



Gastrointestinal (GI) Bleeding in Children

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References: *Nelson Textbook of Pediatrics, UpToDate*



Definition

GI bleeding is bleeding originating from the gastrointestinal tract and may present in several distinct clinical forms:

Hematemesis

Vomiting of fresh blood or **coffee-ground material**, indicating upper GI source

Melena

Black, tarry stool — usually indicates upper GI bleeding due to digested blood

Hematochezia

Bright red blood per rectum — usually lower GI bleeding, but may occur with massive upper GI bleeding

Common Causes of GI Bleeding

Upper GI Bleeding

- Gastritis
- Peptic ulcer disease
- Esophagitis
- Esophageal varices
- Mallory-Weiss tear

Lower GI Bleeding

- Anal fissure
- Infectious colitis
- Inflammatory bowel disease
- Juvenile polyps
- Meckel's diverticulum
- Intussusception

Initial Assessment — Most Important Step

ABC FIRST



A — Airway

Assess airway protection, especially with **massive hematemesis**. Ensure the patient can protect their own airway.



B — Breathing

Monitor **respiratory status** and oxygen saturation continuously throughout assessment.



C — Circulation

Look for: **Tachycardia** · **Hypotension** · **Delayed capillary refill** · **Pallor** · **Altered mental status**



Shock = Emergency. Immediate resuscitation is required without delay.



History Taking

A thorough history guides the differential diagnosis and urgency of management. Ask about the following:

→ Bleeding Characteristics

Amount and duration of bleeding; color of blood

- **Bright red** → lower GI or brisk upper GI bleeding
- **Coffee-ground** → upper GI bleeding
- **Black stool** → melena

→ Associated Symptoms

Abdominal pain, vomiting or diarrhea, fever, weight loss

→ Medication & Substance History

NSAID use — a major risk factor for peptic ulcer disease and gastritis

→ Past Medical & Family History

Liver disease, family history of polyps or IBD

Physical Examination

A focused physical examination helps identify the severity of bleeding and potential underlying causes.



Pallor

Suggests significant blood loss and possible anemia



Tachycardia & Hypotension

Key signs of hemodynamic compromise and shock



Abdominal Findings

Tenderness, hepatosplenomegaly, or palpable abdominal mass



Perianal Disease

Anal fissure or perianal disease — common cause of rectal bleeding in children



Signs of Chronic Illness

Growth failure, clubbing, or other systemic signs suggesting underlying disease

Investigations — Initial Laboratory Tests

The following laboratory investigations should be ordered immediately upon presentation of GI bleeding:



CBC

Complete blood count to assess hemoglobin, hematocrit, and platelet count



PT, PTT, INR

Coagulation profile to identify clotting disorders contributing to bleeding



Blood Type & Cross-Match

Essential preparation for potential blood transfusion in severe cases



Stool Occult Blood Test

Ordered when needed to confirm occult GI blood loss not visible to the naked eye

Investigations — Imaging

Abdominal Ultrasound

Useful for identifying:

- Intussusception
- Abdominal masses
- Hepatobiliary disease

Abdominal X-Ray

Indicated when the following are suspected:

- Bowel obstruction
- Intestinal perforation

 Plain X-ray is a rapid, accessible first-line imaging tool in the emergency setting.

A close-up photograph of an endoscopic procedure. A black endoscopic tube with a camera lens and lights at the tip is resting on a blue surgical drape. In the background, surgical instruments are visible on a tray.

Investigations — Upper Endoscopy (EGD)

Upper endoscopy (esophagogastroduodenoscopy) is the **preferred investigation** for suspected upper GI bleeding. It is both **diagnostic and therapeutic**.

Hematemesis

Direct visualization of the bleeding source in the esophagus, stomach, or duodenum

Melena

Identifies upper GI sources of digested blood presenting as black tarry stool

Suspected Upper GI Bleeding

Any clinical scenario where an upper GI source is the leading differential diagnosis

- ✓ EGD is both diagnostic AND therapeutic — it can identify and treat the bleeding source in a single procedure.

Investigations — Colonoscopy

Colonoscopy is the primary investigation for suspected lower GI bleeding and allows direct visualization of the colon and terminal ileum.

1 Persistent Hematochezia

Ongoing bright red blood per rectum that does not resolve spontaneously warrants colonoscopic evaluation

2 Suspected Lower GI Bleeding

When clinical features point to a colonic or rectal source of hemorrhage

3 Polyps or IBD

Colonoscopy allows biopsy, polypectomy, and assessment of mucosal inflammation in inflammatory bowel disease

Investigations — Meckel Scan

The Meckel scan (Technetium-99m pertechnetate scintigraphy) is a specialized nuclear medicine study used to detect ectopic gastric mucosa within a Meckel's diverticulum.

