Appendicitis Management Pathway

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 who require a surgical appendectomy or medical management. Patients are to be removed from this pathway if there are significant postoperative complications (eg. bowel obstruction or prolonged TPN) or a change in diagnosis.

Target Users

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

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

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Appendicitis Algorithm

Recommendations - Printable Version

1. Child in ED with confirmed diagnosis of Appendicitis on ultrasound:
   - ED consult General Surgery team and initiate ED Appendicitis ultrasound.

2. Are there signs of perforation on ultrasound?
   - If yes, refer to Appendicitis Management Pathway.
   - If no, proceed with medical management.

3. Medical management of perforated appendicitis with IV colloid/intermediates using Epic order set.
   - Admit patient to General Surgery for further management.

4. Are there drainable collections on ultrasound?
   - If yes, refer to Appendicitis Management Pathway.
   - If no, convert to oral antibiotics when culture results are available and weight is over 10kg.

5. Post-op:
   - Continue IV colloid/intermediates (refer to e-INSIGHT).
   - Switch to oral antibiotics if tolerated.

6. If the patient clinically worsens, consider upgrade to IV antibiotics.

7. If no improvement within 2-3 days, repeat imaging for drainable collection.

8. Antibiotic therapy should be reassessed based on available microbiological data.

9. A fever is defined as any temperature reading greater than 38°C.

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## Inpatient Non-Perforated Appendicitis Care Pathway

<table>
<thead>
<tr>
<th>Pre-operative</th>
<th>POST-OPERATIVE</th>
<th>On-ward care: Within 24 hours post-op</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GOALS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Oropharynx is assessed for pre-op status. Wipes to be used upon arrival. Review procedure assessment</td>
<td>4. Able to tolerate diet (clear fluids to regular diet)</td>
<td>4. Able to tolerate diet (clear fluids to regular diet)</td>
</tr>
<tr>
<td>5. Incision intact, no drainage, dry and intact</td>
<td>5. Incision dry and intact</td>
<td>5. Incision dry and intact</td>
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<table>
<thead>
<tr>
<th><strong>PHYSICAL EXAM</strong></th>
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<tbody>
<tr>
<td>Obtain history</td>
<td>Complete physical exam</td>
<td>Complete physical exam</td>
</tr>
<tr>
<td>Complete pain assessment (refer to Pain Assessment Guidelines)</td>
<td>Assess vital signs as per Bedside review</td>
<td>Assess vital signs as per Bedside review</td>
</tr>
<tr>
<td>Obtain accurate in and out</td>
<td>Obtain accurate in and out</td>
<td>Obtain accurate in and out</td>
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<thead>
<tr>
<th><strong>POST-OBJECTIVE</strong></th>
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<tbody>
<tr>
<td>Ensure patient is NPO</td>
<td>Extravenous D5 w/ 0.9 NaCl or 20mm HCO3 at maintenance</td>
<td>Extravenous D5 w/ 0.9 NaCl or 20mm HCO3 at maintenance</td>
</tr>
<tr>
<td>Stoma as indicated</td>
<td>Refer to Fluid and Electrolyte Guidelines</td>
<td>Refer to Fluid and Electrolyte Guidelines</td>
</tr>
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<table>
<thead>
<tr>
<th><strong>MEDICATION</strong></th>
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<tbody>
<tr>
<td>Ceftazidime/Metronidazole IM or Levaquin or Ciprofloxacin &amp; Metronidazole. Refer to the e-formulary</td>
<td>Acetaminophen as needed for pain, fever</td>
<td>Acetaminophen as needed for pain, fever</td>
</tr>
<tr>
<td>Pain medication as needed, morphine or acetaminophen NDA. Refer to the e-formulary</td>
<td>Morphine IM bolus, PNF</td>
<td>Morphine IM bolus, PNF</td>
</tr>
</tbody>
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<thead>
<tr>
<th><strong>ACTIVITY EDUCATION</strong></th>
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<tbody>
<tr>
<td>Activity as tolerated</td>
<td>Advance diet as tolerated</td>
<td>Advance diet as tolerated</td>
</tr>
</tbody>
</table>

