

Gastrointestinal Haemorrhage

Gastrointestinal haemorrhage (also known as *gastrointestinal bleeding* or *GI bleeding*) may include all forms of bleeding in the gastrointestinal tract, along the passage of food from *the oral cavity* to *the rectum*. The source of haemorrhage is often difficult to find; however, the precise etiopathogenesis might be determined according to the **amount of bleeding, duration, or other accompanying symptoms**.

When there is **significant blood loss over a short time**, symptoms may include vomiting "bright" red blood (*hematemesis*) or *coffee ground vomitus* (the blood has already been partially digested), as well as **melena** (black or tarry stools). **The source is generally the upper gastrointestinal tract**, typically above the suspensory muscle of the duodenum (or *lig. Treitz*). It may be caused by peptic ulcers, tumors of the stomach or oesophagus, varices, prolonged and vigorous retching, **gastroenteritis**, ingested blood.

Small amounts of bleeding over a long time may cause **iron-deficiency anemia** resulting in feeling tired, dizziness, or heart-related chest pain. Other symptoms may include abdominal pain, shortness of breath, pale skin, or passing out. Sometimes in those with small amounts of bleeding no symptoms may be present.

Prolonged exhausting emesis in some children can result in vomiting tiny red veins as a result of the disrupted oesophageal or pharyngeal inner lining.

Upper Gastrointestinal Bleeding

Commonly defined as bleeding arising from the **oesophagus, stomach, or duodenum**. Clinical evidence generally includes *hematemesis*, *coffee ground vomiting*, *melena*, or less frequently *hematochezia* (more often associated with lower gastrointestinal bleeding, but may also occur from a brisk upper gastrointestinal bleed)

- **Hematemesis** is characterized as vomiting blood. If the blood is bright red, its most common cause is bleeding from **oesophageal varices** or **arterial bleeding from a peptic stomach ulcer**. It can be confused with hemoptysis (coughing up blood) or epistaxis (nosebleed).
- The dark content of the vomited stomach contents ("**coffee grounds**") is the digested blood, usually accompanied by melena.
- **Melena** means black, greasy, tarry stool with significant odor caused by bleeding above the caecum in the GI tract.



Gastroscopy image of esophageal varices with prominent cherry-red spots

Bleeding can result in the development of hemorrhagic shock: tachycardia over 100/min, hypotension, hypovolemia, sweating, dizziness, cold acros. . A person with upper gastrointestinal bleeding may also present with complications of **anemia** (there is a serious decrease in hemoglobin (by more than 20 g/l)), including chest pain, syncope, fatigue and shortness of breath.

The causes for upper gastrointestinal haemorrhage include the following:

- **gastric and duodenal peptic ulcers** - present in about 50% of all causes of GI bleed
 - bleeding usually stops spontaneously, but recurrences often occur. The most common causes of ulcers (and subsequent complications) are: *Helicobacter pylori* infection and the use of non-steroidal anti-inflammatory drugs (2/3 of cases)
- **oesophageal varices** - extremely dilated sub-mucosal veins as a further complication of portal hypertension; varices have a strong tendency to develop severe bleeding which left untreated can be fatal (enormous blood loss)
- **erosive gastritis**
- **reflux oesophagitis** - an inflammation of the oesophagus resulting from a failure of the valve and may lead to serious disruption of the inner lining (mucosa) and diffuse bleeding
- **Mallory-Weiss syndrome: a tear or laceration of the mucous membrane**, most commonly at the gastroesophageal junction as a consequence of any condition which causes violent vomiting and retching such as food poisoning
- **gastric antral vascular ectasia**
- oesophageal or gastric cancer



Benign antral gastric ulcer

Diagnosis and Treatment

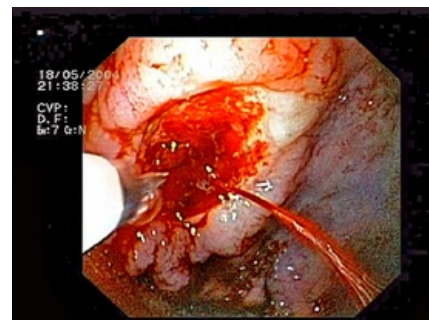
Endoscopy

Endoscopy has high sensitivity and specificity for **locating and identifying bleeding lesions in the upper GI tract**, as well as a hemostatic treatment for actively bleeding lesions.

