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Therapeutic Alternatives to Amoxicillin for Common Pediatric Conditions

Amoxicillin suspension products may be in short supply in some parts of Canada. The following table presents therapeutic alternatives for common pediatric conditions. Amoxicillin capsules continue to be available in Canada; children able to safely swallow capsules should be given capsules where dosing permits. In cases where safety or ability to swallow is uncertain and dosing permits, experts suggest that it is reasonable to open the capsule and mix the contents with a small amount of soft, cold or room temperature food such as applesauce; however, palatability may be an issue.[1][2][3] The amount of food used should be ≤15 mL (1 tbsp) to reduce the chance of waste.

Indication	Amoxicillin Dosing[a]	Duration of Therapy	Therapeutic Alternatives to Amoxicillin[b][c]		Clinical Comment	References
			First-Line	Alternatives		
Acute otitis media	Children: Standard dose: 45–60 mg/kg/day divided Q8H High dose: 75–90 mg/kg/day divided Q12H; maximum 4 g/day	>2 y: 5 days ≤2 y: 10 days	Cefuroxime axetil[d] 30 mg/kg/day divided Q8–12H (same duration as amoxicillin)	If initial therapy fails (no symptomatic improvement after 48–72 h): amoxicillin/clavulanate[d] (7:1 formulation; 400 mg/5 mL): • ≤35 kg: 45–60 mg/kg/day (amoxicillin component) divided Q8–12H[e] × 10 days; maximum 500 mg/dose • >35 kg: 500 mg (amoxicillin component) Q8H × 10 days	Reassess patients who fail to respond to therapy within 48–72 h. See guidelines and/or *Acute Otitis Media in Childhood* chapter[f] for more information. When amoxicillin is available, reserve standard-dose amoxicillin for the limited number of children at low risk of being infected with drug-resistant bacteria.[g]	[*Paediatr Child Health* 2016;21(1): 39-44]
Acute rhinosinusitis	Children: Standard dose: 40–50 mg/kg/day divided Q8H; maximum 1,500 mg/day High dose: 80–90 mg/kg/day divided Q8–12H; maximum 2–3 g/day Adults: Standard dose: 500 mg Q8H High dose: 1 g Q8H	5–10 days	Clindamycin[d] 20–30 mg/kg/day divided Q6–8H (maximum 1.2–1.8 g/day) *in combination with* cefixime[d] 8 mg/kg/day divided Q12H (maximum 400 mg/day) × 10 days Cefuroxime axetil[d][e] 30 mg/kg/day divided Q12H × 10 days	If initial therapy fails (no symptomatic improvement after 48–72 h):[e] amoxicillin/clavulanate[d] (7:1 formulation; 400 mg/5 mL) 45 mg/kg/day (amoxicillin) divided Q8–12H ± *additional* amoxicillin (if available) 45 mg/kg/day divided Q8–12H × 10 days If all other treatments have been ruled out and the benefits exceed the risks, levofloxacin or moxifloxacin could be considered.	Acute rhinosinusitis is often viral in etiology; guidelines recommend initiating antibiotics only if symptom duration is >7 days. Reassess patients who fail to respond to therapy within 48–72 h. See guidelines and/or *Acute Rhinosinusitis* chapter[f] for more information. When amoxicillin is available, reserve standard-dose amoxicillin for the limited number of children at low risk of being infected with drug-resistant bacteria.[g] If patient has failed standard-dose amoxicillin, combine amoxicillin/clavulanate with amoxicillin (if available) to increase the total dose of amoxicillin while minimizing diarrhea due to the clavulanate. If patient has failed high-dose amoxicillin therapy, amoxicillin/clavulanate alone is adequate to cover beta-lactamase-producing organisms.	[*Allergy Asthma Clin Immunol* 2011;7(1):2], [*Clin Infect Dis* 2012;54(8): e72-e112]

