GI Bleeding Approach

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Objectives

By the end of the lecture the student should be able to:

1. Explain the pathophysiology of shock from upper gastrointestinal bleeding.

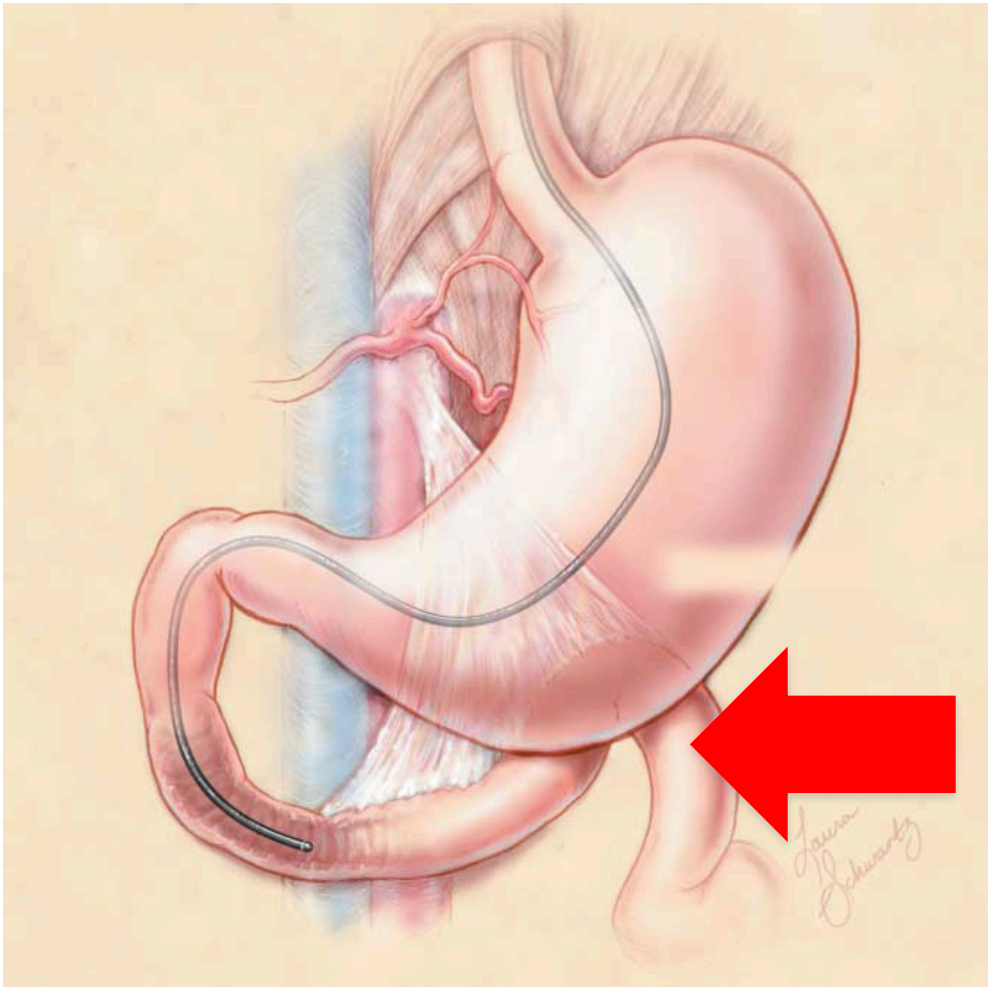
2. Outline the proper investigation of patients presenting with upper gastrointestinal bleeding and an appropriate deferential diagnosis.

Objectives

3. Outline the proper initial management of patients presenting with upper gastrointestinal bleeding

4. Recognize the differences in the approach of upper gastrointestinal bleeding from a variceal vs. non-variceal source.

Anatomical Landmarks and Location of Gastrointestinal Bleeding



Srygley et al.,JAMA. 2012;307(10):1072-1079

Clinical manifestations of UGIB

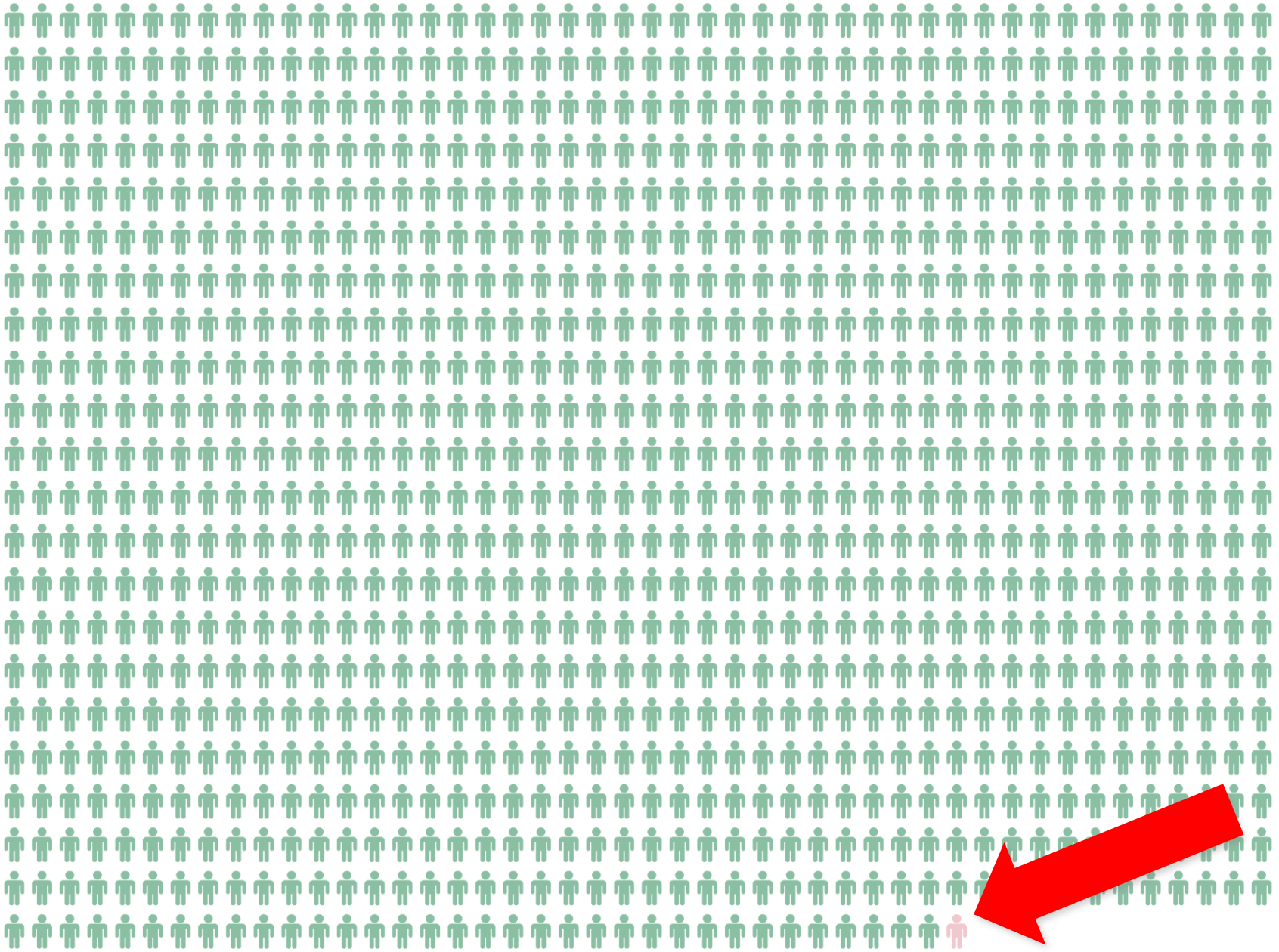
	Sources of GI Bleeding					
	Esophagus	Stomach	Duodenum	Small Intestine[a]	Right Colon	Left Colon
Hematemesis	X	X	X	—	—	—
Coffee-ground emesis	X	X	X	—	—	—
Melena	X	X	X	X	X	—
Guaiac-positive stool	X	X	X	X	X	X
BRBPR	(If severe)	(If severe)	(If severe)	(If severe)	X	X

