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Effective management of acute gastrointestinal hemorrhage: Current approaches for pharmacists, emergency medical services, and updated role of health information

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Abstract--Background: Gastrointestinal (GI) hemorrhage, a significant health concern particularly among the elderly, is a leading cause of hospital admissions for gastrointestinal disorders. The condition can be present as hematemesis, hematochezia, or melena, with varying etiologies based on the site of bleeding. Management of GI bleeding is complex and varies according to the stability of the patient and the source of bleeding. **Aim:** This article aims to review current approaches for the effective management of acute GI hemorrhage, focusing on diagnostic and therapeutic strategies employed by pharmacists and emergency medical services. Also, review will focus on the role of health information systems for the management and controlling GI hemorrhage in future responses. **Methods:** A comprehensive review of management practices was conducted, including initial evaluation, resuscitation strategies, and

diagnostic procedures. Emphasis was placed on the roles of endoscopy, imaging studies, and multidisciplinary care in the management of both stable and unstable GI bleeding. **Results:** Effective management starts with hemodynamic stabilization and involves the use of crystalloid resuscitation and blood transfusions as needed. Endoscopy is preferred for stable cases of upper and lower GI bleeding, performed within 24 hours of presentation. For unstable bleeding, CT angiography is a crucial initial diagnostic tool, with further options including traditional angiography and endoscopy. Multidisciplinary care is vital, with collaboration among gastroenterology, interventional radiology, and surgery. **Conclusion:** Management of GI hemorrhage requires a tailored approach based on patient stability and bleeding source. Stable patients benefit from prompt endoscopic evaluation, while unstable cases necessitate a combination of advanced imaging and potential surgical intervention. Multidisciplinary collaboration enhances diagnostic accuracy and treatment efficacy.

Keywords---Gastrointestinal bleeding, hemodynamic stabilization, endoscopy, CT angiography, multidisciplinary care, emergency medical services.

Introduction

Gastrointestinal (GI) bleeding is a major contributor to morbidity and mortality among the elderly population. It represents the leading cause of hospital admissions for gastrointestinal disorders in the United States. Approximately 1% of individuals aged 80 and older are hospitalized annually due to GI bleeding. Severe GI bleeding can manifest in various forms, including hematemesis (vomiting of fresh blood), hematochezia (passage of red or maroon stools), or melena (presence of black or tarry stools). Traditionally, melena is linked to upper GI sources of bleeding, whereas hematochezia is associated with lower GI origins. However, substantial upper GI hemorrhage may present as hematochezia, and lower GI bleeding may occasionally present as melena. Upper GI bleeding is typically defined as hemorrhage occurring proximally to the ligament of Treitz, while lower GI bleeding occurs distal to this landmark. These different etiologies will be explored further. The prevalence of both upper and lower GI bleeding rises with age, given that the conditions leading to GI bleeding are more prevalent in the elderly. Individuals aged 80 and above exhibit a threefold higher rate of hospitalization for GI bleeding compared to those aged 65–69. Additional factors that increase hospitalization risk include male gender, polypharmacy, use of oral anticoagulants, presence of cardiovascular disease, difficulties with daily activities, and being unmarried. Mortality rates for both upper and lower GI bleeding have decreased since the early 2000s, with current rates at 2–3% for both types. However, mortality rates are substantially higher for unstable GI bleeding. An analysis of over 6 million patients in the United States (2002–2013) revealed a mortality rate of 20% for those presenting with shock compared to 2% for those without shock. The management of GI bleeding is intricate and often necessitates the adjustment of anticoagulation or antiplatelet therapies. Since

most GI bleeding resolves spontaneously, identifying the source of bleeding during active hemorrhage poses a clinical challenge. Several diagnostic modalities are available, each with varying success and failure rates. Selecting the appropriate test or procedure requires the coordinated efforts of a multidisciplinary team.

