DIAGNOSIS AND MANAGEMENT OF GASTROINTESTINAL BLEEDING

By

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DIAGNOSIS AND MANAGEMENT OF GASTROINTESTINAL BLEEDING

Abstract

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Chair: Lorna L. Schumann

The epidemiology, pathology, history/physical, and diagnostic tests for gastrointestinal bleeding are discussed and presented through an algorithm to be utilized by a general practitioner in determining treatments and costs. The tests described include serum tests, fecal occult blood, nasogastric aspiration, flexible rectosigmoidoscopy, esophagogastroduodenoscopy, colonoscopy, barium studies, enteroscopy, arteriography, nuclear medicine scans, surgery, and pharmaceutical treatment. Patient education and preparation are presented from an outpatient focus, except for arteriography and nuclear medicine scans. The specificity and sensitivity of the diagnostic tests are compared to allow the practitioner a choice as to which treatment path is most likely to provide the desired results.
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Introduction

Gastrointestinal bleeding is defined as a recent onset of blood loss from any part of the gastrointestinal (GI) tract resulting in instability of vital signs, anemia, and/or need for blood transfusion (Zuccaro, 1997; Zuckerman, Prakash, Askin, & Lewis, 2000). Upper GI bleeding is considered originating proximal to the ligament of Treitz and lower GI bleeding distal to the ligament of Treitz. The most common diagnoses for upper GI bleeding are peptic ulcers, gastric erosions, gastritis, esophageal varices, and acute lacerations. The most common diagnoses for lower GI bleeding are diverticulosis, arteriovenous malformations, and neoplasms (see Table 1).

Epidemiology

In the United States approximately 120,000 to 300,000 cases of GI bleeding are reported annually. Based on hospital admission and discharge data, the annual incidence of upper GI hemorrhage is 50 to 150 per 100,000 population (Longstreth, 1998; Hussain, Lapin & Cappell, 2000). The reported hospital mortality rate for upper GI bleeding is approximately 10%, approximately 10,000 to 20,000 deaths per year in the United States (Farrell & Friedman, 2000; Stump, 1993). “Persons older than age 60 years now account for 35% to 45% of all cases of acute upper GI hemorrhage” (Farrell et al., 2000, p. 2) and women are estimated to represent 60% of this group (Hussain et al., 2000). However, up to 85% of patients who present with upper GI bleeding will stop bleeding regardless of therapy (Stump, 1993; Zuckerman et al., 2000). During a mass screening of people chosen from the general population, 2% to 8% of the persons tested were positive for occult bleeding (Wilson, 1996). “The mean age of patients with lower GI bleeding ranges from 63 to 77 years, and the reported mortality rate is 2% to 4%”
Gastrointestinal bleeding of the lower region in adult patients has been generally found to be self-limiting, rather than severe and ongoing and can be treated with an elective evaluation, such as colonoscopy and/or endoscopy (Jensen, 1995).

In more than 50% of the patients presenting with GI bleeding, peptic ulcer disease is the source. Peptic ulcer disease may be affected by genetic differences, environmental factors, diet, cigarette smoking and emotional stress. The use of aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) in the elderly patient may be a risk factor for peptic ulcer disease and acute hemorrhagic gastritis. The source of bleeding for the elderly, 70% to 91% of the time, who are admitted to the hospital is a combination of peptic ulcer disease with either esophagitis or gastritis (Farrell et al., 2000). The chronic and excessive use of alcohol may cause cirrhosis of the liver which could bring about the development of esophageal varices or Mallory-Weiss tears.

Diverticulosis and angiodysplasia are the commonest causes for lower GI bleeding. In lower GI bleeding, a low fiber diet in people over 50 years of age is an important risk factor for the development of diverticular disease of the colon. Furthermore, people over 50 years of age, up to 75 years of age have increased incidence of colorectal carcinomas with 60,000 deaths occurring each year. Farrell & Friedman (2000) state “of rectal carcinomas diagnosed by proctoscopy, 40% are palpable on digital rectal examination” (p. 19). Angiodysplasia occur in people over the age of 50, as a result from dilation and tortuosity of the submucosal veins, with equal frequency in men and women. They are responsible for 3% to 12% of lower GI bleeding. There is an increase finding of colonic polyps in people over 30 years of age (Farrell et al., 2000; Wilson, 1996).
The epithelial lining of the gastrointestinal tract is composed of a single layer of cells separating the lumen of the gut from the capillary blood supply. Minor or major injuries from numerous disorders may result in bleeding, ranging in severity from acute massive hemorrhage to chronic, intermittent, or insignificant blood loss. The origins of upper GI bleeding are the esophagus, stomach, or duodenum, whereas, lower GI bleeding sources are found in the jejunum, ileum, colon, or rectum.

