BAD BLOOD: MANAGEMENT OF ACUTE GI HEMORRHAGE

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LEARNING OBJECTIVES

- Order & correctly interpret appropriate laboratory and diagnostic tests for a patient admitted with acute GI bleeding, with a focus on those that will indicate disease severity and differentiate between common etiologies of upper and lower GI bleeds.
- Perform appropriate stabilization and treatment of acute GI blood loss, including rapid hemodynamic resuscitation and an evidence-based approach to transfusion therapy
- List the indications for early specialty consultation, including gastroenterology, interventional radiology, and surgery.
- Explain the indications for and risks/benefits of medical/pharmacologic, endoscopic, and surgical treatment modalities for GI bleeds
- Identify goals and criteria for hospital discharge, including measures of clinical stability

ACUTE GI BLEEDING

- Common reason for hospitalization

- Upper GI Bleed
  - Reported mortality of 2-10%[1]
  - Esophagus, stomach, duodenum (above Ligament of Treitz)
  - Variceal vs. Non-variceal

- Lower GI Bleed
  - Approx 20% of all GI bleeding cases [2]
  - Historically: below Ligament of Treitz
  - Now: colon or rectum (small intestinal/middle GI bleeding = distinct)

[1] Stanley & Laine. BMJ 2019.
[2] Strate & Gralneck. Am J Gastroenterol 2016.

CASE 1

- 75 y/o woman presents to the ED with several episodes of coffee ground emesis. Initial evaluation reveals a BP of 100/60 with orthostatic changes and melanic stools on DRE. Hemoglobin is 9.2. She is bloused 1L saline and admitted to you.

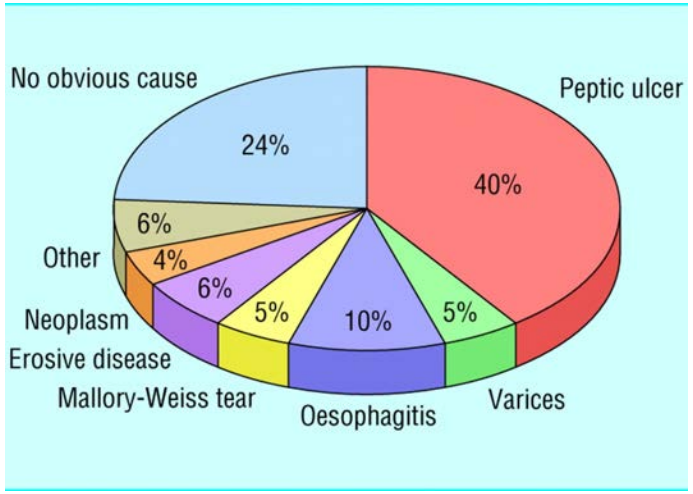
- What are important components of your history and exam that will guide your diagnostic and management plan? What labs do you want?

- Hx elements:
  - Coffee ground emesis vs. hematemesis. Melena/hematochezia?
  - # episodes (ongoing or resolved?)
  - Weight loss, Age, Prior bleeds?
- PMH/Meds:
  - Comorbidities
  - NSAIDS, ASA, anticoagulants
- SocHx: EtOH or Tobacco use
- Exam: Repeat vitals. Mentation? Stigmata of chronic liver disease?
- Labs: CBC, PT/PTT, CMP, +/-Trop

UGIB: ETIOLOGIES & KEY ELEMENTS

Upper GI Bleed (n = 180)		
Etiology	Frequency	Percent of Total (%)
Erosive disease	86	48
Peptic ulcer	51	28
Not identified	26	14
Mallory Weiss	17	9
Varices	8	4
AVMs	5	3
Mass/cancer	5	3

Whelan et al. JHM 2010.



Dallal et al. BMJ 2001.

Hx elements:
- Most likely etiology
- Rapidity/severity of bleed

PMH / Meds / SocHx:
- Risk factors → likely etiology
- Comorbidities → risk assessment
- Management (med reversal?)

