Intussusception

Presented by: Dr Ayah Elayan

Case senario

- A 9-month-old male presented to ER with Episodes of inconsolable crying and sudden sleepiness.
- mother reports that he was perfectly healthy until six hours ago. He began having sudden, 5-minute episodes of intense screaming while drawing his legs up to his chest. Between these episodes, he seems unusually lethargic—his mother describes him as "floppy" and "exhausted." He has vomited twice; the vomit was non-bilious (yellow).

Physical Exam

- **Vitals:** HR 145 (tachycardic), Temp 37.2°C (99°F), RR 30.
- **General:** Infant is currently somnolent but rouses and screams when the abdomen is touched.
- **Abdomen:** Soft, but there is a subtle fullness in the Right Upper Quadrant (RUQ). The Right Lower Quadrant (RLQ) feels "empty" upon deep palpation.
- **Skin:** Normal turgor, no rashes.

- What is the significance of the "empty" Right Lower Quadrant?
- What is the top differential for "sudden screaming" in a 9-month-old?

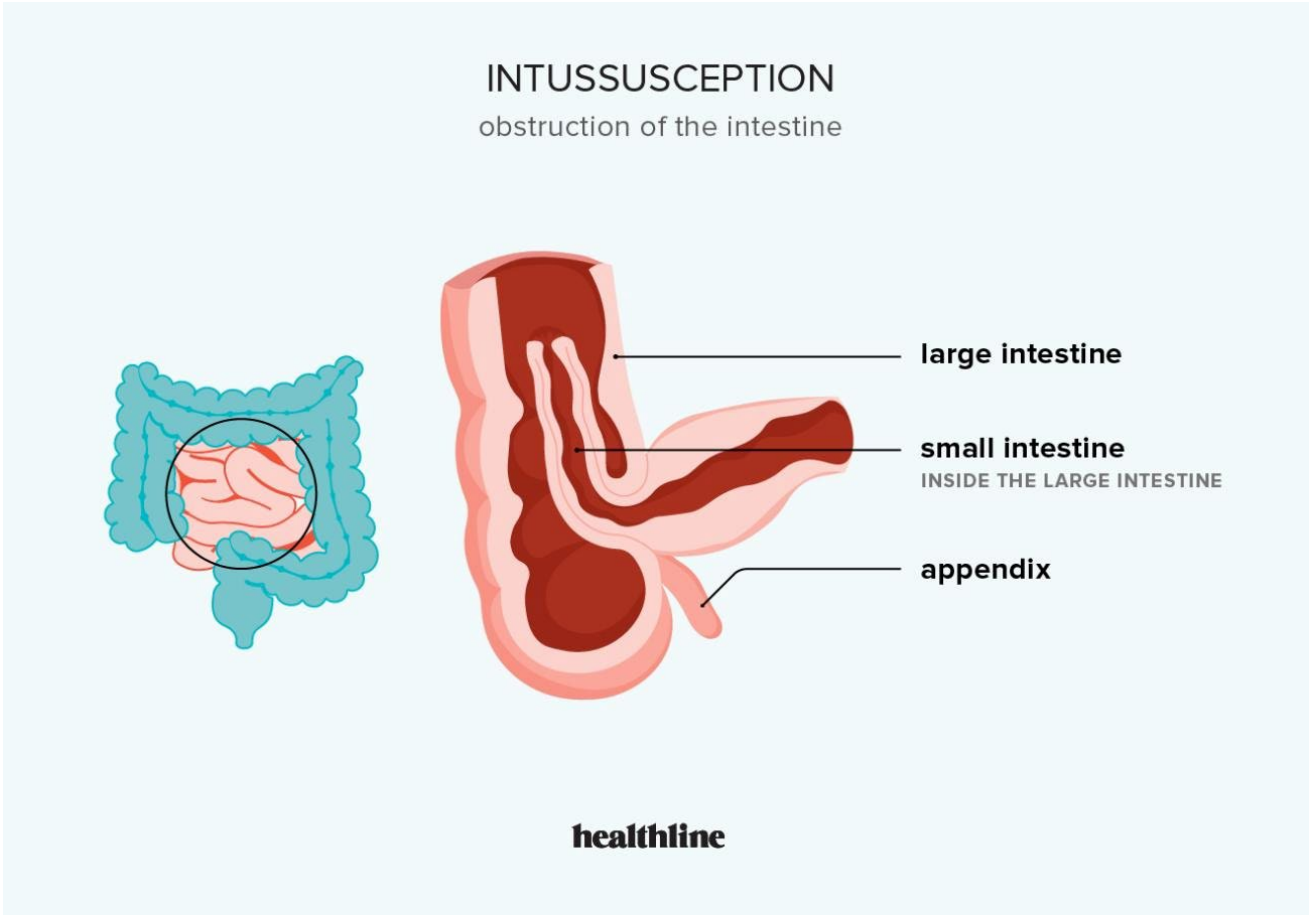
- The mother mentions that her child had a "cold" (cough and runny nose) last week.