The cause of gastritis bleeding is superficial mucosal lesions in the stomach. Helicobacter pylori infection can “lead to serious occult blood loss (up to 60 ml per day)” (Rockey, 1999, p. 43) and produce large mass lesions, ulcerative gastrointestinal lesions and erosive gastritis.

Peptic ulcer disease is an ulcer of the alimentary mucosa, when the stomach or duodenum is exposed to the acidic gastric secretions from a break in the mucosa that extends through the muscularis layer. Esophageal varices are longitudinal superficial venous varices at the lower end of the esophagus and may result from portal hypertension or primary biliary cirrhosis. The varices may cause ulceration and massive bleeding when a vessel ruptures resulting in a drop of hemoglobin of greater than 2 g/dl or requiring a transfusion. Mallory-Weiss tears may be caused by mechanical forces or severe retching. The cause of diverticular bleeding has not been concluded, but may result from abnormalities in the arterial wall of diverticular vessels. Vascular lesions of angiodysplasia are arteriovenous malformations caused by the natural aging process (Farrell et al., 2000; Rakel, 1995; Wilson, 1996; Zuckerman et al., 2000).

Gastrointestinal bleeding may present as acute or occult bleeding. Acute bleeding is categorized as hematemesis, melena or hematochezia. Hematemesis is defined as bloody vomitus,
either fresh, bright red blood or dark, grainy digested blood with “coffee grounds” appearance.

As blood accumulates and is digested within the GI tract, irritation and increase peristalsis occurs, resulting in diarrhea and/or melena, a black, sticky, tarry, foul-smelling stool. In order for “melena to be produced consistently, 150 to 200 ml of blood must be present in the stomach” and the stool may appear normal with a gastroduodenal blood loss of 100 ml per day (Rockey, 1999, p 38). If bleeding is from the lower GI tract the diarrhea is characterized as hematochezia, fresh, bright red blood passed from the rectum. In contrast, occult bleeding is usually caused by slow chronic blood loss that may result in iron-deficiency anemia as iron stores in the bone marrow are slowly depleted. Occult bleeding is represented by trace amounts of blood in normal appearing stools or gastric secretions and detectable only with a guaiac test (Hirsch & Caswell, 1999; Wilson, 1996; Eastwood, 1998).

History and Physical Examination

The patient’s history should include the characteristics and duration of bleeding, including stool color and frequency. Also a description of abdominal pain, recent change in bowel habits, fever, urgency, intestinal spasm, and weight loss. The past history should include previous bleeding episodes, trauma, abdominal surgeries, peptic ulcer disease, inflammatory bowel disease, radiation therapy to the abdomen and pelvis, and any major organ dysfunction. The patient should be questioned as to their current medications including the use of NSAIDs, aspirin, and anticoagulants and allergies to medications. The patient’s use of alcohol should be evaluated as the “consumption of alcohol increases the risk of major gastric and duodenal bleeding in non-predisposed individuals” (Kelly, 1995, p. 1058). The presence or absence of chest
pain/palpitations, dyspnea at rest or on exertion, lightheadedness, or postural symptoms should be documented. “Unexplained syncope should raise the suspicion of GI bleeding in the elderly” (Farrell et al., 2000, p. 4). The practitioner should also be aware that elderly may present with the following differences: less frequent abdominal pain; less antecedent dyspepsia; less tenderness on abdominal examination; and the first disease signs may be bleeding, perforation, and anemia (Farrell et al., 2000).

The physical examination should begin with vital signs. An increased pulse of 100 beats per minute or more and systolic blood pressure of 100 mm Hg or less over a 15 to 30 minute time period may indicate a loss of 1 liter or more of blood. Hussain et al., (2000) report “a mortality of 7% in patients with a systolic blood pressure of 100 mm Hg or higher compared with a mortality of 17% with a systolic blood pressure of 80 to 99 mm Hg” (p. 452). During orthostatic blood pressure measurement, a decrease in systolic blood pressure of 10 mm Hg or more and a heart rate increase of 20 beats per minute or more are also signs of significant blood loss; 1 to 2 units of whole blood and an increased risk of mortality (Hussain et al., 2000).

