Gastrointestinal Bleeding

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PERSPECTIVE

Upper and lower gastrointestinal bleeding (GIB) are defined based on their location relative to the ligament of Treitz in the terminal duodenum, so esophagus, stomach, and duodenum origin bleeds are upper and all others are lower. Upper GIB (UGIB) mortality rates have remained constant at about 15% over the past 2 decades despite advances in medical therapy, intensive care unit (ICU) management, endoscopy, and surgery. This is most likely due to the increasing proportion of older patients, who may die due to comorbid conditions, and increases in cirrhotic and varicel patients. The lower GIB (LGIB) mortality rate is approximately 4%. Predictors include age older than 70 years, intestinal ischemia, comorbid illness, coagulation defects, transfusion of packed red blood cells, and male gender.

DIAGNOSTIC APPROACH

Differential Considerations

The characteristics of the GIB, age of the patient, and social factors can all help determine the cause. UGIB can routinely manifest as bloody or coffee-ground–like vomit termed hematemesis or as dark, tarry stools termed melena. In older adults, peptic ulcer disease, esophagitis, and gastritis account for most cases. Younger patients typically present with Mallory-Weiss tears, GI varices, and gastropathy (Table 27.1). As a whole, peptic ulcer disease makes up more than 50% of all acute cases of UGIB seen in the emergency department (ED).1 In pediatric patients, gastric and duodenal ulcers, esophagitis, gastritis, esophageal varices, and Mallory-Weiss tears account for most cases of UGIB, in descending order of frequency.

LGIB usually produces bright red or maroon blood per rectum, termed hematochezia. LGIB may be classified according to pathophysiologic cause—inflammatory, vascular, oncologic, traumatic, or iatrogenic. Anorectal sources, such as hemorrhoids, are the most common causes of LGIB in all age groups. In adults, the most common sources of hematochezia are colonic diverticula and angiodysplasia. Other noteworthy causes include colitis caused by ischemia, infection, and inflammatory bowel disease. Among older patients with cardiovascular disease, ischemic colitis as a cause for LGIB has been increasing. Although uncommon, a brisk UGIB may present as hematochezia and be mistaken for a bleed from a lower GI source. Up to 14% of bleeds characterized as hematochezia are due to such lesions and are associated with higher transfusion rates, surgical interventions, and mortality.

Major causes of LGIB in children include anorectal fissures and infectious colitis. Bleeding can also be caused by intussusception and Meckel’s diverticulum in infants and toddlers. Despite diagnostic advances for all ages, the source of GI bleeding is not identified in nearly 15% of patients.

Death from exsanguination resulting from GIB is rare. However, there are two causes of GIB that may rapidly cause death if not recognized and mitigated, esophageal varices and aortoenteric fistula. The former, which typically arises from portal hypertension usually caused by alcoholic cirrhosis, is the single most common source of massive UGIB and has a mortality rate of 30%. The latter is caused when an abdominal aortic aneurysm, or, more commonly, an aortic graft adheres to and erodes through a bowel wall. Aortoenteric fistula is a rare but rapidly fatal cause of GIB, with the mortality of an untreated fistula of nearly 100%. Aortoenteric fistula is a primary consideration in patients with GIB and known abdominal aortic aneurysms or aortic grafts until an alternative bleeding source is identified. Prompt surgical consultation is warranted when aortoenteric fistula is a likely diagnosis.

Finally, in the differential considerations, one must determine whether the blood is actually of GI origin. Epistaxis, dental bleeding, or red food coloring can mimic the appearance of hematemesis. Bismuth-containing medications and iron supplements can create melanotic-appearing (but guaiac-negative) stools. Vaginal bleeding, gross hematuria, and red foods (eg, beets) can all be mistaken for hematochezia (Box 27.1). Unless an alternative diagnosis is clearly evident, the appropriate approach is to continue with the evaluation for GIB.

Pivotal Findings

The history centers on the GI tract and on the timing, quantity, and appearance of the bleeding. Relevant comorbid conditions should be reviewed as well (Box 27.2). The extent of the history will be dictated by the severity of the complaint and hemodynamic stability of the patient on ED arrival. Reviewing the patient’s vital signs, appearance of the stool, and basic laboratory studies will help identify the bleeding source and guide treatment.

Symptoms

A useful starting point for the emergency clinician is to determine the time of onset, duration of symptoms, and relevant supporting historical facts. Often, the degree of bleeding is better gauged by assessing symptoms associated with significant intravascular loss, such as weakness, shortness of breath, angina, orthostatic dizziness, confusion, palpitations, and report of cool extremities. Blood loss more than 800 mL will usually result in the onset of these complaints, with severe symptoms being described at a threshold greater than 1500 mL. Such symptoms indicate a decreased oxygen-carrying capacity that often accompanies significant blood loss and should prompt a thorough and expeditious evaluation and resuscitation.