Key points

- The diagnosis of intussusception requires a high index of suspicion. Consider intussusception in infants and children with intermittent distress, pallor, vomiting or isolated unexplained lethargy
- Fluid resuscitation is important prior to sedation and reduction
- Delayed presentation of intussusception can manifest as small bowel obstruction, bowel perforation, peritonitis and/or shock
- Ultrasound is the initial study of choice
- Ileocolic intussusception necessitates rapid diagnosis and a collaborative treatment approach involving emergency medicine, radiology and surgery

- Intussusception is the invagination (telescoping) of a proximal segment of bowel into the distal bowel lumen. The most common site is a segment of ileum moving into the colon through the ileo-caecal valve. This process leads to bowel obstruction, venous congestion and eventually bowel wall ischaemia. Perforation can occur and lead to peritonitis and shock

- May occur at any age, but most commonly between 3 months and 2 years of age, with peak incidence at 4-9 months of age
- Most cases are idiopathic, with one-third of the patients having a recent viral illness
- In younger infants, the clinical presentation may be atypical, often more acute and rapidly progressive
- In older children, a pathological lead point may be the cause


INTUSSUSCEPTION
obstruction of the intestine
large intestine
small intestine
INSIDE THE LARGE INTESTINE
appendix
healthline

Type	Age Group	Cause
Idiopathic	3 months – 3 years	Often triggered by viral illness (e.g., Adenovirus) causing Peyer’s patch hypertrophy which acts as a lead point.
Pathologic Lead Point	> 3 years	Higher suspicion for Meckel’s diverticulum, polyp, lymphoma, or Henoch-Schönlein purpura (HSP) submucosal hematoma.

- **The Classic Triad (Only ~20% of cases):**
  - Intermittent colicky abdominal pain (the child screams and draws knees to chest).
  - Sausage-shaped palpable mass (usually in the RUQ).
  - "Currant jelly" stools (a late sign indicating bowel ischemia and mucosal sloughing).

History

- Children most commonly present to the ED with paroxysmal (colicky) abdominal pain and/or vomiting (70% of presentations)
  - The typical paroxysmal pain is described as severe, cyclic or cramping. The pain episodes usually last 4-5 minutes
  - Episodes can recur within minutes to hours and may increase in frequency over the next 12-24 hours
  - Vomiting is usually a prominent feature, **bile-stained vomiting** is a late sign and indicates a bowel obstruction

- Intermittent pain or distress, the child may appear very well between episodes
- Poor feeding
- Pallor, especially during episodes
- Lethargy may be the only presenting symptom. It may be profound, episodic or persistent
- Diarrhoea may occur initially and can lead to a misdiagnosis of gastroenteritis. **Rectal bleeding** or the classic **"red currant jelly"** stool are late, less common signs suggesting bowel ischemia and infarction
- The triad of intermittent abdominal pain, palpable abdominal mass and red currant jelly stools occurs in less than 15% of children

Additional risk factors

- More frequent in males than females (3:1 ratio)
- Recent intussusception (may present with more subtle symptoms)
- Henoch Schönlein Purpura
- Rare associations: Meckel's diverticulum, lymphoma, luminal polyps eg Peutz Jegher Syndrome, recent bowel surgery
- Current rotavirus vaccines are not linked to intussusception

