



Pediatric Outpatient Empiric Antimicrobial Guidelines and Dosing Recommendations

*Populations Excluded:
Neonates, Cystic Fibrosis,
and Immunosuppressed*

Upper and Lower Respiratory Tract Infections

[Acute Otitis Media \(AOM\)](#)
[Acute otitis externa \(AOE\)](#)
[Acute Sinusitis](#)
[Community acquired pneumonia](#)
[Conjunctivitis](#)
[Pharyngitis \(GAS\)](#)
[Influenza](#)
[COVID-19](#)

Urinary Tract Infections

[Cystitis](#)
[Pyelonephritis](#)

Skin and Soft Tissue Infections (SSTI)

[Cellulitis, non-purulent](#)
[Cellulitis, purulent](#)
[Bite wounds \(Animal\)](#)
[Bite wounds \(Human\)](#)
[Impetigo](#)
[SSTI with soil contamination,
or water exposure](#)

Intra-Abdominal Infections

[*Clostridioides difficile*
Infection](#)

Dermatologic Infections

[Head Lice](#)
[Scabies](#)
[Tinea capitis](#)
[Tinea unguium](#)
[Tinea corporis \(ring
worm\), curis, pedis](#)

Sexually Transmitted Infections (STI)

[Gonorrhea](#)
[Chlamydia](#)
[Trichomonas](#)
[Bacterial vaginitis](#)

Disease State	Pathogens	Empiric Therapy	Duration	Duration
Upper and Lower Respiratory Tract Infections				
<p>Acute otitis media (AOM) Watch and wait x 48-72 hr is recommended for children ≥ 2 years of age with unilateral or bilateral AOM without otalgia and children greater than 6 months with unilateral AOM without otalgia</p> <p>For high-dose amox/clavulanate: - Patients < 40 kg, prescribe 600 mg-42.9mg/5mL suspension; - ≥ 40 kg & can swallow tablets, prescribe 1000 mg- 62.5 mg XR tablet</p> <p>Ceftriaxone 50 mg/kg IM (Max: 1,000 mg per dose) 1-3 doses. Should be reserved in patients with compliance concerns</p>	<p><i>S. pneumoniae</i> <i>H. influenzae</i> <i>M. catarrhalis</i></p>	<p>No risk factors</p> <p>First line: -High-dose amoxicillin 80–90 mg/kg per day PO divided in 2 doses (Max: 2,000 mg per dose) OR -High-dose amox/clavulanate 80–90 mg/kg per day PO divided in 2 doses (Max: 2,000 mg per dose)</p> <p>Alternative due to penicillin allergy (able to tolerate cephalosporins): -Cefdinir 14 mg/kg/day PO in 1 or 2 divided doses (Max: 300 mg per dose or 600 mg per day) -Cefprozil 15mg/kg/dose every 12 hours (Max: 500mg per dose or 1000mg per day)</p>	<p>Abx use in prior month, Daycare attendance, or unimmunized for <i>S. pneumo</i> / <i>H. influenzae</i></p> <p>First line: -High-dose amox/clav 80–90 mg/kg per day PO divided in 2 doses (Max: 2,000 mg per dose)</p> <p>Alternative due to penicillin allergy (able to tolerate cephalosporins): -Cefdinir 14 mg/kg/day PO in 1 or 2 divided doses (Max: 300 mg per dose or 600 mg/day) -Cefprozil 15mg/kg/dose every 12 hours (Max: 500mg per dose or 1000mg per day)</p>	<p>5-10 days</p> <p>Infants < 2 years, OR children with severe symptoms: 10 days</p> <p>Children 2-5 years: 7 days</p> <p>Children > 6 years: 5-7 days</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Acute otitis externa (AOE)	<i>P. aeruginosa</i> <i>S. aureus</i>	Topical Preferred - Ciprofloxacin /dexamethasone otic suspension (> 6 months): 4 gtts twice daily - Ofloxacin otic: <ul style="list-style-type: none"> • 6 months-12 years: 5 gtts twice daily • > 12 years: 10 gtts daily 	7 days
Acute Sinusitis Bacterial etiology should be considered if one of the following: - Persistent symptoms without improvement of nasal discharge or daytime cough >10 days - Severe symptoms: fever $\geq 39^{\circ}\text{C}$, purulent nasal discharge for at least 3 consecutive days For high-dose amox/clavulanate : - Patients < 40 kg, prescribe 600 mg-42.9mg/5mL suspension; - ≥ 40 kg & can swallow tablets, prescribe 1000 mg- 62.5 mg XR tablet	Viral <i>S. pneumoniae</i> <i>H. influenzae</i> <i>M. catarrhalis</i>	First line for suspected bacterial cause: - Standard dose amox/clavulanate 45 mg/kg per day PO divided in 2 doses (Max: 875 mg per dose) Second line OR antibiotic use in prior month and/or day care attendance: - High-dose amox/clavulanate 80–90 mg/kg per day PO divided in 2 doses (Max: 2,000 mg per dose) Alternative due to penicillin allergy (able to tolerate cephalosporins): - Clindamycin 30 mg/kg per day PO divided in 3 doses (Max: 600 mg per dose) PLUS cefixime 8 mg/kg per day PO divided in 2 doses (max: 400 mg per <u>DAY</u>) Alternative due to severe penicillin allergy (unable to tolerate cephalosporins): - 6 months to < 5 years: Levofloxacin 10 mg/kg per dose 2 times daily (Max: 750 mg per <u>DAY</u>) - ≥ 5 years: Levofloxacin 10 mg/kg per dose once daily (Max: 750 mg per <u>DAY</u>)	10 days

