitis BEFORE Prescribing Antibiotics.



Educate, Advise and Assist Patients and Parents/Caregivers.

Viral cause: If rapid strep testing is negative, educate patients and parents/caregivers that the cause (pending possible cultures) is not strep but one of many different viruses, and antibiotics are not necessary. Even with typical symptoms, fewer than 30% of children have strep pharyngitis. Inform parents/caregivers that prior, repeated, or recent strep infection or exposure to someone with strep may increase the chance, but does not adequately confirm a current strep infection.

Value of testing/potential harm of antibiotics: Advise patients and parents/caregivers that rapid tests are highly reliable and allow providers to avoid using unnecessary antibiotics and the associated possible harm (medication side effects and increasing personal and societal antimicrobial resistance).

Signs of worsening: Educate patients and parents/caregivers that, occasionally, whatever the cause of a sore throat and whether antibiotics are prescribed or not, symptoms can worsen. If this is the case, re-evaluation is necessary. If symptoms do not begin to subside in 72 hours, schedule a re-visit for further evaluation.

Illness prevention: Review illness prevention, including good hand and respiratory hygiene. Offer influenza vaccination to children 6 months to 18 years of age. Encourage parents/caregivers and household contacts of children to get vaccinated.

Otitis Media:

1. Lieberthal AS et al. The Diagnosis and Management of Acute Otitis Media. *Pediatrics* 2013;131:e964–e999.

Acute Bacterial Sinusitis:

1. The Sinus and Allergy Health Partnership. Antimicrobial Treatment Guidelines for Acute Bacterial Rhinosinusitis. *Otolaryngol Head Neck Surg.* 2004;130:1-45.
2. Piccirillo JF. Acute Bacterial Sinusitis. *NEJM.* 2004;351:902-910.
3. Wald E et al. Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years. *Pediatrics* 2013;132:e232-e280.
4. O'Brien K, et al. Acute Sinusitis – Principles of Judicious Use of Antimicrobial Agents. *Pediatrics.* 1998;101:174-77.
5. Chow A, et al. IDSA Clinical Practice Guideline for Acute Bacterial Rhinosinusitis in Children and Adults. *Clinical Infectious Diseases.* 2012 Apr;54(8):e72-e112. Epub 2012 Mar 20.
6. DeMuri G, et al. Acute bacterial sinusitis in children. *Pediatr Rev* 2013;34:429-437.

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 Illness/Bronchitis/Pertussis:

1. O'Brien K, et al. Cough Illness/Bronchitis Principles of Judicious Use of Antimicrobial Agents. *Pediatrics.* 1998;101:178-81.
2. 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.

Bronchiolitis/Nonspecific URI:

1. Colgan R, et al. Appropriate Antimicrobial Prescribing: Approaches that Limit Antibiotic Resistance. *AFP.* 2001;64:999-1004.
2. Dowell S, et al. Appropriate Use of Antibiotics for URIs in Children: Part II. Cough, Pharyngitis and the Common Cold. *AFP.* 1998;58:1335-42.
3. Hersh AL, et al. Principles of Judicious Antibiotic Prescribing for Upper Respiratory Tract Infections in Pediatrics. *Pediatrics.* 2013;132:1146-1154.
4. Institute for Clinical Systems Improvement. Health Care Guideline: Diagnosis and Treatment of Respiratory Illness in Children and Adults. Available at: www.icsi.org. Accessed August 2014.

Cellulitis and Abscesses:

1. Stevens DL, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections. *Clin Infect Dis* 2005; 41:1373-406.
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.

