

PEDIATRIC ANTIBIOTIC PRESCRIBING GUIDELINES

Adapted by experts in antibiotic prescribing, including primary care providers, academic infectious disease physicians, clinical pharmacists, and health care systems antibiotic stewardship leaders from across North Carolina from 2018 guidelines produced by the New York State Department of Health

PEDIATRIC OUTPATIENT TREATMENT RECOMMENDATIONS 2024: SUMMARY OF GUIDELINES¹

	Diagnosis	Management
<p>Non-specific upper respiratory tract infection (URI)^{6,8} URIs usually last around 10 days.</p>	<p>Usually, nasal discharge begins as clear fluid and changes throughout the course of the illness. Fever, if present, occurs early in the illness.</p>	<p>Antibiotics are not helpful and should not be used. Focus on symptomatic relief. OTC cough and cold medications are not recommended for use in children < 6 yo. See references for more details, additional treatment options, and other important information</p>
<p>Acute rhinosinusitis²⁻³ Most cases are viral</p>	<p>Presentations consistent with acute bacterial sinusitis are:</p> <ul style="list-style-type: none"> • Symptoms of acute rhinosinusitis lasting ≥10 days without improvement • Severe symptoms lasting ≥3 days: <ul style="list-style-type: none"> – Fever ≥39°C (102.2°F) – Purulent nasal discharge – Facial Pain • “Double worsening”, following a typical URI that lasted 5-6 days with new onset: <ul style="list-style-type: none"> – Fever – Headache – Increased nasal discharge <p>Halitosis, fatigue, headache, decreased appetite, and most physical exam findings are non-specific and do not distinguish bacterial from viral causes.</p> <p>Imaging is not recommended for uncomplicated cases and do not differentiate between viral and bacterial causes.</p>	<p>If diagnosis is based on persistent and non-severe symptoms, consider additional watchful waiting for up to 3 days.</p> <p>First line treatment: If non-severe and no risk factor for resistance:</p> <ul style="list-style-type: none"> • amoxicillin 80-90 mg/kg/day PO in 2 divided doses (max 4 g / day) x 7 days <p>If age <2y, severe, or antibiotics in past 30 days:</p> <ul style="list-style-type: none"> • amoxicillin/clavulanate (600 mg /42.9 mg / 5 mL) 90 mg/kg/day PO of the amoxicillin component in 2 divided doses (max 4g/day) x 7-10 days • May use amoxicillin / clavulanate 875/125 mg or amoxicillin/clavulanate1000 /62.5 mg 1-2 tabs PO BID, if tablet preferred. <p>Non-type I penicillin allergy:</p> <ul style="list-style-type: none"> • cefdinir 14 mg/kg/day in 1-2 divided doses x 7-10 days (max 600mg/day) • If severe, consider adding clindamycin 30 mg/kg/day in 3 divided doses (max 1,800 mg/day) • If unable to tolerate cephalosporins, options include doxycycline, clindamycin, or, if severe disease, levofloxacin <p>Macrolides (such as azithromycin) are not recommended due to high levels of <i>S. pneumoniae</i> antibiotic resistance (~40%).</p> <p>See references for more details, additional treatment options, including re-treatment after initial treatment failure, supportive care, and other important information.</p>
<p>Acute otitis media (AOM)^{4,5} 4-10% of children with AOM treated with antibiotics experience adverse effects.</p>	<p>Definitive diagnosis requires one of the following:</p> <ul style="list-style-type: none"> • Moderate or severe bulging of tympanic membrane, OR • Mild bulging of the TM AND recent (<48h) onset of otalgia (holding, tugging, rubbing of the ear in a nonverbal child) or intense erythema of the TM. <p>AOM should not be diagnosed in children without middle ear effusion (ideally based on pneumatic otoscopy and/or tympanometry).</p> <p>Severe AOM: moderate or severe otalgia or otalgia for ≥48 hours, or temperature ≥39°C (102.2°F).</p>	<p>Treat with antibiotics:</p> <ul style="list-style-type: none"> • AOM in <6 mo • Age 6-23 mo with bilateral AOM • Severe AOM, regardless of age <p>Consider watchful waiting (if reliable follow-up):</p> <ul style="list-style-type: none"> • Age 6-23 mo with unilateral AOM • ≥2 yo with unilateral or bilateral AOM <p>If mild/moderate and no risk factors for resistance:</p> <ul style="list-style-type: none"> • amoxicillin 80-90 mg/kg/day PO in 2 divided doses (max 2 g/dose) <p>If severe or risk factors for resistance (recent beta-lactam therapy, purulent conjunctivitis, or history of recurrent AOM unresponsive to amoxicillin):</p> <ul style="list-style-type: none"> • amoxicillin/clavulanate (600 mg/42.9 mg/5 mL) 90 mg/kg/day PO of amoxicillin in 2 divided doses (max 4g/day) x 7-10 days • May use amoxicillin/clavulanate 875/125 mg or amoxicillin/clavulanate 1000/62.5 mg 1-2 tabs PO BID, if tablet preferred <p>Non-type I penicillin allergy:</p> <ul style="list-style-type: none"> • cefdinir 14 mg/kg/day PO in 1-2 divided doses (max 600mg/day) <p>Duration of treatment:</p> <ul style="list-style-type: none"> • <2 yo or severe symptoms: 10 days • 2-5 yo, mild-moderate symptoms: 7 days • ≥6 yo, mild-moderate symptoms: 5-7 days <p>See references for more details, additional treatment options, and other important information.</p>