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
<p>Community Acquired Pneumonia (≥3-6 months)</p> <p>For high-dose amox/clavulanate:</p> <ul style="list-style-type: none"> - Patients < 40 kg, prescribe 600 mg-42.9mg/5mL suspension; - ≥ 40 kg & can swallow tablets, prescribe 1000 mg- 62.5 mg XR tablet <p>Most 2nd or 3rd generation oral cephalosporins provide adequate activity against only 60%–70% of currently isolated strains of pneumococcus. Therefore, for step-down therapy, high-dose amoxicillin or amox-clav is preferred if able to tolerate.</p> <p>Note: Azithromycin is likely over prescribed in pediatric pneumonia.</p> <p>Note: Cefdinir is not an appropriate option for treatment of CAP</p>	<p><i>S. pneumoniae</i></p> <p>In school age children: <i>Mycoplasma, C. pneumoniae</i></p> <p>Age < 2 years: Commonly viral pathogens e.g. RSV, influenza, parainfluenza, human metapneumovirus</p>	<p>For Children ≥3-6 months</p> <p>First line (Appropriately Vaccinated):</p> <ul style="list-style-type: none"> - High-dose amoxicillin 80–90 mg/kg per day PO divided in 2 doses (Max: 2,000 mg per dose) <p>Alternative (Not-Fully Vaccinated):</p> <ul style="list-style-type: none"> - High-dose amox/clavulanate 80–90 mg/kg per day PO divided in 2 doses (Max: 2,000 mg per dose) <p>Alternative due to penicillin allergy (<u>able</u> to tolerate cephalosporins):</p> <ul style="list-style-type: none"> - Cefprozil 15 mg/kg per dose every 12 hour (Max: 500 mg per dose, or 1000 mg per day) <p>Alternative due to severe penicillin allergy (<u>unable</u> to tolerate cephalosporins):</p> <ul style="list-style-type: none"> - 6 months to < 5 years: Levofloxacin 10 mg/kg per dose 2 times daily (Max: 750 mg per <u>DAY</u>) - ≥ 5 years: Levofloxacin 10 mg/kg per dose once daily (Max: 750 mg per <u>DAY</u>) <p>In school age children, or diagnosis of atypical pneumonia can consider beta-lactam plus addition of:</p> <ul style="list-style-type: none"> - Azithromycin 10 mg/kg PO on day 1 (Max: 500 mg per dose), followed by 5 mg/kg/day PO daily on days 2–5 (Max: 250 per dose) 	<p>7-10 days</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Conjunctivitis	Viral <i>S. aureus</i> , <i>S. pneumoniae</i> , <i>H. influenzae</i> , <i>M. catarrhalis</i> , <i>E. coli</i>	First line: - Polymyxin + trimethoprim ophthalmic solution: instill 1-2 gtts q6h Alternatives: - Ofloxacin ophthalmic solution: instill 1-2 gtts q6h - Erythromycin ophthalmic ointment: apply ½ inch q4-6h depending on severity	Viral: typically clears within 2 weeks on its own 7 days for bacterial
Pharyngitis (GAS) Penicillin G IM Benzathine ≤ 27kg: 600,000 units x1 > 27kg: 1,200,000 units x1 Should be reserved for patients with compliance concerns.	Group A <i>Streptococcus</i>	First-line: - Amoxicillin 50 mg/kg per day PO in 1 or 2 divided doses (Max: 1,000/day) - Penicillin VK : children ≤27 kg: 250 mg PO 2-3 times daily - Penicillin VK : children/adolescents >27 kg: 500 mg PO 2-3 times daily Second-line: - Cephalexin 40 mg/kg per day PO divided in 2 doses(Max: 500 mg/dose) Alternative due to severe penicillin allergy (unable to tolerate cephalosporins): - Clindamycin 21 mg/kg per day divided in 3 doses (Max: 300 mg/dose)	10 days