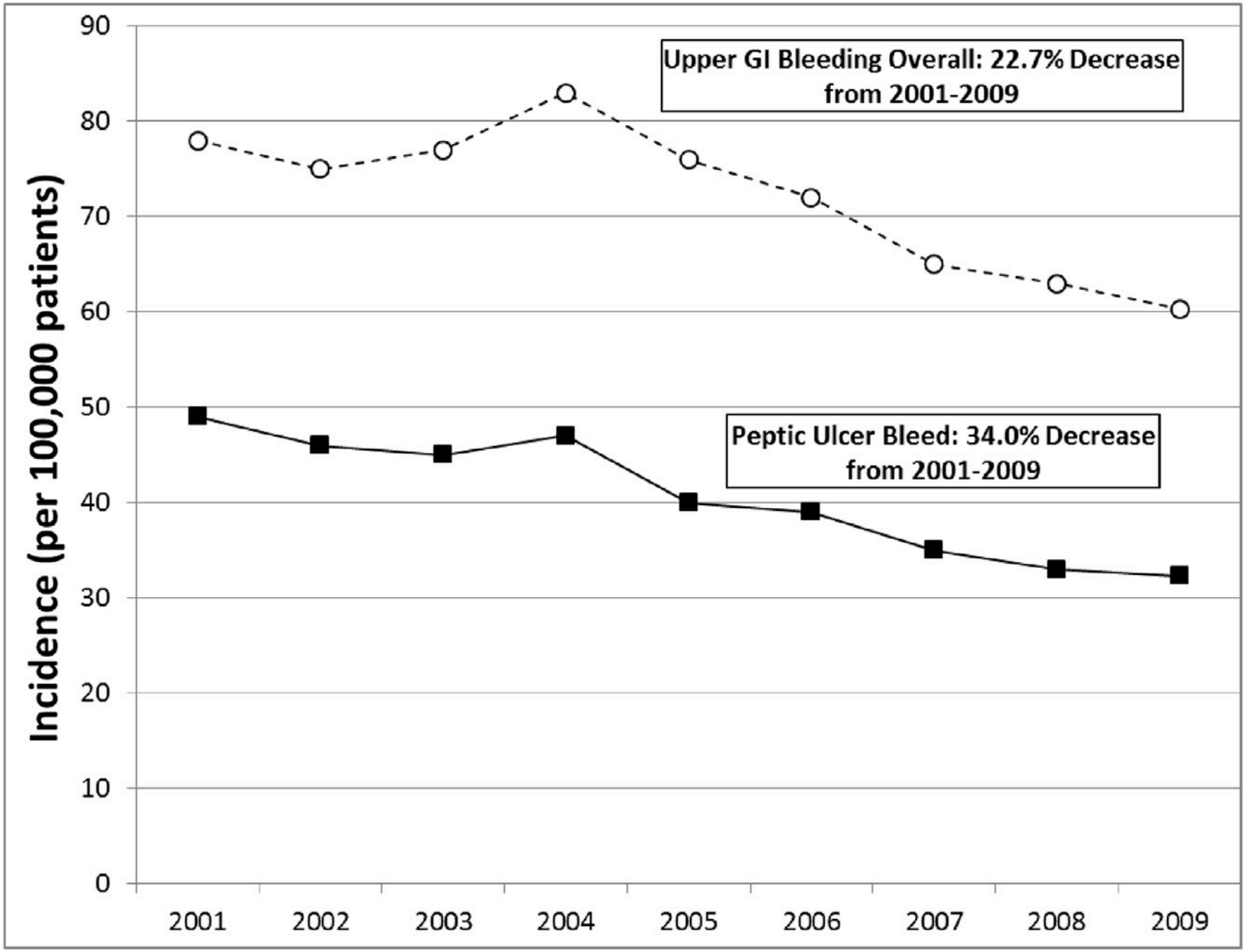
Simon TG, et al. Gastrointestinal endoscopy clinics of North America 2015;25:429-42.

Hypovolemic shock: symptoms, signs and fluid replacement

Blood loss (mL)	<750	750–1500	1500–2000	>2000
Blood loss (%)	<15	15–30	30–40	>40
Pulse rate	<100	>100	>120	>140
Blood pressure	Normal	Normal	Decreased	Decreased
Pulse pressure	Normal or increased	Decreased	Decreased	Decreased
Respiratory rate	14–20	20–30	30–40	>35
Urine output (mL)	>30	20–30	5–15	Negligible
Mental status	Slightly anxious	Mildly anxious	Anxious and confused	Confused and lethargic
Fluid replacement	Crystalloid	Crystalloid	Crystalloid and blood	Crystalloid and blood

Incidence; 57-78 cases per 100,000 population





Tielleman T, et al. Gastrointestinal endoscopy clinics of North America 2015;25:415-28.

Case 1

- A 65 years old male referred for evaluation of 4 months HX of weight loss, fatigue , and weakness. He also gave history of passing dark stool intermittently for the last 3 months. He is known DM on insulin , hyperlipedemia on statin and occasionally aspirin

- What other information you would like to ask?

ESSENTIALS OF DIAGNOSIS

- Symptoms: Coffee ground vomiting, hematemesis, melena, hematochezia, anemic symptoms
- Past medical history: Liver cirrhosis, use of non-steroidal anti-inflammatory drugs
- Signs: Hypotension, tachycardia, pallor, altered mental status, melena or blood per rectum, decreased urine output
- Bloods: Anemia, raised urea, high urea to creatinine ratio

- What is the likely diagnosis?

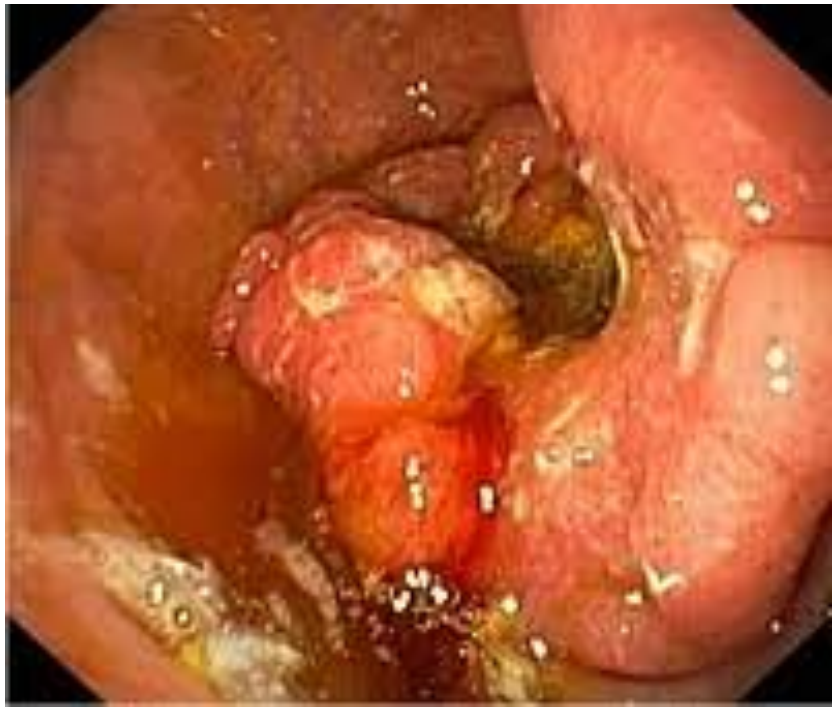
Causes of UGIB

Table 1
Frequency of common causes of upper gastrointestinal bleeding

Diagnosis	Frequency (Percentage)
Peptic ulcer disease, including duodenal and gastric ulcer	28–59
Variceal bleeding	4–14
Mucosal erosive disease, including esophagitis, gastritis, and duodenitis	1–31
Mallory-Weiss tear	4–8
Malignancy	2–4
Arteriovenous malformation	3
Gastric antral vascular ectasia	~1
Dieulafoy lesion	~1

Gibson et al. Gastrointest Endosc Clin N Am 2011;21:583-96.

- What will be the next step?



Case 2

- A 42 years old male complaining of chronic recurrent epigastric pain which worsen recently especially when he is fasting
- For the last 2 days he started to have frequent vomiting associated with blood
- He is not known to have any chronic medical problems and not on any medications

- What is the best next step in the approach of such patient?

- Detailed HX
- Full Physical examination

- How would you assess the bleeding severity?

Risk Stratification

Glasgow- Blatchford Score (GBS)

Rockall Score

Table 1 | Glasgow–Blatchford score assessment criteria

	Risk factors at presentation	Threshold	Score
Urea	Blood urea nitrogen (mmol/l)	6.5–7.9	2
		8.0–9.9	3
		10.0–24.9	4
		≥25.0	6
CBC	Hemoglobin for men (g/l)	120–130	1
		100–119	3
		<100	6
	Hemoglobin for women (g/l)	100–120	1
		<100	6
Physical	Systolic blood pressure (mmHg)	100–109	1
		90–99	2
		<90	3
	Heart rate (bpm)	>100	1
History	Melena	Present	1
	Syncope	Present	2
	Hepatic disease	Present	2
	Cardiac failure	Present	2

Total score (0–23). Patients with scores >0 are considered to be at high risk. Permission obtained from Elsevier Ltd © Blatchford, O. *et al*. *Lancet* **356**, 1318–1321 (2000).

Bardou et al. Nat Rev Gastroenterol Hepatol 2012;9:97-104.

