Gastroenterology Exam preparation

Gastroenterology unit

Rambam Healthcare center

A 45-year-old man is admitted to the hospital for a 2-day history of fever and abdominal pain. His medical history is notable for cirrhosis due to chronic hepatitis C, esophageal varices, ascites, and minimal hepatic encephalopathy. His medications are furosemide, spironolactone, nadolol, lactulose, zinc, vitamin A, and vitamin D.

On physical examination, temperature is 36.5 °C (97.7 °F), blood pressure is 100/50 mm Hg, pulse rate is 84/min, and respiration rate is 20/min. BMI is 28. Abdominal examination discloses distention consistent with ascites. The abdomen is nontender to palpation.

Laboratory studies:

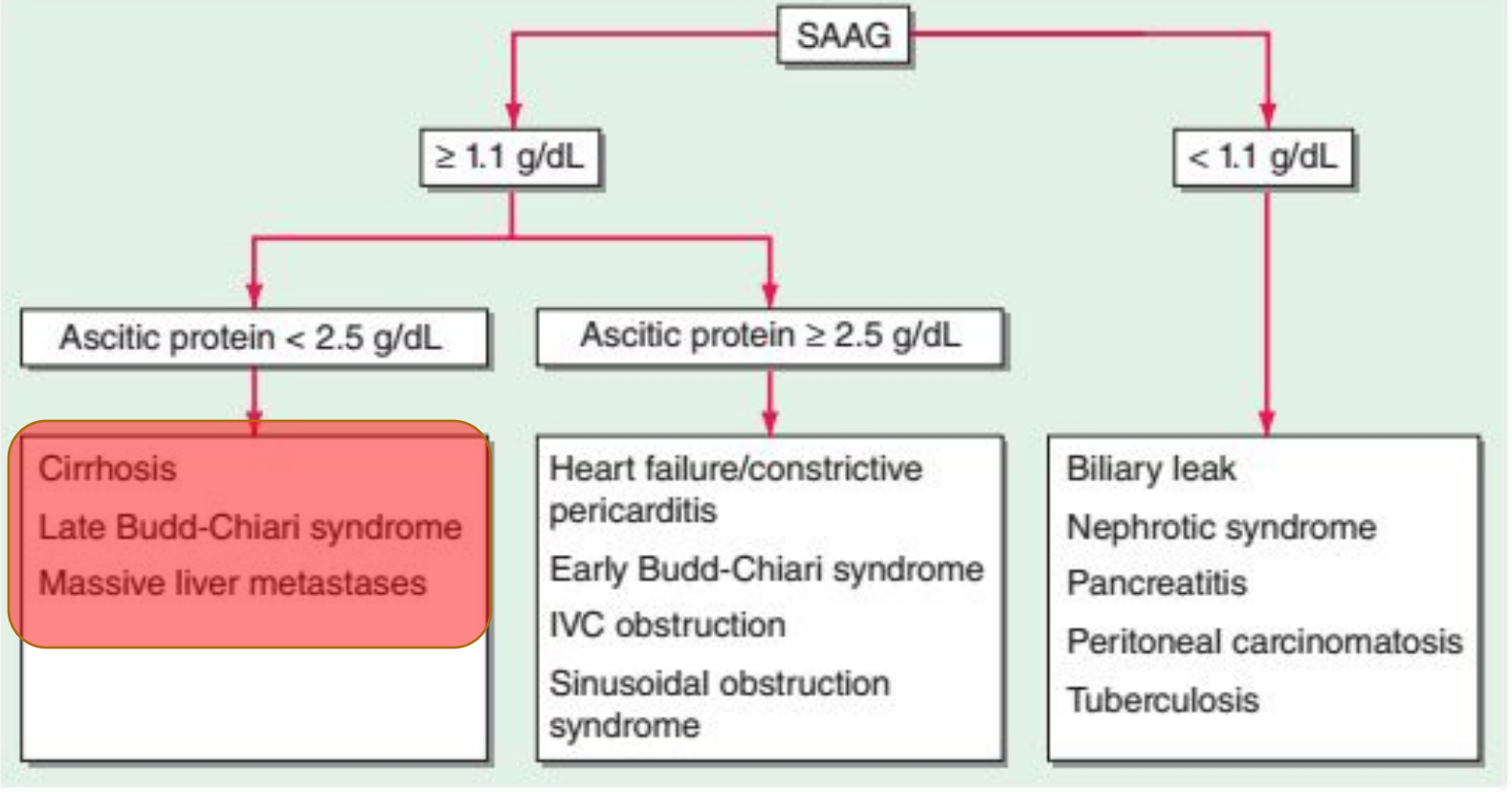
Hemoglobin	10 g/dL (100 g/L)
Leukocyte count	3500/μL (3.5×10^9/L)
Platelet count	70,000/μL (70×10^9/L)
INR	1.5 (normal range, 0.8-1.2)
Albumin	2.5 g/dL (25 g/L)
Alkaline phosphatase	220 units/L
Alanine aminotransferase	30 units/L
Aspartate aminotransferase	40 units/L
Total bilirubin	4 mg/dL (68.4 μmol/L)
Creatinine	1.8 mg/dL (159 μmol/L)
Urinalysis	Normal

Abdominal ultrasound discloses cirrhosis, splenomegaly, and ascites. The portal and hepatic veins are patent, and there is no hydronephrosis. Diagnostic paracentesis discloses a cell count of 2000/μL with 20% neutrophils, a total protein level of 1 g/dL (10 g/L), and an albumin level of 0.7 g/dL (7 g/L), consistent with spontaneous bacterial peritonitis.

Which of the following is the most appropriate treatment?

(A) Cefotaxime
(B) Cefotaxime and albumin
(C) Furosemide and spironolactone
(D) Large-volume paracentesis

Serum ascites albumin gradient



1.8 = 0.7 – 2.5

SAAG > 1.1

Ascitic protein = 1

Spontaneous bacterial peritonitis

- common and severe complication of ascites characterized by spontaneous infection of the ascitic fluid without an intraabdominal source.
- In patients with cirrhosis and ascites severe enough for hospitalization, SBP can occur in up to 30% of individuals and can have a 25% in-hospital mortality rate.
- Bacterial translocation is the presumed mechanism for development of SBP, with gut flora traversing the intestine into mesenteric lymph nodes, leading to bacteremia and seeding of the ascitic fluid
- The most common organisms are *Escherichia coli* and other gut bacteria (also enterococci, Strep viridans, Staph aureus…)
- The diagnosis of SBP is made when the fluid sample has an absolute neutrophil count >**250/µL**

Spontaneous bacterial peritonitis (cont.)

- Patients with ascites may present with fever, altered mental status, elevated white blood cell count, and abdominal pain or discomfort, or they may present without any of these features.
- Therefore, it is necessary to have a high degree of clinical suspicion, and peritoneal taps are important for making the diagnosis.
- Treatment is with a **second-generation cephalosporin**, with cefotaxime being the most commonly used antibiotic.
- In patients with variceal hemorrhage, the frequency of SBP is significantly increased, and prophylaxis against SBP is recommended when a patient presents with upper GI bleeding.

the risk for mortality. The use of cefotaxime plus intravenous albumin at 1.5 g/kg on admission and 1 g/kg on day 3 has been shown to decrease in-hospital mortality by 20% in patients with serum creatinine values of 1.5 mg/dL (133 micromoles/L) or greater, as in this

Hepatorenal syndrome

- form of functional renal failure without renal pathology that occurs in about 10% of patients with advanced cirrhosis or acute liver failure
- The diagnosis is made usually in the presence of a large amount of ascites in patients who have a stepwise progressive increase in creatinine
- Type 1 HRS  Type 2 HRS 
- Currently, patients are treated with **α-agonist (glypressin) / octreotide and intravenous albumin.**
- The best therapy for HRS is liver transplantation

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Which of the following is the most appropriate treatment?

(A) Cefotaxime
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(C) Furosemide and spironolactone
(D) Large-volume paracentesis

A 42-year-old woman is evaluated for an 8-month history of crampy abdominal pain and three loose bowel movements per day. The pain is relieved by a bowel movement. There are no nocturnal bowel movements, and there is no blood or dark tarry material in the stool. She has not had fever, night sweats, or weight loss. She has a history of Hashimoto disease and is treated with levothyroxine.