Acute Infection Guideline Summary

2015

PEDIATRIC



Supporting Organizations

Alameda Alliance for Health
Anthem Blue Cross
CalOptima
Care1st Health Plan
CenCal Health
Health Net of California

Health Plan of San Joaquin
Inland Empire Health Plan
Kaiser Permanente
L.A. Care Health Plan
Molina Healthcare of California

Endorsing Organizations

American Academy of Pediatrics, California District Association of California Nurse Leaders
California Academy of Family Physicians
California Academy of Physician Assistants

California Association of Nurse Practitioners
California Pharmacists Association
California Society of Health-System Pharmacists
Urgent Care Association of America
Urgent Care College of Physicians

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Illness	Indications for Antibiotic Treatment	Pathogen	Antimicrobial Therapy	Antibiotic	Guidelines
Otitis Media	<p>When NOT to Treat with an Antibiotic: Otitis Media with Effusion.</p> <p>Do <u>not</u> prescribe prophylactic antibiotics to reduce the frequency of episodes of Acute Otitis Media (AOM) in children with recurrent AOM.</p> <p>When to Treat with an Antibiotic: Acute Otitis Media (AOM)</p> <ol style="list-style-type: none"> Moderate to severe bulging of the tympanic membrane (TM) or new onset of otorrhea not due to acute otitis externa. May diagnose acute otitis media in presence of mild bulging of the TM and recent (less than 48 hours) onset of ear pain (holding, tugging, and rubbing of the ear in a nonverbal child) or intense erythema of the TM. Signs or symptoms of middle-ear inflammation as indicated by either: <ol style="list-style-type: none"> Distinct erythema of the TM or Distinct otalgia [discomfort clearly referable to the ear(s) that interferes with or precludes normal activity or sleep] <p>Note: Clinicians should not diagnose AOM in children who do not have middle ear effusion.</p>	<p><i>Streptococcus pneumoniae</i></p> <p>Nontypeable <i>Haemophilus influenzae</i></p> <p><i>Moraxella catarrhalis</i></p>	<p>Severe AOM: Prescribe antibiotic therapy for AOM in children > 6 months of age with severe signs or symptoms (moderate or severe otalgia or otalgia for at least 48 hours or temperature > 39°C [102.2°F]).</p> <p>Non-severe bilateral AOM in young children: Prescribe antibiotic therapy for bilateral AOM in children 6-23 months of age without severe signs or symptoms (mild otalgia for less than 48 hours and temperature < 39°C [102.2°F]).</p> <p>Non-severe unilateral AOM in young children (6 months to 23 months of age or non-severe AOM (bilateral or unilateral) in older children (24 months or older):</p> <p>Prescribe antibiotic therapy or offer observation and close follow-up based on joint decision-making with the parent(s)/ caregiver in children without severe signs or symptoms (mild otalgia <48 hours and temperature <39°C [102.2°F]). When observation is used, ensure follow-up and begin antibiotic therapy if the child worsens or fails to improve within 48-72 hours of onset of symptoms.</p> <p>Analgesics and Antipyretics: Always assess pain. If pain is present, add treatment to reduce pain. Oral: ibuprofen/acetaminophen (may use acetaminophen with codeine for moderate-severe pain). Topical: benzocaine (> 5 years of age).