



DIAGNOSIS: Perforated Appendicitis <input type="checkbox"/> Abscess <input type="checkbox"/> Phlegmon		WT: _____ kg	HT: _____ cm
ALLERGIES:		Message Phone Number:	
Patient to include on pathway:	<ol style="list-style-type: none"> 1. Patient with a diagnosis of appendicitis with perforation / peritonitis receiving initial treatment with IV antibiotics, followed by delayed interval appendectomy 2. Patient undergoing transrectal or abdominal percutaneous drainage of abscess. 		
Patient to exclude from pathway:	<ol style="list-style-type: none"> 1. Patient with symptoms that require ICU level of care 2. Patient with complicating chronic condition. 3. Patient s/p appendectomy readmitted for abscess. 		
Remove the patient from the pathway if the following occurs:	<ol style="list-style-type: none"> 1. Transfer to a higher level of care. 2. Change in diagnosis 		
PHASE OF CARE:	EMERGENCY ROOM / ADMISSION / DISCHARGE PLANNING		SUPPLEMENTAL ORDERS AND CARE:
INTERVENTION CATEGORIES	START DATE _____	TIME: _____	BY: _____
ADMIT TO:	Acute Care Unit		
ASSESSMENT & MONITORING:	<ul style="list-style-type: none"> - Routine VS, pain assessment - Accurate I&O every shift - If no urine output in 8 hours, <u>without</u> bladder distension, give IV bolus of NS 20 ml/kg x 1 (Max. = one liter); if no void within next 4 hours, notify physician - Assess for developmental delays, regressed behavior, cultural or religious diversity, knowledge deficits and language barriers. 		
ACTIVITY / ENVIRONMENTAL:	<ul style="list-style-type: none"> - Progress ambulation as tolerated to at least TID - Pre-medicate with analgesic prior to activity / ambulation PRN - Sponge bath only if rectal tube or percutaneous abdominal drainage tube in place 		
OPERATIVE / INVASIVE PROCEDURES:	<input type="checkbox"/> Consent for " <i>Transrectal drainage of pelvic abscess</i> " <ul style="list-style-type: none"> • To be obtained after the surgeon/surgical resident has talked to the patient/family <input type="checkbox"/> Consent for " <i>Percutaneous drainage of abdominal abscess with ultrasound, CT or fluoroscopic guidance</i> " <ul style="list-style-type: none"> • To be obtained after the surgeon/surgical resident has talked to the patient/family 		
CONSULTS:	<input type="checkbox"/> PICC evaluation and placement by PICC credentialed registered nurse <input type="checkbox"/> Sedation Team/Anesthesia Care consult as needed for PICC placement; PICC RN to coordinate		
LABORATORY:	<ul style="list-style-type: none"> - CBC, if not done prior to surgery consult - Basic Metabolic Panel (BMP), if patient has been vomiting > 24 hours & if not done prior to surgery consult - Urine pregnancy test per protocol, if patient is scheduled for drainage of abscess with general anesthesia - Avoid antecubitals for lab draws, if possible; reserve for PICC placement 		
NUTRITION:	<input type="checkbox"/> NPO <input type="checkbox"/> May advance to clear liquids PO if bowel sounds present, no abdominal distension, no nausea/emesis (<i>RN to notify HUC of diet change</i>) <input type="checkbox"/> May advance to regular diet if clear liquids tolerated (<i>RN to notify HUC of diet change</i>)		

DIAGNOSIS: Perforated Appendicitis**PHASE OF CARE****EMERGENCY ROOM / ADMISSION / DISCHARGE PLANNING****SUPPLEMENTAL ORDERS AND CARE:****IV THERAPY:**

- Place PIV, avoid antecubitals for IV placement, if possible; If antecubital site must be used, insert #22 gauge or larger, if possible, for later conversion to PICC.
- NS 20 ml/kg IV (Max. = one liter) over 30 minutes ASAP, if not given in ER
- Following completion of bolus, give D5 1/2 NS with 20 mEq KCl/L IV at twice maintenance rate for weight: ____ml/hr (Max. = 125 ml/hr)
- IV bag/tubing change every 96 hrs (noc) _____
- IV site care:
 - PIV - IV site care per 2.3169 Intravenous Catheter Procedure and Management
 - PICC - Dressing change within 48 hours after insertion, if gauze dressing placed beneath tegaderm; routine dressing/cap change every 7 days (days) _____
- Saline lock PIV/Heplock PICC if PO intake adequate