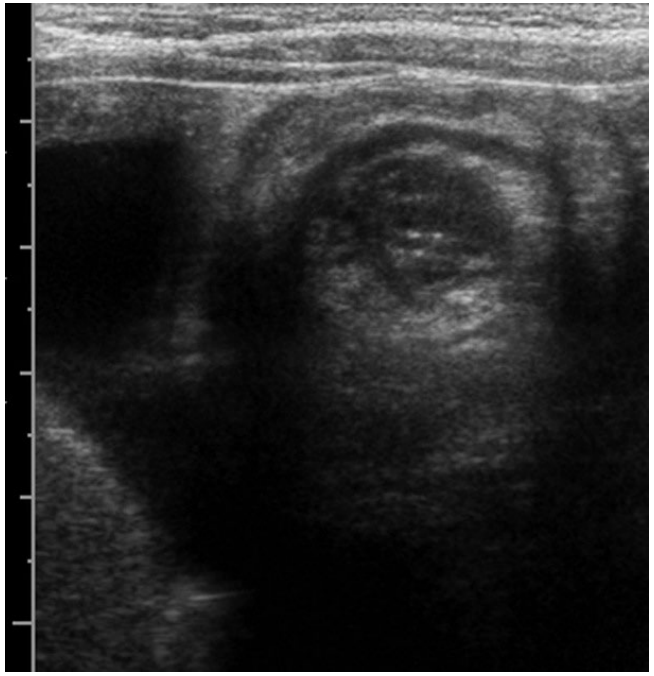
Examination

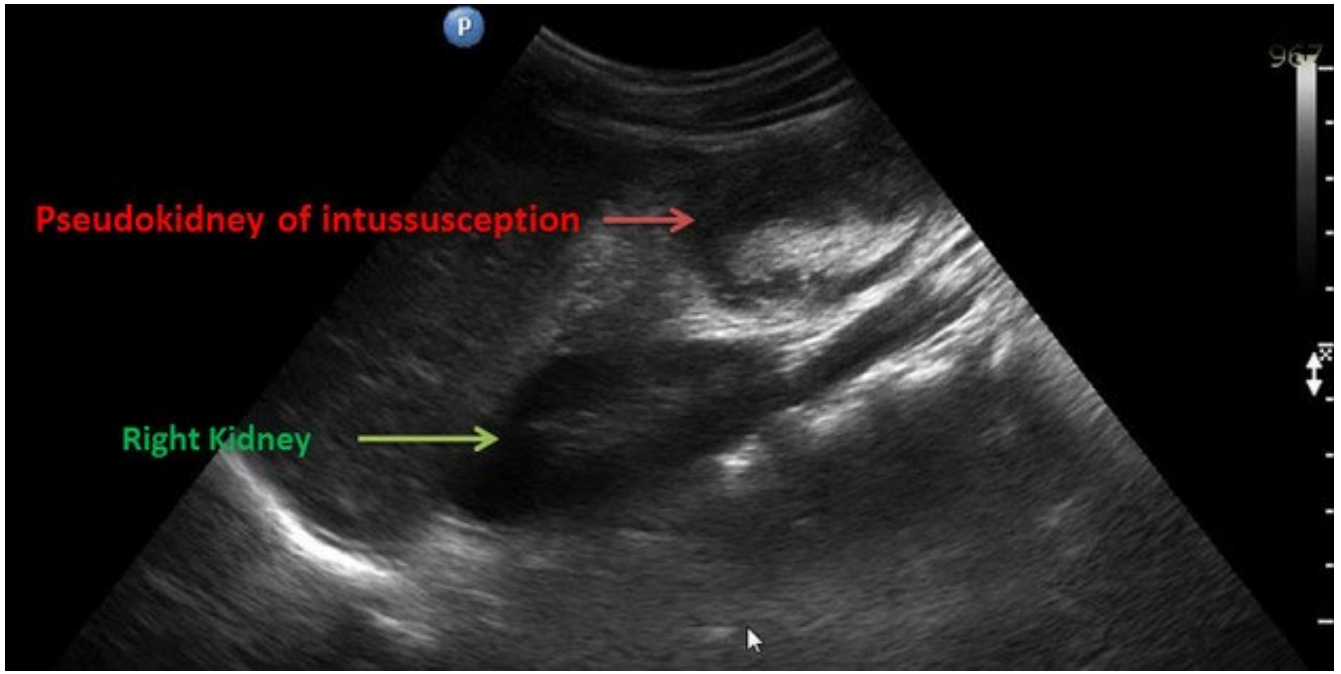
- **Abdominal distension** suggests bowel obstruction
- **Tenderness or guarding** may suggest perforation and peritonitis
- Abdominal mass may be felt, typically a sausage shaped mass in the right abdomen, crossing the midline in the epigastrium or behind umbilicus
  - may be subtle and examination is best performed when the child is settled in between episodes
- Inspect the nappy and perianal region. A rectal examination is rarely indicated
- Infants may present with **hypovolaemic shock**

