

# Amoxicillin & Amoxicillin/Clavulanate Dosing for Common Pediatric Respiratory Tract Infections

**Amoxicillin:** an aminopenicillin commonly used for a variety of infections. Note: ampicillin is also an aminopenicillin, is structurally similar to amoxicillin, and has a similar spectrum of activity.

**Clavulante:** a beta-lactamase inhibitor used in combination with amoxicillin to inhibit beta-lactamases and prevent inactivation of amoxicillin. This combination effectively broadens the spectrum of activity relative to amoxicillin alone.

## Spectrum of Activity

### Amoxicillin

**Gram positive:** most *Streptococcus* spp., *Enterococcus faecalis*, *Listeria monocytogenes*

**Gram negative:** *Neisseria meningitidis*, *Pasteurella multocida*

**Anaerobes:** *Actinomyces* spp., *Clostridium* spp. (excluding *Clostridioides difficile*), *Peptostreptococcus* spp., *Cutibacterium acnes* (formerly *Propionibacterium acnes*)

### Amoxicillin/Clavulanate

**Gram positive:** MSSA, most *Streptococcus* spp., *Enterococcus faecalis*, *Listeria monocytogenes*

**Gram negative:** many *Enterobacterales*, *Haemophilus* spp., *Moraxella catarrhalis*, *Neisseria meningitidis*, *Pasteurella multocida*

**Anaerobes:** *Actinomyces* spp., *Clostridium* spp. (excluding *Clostridioides difficile*), *Peptostreptococcus* spp., *Cutibacterium acnes* (formerly *Propionibacterium acnes*), *Prevotella* spp., *Fusobacterium* spp., *Bacteriodes fragilis*

**\*\*Amoxicillin has a narrower spectrum of activity and should be used preferentially over amoxicillin/clavulanate whenever possible.\*\***

Ensure you refer to your local antibiogram on Firstline for local resistance patterns.



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DISEASE STATE	USUAL PATHOGEN(S)	EMPIRIC THERAPY	DOSE	DURATION	NOTES
<b>Acute Pharyngitis</b>	Viruses  <i>Strep pyogenes/ Group A Strep (GAS)</i>	If GAS: <b>1st Line:</b> Penicillin VK (only tabs available) OR Amoxicillin	40-50 mg/kg/day divided BID or TID  Maximum: 1000 mg/day	10 days	<b>80-90% of cases are caused by viruses. If viral, there is <u>no indication for antibiotics.</u></b>  Clinical decision tools, e.g. CENTOR score, should be used to identify patients with higher risk for GAS infection and require point-of-care rapid antigen detection tests.
<b>Acute Otitis Media</b>  *Diagnosis requires acute onset of symptoms with middle ear effusion and significant inflammation of the TM.	Viruses  <i>S. pneumoniae</i> <i>H. influenzae</i> <i>M. catarrhalis</i> Less commonly GAS	<b>1st Line:</b> Amoxicillin  *Macrolides have inferior bacterial killing capabilities compared to beta-lactams*	<b>Standard dose:</b> 40-50 mg/day divided TID  <b>High dose:</b> 80-90 mg/kg/day divided BID or TID <b>**Reserve high dose for those patients at risk of pen-R-S.pneumo (see notes)**</b>  Maximum: 4000 mg/day amoxicillin	≥2 yo: 5 days  <2 yo, recurrent AOM, perforated TM, and therapy failures: 10 days	Consider watchful waiting and withholding antibiotics in mild illness (likely viral) in those > 6 months.  <b>High Dose:</b> will overcome pen-R- <i>S.pneumo</i> (PRSP). <u>Risk factors for PRSP: daycare, antibiotic exposure within last 3 months, &lt; 2 yo</u>  Amoxicillin does not cover beta-lactamase producing <i>H. influenzae</i> and <i>M. catarrhalis</i> , however, <b>these pathogens are less common and more likely to resolve spontaneously, therefore, amoxicillin remains 1st line therapy.</b>
	<i>S. pneumoniae</i> Beta-lactamase (+) <i>H. influenzae</i> Beta-lactamase (+) <i>M. catarrhalis</i>	<b>Treatment failure or Recurrence:</b> Amox/clav  <b>Treatment failure:</b> ≥ 3 days of therapy without improvement . <b>Recurrence:</b> ≥3 episodes in 6 months or ≥4 episodes in 12 months.	<b>Failure of Amoxicillin:</b> 7:1 formulation 40-50 mg/kg/day amoxicillin component divided TID	10 days	<b>Clavulanate:</b> Overcomes beta-lactamase producing <i>H. influenzae</i> and <i>M. catarrhalis</i> organisms.  Associated with increased diarrhea. Ensure the formulation with the correct ratio is selected: <b>7:1 formulation is preferred</b> (not the 4:1 formulation).  High dose 14:1 amox/clav is <u>very rarely indicated</u> . If used, combine the 7:1 formulation with regular amoxicillin.



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DISEASE STATE	USUAL PATHOGEN(S)	EMPIRIC THERAPY	DOSE	DURATION	NOTES
<p><b>Uncomplicated Community Acquired Pneumonia</b></p> <p>*Optimally, diagnosis of bacterial pneumonia should be supported by chest radiograph</p>	<p><b>Most common:</b> Viruses <i>S.pneumoniae</i></p> <p><b>Less common:</b> GAS <i>H.influenzae</i> <i>M.pneumoniae</i> <i>C.pneumoniae</i></p>	<p><b>1st Line:</b> Amoxicillin</p>	<p><b>Standard dose:</b> 40-50 mg/day divided TID</p> <p><b>**Standard dose is appropriate for most patients</b></p> <p><b>High dose:</b> 80-90 mg/kg/day divided TID</p> <p><b>**Reserve high dose for those patients who have failed conventional dosing.</b></p>	<p>5-7 days</p>	<p>Most common cause of pneumonia in infants and preschool aged children are <b>viruses</b>. If viral, there is <u>no indication for antibiotics</u>.</p> <p>Typically, for uncomplicated infections managed in the outpatient setting, coverage for <i>S.pneumoniae</i> is all that is required as it is the predominant bacterial pathogen.</p> <p><b>**Amox/clav</b> would be a second line option and should be reserved for complicated CAP which would likely require hospital admission.</p>

**Penicillin allergies:** 10% of the population report an allergy to penicillin but the true prevalence is less than 1%. The most commonly reported reaction is a delayed benign rash that appears after days of taking penicillins (not immediate hypersensitivity reactions). These reactions may or may not recur with re-exposure and are not a contraindication to receiving penicillins. Refer to the penicillin allergy de-labeling tool on Firstline for further guidance.

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## REFERENCES

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