Exam:
- Stable/unstable
- Severity of bleed; urgency of intervention
- Likely etiology
- Risk assessment

Labs: CBC, PT/PTT, CMP, +/-Trop
- Risk assessment

RISK ASSESSMENT IN UGIB

- Glasgow-Blatchford Score
  - Best predictor: clinical intervention need
  - Score ≤ 1 : "low risk" & candidate for outpatient management
- Pre-endoscopy ("admission") Rockall Score
  - Predicts mortality/severity of bleeding (prior to endoscopy)
  - Can help stratify need for ICU/emergent scope
- "Complete" Rockall Score (post-endoscopy)
  - Best predictor of mortality
- AIMS65 Score
  - Risk of in-hospital mortality from UGIB

Glasgow-Blatchford score	
Factor	Score
Blood urea (mmol/L)	
≥ 6.5 < 8.0	2
≥ 8.0 < 10.0	3
≥ 10.0 ≤ 25.0	4
≥ 25	6
Hemoglobin(g/dl) for men	
≥ 12.0 < 13.0	1
≥ 10.0 < 12.0	3
< 10.0	6
Hemoglobin(g/dl) for women	
≥ 10.0 < 12.0	1
< 10.0	6
Systolic blood pressure (mm Hg)	
100–109	1
90–99	2
< 90	3
Pulse ≥ 100 (per min)	1
Presentation with melena	1
Presentation with syncope	2
Hepatic disease	2
Cardiac failure	2
Maximum score	23

Ur-Rahman l et al. Digestive Diseases & Science 2018.

PROGNOSTIC FACTORS IN UGIB (at admission)

- Age >60
- Comorbidities:
  - Hepatic, renal, and/or pulmonary disease
  - CHF
  - Cancer
- Ongoing bleeding
- Transfusion requirements >6 units PRBCs
- Shock
- Low systolic BP
- Elevated PT
- Encephalopathy

Scoring Tool	Component Elements	
Glasgow-Blatchford Score	Hgb (M vs. F cutoffs) BUN Systolic BP (initial) HR ≥ 100	Melena Syncope Liver disease hx Cardiac failure hx
Pre-endo Rockall Score	Age Shock Comorbidities	
AIMS65	Albumin < 3 INR > 1.5 Alteration in Mental Status SBP ≤ 90 Age ≥ 65	

CASE 1 (cont'd)

- 75 y/o woman with h/o HTN on beta blocker and CAD on ASA presents to the ED with several episodes of coffee ground emesis. No syncope.
  - Risk factors for UGIB include NSAID & EtOH use.
  - Melena on DRE. Initial BP of 100/60 with orthostatic changes in the ED; bloused 1L NS. Initial Hemoglobin is 9.2. Hct 27.6. Plts & WBC normal
- Your evaluation:
  - BP 105/65, HR 80 (beta blocked), normal mentation, no stigmata of liver disease.
  - Remainder of labs: BUN 60, Cr 1.0, INR 1.2, PT 13.4, Albumin 3.3
- Risk assessment …

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  - BP 105/65, HR 80 (beta blocked), normal mentation, no stigmata of liver disease.
  - Remainder of labs: BUN 60, Cr 1.0, INR 1.2, PT 13.4, Albumin 3.3
- **Risk assessment**:
  - Glasgow-Blatchford Score: 12 points (likely to require medical intervention)
  - Pre-endoscopy Rockall Score: 3 points (11% mortality prior to endoscopy)
  - AIMS65 Score: 0 points (0.3% in-hospital mortality)