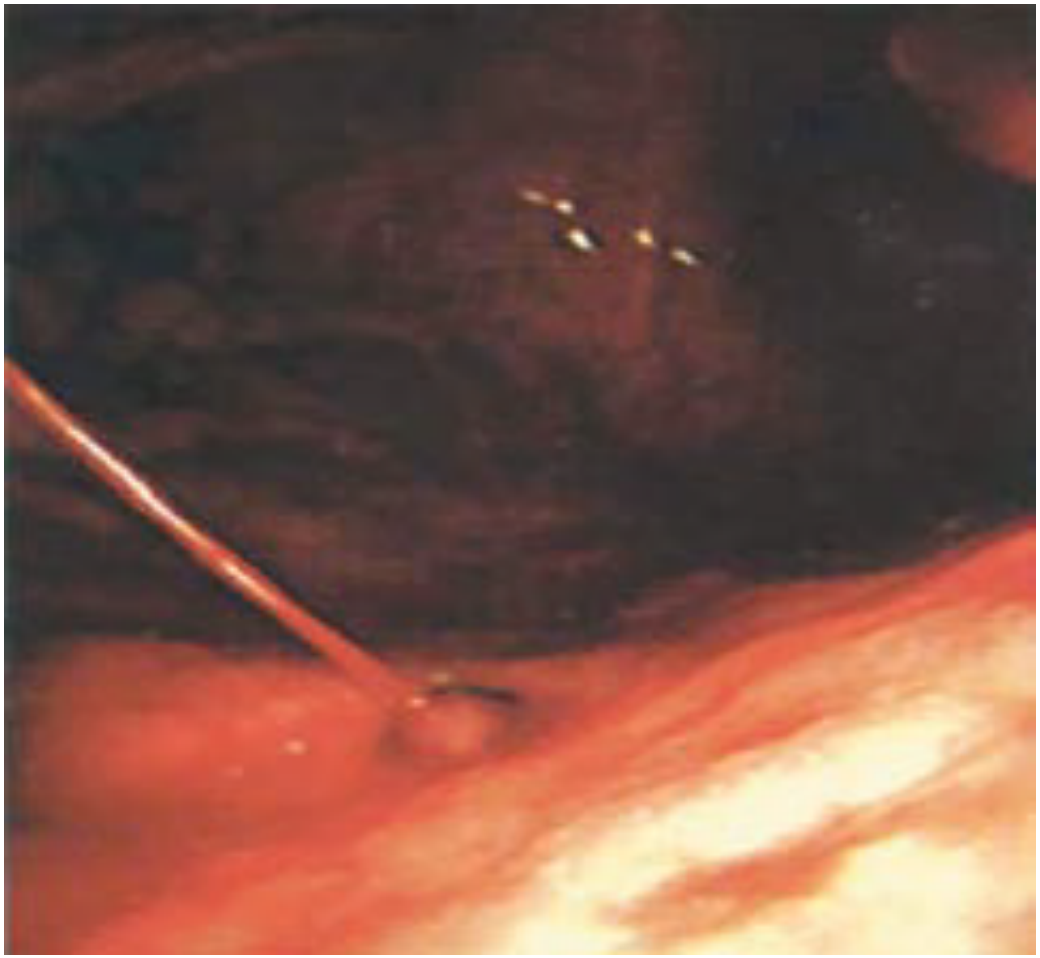
B Rockall Score

	Variable	Points	
Complete Rockall Score			
Clinical Rockall Score	Age		History
	<60 yr	0	
	60–79 yr	1	
	≥80 yr	2	
	Shock		Physical
	Heart rate >100 beats/min	1	
	Systolic blood pressure <100 mm Hg	2	
	Coexisting illness		History
	Ischemic heart disease, congestive heart failure, other major illness	2	
	Renal failure, hepatic failure, metastatic cancer	3	
	Endoscopic diagnosis		
	No lesion observed, Mallory–Weiss tear	0	
	Peptic ulcer, erosive disease, esophagitis	1	
	Cancer of upper GI tract	2	
	Endoscopic stigmata of recent hemorrhage		
	Clean base ulcer, flat pigmented spot	0	
	Blood in upper GI tract, active bleeding, visible vessel, clot	2	

Hearnshaw et al. Aliment Pharmacol Ther 2010;32:215-24.

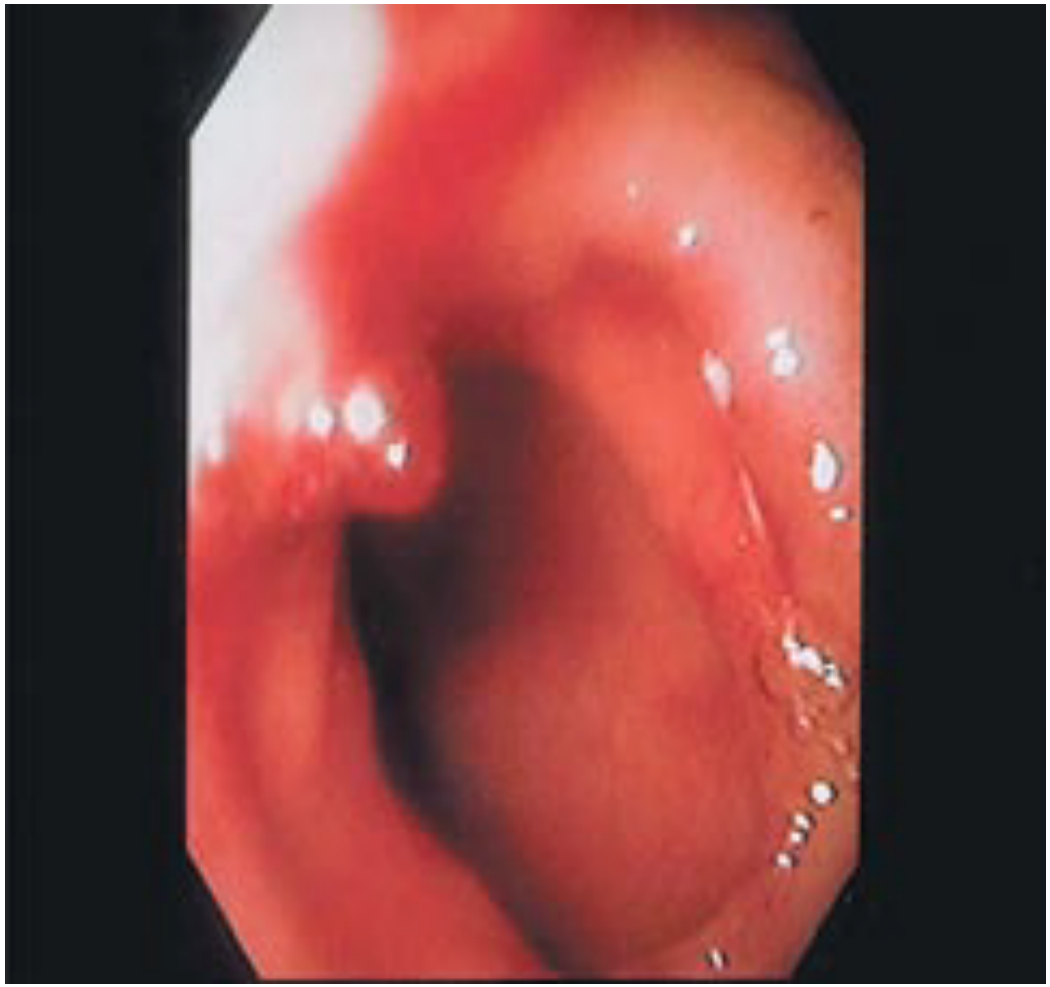
- What is the diagnosis and the associated risk factors?

Spurting Blood



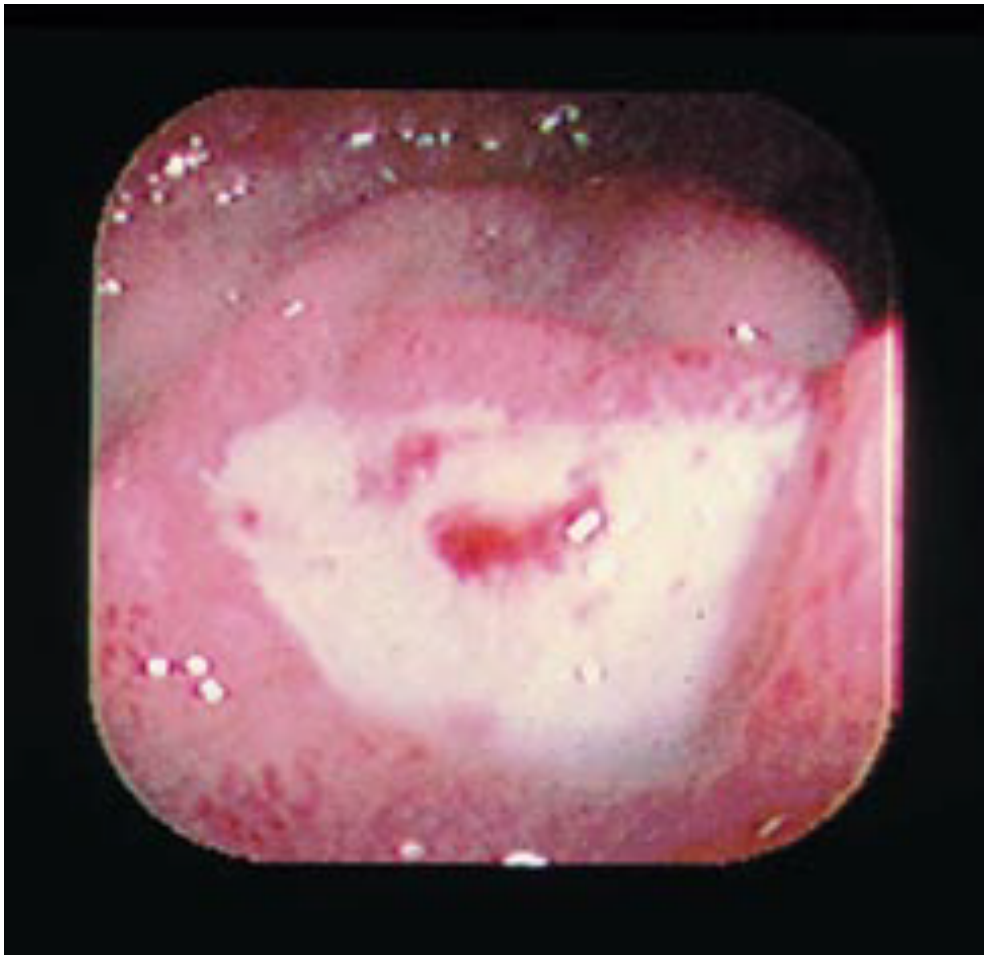
Gralnek et al. N Engl J Med 2008;359:928-37.