The patient’s skin should be evaluated for telangiectasias (dilation of the previously existing small or terminal vessels) and jaundice which is suggestive of cirrhosis of the liver and possible esophageal varices. The evaluation of the cardiovascular system may provide evidence of chronic blood loss, such as gallops or a systolic flow murmur. The abdomen should be examined for epigastric pain on palpation, indicating peptic ulcer disease. Hyperactive bowel sounds may indicate blood in the intestinal tract, whereas hypoactive bowel sounds and distention may be caused by intestinal obstruction from a carcinoma of the colon suggesting a
neoplasm or diverticular disease. The presease of rigidity may imply peritoneal irritation from blood attributable to a perforated ulcer. The rectal examination may identify a mass, melena or bright red blood (Epstein, 1998; Eastwood, 1998; Wilson, 1996).

The signs of upper GI bleeding are hematemesis, blood aspirated from a nasogastric tube, melena, hyperactive bowel sounds and BUN elevation to 30-40 mg/dL (Eastwood, 1998; Farrell et al., 2000; Rockey, 1999). The signs of lower GI bleeding are bright red blood from the rectum, current jelly type stools or melena (Eastwood, 1998; Stump, 1993).

Clinical Approach

The practitioner should consider who is at high risk for adverse outcomes, when considering the treatment options. Patients may be treated on an outpatient basis or admitted for hospitalization due to their clinical presentation (see Figure 1). A number of studies suggest, patients could be treated as outpatient if they were: less than 60 years of age; a longer time period had elapsed between the first sign of bleeding and endoscopy; no evidence of presyncope or syncope; no evidence of alcoholism or severe liver disease; no major concomitant disease; no orthostatic vital sign change; no anticoagulation therapy or coagulopathy; no hemorrhage, varices, or portal hypertensive gastropathy; a hemoglobin above 8.0 gm/dL; and adequate support at home (Farrell et al., 2000; Hussain et al., 2000; Longstreth, 1998; Terdiman, 1998; Zuckerman et al., 2000). Patients considered at high risk and may need to be hospitalized for treatment have: presence of comorbid illness (renal, hepatic, pulmonary, hematological, neurological or cardiac), a lower serum albumin, a higher prothrombin time, and a higher serum bilirubin (Hussain et al., 2000; Zuccaro, 1997).
The utilization of “early upper GI endoscopy is the cornerstone of management of upper GI bleeding and serves three vital roles: diagnosis, treatment, and risk stratification” (Terdiman, 1998, p. 47). Colonoscopy has been “advocated as a primary means of evaluating patients with lower GI bleeding” and “has yielded a diagnosis in 90% of patients, provided the opportunity for successful therapy in 69% and shortened hospital stay” (Richter, 1995, p. 93) in a study conducted at Massachusetts General Hospital. If a bleeding site can not be identified, then evaluation of the small bowel may be necessary by push enteroscopy, arteriography, nuclear medicine scanning, or laparotomy.

If acute lower GI bleeding occurs in a younger patient, evaluation for Meckel’s diverticulum should be performed. “The reported sensitivity and specificity rates for nuclear medicine scanning for Meckel’s diverticulum are 85% and 95% respectively” (Zuccaro, 1997, p. 1207).

In the elderly, fragile patient the use of medication might be the only alternative. The use of hormonal therapy with compounds of estrogen and progesterone has been tried with severe, recurrent bleeding from vascular ectasias with positive outcomes (Rockey, 1999). In the elderly, Omeprazole has been shown to decrease the rate of rebleeding and need for surgery (Farrell et al., 2000).

Laboratory and Diagnostic Tests

The upper and lower GI bleeds cannot be diagnosed from isolated laboratory values or diagnostic tests. The practitioner should consider trends in laboratory values and a progression in diagnostic procedures to rule out the source of bleeding (See Table 2).


Serum Tests

The hematocrit is not a sensitive indicator of acute blood loss, as it may take 12 to 24 hours to completely equalize with the vascular compartment and may decrease significantly after the patient has received intravenous fluids (Hussain et al., 2000; Stump, 1993; Zuckerman et al., 2000). However in a chronic bleeding patient, the hematocrit may be an indicator of slow prolonged bleeding resulting in anemia.

An elevated blood urea nitrogen (BUN) in a patient whose BUN has recently been normal or whose serum creatinine concentration is normal may suggest an upper gastrointestinal bleeding source (Eastwood, 1998). This might be due to absorption of proteins from blood in the GI tract and from dehydration (Zuccaro, 1997; Zuckerman et al., 2000).

A study conducted by Ernst, Haynes, Nick and Weiss (1999) concluded that the blood urea nitrogen/creatinine ratio may be useful in the diagnosis of GI bleeding and distinguishing upper from lower sources. The study suggested “when age and gender were corrected for, a BUN/CR level of 36 was significantly associated with an upper GI source of bleeding” (Ernst, et al, 1999, p. 72). Ernst et al, recommend: when it is unclear if a bleed is upper versus lower and the patient has a negative nasogastric aspirate with a guiac-positive stool and/or rectal bleeding, the BUN/Cr ratio level of 36 or higher should be considered to avoid unnecessary tests of the lower GI tract (Ernst et al., 1999, Rockey, 1999). However, the practitioner should not rule out an upper GI source of bleeding, if the blood urea nitrogen has not risen.

