

## Haematemesis (Blood Stained Vomiting)

### Definition / Supporting Information

Haematemesis is blood-stained vomiting. Acute haematemesis may be a medical emergency.

Appearance of blood-stained vomit:

- Dark, 'coffee grounds' appearance indicates contact with gastric acid and suggests old or low grade / slow bleed.
- Bright red appearance, when there is little or no contact with gastric acid, suggests recent acute and / or significant bleed.

**Keywords / also known as:** vomiting blood

### Essential History

In cases of acute haematemesis, evaluation should progress only after the ABCs (airway, breathing, and circulation) of resuscitation have been addressed.

**Ask about:**

- Nose bleeds or bleeding mouth lesions
- Associated repeated vomiting or violent coughing
  - Mallory–Weiss syndrome
- Any family history of:
  - Bleeding disorders
  - Gastrointestinal (GI) diseases
- Associated abdominal pain
- Associated bloody diarrhoea (see Melaena)
  - Infectious enteritis
  - Food allergy
  - Inflammatory bowel disease (IBD)
  - Note – bloody diarrhoea may precede haemolytic uraemic syndrome (HUS)
- Associated fever
  - Common in infectious or inflammatory disorders
- Associated joint pains and / or rash seen with Henoch–Schönlein purpura (HSP)
- History of liver disease or failure
- Planned or accidental drug ingestion (see Drug Overdose and Poisoning)
  - Non-steroidal anti-inflammatory drugs
  - Corticosteroids

- Iron supplements

## ‘Red Flag’ Symptoms and Signs

In cases of acute haematemesis, evaluation should progress only after the ABCs of resuscitation have been addressed.

### Ask about:

- Bile-stained vomitus
  - Intestinal obstruction (see Acute Surgical Abdomen)
    - Volvulus
    - Intussusception
    - Necrotising enterocolitis (NEC)
- Altered mental status (see Altered Conscious Level), lethargy, and / or fatigue
- Ingestion of caustic substances such as button batteries
  - Can present up to 28 days after the ingestion

### Look for:

- Signs of shock (using age adjusted ranges, where appropriate)
  - Tachycardia
    - First compensatory mechanism observed
  - Tachypnoea (see Dyspnoea)
  - Altered conscious level
  - Prolonged capillary refill time
  - Hypotension
- Pallor
- Evidence of bleeding lesions or burns around the nose or mouth
- Abdominal tenderness
- Absent bowel sounds
- Masses
- Hepatomegaly / splenomegaly
- Rash
  - Bleeding disorders (purpuric)
  - HSP (purpuric)

## Differential Diagnosis / Conditions

### Newborns

- Maternal blood swallowed during delivery or from bleeding nipples
- Local trauma after nasogastric suctioning

- Can be a presentation of fulminant neonatal sepsis (e.g. [disseminated intravascular coagulation](#))
- Haemorrhagic disease of the newborn
  - Inherited deficits of coagulation factors or delay in administration of postnatal vitamin K occasionally produce GI bleeding.
- Gastric ulcerations and erosions, which may be associated with:
  - Asphyxia associated with a difficult delivery
  - Cardiac lesion
  - Sepsis
  - Premature infants and newborns who have low Apgar scores
  - Extrahepatic portal vein obstruction leading to gastro-oesophageal varices from:
    - Omphalitis
    - Catheterisation of the umbilical vein
    - Spontaneous inflammation of the umbilical blood vessels

### Infants and children

- Swallowed blood from nosebleeds or bleeding mouth lesions may mimic haematemesis
- Oesophageal bleeding
  - Gastro-oesophageal reflux disease in children and young people: diagnosis and management [[NICE guidance NG1](#)]
  - Viral gastroenteritis with repeated vomiting leading to Mallory–Weiss tear
  - Infection, including fungal infection
    - Particularly in immunocompromised patients
  - Caustic ingestion severe enough to burn the oesophageal mucosa
  - Oesophageal foreign body (eg, button batteries (which can present up to 28 days after ingestion))
- Gastric bleeding
  - Gastritis
    - Erosive
    - Non-erosive
  - Infectious (*Helicobacter pylori* associated)
  - Medications, for example:
    - Non-steroidal anti-inflammatory drugs
    - Corticosteroids
    - Iron supplements
- Peptic ulcer disease
- Gastro-oesophageal varices resulting from intrahepatic obstruction
  - Secondary to cirrhotic liver disease from congenital hepatitis, hepatic fibrosis and cystic fibrosis