Non-bleeding Visible Vessel



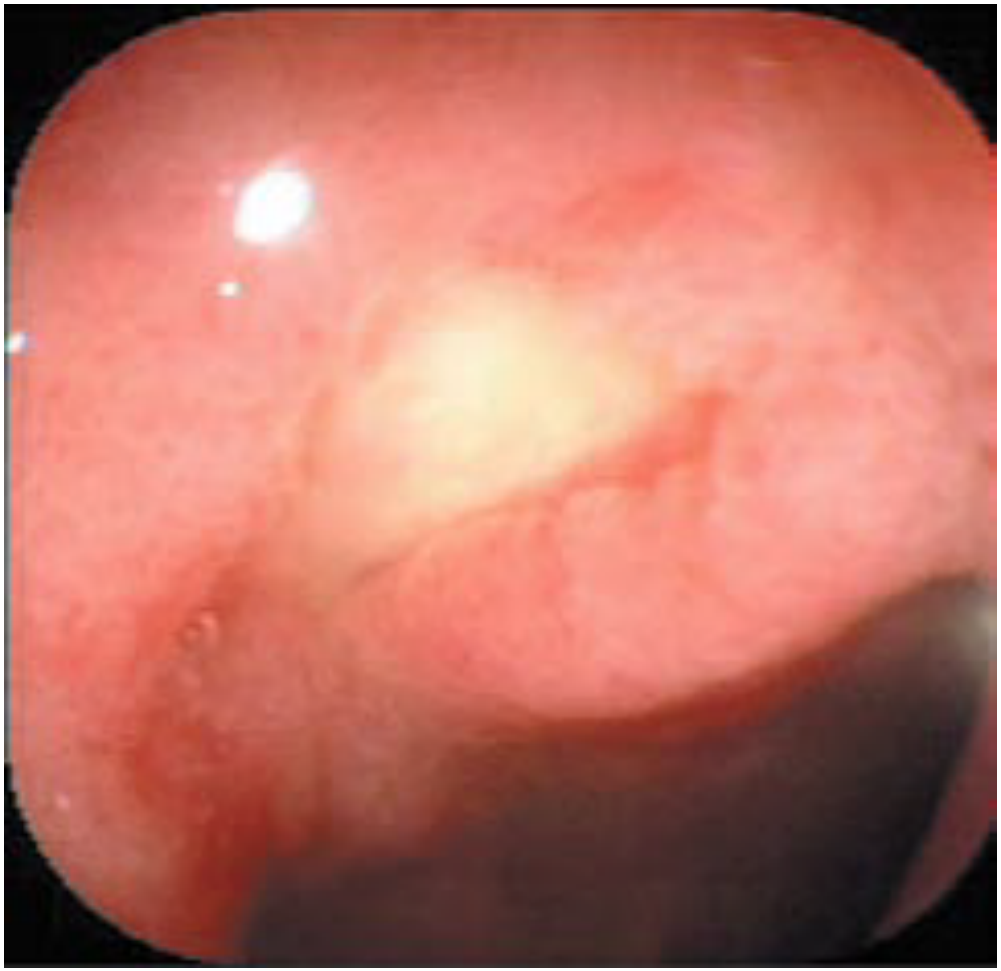
Gralnek et al. N Engl J Med 2008;359:928-37.

Flat, Pigmented Spot



Gralnek et al. N Engl J Med 2008;359:928-37.

Clean Base



Gralnek et al. N Engl J Med 2008;359:928-37.

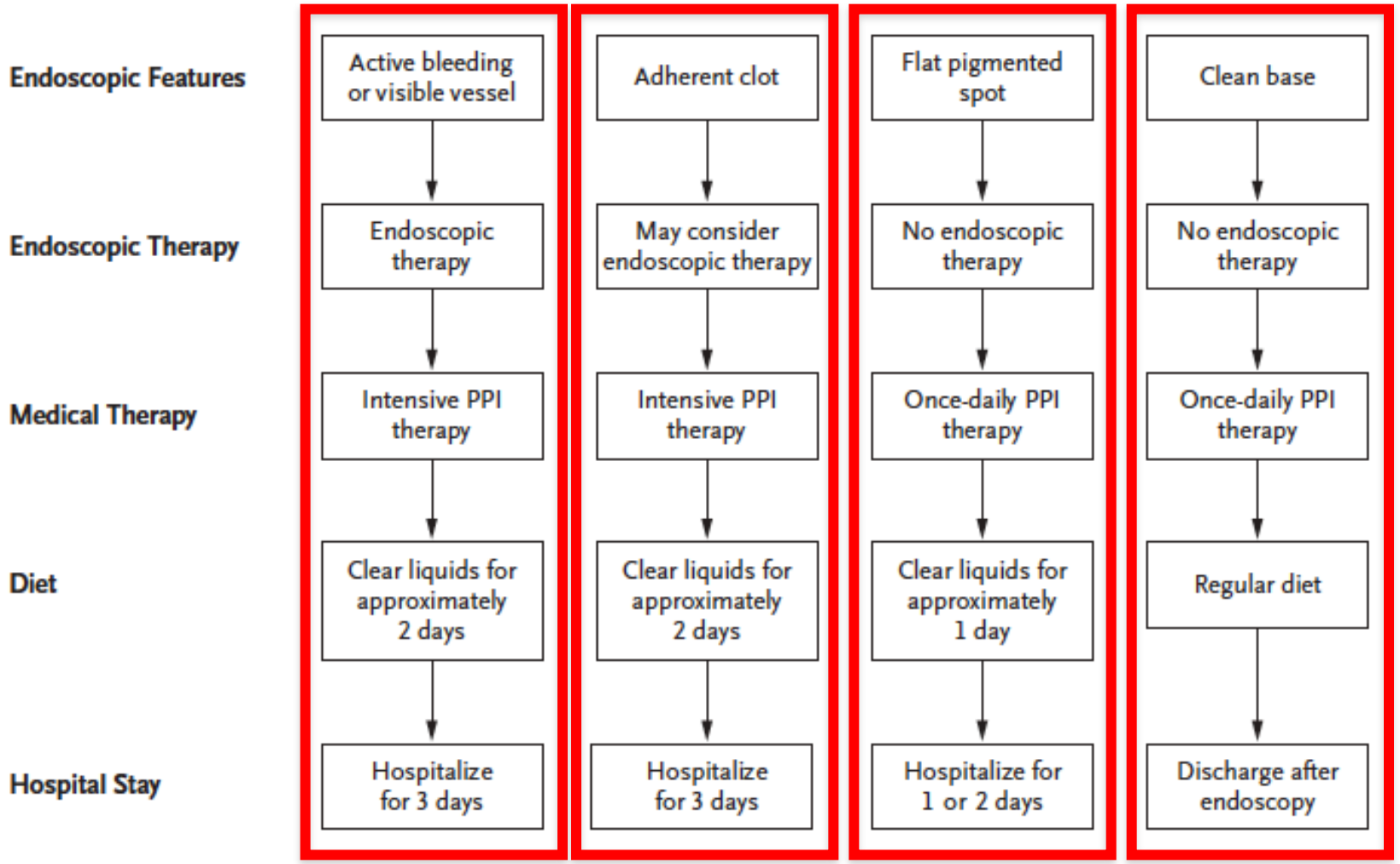


Figure 1. Initial Treatment of Patients with Ulcer Bleeding, According to the Endoscopic Features of the Ulcer.

Intensive proton-pump inhibitor (PPI) therapy is an intravenous bolus (80 mg) followed by an infusion (8 mg per hour) for 72 hours or an oral or intravenous bolus (e.g., 80 mg) followed by intermittent high-dose PPI therapy (e.g., 40 to 80 mg twice daily) for 3 days.[11] The diets shown are diets after endoscopy in patients who do not have nausea or vomiting. The duration of hospital stay after endoscopy is shown in patients who are in stable condition and do not have further bleeding or concurrent medical conditions requiring hospitalization.

NEJM 2016

Age >65
Previous peptic ulcer
Previous ulcer-related upper GI complication
High-dose NSAIDs
Multiple NSAID use
Selection of NSAID (e.g., COX-1 vs. COX-2 inhibition)
NSAID-related dyspepsia
Aspirin (including cardioprotective dosages)
Concomitant use of
NSAID plus low-dose aspirin
Oral bisphosphonates (e.g., alendronate)
Corticosteroids
Anticoagulant or coagulopathy
Antiplatelet drugs (e.g., clopidogrel)
Selective serotonin reuptake inhibitor
Chronic debilitating disorders (e.g., cardiovascular disease, rheumatoid arthritis)
Helicobacter pylori infection
Cigarette smoking
Alcohol consumption

[a]Combinations of risk factors are additive.

Data from references 1, 12–15, 20, and 29.

H pylori

- Patients with bleeding peptic ulcers should be tested for H. pylori
  - Receive eradication therapy if present
  - Confirmation of eradication

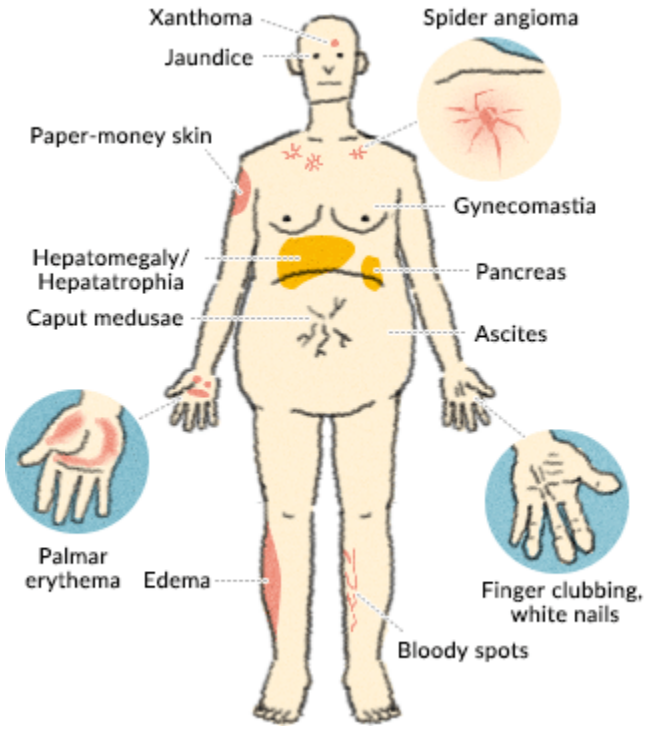
- Negative H. pylori diagnostic tests obtained in the acute setting should be repeated

Barkun et al. Ann Intern Med 2010;152:101-13.