MANAGEMENT OF ACUTE UGIB

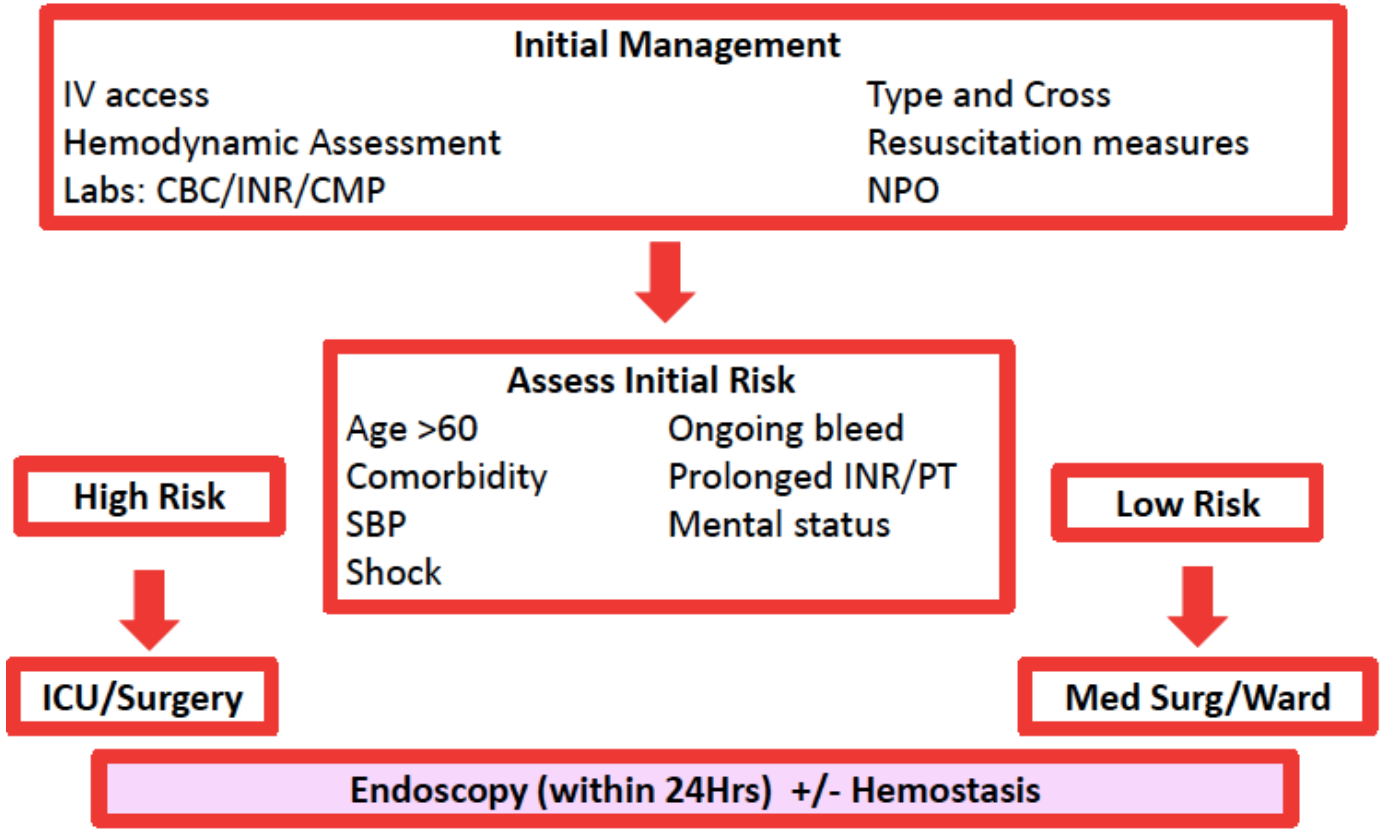

Image credit: Magdalena Espinoza, MD

Guiding Principles

- Restore/maintain hemodynamic stability
- Blood products
- Pre-Endoscopic medical therapy
- Endoscopy within 24 hours
- Post-Endoscopic medical therapy

- NG lavage? Not needed

RESTORE/MAINTAIN HEMODYNAMIC STABILITY

- Hemodynamic assessment & resuscitation as needed
  - Frequent vitals
  - 2 large bore IV's

- Hypotension is associated with increased mortality
  - SBP < 90 mmHg had mortality odds ratio of 9.8 (95% CI 5.1 - 19) vs. SBP > 90 mmHg

- No mortality difference between crystalloid & colloid for fluid resuscitation

Stanley & Laine. BMJ 2019

BLOOD PRODUCTS – PRBC's

- Hgb threshold for PRBC transfusion: **7-8** (Restrictive Transfusion Approach)
  - Higher threshold if severe bleeding or hypotension
- Safe
  - No change in mortality compared with Hgb threshold of 9
- Clinical benefit:
  - Reduced re-bleeding
  - Improved mortality

