

## Appendicitis Management Pathway

Version: 3

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### 1.0 Introduction

This pathway is for use with children aged 2-18 years old with no underlying disease or co-morbidity who have a confirmed diagnosis of appendicitis (either non-perforated or perforated) by the General Surgery Team and require a surgical appendectomy or medical management. Patients are to be removed from this pathway if there are significant postoperative complications (e.g. bowel obstruction or prolonged TPN) or a change in diagnosis.

The care pathways attached refer to patients admitted post-operatively. For patients with uncomplicated appendicitis discharged on day of surgery, discharge criteria are:

- Vital signs at baseline or within 10% of baseline vitals
- Good pain control: numeric rating score of less than 7/10 or pain word scale "medium" or less
- Tolerating clear fluids
- Able to transport safely home with family
- AVS reviewed with patient and family and PIV discontinued

### Target Users

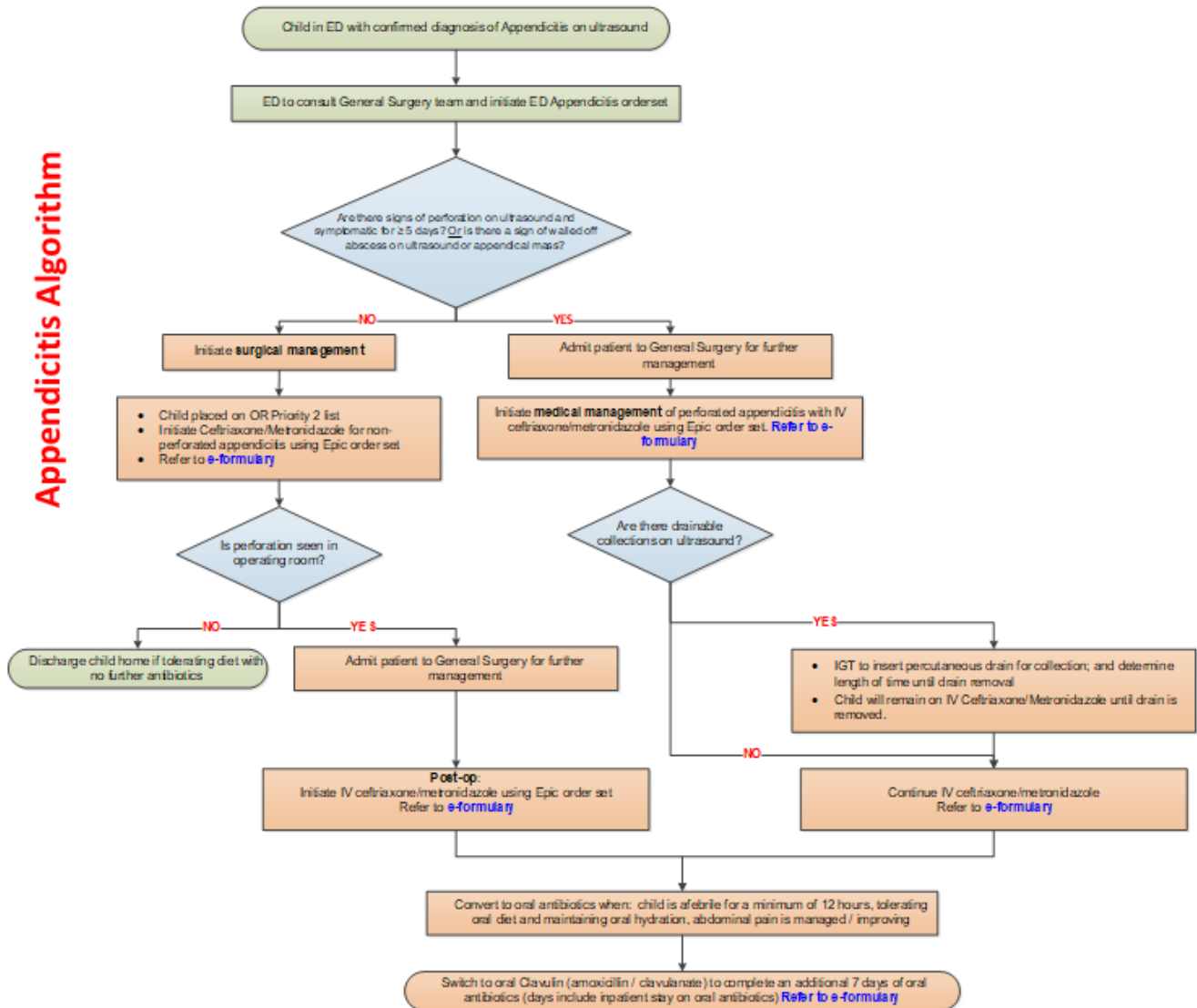
- General Surgery Surgeons, Residents, Fellow, Nurse Practitioners, and nurses on the inpatient units