Indication	Amoxicillin Dosing[a]	Duration of Therapy	Therapeutic Alternatives to Amoxicillin[b][c]		Clinical Comment	References
			First-Line	Alternatives		
Community-acquired pneumonia	Children: Standard dose: 40–50 mg/kg/day divided Q8H High dose: 80–90 mg/kg/day divided Q8H; maximum 4 g/day Adult: Standard dose: 500 mg Q8H High-dose: 1 g TID	7–10 days	Cefuroxime[d] or cefprozil[d] (not a Health Canada–approved indication; no dosing information provided by guidelines)	For suspected or proven *M. pneumoniae* or *C. pneumoniae:* • Clarithromycin[d] 15 mg/kg/day divided Q12H × 7 days; • Azithromycin[d] 10 mg/kg once daily × 1 day then 5 mg/kg once daily × 4 days, maximum 500 mg/day; *or* • Doxycycline[e] (if ≥8 y): 4 mg/kg/day divided Q12H	Reassess patients who fail to respond to therapy within 48–72 h. Continue for 48–72 h after patient is asymptomatic or evidence of eradication of infection is obtained. Duration of therapy is usually 7–10 days; severe or persistent infections may require several wk of therapy. See guidelines and/or *Community-Acquired Pneumonia* chapter[f] for more information. When amoxicillin is available, reserve standard-dose amoxicillin for the limited number of children at low risk of being infected with drug-resistant bacteria.[g]	[*Paediatr Child Health* 2015; 20(8):441-50]
Group A streptococcal pharyngitis	Children and adults: 50 mg/kg divided Q12–24H × 10 days; maximum 1 g/day	10 days	Penicillin V: • Children (≤27 kg): 250 mg (or 40 mg/kg)[e] Q8–12H × 10 days • Children (>27 kg), adolescents and adults: 250 mg Q6H *or* 500 mg Q12H × 10 days	If history of beta-lactam allergy or not susceptible to penicillin V: • Cephalexin[d] 20 mg/kg/dose Q12H (maximum 500 mg/dose) × 10 days; • Cefadroxil 30 mg/kg once daily (maximum 1 g/dose) × 10 days; • Clindamycin[d] 7 mg/kg/dose Q8H (maximum 300 mg/dose) × 10 days; • Clarithromycin[d] 7.5 mg/kg/dose Q12H (maximum 250 mg/dose) × 10 days; *or* • Azithromycin[d] 12 mg/kg once daily (maximum 500 mg/dose) × 1 day then 6 mg/kg once daily (maximum 250 mg/dose) × 4 days	Group A streptococcal pharyngitis is a self-limiting disease and antibiotics are often not required; see guidelines and/or Group A *Streptococcal Pharyngitis* chapter[f] for more information. Reassess patients who fail to respond to therapy within 48–72 h. Duration of therapy is usually 5–10 days.	[*Clin Infect Dis* 2012;55(10): e86-e102]
Infective endocarditis, prevention	Children: 50 mg/kg × 1 dose Adults: 2 g × 1 dose	1 dose, 30–60 min before procedure	• Cephalexin[d] 50 mg/kg (maximum: 2 g) × 1 dose; • Clindamycin[d] 20 mg/kg (maximum: 600 mg) × 1 dose; • Azithromycin[d] 15 mg/kg (maximum: 500 mg) × 1 dose; *or* • Clarithromycin[d] 15 mg/kg (maximum: 500 mg) × 1 dose		See guidelines and/or *Infective Endocarditis* chapter[f] (see Prevention section) for more information, such as for whom prophylaxis is recommended.	[*Circulation* 2007;116(15): 1736-54], [*Paediatr Child Health* 2010; 15(4):205-8]