On physical examination, temperature is 36.8 °C (98.2 °F), blood pressure is 128/84 mm Hg, pulse rate is 64/min, and respiration rate is 16/min; BMI is 23. No rash is noted. There is mild diffuse abdominal tenderness without peritoneal signs and no abdominal masses. Rectal examination is normal. Complete blood count and thyroid-stimulating hormone level are normal.

Which of the following is the most appropriate next step in management?

(A) Breath test for bacterial overgrowth
(B) Colonoscopy with random biopsies
(C) Stool culture
(D) Tissue transglutaminase antibody testing

Irritable bowel syndrome

Rome IV Criteria

Recurrent abdominal pain, on average of at least 1 day per week in the last 3 months. associated with two or more of the following:

- Related to defecation
- Associated with a change in stool frequency
- Associated with a change in stool form (appearance)

Criteria should be fulfilled for the last 3 months with symptom onset over six months prior to diagnosis.

ibs Nutrition

1. IBS-C
   - Hard or lumpy stools ≥25% of bowel movements
   - Loose (mushy) or watery stools <25% of bowel movements
2. IBS-D
   - Loose (mushy) or watery stools ≥25% of bowel movements
   - Hard or lumpy stools <25% of bowel movments
3. IBS-M
   - Hard or lumpy stools ≥25% of bowel movements
   - Loose (mushy) or watery stools ≥25% of bowel movements
4. Un-subtyped IBS

Diagnosis

- No specific laboratory or imaging test can be performed to diagnose irritable bowel syndrome.
- Diagnosis involves excluding conditions that produce IBS-like symptoms, and then following a procedure to categorize the patient's symptoms.
- Ruling out parasitic infections, lactose intolerance, small intestinal bacterial overgrowth, and celiac disease is recommended for all patients before a diagnosis of irritable bowel syndrome is made.
- In patients over 50 years old, they are recommended to undergo a screening colonoscopy

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This patient should undergo tissue transglutaminase antibody testing. The American College of Gastroenterology recommends routine serologic testing for celiac disease in patients who present with symptoms of diarrhea-predominant or mixed irritable bowel syndrome (IBS). Additionally, there is a well-established association between comorbid autoimmune disorders and celiac disease, especially type 1 diabetes mellitus and autoimmune thyroid disease.

A 58-year-old man is evaluated in the emergency department for painless bright red blood per rectum that began 3 hours ago. The bleeding was accompanied by a syncopal episode. He has a history of rheumatoid arthritis. His current medications are adalimumab, methotrexate, and ibuprofen.

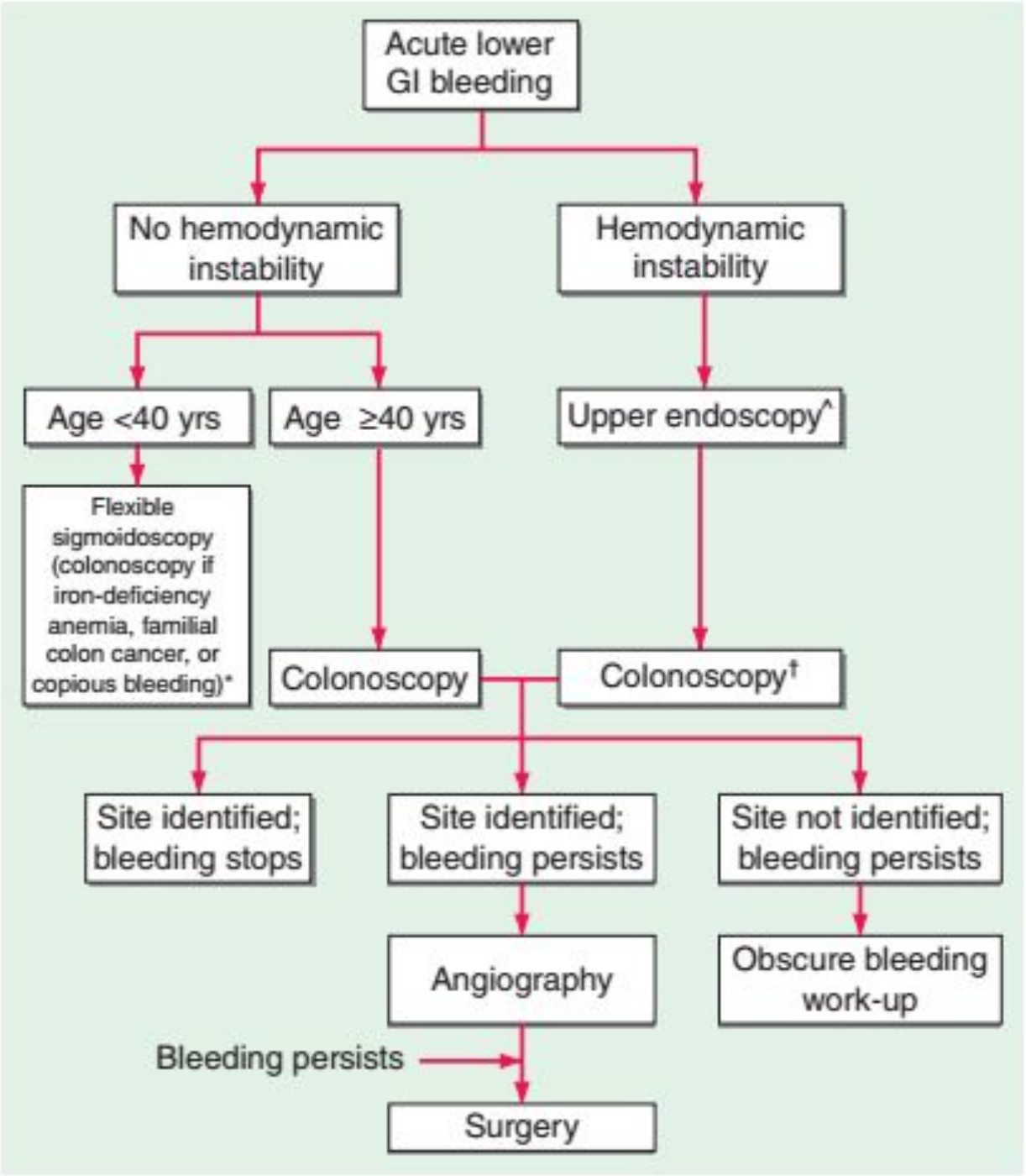
On physical examination, temperature is 37.2 °C (99.0 °F), blood pressure is 88/58 mm Hg, pulse rate is 132/min, and respiration rate is 24/min. Abdominal examination is normal. Rectal examination discloses bright red blood in the rectal vault. Nasogastric tube aspirate shows no evidence of blood or coffee-ground material.

Laboratory studies reveal a hemoglobin level of 7.3 g/dL (73 g/L).

Emergency intravenous fluid resuscitation is begun.

Which of the following is the most appropriate diagnostic test to perform next?

(A) Colonoscopy
(B) Tagged red blood cell scan
(C) Upper endoscopy
(D) Video capsule endoscopy



- Melena – UGIB (as little as 150-200 ml of blood loss)
- Hematemesis – ongoing UGIB
- Hematochezia – LGIB or brisk ongoing UGIB with at least 1000 ml blood loss
- NG tube placement misses up to 15% of actively bleeding lesions