The coagulation profile (PT/PTT) is used, if the patient has a history of liver disease or if the patient has been taking anticoagulant medication. Patients who are currently bleeding and taking therapeutic anticoagulants “usually have a clinically significant lesion...and it is important to
evaluate these patients for GI pathologic conditions, in addition to correcting their clotting status” (Eastwood, 1998, p. 2011). Plevris et al., (1995) studied variceal bleeding in patients with primary biliary cirrhosis. Their findings suggested the usage of a platelet count as an early factor to predicting variceal hemorrhage instead of repeated endoscopy examination. “Patients whose platelet counts dropped below 200 x 10^9/L had a substantial chance of bleeding over the next few years...once this threshold in platelet count...is crossed, endoscopy is indicated” (Plevris et al., 1995, p. 961).

Fecal Occult Blood

This test is a rapid, convenient and qualitative method for detecting blood in the feces. It may be a good indicator of gastrointestinal disease, but is not a test for colorectal cancer and other specific diseases. The test is routinely used to monitor bleeding in patients with iron deficiency anemia, peptic ulcer disease, ulcerative colitis and after surgery.

Nasogastric Tube

A nasogastric aspiration is useful in assessing the amount and rate of bleeding for patients who currently have a tube in place or displaying signs and symptoms of active bleeding. A large-bore tube is best placed through the mouth for gastric lavage with tap water. The continued return of pinkish fluid after lavage may indicate breakdown of large clots and not continued bleeding (Eastman, 1998). If the nasogastric aspirate shows extensive amounts of bile and is negative for blood, an upper GI source may be unlikely (Zuccaro, 1997). An upper GI endoscopy should be performed, if the results of nasogastric aspiration shows evidence of upper GI bleeding or is negative for blood and bile since blood from a duodenal source may not reflux into the stomach. It has been, “found that nasogastric aspiration was 98% accurate in detection of
bleeding duodenal ulcers” if no trauma was experienced during insertions (Zuccaro, 1997, p. 1205).

Flexible Rectosigmoidoscopy

Flexible rectosigmoidoscopy is a screening tool for lower GI bleeding and locating colorectal cancer. The examination visualizes the anus, rectum, and sigmoid colon. Patients who present with hematochezia usually are examined with an unprepped sigmoidoscope. If a lesion is found in the rectum associated with the bleeding and no further bleeding higher up is identified, usually no further evaluation is necessary. In addition, an anoscopy may be performed to inspect the anal canal for fissures and hemorrhoids (Eastwood, 1998; Stump, 1993; Zuckerman et al., 2000).

Esophagogastroduodenoscopy

The upper endoscopy is the procedure of choice for diagnosing the source of upper gastrointestinal bleeding, dyspepsia, and abdominal pain (Lieberman, DeGarmo, Fleischer, Eisen & Helfand, 2000). The esophagus, stomach, and duodenum may be examined for tumors, varices, mucosal inflammations, hiatal hernias, polyps, ulcers, and obstructions. The test should be timed within 12-24 hours after the bleeding episode for the best results (Eastwood, 1998; Zuckerman et al., 2000). This test is also used for structural evaluation of lower GI bleeding and possible treatment. The treatment can include: “thermal coagulation (including heater probe, bipolar/multipolar coagulation, and laser therapy), and injection of vasoconstrictors and/or sclerosants” (Zuccaro, 1997). The treatment procedure can be used for vascular lesions, bleeding from polypectomy sites, and some colonic ulcers. In a prospective study, aspiration pneumonia occurred as a complication in 20% of patients undergoing upper endoscopy (Farrell et al., 2000).
Colonoscopy

Colonoscopy allows visualization, evaluation, and treatment of the lower GI mucosa, from anus to cecum, after the bleeding has stopped. However, some practitioners may perform the test with active bleeding. The test is usually recommended for patients who present with hemoccult positive stools, lower GI bleeding, change in bowel habits, or if they have a high risk for colon cancer. The following treatments can be performed when bleeding lesions are present: thermal probes, electrocoagulation, and laser coagulation. The most common site of bleeding is the descending colon, and the most encountered lesions are ulcerated carcinomas and diverticular disease (Zuccaro, 1997). The procedure is generally safe, if the patient has been sufficiently resuscitated with fluids and/or blood prior to the procedure. The patient with continued hematochezia should proceed with the test, as soon as fluid resuscitation allows (Stump, 1993; Zuckerman et al., 2000). “Colonoscopy performed early in the hospital course had a higher diagnostic yield and was associated with a shortened hospital stay” in a research study conducted at Massachusetts General Hospital (Richter, Christensen, Kaplan, & Nishioka, 1995, p. 98). In the patient who has apparently stopped bleeding, the test may be performed on an elective basis as an outpatient.