Key Points:

For elderly patients presenting with GI hemorrhage, initial management should focus on hemodynamic stabilization through crystalloid resuscitation and transfusions as needed. Subsequently, efforts should be directed toward localizing the source of bleeding. Upon presentation, risk stratification should be conducted to prioritize patient triage and determine the appropriate clinical services to engage. For stable upper GI bleeding, the preferred diagnostic procedure is an upper endoscopy, ideally performed within 24 hours of presentation. Endoscopic intervention should be administered for active bleeding, with peptic ulcer disease being the most frequent cause of upper GI bleeding. For stable lower GI bleeding, colonoscopy is the diagnostic procedure of choice, also to be performed within 24 hours of presentation. Endoscopic treatment should be provided for active bleeding, with diverticulosis being the predominant cause of lower GI bleeding. Unstable bleeding cases require a multidisciplinary approach involving gastroenterology, interventional radiology, critical care, and surgery to determine the most effective diagnostic and therapeutic strategies. CT angiography serves as an excellent initial diagnostic tool for unstable bleeding cases. If CT angiography results are negative, the patient should proceed to upper endoscopy as the subsequent step. If CT angiography results are positive, consider immediate transcatheter angiography and embolization as the next course of action. Surgery is indicated for patients who do not respond to endoscopic or catheter-based treatments, or if it is determined to be the optimal option following a multidisciplinary consultation. Efforts should be made to localize the bleeding site before proceeding with surgery.

Initial Evaluation:

The initial assessment of a patient with gastrointestinal (GI) bleeding involves a comprehensive history and physical examination, including the recording of vital signs and laboratory tests. Key aspects to inquire about include the duration, volume, and characteristics of the bleeding. It is crucial to evaluate the presence of comorbid conditions, such as cardiovascular, pulmonary, renal, and hepatic diseases. A history of peptic ulcer disease, inflammatory bowel disease, neoplasms, or prior radiation therapy should also be noted. Additionally, obtaining a detailed medication history is essential, focusing on nonsteroidal anti-inflammatory drugs (NSAIDs), anticoagulants, and antiplatelet agents that could contribute to the bleeding. Any history of cardiac stenting or prosthetic heart valves should be documented.

In elderly patients, cognitive impairments such as memory loss and dementia may complicate the history-taking process. Cognitive disorders can affect decision-making abilities, making it challenging for elderly individuals to make informed decisions. In such cases, it is important to gather information from family members and the primary care physician. Advanced directives and a

healthcare proxy can be particularly valuable in these situations. A targeted physical examination should include an abdominal assessment and a digital rectal examination. Anoscopy should be conducted during the initial evaluation to exclude active hemorrhoidal bleeding, as hemorrhoids account for up to 20% of lower GI bleeding cases.

Initial Treatment:**Resuscitation:**

Immediate supportive measures are critical in the management of acute hemorrhage. Two large-bore peripheral intravenous catheters should be established, and the patient should be monitored on a cardiac monitor. Supplemental oxygen should be administered if needed, and the patient should be kept NPO (nothing by mouth). Initial resuscitation involves crystalloid intravenous infusion. Blood transfusions are generally initiated when hemoglobin (Hb) levels drop below 7 g/dL, with a target post-transfusion Hb of 7–9 g/dL. Restrictive transfusion strategies, compared to more liberal approaches, have shown comparable or reduced mortality and rebleeding risks. For patients with underlying cardiovascular conditions, transfusions should aim to maintain Hb levels of ≥ 8 g/dL. Platelet transfusions should follow after 4 units of packed red blood cells. In cases of severe, persistent bleeding, a 1:1:1 ratio of packed red blood cells, platelets, and plasma (similar to trauma resuscitation protocols) is recommended.

Management of Antiplatelet and Anticoagulant Agents:

Anticoagulant and antiplatelet therapies are frequently used in elderly patients with GI bleeding. Warfarin, an anticoagulant, should be discontinued upon initial presentation. For unstable hemorrhage, the anticoagulant effects of warfarin are reversed using a prothrombin complex concentrate and/or vitamin K. Warfarin can be resumed 7 days after bleeding cessation. For patients at high risk of thromboembolism, such as those with prosthetic heart valves or recent (<3 months) venous thromboembolism, low molecular weight heparin should be initiated 48 hours after bleeding cessation. Aspirin used for primary prevention in patients with low thromboembolic risk should be discontinued. However, for patients on aspirin for secondary prophylaxis (e.g., post-cardiac stent placement), discontinuation increases the risk of cardiovascular or cerebrovascular events threefold. In these cases, low-dose aspirin (81 mg daily) should be continued. Dual antiplatelet therapy involving a P2Y₁₂ receptor antagonist and aspirin should not be discontinued without cardiology consultation. Stopping both medications is particularly risky for patients with acute coronary syndrome within the past 90 days or recent coronary stenting (bare metal stent within the last 6 weeks, or drug-eluting stent within the last 6–12 months). In life-threatening hemorrhage, the P2Y₁₂ receptor antagonist should be stopped while continuing aspirin. After bleeding resolution, the P2Y₁₂ receptor antagonist should be resumed within 5 days.