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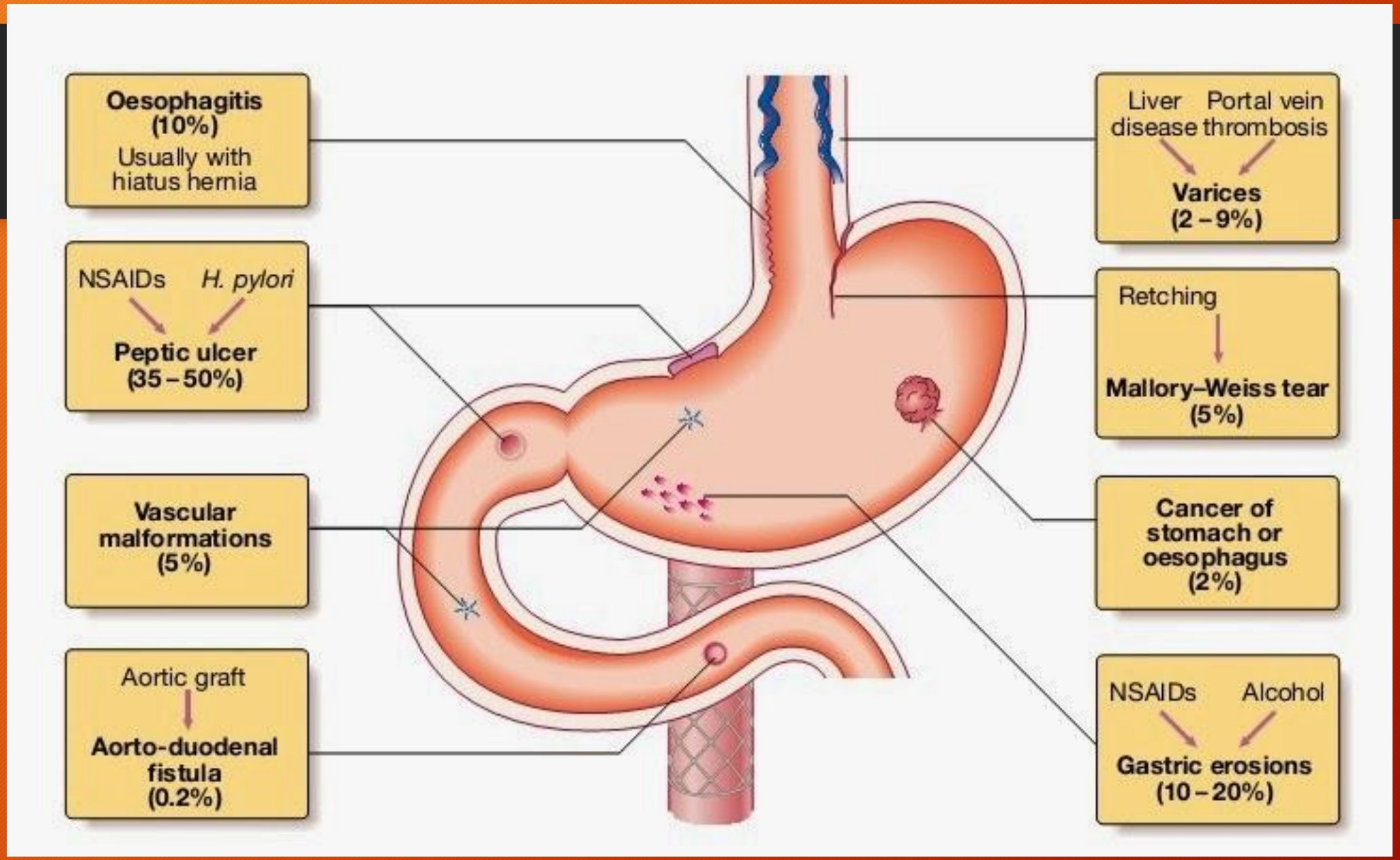
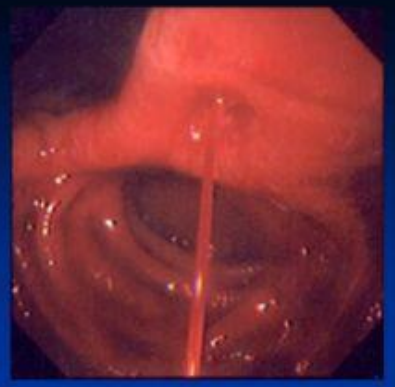
KEY POINT

- If an upper gastrointestinal source of bleeding is suspected in a patient with hematochezia, upper endoscopy is the most appropriate diagnostic procedure.


Oesophagitis (10%)
Usually with hiatus hernia
NSAIDs
H. pylori
Peptic ulcer (35–50%)
Vascular malformations (5%)
Aortic graft
Aorto-duodenal fistula (0.2%)
Liver disease
Portal vein thrombosis
Varices (2–9%)
Retching
Mallory–Weiss tear (5%)
Cancer of stomach or oesophagus (2%)
NSAIDs
Alcohol
Gastric erosions (10–20%)

Forrest's classification for PU bleeding

Stage	Characteristics	Rebleeding
I a	Jet arterial bleeding	90 %
Ib	Oozing	50 %
IIa	Visible Vessel	25 - 30 %
IIb	Adherent clot	10 - 20%
IIc	Black spot in ulcer crater	7 - 10%
III	Clean base ulcer	3 - 5 %