Barium Studies

The upper GI barium study consists of a series of x-ray films of the lower esophagus, stomach, and duodenum. Superficial lesions may be missed, and the presence of multiple lesions may complicate the search. This study is useful in a stable patient with resolved or chronic low-grade bleeding of greater than 2 to 3 days (Eastwood, 1998; Stump, 1993; Zuckerman et al., 2000). Upper GI barium studies locate the lesion in 30-80% of cases, but do not confirm the
source of bleeding. The practitioner must keep in mind that the barium will impair subsequent endoscopic or angiographic studies. The lower barium enema is used to locate the presence of polyps, tumors, diverticulum, structural lesions, ulcers and Crohn’s disease (Zuccaro, 1997). An upper GI barium study should not be utilized in the evaluation of acute, severe hematochezia.

**Enteroscopy**

There are two types of enteroscopy, push or Sonde. The push enteroscopy is per oral insertion by an enteroscope or pediatric colonoscope to examine the distal duodenum and proximal jejunum while a patient is under mild sedation. The source of bleeding has been identified in 24% to 75% (Rockey, 1999; Zuckerman et al., 2000). The procedure is considered relatively safe allowing for therapeutic interventions and biopsy. Complications reported are abdominal pain, acute pancreatitis, Mallory-Weiss tear and pharyngoesophageal tear. The Sonde type enteroscopy can visualize almost the entire small bowel and is performed by placing a “long, small-caliber endoscope into the proximal small bowel; subsequent peristalsis carries the endoscope to the distal small intestine” (Rockey, 1999, p. 47). The procedure is approximately 5 hours in length, uncomfortable for the patient, and does not allow for therapeutic treatment. “The overall diagnostic rate ranges from 26% to 54%” (Zuckerman et al., 2000, p. 207.) If the enteroscopy is used during a laparotomy, some clinicians have reported detecting abnormalities in 70% to 100% of patients (Rockey, 1999).

**Arteriography**

Arteriography defines the site of bleeding or abnormal vasculature for patients with severe persistent bleeding in which other treatments have been unsuccessful, unavailable or surgery poses too high of a risk. A radionuclide scan is usually done prior to this test to help localize and
confirm active bleeding. If a source of active bleeding can be identified, surgery may be performed or therapeutic embolization. However patients with continuing brisk bleeding that prevents adequate endoscopic visualization should “probably proceed directly to arteriography to avoid delays in achieving cessation of hemorrhage” (Stump, 1993, p. 193). The techniques employed instead of surgery are “injection of intraarterial vasopressin or superselective embolization with materials such as gelatines or oxidized cellulose” (Zuccaro, 1997, p. 1206). A study conducted at Yale-New Haven Hospital strongly cautions that an “angiography carries a significant risk of complications...suggesting that this invasive procedure is indicated only for acute lower GI bleeding in those patients who cannot undergo surgery because of technical reasons or are deemed unsuitable surgical candidates” (Cohn, Moller, Zieg, Milner, & Angood, 1998, p. 12). The study also points out that angiography “can be misleading, showing only some multiple bleeding sites, leading to inadequate segmental resection” and “findings are negative in more than 50% of patients requiring emergency operation” (Cohn et al., 1998, p. 6). Nuclear Medicine Scan

Nuclear Medicine Scans are used primarily as screening test to confirm intermittent bleeding or bleeding of unclear origin. The advantage with this scan is the long half-life of the label, allowing for repeat scanning, if necessary, for up to a 24 hour period (Zuckerman et al., 2000). “Bleeding rates, as low as 0.05 mL/min can be detected” (Stump 1998, p. 192). The test is also utilized to assist in localizing the site of bleeding prior to an arteriography test. The test is positive in 26% to 78%, with a higher yield when angiography, endoscopy or surgery verify the site of bleeding (Zuckerman et al., 2000).
Treatment

The practitioner must always consider that 85% of GI bleeds will stop spontaneously and the patient can be managed with medication or general supportive measures. In addition, after examination of the GI tract, the source of bleeding can remained unexplained in approximately 52% of patients (American Gastroenterological Association, 2000). However, patients who present with severe bleeding in association with tachycardia, hypotension, postural changes, or shock require hospitalization to be stabilized. In the hospital, a diagnostic evaluation, parenteral volume replacement; as well as, a gastroenterologist and surgical consultation should be initiated. The total cost of diagnostic tests as an inpatient could range from approximately $900 to $5,500, not including hospital or physician’s costs.