Investigations

- **Ultrasound scan**
- High sensitivity (>98%) and specificity (>98%) when performed by an experienced paediatric ultrasonographer
- Point of Care Ultrasound (POCUS) can be used to confirm the diagnosis of intussusception by appropriately trained clinicians (95% sensitivity and 98% specificity). It should not be used to exclude the diagnosis
- If no bowel abnormality is seen, extend the examination to full abdomen to rule out other causes for pain
- Ileo-ileal intussusception, involving invagination of two small bowel segments, may present with mild symptoms. This type of intussusception is more likely to resolve spontaneously and rarely requires enema reduction, as ischaemia is rare. This is generally the manifestation of viral illness and usually self resolves if the affected area is small (2-3cm)


F# 39

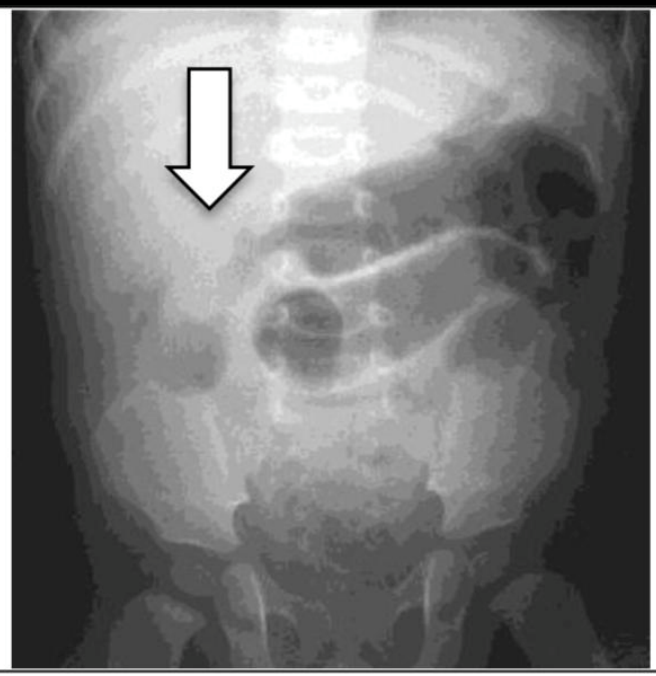



P
Pseudokidney of intussusception
Right Kidney

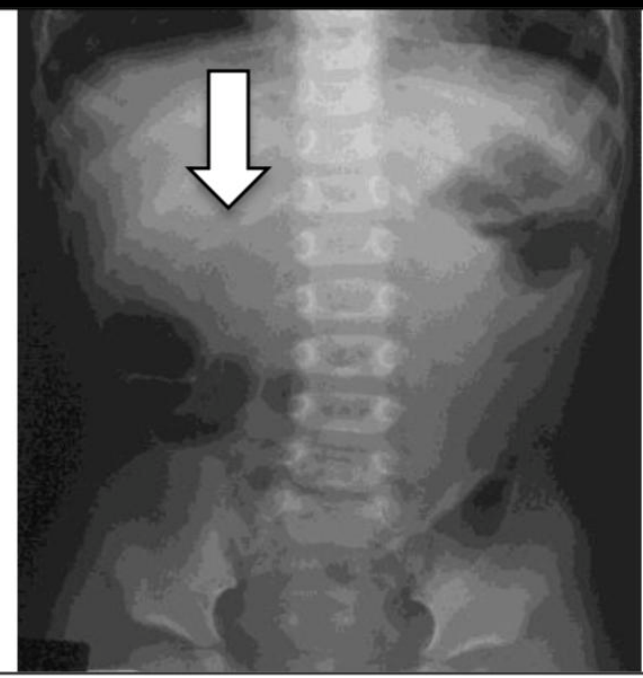
Abdominal X-Ray

- Perform AXR **only** if there are signs of obstruction or perforation
- AXR may be used in centres without ready access to ultrasound, although this should not delay transfer to appropriate services.
- A normal AXR does not exclude intussusception (sensitivity <50%)
- Signs suggesting intussusception on an abdominal x-ray include
  - an abnormal gas pattern, with an empty right lower quadrant and visible soft tissue mass in the upper abdomen
  - a soft tissue mass surrounded by a crescent lucency of bowel gas (crescent sign)
  - lack of faecal material in the large bowel
  - signs of small bowel obstruction
  - pneumoperitoneum indicating bowel perforation