Case 3

- A 52 years old lady presented to ER with one day history of vomiting of fresh blood. She also notices passing black tarry stool. She is feeling dizzy and unwell
- Past HX of jaundice no other medical problems and not on any medications
- Clinically jaundiced and pale
- Vital signs BP 100/70 pulse 110/min
- Abdomen examination showed liver span of 7 cm and spleen felt 3 fingers below costal margin with few spider nevi seen over chest

- what is the likely diagnosis of this case and list 4 common aetiology ?



Symptoms of liver cirrhosis

- General malaise, fatigue
- Anorexia / weight loss
- Feeling of enlarged abdomen
- Swollen abdomen / legs
- Nose bleed / bleeding from lower limbs
- Jaundice / itch
- Hand tremors

Physical findings

- Skin pigmentation
- Xanthoma
- Spider angioma
- Palmar erythema
- Finger clubbing (hepatopulmonary syndrome)
- Caput medusae
- Gynecomastia
- Fever
- Hepatoceleoma
- Hepatic halitosis (dimethyls -ulphide, ketons in the expired breath)
- Jaundice
- Ascites, lower thigh edema
- Hepatic encephalopathy
- Bleeding plaque / purpura

Akuko Wakuta etc., Hepatobiliary and pancreas, 73(6), 979-984, 2016 (Partially modified)

Causes of liver cirrhosis:

1) Viral Hepatitis B, C.
2) Alcoholic liver disease.
3) Non-alcoholic fatty liver disease (NAFLD).
4) Autoimmune hepatitis.
5) Primary biliary cirrhosis.
6) Secondary biliary cirrhosis (associated with chronic extrahepatic bile duct obstruction).
7) Primary sclerosing cholangitis.
8) Hemochromatosis
9) Wilson disease.
10) Alpha-1 antitrypsin deficiency.
11) Granulomatous disease (eg, sarcoidosis).
12) Type IV glycogen storage disease.
13) Drug-induced liver disease (eg, methotrexate, alpha methyldopa, amiodarone).
14) Venous outflow obstruction (eg, Budd-Chiari syndrome, veno-occlusive disease).
15) Cardiac cirrhosis: chronic right-sided heart failure, tricuspid regurgitation.

Management of Patients With Moderate/ Large Varices That Have Not Bled

Therapy	Dose	Therapy goals	Maintenance/follow-up evaluation
Propranolol[a]	20 mg orally twice a day Adjust every 2–3 days until treatment goal is achieved[a] Maximal daily dose should not exceed 320 mg	Maximum tolerated dose Aim for resting heart rate of 50–55 beats per minute	At every outpatient visit make sure that patient is appropriately β-blocked Continue indefinitely No need for follow-up EGD
Nadolol[a]	40 mg orally once a day Adjust every 2–3 days until treatment goal is achieved[a] Maximal daily dose should not exceed 160 mg	As for propranolol	As for propranolol
Carvedilol	Start with 6.25 mg once a day After 3 days increase to 12.5 mg Maximal dose should not exceed 12.5 mg/day (except in patients with arterial hypertension)	Systolic arterial blood pressure should not decrease <90 mm Hg	
EVL[b]	Every 2–4 weeks until the obliteration of varices	Obliteration varices Eradication of new varices after initial obliteration	First EGD performed 1–3 months after obliteration and every 6–12 months thereafter

NOTE. Only 1 of the 4 therapies shown in the table are recommended.

[a]Dose titration is feasible in 1–2 weeks in settings where a medical assistant is available to check the patient's heart rate. In the case of carvedilol, the dose is fixed at a maximum of 12.5 mg/day so no titration is necessary.

[b]EVL is unlikely to prevent other complications of portal hypertension.

Most Commonly Used Vasoactive Agents in the Management of Acute Hemorrhage

Drug	Standard dosing	Duration	Mechanism of action
Somatostatin	Initial IV bolus 250 mcg (can be repeated in the first hour if ongoing bleeding) Continuous IV infusion of 250–500 mcg/h	Up to 5 days	nhibits vasodilator hormones similar to glucagon, causing splanchnic vasoconstriction and reduces portal blood flow Facilitates adrenergic vasoconstriction
Octreotide (somatostatin analogue)	Initial IV bolus of 50 mcg (can be repeated in first hour if ongoing bleeding) Continuous IV infusion of 50 mcg/h	Up to 5 days	Same as somatostatin, longer duration of action
Terlipressin (vasopressin analogue)	Initial 48 hours: 2 mg IV every 4 hours until control of bleeding Maintenance: 1 mg IV every 4 hours to prevent re-bleeding	Up to 5 days	Splanchnic vasoconstriction The active metabolite lysine-vasopressin is released gradually over several hours in tissue, thus decreasing typical systemic vasopressin side effects

Pharmacologic therapy in the management of acute esophageal variceal hemorrhage

Regimen	Dose	Duration	Follow-up
Vasoconstrictor			
Octreotide	Intravenous 50-μg bolus, followed by infusion of 50 μg/h	2–5 d	Bolus can be repeated in first hour if variceal hemorrhage uncontrolled; if rebleeding occurs during therapy, consider TIPS
Terlipressin	2 mg given intravenously every 4 h for first 48 h, followed by 1 mg given intravenously every 4 h	2–5 d	If rebleeding occurs during therapy, consider TIPS
Somatostatin	Intravenous 250-μg bolus, followed by infusion of 250–500 μg/h	2–5 d	Bolus can be repeated in first hour if variceal hemorrhage uncontrolled; if rebleeding occurs during therapy, consider TIPS
Antibiotic			
Ceftriaxone	Intravenous ceftriaxone at a dose of 1 g once a day	5–7 d or until discharge	No long-term antibiotics unless spontaneous bacterial peritonitis develops
Norfloxacin	400 mg given orally twice a day	5–7 d or until discharge	No long-term antibiotics unless spontaneous bacterial peritonitis develops

Bhutta AQ, et al. Gastrointestinal endoscopy clinics of North America 2015;25:479-90.

- What is the priority in the management of this patient?

IV Fluid Resuscitation

- What is the target Hb and INR prior to the endoscopy for this cases?

3- Blood Transfusions

- The role of transfusion in clinically stable patients with mild GI bleeding remains controversial, with uncertainty at which hemoglobin level transfusion should be initiated

- Literature suggesting poor outcomes in patients managed with a liberal transfusion

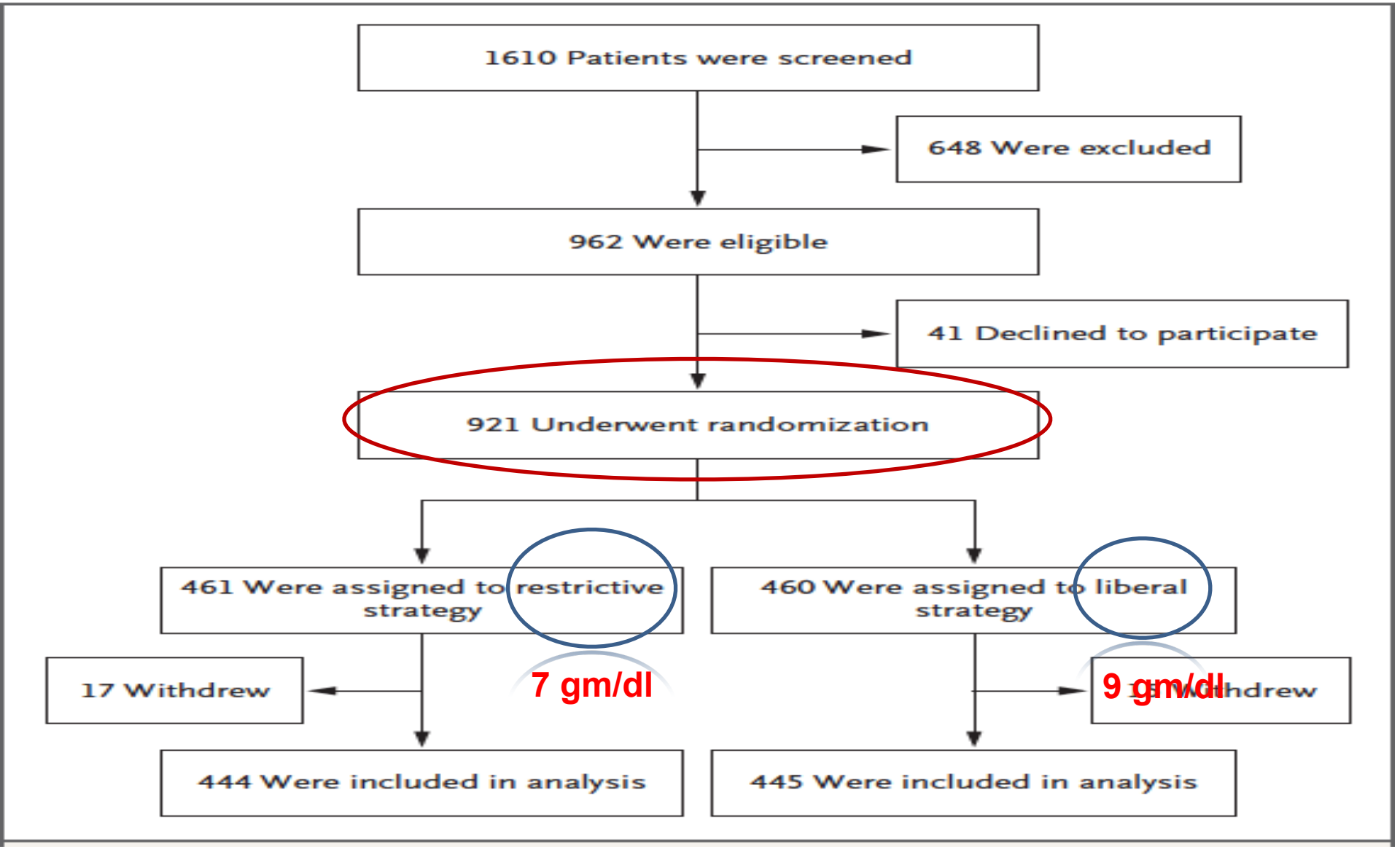
Marik PE, Corwin HL. Crit Care Med 2008; 36: 2667 – 2674
Restellini S, Kherad O, Jairath V et al. Aliment Pharmacol Ther 2013; 37: 316 – 322