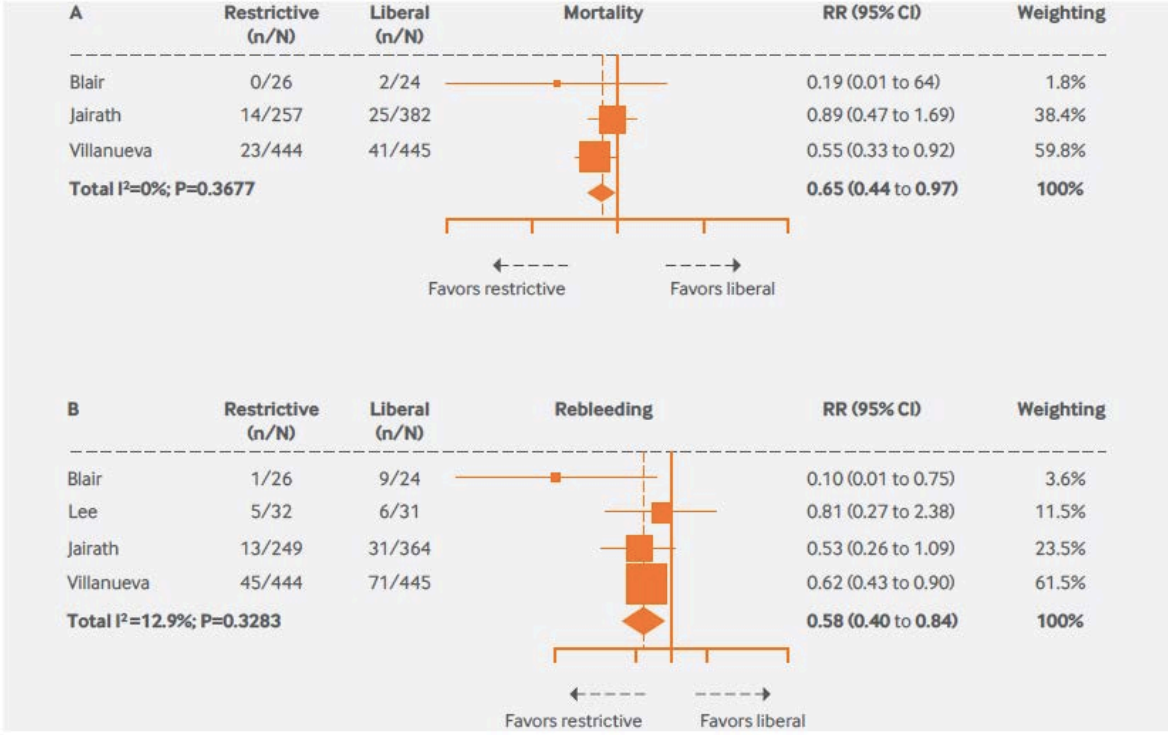

Fig 1 | Blood transfusion meta-analysis: liberal versus restrictive transfusion for (A) mortality and (B) rebleeding.[27] Reproduced with permission from Elsevier. Abbreviations: CI=confidence interval; RR=relative risk.

Stanley & Laine. BMJ 2019

PRE-ENDOSCOPIC MEDICAL THERAPY: NON-VARICEAL UGIB

- Proton Pump Inhibitors
  - Best evidence
- Histamine 2 Receptor Antagonists
  - Minimal benefit, not recommended
- Prokinetic therapy (Erythromycin)
- Somatostatin or its analogue Octreotide
  - If cirrhotic → role in variceal bleeding via splanchnic vasoconstriction
- Correction of coagulopathy/anti-platelet agents/thrombocytopenia?