### 2.0 Definitions

- **Non-perforated appendicitis**- Appendix is normal, injected, inflamed or suppurative. Presence of cloudy fluid +/- local fibrinous exudate, or gangrenous appendicitis but with no visible hole in appendix, abscess or free fecalith
- **Perforated appendicitis**- Visible hole in appendix, free fecalith, diffuse peritonitis with fibrinous exudate or abscess
- **Appendectomy**- surgical removal of the appendix
- **Fever**- a fever is defined as any temperature reading greater than 38°C

### 3.0 Recommendations - [Printable Version](#)

#### Appendicitis Algorithm



\*If the patient clinically worsens, consider upgrade to IV piperacillin/tazobactam. If no ultrasound within the past 2-3 days, repeat in order to evaluate for drainable collection. If collection found, refer to algorithm for patient with drainable collections (IGT).

\*\*Alternative oral antibiotic therapy with Ciprofloxacin and Metronidazole may be considered in setting of confirmed beta-lactam allergy

\*\*\*Antibiotic therapy should be reassessed based on any available microbiological data (ie- if cultures are obtained from an abdominal abscess aspiration)

\*\*\*\* A fever is defined as any temperature reading greater than 38° C (refer to Sepsis Clinical Pathway)

## Inpatient Non-Perforated Appendicitis Care Pathway

	PRE-OPERATIVE	POST-OPERATIVELY	DISCHARGE: WITHIN 24 HOURS POST-OP
GOALS	<ol style="list-style-type: none"> <li>1. Hydration maintained</li> <li>2. Adequate pain control</li> <li>3. Patient prepared for OR</li> <li>4. Child/family are advised of pre-op bath. Wipes to be used upon arrival. Refer to <a href="#">procedure document</a></li> </ol>	<ol style="list-style-type: none"> <li>1. Afebrile</li> <li>2. Adequate pain control</li> <li>3. Ambulating</li> <li>4. Able to tolerate diet (clear fluids to regular diet)</li> <li>5. Incision intact, no drainage, dry and intact</li> </ol>	<ol style="list-style-type: none"> <li>1. Afebrile</li> <li>2. Adequate pain control</li> <li>3. Ambulating</li> <li>4. Able to tolerate diet</li> <li>5. Incision dry and intact</li> <li>6. Child/ caregiver teaching</li> </ol>
PHYSICAL EXAM	<ul style="list-style-type: none"> <li>• Obtain history</li> <li>• Complete physical exam</li> <li>• Assess vital signs</li> <li>• Complete pain assessment (refer to <a href="#">Pain Assessment Guidelines</a>)</li> <li>• Obtain accurate in and out</li> </ul>	<ul style="list-style-type: none"> <li>• Complete pain assessment every 4 hours</li> <li>• Ensure child has adequate pain control (refer to <a href="#">Pain Management Guidelines</a>)</li> <li>• Monitor vital signs as per Bedside Pews (<a href="#">refer to Sepsis Clinical Pathway</a>)</li> <li>• Obtain accurate in and out</li> <li>• Complete wound assessment</li> <li>• Complete abdominal assessment</li> </ul>	
DIET & IV FLUIDS	<ul style="list-style-type: none"> <li>• Ensure that patient is NPO</li> <li>• Administer D5W and 0.9 NaCl with 20mmol KCl/L at maintenance</li> <li>• Bolus as indicated</li> <li>• Refer to <a href="#">Fluid and Electrolyte Guidelines</a></li> </ul>	<ul style="list-style-type: none"> <li>• Clear fluids to regular diet as tolerated</li> <li>• IV to maintenance; TKVO once adequate oral fluid intake</li> <li>• Bolus as indicated</li> <li>• Refer to <a href="#">Fluid and Electrolyte Guidelines</a></li> </ul>	
MEDICATION	<ul style="list-style-type: none"> <li>• Ceftriaxone/Metronidazole IV; if allergy then Clindamycin or Ciprofloxacin &amp; Metronidazole. Refer to the e-formulary</li> <li>• Pain medication as needed; morphine/ acetaminophen/ NSAIDs. Refer to the <a href="#">e-formulary</a></li> </ul>	<ul style="list-style-type: none"> <li>• Acetaminophen as needed for pain/fever</li> <li>• Ketorolac or ibuprofen as needed for pain management</li> <li>• Morphine IV bolus PRN</li> </ul>	
ACTIVITY & EDUCATION	<ul style="list-style-type: none"> <li>• Activity: as tolerated</li> <li>• Consent for surgery</li> <li>• Pre-op procedures for child and caregiver</li> <li>• Review parental involvement in care (pre and post-operatively)</li> </ul>	<p><b>Diet:</b></p> <ul style="list-style-type: none"> <li>• Advance diet as tolerated</li> </ul> <p><b>Pain:</b></p> <ul style="list-style-type: none"> <li>• Acetaminophen and ibuprofen (if not contraindicated) for 48 hours then as needed</li> <li>• Review need for pain management</li> </ul> <p><b>Incision care:</b></p> <ul style="list-style-type: none"> <li>• Leave steri-strips until fall off on own or remove after 10 days</li> <li>• Once steri-strips removed, may wash incision gently with soap and water</li> </ul> <p><b>Signs and symptoms of wound infection:</b></p> <ul style="list-style-type: none"> <li>• Fever</li> <li>• Redness around incision</li> <li>• Drainage from incision</li> <li>• Increasing pain around incision</li> </ul> <p><b>Bathing:</b></p> <ul style="list-style-type: none"> <li>• May shower or bathe; 48 hours after surgery</li> </ul> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Ambulate in hallway</li> <li>• May return to normal daily activities as patient feels able</li> </ul>	<p><b>When to call surgeon's office:</b></p> <ul style="list-style-type: none"> <li>• Wound infection</li> <li>• Vomiting</li> <li>• Fever</li> <li>• Pain</li> </ul> <p><b>Follow-up:</b></p> <ul style="list-style-type: none"> <li>• Confirm need for follow-up with Primary Surgeon</li> <li>• Family doctor/pediatrician in 1-2 weeks</li> </ul>