The context of the bleeding can help explain its cause. For example, if a patient complains of bright red blood per rectum after several days of constipation and straining, that presentation suggests an anorectal source. Alternatively, a patient with hematemesis after several earlier episodes of retching would lead one to suspect an esophageal tear. Finally, a patient with easy bruising and recurrent gingival bleeding might suggest an underlying coagulopathy.

Efforts should be made to quantify the amount of blood lost during the bleeding event. Patients may describe the passage of large clots, blood changing the toilet bowl water red, or simply streaks of blood on the toilet paper. The patient’s recollection of
Common Causes of Gastrointestinal (GI) Bleeding in Adults and Children

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>ADULTS</th>
<th>CHILDREN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common causes of upper GI bleeds</td>
<td>Peptic ulcers (gastric more than duodenal)</td>
<td>Duodenal ulcers</td>
</tr>
<tr>
<td></td>
<td>Gastric erosion</td>
<td>Gastric ulcers</td>
</tr>
<tr>
<td></td>
<td>Esophagogastric varices</td>
<td>Esophagitis</td>
</tr>
<tr>
<td></td>
<td>Mallory-Weiss tears</td>
<td>Gastric erosion</td>
</tr>
<tr>
<td></td>
<td>Esophagitis</td>
<td>Esophageal varices</td>
</tr>
<tr>
<td></td>
<td>Gastric cancer</td>
<td>Mallory-Weiss tears</td>
</tr>
</tbody>
</table>

| Common causes of lower GI bleeds | Diverticular disease | Anorectal fissure |
|                                  | Angiodysplasia         | Infectious colitis |
|                                  | Colitis (inflammatory, infectious, ischemic)                          | Inflammatory bowel disease |
|                                  | Anorectal sources       | Juvenile polyps |
|                                  | Neoplasm                | Intussusception |
|                                  | Upper GI bleeding       | Meckel’s diverticulum |

**TABLE 27.1**

**BOX 27.1**

**Alternative Diagnoses or Mimics of Gastrointestinal Bleeding**

- Melena
- Ingestion of bismuth medications
- Ingestion of activated charcoal

- Hematemesis
- Nasopharyngeal bleeding (eg, nosebleeds, dental bleeding)
- Ingestion of red drinks or food

- Hemoatochezia
- Vaginal bleeding
- Gross hematuria
- Partially digested red food (eg, red beets, red grapes)

**BOX 27.2**

**Characteristics of Patients With High-Risk Gastrointestinal Bleeds**

- Medication use
  - Aspirin
  - Nonsteroidal antiinflammatory drugs
  - Steroids
  - Anticoagulants (warfarin, heparin)
  - Chemotherapeutic agents

- History of peptic ulcer disease
  - Known liver disease, cirrhosis
  - Advanced age (>60 yr)
  - Alcoholism
  - Current smoker

- Chronic medical comorbidities
  - Congestive heart failure
  - Diabetes
  - Chronic renal failure
  - Malignancy
  - Coronary artery disease

- History of abdominal aortic aneurysm graft

**BOX 27.3**

**Key Historical Information for Patients With Gastrointestinal Bleeds (GIBs)**

- Events prior to or leading up to the bleeding episode
- Severity, frequency, and quantity of the bleeding episode
- Appearance and color of the bleed
- Medical history, including risk factors for GIB:
  - Prior bleeding episodes and any identified source
  - Medication use that may increase the risk of GIB
  - Social factors that may increase the risk of GIB
  - Symptoms patient is experiencing with the bleeding episode

Relevant Medical History

A review of the patient’s relevant medical history and risk factors for bleeding should note whether a patient has had similar bleeding before and the location of the causative lesion (Box 27.3). This is especially important with UGIB because most of these presentations are caused by rebleeding of previously identified sources. Next, identification of relevant comorbid diseases helps risk-stratify these patients in the context of their bleed. Patients with GIB and a history of coronary artery disease, congestive heart failure, liver disease, or diabetes have a higher mortality and therefore may require earlier or more extensive interventions.

A review of the patient’s medications should pay particular attention to gastrotoxic substances, anticoagulants, and antiplatelet drugs. Medications such as nonsteroidal antiinflammatory drugs (NSAIDs), aspirin, warfarin, clopidogrel, corticosteroids, and certain chemotherapeutic agents are known to increase the risk of GIB by as much as threefold. In addition, reviewing the patient’s social history can identify activities that increase risk for GIB. Alcohol abuse is associated with gastritis and peptic ulcer disease. It can also result in cirrhosis, portal hypertension and, ultimately, esophageal variceal bleeding. Smoking cigarettes results in slower healing and greater recurrence of ulcers. These two social habits are also closely associated with GI malignancy—another, albeit rare, risk factor for GIB.