3- Blood Transfusions (cont'd)

- The restrictive RBC transfusion had significantly improved survival and reduced rebleeding

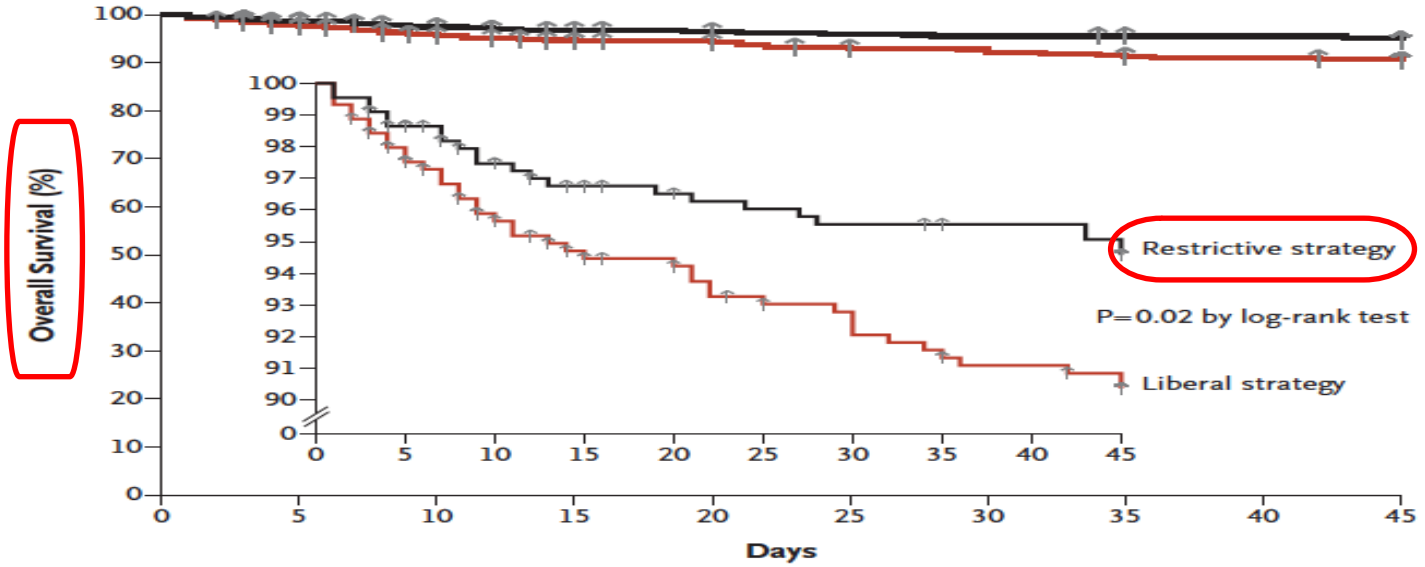
Villanueva C, Colomo A, Bosch A et al. N Engl J Med 2013; 368: 11 – 21

3- Blood Transfusions (Cont'd)



3- Blood Transfusions (Cont'd)

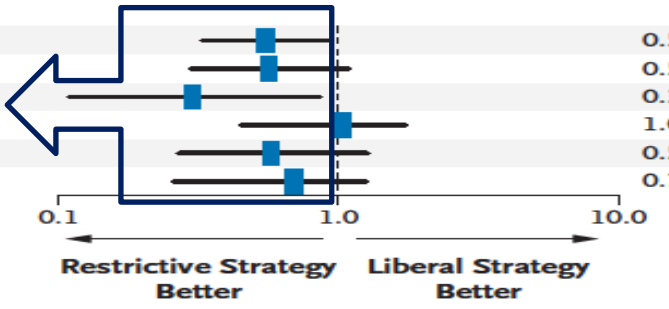
A Survival, According to Transfusion Strategy



No. at Risk										
Restrictive strategy	444	429	412	404	401	399	397	395	394	392
Liberal strategy	445	428	407	397	393	386	383	378	375	372

B Death by 6 Weeks, According to Subgroup

Subgroup	Restrictive Strategy	Liberal Strategy	Hazard Ratio (95% CI)	P Value
	no. of patients/total no. (%)			
Overall	23/444 (5)	41/445 (9)	0.55 (0.33–0.92)	0.02
Patients with cirrhosis	15/139 (11)	25/138 (18)	0.57 (0.30–1.08)	0.08
Child–Pugh class A or B	5/113 (4)	13/109 (12)	0.30 (0.11–0.85)	0.02
Child–Pugh class C	10/26 (38)	12/29 (41)	1.04 (0.45–2.37)	0.91
Bleeding from varices	10/93 (11)	17/97 (18)	0.58 (0.27–1.27)	0.18
Bleeding from peptic ulcer	7/228 (3)	11/209 (5)	0.70 (0.26–1.25)	0.26



Patients receiving anticoagulants

Correction of coagulopathy is recommended

Endoscopy should not be delayed for a high INR unless the INR is supratherapeutic

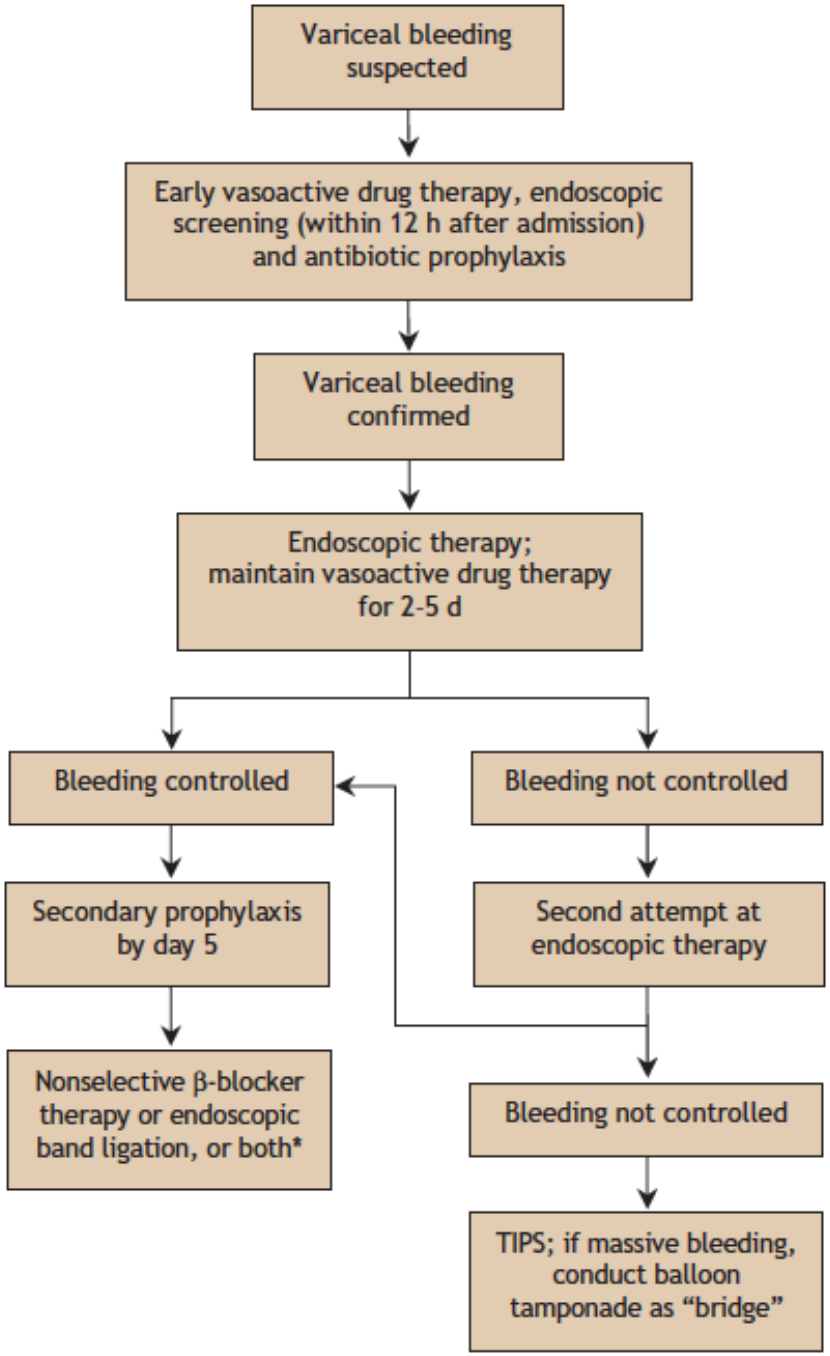
Barkun et al. Ann Intern Med 2010;152:101-13.