</p>	<p>Length of Oral Therapy:</p> <ul style="list-style-type: none"> Younger than 2 years or severe symptoms: 10 days 2-5 years old with mild to moderate symptoms: 7 days ≥ 6 years of age with mild to moderate symptoms: 5-7 days <p>Antibiotic Choice:</p> <p>If child has not received amoxicillin in the past 30 days or the child does not have concurrent purulent conjunctivitis: high dose amoxicillin (80-90 mg/kg/day)</p> <p>If the child has received amoxicillin in the last 30 days or has concurrent purulent conjunctivitis, or has a history of recurrent AOM unresponsive to amoxicillin: high dose amoxicillin-clavulanate (80-90 mg/kg/day of amoxicillin component)</p> <p>Alternatives: For non-anaphylactic β-Lactam allergy: cefdinir, cefpodoxime, cefuroxime, ceftriaxone (50 mg/kg IM or IV per day for 1 or 3 days)</p> <p>For severe β-Lactam allergy: clindamycin</p> <p>Unable to tolerate oral antibiotic: ceftriaxone (50 mg/kg IM or IV per day for 1 or 3 days)</p> <p>Failure of Initial Therapy:</p> <p>Reassess the patient if the caregiver reports that the child's symptoms have worsened or failed to respond to the initial antibiotic treatment within 48 to 72 hours and determine whether a change in therapy is needed.</p> <p>If initial therapy has failed: high dose amoxicillin/clavulanate (80-90 mg/kg/day of amoxicillin component), or ceftriaxone (50 mg/kg IM or IV per day for 3 days), or clindamycin with or without cephalosporin (cefdinir, cefixime or cefuroxime)</p>	<p>American Academy of Family Physicians (AAFP)</p> <p>American Academy of Pediatrics (AAP)</p> <p>Centers for Disease Control and Prevention (CDC)</p>
Acute Bacterial Sinusitis	<p>When NOT to Treat with an Antibiotic: Nearly all cases of acute sinusitis resolve without antibiotics. Antibiotic use should be reserved for moderate symptoms not improving after 10 days, or that are worsening after 5-6 days, and severe symptoms.</p> <p>When to Treat with an Antibiotic: Clinicians should make a presumptive diagnosis of acute bacterial sinusitis when a child with an acute URI presents with the following:</p> <ol style="list-style-type: none"> Persistent illness, ie, nasal discharge (of any quality) or daytime cough or both lasting > 10 days without improvement; OR Worsening course, ie, worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement; OR Severe onset, ie, concurrent fever (temperature ≥ 39°C [102.2°F]) and purulent nasal discharge for at least 3 consecutive days. 	<p>Mainly viral pathogens</p> <p><i>Streptococcus pneumoniae</i></p> <p>Nontypeable <i>Haemophilus influenzae</i></p> <p><i>Moraxella catarrhalis</i></p>	<p>Antibiotic Duration: Continued for 7 days after the patient becomes free of signs and symptoms (minimum 10 days)</p> <p>Clinical Presentation: Severe onset and worsening course: Antibiotic therapy should be prescribed.</p> <p>Persistent illness: Antibiotics should be prescribed OR offer additional outpatient observation for 3 days to children with persistent illness as previously described.</p>	<p>1st Line:</p> <ul style="list-style-type: none"> Patients without increased risk for antibiotic resistant pneumococcal infection: amoxicillin or amoxicillin-clavulanate 45 mg/kg/day of amoxicillin component Patients with increased risk of antibiotic-resistant pneumococcal infection (in those with severe infection [fever > 39°C, threat of suppurative complications], daycare attendance, <2 years of age, recent hospitalization, antibiotic use within the past month, immunocompromised): amoxicillin-clavulanate high dose (90 mg/kg/day of amoxicillin component) <p>2nd Line:</p> <ul style="list-style-type: none"> If amoxicillin-clavulanate 45 mg/kg/day used initially, may increase dose to 90 mg/kg/day For non-anaphylactic β-lactam allergy: cefdinir, cefuroxime, or cefpodoxime For severe β-lactam allergy: levofloxacin Combination of clindamycin (or linezolid) and cefixime 	<p>AAFP, AAP, CDC</p> <p>Infectious Diseases Society of America (IDSA)</p> <p>Sinus and Allergy Health Partnership (SAHP)</p>