**Signs**

Hypotension and tachycardia can suggest moderate hypovolemia and can be the early indicators of impending shock. Normal vital signs do not preclude the possibility of a severe bleed. Orthostatic vital signs, although frequently used historically, are insufficiently sensitive or specific to be of value in determining volume status in the context of acute blood loss.
Mental status is evaluated for signs of poor cerebral perfusion. Generalized pallor in a hemodynamically stable patient might indicate the anemia of a subacute or chronic GIB; in the unstable patient, pallor might reinforce the impression of malperfusion caused by massive blood loss. Cold clammy skin on the extremities signal significant volume loss consistent with hemorrhagic shock. Echymoses or petechiae suggest a coagulopathy. Finally, jaundice, palmar erythema, or spider angiomas suggests the possibility of UGIB from esophageal varices.

The abdomen is carefully examined for subtle findings that can help identify the source of bleeding. Hyperactive bowel sounds are a nonspecific finding, but might indicate UGIB, because intraluminal blood is a known cathartic that can stimulate peristalsis. Tenderness to palpation can be seen in many cases of peptic ulcer disease. Severe diffuse tenderness on examination warrants the consideration of bowel ischemia, mechanical obstruction, ileus, or bowel perforation. Evidence of peritonitis merits a rapid surgical consultation for possible operative management. The abdominal examination may also show further signs of portal hypertension with the presence of hepatomegaly, ascites, or caput medusae. The rectal examination helps determine the type of bleeding and should be performed in most patients with GIB. The examination should include evaluation of the external anus, digital rectal examination and, when local bleeding is thought to be the cause, anoscopy for hemorrhoids, polyps, or fissures.

Ancillary Testing

Occult Blood and Guaiac Bedside Testing

In patients with suspected UGIB, guaiac testing can be performed at the bedside to evaluate for occult blood, even when stool appears normal. The test makes use of the pseudoperoxidase activity found in hemoglobin. When hydrogen peroxide is dripped onto the guaiac paper containing the stool sample, an oxidative reaction rapidly turns the paper blue. The test can actually be positive for up to 2 weeks after an acute bleed and thus is more useful for diagnosing chronic occult bleeding. Uncommonly, false-positive results can be triggered by ingestions of red meat, turnips, horseradish, vitamin C, methylene blue, and bromide preparations. Iron- and bismuth-containing medications can cause dark stools that will be guaiac-negative. Similar testing is available for gastric contents but testing of UGI aspirates and vomitus is less reliable than testing of an LGI sample, and we do not recommend it. The clinical impression of an UGIB should override any testing. The diagnostic and prognostic limitations of nasogastric (NG) tube insertion are discussed below.

Laboratory Studies

Laboratory studies can assist in the risk stratification of GIB. Minimum testing should include evaluation of the patient’s hemoglobin and blood urea nitrogen (BUN) levels, coagulation studies, and platelets. The hemoglobin level does not immediately decline in the setting of an acute bleed, because whole blood is lost. Changes in hemoglobin levels are typically seen after 24 hours, when there is hemodilution from shifting extravascular fluids and intravenous (IV) hydration with crystalloid. Nevertheless, acute hemoglobin levels less than 10 g/dL have been positively correlated with higher rates of rebleeding and mortality. Blood transfusion is indicated in a patient with GIB when their hemoglobin level is acutely less than 7 to 8 g/dL, they are experiencing vigorous blood loss, or they require further resuscitation beyond 2 L of crystalloid due to unstable vital signs. An even lower threshold for transfusion is indicated in older adults and those with significant comorbidities, such as coronary artery disease. Absorption of digested blood breakdown products into the circulatory system from the gut causes elevation of BUN levels. The BUN level can also be elevated from prerenal azotemia in the setting of hypovolemia. A BUN-to-creatinine ratio greater than 36 when the patient does not have renal failure has a sensitivity of 90% in predicting GIB, but specificity is very low, at 27%.

Coagulation studies, particularly prothrombin time, monitor for coagulopathy in the context of blood loss and replacement. This becomes especially important in patients with liver disease or those taking therapeutic anticoagulants such as warfarin.

Other laboratory tests rarely are useful in patients with GIB. Electrolyte abnormalities may be present in patients with repeated or prolonged episodes of vomiting or diarrhea. Leukocytosis often is present because of the stress response to acute blood loss and should not be considered to represent underlying infection unless other indications of infection are present. The serum lactate level is elevated when circulatory shock is present or, much less commonly, from gut ischemia, if that is the cause of the GI blood loss.

Blood is sent to the blood bank for a type and screen if the patient is stable and for crossmatching if blood loss is brisk or the patient is hemodynamically unstable or has significant comorbidities, especially heart disease. If the patient is highly unstable, transfusion of non–crossmatched blood may be necessary.