In emergency situations, care is directed at **stopping blood loss**, maintaining plasma volume, correcting disorders in coagulation induced by cirrhosis, and appropriate use of antibiotics. Blood volume resuscitation should be done promptly and with caution. The goal should be **hemodynamic stability** and hemoglobin of over 8 g/dl. Resuscitation of all lost blood leads to an increase in portal pressure leading to more bleeding. Volume resuscitation can also worsen ascites and increase portal pressure.

Therapeutic endoscopy is considered the mainstay of urgent treatment. The two main therapeutic approaches are:

- **variceal ligation (banding)**
- **sclerotherapy**



Bleeding gastric ulcer

In cases of refractory bleeding, **balloon tamponade** with a Sengstaken-Blakemore tube may be necessary, usually as a bridge to further endoscopy or treatment of the underlying cause of bleeding (ie: portal hypertension).

Further procedures:

- insertion of a central venous catheter
- vital functions monitoring
- blood transfers: 3-4 units of ery-mass or 1 unit of frozen plasma
- **in acute non-varicose haemorrhage** a proton pump blocker (*Omeprazole 80mg, Pantoprazole 40mg*) is advised before the endoscopy
- **for varicose haemorrhage** - vasoactive drugs such as *somatostatin, ocreotide or terlipressin* (beware of CVS contraindications)
 - at endoscopic confirmation of varicose bleeding, continue for 5 days.
- **Angiographic radiointervention methods** show extravasation of the contrast agent to determine the site of bleeding.
- for bleeding from esophageal varices, **TIPS** (transjugular intrahepatic portosystemic shunt) is performed.

Prognosis

Death in those with a GI bleed is more commonly due to other illnesses (some of which may have contributed to the bleed, such as cancer or cirrhosis) than the bleeding itself. Despite treatment, **re-bleeding occurs in about 7-16% of those with upper GI bleeding**. In those with esophageal varices, bleeding occurs in about 5-15% a year and if they have bled once, there is a higher risk of further bleeding within six weeks. Re-bleeding may be prompted by other comorbidities (ischemic heart disease, renal insufficiency, lungs-related disease, cancer, etc.)

Forrest classification is a classification of upper gastrointestinal haemorrhage used for purposes of clinical evaluation of bleeding. It is also a significant method of prediction of the risk of rebleeding and very often is used for evaluation of the endoscopic intervention modalities.

	Forrest classification ^[1]	
	stupeň	projevy
Active bleeding	Ia	arterial or spurting haemorrhage
	Ib	oozing haemorrhage
Stigmata of recent haemorrhage	IIa	visible vessel
	IIb	adherent clot
	IIc	haematin-covered lesion (black spots)
No signs of active haemorrhage	III	lesions without active bleeding site

Lower Gastrointestinal Bleeding

A lower gastrointestinal bleed is defined as bleeding originating **distal to the ileocecal valve** which includes the **colon, rectum, and anus** - meaning bleeding that occurs distal to the *lig. of Treitz*.

The stool of a person with a lower gastrointestinal bleed is a good indication of where the bleeding is occurring. Black tarry appearing stools medically referred to as **melena** usually indicates blood that has been in the GI tract for at least 8 hours. Melena is four times more likely to come from an upper gastrointestinal bleed than from the lower GI tract; however, it can also occur in either the duodenum and jejunum and occasionally the portions of the

small intestine and proximal colon. Bright red stool, called **hematochezia**, is the sign of a fast-moving active GI bleed. The bright red or maroon color is due to the short time taken from the site of the bleed and the exiting at the anus.