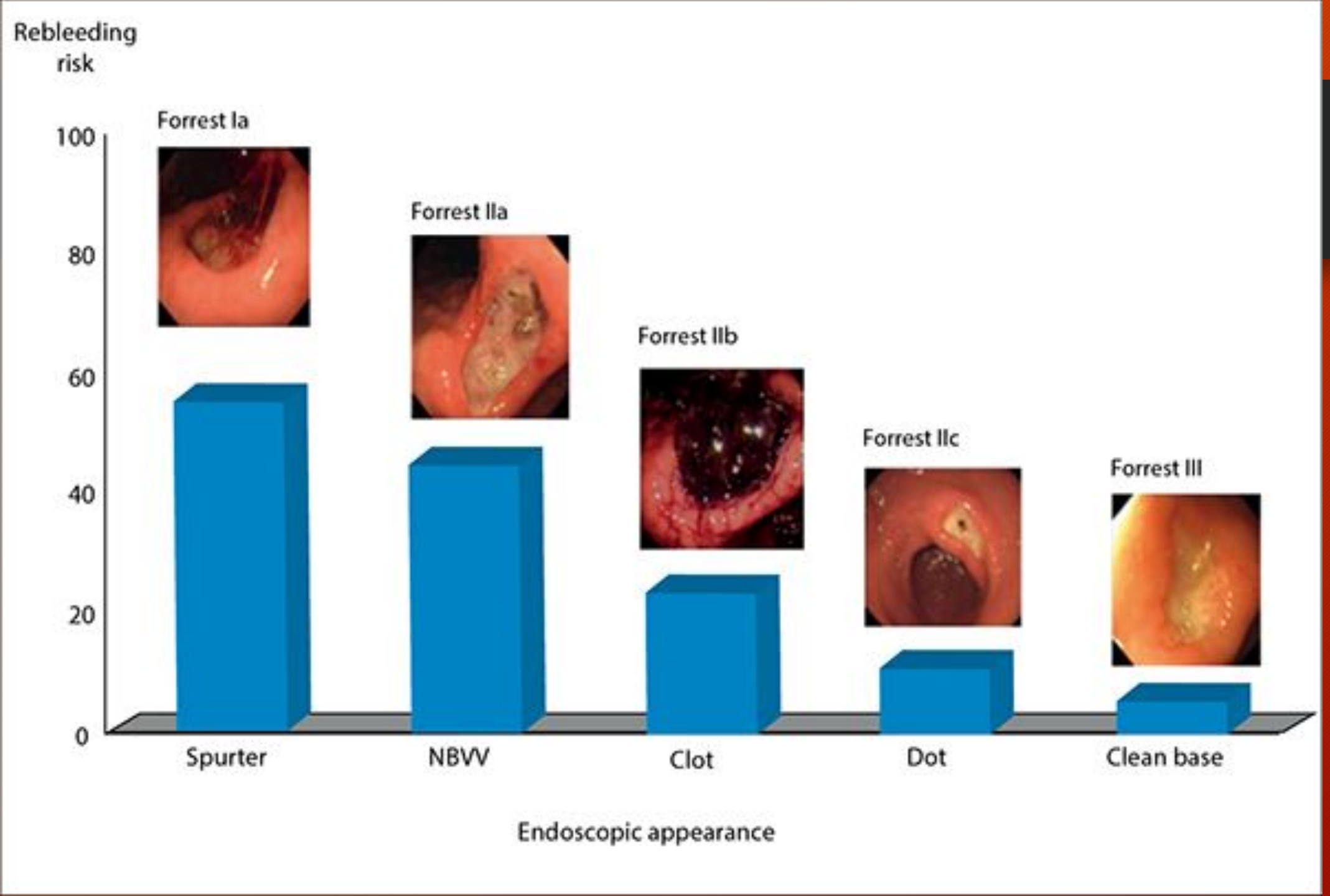
Forrest Ia - струйное кровотечение

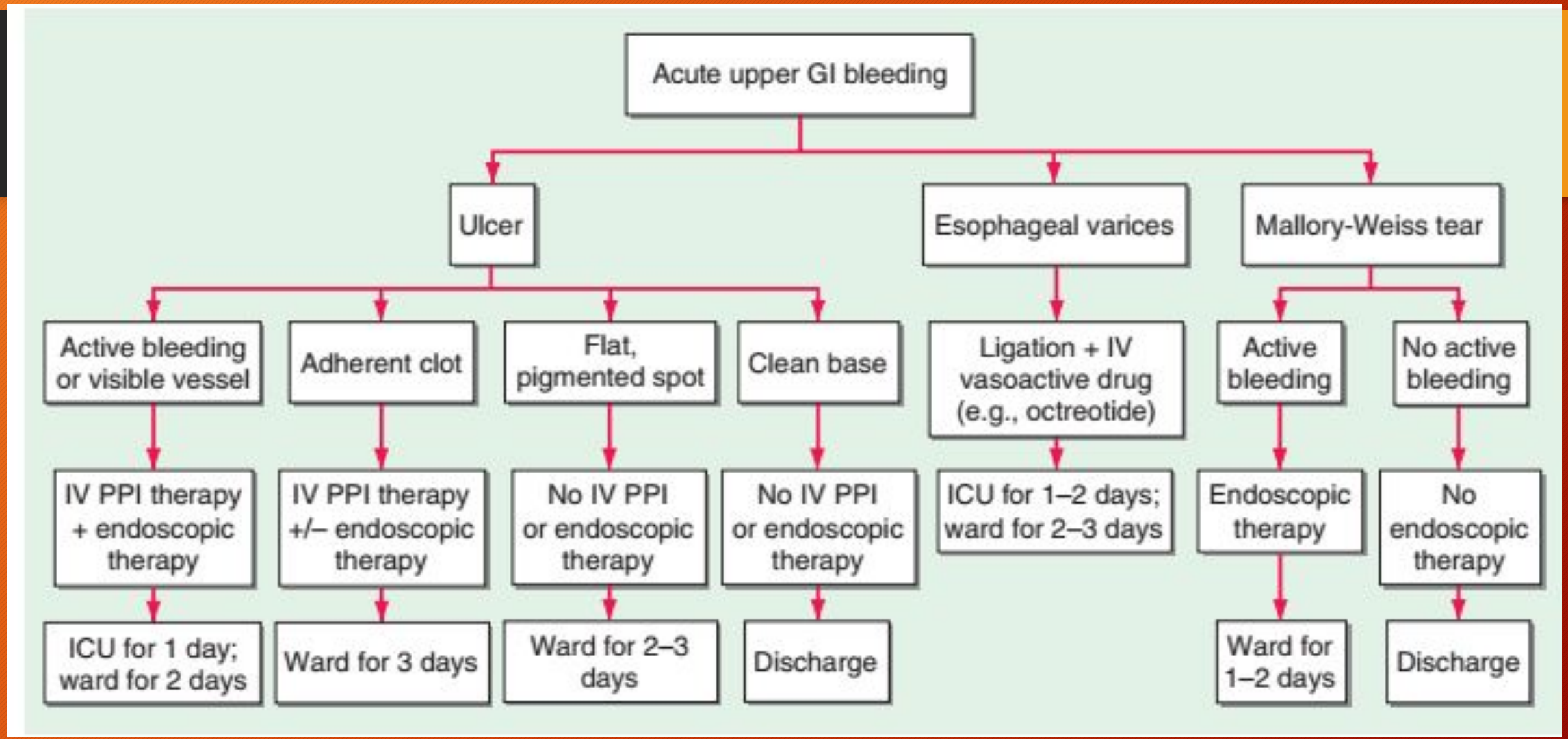
Forrest Ib - вялое венозное кровотечение

Forrest IIb – фиксированный сгусток

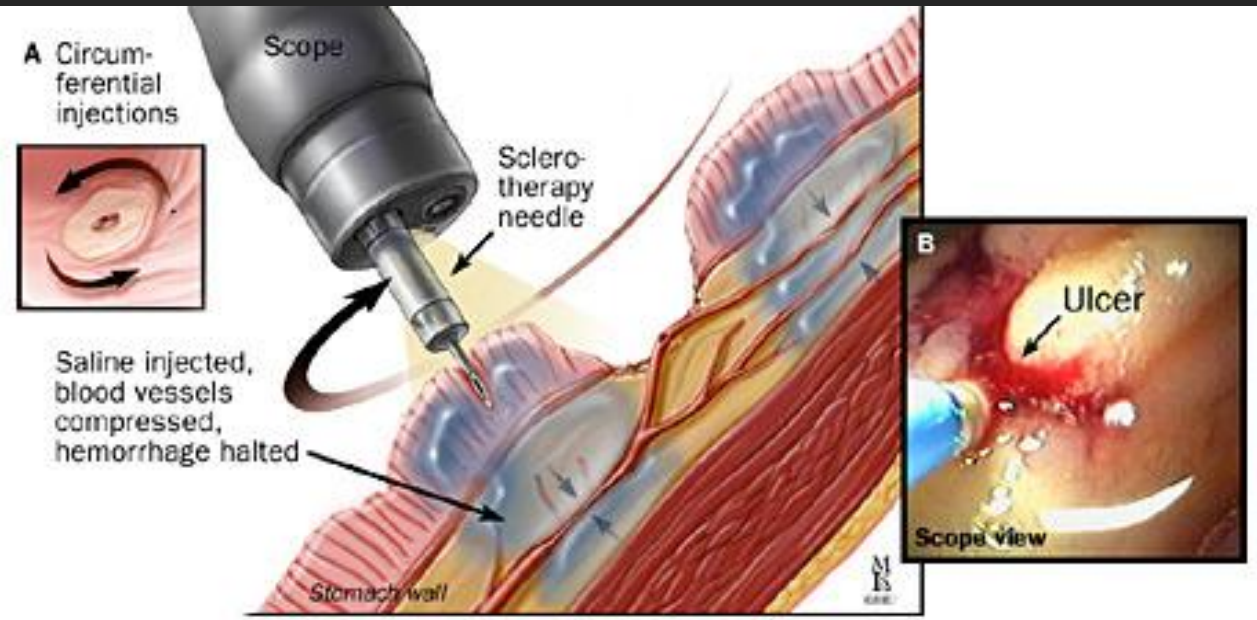
Forrest IIa – видимый тромбированный сосуд («часовой тромб»)

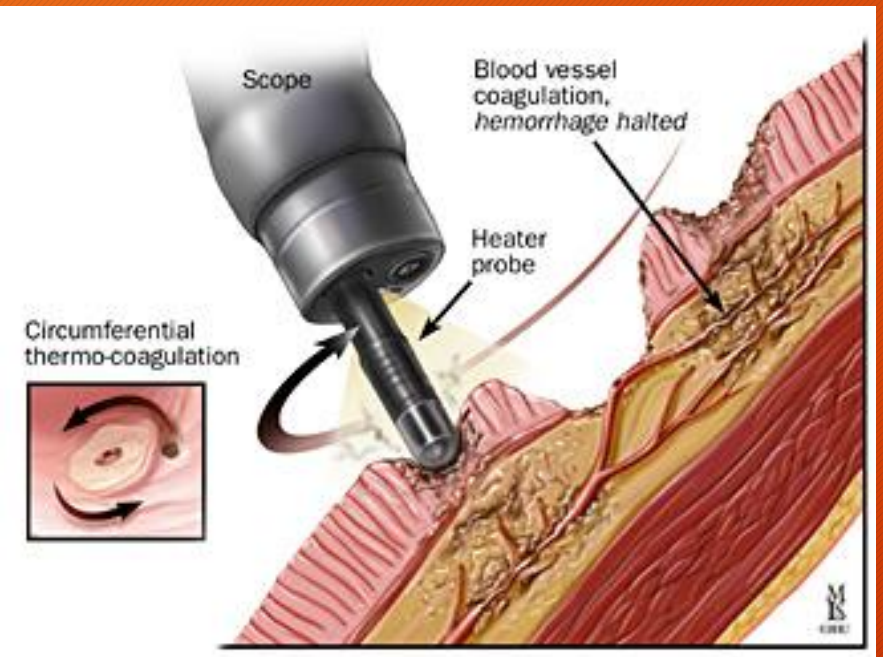
Forrest IIc – геморрагическое пропитывание