MEDICATIONS:**ANTIBIOTICS**

- **Piperacillin/tazobactam (Zosyn):**
 - Wt ≤ 40 kg: 100 mg/kg (piperacillin component) IV over 60 minutes every 8 hours
 - Wt > 40 kg: 3.375 gm (piperacillin 3 gm + tazobactam 0.375 gm) IV over 60 minutes every 6 hours
- (*Contact Pharmacy for dosing recommendations for patients with renal dysfunction).

ANTI-EMETIC

- **Ondansetron 0.1 mg/kg (max. = 4 mg)** IV every 6 hours PRN nausea/vomiting

ANALGESICS

- **Morphine sulfate 0.05 mg/kg (max. = 4 mg/dose, OR max. dose of ____ mg)** IV every 2 hours PRN moderate to severe pain
- **Morphine sulfate 0.1 mg/kg (max. = 8 mg/dose, OR max. dose of ____ mg)** IV every 2 hours PRN moderate to severe pain, if pain is unrelieved by lower dose

NOTE: Total daily acetaminophen dose not to exceed 75 mg/kg/day or 4000 mg/day, whichever is lower. Include all sources of acetaminophen.

- **Acetaminophen with hydrocodone** (500 mg/5mg) _____ tab(s) PO every 4 hours, PRN moderate pain, if tolerating oral fluids. (max= 8 tabs/24 hours)
- **Acetaminophen with hydrocodone** elixir (167 mg/2.5 mg/5 ml) _____ ml(s) (**Max. = 15 ml**) PO every 4 hours, PRN moderate pain, if tolerating oral fluids
- **Acetaminophen 15 mg/kg (Max. = 650 mg/dose)** PR or PO every 4 hours, PRN mild pain or temperature > 101.5°F (oral)

If patient is NPO:

- **Ketorolac 0.5 mg/kg (Max. = 30 mg/dose)** IV times 1 (loading dose); then:
- **Ketorolac 0.25 mg/kg (Max. = 15 mg/dose)** IV every 6 hours times 7 doses

If patient is tolerating PO, discontinue Ketorolac and give:

- **Ibuprofen 10 mg/kg (Max. = 600 mg/dose)** PO every 6 hours for the remainder of the 7 doses, then every 6 hours, PRN moderate pain.

- Fax order to pharmacy indicating: "Patient tolerating PO, please change Ketorolac to Ibuprofen per Interval Appendectomy Pathway/RN signature



DIAGNOSIS: Perforated Appendicitis		
PHASE OF CARE	EMERGENCY ROOM / ADMISSION / DISCHARGE PLANNING	SUPPLEMENTAL ORDERS AND CARE:
THERAPIES:	<ul style="list-style-type: none"> - Give oxygen per nasal cannula to maintain O₂ saturation ≥ 92% - Pulse oximetry, if patient is receiving oxygen - Wean to room air as tolerated - Incentive spirometry every 1 hour times 24 hours, while awake, then every 6 hours, while awake 	
DISCHARGE PLANNING:	<ul style="list-style-type: none"> - Case Management Referral for home IV therapy - Refer to Appendectomy Discharge Preprinted Order Sheet 	
PATIENT / FAMILY TEACHING:	<ul style="list-style-type: none"> - Explain diagnostic studies - Provide patient/family with a copy of the Appendicitis / Interval Appendectomy Teaching Handout - Initiate "Teaching Plan for Appendectomy" - Initiate "Teaching Plan for Surgical Patient", as indicated - Initiate "Teaching Plan for Home IV Medication Administration" - Explain discharge criteria 	
EXPECTED OUTCOMES:	<ul style="list-style-type: none"> - Notify physician when patient demonstrates all of the following criteria for discharge: <ul style="list-style-type: none"> • Tolerating a regular diet • Pain relief with oral analgesics • Ambulating with minimal assistance, as age-appropriate • PICC / IV antibiotic teaching completed • Arrangements for home IV antibiotic therapy, lab/medical imaging studies, and follow-up clinic appointment complete 	

HUC: Initiated order for clinical pathway in meditech Date: ___/___/___ Time: _____ Signature: _____

PHYSICIAN'S SIGNATURE: Date: ___/___/___ Time: _____ Signature: _____ MD

Pathway Orders Initiated on: Date: ___/___/___ Time: _____ Signature: _____

Reviewed Days: ___/___/___ Time: _____ Signature: _____ Reviewed Nights: ___/___/___ Time: _____ Signature: _____

Reviewed Days: ___/___/___ Time: _____ Signature: _____ Reviewed Nights: ___/___/___ Time: _____ Signature: _____

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What is the appendix?