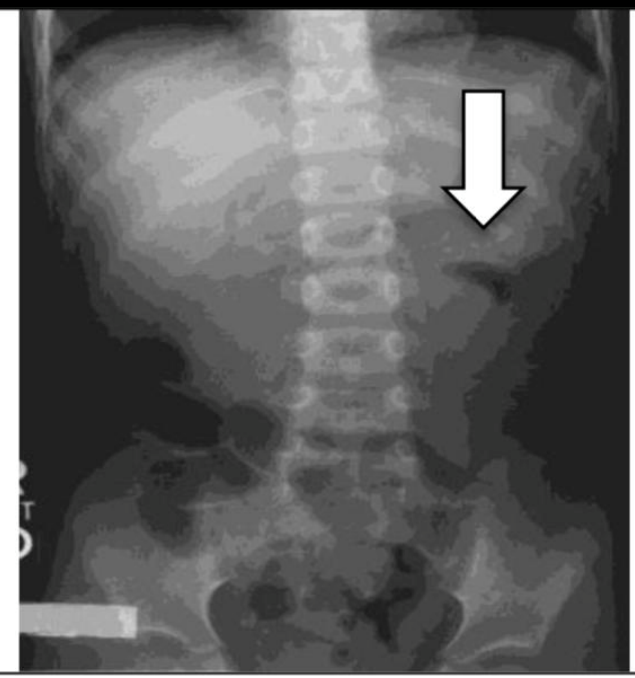
XRAY FINDINGS OF INTUSUSCEPTION



ABSENT LIVER EDGE



TARGET SIGN



CRESENT SIGN

Contrast/gas enema

- The enema may be used diagnostically and therapeutically in consultation with a surgical team.
- There is a small risk of **bowel perforation** and **bacteraemia** during the gas enema. Therefore, the enema is performed where paediatric surgery is available in case of the need for laparotomy. A surgical doctor, as well as a suitably trained nurse, may accompany the child with appropriate resuscitation equipment
- Appropriate peri-procedural analgesia is necessary, is usually intranasal fentanyl or IV morphine
- Procedural sedation by an experienced clinician should be strongly considered, as this may improve the success rate of non-operative reduction, both hydrostatic and pneumatic enema

- Procedural sedation by an experienced clinician should be strongly considered, as this may improve the success rate of non-operative reduction, both hydrostatic and pneumatic enema
- Routine prophylactic antibiotics do not decrease post-reduction complications and are therefore unnecessary
- Success rate is more than 80%
- Recurrences most commonly occur within the first 24-48 hours
- Repeated enemas may be considered and may increase success rates by 10% with few complications
- **Contraindicated** in **peritonitis**, **shock**, radiological evidence of **bowel perforation**, or an unstable clinical condition

Fig-1. Plain film--crescent sign.