### When to call surgeon’s office:
- Wound infection
- Vomiting
- Fever
- Pain

### Follow-up:
- Confirm need for follow-up with Primary Surgeon
- Family doctor/pediatrician in 1-2 weeks

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# Inpatient Perforated Appendicitis Care Pathway

## DAY OF ADMISSION
1. **Hydration maintenance**
2. **Adhesive pain control**
3. **Patient prepared for OR if surgical management required**

## DAY #1
1. **Adhesive**
2. **Adequate pain control**
3. **Antibiotics**
4. **Able to tolerate clear fluids (immediately post-op)**
5. **Insert rectal, no drainage, dry and intact**
6. **If Nasogastric Tube present, advance from intermittent suction to straight drainage**

## DAY #2 - #3
1. **Adhesive**
2. **Adequate pain control**
3. **Antibiotics**
4. **Able to tolerate regular diet**
5. **Insert dry and intact**
6. **If needed, advance from straight drainage to stamp and remove**

## DAY #4
1. **Adhesive**
2. **Adequate pain control**
3. **Antibiotics**
4. **Able to tolerate regular diet**
5. **Insert dry and intact**
6. **Child and family understand discharge teaching**
7. **If needed, tolerate oral antibiotics**

### Pre-operatively:
- Pain medication as needed (morphine / acetaminophen)
- Start IV (dosing of IV fluid rate and maintenance) (Refer to the formulary for dosing)

### Post-operatively:
- As needed pain medication, as needed for pain management
- Morphine IV as required
- Please check with Primary Surgeon if NSAsIDs can be prescribed (Ibuprofen vs. naproxen)
- IV fluid dosing of IV fluid rate and maintenance (Refer to the formulary for dosing)

## Activity
- Ambulating
- Ambulating to chair daily
- Progress to ambulating in hallway X 5

## Diagnosis and Management
- If collection is found, refer to [Appendicitis Algorithm](#)
- If collection is found, refer to [Appendicitis Algorithm](#)

## Pain Management
- If an epidural infusion, assess as needed
- As needed pain medication
- Morphine IV as required
- NSAsIDS can be prescribed (Ibuprofen vs. naproxen)
- IV fluid dosing of IV fluid rate and maintenance (Refer to the formulary for dosing)

## Antibiotics
- IV fluid (dosing of IV fluid rate and maintenance)
- Consider switching to oral antibiotics – Ceftriaxone (intravenous) (Refer to the formulary for dosing)
- Consider switching to oral antibiotics – Ceftriaxone (intravenous) (Refer to the formulary for dosing)

## Support Services
- **Nursing Interventions:**
  - IV fluid therapy
  - Pain management
  - Fluid and electrolyte management

## Related Documents
- **E-formulary**
- **Sepsis Pathway**
- **Pain Management Guidelines**
- **Pain Assessment Guidelines**
- **Fluid & Electrolyte Guidelines**

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References


6. Children’s Hospital of Philadelphia: Appendicitis without Known GI Disease Clinical Pathway- Emergency

7. Children’s Hospital of Philadelphia: Appendicitis Clinical Pathway- Inpatients

8. Cincinnati Children’s Hospital: Emergency Appendectomy Clinical Pathway


14. Inpatient and Surgical Care: Appendectomy for Ruptured Appendix with Abscess or Generalized Peritonitis Care Guideline


28. University Hospitals of Cleveland: Pediatric Appendicitis/Simple Laparoscopic/Open Technique Care Path


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Attachments:
appendicitis algorithm.docx
appendicitis algorithm.pdf
Non perforated appy pathway.pdf
Non perforated appy pathway.rtf
Perforated appy pathway.pdf
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