Patients who have persistent, recurrent lower GI bleeding or associated with high transfusion requirements may require surgery. However endoscopic and radiologic studies should be attempted first to localize the bleeding site. If the patient has the following conditions, surgery may be applicable: exsanguinating bleeding that cannot be stopped, bleeding that continues over the initial 24 hours and the patient becomes hemodynamically unstable with the need for transfusion, large peptic ulcers, history of bleeding ulcers, a large clot or visible vessel on endoscopy (Stump, 1993; Zuckerman et al., 2000).

Patients presenting with mild bleeding and stable vital signs may be managed as an outpatient with a referral to a gastroenterologist for elective procedures. The total cost of diagnostic tests as an outpatient may range from approximately $400 to $1,200, not including consulting physician’s costs. The cost benefit of outpatient versus inpatient is significant and should be an important consideration, if the patient’s condition is stable. After the disease process
has been identified, proper treatment may be initiated and the patient followed by the primary care provider.

Hormonal therapy with compounds of estrogen and progesterone have been tried as a medical alternative to treat patients with chronic and intermittent GI bleeding (Rockey, 1999). The therapy consists of ethinyl estradiol, 0.035-0.05 mg and norethisterone, 1 mg for a six-month courses with treatment pauses. The pauses reduce side effects of breast tenderness and vaginal bleeding in women; and gynecomastia and loss of libido in men (American Gastroenterological Association, 2000).

Conclusion

Once the patient has been stabilized and the source of bleeding identified, preventing the recurrence of bleeding and reduction of risk factors is the treatment goal. “The number of Americans aged 65 years and older is projected to increase from 35 million in 2000 to 78 million in 2050, a rise greater than that for any other age group” (Farrell et al., 2000, p. 1). This population has a greater morbidity and mortality when diagnosed with GI bleeding. The elderly develop bleeding lesions as a result of the aging process, comorbidities, and multiple medication usage. The practitioner should be aware of alternative medications to suggest in replacing NSAIDs, such as the use of acetaminophen, COX-2 inhibitors and capsaicin cream for treatment in the elderly population (Cappell et al., 2000; Farrell et al., 2000). The older patient, 68 years and older, should be encouraged to practice regular physical activity, because it as been associated with a decreased risk for severe gastrointestinal hemorrhage (Pahor, Gurainik, Salive, Chrischilles, Brown, & Wallace, 1994, p. 595).
The American Gastroenterological Association advises screening for colon cancer to begin at age 50; and with a positive Fecal occult blood test, a total evaluation of the colon by colonoscopy. The practitioner, as a routine during outpatient visits, should suggest community programs to their patient, teach them to avoid alcohol and cigarettes, modify their diet and reduce stress in their life.
References


### Table 1 Common Diagnoses for Upper and Lower Gastrointestinal Bleeding

<table>
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<th>Diagnosis</th>
<th>Percentage of Occurrence</th>
<th>Explanation</th>
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<tr>
<td><strong>Upper Gastrointestinal Bleeding</strong></td>
<td></td>
<td></td>
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<tr>
<td>Peptic ulcers</td>
<td>50-80%</td>
<td></td>
</tr>
<tr>
<td>Gastric erosions and gastritis</td>
<td>20-30%</td>
<td></td>
</tr>
<tr>
<td>Gastric ulcers</td>
<td>20-25%</td>
<td></td>
</tr>
<tr>
<td>Esophageal varices</td>
<td>10-20%</td>
<td>Highest rate of mortality</td>
</tr>
<tr>
<td>Acute lacerations</td>
<td>5-15%</td>
<td>Mallory-Weiss tears</td>
</tr>
<tr>
<td>Esophagitis</td>
<td>3-15%</td>
<td></td>
</tr>
<tr>
<td>Neoplasm</td>
<td>&lt;3%</td>
<td></td>
</tr>
<tr>
<td><strong>Lower Gastrointestinal Bleeding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diverticulosis</td>
<td>50%</td>
<td>Usually severe-angiographic examination</td>
</tr>
<tr>
<td>Arteriovenous malformations</td>
<td>40-60%</td>
<td>Usually over 60 years of age</td>
</tr>
<tr>
<td>Neoplasms</td>
<td>-----</td>
<td>Mild occult blood loss with intermittent acute bleeding</td>
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Table 2  Diagnostic Tests for Evaluation of Gastrointestinal Bleeding