Next Diagnostic Steps:

Following initial evaluation and resuscitation, the subsequent diagnostic steps focus on identifying the source of gastrointestinal (GI) bleeding and guiding further management. The choice of diagnostic tests and procedures depends on the patient's stability, the suspected source of bleeding, and the clinical context.

1. Endoscopy:

- **Upper Endoscopy (Esophagogastroduodenoscopy, EGD):** This is the preferred diagnostic procedure for evaluating upper GI bleeding. It should be performed within 24 hours of presentation in stable patients. EGD allows direct visualization of the esophagus, stomach, and duodenum, helping to identify and potentially treat sources of bleeding such as peptic ulcers, esophageal varices, or malignancies.
- **Colonoscopy:** This is the diagnostic test of choice for lower GI bleeding and should also be performed within 24 hours of presentation in stable patients. Colonoscopy provides a view of the colon and rectum, allowing for the detection and management of conditions like diverticulosis, colorectal polyps, or tumors.

2. Imaging Studies:

- **CT Angiography:** For unstable patients or those in whom endoscopy is not immediately feasible, CT angiography is an excellent initial diagnostic tool. It helps to identify active bleeding sites and can guide subsequent interventions. CT angiography is particularly useful in detecting bleeding sources in both upper and lower GI tract.
- **Traditional Angiography:** If CT angiography indicates active bleeding, traditional angiography with possible embolization may be performed. This procedure can not only confirm the bleeding source but also provide therapeutic options to control the hemorrhage.

3. Additional Diagnostic Procedures:

- **Tagging Red Blood Cells (Radionuclide Scintigraphy):** This imaging technique is used when other methods are inconclusive. It helps localize the bleeding source by tracking radiolabeled red blood cells. This method is particularly useful in identifying intermittent or slow bleeders.
- **Capsule Endoscopy:** This technique involves swallowing a small capsule with a camera that captures images of the small intestine. It is typically used for patients with obscure GI bleeding when traditional endoscopic methods have failed to identify the bleeding source.

4. Laboratory Tests:

- **Complete Blood Count (CBC):** Monitoring hemoglobin and hematocrit levels helps assess the severity of bleeding and the patient's response to treatment.
- **Coagulation Profile:** Testing for INR (International Normalized Ratio), PT (Prothrombin Time), and aPTT (Activated Partial Thromboplastin Time) is important to evaluate the impact of anticoagulant therapy and to guide reversal if necessary.

5. Multidisciplinary Consultation:

- **Surgical Consultation:** If bleeding persists despite endoscopic and angiographic interventions, or if the bleeding source is unclear, surgical

consultation may be necessary for further evaluation and possible surgical intervention.

- **Gastroenterology and Interventional Radiology:** Collaboration with these specialties ensures comprehensive management, including both diagnostic and therapeutic approaches tailored to the patient's specific needs.

Overall, the diagnostic approach should be tailored to the patient's clinical condition and the suspected source of bleeding, with a focus on timely and effective identification and management of the hemorrhage.

Risk Stratification:

Upon presentation, a risk stratification process should be undertaken for each patient experiencing gastrointestinal (GI) bleeding. This stratification aids in identifying individuals at elevated risk of adverse outcomes and facilitates patient triage, directing them to appropriate care settings such as intensive care units, general hospital wards, or outpatient follow-up. It also informs which clinical services should be consulted. Factors contributing to worsened outcomes include hypotension, tachycardia, persistent GI bleeding, advanced age, renal impairment, and the presence of unstable or significant coexisting conditions. Patients are categorized based on acuity levels (low, medium, or high) and their bleeding status is classified as either stable or unstable.