Pharyngitis	<p>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, and diarrhea.</p> <p>When to Treat with an Antibiotic: Streptococcus pyogenes (Group A Strep) Symptoms and signs: sore throat, fever, headache, tonsillopharyngeal erythema, exudates, palatal petechiae, tender enlarged anterior cervical lymph nodes. Confirm diagnosis with throat culture or rapid antigen detection. If rapid antigen detection is negative, obtain throat culture.</p> <p><i>Diagnostic studies for Group A Strep are not indicated for children <2 years of age (because acute rheumatic fever is rare in children <3 years old and the incidence of streptococcal pharyngitis and the classic presentation of streptococcal pharyngitis are uncommon in this age group).</i></p>	<p>Routine respiratory viruses</p> <p><i>Streptococcus pyogenes</i></p>	<p>Group A Strep: Treatment reserved for patients with positive rapid antigen detection or throat culture.</p> <p>Antibiotic Duration: Generally 10 days (5 days if azithromycin used)</p>	<p>1st Line:</p> <ul style="list-style-type: none"> penicillin V, benzathine penicillin G, amoxicillin <p>For non-anaphylactic β-Lactam allergy:</p> <ul style="list-style-type: none"> cephalosporin <p>For severe β-Lactam allergy:</p> <ul style="list-style-type: none"> clindamycin, azithromycin, clarithromycin 	<p>AAFP, AAP, CDC, IDSA</p> <p>Institute for Clinical Systems Improvement (ICSI)</p>
Nonspecific Cough Illness / Bronchitis / Pertussis	<p>When NOT to Treat with an Antibiotic: Nonspecific cough illness.</p> <p>When to Treat with an Antibiotic: Presents with prolonged, unimproving cough (14 days). Clinically differentiate from pneumonia. If pertussis is suspected, appropriate laboratory diagnosis encouraged (culture, PCR). Pertussis should be reported to public health authorities. <i>Chlamydia pneumoniae</i> and <i>Mycoplasma pneumoniae</i> may occur in older children (unusual < 5 years of age).</p>	<p>> 90% of cases caused by routine respiratory viruses</p> <p>< 10% of cases caused by <i>Bordetella pertussis</i>, <i>Chlamydia pneumoniae</i>, or <i>Mycoplasma pneumoniae</i></p>	<p>Antibiotics are generally not indicated.</p> <p>Treatment reserved for <i>Bordetella pertussis</i>, <i>Chlamydia pneumoniae</i>, <i>Mycoplasma pneumoniae</i>.</p> <p>Length of Therapy: 7-14 days (5 days for azithromycin)</p>	<p>1st Line:</p> <ul style="list-style-type: none"> azithromycin, clarithromycin <p>Alternatives:</p> <ul style="list-style-type: none"> tetracyclines for children > 8 years of age 	<p>AAFP, AAP, CDC</p>
Bronchiolitis / Nonspecific URI	<p>When NOT to Treat with an Antibiotic: Sore throat, sneezing, mild cough, fever (generally < 102° F / 38.9° C, < 3 days), rhinorrhea, nasal congestion; self-limited (typically 5-14 days).</p>	<p>> 200 viruses, including rhinoviruses, coronaviruses, adenoviruses, respiratory syncytial virus, enteroviruses (coxsackieviruses and echoviruses), influenza viruses and parainfluenza viruses</p>	<p>Antibiotics not indicated.</p> <p>Ensure hydration. May advise rest, antipyretics, analgesics, humidifier.</p>	<ul style="list-style-type: none"> None 	<p>AAFP, AAP, CDC, ICSI</p>
Cellulitis and Abscesses	<p>Cellulitis is almost always secondary to streptococcal species. Treatment can be directed narrowly.</p> <p>Abscesses are often secondary to Staph – including 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.</p>	<p><i>Streptococcus pyogenes</i></p> <p><i>Staphylococcus aureus</i> (Methicillin sensitive and Methicillin resistant)</p>	<p>Indicated</p> <p>Incision and drainage.</p> <p>If significant associated cellulitis, add antibiotics</p> <p>Duration of antibiotic therapy: 5-10 days</p>	<p>Cellulitis only: cephalexin, cefpodoxime, amoxicillin-clavulanate</p> <p>For penicillin allergy: clindamycin</p> <p>Abscess with cellulitis: clindamycin</p> <p>Alternatives: trimethoprim-sulfamethoxazole, linezolid; doxycycline or minocycline may be used for children ≥ 8 years of age</p>	<p>IDSA</p>