<table>
<thead>
<tr>
<th>Test</th>
<th>*Cost</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Expected Time Frame for Results</th>
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<tr>
<td>Hemoglobin/Hematocrit</td>
<td>$17.00</td>
<td>low</td>
<td>low</td>
<td>2-24 hours or STAT</td>
</tr>
<tr>
<td>Prothrombin Time</td>
<td>$12.15</td>
<td>low</td>
<td>low</td>
<td>2-24 hours or STAT</td>
</tr>
<tr>
<td>Partial Thromboplastin Time</td>
<td>$15.65</td>
<td>low</td>
<td>low</td>
<td>2-24 hours or STAT</td>
</tr>
<tr>
<td>Blood Urea Nitrogen (BUN)</td>
<td>$11.60</td>
<td>low</td>
<td>low</td>
<td>2-24 hours or STAT</td>
</tr>
<tr>
<td>Creatinine (Cr)</td>
<td>$12.10</td>
<td>low</td>
<td>low</td>
<td>2-24 hours or STAT</td>
</tr>
<tr>
<td>BUN/Cr Ratio</td>
<td>---</td>
<td>90%</td>
<td>27%</td>
<td>---</td>
</tr>
<tr>
<td>Nasogastric Aspiration</td>
<td>---</td>
<td>98%</td>
<td>---</td>
<td>immediate</td>
</tr>
<tr>
<td>Fecal Occult Blood</td>
<td>$8.60</td>
<td>86%</td>
<td>98%</td>
<td>2-24 hours or immediate</td>
</tr>
<tr>
<td>Barium Enema</td>
<td>$238.00</td>
<td>30-60%</td>
<td>30-40%</td>
<td>Per Physician’s Reading</td>
</tr>
<tr>
<td>Flexible Rectosigmoidoscopy</td>
<td>$336.00</td>
<td>High</td>
<td>---</td>
<td>Per Physician’s Reading</td>
</tr>
<tr>
<td>Endoscopy</td>
<td>$474.00</td>
<td>70-95%</td>
<td>---</td>
<td>Per Physician’s Reading</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>$742.00</td>
<td>60-89%</td>
<td>---</td>
<td>Per Physician’s Reading</td>
</tr>
<tr>
<td>Angiography</td>
<td>$1,000-2,000</td>
<td>40-78%</td>
<td>---</td>
<td>Per Physician’s Reading</td>
</tr>
<tr>
<td>Nuclear Medicine Scan</td>
<td>$1,795.0 0</td>
<td>26-72%</td>
<td>---</td>
<td>Per Physician’s Reading</td>
</tr>
</tbody>
</table>

Sources: Community Hospital; Stump, 1993; Wilson, 1996; Zuckerman, Prakash, Askin, & Lewis, 2000.
*Does not include physician or hospital costs.
Table 3 Patient Teaching and Preparation for Diagnostic Tests

Fecal Occult Blood

Do not collect samples during, or until three days after menstrual period, while bleeding from hemorrhoids, or blood in urine. Do not consume aspirin or other non-steroidal anti-inflammatory drugs 7 days prior to and during the test period. Avoid Vitamin C in excess of 250 mg. per day within 72 hours of the test period. Do not consume beef or lamb, including processed meats and liver; raw fruits and vegetables.

Remove toilet bowel cleaners from toilet tank and flush twice before proceeding. Collect samples from three consecutive bowel movements or three bowel movements closely spaced in time. Protect slides from heat, light, iodine and bleach. Keep cover flap of slides closed when not in use (SmithKline Diagnostics Brochure, 1999; Zuckerman, Prakash, Askin, & Lewis, 2000).

Flexible Rectosigmoidoscopy

Explain the procedure and obtain informed consent for procedure. Assist the patient with the bowel preparation: two Fleet enemas. Instruct patient to ingest only a light breakfast on the morning of the sigmoidoscopy. Assure patient that they will be properly draped to avoid unnecessary embarrassment. After the procedure inform the patient that air was placed into the bowel during the procedure and they may have flatulence or gas pain. Inform the patient ambulation, may help in relieving the discomfort. Tell the patient to report signs of abdominal distention, increased tenderness or rectal bleeding. If a biopsy was taken, tell the patient a slight amount of rectal bleeding may occur, and if it continues to bleed to notify their practitioner (Pagana, 1995).
Endoscopy

Explain the procedure to the patient and obtain informed consent. Instruct patient to not eat after midnight the day of the test. Reassure the patient that the test is not painful and that their throat will be anesthetized with a spray to depress the gag reflex. Encourage patient to verbalize fears, provide support, and inform them they will be sedated for the procedure. Remove patients dentures and eyewear. Instruct patient that they will not be able to speak during the test, their respiration will not be affected, and to not bite down on the endoscope. After the procedure inform the patient that they may have hoarseness or a sore throat. Inform patient, that fluids will be withheld for 2 to 4 hours until their swallowing reflex returns. Inform the patient they may have bloating, belching, or flatulence from the air injected into the GI tract during the procedure. Explain to the patient to observe safety precautions until the sedative has worn off and that they may experience amnesia for a few hours (Pagana, 1995).