- Risk of acute massive haematemesis
- Other less common causes:
  - Aortoesophageal fistula
  - Dieulafoy lesion (eg, torturous arteriole, most commonly in the submucosa of the stomach wall)
  - Hereditary haemorrhagic telangiectasia (Osler-Weber-Rendu syndrome)

## Investigations

In cases of acute haematemesis, evaluation should progress only after the ABCs of resuscitation have been addressed. Investigations may not necessarily be required if a trivial cause such as swallowed blood from minor epistaxis or cracked nipples is suspected and the child is completely well with normal vital signs.

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team, usually with advice from paediatric specialists) or specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Gastroenterology Team(s)):

- Full blood count and reticulocyte count
- Coagulation studies
- Renal function
- Liver function tests for suspected liver disease
- Blood group and cross match (where indicated)
- If suspected, test for *H pylori* using a carbon-13 urea breath test or a stool antigen test
- Apt-Downey test (eg, haemoglobin alkali denaturation test)
  - May be used to differentiate maternal from neonatal blood if ingestion of maternal blood is suspected (swallowed during delivery or whilst breast-feeding)
- Abdominal X-ray in two views (flat and upright) will show:
  - Signs of obstruction or calcifications
  - Air–fluid levels
  - Dilated bowel loops
- Some specific radiographic findings include:
  - *Pneumatosis intestinalis* in NEC
  - Intestinal obstruction with absence of gas in the right colon in intussusception
  - In volvulus / malrotation, a radiograph may show:
    - Loops of small bowel overriding the liver shadow
    - Paucity of air in the GI tract distal to the volvulus

- Barium studies
  - Investigation of:
    - Intestinal foreign bodies
    - Polyps
    - Lymphonodular hyperplasia
    - IBD
  - An upper GI series, barium enema, or both are sometimes needed to confirm the diagnosis of volvulus / malrotation
  - Confirmation of intussusception, followed by hydrostatic reduction with barium or air enema
- Ultrasonography +/- colour Doppler
  - For clinically suspected intussusception
    - Investigation of choice as, if confirmed, can then be reduced by air enema
    - Layering of intestinal mucosa as a bullseye or coiled-spring lesion
- Computed tomography (CT)
  - Occasionally helpful in defining related anatomical features if the child is haemodynamically stable and either co-operative or sedated
  - Midgut volvulus also may be diagnosed by CT or ultrasonography
    - Duodenal dilation
    - Fixed midline bowel
    - Wrapping of the bowel and the superior mesenteric vein around the superior mesenteric artery (whirlpool sign)
- Angiography
  - For severe, life-threatening bleeding
  - Can be both diagnostic and therapeutic, depending on the ability to embolise bleeding vessels
  - Limited sensitivity in detecting slow or past bleeding, so best performed when bleeding is active
  - Selective arteriography or digital subtraction angiography may aid in demonstrating vascular malformation

### Diagnostic procedures

- Upper GI fiberoptic endoscopy can establish diagnosis in 75–90% of patients
  - Adequate visualisation is unlikely if bleeding is massive and cannot be controlled with saline lavage
  - Gastric ulceration is diagnosed in newborns by radiography or upper GI endoscopy
- Oesophagoscopy and pH probe manometry are used to diagnose gastro-oesophageal reflux
- *H pylori* can be tested for using a carbon-13 urea breath test or a stool antigen test

- Gastroduodenoscopy to determine source and type of lesion present if bleeding ceases

## Treatment Approach

### Acute haematemesis (all causes)

Evaluation should progress only after the ABCs of resuscitation have been addressed. Treatment may not necessarily be required if a trivial cause such as swallowed blood from minor epistaxis or cracked nipples is suspected and the child is completely well with normal vital signs.