Electrocardiography

Because GIB and its subsequent anemia can reduce the oxygen-carrying capacity of blood, patients should be screened for signs of myocardial ischemia. We recommend obtaining an electrocardiogram for all patients older than 40 years, those with any symptoms of ischemia, and those with known coronary artery disease who are at higher risk for ischemic events. Electrocardiographic findings consistent with myocardial ischemia likely represent demand ischemia rather than coronary thrombosis and are treated with restoration of adequate circulatory volume, including blood, if needed.

Imaging

Emergent imaging of the chest or abdomen in the ED setting is rarely indicated in the patient with acute GIB. When bowel perforation is suspected on the basis of peritoneal findings on examination, abdominal computed tomography (CT) is the imaging test of choice. Abdominal plain radiographs are of no value for patients with GIB, except in the rare case where bowel obstruction is strongly suspected. In the absence of clinical findings consistent with perforation or bowel ischemia, CT of the solid abdominal organs is not indicated and does not alter the acute management and disposition of the patient with a GIB.

When endoscopy is not possible or cannot locate the hemorrhage source, CT angiography (CTA) is the principle diagnostic imaging tool and has the benefit of allowing for therapeutic options via embolization. CTA has a sensitivity of 85% and specificity of 92% for detecting acute GIB. Conventional angiography is indicated in a very small proportion of cases of GIB and requires a hemorrhage rate of greater than 0.5 mL/min to detect the bleed. Although also potentially therapeutic, angiography has a high complication rate, including acute renal failure, contrast reactions, and bowel infarction. Angiography has a sensitivity of 46% and specificity of 100% for acute bleeds (Fig. 27.1).

Tagged red blood cell imaging or nuclear scintigraphy involves erythrocyte injection to detect indolent or elusive bleeding and is primarily useful in the inpatient setting. Scanning must be performed within 2 hours of injection to localize bleeding accurately (Fig. 27.2).
With numerous approaches available, the American College of Radiology has developed an appropriateness rating scale to help guide emergency clinicians in the use of specific interventions and imaging modalities for patients presenting with GIB (Table 27.2).

### DIAGNOSTIC ALGORITHM

The diagnostic approach to the GIB patient involves a number of key decision points. First, the emergency clinician should assess the patient’s general appearance, vital signs, and volume status. This initial assessment can help categorize the patient as stable or unstable. If the patient is unstable, resuscitation begins with the immediate placement of two large-bore IV catheters (18 gauge or larger) or central venous catheter placement and crystalloid infusion, with the aim of establishing and maintaining adequate tissue perfusion. This does not equate to restoration of normal blood pressure, however, and maintaining a systolic blood pressure in the range of 100 mm Hg is a good initial resuscitative goal. End points of adequate resuscitation would include evidence of adequate perfusion of skin, urine output greater than 1 mL/kg/hr, and normal mental status.

The second decision point involves use of the history and physical examination findings to determine if the patient has UGIB or LGIB. These details will help risk-stratify the GIB patient further and establish the differential diagnosis. Once the presumptive origin of the bleed has been determined, the emergency clinician should consider the anticipated hospital course of the patient.

### TABLE 27.2

<table>
<thead>
<tr>
<th>Treatment or Procedure</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transcatheter arteriography, intervention</td>
<td>8</td>
<td>Allows for embolization if positive on arteriography</td>
</tr>
<tr>
<td>Diagnostic, therapeutic colonoscopy</td>
<td>4</td>
<td>Challenging in an unstable patient</td>
</tr>
<tr>
<td>Surgery</td>
<td>5</td>
<td>Appropriate if bleeding site localized</td>
</tr>
<tr>
<td>Nuclear medicine scan</td>
<td>1</td>
<td>More appropriate for hemodynamically stable patient</td>
</tr>
<tr>
<td>CTA abdomen</td>
<td>5</td>
<td>Continuing to emerge as an appropriate option when the bleeding source is unknown</td>
</tr>
<tr>
<td>MRI abdomen</td>
<td>1</td>
<td>Not appropriate in hemodynamically unstable patients</td>
</tr>
</tbody>
</table>

**Note:** Rating scale from 1 to 9, with 1 = least appropriate and 9 = most appropriate.

*For evaluation and treatment of LGIB in an actively hemodynamically unstable patient.


The third decision point relies on the severity of the UGIB or LGIB to determine the ED management and disposition.

A later section of this chapter (see “Disposition”) discusses risk stratification and hospitalization recommendations. In general, patients who are young, reliable, and hemodynamically stable, with a clear source of bleeding (eg, a minor bleed in a clear context of a Mallory-Weiss tear), can be discharged after an observation period of 12 hours in the ED or ED observation unit. The patient who has been properly resuscitated in the ED and remains hemodynamically stable will require urgent GI consultation, so admission to a medical inpatient unit or observation unit for further evaluation and management is indicated. LGIB patients who are hemodynamically stable, are reliable, have no significant risk factors, and have a clearly visualized source of bleeding on
examination can be safely discharged to follow-up with their outpatient provider.