Lower GI bleeds can be categorized further into three types: massive, moderate, and occult bleeding.

- **Massive bleeding** usually occurs in patients older than 65 years with multiple comorbidities, and this bleeding presents as **hematochezia or bright red blood per rectum**. The patient is usually **hemodynamically unstable** with systolic blood pressure (SBP) equal to or less than 90 mmHg, heart rate (HR) less than or equal to 100/min, and low urine output. Lab work reveals hemoglobin equal to or less than 6 g/dl. Massive lower GI bleeds are mostly due to **diverticulosis** and **angiodysplasia**.
- **Moderate bleeding** can occur at any age and presents as **hematochezia or melena**. The patient is usually hemodynamically stable. Many disease processes should be considered on the differential list including neoplastic disease, inflammatory, infectious, benign anorectal, and congenital.
- **Occult lower GI bleeds** can present in patients at any age. Lab work reveals patients with microcytic hypochromic anemia due to chronic blood loss. The patient is usually hemodynamically stable.

A diagnostic assessment or pre-assessment should watch for other signs and symptoms that the patient may present with. These include, but are not limited to, **hypotension, tachycardia, angina, syncope, weakness, confusion, stroke, myocardial infarction/heart attack, and haemorrhagic shock**.

The causes for lower gastrointestinal haemorrhage include the following:

- diverticulosis (40%)
- angiodysplasia (20%);
- mesenteric colitis(10-15%);
- bleeding from a site where a colonic polyp was removed
- inflammatory bowel disease - Crohn's disease, ulcerative colitis
- neoplasm - colorectal cancer
- haemorrhoids, anal fissures
- bleeding diathesis

! Many foods stain the stool making the stool look like it contains blood. These foods include spinach, beets, blueberries, activated charcoal and iron-containing drugs.



Bloody stool by bleeding from ascending colon.

Common causes of paediatric and adolescent GI bleeding

Infants

- bacterial enteritis, neonatal hemorrhagic disease, cow's milk protein allergy, invagination, anal fissures;
- melena can also be given by ingested blood from the mother's nipples while breastfeeding

Preschool and school-aged children

- bacterial enteritis, anal fissures, intestinal polyps, peptic ulcer, esophageal varices, Mallory-Weiss syndrome (longitudinal rupture in the esophagogastric junction), Henoch-Schönlein purpura (IgA vasculitis), foreign particles, chronic intestinal inflammation, esophagitis, Meckel's diverticulum

Adolescents

- bacterial enteritis, chronic intestinal inflammation, peptic ulcers, polyps, esophageal varices, coagulopathies

Diagnostics

Clinical

Gastric aspiration or lavage, where a tube is inserted into the stomach via the nose in an attempt to determine if there is blood in the stomach, if negative does not rule out an upper GI bleed. Clots in the stool indicate a lower GI source while melena stools an upper one.

Laboratory testing

Recommended laboratory blood testing includes: cross-matching blood, hemoglobin, hematocrit, platelets, coagulation time, and electrolytes. If the ratio of blood urea nitrogen to creatinine is greater than 30 the source is more likely from the upper GI tract.

Imaging

- CT angiography is useful for determining the exact location of the bleeding within the gastrointestinal tract - intravenous application of contrast agents in *truncus coeliacus* or *mesenteric veins*
- Nuclear scintigraphy is a sensitive test for detecting occult gastrointestinal bleeding when direct imaging with upper and lower endoscopies are negative

Links

Related articles

- Ulcer disease (https://www.wikilectures.eu/w/Ulcer_Disease)
- Esophageal Varices
- Melena
- Gastric cancer
- Quantitative determination of hemoglobin in stool

Source

- BENEŠ, Jiří. *Studijní materiály* [online]. [cit. 10.7.2009]. <<http://jirben.wz.cz>>.

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