Colonoscopy

Explain the procedure to the patient and obtain informed consent. Instruct the patient as to proper bowel preparation. One type is a 2-day bowel preparation: the patient uses clear liquids for two days along with a strong cathartic, such as magnesium citrate and bisacodyl. On the day of examination an enema is also given. With the 1-day bowel preparation: the patient ingests a gallon of Colyte until the bowel movements are clear. The practitioner should avoid an oral bowel preparation in patients with suspected upper GI obstruction, acute diverticulitis or recent bowel resectional surgery. Ensure the patient that they will be appropriately draped to avoid embarrassment. Inform patient that they will receive a sedative prior to the procedure. After the procedure they may experience flatulence or gas pains from the air injected into the
bowel. Instruct the patient to notify the practitioner if they develop increased pain or significant bleeding. Encourage the patient to drink a lot of fluids to make up for the dehydration of the bowel preparation.

**Barium Studies**

Explain the procedure to the patient and obtain consent for the procedure. Test preparation for an upper GI barium is: instruct patient to not take anything by mouth for at least 8 hours before the test. Inform the patient, the day of the test they will be asked to swallow a milk-like substance and assess the patient's ability to swallow. After the test inform the patient that they need to evacuate all the barium, that a cathartic might be necessary, and their stool will appear white at first and return to normal with complete evacuation. Test preparation for a lower GI barium is: the day before examination instruct the patient to have only clear liquids for lunch and supper, but no dairy products. Instruct the patient to drink one glass of water every hour for 8 to 10 hours. Inform the patient to drink one full bottle (10 ounces) of magnesium citrate at 2 P.M. Instruct patient to take three 5 mg. bisacodyl tablets at 7 P.M. and to not drink any liquids after midnight. On the day of the exam, the patient should take a bisacodyl suppository at 6 A.M. and/or a cleansing enema. The bowel preparation is complete when fecal return is similar to clear water. After the procedure ensure that the patient defecates, as much barium as possible. Inform the patient that their bowel movements will be white in color until the barium is gone and then their stool will be normal color. Instruct the patient to drink as much fluid, as possible to avoid dehydration (Pagana, 1995).
Arteriography

Explain the procedure to the patient and obtain consent for the procedure. Inform the patient they will be lying on a hard x-ray table for several hours. Assess the patient for allergy to iodine dye and coagulation status. Instruct the patient to not take anything by mouth for 8 hours before the study. Inform the patient that they will receive a sedative prior to the procedure. Instruct the patient that they will be kept on bed rest for at least 8 hours following the procedure to allow the complete sealing of the arterial puncture. After the procedure encourage the patient to drink fluids to prevent dehydration and promote the removal of the dye (Pagana, 1995).

Nuclear Medicine Scan

Explain the procedure to the patient and obtain consent for the procedure. Advise the patient to refrain from eating or drinking for 6 to 12 hours before the examination. Instruct the patient to take the histamine H2-receptor antagonist for 1 to 2 days before the scan. After the procedure the patient is asked to void and a repeat image is obtained. Since only minute amounts of radioisotopes are used the patient does not have to take precautions to protect others from radiation exposure (Pagana, 1995).
Figure 1. Algorithm for Evaluation of Gastrointestinal Bleeding

Presenting Symptoms

Vital Signs

Laboratory Tests

Blood Tests: Hemoglobin, Hematocrit, PT, PTT, BUN, Creatinine

Fecal Occult Blood

Suspect Upper GI Bleeding

Suspect Lower GI Bleeding

Nasogastric Tube Passed

Flexible Rectosigmoidoscopy

Negative

Positive
(blood or "coffee grounds")

Source Not Found
(blood or "coffee grounds")

Source Found

Source Not Found: consider Arteriography

Massive Bleeding: Arteriography

Uncontrolled Hemorrhage

Persistent Bleeding

Consider Nuclear Medicine Scan

Consider Urgent Colonoscopy

Consider Barium Enema: chronic GI bleeding and condition unstable for colonoscopy

Consider Surgery