<p>Pharyngitis^{6,7}</p> <p>During winter and spring, up to 20% of asymptomatic children can be colonized with GAS, leading to false positives from rapid-testing and increases in unnecessary antibiotic exposure.</p> <p>Streptococcal pharyngitis is primarily a disease of children 5-15 years old and is rare in preschool aged children.</p>	<p>Clinical features alone do not distinguish between GAS and viral pharyngitis.</p> <p>Children with sore throat plus 2 or more of the following features should undergo a rapid test:</p> <ol style="list-style-type: none"> 1. Lack of cough 2. Tonsillar exudates 3. History of fever $\geq 38^{\circ}\text{C}$ (100.4°F) 4. Swollen and tender anterior cervical lymphadenopathy 5. Age younger than 15 yo <p>Testing should generally not be performed in children younger than 3 yo in whom GAS rarely causes pharyngitis and rheumatic fever is uncommon.</p>	<p>First-line therapy:</p> <ul style="list-style-type: none"> • amoxicillin 50 mg/kg/day PO (max 1 g/day) daily or in 2 divided doses x 10 days • penicillin V <ul style="list-style-type: none"> – Children ≤ 27 kg: 250 mg PO BID x 10 days – Adolescents and adults (>27kg): 500 mg BID x 10 days <p>Non-type I penicillin allergy:</p> <ul style="list-style-type: none"> • cephalexin 40 mg/kg/day PO (max 1 g/day) in 2 divided doses x 10 days • cefadroxil 30 mg/kg/day PO (max 1 g/day) daily x 10 days <p>If type I penicillin allergy or unable to take cephalosporins:</p> <ul style="list-style-type: none"> • clindamycin 21 mg/kg/day PO (max 900 mg/day) in 3 divided doses x 10 days • azithromycin 12 mg/kg/day PO (max 500 mg/day) daily x 5 days <p>See references for more details, additional treatment options, and other important information.</p>
<p>Bronchiolitis⁹</p>	<p>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).</p>	<p>Antibiotics are not helpful and should not be used.</p> <p>Usually patients worsen between 3-5 days, followed by improvement.</p> <p>Nasal suctioning is the mainstay of therapy.</p> <p>Neither albuterol nor nebulized racemic epinephrine should be administered to infants & children with bronchiolitis.</p> <p>There is no role for corticosteroids, ribavirin, or chest physiotherapy in the management of bronchiolitis.</p> <p>See references for more details, additional treatment options, and other important information.</p>
<p>Urinary tract infections (UTI)^{10, 11, 12}</p>	<p>Definitive diagnosis of urinary tract infection requires both a urinalysis suggestive of infection and at least 50,000 CFUs/mL of a single uropathogen. In infants and children who are not yet toilet-trained, urine should be obtained by urethral catheterization; suprapubic aspiration is an alternative for infants. Diagnosis cannot be made from urine collected in a bag. In toilet-trained children, clean-catch collection is recommended.</p> <p>Urinalysis is suggestive of infection with the presence of pyuria (positive leukocyte esterase or ≥ 5 WBCs per high powered field), bacteriuria, or positive nitrites.</p> <p>Nitrites are not a sensitive measure for UTI in children and cannot be used to rule out UTIs.</p>	<p>Initial antibiotic treatment should be based on local antimicrobial susceptibility patterns.</p> <p>Suggested agents:</p> <p>First Line (typical duration for cystitis is 5 days and for febrile UTI / pyelonephritis is 7-10 days):</p> <ul style="list-style-type: none"> • Cystitis: cephalexin 50- mg/kg/day PO in 2 divided doses (maximum 1 g/day) • Pyelonephritis: cephalexin 75 mg/kg/day PO in 3 divided doses (max 3 g/day) <p>If unable to tolerate cephalexin:</p> <ul style="list-style-type: none"> • cefixime 8 mg/kg/day PO daily (maximum 400 mg per day) or cefdinir 14 mg/kg/day (max 600mg/day) in 2 divided doses • cefixime preferred if available due to limited urinary excretion • TMP/SMX 6-12 mg/kg/day of TMP component PO in 2 divided doses (max 640 mg/day of TMP component) <p>For adolescents with cystitis, refer to adult guidelines.</p> <p>See references for more details, additional treatment options, and other important information.</p>

Pediatric Outpatient References

1. Centers for Disease Control and Prevention. Pediatric treatment recommendations. Get Smart: Know When Antibiotics Work in Doctor's Offices. 2017 February 1; [https:// www.cdc.gov/getsmart/community/for-hcp/outpatient-hcp/pediatric-treatment-rec.html](https://www.cdc.gov/getsmart/community/for-hcp/outpatient-hcp/pediatric-treatment-rec.html)
2. 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.
3. 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.
4. Lieberthal AS, Carroll AE, Chonmaitree T, et al. The diagnosis and management of acute otitis media. *Pediatrics*. 2013;131(3): e964-99.
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. 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.
7. 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.
8. Fashner J, Ericson K, Werner S. Treatment of the common cold in children and adults. *Am Fam Physician*. 2012;86(2):153-9.
9. Ralston SL, Lieberthal AS, Meissner HC, et al. American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. Diagnosis and management of bronchiolitis. *Pediatrics*. 2006;118(4):1774-93.
10. 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.
11. White B. Diagnosis and treatment of urinary tract infections in children. *Am Fam Physician*. 2011;83(4):409-15.
12. Mattoo TK, Shaikh N, Nelson CP. Contemporary Management of Urinary Tract Infection in Children. *Pediatrics*. 2021 Feb 1;147(2):e2020012138.