Various risk assessment models are employed to predict the necessity for transfusions or hemostatic interventions and to determine if patients can be safely discharged from the emergency department. Examples of such models include the Oakland and Strate scores. The Glasgow-Blatchford score (GBS) is particularly effective in identifying patients at risk of adverse outcomes, such as rebleeding, the need for blood transfusions, and in-hospital mortality. This tool is valuable in evaluating the severity of bleeding in hospitalized patients. Our institution utilizes a modified Glasgow-Blatchford scoring system as part of its risk stratification strategy to assess patient acuity and to guide triage and consultation decisions.

Multidisciplinary Care and Treatment Algorithms:

The management of GI hemorrhage necessitates an interdisciplinary approach. While available resources vary across hospitals, establishing institutional protocols and adhering to management algorithms is essential for standardizing care and enhancing patient outcomes. A multidisciplinary team with round-the-clock access to endoscopy, radiology, interventional radiology, critical care, anesthesia, and surgical services is vital for managing acute GI hemorrhage. Timely access to endoscopic and imaging procedures is crucial due to the intermittent nature of GI bleeding.

Stable or Unstable Bleeding:

For patients with stable gastrointestinal (GI) bleeding, endoscopy remains the primary method for both evaluation and treatment. In contrast, patients with unstable bleeding should undergo CT angiography following initial resuscitation.

Multidetector-row helical CT is adept at rapidly identifying the presence and source of active bleeding, with the capability to detect bleeding at a rate of 0.3–0.5 mL/min. The sensitivity and specificity of CT angiography are reported to be 79–95% and 95–100%, respectively, with an approximately 50% success rate in localizing the bleeding source. A notable drawback of CT angiography is its potential nephrotoxicity due to the intravenous contrast agent, which poses a particular risk for elderly patients with a higher prevalence of chronic kidney disease. When CT angiography confirms active bleeding, a multidisciplinary approach is essential to determine the optimal therapeutic strategy, considering factors such as patient condition, bleeding volume, and available resources. Currently, transcatheter mesenteric angiography with embolization of the bleeding vessel is increasingly favored as the next step in managing high-acuity bleeding (Fig. 47.2). In cases where CT angiography does not localize significant hemorrhage, an upper endoscopy should be promptly performed, followed by a lower GI endoscopy if the upper endoscopy results are inconclusive.

Upper GI Bleeding:

The causes of upper gastrointestinal (GI) bleeding are detailed in the following section. Among elderly patients, peptic ulcer disease is the predominant etiology, responsible for 42–73% of cases. This is followed by esophagitis, which accounts for 7–18% of upper GI bleeding incidents, and gastritis or duodenitis, contributing to 7–28% of cases. Gastric and esophageal varices are less common, representing 2–11% of upper GI bleeding cases.

Causes of Upper GI Bleeding:

- Peptic ulcer disease
- Esophagitis
- Gastritis and duodenitis
- Varices
- Mallory-Weiss tear
- Vascular ectasias
- Neoplasm
- Dieulafoy lesion
- Aortoenteric fistula
- Foreign body

Endoscopy:

For hospitalized patients with stable upper gastrointestinal (GI) bleeding, an upper endoscopy is recommended within 24 hours of presentation. For cases classified as medium or high acuity, endoscopy should be performed within 12 hours or sooner, depending on the patient's clinical condition.

Endoscopic Management:

When a bleeding site is identified during endoscopy, therapeutic interventions should be employed. For ulcers, thermal techniques such as bipolar electrocoagulation or heater probe, as well as sclerosant injection (e.g., absolute

ethanol), have been demonstrated to be effective in controlling bleeding and improving mortality rates. Other methods, including clip application, argon plasma coagulation, and monopolar coagulation, show similar efficacy, though supporting evidence is less robust. Dilute epinephrine injection (1:10,000) can aid in stopping bleeding but is less effective as a sole treatment modality, thus should be used in conjunction with other hemostatic techniques. Initial endoscopic hemostasis is successful in approximately 90% of cases involving bleeding peptic ulcers, with rebleeding rates ranging from 12% to 25% in larger studies. Factors associated with increased rebleeding include hemodynamic instability, active bleeding during initial endoscopy, large ulcer size (≥ 2 cm), posterior duodenal ulcers, and gastric ulcers on the lesser curve. Placing an endoscopic clip adjacent to the bleeding site can be beneficial for subsequent interventional radiology procedures if needed.