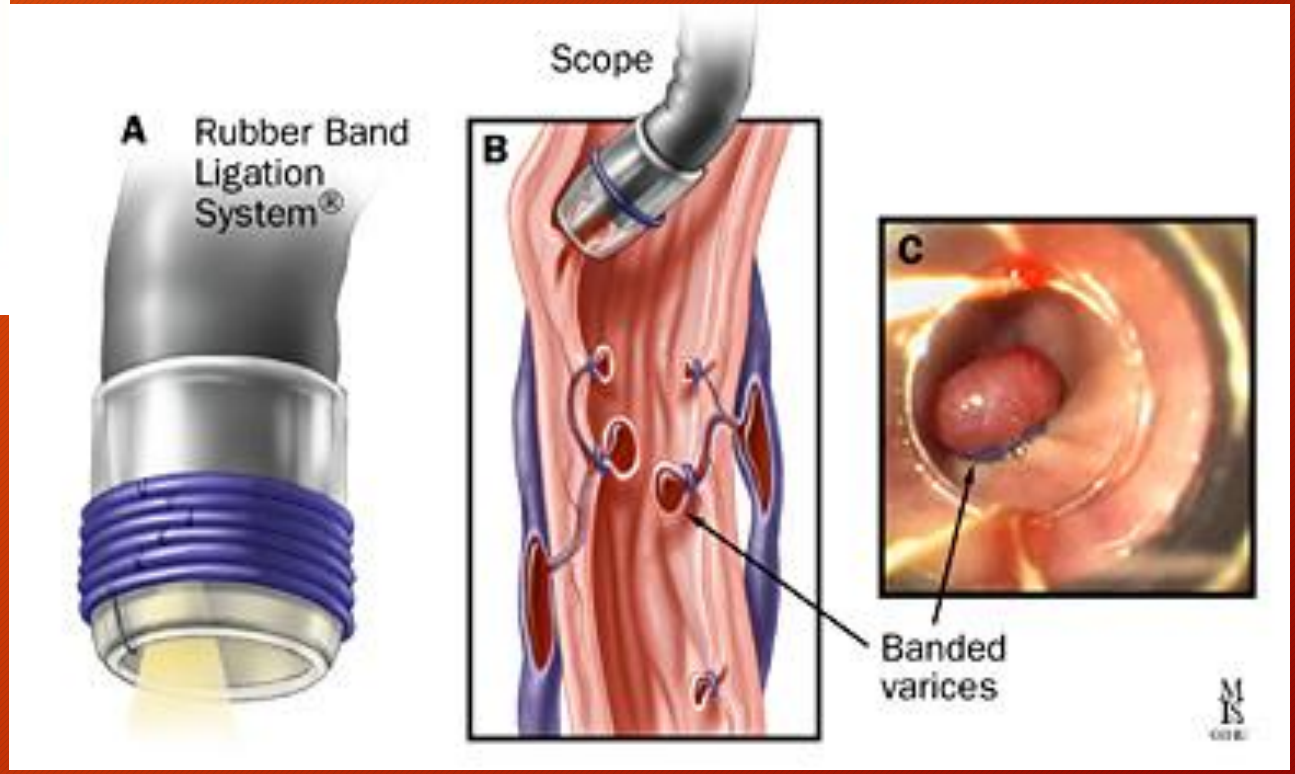

Rebleeding risk
100
80
60
40
20
0
Forrest Ia
Forrest IIa
Forrest IIb
Forrest IIc
Forrest III
Spurter
NBVV
Clot
Dot
Clean base
Endoscopic appearance


Acute upper GI bleeding
Ulcer
Esophageal varices
Mallory-Weiss tear
Active bleeding or visible vessel
Adherent clot
Flat, pigmented spot
Clean base
Ligation + IV vasoactive drug (e.g., octreotide)
Active bleeding
No active bleeding
IV PPI therapy + endoscopic therapy
IV PPI therapy +/– endoscopic therapy
No IV PPI or endoscopic therapy
No IV PPI or endoscopic therapy
ICU for 1–2 days; ward for 2–3 days
Endoscopic therapy
No endoscopic therapy
ICU for 1 day; ward for 2 days
Ward for 3 days
Ward for 2–3 days
Discharge
Ward for 1–2 days
Discharge

Endoscopic therapy







A 19-year-old woman is evaluated for a 3-month history of progressively worsening diarrhea, abdominal pain, and weight loss. Her brother was diagnosed with Crohn disease at age 16 years.

On physical examination, temperature is 37.4 °C (99.3 °F), blood pressure is 110/65 mm Hg, pulse rate is 90/min, and respiration rate is 20/min. Abdominal examination reveals tenderness to palpation in the right lower quadrant with no guarding or rebound tenderness. Perianal and rectal examinations are normal.

Colonoscopy discloses evidence of moderately to severely active Crohn disease involving the terminal ileum; the diagnosis is confirmed histologically. Magnetic resonance enterography shows active inflammation involving the distal 20 cm of the ileum without other bowel inflammation or obstruction. There is no evidence of abscess or phlegmon.

Which of the following is the most effective maintenance treatment?

(A) Ciprofloxacin and metronidazole
(B) Infliximab
(C) Mesalamine
(D) Prednisone
(E) Surgical resection