The appendix is a small finger-shaped pouch found on the large intestine in the lower right side of the abdomen.

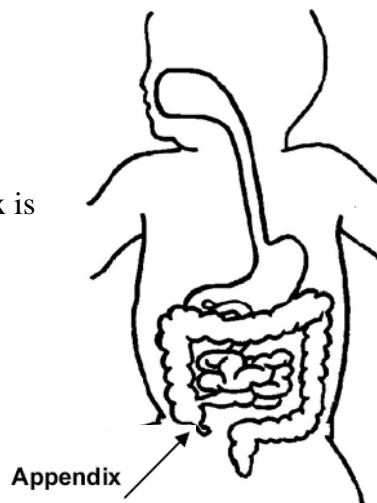
What is appendicitis?

Appendicitis is an inflammation or infection of the appendix. It happens if the opening between the large intestine and the appendix is blocked, or after an infection in the digestive tract.

Sometimes, the appendix can rupture (break open) and spread its infection to the abdomen. This is called a **ruptured appendix**.

How is appendicitis treated?

Appendicitis is treated by an operation to take out the appendix. This surgery is called an **appendectomy**. When the appendix has ruptured and an abscess (collection of pus in the abdomen) has formed, surgery to remove the appendix is not always done right away. Your child will be given IV antibiotics to heal the appendicitis, and the operation to take out the appendix will be scheduled for 6-8 weeks later.



If the abscess is large, it may need to be drained. Drainage can be done by either the surgeon in the operating room, or by the radiologist in the medical imaging center. A radiologist is a doctor who does specialized procedures with the help of x-ray studies. Since every child is different, your child's surgeon will talk with you about the best treatment for your child.

What kind of medicine will my child be given?

Your child will be given IV antibiotics (medicine through a vein) for about 2 weeks. This medicine can be given in the hospital or at home. This depends on how your child is doing and what types of home health services are available to you.

Your child's doctor may ask to have a Peripherally Inserted Central Catheter (PICC line) placed for your child to receive their antibiotics. A specially trained nurse will go over what to expect with you and answer any questions that you may have.

How long will my child be in the hospital?

Children who have a ruptured appendix will usually need to stay in the hospital for several days, even if the plan is to finish treatment at home. Before going home, your child must be able to:

- eat and drink liquids
- stay comfortable on pain medication taken by mouth

What happens after my child leaves the hospital?

You will be given instructions for any special care that is needed at home, including:

- If your child is sent home on IV antibiotics, you will be taught how to care for the PICC line and how to give the medicines at home

- What should my child eat or drink?
Your child can have regular food at home and should drink a lot of liquids
- When can my child go back to normal activities?
 - ❖ Your child can go back to normal activity, but no rough play
 - ❖ Most children are usually able to go back to school after the IV antibiotic treatment is finished
- What type of pain medicines can my child take?
By the time your child goes home, over-the-counter pain medicines, such as acetaminophen (Tylenol) or ibuprofen (Motrin) are usually all that are needed
- Your child's follow-up appointment
This will usually be 10 – 14 days after your child leaves the hospital. Most often, the appointment is scheduled before your child leaves the hospital. If you don't know when your child's follow-up appointment is, call (559) 353-7290

What do I need to do before the follow-up appointment?

- ❖ The surgeon may order a blood test to be done before the clinic visit
- ❖ A CT scan of your child's abdomen and pelvis may also be ordered to help check on the infection. This will be done on the same day as your child's clinic appointment, when possible. Contrast (special dye used for x-ray tests) is given through an IV that will be put in for the CT scan. The contrast cannot be given through a PICC line

When should I call the doctor?

