CARILION CLINIC
Antimicrobial Stewardship

Pediatric Appendicitis Treatment Guideline

Disclaimer: Treatment guidelines are not intended to replace clinical judgment. Recommendations are intended to provide guidance for a majority of immunocompetent patients but cannot account for all clinical situations or atypical presentations. Adequate source control is necessary for almost all patients with complicated intra-abdominal infections.

Covered in this Guideline
1. Diagnostics
2. Organisms
3. Classification
4. Pre-Operative Antimicrobials
5. Operative Pathway
6. Treatment Failure

Diagnostics and Workup

Imaging	Sensitivity	Specificity	NPV	PPV
US	72.5%	97%	87.5%	92.5%
CT	93%	92%	95%	89%
MRI	96.8%	97.4%	98.9%	92.4%

US should always be utilized as a screening exam prior to CT to spare children from ionizing radiation

Imaging yields findings positive for appendicitis

- Rapid clinical improvement prior to procedure and low risk → Consider **Nonoperative Management**
- Acute, non-perforated appendicitis → begin **Pre-Operative Antibiotics** and plan appendectomy
- Perforation suspected → See **Perforation** section

Organisms

Common	
Enterobacteriaceae	***E. coli*** (most common), *K. pneumoniae*, *Enterobacter* spp., *Proteus mirabilis*
Anaerobes	*Bacteroides fragilis*

Unlikely	
Enterococcus	Due to infrequent causes of community-onset appendicitis, routine empiric coverage is not warranted
Pseudomonas	Not commonly isolated, RCTs have not demonstrated improved outcomes with empiric coverage

Classification

Simple Appendicitis	Complicated Appendicitis
• Early in disease time course • Mild inflammation • Without perforation	• Late in disease time course (>72 hours) • Includes localized acute inflammation (phlegmon) • Perforation and/or abscess • Extends beyond the hollow viscus of origin into peritoneal space

Predictors of Post-Operative Complications				
Elevated CRP at admission	Purulent peritonitis	Abdominal drain	Open appendectomy	Untimely antibiotics

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Non-Operative Management

- May be appropriate for a select few low risk patients presenting early with simple appendicitis with rapid clinical improvement prior to any surgical intervention, nonperforated appendicitis, or an abscess not amenable to drainage.
- Current literature on duration is varied. Most data supports use of a minimum of 48 hours of IV upfront followed by oral antibiotics for a total of 7-10 days in patients who are stable at time of discharge.[2]