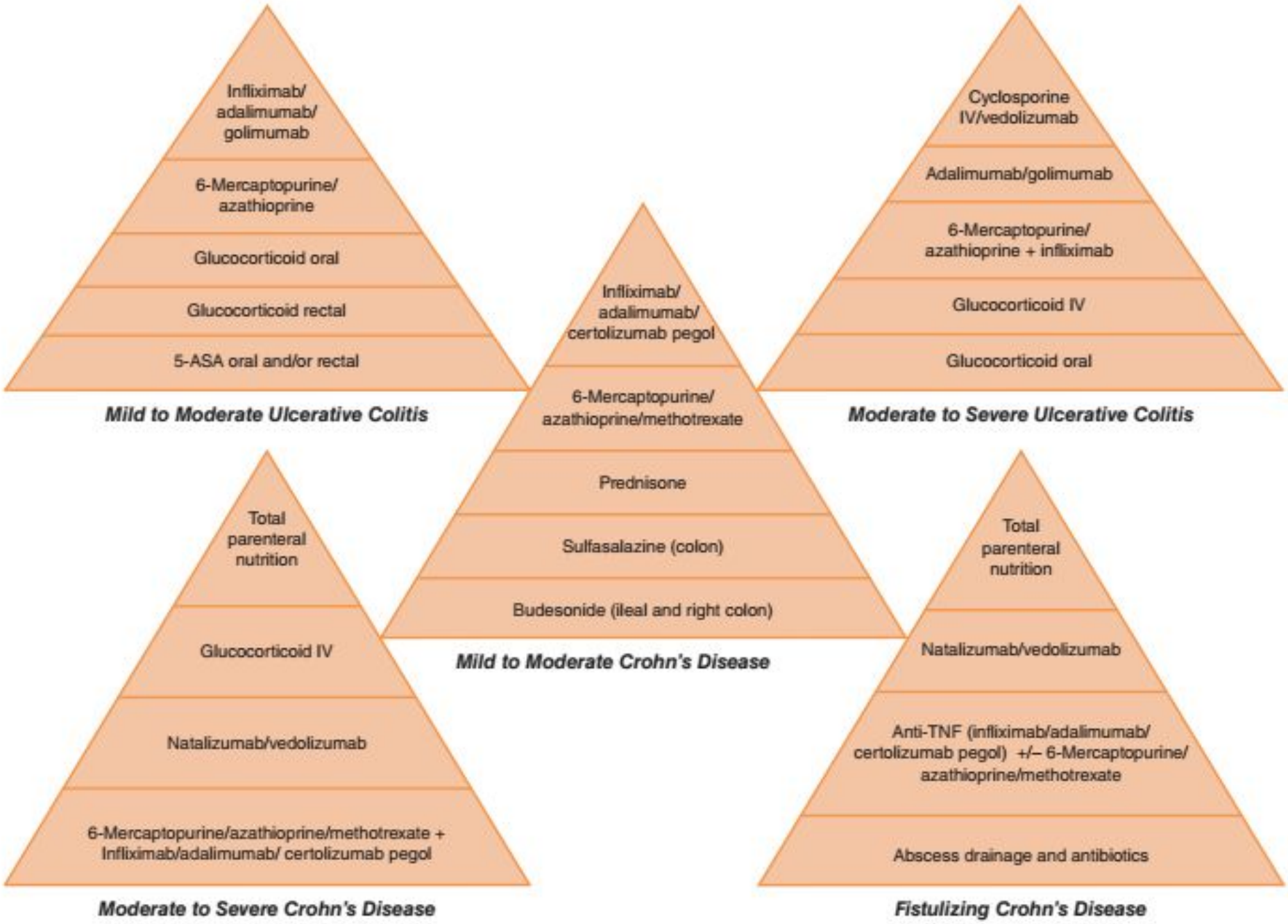
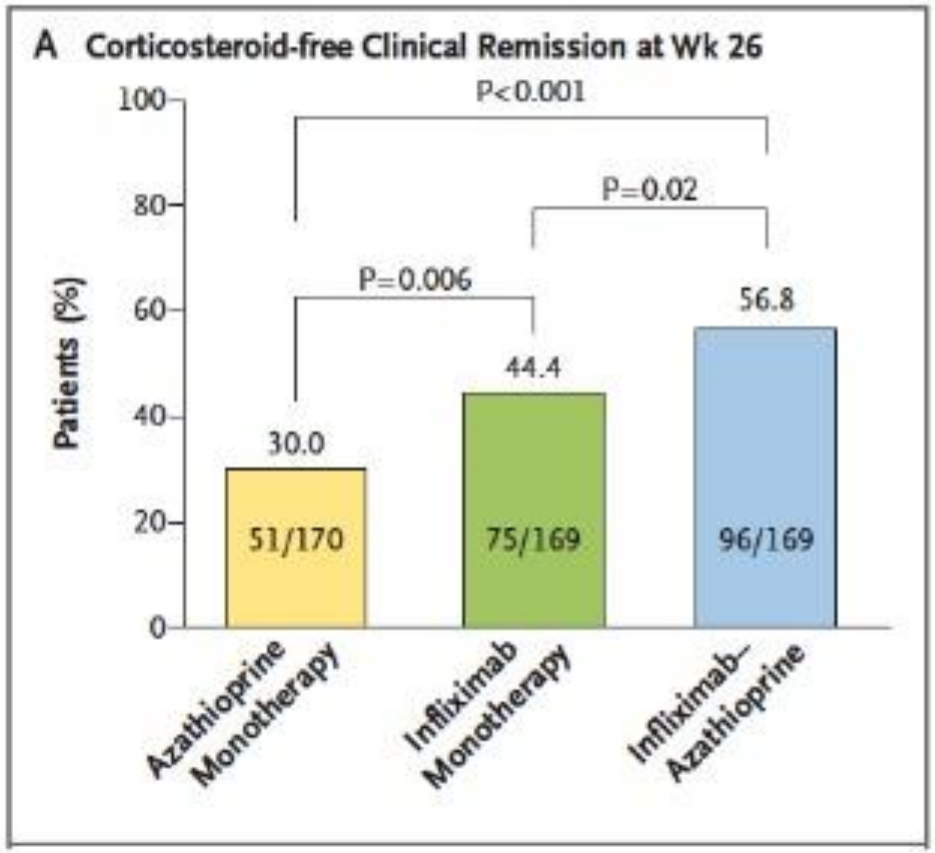
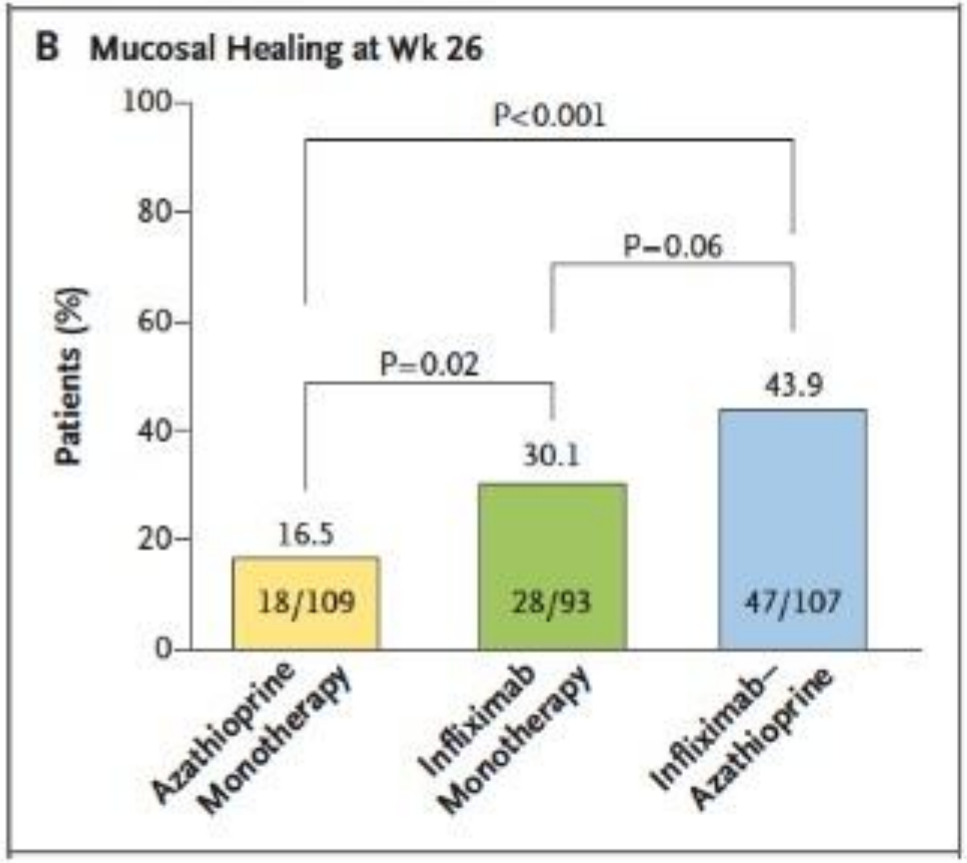


FIGURE 351-12 **Medical management of inflammatory bowel disease.** 5-ASA, 5-aminosalicylic acid; CD, Crohn's disease; UC, ulcerative colitis.

SONIC-Studie: Infliximab, Azathioprine, or Combination Therapy for Crohn's Disease





Colombel JF, et al. N Engl J Med 2010;362:1383-95.

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KEY POINT

- The most effective treatment for patients with recently diagnosed moderately to severely active Crohn disease is anti–tumor necrosis factor therapy with or without an immunomodulator such as azathioprine or 6-mercaptopurine.

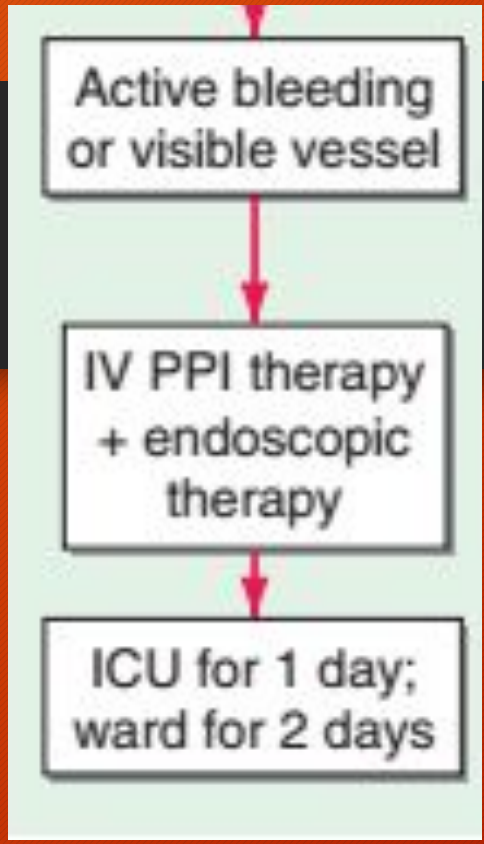
A 55-year-old man is admitted to the hospital for epigastric pain and melena. He works as a carpenter and injured his back approximately 3 weeks ago while working. Since the injury, he has been taking ibuprofen.

On physical examination, blood pressure is 104/62 mm Hg and pulse rate is 110/min. Other than tachycardia, the general physical examination is normal.

Hemoglobin level is 10.2 g/dL (102 g/L). He is given appropriate resuscitation and stabilization. Upper endoscopy shows a 1-cm antral ulcer with a nonbleeding visible vessel. Endoscopic treatment with epinephrine injection and heater probe is performed. A proton pump inhibitor is started, and his hospital course is unremarkable.

Assuming the patient remains asymptomatic, how long should this patient be observed in the hospital after endoscopic treatment?