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  - **Best evidence**

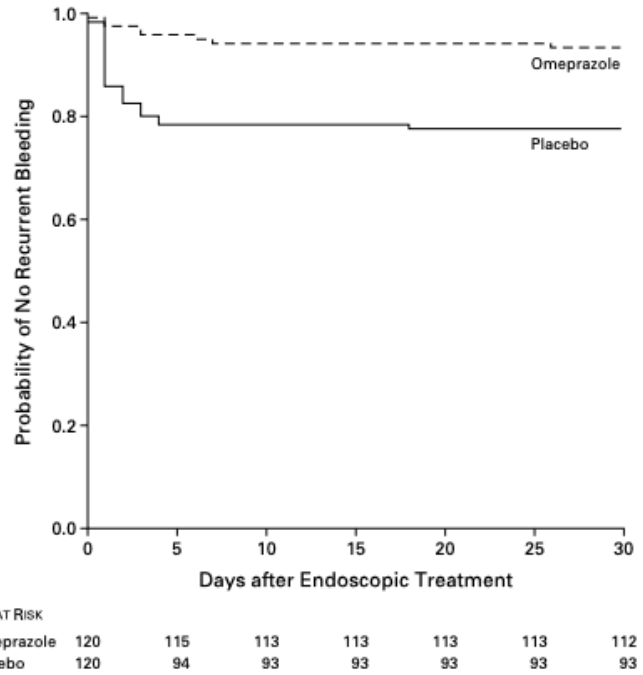

Figure 1. Kaplan–Meier Estimates of the Likelihood That Bleeding Would Not Recur within 30 Days after Endoscopic Treatment.

Table 2. Outcomes after Endoscopic Therapy.

Outcome	Omeprazole Group (N=120)	Placebo Group (N=120)	Relative Risk (95% CI)*	P Value
Recurrent bleeding — no. of patients				
By day 3	5	24	4.80 (1.89–12.2)	<0.001
By day 7	7	26	3.71 (1.68–8.23)	<0.001
By day 30	8†	27†	3.38 (1.60–7.13)	<0.001
Recurrent bleeding within 30 days — no. of patients/total no.				
Actively bleeding ulcers	3/64	10/58	4.24 (1.10–16.3)	0.04
Ulcers with nonbleeding visible vessels	5/56	17/62	3.85 (1.31–11.3)	0.02
Endoscopic retreatment successful — no. of patients	6	23	3.83 (1.62–9.08)	<0.001
Surgery — no. of patients	3	9	3.00 (0.83–10.8)	0.14
Median hospital stay <5 days — no. of patients (%)	56 (46.7)	38 (31.7)		0.02
Duration of hospitalization — days				
Patients admitted for bleeding peptic ulcers				
Median	4	5		0.006
Range	3–65	3–64		
Patients in whom bleeding developed in the hospital				
Median	13	9		0.33
Range	3–40	4–46		
Units of blood transfused‡	2.7±2.5	3.5±3.8		0.04
Before endoscopic therapy	1.0±1.3	1.1±1.5		0.46
After endoscopic therapy	1.7±1.9	2.4±3.2		0.03
Death within 30 days — no. of patients	5	12	2.40 (0.87–6.60)	0.13
Ulcer healing at 8 wk — no. of patients/total no. assessed endoscopically	72/85	77/83	1.10 (0.98–1.22)	0.14

*Values indicate the relative risk of an outcome in the placebo group as compared with the omeprazole group. CI denotes confidence interval.

†This number is the total number of patients in the group who had recurrent bleeding within 30 days after treatment.

‡Plus–minus values are means ±SD.

Lau et al. NEJM 2000.

PRE-ENDOSCOPIC MEDICAL THERAPY: NON-VARICEAL UGIB

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- Somatostatin or its analogue Octreotide
  - If cirrhotic
- Correction of coagulopathy/anti-platelet

- Theory:
  - Improve visualization during endoscopy
- Clinical application:
  - Does this translate to more diagnoses made during endoscopy or better clinical outcomes?
- ACG Guideline:
  - *IV Erythromycin (250mg ~30min before endoscopy) should be considered to improve diagnostic yield and decrease the need for repeat endoscopy. However, has not been shown to improve clinical outcomes.*

PRE-ENDOSCOPIC MEDICAL THERAPY: NON-VARICEAL UGIB

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- Prokinetic therapy (Erythromycin)
- Somatostatin or its analogue Octreotide
  - If cirrhotic → role in variceal bleeding

- Pt on **antiplatelet agent**
  - Platelet transfusion <u>not</u> indicated unless life-threatening bleed
- Pt on **Warfarin**
  - Goal INR <2.5 prior to endoscopy (if possible) in case endoscopic therapy needed
  - INR does not predict rebleeding
- Pt on **DOAC**
  - Time most important
  - Reversal agent or PCC if severe ongoing bleed, ingestion, renal disease