To be undertaken by non-specialist practitioners (eg, GP Team) when a child presents with acute haematemesis:

- Arrange emergency transfer to specialist care if any evidence of shock or altered mental status (see Altered Conscious Level)
- Administer oxygen
- Evaluate for the presence of shock
  - Tachycardia
  - Tachypnoea
  - Altered conscious level
  - Prolonged capillary refill time

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric Intensive Care / General Paediatric / Paediatric Gastroenterology / Paediatric Surgery Team(s)):

- Stabilise airway with endotracheal intubation if massive upper GI bleeding causes aspiration and / or airway obstruction or risk of obstruction.
- In presence of shock:
  - Fluid bolus (20 mL/kg) of 0.9% sodium chloride
  - Packed red blood cells if inadequate response to fluid bolus
    - Consider activating local major haemorrhage protocol and giving tranexamic acid
- Replace clotting factors and platelets as indicated
- Urgent chest X-ray
  - Checking for button battery ingestion unless can be confidently excluded
    - If button battery present arrange emergency removal
- Assess for likelihood of portal hypertension
  - Enlarged liver, enlarged spleen or history of liver disease
  - Urgent abdominal ultrasound scan
  - Likely portal hypertension
    - Continue management as for active variceal bleeding below

- Discuss with centre that can offer endoscopic treatment promptly
- Unlikely to be portal hypertension
  - Assess risk further to predict requirement for endoscopic treatment
    - High risk requires endoscopic treatment +/- octreotide
    - Low risk, endoscopy not urgent, if stable can continue to be managed in local centre
- Prompt surgical intervention is required when the rate of bleeding is excessive and uncontrollable by more conservative methods.
- Insert nasogastric tube, preferably of the vented sump type
  - May determine the source of bleeding and estimate volume of ongoing blood loss
  - Low-pressure continuous suction if vented
  - Intermittent suction if non-vented
  - Consider saline irrigation through the nasogastric tube
    - To decrease mucosal blood flow and stop profuse bleeding
- Nasogastric tube placement may aggravate bleeding in a patient with varice (see active variceal bleeding below)

### Active variceal bleeding

- ABC assessment [[BSPGHAN National Guideline, section 4](#)]
  - Initially transfuse to a haemoglobin level of 90 g/L slowly
  - Give platelets, fresh frozen plasma and cryoprecipitate where indicated (Platelets  $<100 \times 10^9/L$  or INR  $> 1.5$ ) and bleeding not controlled.
  - If a nasogastric tube is in situ it can be used to aspirate and put on free drainage
    - Don't insert a new nasogastric tube due to further bleeding risk
- Subsequent treatment following resuscitation is vasoactive drugs and endoscopy
  - Octreotide [Unlicensed indication]
    - Initial treatment 1 microgram/kg (maximum of 50 micrograms) IV bolus over 5 minutes followed by an infusion of 1 microgram/kg/hour (maximum total dose of 50 micrograms/hour), increased in increments of 1 microgram/kg/hour up to a maximum of 3 micrograms/kg/hour (maximum total dose of 50 micrograms/hour)
      - Has a very short half life, if cannula tissues re-site immediately
  - Endoscopic therapy
    - Band ligation or sclerotherapy
  - Other drugs
    - Proton pump inhibitor (PPI) IV
      - If a PPI is not available give ranitidine
    - Vitamin K (phytomenadione) IV

- Antibiotics
  - Must include gram positive and gram negative cover as well as avoiding local quinolone resistance
    - Consult local antibiotic guideline
- If bleeding continues despite vasoactive and endoscopic therapies (or is continuing despite medical management prior to transfer to a centre that offers endoscopic treatment) consider balloon tamponade with either a:
  - Foleys catheter (Weight < 10kg) [Unlicensed indication] **or**
  - Sengstaken–Blakemore tube (Weight ≥ 10kg)
    - Effective in controlling bleeding, but high incidence of complications
    - Patient must be intubated, ventilated and in an intensive care setting prior to any tube insertion for balloon tamponade

