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Understanding acute upper gastrointestinal bleeding in adults

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Abstract: Acute upper gastrointestinal bleeding (UGIB) is common in both acute care and primary care settings. It can range from self-limited bleeding to life-threatening hemorrhagic emergencies. This article discusses the assessment and management of adults with acute UGIB, including pharmacologic and nursing interventions.

Keywords: acute upper gastrointestinal bleeding, esophageal varices, Mallory-Weiss tears, peptic ulcer disease, UGIB, upper endoscopy

ACUTE UPPER GASTROINTESTINAL BLEEDING (UGIB) is common in both acute care and primary care settings. It leads to more than 300,000 annual hospitalizations and a mortality of an estimated 3.5% to 10% in the US.[1] Globally, UGIB is more common than lower gastrointestinal bleeding, with an annual prevalence of 100 per 100,000 patients and a 6% to 10% mortality.[2] It can range from self-limited bleeding to life-threatening hemorrhagic emergencies. Although mortality is similar among male and female patients, UGIB is more common in males.[2] Similarly, it can occur at any age, but patients older than age 60 may be at an increased risk.[2]

Because clinical nurses may encounter UGIB in any practice setting, they need the skills and knowledge to care for patients with this potentially life-threatening disorder. This article discusses the assessment and management of adults with acute UGIB, including pharmacologic and nursing interventions.

Pathophysiology

UGIB is defined as bleeding derived from a source proximal to the ligament of Treitz, a duodenal suspensory ligament that attaches to the junction of the duodenum and jejunum, separating the upper and lower GI tract (see *Ligament of Treitz*). This includes bleeding from the esophagus, stomach, or duodenum.[3,4] Several studies have described the most common causes of UGIB, which include:[4,5]

- ***Peptic ulcer disease (PUD).*** The most common cause of UGIB, PUD accounts for 62% of all cases and includes both gastric and duodenal

ulcers.[6,7] Smoking, alcohol, and nonsteroidal anti-inflammatory drugs (NSAIDs) can also contribute to PUD bleeding.[4,7]

• ***NSAIDs.*** Gastric injury from NSAIDs accounts for approximately 20% of UGIB.[3] Bleeding due to acute or chronic NSAID use is a common adverse reaction among older adults and in those who have been prescribed anticoagulants and steroids. As NSAIDs are highly acidic, acute and chronic use may cause severe irritation of the gastric mucosa and block the protective mechanisms that help maintain its integrity.[8]

• ***Esophagogastric varices*** are associated with dilated esophageal and gastric veins due to portal hypertension.[3] In the US, alcoholic cirrhosis is the most common cause of portal hypertension, and the vast majority of patients with esophagogastric varices have cirrhosis.[3,6] These varices can rupture and cause acute hemorrhage.

• ***Mallory-Weiss tears*** are longitudinal mucosal lacerations in the distal esophagus and proximal stomach that occur due to profuse and forceful vomiting or gagging. Patients may be at risk for developing Mallory-Weiss tears as a result of alcohol abuse and/or gastritis and esophagitis.[4,6]

Patient history

Nurses caring for patients with UGIB should review their patients' health history and perform medication reconciliation. It is important to take note of any medications known to increase the risk of UGIB, such as aspirin and other NSAIDs, steroids, antiplatelet agents, and anticoagulants. Selective serotonin reuptake inhibitors, calcium channel blockers, and aldosterone antagonists have also been associated with GI bleeding.[4] Similarly, other medications can change patient presentation; for example, iron and bismuth may result in a black stool.[4] Question patients about both prescription and over-the-counter medications, including herbal and nutritional supplements.[4,7]

Determine if the patient has a history of alcohol abuse, previous GI bleeding, liver disease, or coagulopathy.[4] Additional questions may include:

• Have you experienced any nausea, vomiting, or unintentional weight loss?
• Have you vomited any blood?
• Do you have any abdominal pain or any pain before, during, or after a bowel movement?
• Have you experienced constipation or diarrhea, or lost control of your bowels?
• Have you seen any blood in your stool? If so, do you have a history of hemorrhoids?
• Have any of your stools been black, tarry, or sticky?