Unstable UGIB will require emergent gastroenterology consultation, consideration of intubation if shock or hemorrhage is severe, and admission to an ICU for continued resuscitation and emergent endoscopy. Unstable LGB patients require emergent surgical consultation. Management initially centers on proper resuscitation with fluids, blood products, and admission to the ICU.

**MANAGEMENT**

**Empirical Treatment**

Rapid identification of the bleeding source (ie, upper vs. lower GI tract), risk stratification, resuscitation, consultation, and disposition are the integral elements of this process. Massive bleeding, active hematemesis, hypoxia, severe tachypnea, and/or altered mental status may mandate tracheal intubation for protection and to supplement tissue oxygenation. Fig. 27.3 presents a combined diagnostic and management algorithm.

**Resuscitation**

Hemodynamic instability and estimated volume loss should guide initial resuscitation efforts. Patients should be placed on pulse oximetry and should receive supplemental oxygen with prompt crystalloid resuscitation through two peripheral, large-bore IV catheters. Cardiac telemetry should be initiated because demand ischemia and myocardial infarction may occur in patients with significant GIB.

**Blood Product Transfusion**

Continued hemodynamic instability or ongoing hemorrhage dictate the need for blood transfusion. Factors such as age, comorbidities (eg, ischemic heart disease, peripheral vascular disease, heart failure), baseline hemoglobin and hematocrit levels, and evidence of cardiac, renal, or cerebral hypoperfusion should be considered when determining transfusion quantity. Blood transfusion is immediately indicated in patients with GIB who have a hemoglobin level acutely less than 7 to 8 g/dL, are experiencing vigorous blood loss, or require further resuscitation beyond 2 L of crystalloid to maintain a systolic blood pressure in the range of 100 mm Hg. Coagulopathy, especially in patients with underlying liver disease or those requiring massive transfusions, should be corrected promptly. We recommend either a 1:1:1 or a 1:1:2 ratio of plasma to platelets to packed RBC. 1

**Nasogastric Aspiration and Lavage**

NG tube placement with aspiration or gastric lavage is not indicated for the evaluation of GIB. Despite its long time role, with advocates citing diagnostic and prognostic value, evidence has confirmed that it is not useful for either of these purposes. The sensitivity of NG aspiration and lavage for predicting later recurrence or worsening of UGIB is low, and the negative likelihood ratio in patients with melena or hematochezia without hematemesis is poor. 2 Up to 15% of patients without blood or coffee-ground material in NG aspirates have been found to have high risk lesions on endoscopy. NG tube placement is not a benign procedure and has been associated with complications, including pain, aspiration, pneumothorax, pharyngeal or esophageal perforation, and gastric lesions. Occasionally, a consulting gastroenterologist may wish to place an NG tube in hopes of improving endoscopic visibility (and accuracy) by evacuating gastric contents and blood but, absent such an indication, we do not recommend placement of an NG tube in patients with suspected UGIB.

**Sengstaken-Blakemore Tube**

A bedside balloon tamponade should only be considered in exsanguinating patients with likely variceal bleeding when endoscopy is not immediately available. Complications are common and significant, but tube placement is indicated in the appropriate patient population due to the high mortality of uncontrolled bleeding. Insertion of these tubes is a rarely performed procedure, and emergency clinicians have resorted to novel approaches, including indirect laryngoscopy with a GlideScope, to aid placement. 3

**Pharmacologic Agents**

Several medications may improve GIB outcomes. Proton pump inhibitor (PPI) infusions have long been a staple of acute GIB therapy, but evidence has contradicted their necessity in the emergent setting. A recent systematic review has found no evidence to suggest that PPI therapy affects clinically important outcomes such as mortality, rebleeding, or subsequent surgery. 4 However, the infusion of high-dose PPIs before endoscopy has been proven to accelerate the resolution of signs of bleeding in ulcers and reduce the need for endoscopic sclerotherapy and thermocoagulation. Therefore, we recommend initiating IV dosing of an 80-mg bolus of omeprazole, followed by 8 mg/hr by continuous IV infusion for 3 days. High-dose oral PPIs, such as esomeprazole, 40 mg bid, have been shown in Asian populations to reduce the risk of rebleeding, need for surgery, and risk of death, but additional data are needed to determine whether those findings are generalizable to Western patients. If oral therapy proves equivalent to IV therapy, oral PPI therapy would decrease cost, dosage, and supply shortfalls. 5

Somatostatin and octreotide, synthetic analogues, are splanchnic vasoconstrictors that reduce portal hypertension and the risk of persistent bleeding, rebleeding, and transfusion requirements in patients with variceal bleeding. Octreotide should be empirically administered to patients presenting with an acute GIB and history of significant liver disease, variceal bleeding, or alcoholism or with abnormal liver function tests. Octreotide is given as a 50-µg bolus followed by 50 µg/hr continuous IV infusion. Octreotide is not indicated for presumed nonvariceal bleeding. Although an older meta-analysis purported to show benefit for patients with nonvariceal GIBs who were treated with somatostatin, the individual studies were poor, and there is insufficient evidence to support its use.