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
<p>Influenza</p> <p>Treatment only recommended if initiated within 48 hours of symptom onset</p>	<p>Influenza A Influenza B</p>	<p>First line:</p> <ul style="list-style-type: none"> - < 8 months: Oseltamivir 6 mg/kg per day PO divided in 2 doses - 9-12 months: Oseltamivir 7 mg/kg per day PO divided in 2 doses - Children and Adolescents <ul style="list-style-type: none"> • ≤ 15 kg: Oseltamivir 30 mg PO twice daily • 15 to ≤ 23 kg: Oseltamivir 45 mg PO twice daily • 23 to ≤ 40 kg: Oseltamivir 60 mg PO twice daily • > 40 kg: Oseltamivir 75 mg PO twice daily 	<p>5 days</p>
<p>COVID-19</p>	<p>SARS-CoV-2</p>	<p>See MHC COVID-19 Treatment Guidelines</p>	

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Skin and Soft Tissue Infections			
<p>Cellulitis, non-purulent</p> <p>For standard dose amoxicillin/clavulanate, recommend utilizing a 7:1 ratio formulation (e.g. 400 mg-57mg/5mL suspension)</p>	<p>Beta-hemolytic <i>streptococci</i></p> <p><i>S. aureus</i></p>	<p>First line:</p> <ul style="list-style-type: none"> - Cephalexin 50 mg/kg per day PO divided in 3-4 doses (Max: 500 mg per dose) OR - Amox/clavulanate 45 mg/kg per day PO divided in 2 doses (Max: 875 mg per dose) <p>Alternative due to severe penicillin allergy (unable to tolerate cephalosporins) OR history of MRSA:</p> <ul style="list-style-type: none"> - Bactrim (TMP-SMX) 8 mg TMP/kg per day PO divided in 2 doses (0.5-0.75 mL/kg/dose) (Max: 320mg TMP per dose) [avoid in infants < 2 months] OR - Clindamycin 40 mg/kg per day PO divided in 3 doses (Max: 450 mg per dose) 	<p>5-7 days</p>
<p>Cellulitis, purulent</p>	<p><i>S. aureus</i> (including methicillin-resistant staphylococcus aureus or MRSA)</p>	<p>Incision and Drainage (I&D) is preferred treatment Note: Well-drained abscesses do not require antibiotic treatment</p> <p>First line:</p> <ul style="list-style-type: none"> - Bactrim (TMP-SMX) 8 mg TMP/kg per day PO divided in 2 doses (0.5-0.75 mL/kg/dose) (Max: 320mg TMP per dose) [avoid in infants < 2 months] OR - Clindamycin 40 mg/kg per day PO divided in 3 doses (Max: 450 mg per dose) <p>Alternative (if culture shows MSSA and NOT MRSA):</p> <ul style="list-style-type: none"> - Cephalexin 50 mg/kg per day PO divided in 3-4 doses (Max: 500 mg per dose) 	<p>5-7 days</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
<p>Bite wounds (Animal)</p> <p>Reminder: Post-exposure prophylaxis for rabies may be indicated in animal bites</p> <p>For standard dose amoxicillin/clavulanate, recommend to utilize a 7:1 ratio formulation (e.g. 400 mg-57mg/5mL suspension)</p>	<p><i>Pasteurella multocida</i>, <i>Capnocytophaga canimorsus</i>, <i>S. aureus</i>, <i>Streptococcus</i> sp., anaerobes</p>	<p>First line:</p> <ul style="list-style-type: none"> - Amox/clavulanate 45 mg/kg per day PO divided in 2 doses (Max: 875 mg per dose) <p>Alternative due to severe penicillin allergy:</p> <ul style="list-style-type: none"> - Bactrim (TMP-SMX) 8 mg TMP/kg per day PO divided in 2 doses (0.5-0.75 mL/kg/dose) (Max: 320mg TMP per dose) [avoid in infants < 2 months] <u>PLUS</u> metronidazole 30 mg/kg per day PO divided in 3 doses (Max: 500 mg per dose) 	<p>Prophylaxis: 5 days Treatment: 7-10 days</p>
<p>Bite wounds (Human)</p> <p>For standard dose amoxicillin/clavulanate, recommend to utilize a 7:1 ratio formulation (e.g. 400 mg-57mg/5mL suspension)</p>	<p><i>Eikenella corrodens</i>, <i>S. aureus</i>, <i>Streptococcus</i> sp., anaerobes</p>	<p>First line:</p> <ul style="list-style-type: none"> - Amox/clavulanate 45 mg/kg per day PO divided in 2 doses (Max: 875 mg per dose) <p>Alternative due to severe penicillin allergy:</p> <ul style="list-style-type: none"> - 6 months to < 5 years: Levofloxacin 10 mg/kg per dose 2 times daily (Max: 750 mg per <u>DAY</u>) <u>PLUS</u> Metronidazole 30 mg/kg per day PO divided in 3 doses (Max: 500 mg per dose) - ≥ 5 years: Levofloxacin 10 mg/kg per dose once daily (Max: 750 mg per <u>DAY</u>) <u>PLUS</u> Metronidazole 30 mg/kg per day PO divided in 3 doses (Max: 500 mg per dose) 	<p>Prophylaxis: 5 days Treatment: 7-10 days</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