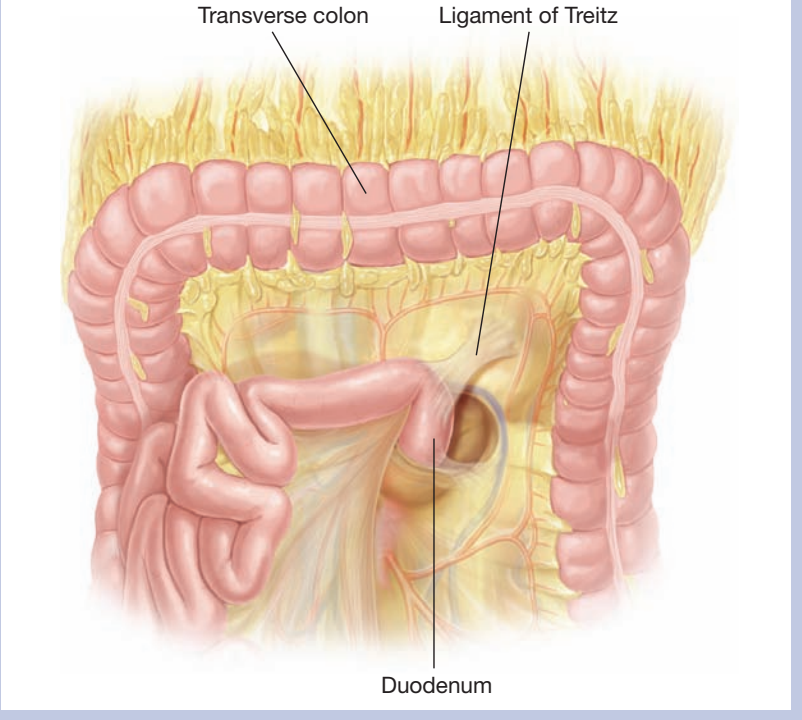
If patients answer yes to any of these questions, nurses should suspect UGIB.[9]

Physical assessment

Physical assessment findings in patients with UGIB may include:[4]

• hematemesis, which is characterized by either red blood or coffee-ground emesis. This suggests bleeding proximal to the ligament of Treitz. Frankly bloody emesis suggests moderate-to-severe bleeding that could be ongoing; coffee-ground emesis suggests more limited bleeding.
• melena or tarry stool, which may be frankly bloody or maroon with massive or brisk UGIB.
• tachycardia.
• orthostatic BP changes, which suggest moderate-to-severe blood loss, and hypotension, which suggests life-threatening blood loss.
• abdominal tenderness and/or pain upon palpation. For example, abdominal tenderness accompanied by

Ligament of Treitz

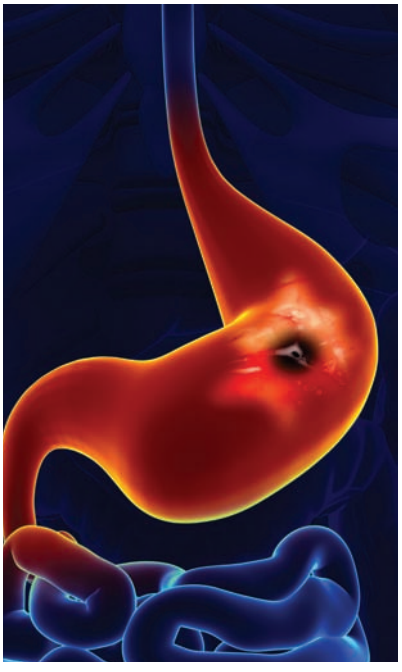


Source: Albo D. *Operative Techniques in Colon and Rectal Surgery.* 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2014.

signs of peritoneal irritation, such as involuntary guarding, may suggest perforation.

