



# Pre-Pathway Validation

## Is this Ileocolic Intussusception?

**Intussusception** is the invagination of one portion of the intestine into lumen of adjacent intestine. Ileocolic intussusception is the invagination of the terminal ileum into the cecum.

- Intussusception is the most common cause of intestinal obstruction in young children.
- 80% of cases occur in children under the age of 2.

### Typical Presentation

- Patients will present with colicky abdominal pain, emesis, bloody stools, and palpable mass on abdominal exam.

### Consider Other Alternative Diagnoses when:

- Fever or concerns for underlying infection or shock
- Signs of severe peritonitis including rebound tenderness and guarding
- Known or concern for underlying disorder including: Meckel's diverticulum, Henoch-Schonlein purpura, bleeding disorder or Inflammatory Bowel Disease

**Consider a Diagnostic Timeout ("What else could this be?") or using a diagnostic checklist.**



### Inclusion Criteria

- Patients presenting with signs and symptoms listed below concerning for intussusception
- Patients with positive ultrasound for ileocolic intussusception

### Exclusion Criteria

- Patients with negative ultrasound for intussusception
- Patients with small bowel to small bowel intussusception

### Diagnostic Timeout

#### Red Flags

- Fever or concerns for underlying infection or shock
- Signs of severe peritonitis including rebound tenderness and guarding
- Known or concern for underlying disorder including: Meckel's diverticulum, Henoch-Schonlein purpura, bleeding disorder or Inflammatory Bowel Disease

### Diagnostic Timeout

#### Differential Diagnoses

- Gastroenteritis
- Ruptured Appendicitis
- Small Bowel Obstruction



## Admission

### Absolute Criteria

- Peritonitis
- Three failed reduction attempts
- Successful enema reduction with identification of lead point requiring semi-urgent operative intervention
- Family unable to return to the ED if symptoms recur
- New or persistent symptoms in the ED after successful reduction

### Relative Criteria

- Fever
- Bloody Stools
- Prolonged duration of symptoms (>12 hours) prior to reduction

# Differential Diagnoses

## Findings suggestive of another diagnosis include:

- **Gastroenteritis** – Patients will present with intermittent abdominal pain and emesis. Ultrasound will rule in intussusception.
- **Ruptured Appendicitis** – Patients will present abdominal pain, emesis, and possible palpable mass. However, these patients will have more symptoms of infection. Ultrasound will demonstrate evidence of ruptured appendicitis and not intussusception.
- **Small Bowel Obstruction** – Patients will present with emesis, distention, decreased stool output, and possible obstipation. Possible causes of SBO include but not limited to intussusception, hernia, adhesive disease, and congenital bands. US will assist with diagnosis ruling in/out intussusception.

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# Complications of Air Enema Reduction

- Perforation
- Tension Pneumoperitoneum
- Hemodynamic Instability

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# Testing

## **Abdominal Ultrasound**

- Ultrasound is 98% sensitive and 98% specific for intussusception. (Level 1 Evidence, Strong Recommendation)<sup>4</sup>
- Ultrasound will demonstrate a peripheral hypoechoic ring (bowel wall) with a central hyperechogenicity (mesenteric fat) (Target Sign).

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# Severity Assessment

- Evidence of shock or acute abdomen should prompt early surgical consultation
- The surgical team should be notified if recurrence of abdominal pain after enema reduction. An interdisciplinary decision can be made to pursue repeat reduction or proceed with surgical management

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# Admission Criteria

## Absolute Criteria

- Peritonitis
- Failed reduction attempt while in the ED
- Successful enema reduction with identification of lead point requiring semi-urgent operative intervention
- Family unable to return to the ED if symptoms recur
- New or persistent symptoms in the ED after successful reduction

## Relative Criteria

- Fever
- Bloody Stools
- Prolonged duration of symptoms (>12 hours) prior to reduction

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# Assessment & Monitoring

- Patients will be assessed for high risk factors prior to reduction
  - High risk factors Include: Less than 10 months old, lethargy, shock, peritonitis, SBO, history of symptoms greater than 48hr, and US findings concerning for ascites or intraloop fluid
- Patient will be evaluated by the surgical team prior to reduction and immediately post-reduction to rule out peritonitis

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# Treatment Recommendations

## Recommended Treatments

- Fluoroscopic (FL) Enema reduction. If enema reduction is unsuccessful, radiology and surgery will discuss reattempt vs operative intervention after 3<sup>rd</sup> attempt or if complications arise. (Level III evidence, Strong Recommendation)
- Repeat FL enema should be performed after 2-4hrs
- Treatment for patients with high risk factors will be determined by surgical team and will be based on entire clinical picture

## Treatments Not Recommended

- Antibiotics are not required.
- Barium Contrast Enema for reduction

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# Deterioration & Escalation of Care

## Identification of Deterioration

- Patient's abdominal exam should be monitored post-reduction for evidence of peritonitis
- If there is change in patient's hemodynamic status or clinical exam surgical team will determine next step in management

## Escalation of Care Protocol

- Unsuccessful reduction should prompt discussion between radiology and surgical team
- Complications after reduction including perforation, peritonitis, hemodynamic instability should prompt admission and evaluation by surgical team to determine next intervention

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# Discharge Criteria & Planning

- Discharge patient once they have been observed for 3 hours after successful reduction and tolerated PO challenge
- The patient must be evaluated by pediatric surgery attending or fellow after reduction
- Patient does not need to stool prior to discharge
- Patient will return to the ED if symptoms recur

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# Patient & Caregiver Education

## Education on: Helping Hands

I-362 Intussusception: Outpatient

I-193 Intussusception: Inpatient

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# Risk Awareness & Zero Hero

- Decrease unnecessary hospital admissions after successful reduction
- Altered mental status (AMS)/Lethargy can be a late finding of intussusception and should be considered in the above mention clinical setting and when other causes of AMS/lethargy have been eliminated

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# Key References

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# Quality Measures

## Process Measure

- ED Order Set usage
- Time between positive ultrasound and air enema

## Outcome Measure

- Percent of patients with ileocolic intussusception discharged from the ED after a successful air enema

## Balancing Measure

- Return to ED/admission within 7 days for same cause or complication

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# Potential Areas for Research

- Retrospective chart review of NCH patients with ileocolic intussusception to demonstrate safety of discharge from the ED since implementation of QI initiative

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# Pathway Team & Process

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## Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associated with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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