<p>SSTI with soil contamination OR water exposure</p> <p>Typically occurs after traumatic injury with significant environmental involvement</p>	<p>Soil exposure: <i>Clostridium</i> sp.</p> <p>Salt/Freshwater: <i>Vibrio vulnificus</i> <i>A. hydrophilia</i>, <i>Plesiomonas shigelloides</i></p>	<p>Soil Contamination:</p> <ul style="list-style-type: none"> - ADD Metronidazole 30 mg/kg per day PO divided in 3 doses (Max: 500 mg per dose) to standard SSTI therapy <p>Saltwater OR Freshwater Exposure:</p> <ul style="list-style-type: none"> - 6 months to < 5 years: ADD Levofloxacin 10 mg/kg per dose 2 times daily (Max: 750 mg per <u>DAY</u>) to standard SSTI therapy - ≥ 5 years: ADD Levofloxacin 10 mg/kg per dose once daily (Max: 750 mg per <u>DAY</u>) to standard SSTI therapy 	<p>10-14 days</p>
<p>Impetigo</p>	<p><i>S. aureus</i>, <i>Streptococci</i></p>	<p>Topical – preferred (if limited number of lesions)</p> <ul style="list-style-type: none"> - Mupirocin 2% ointment three times daily, OR - Retapamulin ointment twice daily <p>First line oral agent:</p> <ul style="list-style-type: none"> - Cephalexin 50 mg/kg per day PO divided in 3-4 doses (Max: 500 mg per dose) <p>Alternative due to severe penicillin allergy (unable to tolerate cephalosporins):</p> <ul style="list-style-type: none"> - Clindamycin 30 mg/kg per day PO divided in 3 doses (Max: 450 mg per dose) 	<p>5-7 days</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Urinary Tract Infections (UTI)			
<p>Cystitis</p>	<p>Enterobacterales</p>	<p>First line:</p> <ul style="list-style-type: none"> - Cephalexin 50 mg/kg per day PO divided in 3-4 doses (Max: 500 mg per dose) <p>Alternative:</p> <ul style="list-style-type: none"> - Bactrim (TMP-SMX) 8 mg TMP/kg per day PO divided in 2 doses (<i>0.5 mL/kg/dose</i>) (Max: 320mg TMP per dose) [avoid in infants < 2 months] <p>Alternative last line [based on culture and sensitivity analysis]:</p> <ul style="list-style-type: none"> - Nitrofurantoin (Macrochantin): 6 mg/kg per day PO divided in 4 doses (Max: 100 mg per dose) - Ciprofloxacin 30 mg/kg per day PO divided in 2 doses (Max: 750 mg per dose) 	<p>3-14 days (depending on antibiotic)</p> <p>Beta-lactam(s):</p> <ul style="list-style-type: none"> < 2 years of age: 7-14 days ≥ 2 years of age: 5-7 days <p>Bactrim (TMP-SMX): 3 days</p> <p>Nitrofurantoin: 5 days</p> <p>Ciprofloxacin (last line): 3 days</p>
<p>Pyelonephritis</p> <p>Note: Nitrofurantoin and Fosfomycin should NOT be used for treatment of complicated urinary tract infections or in the setting of pyelonephritis</p>	<p>Enterobacterales, <i>S. saprophyticus</i></p>	<p>First line:</p> <ul style="list-style-type: none"> - Cephalexin 75-100 mg/kg per day PO divided in 3-4 doses (Max: 1000 mg per dose) <p>Alternative:</p> <ul style="list-style-type: none"> - Bactrim (TMP-SMX) 8 mg TMP/kg per day PO divided in 2 doses (<i>0.5 mL/kg/dose</i>) (Max: 320mg TMP per dose) [avoid in infants < 2 months] 	<p>7-14 days</p> <p>If rapid improvement: 7 days</p> <p>If slow response or improvement: 10-14 days</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Dermatologic Infections			
Head lice	<i>Pediculus humanuscapitis</i> (head louse)	First line: - Topical permethrin 1% cream Alternative: - Benzyl alcohol 5% lotion	Typically applied once; may repeat in 7 days if lice or nits still present
Scabies	<i>Sarcoptes scabiei</i> (mites)	First line: - Topical permethrin 5% cream Alternative: - Lindane 1% lotion	Once – Apply head to toe, leave on for 8 – 14 hours
Tinea capitis Note: Must check baseline LFTS	<i>Trichophyton, Microsporum, and Epidermophyton</i>	First line: Terbinafine (age ≥4 years) - 10 to 20 kg: 62.5 mg PO daily - 20 to 40 kg: 125 mg PO daily - Above 40 kg: 250 mg PO daily	4-6 weeks
Tinea corporis (ring worm), cruris, pedis	<i>Trichophyton rubrum</i> <i>Epidermophyton floccosum</i>	Topical - Miconazole 2% cream apply twice daily Alternative: - Terbinafine 1% cream (age >12 years) apply once daily (Tinea corporis/cruris) OR twice daily (Tinea pedis)	Miconazole: - Tinea corporis x 2-4 weeks - Tinea pedis x 4-8 wks - Tinea unguium x 4-6 months Terbinafine topical x7d
Tinea unguium Note: Must check baseline LFTS	<i>T. rubrum</i> <i>E. floccosum</i>	First line: - Terbinafine (age ≥4 years) • 10-20 kg: 62.5 mg once daily • 20-40 kg: 125 mg once daily • >40 kg: 250 mg once daily	6 weeks (fingernails) 12 weeks (toenails)