Vasopressin, administered by continuous IV infusion, also reduces splanchnic blood flow and portal hypertension. However, we do not recommend its use due to the risk of significant complications, including myocardial and mesenteric ischemia and infarction.

**Definitive Management**

**Consultation**

Patients with hemodynamic instability and severe bleeding of a presumed upper GI source should have emergent gastroenterology consultation. Severe LGIB warrants emergent surgical consultation.

**Endoscopy**

Upper endoscopy is the most effective diagnostic and therapeutic intervention for UGIB, achieving hemostasis in greater than 90% of cases. Endoscopic hemostasis decreases rates of rebleeding,
mortality, and urgent surgery. Endoscopic treatments include injection therapy (e.g., saline, vasoconstrictors, sclerosing agents, tissue adhesives, or a combination), thermal therapy with the use of contact methods, such as multipolar electrocoagulation and heater probe, or noncontact methods, such as argon plasma coagulation and mechanical therapy, principally endoscopic clips. Endoscopy within 13 hours of bleeding reduces mortality in high-risk patients.\(^\text{10}\)

**Colonoscopy**

Urgent colonoscopy has variable diagnostic value for the identification of a bleeding source in LGIB. Lesion visualization is maximized by bowel preparation with polyethylene glycol in brisk, but not severe, hemorrhage. Consultation with a surgeon or gastroenterologist guides decision making with regard to the need for urgent colonoscopy.
**TABLE 27.3**

<table>
<thead>
<tr>
<th>ADMISSION RISK MARKER</th>
<th>SCORE COMPONENT VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood urea nitrogen level (mg/dL)</td>
<td></td>
</tr>
<tr>
<td>≥18.2 to &lt;22.4</td>
<td>2</td>
</tr>
<tr>
<td>&gt;22.4 to &lt;28</td>
<td>3</td>
</tr>
<tr>
<td>&gt;28 to &lt;70</td>
<td>4</td>
</tr>
<tr>
<td>≥70</td>
<td>6</td>
</tr>
<tr>
<td>Hemoglobin level for men (g/dL)</td>
<td></td>
</tr>
<tr>
<td>≥10 to &lt;12</td>
<td>1</td>
</tr>
<tr>
<td>&lt;10</td>
<td>6</td>
</tr>
<tr>
<td>Hemoglobin level for women (g/dL)</td>
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<td>≥10 to &lt;12</td>
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<tr>
<td>&lt;10</td>
<td>6</td>
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<tr>
<td>Systolic blood pressure (mm Hg)</td>
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<td>≥100 to &lt;109</td>
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<td>90 to &lt;99</td>
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<tr>
<td>&lt;90</td>
<td>3</td>
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<tr>
<td>Other markers</td>
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<tr>
<td>Pulse rate ≥100 beats/min</td>
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</tr>
<tr>
<td>Presentation with melena</td>
<td>1</td>
</tr>
<tr>
<td>Presentation with syncope</td>
<td>2</td>
</tr>
<tr>
<td>Hepatic disease</td>
<td>2</td>
</tr>
<tr>
<td>Heart failure</td>
<td>2</td>
</tr>
</tbody>
</table>

*Range of scores is from 0 to 23, with high risk >0.

**DISPOSITION**

There are currently no well-validated clinical decision rules for emergency clinicians to aid in resource allocation and disposition decisions for GIB patients. However, several risk scoring systems, including the Blatchford and Rockall systems, can aid emergency clinicians in stratifying UGIB patients into low- and high-risk groups for adverse outcomes, with high-risk patients defined as those who require a blood transfusion or endoscopic or surgical intervention during their admission. The Blatchford scoring system (Table 27.3) and clinical (or pre-endoscopic) Rockall scoring system (Table 27.4) are two methods that solely use clinical and laboratory data to risk-stratify patients. In a retrospective review of 354 patients, the Blatchford scoring system was 99.6% sensitive and the clinical Rockall scoring system was 90.2% sensitive at identifying patients as high risk.

