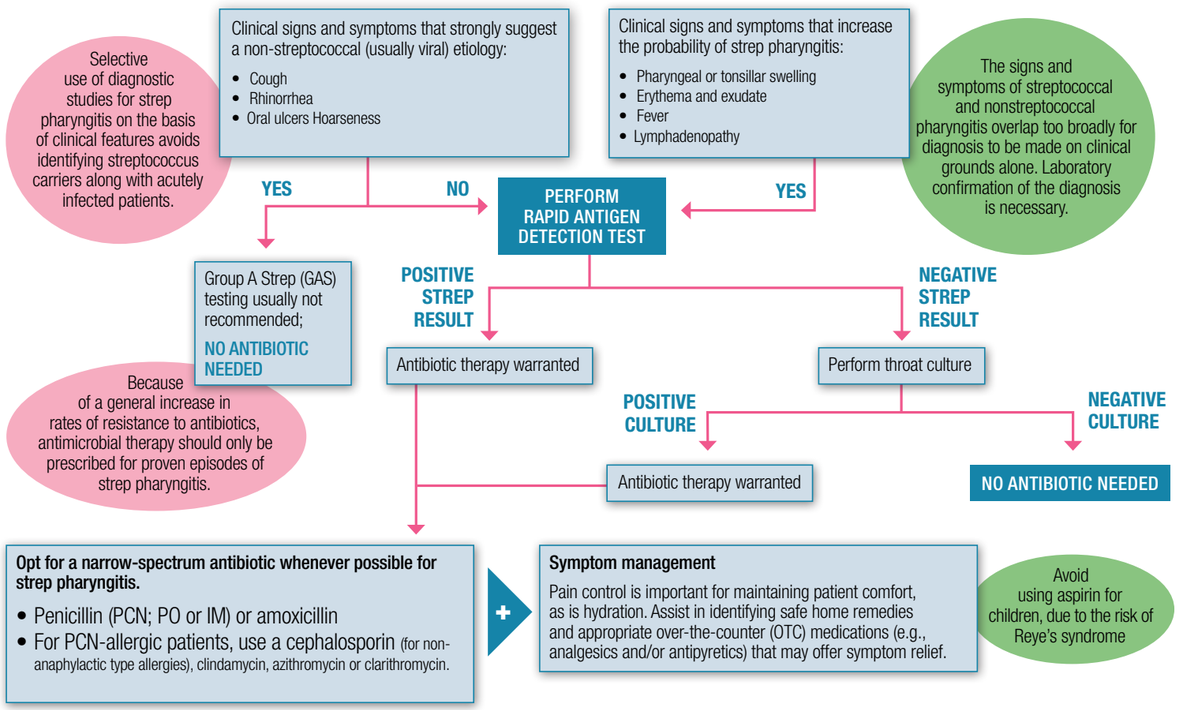
Clinician efforts to prescribe appropriately and to educate young patients and their parents/caregivers about antibiotics continue to play a vital role in decreasing resistance levels. Parents/caregivers want their children to feel better soon but often do not understand that sore throat is usually caused 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.

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

Otitis Media:

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1. 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.

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3. 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.
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Acute Bacterial Sinusitis:

1. 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.
2. 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.
3. DeMuri G, et al. Acute bacterial sinusitis in children. *Pediatr Rev* 2013;34:429-437.

Pharyngitis:

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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;59:147-159.

Urinary Tract Infection

1. Subcommittee on Urinary Tract Infection et al. Urinary tract infection: clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. *Pediatr* 2011;128:595-610.
2. Montini G et al. Febrile urinary tract infections in children. *NEJM* 2011;365:239-250.
3. Jackson EC. Urinary tract infections in children: Knowledge updates and a salute to the future. *Pediatr Rev* 2015;36:153-166.

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)