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Sexually Transmitted Infections (STIs)			
<p>Gonorrhea</p> <p>Patient's partners should be evaluated for Expedited Partner Therapy</p>	<p><i>Neisseria gonorrhoeae</i></p>	<p>Preferred:</p> <ul style="list-style-type: none"> - ≤45 kg: Ceftriaxone 50mg/kg IM x1 dose (Max: 250mg) - 46-149 kg: Ceftriaxone 500mg IM x 1 dose - ≥ 150kg: Ceftriaxone 1000mg IM x 1 dose <p>Alternative(s):</p> <ul style="list-style-type: none"> - If > 45kg: Gentamicin 240mg IM x 1 dose + Azithromycin 2g orally x 1 dose - If >45kg: Cefixime 800mg orally x 1 dose 	<p>1 dose</p> <p>NOTE: Patients should be treated for Chlamydia unless Chlamydia work-up is negative at time of treatment</p>
<p>Chlamydia</p> <p>Patient's partners should be evaluated for Expedited Partner Therapy</p>	<p><i>Chlamydia trachomatis</i></p>	<p>Preferred:</p> <ul style="list-style-type: none"> - Children ≥8 years: Doxycycline 2.2 mg/kg/dose twice daily (Max: 100 mg/dose) - Adolescents: Doxycycline 100 mg twice daily <p>Alternative:</p> <ul style="list-style-type: none"> - ≥ 8 years or ≥ 45kg: Azithromycin 1g orally x 1 dose 	<p>Doxycycline – 7 days</p> <p>Azithromycin – 1 dose</p>
<p>Trichomonas</p> <p>Patient's partners should be evaluated for Expedited Partner Therapy</p>	<p><i>Trichomonas vaginalis</i></p>	<p>Preferred:</p> <ul style="list-style-type: none"> - Children <45 kg: Metronidazole 45 mg/kg/day in divided doses 3 times daily for 7 days (Max: 2,000 mg/day) - ≥45kg: Metronidazole 2g orally x 1 dose <p>Alternative(s):</p> <ul style="list-style-type: none"> - Tinidazole 2g orally x 1 dose - Metronidazole 500 mg orally twice daily x 7 days 	<p>Metronidazole – 1 dose or 7-days</p> <p>Tinidazole – 1 dose</p>