In patients who are hemodynamically stable, nurses should include the following assessments after obtaining their clinical history:

- ***Neurologic:*** Depending on the amount of bleeding, patients may be lethargic. This may be partially related to reduced hemoglobin levels.
- ***Pulmonary system:*** Unless there is an underlying pathology, patient lung sounds should be clear to auscultation. Monitor, SpO_2 levels continuously.
- ***Cardiovascular system:*** Given the risk of hypovolemia, hemodynamic assessment is critical.[7] If left untreated, hypovolemia can lead to shock and multiorgan failure due to blood loss. Nurses must assess and monitor patient heart rate and rhythm. Tachycardia is the first sign of hemodynamic compromise and the most sensitive indicator of volume status, but it is a nonspecific finding and may not occur with bleeding in patients receiving beta-blockers.[7,10]
- ***Renal system:*** As the body compensates for blood loss, the renin-angiotensin system is activated. To conserve circulating blood volume, urine output decreases and the urine becomes more concentrated.[3] Nurses should monitor patients' intake and output, as well as the quantity and characteristics of their urine.
- ***Integumentary system:*** Patients may exhibit abnormal skin changes due to decreased perfusion related to bleeding.[3] Nurses should assess for diaphoresis, pallor, delayed capillary refill time, and cold skin temperature.
- ***Rectal exam:*** The consistency and color of blood in a patient's stool can provide clues to the source of the bleeding. Typically, hematochezia, or red or maroon blood in the stool, indicates lower GIB; tarry, black stools generally indicate UGIB. However, hematochezia can also occur with massive UGIB, which is typically associated with orthostatic hypotension.[4]



Gastric injury from NSAIDs accounts for approximately 20% of UGIB.

Diagnostic studies

The appropriate lab testing for patients with suspected acute UGIB includes a complete blood cell count, serum chemistries, liver tests, coagulation studies, and a serum lactate level.[6] Patients should also be typed and cross-matched for blood transfusion. Additionally, serial electrocardiograms and serum cardiac biomarkers may be indicated in patients at risk for a myocardial infarction, such as older adults or those with a history of coronary artery disease.[4]

The initial hemoglobin level in patients with acute UGIB will often present at baseline because they are losing whole blood. Hemoglobin levels will typically decrease after 24 hours or more as the blood is diluted by extravascular fluid entering the vascular space or during fluid resuscitation.[6] Excessive volume administration can lead to falsely low hemoglobin values. The initial hemoglobin levels are monitored every 2 to 8 hours, depending upon the severity of the UGIB.[4]

UGIB can affect the ratio of blood urea nitrogen to creatinine, which typically ranges between 15:1 and 20:1.[7] In patients with normal creatinine levels between 0.8 mg/dL and 1.3 mg/dL, a ratio greater than 20:1 may indicate an UGIB.[4,7] If it is unclear whether the bleeding stems from the upper or lower GI tract, the provider may consider nasogastric lavage; this may also be used to clean the patient's stomach before endoscopy.[4] (See *Anatomy of the GI tract.*)

Upper endoscopy is the diagnostic modality of choice for acute UGIB. Endoscopy has a high sensitivity and specificity for locating and identifying bleeding lesions in the upper GI tract. Once a bleeding lesion has been identified, therapeutic endoscopy can achieve acute hemostasis and prevent recurrent bleeding in most patients. Early endoscopy (within 24 hours) is recommended for most patients with acute UGIB.[4] For those with suspected variceal bleeding, however, endoscopy should be performed within 12 hours of presentation.[4]

Other diagnostic studies for acute UGIB include angiography, which can detect active bleeding, and deep small bowel enteroscopy. Upper GI barium studies are contraindicated because they will interfere with subsequent endoscopy, angiography, or surgery.[4]

Management

Patients with UGIB should be placed on NPO status and receive supplemental oxygen. Two large caliber (18-gauge or larger) peripheral I.V. catheters or a central venous catheter should be inserted. For patients who are hemodynamically unstable, two

16-gauge I.V. catheters should be inserted.