Hemostatic powders have shown comparable efficacy to traditional therapies but are costly, making them less justifiable as first-line treatments. They may be particularly valuable when thermal energy or clips cannot be applied due to anatomical constraints or in cases of diffuse or massive bleeding. Following successful endoscopic hemostasis of an ulcer, high-dose proton-pump inhibitor (PPI) therapy (equivalent to omeprazole or pantoprazole ≥ 80 mg daily) is recommended for 3 days, significantly reducing the rate of rebleeding (RR = 0.43, 0.33–0.56). For patients at high risk of rebleeding—such as those with a Rockall score ≥ 6 , active bleeding, or a nonbleeding but visible vessel—twice-daily PPI should be administered for 2 weeks after hemostasis. In the event of rebleeding after initial endoscopic therapy, a repeat endoscopy is warranted. Approximately 75% of patients with rebleeding may achieve hemostasis with repeat endoscopy. While two consecutive thermal modalities could increase the risk of perforation, mechanical options like endoscopic clips are preferred. A randomized study comparing repeat endoscopic treatment to surgery found higher rebleeding rates after second endoscopic treatment (23% vs. 7%), but surgery resulted in significantly higher morbidity (15% vs. 36%) and mortality rates (10% vs. 18%). For esophageal and gastric varices, pharmacological treatment with somatostatin analogues (e.g., octreotide 50 μ g bolus followed by a 50 μ g/h infusion) is initiated to reduce splanchnic circulation. Nonselective beta blockers can also serve as prophylaxis for variceal bleeding. Both medications require monitoring for cardiovascular side effects, and band ligation is the preferred endoscopic treatment for varices.

Endovascular Treatment:

If endoscopic therapy fails, a multidisciplinary discussion should determine the next optimal treatment. Options for patients with unsuccessful upper endoscopy include surgery or mesenteric angiography with transcatheter embolization. Embolization can be performed using coils (platinum), particles (N-butyl cyanoacrylate), or liquid agents (polyvinyl alcohol). A systematic review and meta-analysis comparing transarterial embolization to surgery revealed an increased risk of rebleeding with endovascular treatment (OR = 2.44, 1.77–3.36). However, embolization was associated with a significantly lower complication rate (OR = 0.45, 0.3–0.67) and shorter hospital stays (median 8 vs. 16 days), with similar

mortality rates. Consequently, angiography with transcatheter embolization is increasingly considered before resorting to surgery.

Surgery for Upper GI Bleeding:

Advancements in endoscopic and endovascular treatments have reduced the necessity for surgical intervention for upper GI hemorrhage. Nonetheless, emergency surgery remains necessary for up to 10% of patients with bleeding ulcers, with a mortality rate ranging from 2% to 36%.

Surgery for Duodenal Ulcers:

The duodenal bulb is the most frequent site for duodenal ulcers. Surgical intervention typically involves a longitudinal duodenotomy, potentially extended to a duodenopyloromyotomy for better exposure. Ulcers on the posterior aspect of the duodenum may erode into the gastroduodenal artery, necessitating suture ligation of the artery proximal and distal to the ulcer and a U-stitch beneath the ulcer to control the transverse pancreatic branch. For non-posterior ulcers, a four-quadrant suture ligation is employed. While PPIs have reduced the need for acid-reducing procedures, truncal vagotomy might be considered for patients who bled on PPI therapy, are allergic to PPIs, are unreliable, or require NSAID use. A truncal vagotomy should be accompanied by pyloroplasty, as highly selective vagotomy is not recommended in unstable patients.

Surgery for Gastric Ulcers:

Gastric ulcers treated with suture ligation have a rebleeding risk of up to 30%. Because gastric ulcers are not typically associated with acid production, acid-reducing medications are not generally beneficial. Resection is the preferred treatment, with distal gastrectomy recommended for ulcers in the lower half of the stomach and wedge resection for those in the upper stomach.

Surgery for Mallory-Weiss Tear:

Mallory-Weiss tears, usually caused by vigorous vomiting, respond well to non-operative treatment in over 90% of cases. If surgery is necessary, it involves opening the cardia of the stomach to explore the gastroesophageal junction and directly suture ligate the bleeding tear.

Lower GI Bleeding:

The primary causes of lower GI bleeding include diverticulosis (30–65%), hemorrhoids, and ischemic colitis (5–20%).