PEDIATRIC

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 Children	Pathogen	Antimicrobial Therapy	Antibiotic
Otitis Media *Guidelines Reviewed: AAFP, AAP, CDC*	***When NOT to Treat with an Antibiotic:*** Otitis Media with Effusion. Do not prescribe prophylactic antibiotics to reduce the frequency of episodes of Acute Otitis Media (AOM) in children with recurrent AOM.	*Streptococcus pneumoniae* Nontypeable *Haemophilus influenzae* *Moraxella catarrhalis*	**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]). **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]) **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):** 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. **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). **Antibiotic Duration:** • 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	**Antibiotic Choice:** • 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) • 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) **Alternatives:** For non-anaphylactic ß-Lactam allergy: cefdinir, cefpodoxime, cefuroxime, ceftriaxone (50 mg/kg IM or IV per day for 1 or 3 days) For severe ß-Lactam allergy: clindamycin Unable to tolerate oral antibiotic: ceftriaxone (50 mg/kg IM or IV per day for 1 or 3 days) **Failure of Initial Therapy:** 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. 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)
Nonspecific Cough Illness / Bronchitis / Pertussis *Guidelines Reviewed: AAFP, AAP, CDC*	***When NOT to Treat with an Antibiotic:*** Nonspecific cough illness.	**> 90% of cases caused by routine respiratory viruses**	Antibiotics are generally not indicated. Treatment reserved for *Bordetella pertussis*, *Chlamydophila pneumoniae, Mycoplasma pneumoniae.* **Length of Therapy:** 7-14 days (5 days for azithromycin)	**Antibiotic Choice:** • azithromycin, clarithromycin **Alternatives:** • tetracyclines for children > 8 years of age
	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. *Chlamydophila pneumoniae* and *Mycoplasma pneumoniae* may occur in older children (unusual < 5 years of age).	< 10% of cases caused by *Bordetella pertussis*, *Chlamydophila pneumoniae*, or *Mycoplasma pneumoniae*		
Bronchiolitis / Nonspecific URI *Guidelines Reviewed: AAFP, AAP, CDC, ICSI*	***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).	**> 200 viruses, including rhinoviruses, coronaviruses, adenoviruses, respiratory syncytial virus, enteroviruses (coxsackieviruses and echoviruses), influenza viruses and parainfluenza viruses**	Antibiotics not indicated. Ensure hydration. May advise rest, antipyretics, analgesics, humidifier.	• None
Acute Bacterial Sinusitis *Guidelines Reviewed: AAFP, AAP, CDC, IDSA, SAHP*	***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.	**Mainly viral pathogens**	**Clinical Presentation:** Severe onset and worsening course: Antibiotic therapy should be prescribed. **Persistent illness:** Antibiotics should be prescribed OR offer additional outpatient observation for 3 days to children with persistent illness as previously described. **Antibiotic Duration:** Continued for 7 days after the patient becomes free of signs and symptoms (minimum 10 days)	**Antibiotic Choice:** • 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 **Alternatives:** • For non-anaphylactic ß-lactam allergy: cefdinir, cefuroxime, or cefpodoxime • For severe ß-lactam allergy: levofloxacin • Combination of clindamycin (or linezolid) and cefixime **Failure of Initial Therapy:** • If amoxicillin-clavulanate 45 mg/kg/day used initially, may increase dose to 90 mg/kg/day
	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: 1. Persistent illness, ie, nasal discharge (of any quality) or daytime cough or both lasting > 10 days without improvement; OR 2. Worsening course, ie, worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement; OR 3. Severe onset, ie, concurrent fever (temperature ≥ 39°C [102.2°F]) and purulent nasal discharge for at least 3 consecutive days.	*Streptococcus pneumoniae* Nontypeable *Haemophilus influenzae* *Moraxella catarrhalis*		
Pharyngitis *Guidelines Reviewed: AAFP, AAP, CDC, IDSA, ICSI*	***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.	**Routine respiratory viruses**	**Group A Strep: Treatment reserved for patients with positive rapid antigen detection or throat culture.** **Antibiotic Duration:** Generally 10 days (5 days if azithromycin used)	**Antibiotic Choice:** • penicillin V, benzathine penicillin G, amoxicillin **Alternatives:** • For non-anaphylactic ß-Lactam allergy: cephalosporin • For severe ß-Lactam allergy: clindamycin, azithromycin, clarithromycin
	Confirm diagnosis with throat culture or rapid antigen detection. If rapid antigen detection is negative, obtain throat culture. ***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. 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).	*Streptococcus pyogenes*		
Skin and Soft Tissue Infections *Guidelines Reviewed: IDSA*	***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 Duration:** 5-10 days	**Cellulitis only:** cephalexin, clindamycin **Abscess with cellulitis:** trimethoprim-sulfamethoxazole **Alternatives:** linezolid; doxycycline or minocycline may be used for children ≥ 8 years of age
Urinary Tract Infection *Guidelines Reviewed: AAP*	When to treat with an antibiotic: Most children with urinary tract infections (UTIs) are febrile. Empiric therapy for UTI may be given when urinalysis demonstrates pyuria (positive leukocyte esterase test or >5 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 >50,000 colony-forming units (CFUs) per mL of a uropathogen.	>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* in teenage girls.	**Antibiotic Duration:** 7-14 Days	**Antibiotic Choice:** • cephalosporin (cefixime, cefpodoxime, cefprozil, cefuroxime, cephalexin), amoxicillin-clavulanate, trimethoprim-sulfamethoxazole; • Follow- up urine culture and adjust antimicrobial therapy according to sensitivities. • Recommend follow -up with primary care provider to obtain ultrasonogram of kidneys and bladder any time after urinary tract infection is confirmed.

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This guideline summary is intended for physicians and healthcare professionals to consider in managing the care of their patients for acute infections. While 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 professional. These guidelines represent best clinical practice at the time of publication, but practice standards may change as knowledge is gained.