**KEY CONCEPTS**

- Several risk scoring systems, including the Blatchford and Rockall scoring systems, can help emergency clinicians stratify UGIB patients into low- and high-risk groups for adverse outcomes, with high-risk patients defined as those who require a blood transfusion or endoscopic or surgical intervention during their admission.
- Patients who are not at high risk and are without comorbid diseases, have normal vital signs, normal or trace positive results on stool guaiac testing, normal hemoglobin and hematocrit levels, good support systems, proper understanding of signs and symptoms of significant bleeding, and access to emergent care and 24-hour follow up may be discharged.
- Nasogastric lavage is an uncomfortable procedure that has low sensitivity and is not indicated in the acute management of UGI bleeding.
- IV administration of proton pump inhibitors, such as pantoprazole, 40 mg IV bid, should be initiated in the emergent setting for patients with significant UGIB. Alternatively, in patients with significant acute GIB, we recommend an 80 mg IV bolus of omeprazole followed by 8 mg/hr continuous infusion for 3 days.
- A BUN-to-creatinine ratio greater than 36 in the setting of no renal failure can be highly suggestive of UGIB.
- Electrocardiography should be performed in older adults or those with known coronary artery disease who are at higher risk for demand ischemia in the setting of hypotension or anemia due to a GIB.

Our recommendation is to use the Blatchford or Rockall scoring systems as general guidelines, understanding that these clinical decision rules may not be sensitive enough to predict which patients are high risk. High-risk UGIB patients require admission for inpatient monitoring, assessment, and consultation for definitive diagnosis and treatment.

Patients at low risk for recurrent or worsening UGIB bleed can be discharged to home if they meet all the following criteria: no significant comorbid diseases (eg, ischemic heart disease, congestive heart failure, hepatic disease); normal vital signs; normal or trace positive results on stool guaiac testing; normal hemoglobin and hematocrit levels; good support systems; proper understanding of signs and symptoms of significant bleeding; immediate access to emergent care; and arranged follow-up within 24 hours. Low-risk patients deemed appropriate candidates for discharge should be given clear instructions reviewing the signs and symptoms of significant GIB and when to contact their primary care physician or return to the ED. Specific educational guidelines should include information regarding the likely source of bleeding, medication side effects, alcohol abstinence, and discontinuation of the use of aspirin and NSAIDs. These patients require early follow-up for a specific evaluation.

There are no clear guidelines on risk stratification for the outpatient management of LGIB patients, other than clear identification of a local anal source of the bleeding, such as hemorrhoids or fissure. Most LGIB patients, therefore, are hospitalized or placed in an observation unit for further evaluation. Lower GI bleeding not clearly due to hemorrhoids, fissure, or proctitis may require nuclear medicine imaging or colonoscopy.

The references for this chapter can be found online by accessing the accompanying Expert Consult website.
When evaluating a patient with an upper gastrointestinal bleed, the first step in management involves resuscitation with the immediate placement of two large-bore intravenous catheters (18 gauge or larger) and crystalloid infusion. Other diagnostic measures, such as performing electrocardiography or imaging, can be carried out after the initial step of gaining venous access and initiating resuscitation. It is important to note that abdominal plain films are rarely helpful in patients with GI bleeding unless bowel obstruction is suspected. Gastroenterology consultation is an important part of this patient’s care plan; however, it is not the first step in management after the evaluation.

27.2. A 56-year-old man presents with nausea, vomiting, and hematemesis since early this morning. He reports vomiting a combination of coffee-ground emesis and, more recently, bright red blood. His past medical history is significant for heavy alcohol use and known esophageal varices. On arrival, he is pale and diaphoretic. His vitals are remarkable for a blood pressure of 90/54 mm Hg and a regular heart rate of 118 beats/min. What is the most appropriate initial step in management?

A. Consult a gastroenterologist for immediate endoscopy.
B. Perform a rectal examination to confirm a gastrointestinal bleed.
C. Perform electrocardiography to evaluate a cardiac cause for the patient’s presentation.
D. Perform emergent abdominal plain radiography to evaluate the cause of the GI bleed.
E. Place two large-bore intravenous catheters and begin crystalloid resuscitation.

Answer: E. If a patient with a reported GI bleed is unstable, the initial step in management involves resuscitation with the immediate placement of two large-bore intravenous catheters (18 gauge or larger) and crystalloid infusion. Other diagnostic measures, such as performing electrocardiography or imaging, can be carried out after the initial step of gaining venous access and initiating resuscitation. It is important to note that abdominal plain films are rarely helpful in patients with GI bleeding unless bowel obstruction is suspected. Gastroenterology consultation is an important part of this patient’s care plan; however, it is not the first step in management after the evaluation.

27.3. A 65-year-old man presents with weakness, fatigue, melena, and increasing amounts of coffee-ground emesis over the last 24 hours. The patient has a known history of cirrhosis and heavy alcohol abuse. On examination, he is pale and diaphoretic and has rectal findings showing a combination of melena and hematochezia. His vital signs show a blood pressure of 75/40 mm Hg and a regular heart rate of 125 beats/min. You place two large-bore intravenous (IV) catheters and attempt to resuscitate the patient with crystalloid, but the patient shows no improvement after 2 L of fluid. At this point, the management of this patient should include all of the following, except which one?