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## Inpatient Perforated Appendicitis Care Pathway

	DAY OF ADMISSION	DAY # 1	DAY # 2 - # 3	DAY # 4	DAY # 5
GOALS	<ol style="list-style-type: none"> <li>1. Hydration maintained</li> <li>2. Adequate pain control</li> <li>3. Patient prepared for OR if surgical management required</li> <li>4. Child/family are advised of pre-op bath, Wipes to be used upon arrival. Refer to <a href="#">procedure document</a></li> </ol>	<ol style="list-style-type: none"> <li>1. Afebrile</li> <li>2. Adequate pain control</li> <li>3. Ambulating</li> <li>4. Able to tolerate clears (immediately post-op)</li> <li>5. Incision intact, no drainage; dry and intact</li> <li>6. If Nasogastric Tube present, advance from intermittent suction to straight drainage</li> </ol>	<ol style="list-style-type: none"> <li>1. Afebrile</li> <li>2. Adequate pain control</li> <li>3. Ambulating</li> <li>4. Able to tolerate regular diet</li> <li>5. Incision dry and intact</li> <li>6. If Nasogastric Tube present, advance from straight drainage to clamp and remove</li> </ol>	<ol style="list-style-type: none"> <li>1. Afebrile</li> <li>2. Adequate pain control</li> <li>3. Ambulating</li> <li>4. Able to tolerate regular diet</li> <li>5. Incision dry and intact</li> <li>6. Child and family understand discharge teaching</li> <li>7. Able to tolerate oral antibiotics</li> </ol>	
PHYSICAL EXAM	<ul style="list-style-type: none"> <li>• History &amp; Physical</li> <li>• Vital Signs</li> <li>• Height and Weight</li> <li>• Pain Assessment (focus on abdominal) every 4 hours</li> <li>• Accurate In &amp; Out</li> </ul>		<ul style="list-style-type: none"> <li>• Vital signs as per BPEWS (<a href="#">Refer to Sepsis Clinical Pathway</a>)</li> <li>• Pain assessment (focus on abdominal) every 4 hours</li> <li>• Adequate pain control</li> <li>• Accurate In &amp; Out</li> <li>• Wound assessment (remove surgical dressing, leave steri-strips)</li> <li>• Abdominal assessment</li> </ul>		
IV FLUIDS	<ul style="list-style-type: none"> <li>• D5W &amp; 0.9% NaCl with 20mmol KCl/L</li> <li>• Bolus as clinically indicated with 0.9% NS or Lactated Ringer's</li> <li>• Refer to <a href="#">Fluid and Electrolyte Guidelines</a></li> </ul>	<ul style="list-style-type: none"> <li>• D5W &amp; 0.9% NaCl with 20mmol KCl/L at maintenance</li> <li>• Bolus as clinically indicated with 0.9% NS or Lactated Ringer's</li> <li>• Refer to <a href="#">Fluid and Electrolyte Guidelines</a></li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance until adequate oral fluid intake and then TKVO</li> </ul>		
DIET			<ul style="list-style-type: none"> <li>• Diet as tolerated</li> <li>• If NPO, ensure that child is receiving IV fluids with D5W</li> <li>• Assess need for PN therapy</li> </ul>		
MEDICATIONS	<p>Pre-operatively:</p> <ul style="list-style-type: none"> <li>• Pain medication as needed (morphine / acetaminophen)</li> <li>• Start Q24h dosing of IV ceftriaxone and metronidazole (Refer to <a href="#">e-formulary</a> for dosing)</li> </ul> <p>Post-operatively:</p> <ul style="list-style-type: none"> <li>• Acetaminophen as needed for pain/fever</li> <li>• Morphine IV as required</li> <li>• Please check with Primary Surgeon if NSAIDs can be prescribed (Ketorolac vs. ibuprofen).