 Indicated in cases of **painless recurrent rectal bleeding** in children — the hallmark presentation of Meckel's diverticulum.

Why Meckel's Diverticulum?

Meckel's diverticulum is the most common congenital anomaly of the GI tract. It contains ectopic gastric mucosa that secretes acid, causing ulceration and painless bleeding.

Clinical Pearl

The Meckel scan is the **most useful diagnostic tool** for Meckel's diverticulum and should be considered in any child with unexplained painless rectal bleeding.



Management — Step 1: Stabilize the Patient

FIRST PRIORITY



ABCs

Ensure airway, breathing, and circulation are assessed and secured immediately



Oxygen

Administer supplemental oxygen to maintain adequate saturation, especially in hemodynamically unstable patients



Large-Bore IV Access

Establish two large-bore peripheral IV lines for rapid fluid and blood product administration



IV Fluid Resuscitation

Normal saline or Lactated Ringer's solution for volume replacement in hemodynamically unstable patients



Blood Transfusion

Indicated for severe bleeding or hemodynamic instability — packed red blood cells are the product of choice

Management — Step 2: Medical Treatment

Suspected Peptic Ulcer Disease

Proton Pump Inhibitor (PPI)

First-line medical therapy for peptic ulcer disease and acid-related upper GI bleeding

- **Omeprazole**
- **Pantoprazole**

 PPIs suppress gastric acid secretion, promoting mucosal healing and reducing rebleeding risk. They should be started empirically while awaiting endoscopy.

Management — Variceal Bleeding

Esophageal variceal bleeding is a life-threatening emergency, particularly in children with portal hypertension from liver disease.

1

Octreotide

Somatostatin analogue that reduces portal pressure and splanchnic blood flow — administer immediately

2

Urgent Endoscopy

Endoscopic band ligation or sclerotherapy to achieve hemostasis of bleeding varices



Variceal bleeding carries high mortality. Early octreotide and urgent endoscopy are essential — do not delay.



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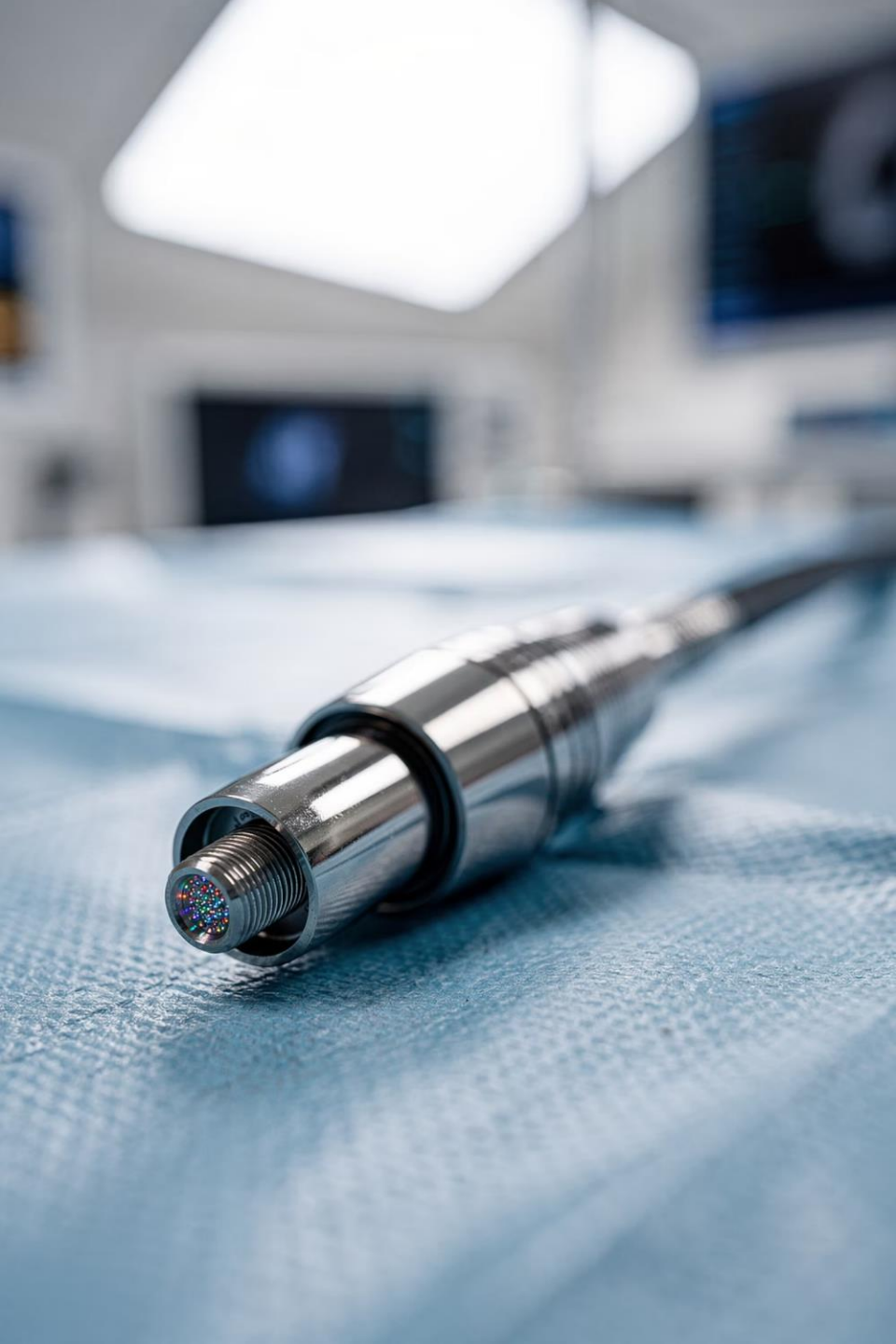
Infectious colitis is a common cause of lower GI bleeding in children, particularly presenting with bloody diarrhea, fever, and abdominal cramping.