Timing and need for early endoscopy

- Definition of early endoscopy
  - Ranges from 6 to 24 hours AFTER INITIAL PRESENTATION

- May need to be delayed or deferred:
  - Active acute coronary syndromes
  - Suspected perforation

Barkun et al. Ann Intern Med 2010;152:101-13.


Variceal bleeding suspected
Early vasoactive drug therapy, endoscopic screening (within 12 h after admission) and antibiotic prophylaxis
Variceal bleeding confirmed
Endoscopic therapy; maintain vasoactive drug therapy for 2-5 d
Bleeding controlled
Bleeding not controlled
Secondary prophylaxis by day 5
Second attempt at endoscopic therapy
Nonselective β-blocker therapy or endoscopic band ligation, or both*
Bleeding not controlled
TIPS; if massive bleeding, conduct balloon tamponade as "bridge"

CMAJ, 2006

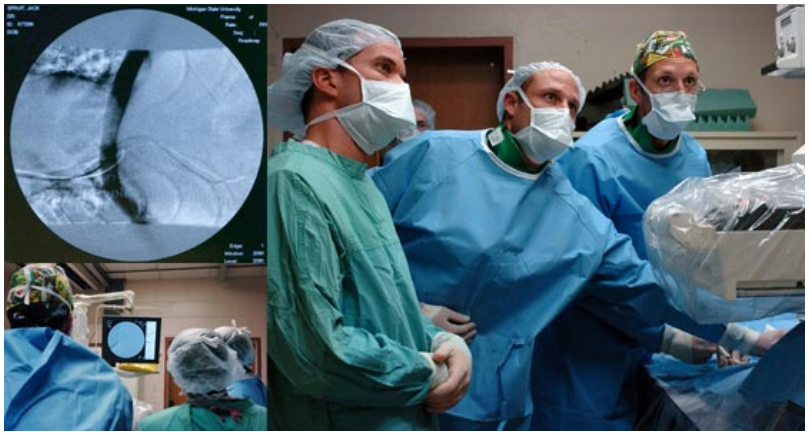
Case 4

- A 47 years old male known to have alcoholic liver disease presented with hematemesis of large amount and dizziness after resuscitation an upper GI endoscopy done which showed multiple large oesophageal varix which was banded , however 12 hrs post endoscopy he continued to have melena with drop of Hb and hypotension

- What is the next step in the patient management?

Gastroenterology

Interventional Rad.