Closely monitor the patient's clinical status, including airway, vital signs, cardiac rhythm, urine output, and nasogastric output if a nasogastric tube is in place.[4]

Initial treatment goals are focused on airway maintenance and volume resuscitation. Endotracheal intubation should be considered for those with ongoing hematemesis or altered respiratory or mental status.[8] Nurses should expect to administer isotonic fluids, such as normal saline or lactated Ringer's solution, as well as any necessary blood products.[4] Coagulopathies should be corrected with fresh frozen plasma and vitamin K. If necessary, more rapid reversal of anticoagulation can be achieved via prothrombin complex concentrate infusions; this is the preferred approach for patients with serious or life-threatening bleeding.[4] Platelets should be administered for patients with thrombocytopenia or a platelet count below 50,000/mcL (normal, 150,000 to 450,000/mcL).[4,8]

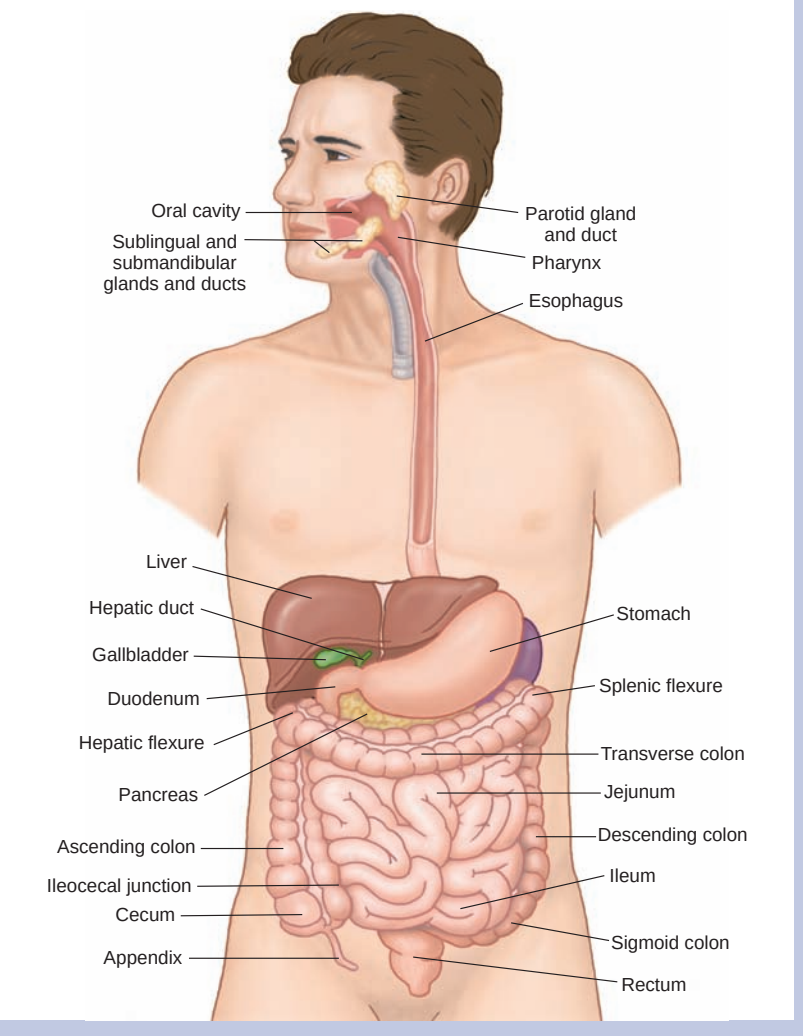
After an initial fluid resuscitation, patients may require a blood transfusion, depending on their signs and symptoms and overall clinical presentation. A hemoglobin level maintained above 7 g/dL (normal, 13.5 to 17.5 g/dL in men) is recommended, but transfusions may be necessary for patients who are clinically unstable despite their hemoglobin levels.[5,7,8]

Pharmacotherapy for patients with UGIB is aimed at gastric acid suppression. Proton pump inhibitors (PPIs) are the drug class most associated with healing ulcers and erosions, decreasing drug-induced gastritis, and reducing rates of UGIB.[11] PPIs such as I.V. pantoprazole and esomeprazole are twice as effective as histamine-receptor antagonists in treating PUD.[8] When used in combination with endoscopy, they reduce the need for blood transfusions, decrease the rate of rebleeding, and shorten patients' lengths of stay.[4,8] As such, PPIs should be used in both pre- and postendoscopic therapy.

