Acute Abdominal Pain

BACKGROUND

- Acute abdominal pain is a **common** pediatric presentation.
- It accounts for **~10% of primary care visits** and ~**10% of emergency department (ED) visits**.
- Abdominal pain can be **visceral**, **somatic**, or **referred**.
- Much of the time, abdominal pain is **self-resolving** and **non-life-threatening**.
- In children, **constipation** is the most frequently identified cause of acute abdominal pain.
- Between **10-30%** of pediatric **ED** visits for acute abdominal pain require **surgical intervention**.
- **Appendicitis** is the most common surgical emergency.

HISTORY

- **HPI**: *OPQRST* [onset (gradual vs. sudden), palliating/provoking factors, quality, region & radiation, severity, timing (intermittent vs. constant)], previous episodes of similar pain, trauma history, pain interfering with activities or sleep
- **Associated symptoms**: fever, vomiting (bilious vs. non-bilious, bloody), hard stools, diarrhea, bloody stool, anorexia, cough, SOB, sore throat, urinary symptoms, vaginal bleeding/discharge, joint pain, rash, weight loss
- **Past medical** & **past surgical history**
- **Menstrual history**: age at menarche, duration, frequency, blood flow, dysmenorrhea, last menstrual period (LMP)
- **Sexual history**: partners, practices, past sexually transmitted infections (STIs), STI protection, contraception
- **Medication history**: some meds can cause nausea or abdominal pain
- **Family history**: sickle cell anemia, cystic fibrosis, etc.

Clinical pearl: if pain precedes vomiting, it is likely a surgical cause; however, if the *pain follows vomiting*, it is more likely to be a *medical cause*.

PHYSICAL EXAM

- **General appearance** & **vitals**: *sick vs. not sick*, activity level, food and fluid intake, fluid status, jaundice, etc.
- **ENT exam**: otitis media, pharyngeal exudate or erythema
- **Pulmonary exam**: focal consolidation
- **Abdominal exam**: bowel sounds, palpation for enlarged organs or masses, distention, guarding, rebound tenderness, Murphy's sign, Rovsing's sign, iliopsoas and obturator tests, McBurney's point tenderness
- **+/- DRE**: presence of constipation (hard stool in the rectal vault), melena
- **+/- Testicular exam**
- **+/- Pelvic exam**: pubertal girls, discharge, cervical motion tenderness, etc.

INVESTIGATIONS

Initial investigations:	**Other investigations to consider depending on the history and presentation**:			
CBCdiff	Urinalysis	Lipase, amylase	Chlamydia & gonorrhea	Ultrasonography	Upper GI study
CRP	β-hCG	LFTs	Stool studies	Abdominal x-ray	CT or MRI

However, not all children presenting with acute abdominal pain require investigations. Investigations should be guided based on history and physical exam.

DIFFERENTIAL DIAGNOSIS FOR ACUTE ABDOMINAL PAIN IN PEDIATRICS

- Considering a differential diagnosis by **age group** is a logical approach as the differential for acute abdominal pain is vast.
- Before you even step into the room to meet the patient, you can have an idea of potential diagnoses based on age.

INFANTS & TODDLERS (0-4 years)

- Colic
- Cow's milk protein allergy
- Hirschsprung disease
- Incarcerated hernia
- Intussusception
- Lead poisoning
- Malrotation of the midgut
- Meckel diverticulum
- Necrotizing enterocolitis

SCHOOL AGE (5-11 years)

- Abdominal migraine
- Diabetic ketoacidosis
- Functional pain
- Henoch-Schonlein purpura
- Lactose intolerance
- Lead poisoning
- Mononucleosis
- Perforated ulcer

ADOLESCENCE (12-18 years)

- Diabetic ketoacidosis
- Dysmenorrhea
- Early pregnancy loss
- Ectopic pregnancy
- Functional pain
- Henoch-Schonlein purpura
- Hepatitis
- Inflammatory bowel disease
- Irritable bowel syndrome
- Lactose intolerance
- Mononucleosis
- Pelvic inflammatory disease
- Perforated ulcer
- Ruptured ovarian cyst
- Sexually transmitted infections
- Urolithiasis