Call your child's surgeon if you have any questions or concerns about how your child is doing after leaving the hospital, or if your child has:

- ❖ A fever (greater than 101.5° F for more than 24 hours)
- ❖ Pain that does not go away after taking acetaminophen (Tylenol) or ibuprofen (Motrin)
- ❖ Nausea (feeling sick to your stomach) or vomiting (throwing up)
- ❖ Problems with urinating (making pee), diarrhea (watery poop) or constipation (no poop)

References:

Roach, J. P., Partrick, D. A., Bruny, J. L., Allshouse, M. J., Karrer, F. M., & Ziegler, M. M. (2007). Complicated appendicitis in children: a clear role for drainage and delayed appendectomy. *American Journal of Surgery*, 194(6), 772-773.

Emil, S., & Duong, S. (2007). Antibiotic therapy and interval appendectomy for perforated appendicitis in children: A selective approach. *American Surgeon*, 73(9), 917-922.

Interval Appendectomy Surgical Pathway (2009).

[http://childrenscentralcal.org/Services/medicaloffice/pathways/Documents/Interval Appendectomy Pathway.pdf](http://childrenscentralcal.org/Services/medicaloffice/pathways/Documents/Interval_Appendectomy_Pathway.pdf)

DRUG SENSITIVITY

WT.

kg.

**Time/
Date:**

Generic equivalent will be dispensed unless orders specify "Do Not Substitute"

- 1. PICC PIV line supplies, medication pump, pole
- 2. **Home Health Nursing to teach IV therapy administration**
- 3. **Medications to be dispensed by Home Health Agency:**

Stop Date

- CefTRIAxone 50 mg/kg (max.= 2000 mg/dose)** IV every 24 hours
- (see Metronidazole below)
- Ertapenem**
 - < 13 years: Ertapenem 15 mg/kg/dose (up to 500 mg) IV every 12 hours
 - ≥ 13 years: Ertapenem 1000 mg IV every 24 hours
- Piperacillin/tazobactam (Zosyn):**
 - Wt ≤ 40 kg: 100 mg/kg (piperacillin component) IV over 60 minutes every 8 hours
 - Wt > 40 kg: 3.375 gm (piperacillin 3 gm + tazobactam 0.375 gm) IV over 60 minutes every 6 hours

(*Contact Pharmacy for dosing recommendations for patients with renal dysfunction)

- Other** _____
- Other** _____

4. Medications to be dispensed by Outpatient Pharmacy:

Stop Date

- Metronidazole 10mg/kg/dose (Max. = 500mg/dose)** PO 3 times a day
- Other Medication:** _____

Pain Medication(s) for _____ to include:
(Patient's Name)

- 1) _____
- 2) _____

**Please specify drug, dosing instructions and quantity to be dispensed*

5. Medical Imaging studies to be completed on: _____

- Abdominal/pelvic CT scan with IV and/or PO contrast
- Abdominal/pelvic CT scan without contrast
- Abdominal/pelvic ultrasound

6. Laboratory studies

- To be done at Children's Hospital Outpatient Lab To be drawn by Home Health Nurse; Fax results to: (559) 353-7286
- **If patient is receiving Gentamicin***, BUN/Creatinine, Gentamicin Trough Level to be completed on: _____
(*Obtain after 7 days total therapy, and every 7 days thereafter)
- CBC with differential, to be completed on: _____

7. Follow-up visit in Surgery Clinic on: _____

Physician's Signature

Date/Time

Note: Physician or NP/PA signature required; verbal/telephone orders are not permitted for this form.

- Karen Cartwright, MD (Lic #G44733; DEA #AC132549)
- Michael Allshouse, DO (Lic #A4992; DEA #BA3397278)
- Jill Ghanbarian, MSN, FNP-C (Lic #NPF12584; DEA #MG1461893)
- Russel Ladwig, PA-C (Lic #PA17196; DEA #ML1685075)
- Douglas Tamura, MD (Lic #A72165; DEA #BT6867709)
- Lisa Gilliam, MSN, CPNP (Lic #NPF13021; DEA #MG1671115)
- Susan Morgan, MSN, CPNP (Lic #NPF95250; DEA #MM1555311)

Pediatric Surgery Clinic, 9300 Valley Children's Place (GE01), (559) 353-7290

Appendicitis Pathway Discharge

Patient Label

0032



George Page 3/2009



Physician's Preprinted Orders