Pharmacologic strategies to reduce variceal bleeding include vasoactive medications such as octreotide and vasopressin. Octreotide reduces bleeding by decreasing visceral or splanchnic blood flow.[6,8] It also inhibits the release of gastrin, a hormone that stimulates gastric acid secretion.[8] This helps lessen variceal pressure and improved control of the variceal hemorrhage.[5]

Vasopressin is a potent vasoconstrictor that requires administration of concurrent I.V. nitroglycerin to treat UGIB.[5] Nitroglycerin increases the portal hypotensive action of vasopressin while reducing its systemic hemodynamic effects, such as coronary artery vasoconstriction.[5] However, the adverse reactions associated with vasopressin, including extrasplanchnic vasoconstrictive properties and subsequent myocardial, cerebral, bowel, and limb ischemia, have made this combination therapy a

Anatomy of the GI tract



Source: Porth CM. *Essentials of Pathophysiology: Concepts of Altered Health States*. 4th ed. Philadelphia, PA: Wolters Kluwer; 2014.

last-line pharmacologic option for the management of UGIB.

Nursing considerations

When caring for patients with UGIB, nurses should take the following precautions to ensure high-quality care:

- Establish adequate venous access. If bleeding is suspected, insert at least two large-bore I.V. catheters in case blood products, fluid resuscitation, and/or medications are required.
- Prepare to administer supplemental oxygen as prescribed.
- Administer blood products as prescribed.
- Monitor vital signs frequently to assess for hemodynamic instability.
- Accurately document intake and output, including emesis and liquid stools.
- Prepare patients for any diagnostic studies, including upper endoscopy.
- Administer medications as prescribed.
- Monitor lab study results, including hemoglobin, hematocrit, platelet counts, and electrolyte levels.
- Assess for adequate urinary output with a goal of at least 0.5 mL/kg/h.

Patient education is key

Nurses must be prepared to teach patients about UGIB and the ways to reduce the risk of its recurrence. They should encourage patient follow-up with the gastroenterology team and provide education regarding PPIs, the proper use of NSAIDs, and the signs and symptoms of UGIB.

UGIB can be caused by various underlying etiologies. With careful assessment, appropriate interventions, and thorough patient education, nurses can help their patients through the immediate danger of UGIB and empower them to combat subsequent bleeding episodes. ■

REFERENCES

1. Hwang JH, Fisher DA, Ben-Menachem T, et al. The role of endoscopy in the management of acute non-variceal upper GI bleeding. *Gastrointest Endosc*. 2012;75(6):1132-1138.
2. Upchurch BR. Upper gastrointestinal bleeding (UGIB). Medscape. 2019. https://emedicine.medscape.com/article/187857-overview.
3. McDonough CR. Approach to gastrointestinal bleeding. In: Ciesielski T, ed. *The Washington Manual: General Internal Medicine Consult*. Philadelphia, PA, and St. Louis, MO: Wolters Kluwer and the Washington University School of Medicine; 2017:134-142.
4. Saltzman JR. Approach to acute upper gastrointestinal bleeding in adults. UpToDate. 2019. www.uptodate.com.
5. Gibson W, Scaturo N, Allen C. Acute management of upper gastrointestinal bleeding. *AACN Adv Crit Care*. 2018;29(4):369-376.
6. Farrar FC. Management of acute gastrointestinal bleed. *Crit Care Nurs Clin North Am*. 2018;30(1):55-66.
7. Meehan CD, McKenna CG. Stopping acute upper-GI bleeds. *Am Nurse Today*. 2018;13(3):6-8.
8. Lenn M, Grantner GR. Differentiating upper and lower GI bleeds. *US Pharm*. 2018;43(12):HS-2-HS-6.
9. Dains JE, Baumann LC, Scheibel P. *Advanced Health Assessment and Clinical Diagnosis in Primary Care*. 6th ed. St. Louis, MO: Elsevier; 2020.
10. Strate LL, Gralnek IM. ACG clinical guideline: management of patients with acute lower gastrointestinal bleeding. *Am J Gastroenterol*. 2016;111(5):755.
11. Ali Khan M, Howden CW. The role of proton pump inhibitors in the management of upper gastrointestinal disorders. *Gastroenterol Hepatol (N Y)*. 2018;14(3):169-175.

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