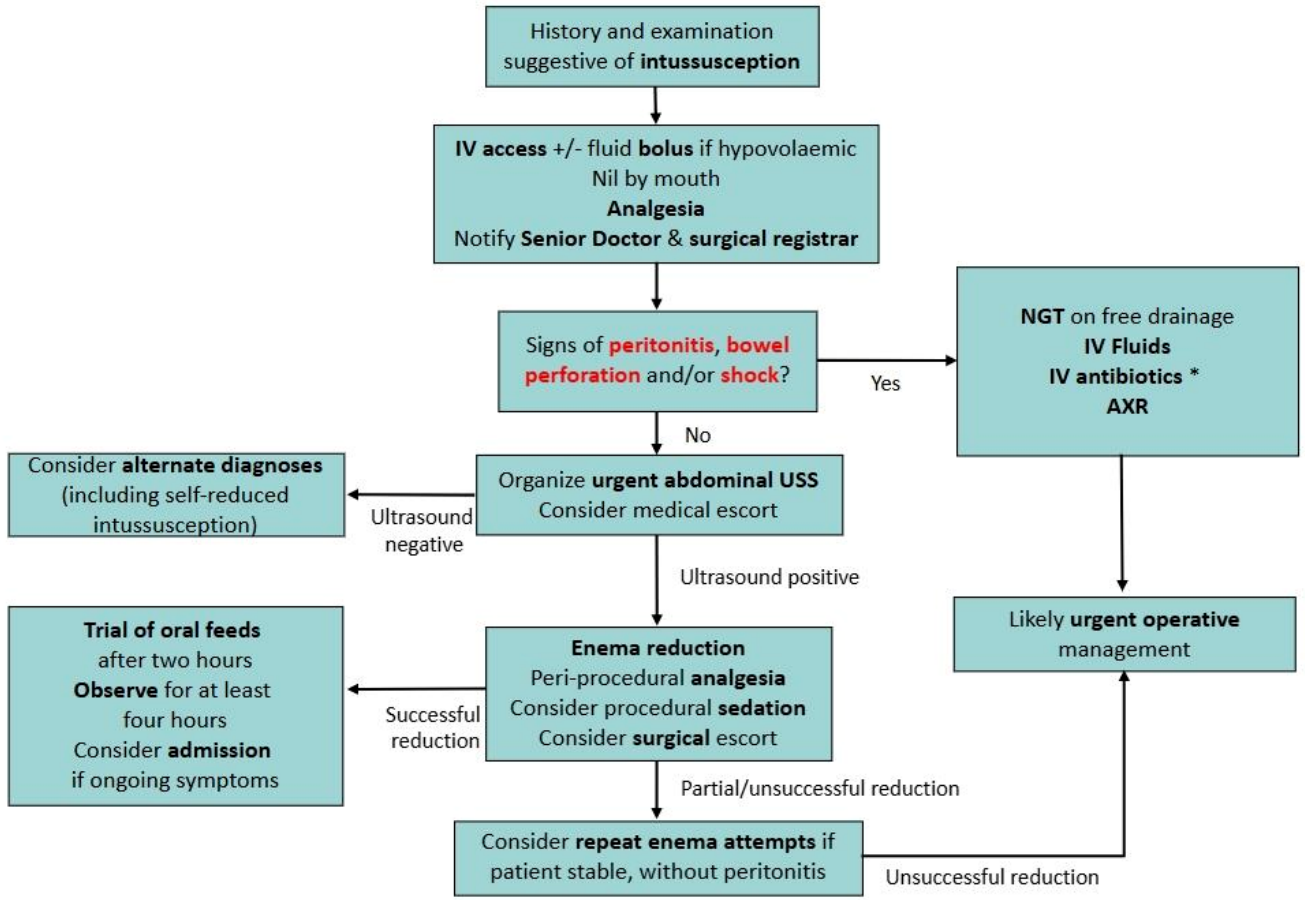
Fig 2: Coiled spring appearance on Barium enema.

Fig 3: Intussusception up to sigmoid colon.

Fig 4: Intussusception- filling defect in head of contrast column.

Fig 5: After reduction filling defect due to edematous valve. Patient made uneventful recovery.

Fig 6: Perforation during reduction. Patient underwent surgery


History and examination suggestive of **intussusception**
IV access +/- fluid **bolus** if hypovolaemic
Nil by mouth
Analgesia
Notify **Senior Doctor** & **surgical registrar**
Signs of **peritonitis**, **bowel perforation** and/or **shock**?
Yes
NGT on free drainage
IV Fluids
IV antibiotics *
AXR
No
Organize **urgent abdominal USS**
Consider medical escort
Ultrasound negative
Consider **alternate diagnoses** (including self-reduced intussusception)
Ultrasound positive
Enema reduction
Peri-procedural **analgesia**
Consider procedural **sedation**
Consider **surgical** escort
Successful reduction
Trial of oral feeds
after two hours
Observe for at least four hours
Consider **admission** if ongoing symptoms
Partial/unsuccessful reduction
Consider **repeat enema attempts** if patient stable, without peritonitis
Unsuccessful reduction
Likely **urgent operative** management

- **Post-Reduction Care**
- **Recurrence:** Occurs in about 10% of cases, usually within the first 24–48 hours.
- **Observation:** Most protocols suggest a period of observation (4–24 hours) and gradual reintroduction of oral intake.

Resource	Key Takeaway for Students
Royal Children’s Hospital (2026)	Focused on pre-reduction fluid resuscitation and the "high index of suspicion" for lethargy.
CHOP Clinical Pathway	Provides the specific "4-hour observation" rule for stable post-reduction patients.
Cochrane Review (Updated 2024)	Synthesizes the success rates of air vs. liquid enemas (Air > Liquid).