(A) 12 hours
(B) 24 hours
(C) 48 hours
(D) 72 hours



KEY POINT

- **Patients with high-risk peptic ulcers (active bleeding or a visible vessel in an ulcer base) require hospitalization for at least 72 hours after endoscopic therapy.**

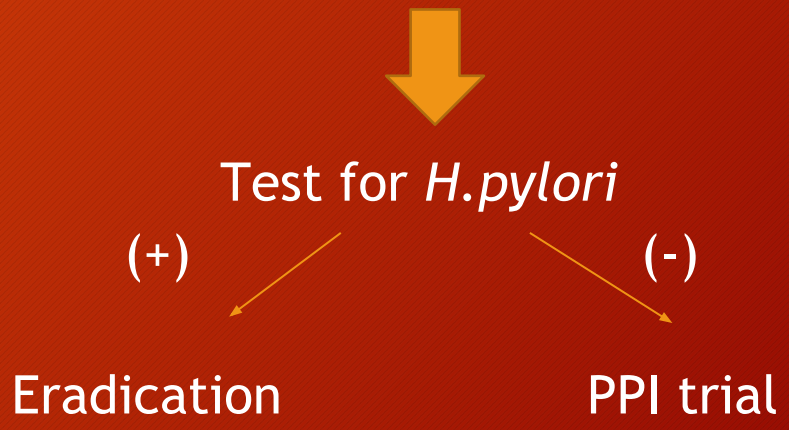
A 44-year-old woman is evaluated for a 1-year history of vague upper abdominal discomfort that occurs after eating. She is from a rural area in a developing country. She has not had nausea, vomiting, dysphagia, odynophagia, weight loss, or black or bloody stools. She is otherwise healthy. She has no personal history of peptic ulcer disease and no family history of gastrointestinal malignancy. Her only medication is a multivitamin.

On physical examination, temperature is 36.8 °C (98.2 °F), blood pressure is 127/82 mm Hg, pulse rate is 72/min, and respiration rate is 16/min. BMI is 27. There is epigastric tenderness with moderate palpation but no masses or lymphadenopathy. Complete blood count is normal.

Which of the following is the most appropriate management?

(A) *Helicobacter pylori* stool antigen testing
(B) Initiate an H_2 blocker
(C) Initiate empiric treatment for *H. pylori* infection
(D) Perform endoscopy

- Dyspepsia in patient younger than 50 yo w/o alarm features
  - Anemia
  - Dysphagia
  - Odynophagia
  - Weight loss
  - Vomiting
  - FH of UGI malignancy
  - PH of PUD, gastric surgery or GI malignancy
  - Abdominal mass / LAD on exam



Common Testing Methods for *H. pylori*

	BreathTek™ UBT	Serology (ELISA)	Stool (HpSA)	Endoscopy
Sample collection	Breath Sample	Blood Sample	Stool Sample	Tissue Sample
Tests for active infection	YES	NO	YES	YES
Scope of test	Tests the entire gastric mucosa for **active** *H. pylori* infection[1]	Tests the immune system for prior exposure	Tests for *H. pylori* antigens in stool	Tests small areas of the stomach
Post-treatment monitoring	YES	NO	YES	YES

Table 1 Diagnostic tests for the detection of *H. pylori* infection (2,15-17)

Test	Sensitivity	Specificity	Advantages	Disadvantages
Noninvasive				
Serology	76-84	79-90	Widely available, inexpensive	Positive result may reflect previous rather than current infection, not useful after treatment
Urea breath test	>95	>95	High negative and positive predictive values, useful before and after treatment	False-negative results possible in the presence of PPIs or with recent use of antibiotics of bismuth preparations, considerable resources and personnel required to perform test
Stool antigen test	96	97	High negative and positive predictive values, useful before and after treatment	Process of stool collection may be distasteful to patient, false-negative results possible in the presence of PPIs or with recent use of antibiotics or bismuth preparations
Invasive				
Histology	95	99	Excellent sensitivity and specificity, especially with special and immune stains, provides additional information about gastric mucosa	Expensive (endoscopy and histopathology costs), interobserver variability, accuracy affected by PPI and antibiotics use, requires trained personnel
Rapid urease test	90	93	Rapid results, accurate in patients not using PPIs or antibiotics, no added histopathology cost	Requires endoscopy, less accurate after treatment or in patients using PPIs
Culture	58.1	100	Specificity 100%, allows antibiotics sensitivity testing	Variable sensitivity; requires trained staff and properly equipped facilities, expensive

PPI, proton pump inhibitor; *H. pylori*, *Helicobacter pylori*.

A 36-year-old man is evaluated in the emergency department for melena. He began taking an over-the-counter proton pump inhibitor (PPI) 7 days ago for epigastric pain. He has no previous history of gastrointestinal illnesses.

On physical examination, vital signs are normal. BMI is 21. Abdominal palpation discloses epigastric tenderness without rebound; no masses are present. The remainder of the physical examination is normal. Hemoglobin level is 10.4 g/dL (104 g/L). Endoscopy shows a 1-cm, clean-based duodenal ulcer. Histologic examination for *Helicobacter pylori* is negative.

Which of the following is the most appropriate management?

(A) Continue the PPI with no further testing for *H. pylori*

(B) *H. pylori* serology

(C) *H. pylori* stool antigen test

(D) Urea breath test

Recent gastrointestinal bleeding can reduce the accuracy of certain methods to detect *H. pylori*, specifically the rapid urease test, histology, and culture. Therefore, in a patient with a bleeding peptic ulcer, a negative rapid urease test or histology is not sufficient to rule out *H. pylori* infection, and a second test is warranted. The sensitivity of the rapid urease test can be reduced up to 25% in patients who have taken a proton pump inhibitor (PPI) or bismuth within 2 weeks of testing or antibiotic therapy within 4 weeks. The sensitivity of the urea breath test and stool antigen test, like that of the rapid urease test, is reduced by medications that affect urease production. *H. pylori* serology is indicated in this patient because it is the only test that is not affected by recent gastrointestinal bleeding or use of PPIs.

KEY POINT

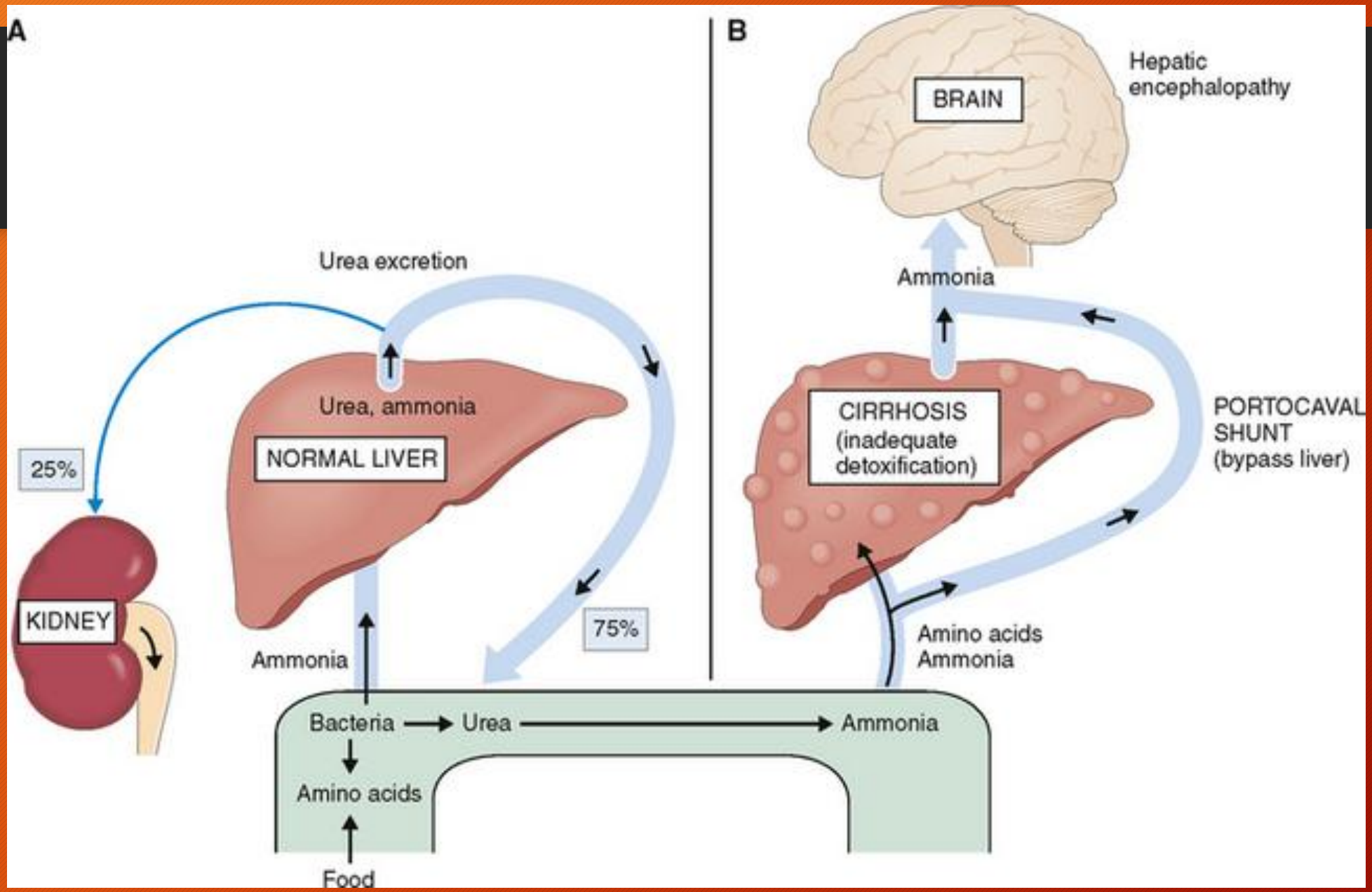
- *Helicobacter pylori* serology is the only test that is not affected by recent gastrointestinal bleeding or use of proton pump inhibitors.