Antibiotic Therapy

Appropriate antibiotics should be initiated **when clinically indicated**. Not all infectious colitis requires antibiotics – treatment depends on the causative organism and clinical severity.

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Avoid antibiotics in *E. coli* O157:H7 infection due to the risk of precipitating hemolytic uremic syndrome (HUS). Stool cultures guide targeted therapy.



Management — Step 3: Endoscopic Therapy

Endoscopy is not only diagnostic but also provides definitive therapeutic options for controlling GI bleeding at the source.



Mechanical Clips

Mechanical clips applied directly to bleeding vessels to achieve immediate hemostasis



Thermal Coagulation

Heat energy applied to cauterize bleeding points and seal damaged vessels



Injection Therapy

Epinephrine or sclerosant injected around the bleeding site to induce vasoconstriction and thrombosis



Band Ligation of Varices

Elastic bands placed around esophageal varices to strangulate and obliterate them

Indications for Surgery

Surgery is reserved for cases where medical and endoscopic management have failed or where the underlying condition mandates operative intervention.

Meckel's Diverticulum

Surgical resection (diverticulectomy or segmental bowel resection) is the definitive treatment for symptomatic Meckel's diverticulum

Persistent Uncontrolled Bleeding

When endoscopic and medical therapies fail to achieve hemostasis, surgical intervention becomes necessary

Intestinal Perforation

Emergency surgical repair is required for any perforation of the GI tract – a life-threatening complication

Intestinal Obstruction

Failed pneumatic or hydrostatic reduction requires operative management to manually reduce or resect the intussuscepted bowel

Red Flags — Do Not Miss

⊗ These patients require **urgent hospitalization and specialist evaluation**. Never delay management when red flags are present.

● Hemodynamic Instability

Tachycardia and hypotension indicating significant blood loss

● Persistent Hematemesis

Ongoing vomiting of blood despite initial management

● Massive Rectal Bleeding

Large-volume bright red blood per rectum suggesting brisk hemorrhage

● Signs of Shock

Pallor, cold extremities, delayed capillary refill, altered consciousness

● Severe Abdominal Pain

May indicate perforation, ischemia, or intussusception requiring urgent intervention

● Known Liver Disease with GI Bleeding

High suspicion for variceal bleeding — a potentially fatal emergency

Key Home Messages

The most important takeaways from this revision sheet for your clinical practice and examinations:



ABC Stabilization is Always First

Regardless of the cause, airway, breathing, and circulation must be secured before any other intervention



Initial Investigations

CBC, coagulation profile (PT/PTT/INR), and blood typing are the essential first-line laboratory tests



Meckel's Diverticulum

An important cause of **painless rectal bleeding** in children — always consider it in the differential diagnosis



Hematemesis & Melena = Upper GI Bleeding

These presentations almost always indicate a source proximal to the ligament of Treitz



Endoscopy is Diagnostic AND Therapeutic

A single endoscopic procedure can both identify and treat the source of GI bleeding



Hematochezia = Usually Lower GI

But remember — massive upper GI bleeding can also present with bright red blood per rectum



Emergencies to Recognize

Shock, persistent bleeding, and variceal bleeding are medical emergencies requiring immediate escalation