Colonoscopy:

Colonoscopy is the preferred diagnostic and therapeutic procedure for stable lower GI bleeding. It should be performed within the first 24 hours of presentation in hospitalized patients, following a mechanical bowel preparation with polyethylene glycol or a similar agent. Evidence does not support a significant

benefit of performing colonoscopy within 12 hours over the 24-hour timeframe in terms of diagnostic yield, transfusion requirements, hospital stay, or mortality. Colonoscopy without bowel preparation may result in incomplete procedures due to impaired visualization. However, urgent flexible sigmoidoscopy, preceded by an enema preparation, can be valuable for suspected brisk bleeding from the distal left colon.

Endoscopic Management

When active bleeding is identified in the lower GI tract, several endoscopic options are available for hemostasis, including:

- **Injectional Therapies:** E.g., dilute epinephrine solution (1:10,000), which should be combined with mechanical or thermal methods for more definitive control.
- **Thermal Approaches:** E.g., bipolar coagulation, argon plasma coagulation, and heater probe.
- **Mechanical Techniques:** E.g., endoscopic clips and band ligation.
- **Hemostatic Sprays:** Though promising, they are costly and may be less practical as first-line treatments.

Endoscopic interventions are successful in achieving hemostasis in over 90% of cases. Early and late rebleeding rates are approximately 8% and 12%, respectively. Even without active bleeding, endoscopic treatment is warranted for a large visible vessel or adherent clot. Mechanical methods are generally preferred over thermal techniques for diverticular bleeding due to the risk of delayed perforation with aggressive thermal application. Bleeding sites should be marked with a tattoo for future reference in case of rebleeding or need for surgery.

Endovascular Treatment:

For unstable patients where CT angiography shows active bleeding, a multidisciplinary approach is essential to determine the best therapeutic option. A transcatheter mesenteric angiography is often an excellent next step. If a bleeding vessel is identified, embolization can be performed. Although embolization has a high technical success rate (93–100%) and a rebleeding rate of 10–50%, it carries a risk of bowel ischemia up to 24%. Superselective embolization using microcatheters (1.0–3.0 French) can reduce bowel ischemia to 1–4% and is preferred when feasible.

Surgery for Lower GI Bleeding:

Despite advances in endoscopic and endovascular treatments, surgery remains necessary for about 6% of lower GI bleeding cases and up to 25% of patients requiring transfusions. Indications for surgery include:

- Failure of endoscopic and interventional procedures to diagnose or stabilize the patient
- Bowel ischemia or perforation
- Bleeding neoplasms
- Blood transfusion requirement of 6 or more units of packed red blood cells within 24 hours

Accurate localization of the bleeding site is crucial before surgery. Options include:

- **Segmental Resection:** Should only be performed if the bleeding site has been definitively localized.
- **Total Abdominal Colectomy:** May be necessary if localization is unclear in an unstable patient, possibly involving intraoperative colonoscopy and/or enteroscopy. However, rebleeding rates may be higher with this approach due to potential missed sources of bleeding. Mortality rates for surgical intervention in recent reports are between 12% and 17%.

Whether to perform an anastomosis after segmental or total colectomy depends on the patient's clinical condition. Factors such as ongoing hemodynamic instability, poor nutritional state, significant comorbidities, and massive transfusion requirements often lead to preference for an end stoma over a primary anastomosis. A thorough exploration during surgery should include examination of the entire GI tract for neoplasms and potential bleeding sources, including Meckel's diverticulum. Laparoscopic techniques can be used but are best suited for hemodynamically stable patients with the necessary technical expertise.

Roles of Health Information System in Future Responses to GI Hemorrhage Cases:

The roles of Health Information Systems (HIS) in future responses to gastrointestinal (GI) hemorrhage cases include:

1. **Real-Time Data Access:** HIS provides immediate access to patient records, including medical history, medications, and lab results, enabling healthcare providers to make informed decisions during GI hemorrhage emergencies.
2. **Clinical Decision Support:** HIS integrates decision support tools that offer evidence-based recommendations for diagnosing and managing GI hemorrhage, improving adherence to clinical protocols and enhancing patient outcomes.
3. **Remote Monitoring and Telemedicine:** HIS facilitates remote monitoring of high-risk patients, allowing early detection of GI bleeding symptoms and enabling timely intervention through telemedicine platforms, reducing the need for hospital visits.
4. **Data Analytics and Predictive Modeling:** HIS utilizes data analytics to identify trends and predict future GI hemorrhage events, helping healthcare providers implement preventive measures and improve resource allocation.
5. **Coordinated Care:** HIS enables seamless communication and coordination among healthcare teams, emergency services, and specialists, ensuring that GI hemorrhage cases are managed efficiently from diagnosis to treatment.
6. **Quality Improvement and Protocol Optimization:** HIS supports continuous data collection and analysis to assess the effectiveness of current management protocols, leading to improved guidelines and best practices for future responses to GI hemorrhage cases.

Conclusion

The management of acute gastrointestinal (GI) hemorrhage presents a multifaceted challenge, particularly in the elderly, who are at increased risk due to age-related factors and comorbid conditions. Effective treatment requires a structured approach starting with initial stabilization, diagnostic assessment, and tailored therapeutic interventions. For stable patients, upper and lower GI bleeding are managed through endoscopy, which allows direct visualization and intervention. Upper GI bleeding, frequently caused by peptic ulcer disease, is best managed with an upper endoscopy performed within 24 hours, while lower GI bleeding is evaluated via colonoscopy within the same timeframe. For unstable patients, who exhibit signs of shock or significant ongoing hemorrhage, CT angiography is the preferred initial diagnostic tool. This imaging technique assists in localizing the bleeding source and guiding subsequent interventions. If CT angiography identifies active bleeding, transcatheter angiography and embolization are considered, offering both diagnostic and therapeutic benefits. When endoscopic or embolization techniques are insufficient, surgical intervention may be necessary, though advancements in endoscopic and endovascular treatments have reduced the frequency of surgical procedures. The management protocols emphasize the importance of timely and accurate diagnosis combined with effective treatment strategies. Risk stratification models, such as the Glasgow-Blatchford score, play a crucial role in guiding triage and clinical decisions. Furthermore, a multidisciplinary approach involving gastroenterologists, radiologists, critical care specialists, and surgeons ensures comprehensive care tailored to individual patient needs. In summary, managing GI hemorrhage demands a nuanced understanding of various diagnostic tools and therapeutic modalities. The coordinated efforts of a multidisciplinary team are essential for optimizing patient outcomes, minimizing complications, and improving overall management strategies for this critical condition.

References

1. Kaplan RC, Heckbert SR, Koepsell TD, Furberg CD, Polak JF, Schoen RE, Psaty BM. Risk factors for hospitalized gastrointestinal bleeding among older persons. *J Am Geriatr Soc.* 2001;49:126–33. <https://doi.org/10.1046/j.1532-5415.2001.49032.x>.
2. Siddiqui NS, Paul S, Khan Z, Javaid T, Hasan SS, Khan Z, et al. Rising events and improved outcomes of gastrointestinal bleed with shock in the USA. A 12-year national analysis. *J Clin Gastroenterol.* 2019;53:194–201. <https://doi.org/10.1097/MCG.0000000000000995>.
3. Gralnek IM, Neeman Z, Strate LL. Acute lower gastrointestinal bleeding. *N Engl J Med.* 2017;376:1054–63. <https://doi.org/10.1056/NEJMcp1603455>.
4. Oakland K, Chadwick G, East JE, Guy R, Humphries A, Jairath V, et al. Diagnosis and management of acute lower gastrointestinal bleeding: guidelines from the British Society of gastroenterology. *Gut.* 2019;68:776–89. <https://doi.org/10.1136/gutjnl-2018-317807>.
5. Almaghrabi M, Gandhi M, Guizzetti L, Iansavichene A, Yan B, Wilson A, et al. Comparison of risk scores for lower gastrointestinal bleeding. A systematic

