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
Appendicitis Algorithm

Recommendations - **Printable Version**

- **Initial ED Evaluation**
  - ED consult General Surgery team and initiate ED Appendicitis protocol.
  -—are there signs of perforation on ultrasound?
  -—no, initiate surgical management
  -—yes, initiate medical management of perforated appendicitis with IV ceftriaxone/metronidazole (or empirical IV ampicillin/sulbactam, refer to antimicrobial guideline)

- **Surgical Management**
  - Child placed on OR Priority 2 list
  - Initiate admission to hospital and perform appendectomy, refer to E-FORMulary

- **Medical Management**
  - Are there drainable collections on ultrasound?
  -—no, discharge patient home if stable with no further antibiotics
  -—yes, initiate post-op care:
    - IV ceftriaxone/metronidazole (or ampicillin/sulbactam, refer to antimicrobial guideline)
    - Continuous IV ceftriaxone/metronidazole (refer to E-FORMulary)

- **Post-op Care**
  - Convert to oral antibiotics when child is able to tolerate a minimum of 12 hours, tapering oral antibiotics and ensuring adequate hydration, stool management
  - Switch to oral Cefdinir (per oral) (doxycycline) to complete an additional 7 days of oral antibiotics (days should be confirmed on oral medications) (refer to E-FORMulary)

- **Special Considerations**
  - If patient clinically worsens, consider upgrade to IV aminoglycoside.
  - If no ultrasound within the past 2-3 days, repeat in order to rule out drainable collection.
  - **Alternative** oral antibiotic therapy with Ceftriaxone and Metronidazole may be considered in setting of confirmed bacteraemia.
  - **Antibiotics** therapy should be assessed based on any available microbiological data (i.e., if cultures are obtained from an abdominal abscess aspiration).
  - **A fever** is defined as any temperature reading greater than 38°C (refer to Surgical Clinical Pathway).

©The Hospital for Sick Children ("SickKids"). All Rights Reserved. This document was developed solely for use at SickKids. SickKids accepts no responsibility for use of this material by any person or organization not associated with SickKids. A printed copy of this document may not reflect the current, electronic version on the SickKids Intranet. Use of this document in any setting must be subject to the professional judgment of the user. No part of the document should be used for publication without prior written consent of SickKids.

Appendicitis Management Pathway
# Inpatient Non-Perforated Appendicitis Care Pathway

## Pre-operative

1. **Hydration maintained**
2. **Adequate pain control**
3. **Patient prepared for OR**
4. **Children are advised of pre-op bath. Wipes to be used upon arrival. Refer to Procedure Document.**

## Physical Exam

- Obtain history
- Complete physical exam
- Assess vital signs
- Complete pain assessment (refer to Pain Assessment Guidelines)
- Obtain accurate in and out

## New ints int

- Ensure that patient is NPO
- Administer D5W and 0.9% NaCl with 20mm HCO3 at maintenance
- Bolus as indicated
- Refer to Fluid and Electrolyte Guidelines

## Medication

- Ceftriaxone/Metronidazole IV, if allergy then Cilnidamicin or Ciprofloxacin & Metronidazole. Refer to the e-Formulary
- Pain medication as needed, monitored acetylsalicylic NSAIDs. Refer to the e-Formulary

## Activity Education

- Activity as tolerated
- Consent for surgery
- Pre-procedures for child and caregiver
- Review parental involvement in care (pre and post-operatively)

## Diet

- **Diet:**
  - Advance diet as tolerated

## Pain

- **Pain:**
  - Acetaminophen and ibuprofen (if not contraindicated) for 48 hours then as needed
  - Review need for pain management

## Incision care

- Leave suture-hips until fall off or come loose after 10 days
- **Once suture-hips removed, may wash incision gently with soap and water**

## Signs and symptoms of wound infection:

- Fever
- Redness around incision
- Drainage from incision
- Increasing pain around incision

## Follow-up

- May shower or bath, 48 hours after surgery
- Activity:
  - Ambulate in hallway
  - May return to basic daily activities as patient feels able

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
# Inpatient Perforated Appendicitis Care Pathway

## DAY OF ADMISSION
1. Hydration maintenance
2. Adequate pain control
3. Patient prepared for OR if surgical management required
- Abdominal pain symptoms are advanced of crampy or colicky.
- Vomiting is to be expected upon arrival.
- Refer to Inpatient Admissions:

## PHYSICAL CARE
- History & Physical
- Vital Signs
- Height & Weight
- Pain Assessment (focus on abdomen) every 4 hours
- Accurate In & Out

## TREATMENTS
- IV 0.9% NaCl with 20mmol KC1
- Order as clinically indicated with 0.9% NS or Lactated Ringer’s
- Refer to Fluid and Electrolyte Guidelines

## DAY # 1
1. Albunex
2. Adequate pain control
3. Antibiotic
4. Able to tolerate clear liquids immediately post-op
5. Increased intake, no drainage, dry and intact
6. If Nasogastric Tube present, advance from intermittent suction to straight drainage

## DAY # 2 - # 3
1. Albunex
2. Adequate pain control
3. Antibiotic
4. Able to tolerate regular diet
5. Incision dry and intact
6. Monitor intake, output, and weekly weight loss

## DAY # 4
1. Albunex
2. Adequate pain control
3. Antibiotic
4. Able to tolerate regular diet
5. Incision dry and intact
6. Child and family understand discharge planning
7. Advice to oral antibiotics

## DAY # 5
1. Vital signs as per PRN (Refer to Sepsis Clinical Pathway)
2. Pain assessment (focus on abdomen) every 4 hours
3. Accurate In & Out
4. Wound assessment (remove suction drain, leave ster-strips)
5. Abdominal dressing

## Nutritional: Pre-operatively:
- Pain medication as needed (morphine / acetaminophen)
- Start ORI dosing of IV narcotics and metoclopramide (Refer to Formulary for dosing)

## Nutritional: Post-operatively:
- Analgesia as needed for pain (acetaminophen IV as needed)
- Morphin IV as needed
- Please check with Primary Surgeon if NSAsIDs can be prescribed (Ketorolac vs. Ibuprofen)
- Oral dosing of IV narcotics and metoclopramide (Refer to Formulary for dosing)
- Oral dosing of IV narcotics and metoclopramide (Refer to Formulary for dosing)

## Pain management:
- If oral morphine infusion, wean as tolerated
- Acetaminophen every 4 to 6 hours for 48 hours then as needed for pain
- Ketorolac or Ibuprofen every 6 hours for 48 hours

## Antibiotics:
- ORI dosing of IV narcotics and metoclopramide
- Consider switching to oral antibiotics – Cefazolin (initially) or amoxicillin (subsequently) to complete an additional 7 days course when child is able to tolerate
- Intravenous oral and intravenous hydration and abdominal pain is well-managed
- Improvement
- Refer to Antibiotics Algorithm
- Refer to Appendicitis Algorithm

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

## INPATIENT EDUCATION:
- If collection is found, refer to Appendicitis Algorithm for child with drainable collection

## Family / Discharge Education:
- When diet will be started
- Need for pain management
- Need for mobilization
- Potential involvement in care

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

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

---

**PRINTABLE VERSION**

**Related Documents**

- E-formulary
- Sepsis Pathway
- Pain Management Guidelines
- Pain Assessment Guidelines
- Fluid & Electrolyte Guidelines

©The Hospital for Sick Children (“SickKids”). All Rights Reserved. This document was developed solely for use at SickKids. SickKids accepts no responsibility for use of this material by any person or organization not associated with SickKids. A printed copy of this document may not reflect the current, electronic version on the SickKids Intranet. Use of this document in any setting must be subject to the professional judgment of the user. No part of the document should be used for publication without prior written consent of SickKids.

Appendicitis Management Pathway  Page 4 of 6
Appendicitis Management Pathway

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


Guideline Group and Reviewers

Guideline Group Membership:
1. Monping Chiang, NP, General and Thoracic Surgery
2. Dr. Joshua Ramjist, Fellow, General and Thoracic Surgery
3. Dr. Augusto Zani, Surgeon, General and Thoracic Surgery
4. Dr. Annie Fecteau, Surgeon, General and Thoracic Surgery

Internal Reviewers:
1. Kealey Clarke, RN, Quality Leader- 5B General Surgery
2. Sabrina Boohan, Clinical Pharmacist- 5B General Surgery
3. Christine McGovern, Sr Clinical Manager- 5B General Surgery

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