[Click here](#) to return to First Page

Disease State	Pathogens	Empiric Therapy	Duration
Bacterial vaginitis	<i>G. vaginalis</i> <i>Ureaplasma</i> <i>Mycoplasma</i> <i>Prevotella spp.</i>	Preferred (Children >45 kg & adolescents): - Metronidazole 500mg twice daily x 7 days OR - Metronidazole 0.75% intravaginal gel once daily x 5 days Alternatives (Children >45 kg & adolescents): - Clindamycin 2% intravaginal cream daily x 7 days - Tinidazole 2g by mouth daily x 2 days	See Empiric Therapy section
Intra-Abdominal Infections			
<i>Clostridioides difficile</i> Infection	<i>Clostridioides difficile</i>	Preferred: - <u>Primary Episode</u> : Vancomycin 10 mg/kg/dose four times daily (max 125 mg/dose) - <u>First Recurrence</u> : Vancomycin 10 mg/kg/dose four times daily (max 125 mg/dose) (consider vancomycin taper after treatment course) - <u>Second Recurrence</u> : ≥12.5 kg: Fidaxomicin 200 mg twice daily Alternatives: - ≥12.5 kg: Fidaxomicin 200mg twice daily - Metronidazole 30 mg/kg per day in 3 divided doses (Max: 500 mg per dose)	10 days If slow to respond can extend to 14 days

Guideline adapted with permission from Corewell Health

These guidelines are intended for assistance in empiric antibiotic selection. These are not meant to supersede clinical judgement, as individual patient characteristics may dictate alternative therapy and treatment. Specimens obtained for culture prior to administering antibiotics are the most reliable. Every attempt should be made to obtain cultures before antibiotics are given; however, antibiotic therapy should not be withheld to obtain culture and/or while awaiting culture results. Definitive therapy should be individualized based on patient and culture results if obtained.

[Click here](#) to return to First Page

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[Click here](#) to return to First Page