</li> <li>• Q24h dosing of IV ceftriaxone and metronidazole until child is tolerating oral diet and afebrile for 12 hours (Refer to Appendicitis Management Pathway Algorithm (Refer to <a href="#">e-formulary</a> for dosing)</li> </ul>	<p>Pain management:</p> <ul style="list-style-type: none"> <li>• If on morphine infusion, wean as tolerated</li> <li>• Acetaminophen every 4 to 6 hours for 48 hours then as needed for pain/fever</li> <li>• Ketorolac or ibuprofen every 6 hours for 48 hours</li> </ul> <p>Antibiotics:</p> <ul style="list-style-type: none"> <li>• Q24h dosing of IV ceftriaxone and metronidazole</li> <li>• Consider switching to oral antibiotics - Clavulin (amoxicillin/clavulanate) to complete an additional 7 day course) when child is afebrile for a minimum of 12 hours, tolerating oral diet and maintaining oral hydration and abdominal pain is well managed/improving</li> <li>• Refer to <a href="#">e-formulary</a> for dosages</li> <li>• Refer to <a href="#">Appendicitis Algorithm</a></li> </ul>			
ACTIVITY	<ul style="list-style-type: none"> <li>• Ambulating</li> </ul>		<ul style="list-style-type: none"> <li>• Ambulating to chair daily</li> <li>• Progress to ambulating in hallway X 5</li> </ul>		
DIAGNOSTIC IMAGING	<ul style="list-style-type: none"> <li>• Consider an abdominal ultrasound to evaluate for drainable intra-abdominal collection if child is not improving or clinically worsens</li> <li>• If collection is found, refer to <a href="#">Appendicitis Algorithm</a> for child with drainable collection</li> </ul>				
FAMILY / CAREGIVER EDUCATION	<ul style="list-style-type: none"> <li>• Pre-op procedures for parent and child</li> <li>• Consent for surgery signed</li> </ul>	<ul style="list-style-type: none"> <li>• When diet will be started</li> <li>• Need for pain management</li> <li>• Need for mobilizing</li> <li>• Parental involvement in care</li> </ul>	<p>Incision care:</p> <ul style="list-style-type: none"> <li>• Leave steri-strips until fall off on own or remove after 10 days</li> <li>• Once steri-strips removed, may wash incision gently with soap and water</li> </ul> <p>Signs and symptoms of wound infection:</p> <ul style="list-style-type: none"> <li>• Fever</li> <li>• Redness around incision</li> <li>• Drainage from incision</li> <li>• Increasing pain around incision</li> </ul> <p>Bathing:</p> <ul style="list-style-type: none"> <li>• May shower or bathe; 48 hours after surgery</li> </ul> <p>Activity:</p> <ul style="list-style-type: none"> <li>• Ambulate in hallway at least 5 times</li> <li>• May return to normal daily activities as patient feels able</li> </ul>	<p>When to call surgeon's office:</p> <ul style="list-style-type: none"> <li>• Wound infection</li> <li>• Vomiting</li> <li>• Fever</li> <li>• Pain</li> </ul> <p>Follow-up:</p> <ul style="list-style-type: none"> <li>• Confirm need for follow-up with Primary Surgeon</li> <li>• Family doctor/pediatrician in 1-2 weeks</li> </ul>	

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## 4.0 Related Documents

[E-formulary](#)

[Sepsis Pathway](#)

[Pain Management Guidelines](#)

[Pain Assessment Guidelines](#)

[Fluid & Electrolyte Guidelines](#)

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2. Sabrina Boohan, Clinical Pharmacist- 5B General Surgery
3. Christine McGovern, Sr Clinical Manager- 5B General Surgery

### Attachments:

[appendicitis algorithm.pdf](#)

[Non perforated appy pathway.pdf](#)

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