- review and meta-analysis. *JAMA Netw Open*. 2022;5(5):e2214253. <https://doi.org/10.1001/jamanetworkopen.2022.14253>.
6. Moss AJ, Tuffaha H, Malik A. Lower GI bleeding: a review of current management, controversies, and advances. *Int J Color Dis*. 2016;31:175–88. <https://doi.org/10.1007/s00384-015-2400-x>.
 7. Yachimski P, Friedman L. Gastrointestinal bleeding in the elderly. *Nature*. 2007;5:80–93. <https://doi.org/10.1038/ncpgasthep1034>.
 8. Laine L, Barkun A, Saltzman J, Martel M, Leontiadis GI. ACG guideline: upper gastrointestinal and ulcer bleeding. *Am J Gastroenterol*. 2021;116:899–917. <https://doi.org/10.14309/ajg.0000000000001245>.
 9. Elmunzer BJ, Young SD, Inadomi JM, Schoenfeld P, Laine L. Systematic review of the predictors of recurrent hemorrhage after endoscopic hemostatic therapy for bleeding peptic ulcers. *Am J Gastroenterol*. 2008;103:2625–32. <https://doi.org/10.1111/j.1572-0241.2008.02070.x>.
 10. Kazanjian KK, Hines O. Nonvariceal upper gastrointestinal bleeding: when endoscopic therapy fails—a surgeon’s perspective. *Tech Gastrointest Endosc*. 2005;7:156–9. <https://doi.org/10.1016/j.tgie.2005.04.013>.
 11. Kim HS, Lee IS. Role of surgery in gastrointestinal bleeding. *Int J Gastrointest Interv*. 2018;7:136–41. <https://doi.org/10.18528/gii180029>.

الإدارة الفعالة للتنظير الحاد في الجهاز الهضمي: النهج الحالية للصيادلة وخدمات الطوارئ الطبية والدور المحدّث للمعلومات الصحية.

الملخص:

الخلفية: يعد التنظير في الجهاز الهضمي مشكلة صحية هامة، خاصة بين كبار السن، ويُعتبر من الأسباب الرئيسية لدخول المستشفيات بسبب اضطرابات الجهاز الهضمي. يمكن أن يظهر التنظير في شكل قيء دموي، براز دموي، أو ميلينا، مع أسباب مختلفة بناءً على موقع التنظير. إدارة التنظير في الجهاز الهضمي معقدة وتختلف بناءً على استقرار المريض ومصدر التنظير.

الهدف: تهدف هذه المقالة إلى مراجعة النهج الحالية للإدارة الفعالة للتنظير الحاد في الجهاز الهضمي، مع التركيز على الاستراتيجيات التشخيصية والعلاجية التي يستخدمها الصيادلة وخدمات الطوارئ الطبية. كما ستركز المراجعة على دور أنظمة المعلومات الصحية في إدارة والسيطرة على التنظير في الجهاز الهضمي في الاستجابات المستقبلية.

الطرق: تم إجراء مراجعة شاملة لممارسات الإدارة، بما في ذلك التقييم الأولي، استراتيجيات الإنعاش، والإجراءات التشخيصية. تم التركيز على أدوار التنظير، الدراسات التصويرية، والرعاية متعددة التخصصات في إدارة التنظير في الجهاز الهضمي سواء في الحالات المستقرة أو غير المستقرة.

النتائج: تبدأ الإدارة الفعالة باستقرار الديناميكا الدموية وتشمل استخدام الإنعاش بالمحاليل البلورية ونقل الدم عند الحاجة. يُفضل التنظير للحالات المستقرة من التنظير في الجهاز الهضمي العلوي والسفلي، ويتم إجراؤه خلال 24 ساعة من التقديم. بالنسبة للتنظير غير المستقر، تعتبر تصوير الأوعية باستخدام الأشعة المقطعية أداة تشخيصية أولية هامة، مع خيارات أخرى تشمل تصوير الأوعية التقليدي والتنظير. الرعاية متعددة التخصصات ضرورية، مع التعاون بين أمراض الجهاز الهضمي، الأشعة التداخلية، والجراحة.

الخلاصة: تتطلب إدارة التنظير في الجهاز الهضمي نهجًا مخصصًا بناءً على استقرار المريض ومصدر التنظير. يستفيد المرضى المستقر من التقييم التنظيري السريع، بينما تتطلب الحالات غير المستقرة مزيجًا من التصوير المتقدم والتدخل الجراحي المحتمل. يعزز التعاون بين التخصصات من دقة التشخيص وفعالية العلاج.

الكلمات المفتاحية: التنظير في الجهاز الهضمي، الاستقرار الديناميكي، التنظير، تصوير الأوعية بالأشعة المقطعية، الرعاية متعددة التخصصات، الخدمات الطبية الطارئة.