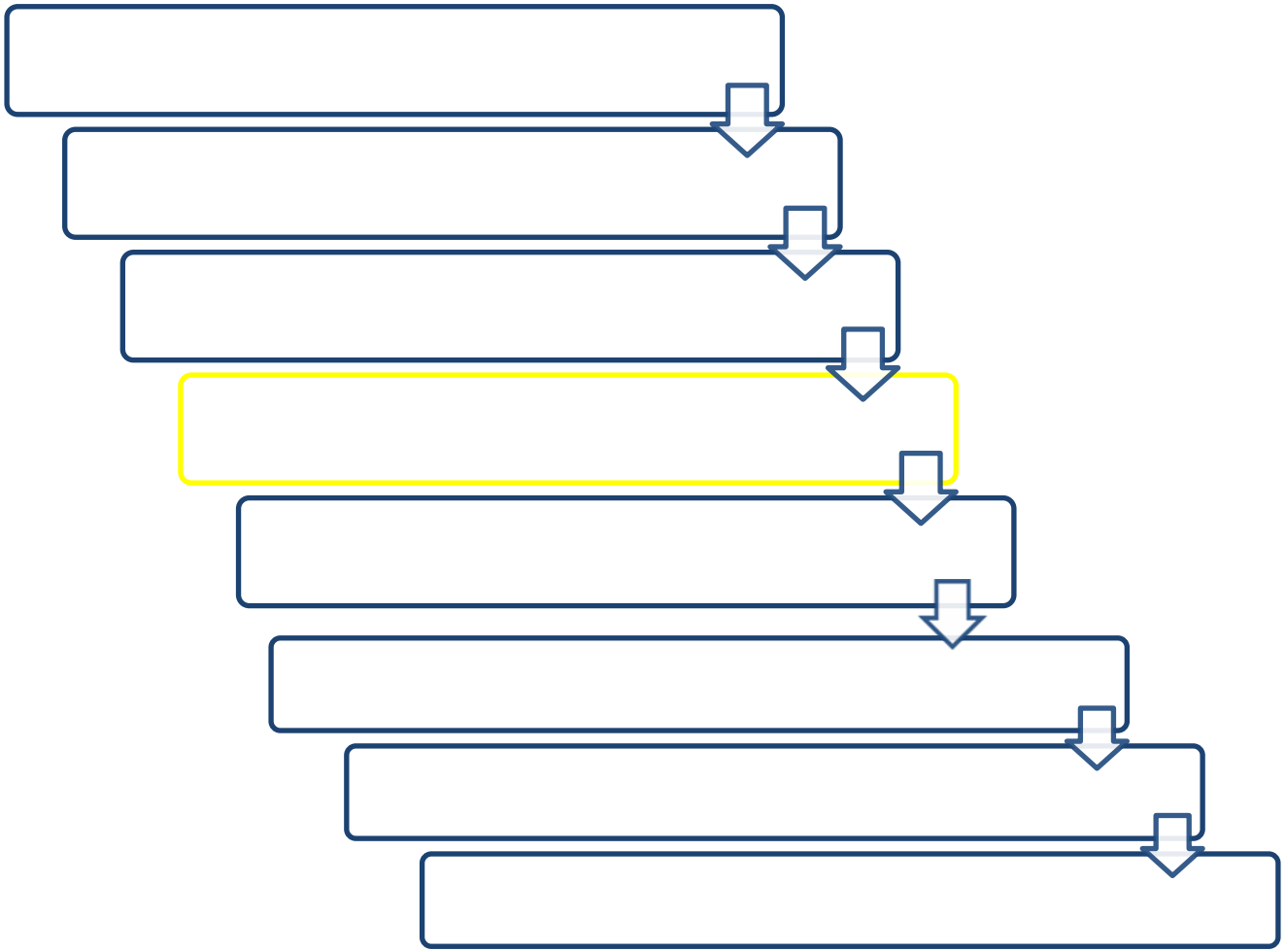


YOU ARE NOT ALONE

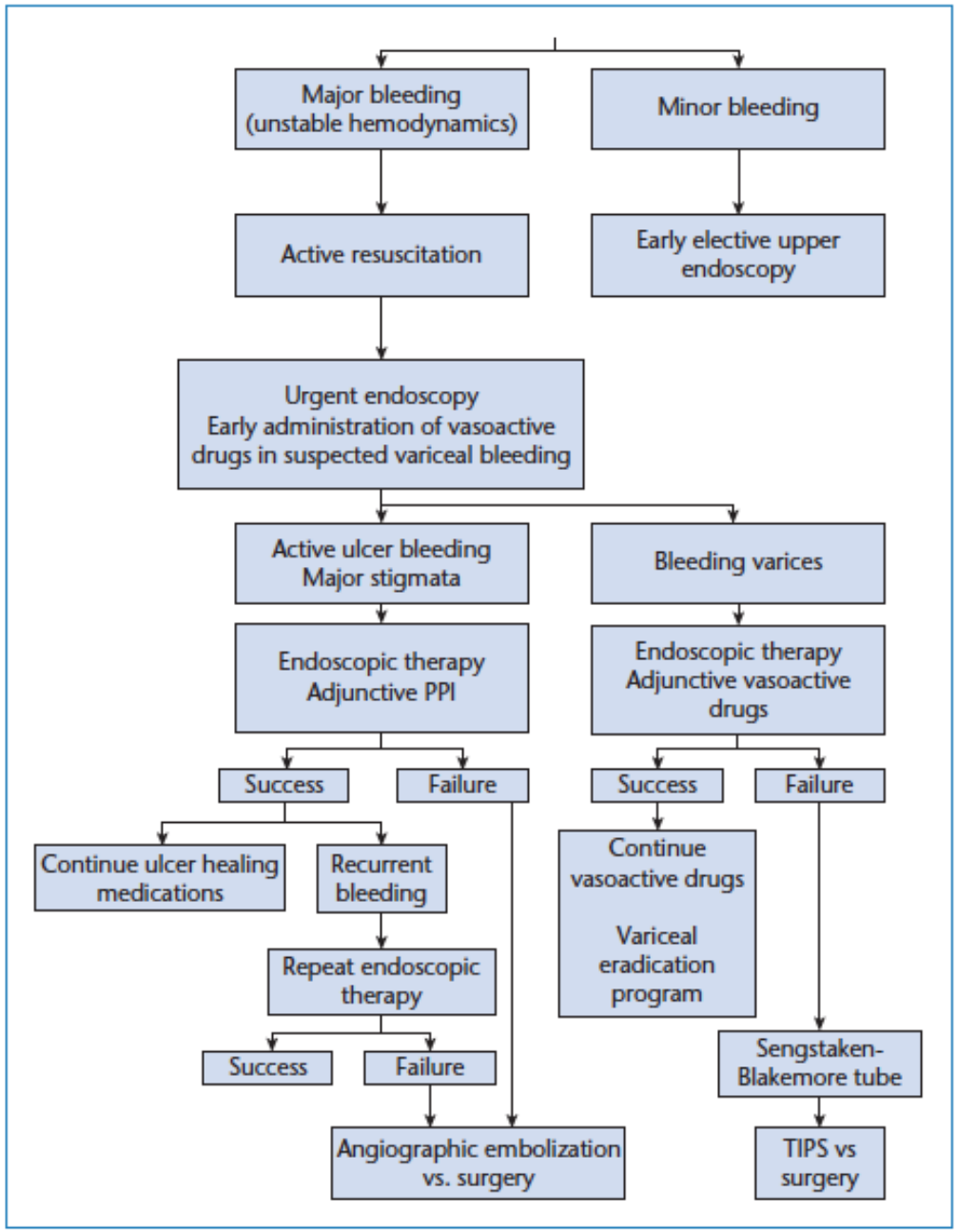
Intensive Care

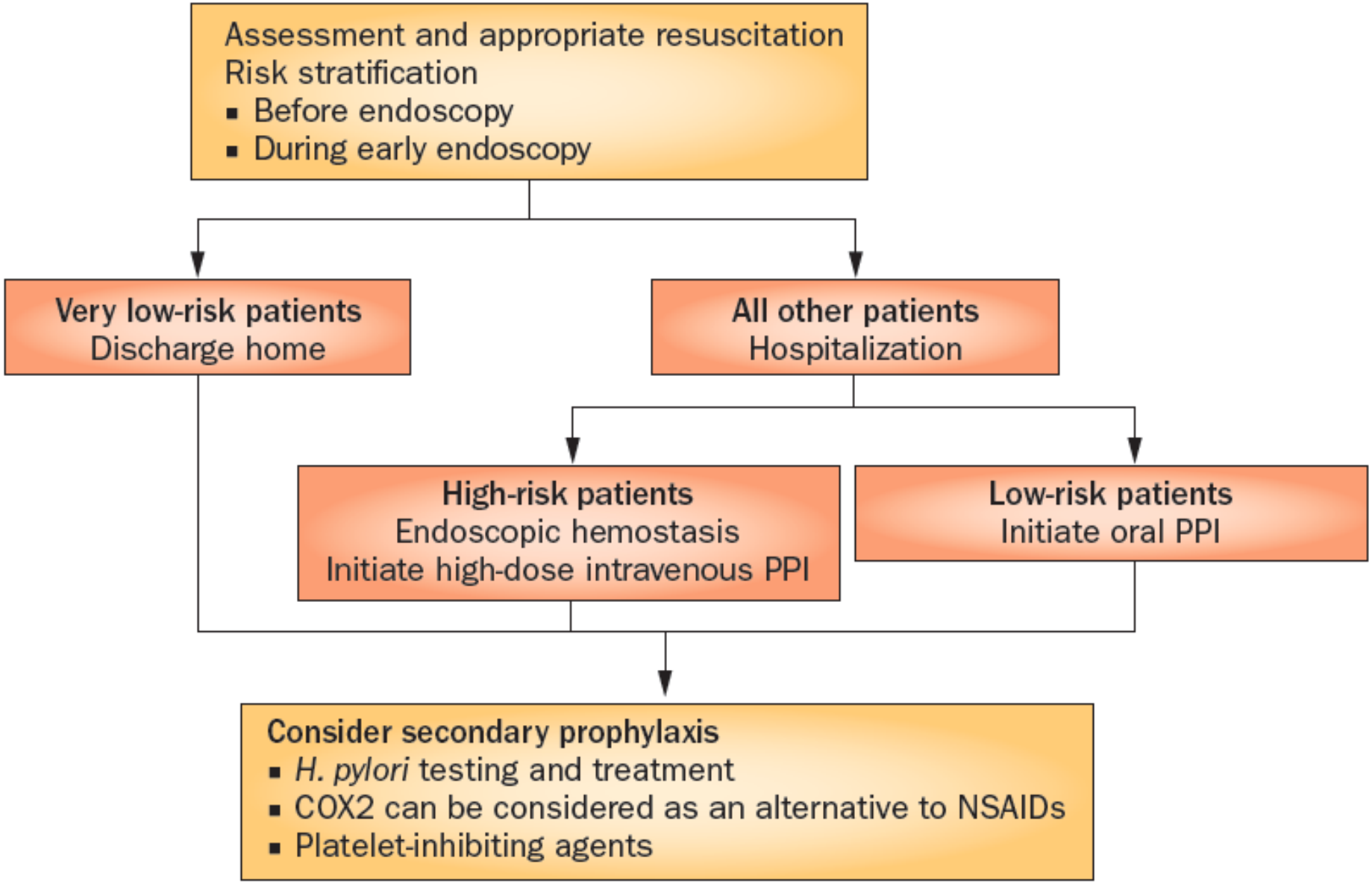
Surgery

Summary for steps of GI bledding approach



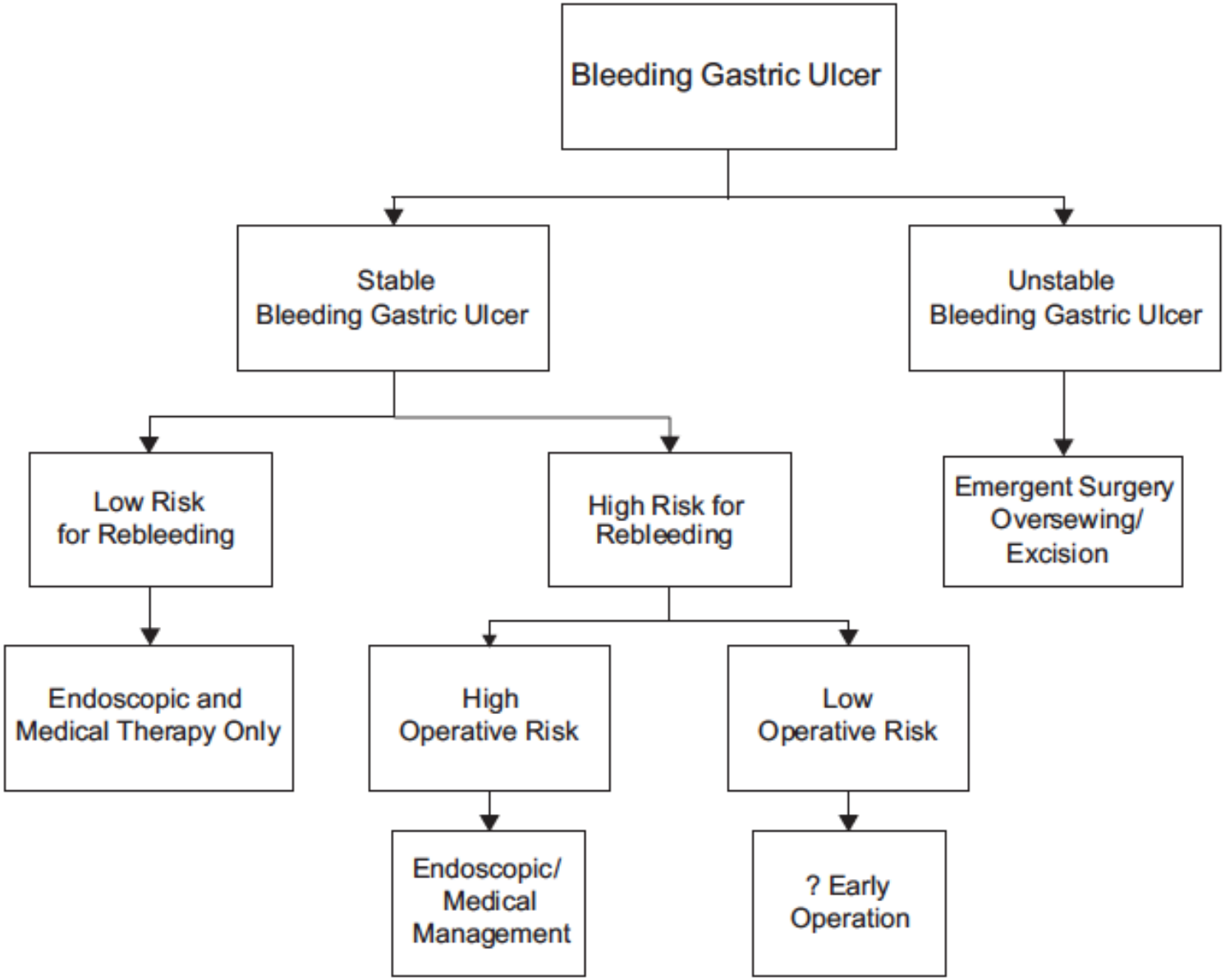
Algorithm for management of acute GI bleeding





Bardou et al. Nat Rev Gastroenterol Hepatol 2012;9:97-104.

When to go to surgery?



Conclusions

- Resuscitation should be initiated prior to any diagnostic procedure
- Gastrointestinal endoscopy allows visualization of the stigmata, accurate assessment of the level of risk and treatment of the underlying lesion
- Intravenous PPI therapy after endoscopy is crucial to decrease the risk of cardiovascular complications and to prevent recurrence of bleeding
- *Helicobacter pylori testing should be performed in the acute setting*

Bardou et al. Nat Rev Gastroenterol Hepatol 2012;9:97-104.