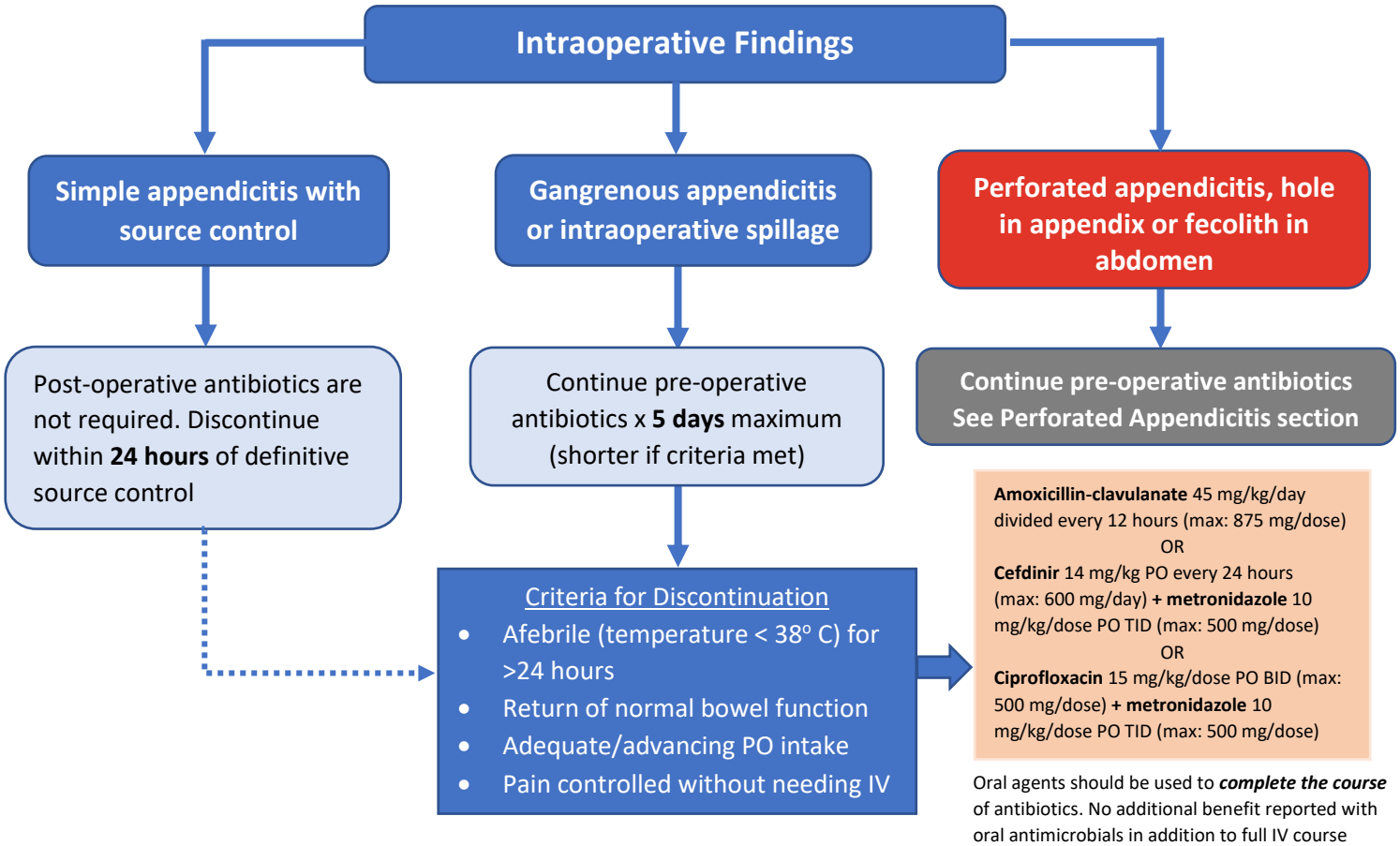
Pre-Operative Antibiotics

- Pre-operative antibiotic therapy is recommended for all patients diagnosed with appendicitis (non-perforated and perforated). The following antibiotics should be administered:

Recommended	Alternative
Ceftriaxone 50 mg/kg/dose IV every 24 hours (max: 2000 mg/dose) **+** Metronidazole 30 mg/kg/dose IV every 24 hours[3,4] (max: 1500 mg/dose)	Piperacillin/tazobactam 100 mg/kg/dose IV every 8 hours (max: 4.5 g/dose) **OR** **Severe Penicillin Allergy*** Ciprofloxacin 10-15 mg/kg/dose IV every 12 hours (max: 400 mg/dose) **+** Metronidazole 30 mg/kg/dose IV every 24 hours[3,4] (max: 1500 mg/dose)
***Severe Allergy:** History of anaphylaxis, angioedema, respiratory distress or extensive rash	

Routine dual anaerobic coverage is not warranted[5]: Antibiotic coverage against ***Bacteroides*** is excellent for either metronidazole or piperacillin/tazobactam monotherapy. Resistance against these agents is **generally less than 1%.**

Operative Pathway



Oral agents should be used to ***complete the course*** of antibiotics. No additional benefit reported with oral antimicrobials in addition to full IV course

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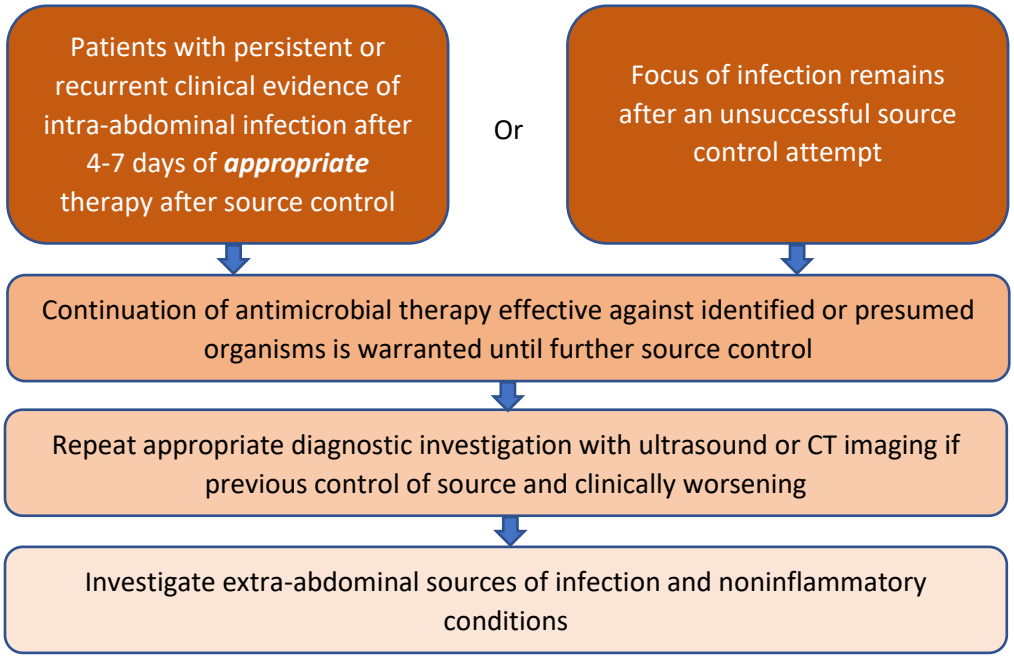
Perforated Appendicitis

Source Control with Clinical Improvement	Source not Controlled or without Clinical Improvement
• If total duration of IV = 5 days, discontinue • If < 5 days duration of IV, apply discontinuation criteria and transition to PO when indicated	• Consider repeated abdominal imaging if no improvement by POD#7 • If repeat imaging shows drainable abscess, continue original antibiotics and reattempt source control • If source control not obtained, consider limiting treatment to 5-7 days

Treatment Failure



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