A 65-year-old woman is evaluated in follow-up after recent discharge from her third hospitalization for an acute exacerbation of hepatic encephalopathy. No specific trigger was identified for the worsening encephalopathy. Her medical history is significant for cirrhosis due to primary biliary cirrhosis, as well as esophageal varices and ascites. Her medications are lactulose, nadolol, furosemide, spironolactone, and zinc sulfate; she is adherent to her lactulose therapy.

On physical examination, temperature is 37.5 °C (99.5 °F), blood pressure is 105/65 mm Hg, pulse rate is 68/min, and respiration rate is 16/min. BMI is 33. There are no gross or focal neurologic deficits. The spleen tip is palpable.

Which of the following is the most appropriate additional treatment?

(A) Ciprofloxacin
(B) Metronidazole
(C) Protein restriction
(D) Rifaximin


A
B
Urea excretion
Urea, ammonia
NORMAL LIVER
25%
KIDNEY
75%
Ammonia
Bacteria
Urea
Ammonia
Amino acids
Food
BRAIN
Hepatic encephalopathy
Ammonia
CIRRHOSIS (inadequate detoxification)
PORTOCAVAL SHUNT (bypass liver)
Amino acids
Ammonia

BOX

Precipitating factors for development of MHE and episodic HE

- Gastrointestinal bleeding
- Excessive protein
- Hyperkalemia/hyponatremia
- Constipation
- Sedatives and tranquilizers
- Electrolyte imbalances
- Infections
- Trauma
- Dehydration
- Uremia

MHE, minimal hepatic encephalopathy
HE, hepatic encephalopathy

Therapies for Overt Episodic Hepatic Encephalopathy (HE)
1. Supportive care, airway protection
2. Identification and treatment of precipitating causes
3. Lactulose: 10 to 30 g (15-45 ml) PO/per nasogastric tube every 1 to 2 hours until bowel movement, then 10 to 30 g PO 2 to 4 times daily, titrated to 2 to 3 soft stools daily; or lactulose enema (300 mL in 1 L water) every 6 to 8 hours until able to take oral form of medication
4. Rifaximin: 550 mg PO twice daily
5. Do not limit protein intake
6. Consider need for long term management of HE and liver transplant evaluation

172 Patients with cirrhosis with HE screened

Excluded (*n*=52)

- Serum creatinine >1.5 mg/dl (*n*=24)
- Recent alcohol intake (*n*=12)
- Hepatocellular carcinoma (*n*=3)
- Significant systemic illness (*n*=13)

120 Patients enrolled

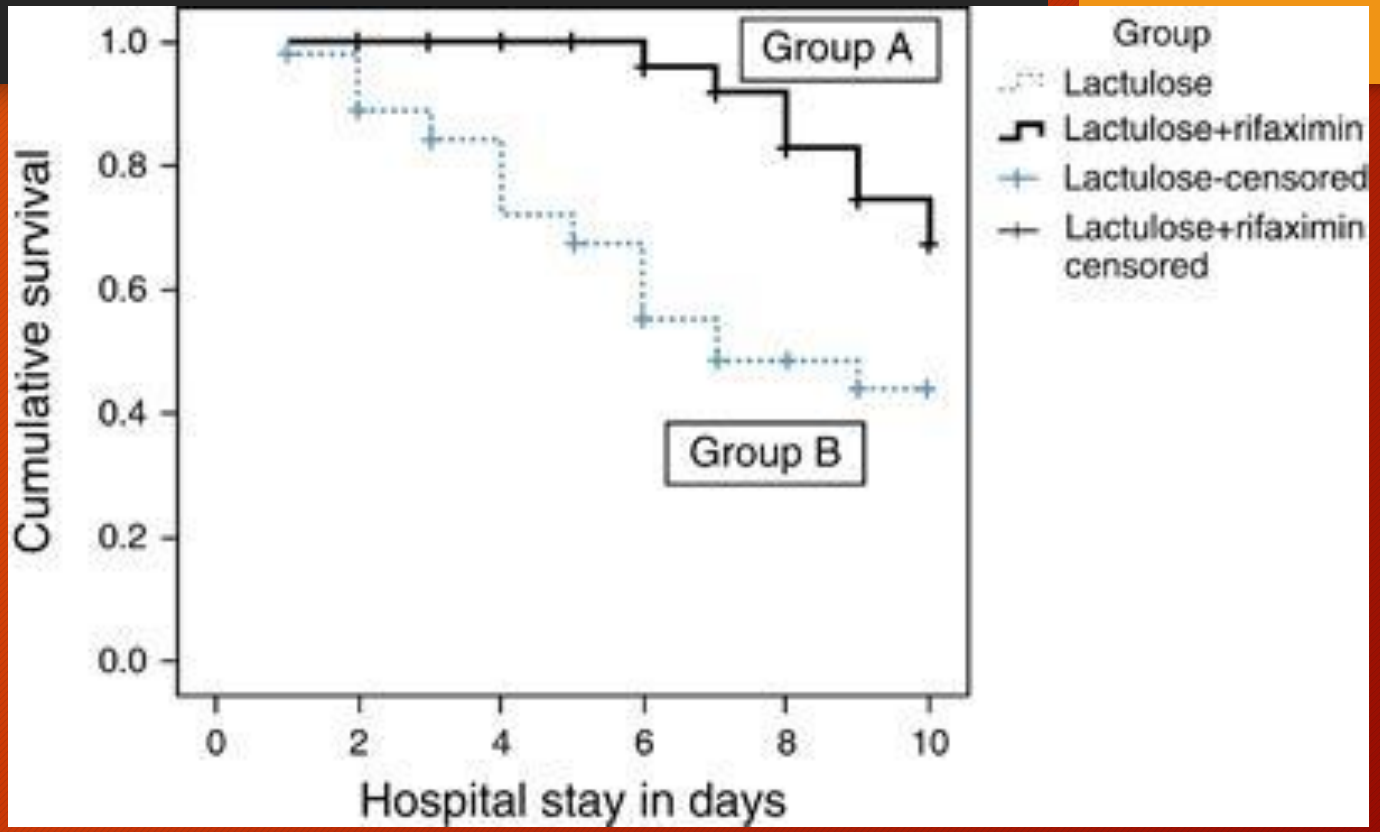
Randomization

Group A (lactulose plus rifaximin), *n*=63

Group B (lactulose plus placebo), *n*=57

Reversal of HE (*n*=48)
Death (*n*=15)

Reversal of HE (*n*=29)
Death (*n*=28)



A 65-year-old woman is evaluated in follow-up after recent discharge from her third hospitalization for an acute exacerbation of hepatic encephalopathy. No specific trigger was identified for the worsening encephalopathy. Her medical history is significant for cirrhosis due to primary biliary cirrhosis, as well as esophageal varices and ascites. Her medications are lactulose, nadolol, furosemide, spironolactone, and zinc sulfate; she is adherent to her lactulose therapy.

On physical examination, temperature is 37.5 °C (99.5 °F), blood pressure is 105/65 mm Hg, pulse rate is 68/min, and respiration rate is 16/min. BMI is 33. There are no gross or focal neurologic deficits. The spleen tip is palpable.

Which of the following is the most appropriate additional treatment?

(A) Ciprofloxacin
(B) Metronidazole
(C) Protein restriction
(D) Rifaximin

KEY POINT

- Patients with refractory hepatic encephalopathy despite lactulose therapy may benefit from the addition of rifaximin.

!Good luck