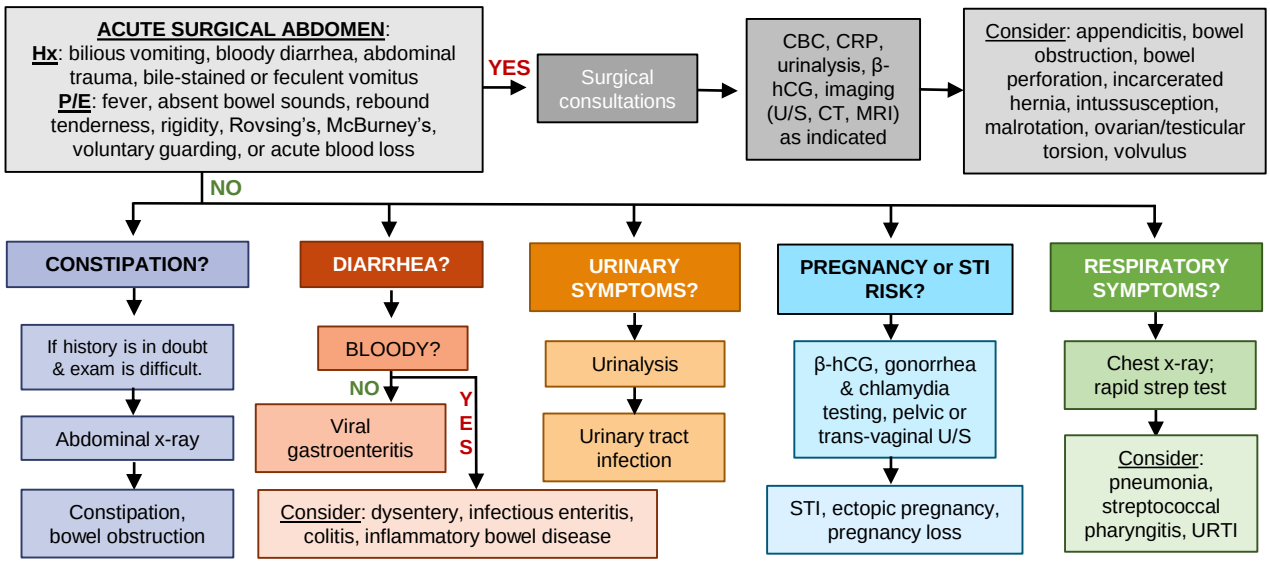
ALL AGES (0-18 years)

- Adhesions
- **Appendicitis**
- Bowel obstruction
- **Child abuse**
- **Constipation**
- Dietary allergies
- Gallbladder disease
- **Gastroenteritis**
- Hemolytic uremic syndrome
- Hepatitis
- Mesenteric adenitis
- Myocarditis/pericarditis
- Ovarian torsion
- Pancreatitis
- Sickle cell crisis
- Testicular torsion
- Trauma
- Tumour
- Urinary tract infection
- Viral infection
- Volvulus

Published Oct 03, 2020
Katharine V. Jensen (Medical Student 2021, University of Alberta), Dr. Peter MacPherson (Pediatrician & Assistant Professor, Queen's University), & Dr. Melanie Lewis (Pediatrician & Professor, University of Alberta) for www.pedscases.com

Acute Abdominal Pain

Evaluation & Diagnostic Algorithm for Acute Abdominal Pain



Appendicitis

Acute appendicitis is the **most common** pediatric surgical emergency.

Pediatric Appendicitis Score (PAS)

Criteria	Description	Score
RLQ tenderness to percussion, hopping, or cough	No Yes	0 2
Migration of pain to RLQ	No Yes	0 1
Fever ≥ 38°C (100.4°F)	No Yes	0 1
Anorexia	No Yes	0 1
Nausea or vomiting	No Yes	0 1
Tenderness over right iliac fossa	No Yes	0 2
Leukocytosis WBC >10,000	No Yes	0 1
Neutrophilia ANC > 7,500	No Yes	0 1

Management Based on PAS Score

Low Risk (<4)	Equivocal (4-6)	High Risk (>6)
▪ Low likelihood of acute appendicitis ▪ Likely do not warrant imaging	▪ Imaging (U/S or MRI) ▪ Surgical consult *may* be warranted	▪ Surgical consult is warranted

Equivocal & high risk patients: maintain NPO, IV fluids, analgesia, and imaging or surgical consultation.

Constipation

The **most frequently identified** cause of acute abdominal pain is constipation.

Constipation

History	Physical Exam
▪ Long history of **difficult** or **painful defecation** ▪ **Infrequent** bowel movements ▪ **Withholding behavior** ▪ **Poorly localized** pain, usually non-radiating	▪ Mild **tenderness** to palpation ▪ Palpable **fecal masses** ▪ DRE may reveal hard **stool in the rectal vault**

Investigations	Management
▪ Labs are usually **unnecessary** ▪ Consider **abdominal x-rays** if the history is in doubt and the physical exam is difficult.	▪ **Lactulose** or **polyethylene glycol 3350** PO or via NG tube ▪ Enemas are not recommended ▪ Maintenance regimen: **daily stool softeners**, daily timed **toilet sitting**, and **improved diet**

Functional constipation: (*most common*) does not have an anatomical or physiological cause, yet the child experiences distressing infrequent passage of uncomfortable and hard stools.

Important Points

- Look for any **red flags** that would require further investigation and/or consultation.
- Remember that this may be an **acute presentation of a chronic problem** (e.g.: child presenting to the ED with abdominal pain from chronic constipation).
- If the child is being discharged with an uncertain diagnosis, it is crucial to inform families to **return to hospital** should **symptoms progress** or the child **becomes sicker**.

Published October 03, 2020
Katharine V. Jensen (Medical Student 2021, University of Alberta), Dr. Peter MacPherson (Pediatrician & Assistant Professor, Queen's University), & Dr. Melanie Lewis (Pediatrician & Professor, University of Alberta) for www.pedscases.com