Indication	Amoxicillin Dosing[a]	Duration of Therapy	Therapeutic Alternatives to Amoxicillin[b][c]		Clinical Comment	References
			First-Line	Alternatives		
Lyme disease, treatment	Children: 50 mg/kg/day divided Q8H; maximum 1.5 g/day Adults: 500 mg Q8H	Recommendations on duration of treatment vary based on age of patient, indication and chosen antibiotic. For amoxicillin (in children): • Single EM (first line): 14 days • Multiple EM (first line): 14 days • Carditis with first-degree heart block (PR interval <30 ms) (first line): 14–21 days • Arthritis (first line): 28 days • Facial nerve palsy (last line): 14–21 days	• Doxycycline 4–4.4 mg/kg/day divided Q12H (maximum 200 mg/day); *or* • Cefuroxime[d] 30 mg/kg/day divided Q12H (maximum 1 g/day)	• Azithromycin[d] 10 mg/kg/day (maximum 500 mg/day) once daily; *or* • Clarithromycin[d] 15 mg/kg/day divided Q12H	Duration of therapy varies based on age of patient, indication and chosen antibiotic. In 2018, the American Academy of Pediatrics published updated recommendations for the treatment of Lyme disease in children; of note, doxycycline is *not* discouraged in children <8 y in these recommendations [American Academy of Pediatrics. Lyme disease. In: Kimberlin DW, Brady MT, Jackson MA et al, editors. *Red book: 2018 report of the Committee on Infectious Diseases*. 31st ed. Itasca (IL): American Academy of Pediatrics; 2018. p. 515-23]. See guidelines and/or *Lyme Disease* chapter[f] for more information.	[*Clin Infect Dis* 2006;43(9): 1089-134], [*Paediatr Child Health* 2014; 19(7):379-88]
Typhoid fever (not a Health Canada–approved use)	100 mg/kg/day divided Q6H; maximum 4 g/day	14 days	If MDR *S. typhi* is uncommon in area: • SMX/TMP[d] 8 mg/kg/day (of TMP component) divided Q12H; *or* • Chloramphenicol 50 mg/kg/day divided Q6–8H (maximum 750 mg/dose Q6H)	If MDR *S. typhi* is common in area: • Azithromycin[d] 20 mg/kg/day (maximum 1 g/day) once daily; • Ciprofloxacin (if benefits of treatment exceed risks) 20–30 mg/kg/day divided Q12H (up to 750 mg Q12H in adolescents and adults); *or* • Cefixime[d] (if sensitive) 20 mg/kg/day divided Q12H	See guidelines for more information.	[*Pediatr Infect Dis J* 2002; 21(2):157-8], [Centre for Tropical Medicine and Global Health. *Review of antibacterial medicines for the treatment of enteric fever for the WHO model list of essential medicines.* 2019 Update]
Urinary tract infection, uncomplicated	50 mg/kg/day divided Q8H; maximum 1,500 mg/day	7–10 days if febrile	• Amoxicillin/clavulanate[d] (7:1 formulation; 400 mg/5 mL) 40 mg/kg/day divided Q8–12H;[e] • SMX/TMP[d] 8 mg/kg/day (TMP) divided Q12H; • Cefixime[d] 8 mg/kg once daily; • Cefprozil[d] 30 mg/kg/day divided Q12H; • Cephalexin[d] 50 mg/kg/day divided Q6H; *or* • Nitrofurantoin[e] 5–7 mg/kg/day (maximum 200 mg/day) divided Q6H	Ciprofloxacin (if benefits of treatment exceed risks) 30 mg/kg/day divided Q12H	Empiric antibiotic choice should be based on local susceptibility patterns and should be modified based on sensitivity results. See guidelines and/or *Urinary Tract Infections* chapter[f] for more information.	[*Paediatr Child Health* 2014;19(6): 315-25]

Abbreviations: AOM = acute otitis media; EM = erythema migrans; MDR = multidrug resistant; SMX/TMP = sulfamethoxazole/trimethoprim; TMP = trimethoprim

[a] Alternatively, amoxicillin capsules (250 mg, 500 mg) may be opened and sprinkled over food (e.g., applesauce); however, palatability may be an issue.[1][2][3]

[b] Only therapeutic options with available oral dosing are presented.

[c] If appropriate, culture and sensitivity tests should occur to ensure that the most effective antibiotic regimen is utilized.

[d] Suspension product approved by Health Canada; however, product may be in short supply. Alternative therapy may be required.

[e] Source: Alberta Health Services. Bugs & Drugs [mobile application software]. Edmonton: Alberta Health Services [2020]. Retrieved from https://googleplay.com.

[f] Available in print or online at myRxTx.ca (subscription required).

[g] Risk factors for drug-resistant bacteria include daycare attendance, recent antibiotic use (<3 months), recent episode of AOM, treatment failure or early recurrence.

[1] Royal Pharmaceutical Society. *Pharmaceutical issues when crushing, opening or splitting oral dosage forms* [PDF file]. June 2011. Available from: www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Support/toolkit/pharmaceuticalissuesdosageforms-%282%29.pdf. Accessed April 17, 2020.

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[3] Thambavita D, Galappatthy P, Mannapperuma U et al. Biowaiver monograph for immediate-release solid oral dosage forms: amoxicillin trihydrate. *J Pharm Sci* 2017;106(10):2930-45. https://www.ncbi.nlm.nih.gov/pubmed/28483422