A. Emergent gastroenterology consultation for endoscopy.
B. Emergent intensive care unit (ICU) consultation for admission, further evaluation, and monitoring.
C. Placement of a nasogastric (NG) tube with gastric lavage.
D. Transfusion of 1 unit of fresh frozen plasma (FFP) for every 4 units of packed red blood cells.
E. Transfusion of packed red blood cells.

Answer: C. Placement of an NG tube in suspected upper GI bleed is not recommended. The sensitivity of this modality for predicting upper GI bleed is low, and there is a negative likelihood ratio in patients with melena or hematochezia. Along with this, NG tube placement has been associated with severe complications, including aspiration, pneumothorax, perforation, and development of gastric lesions. Transfusion of packed red blood cells and FFP is indicated here because the patient is hemodynamically unstable and likely to be suffering from coagulopathy resulting from his liver disease. Both GI and ICU consultation should be pursued because the patient will require endoscopy and close monitoring.

27.4. Which of the following statements regarding the epidemiology of GI bleeding is correct?

A. LGIB affects a larger portion of patients than does UGIB.
B. LGIB requiring admission is more common in adults than in children.
C. Most deaths secondary to GI bleeding occur in patients older than 60 years.
D. Overall mortality has remained the same over the past 20 years.
E. UGIB is more common in women than in men.

Answer: C. The overall mortality of GI bleeding is approximately 13% to 14% and has not changed significantly since the 1960s. LGIB affects a smaller portion of patients and results in proportionally fewer hospital admissions than UGIB. GI bleeding can occur in individuals of any age but usually affects people in their 50s and 60s.
40s through 70s (mean age, 59 years). Most deaths caused by GI bleeding occur in patients older than 60 years. UGIB is more common in men than in women (2:1), whereas LGIB is more common in women. Significant UGIB requiring admission is more common in adults, whereas LGIB requiring admission is more common in children.

27.5. What is the most common cause of significant upper GI bleeding in adults?
- A. Duodenitis
- B. Esophagitis
- C. Gastric erosions
- D. Peptic ulcer disease
- E. Varices

**Answer:** D. The most common cause of significant upper GI bleeding in adults is peptic ulcer disease. In descending order of frequency, this is followed by gastric erosions, varices, Mallory-Weiss tear, esophagitis, and duodenitis.

27.6. What is the most common cause of significant lower GI bleeding in adults?
- A. Cancer
- B. Diverticular disease
- C. Inflammatory bowel disease
- D. Rectal disease
- E. Upper GI bleeding

**Answer:** B. The most common cause of significant lower GI bleeding in adults is diverticular disease. In descending order of frequency, this is followed by angiodysplasia, upper GI bleeding, cancer or polyps, rectal disease, and inflammatory bowel disease.

27.7. What is the most common cause of upper GI bleeding in children?
- A. Esophageal varices
- B. Esophagitis
- C. Gastric and duodenal ulcers
- D. Gastritis
- E. Mallory-Weiss tear

**Answer:** C. Gastric and duodenal ulcers are the most common cause of upper GI bleeding in children. In descending order of frequency, this is followed by esophagitis, gastritis, esophageal varices, and Mallory-Weiss tear.

27.8. What is the most common cause of lower GI bleeding in children?
- A. Anorectal fissure
- B. Infectious colitis
- C. Inflammatory bowel disease
- D. Intussusception
- E. Polyps

**Answer:** A. Anorectal fissure is the most common cause of lower GI bleeding in children. In descending order of frequency, this is followed by infectious colitis, inflammatory bowel disease, polyps, intussusception, and Meckel's diverticulum.

27.9. Which of the following has been shown to decrease rebleeding occurrences effectively in patients treated for upper GI bleeding secondary to esophageal varices?
- A. Cimetidine
- B. Famotidine
- C. Octreotide
- D. Omeprazole
- E. Vasopressin

**Answer:** C. Octreotide is a useful addition to endoscopic sclerotherapy and decreases rebleeding occurrences. Patients with documented esophageal varices and acute upper GI bleeding should be treated with an intravenous infusion of DAM, 50 µg/hr, for a minimum of 24 hours while being observed in the intensive care unit.

27.10. Emergent surgical consultation should be obtained in a patient with GI bleeding and which of the following?
- A. Esophageal varices
- B. History of abdominal aortic graft
- C. Initial systolic blood pressure < 100 mm Hg
- D. Liver disease
- E. Transfusion requiring 4 units of blood

**Answer:** B. Emergent surgical consultation is needed for patients who have abdominal aortic grafts and who present to the emergency department with GI bleeding because of the possibility of an aortoenteric fistula. Consultation with a surgeon should be obtained if it appears that more than 5 units of blood is required to achieve hemodynamic stability or if there is reasonable suspicion that operative intervention may be needed. This is especially true for patients older than 65 years. Patients with a history of varices, persistent postural changes in heart rate, or significant bright red blood per rectum are more likely to require surgery than patients without these findings.