#### Mucosal erosion or inflammation

- Antacid therapy, with or without concomitant use of a histamine H<sub>2</sub>-receptor blocker
- Bleeding ulcers
  - Intravenous therapy with a proton-pump inhibitor
    - Reduces risk of re-bleeding
    - Does not appear to influence overall mortality rate

#### ***H pylori* infection**

- See *Helicobacter pylori* infection
- Treatment, when indicated, should be initiated under specialist supervision and consists of:
  - A 7-day course of a variety of antibiotic regimens
  - A proton-pump inhibitor

#### **Necrotising enterocolitis**

- Neonates remain in hospital for bowel rest and intravenous antibiotics
- Occasionally requires surgical intervention

#### **Mallory–Weiss tear**

- Bleeding is minor and usually resolves spontaneously
- Ranitidine may be needed to prevent continued irritation by stomach acid.

#### **Volvulus / malrotation**

- Immediate surgical repair is necessary

## When to Refer

Arrange immediate emergency transfer to specialist practitioners (eg, Emergency Department and / or Paediatric Intensive Care Team(s)) if:

- Upper GI bleeding and haemodynamic instability
- Altered mental status (see Altered Conscious Level) or lethargy
- Suggestion of surgical aetiology (eg, intussusception, volvulus) (see Acute Surgical Abdomen)

Refer urgently to specialist practitioners (eg, Emergency Department / Paediatric Intensive Care / General Paediatric / Paediatric Gastroenterology / Paediatric Surgery Team(s)) if:

- Any non-trivial upper GI bleeding
- Anaemia / fall in haematocrit
  - May not drop immediately after massive haematemesis
- Severe abdominal pain
- Associated systemic symptoms (eg, HUS or HSP)

## When to Admit

Admit and escalate care to relevant specialist practitioners (eg, Paediatric Intensive Care / General Paediatric / Paediatric Gastroenterology / Paediatric Surgery Team(s)) if:

- Haemodynamic instability
- Any non-trivial upper GI bleeding
- Altered mental status (see Altered Conscious Level) or lethargy
- Suggestion of surgical aetiology (eg, intussusception, volvulus)
- Anaemia / fall in haematocrit
- Severe abdominal pain
- Associated systemic symptoms (eg, HUS or IBD)

## ‘Safety Netting’ Advice

Advise parents to seek medical review straightaway if their child has haematemesis.

## Patient / Carer Information

***\*Please note: whilst these resources have been developed to a high standard they may not be specific to children.***

- [Vomiting blood \(haematemesis\)](#) (Web page), the NHS website
- [NHS England Patient Safety Alert about ingestion of button batteries](#) (Web page), NHS England

## Resources

### National Clinical Guidance

[Gastro-oesophageal reflux disease in children and young people: diagnosis and management](#) (Web page) NICE clinical guideline NG1, National Institute for Health and Care Excellence.

### Suggested Resources

***\*Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.***

[Assessment and Management of Oesophageal Varices in Children](#) (PDF) Guideline of British Society of Paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN)

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D’Amico G, Pietrosi G, Tarantino I, et al. Emergency sclerotherapy versus medical interventions for bleeding oesophageal varices in cirrhotic patients. *Cochrane Database Syst Rev* 2002;1:CD002233. [\[PubMed\]](#)

[GI Bleeding Pathway](#) (Web page) Guideline of British Society of Paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN)

[GI Bleeding Management Extra Information](#) (Web page) Guideline of British Society of Paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN)

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Owensby S, Taylor K, Wilkins T. Diagnosis and Management of Upper Gastrointestinal Bleeding in Children. J Am Board Fam Med January-February 2015;28(1): 134-145 [[PubMed](#)]

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