- **Correction of coagulopathy/anti-platelet agents in patients <u>without</u> cirrhosis?**

MANAGEMENT OF ACUTE UGIB

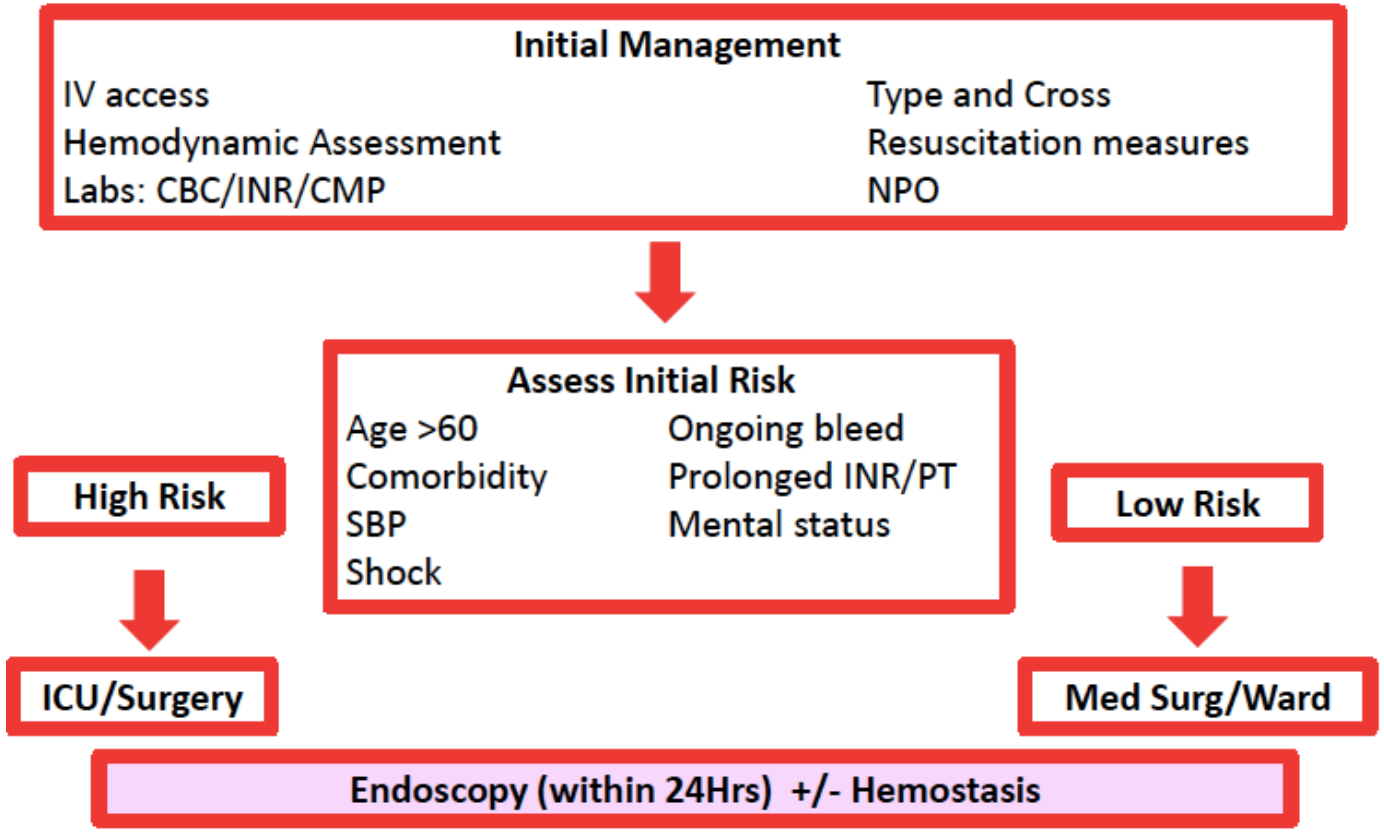

Image credit: Magdalena Espinoza, MD

Guiding Principles

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CASE 1 (cont'd)

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- 75 y/o woman with coffee ground emesis. No syncope. +Melena on DRE.
  - h/o HTN on beta blocker and CAD on ASA. Risk factors for UGIB include NSAID & EtOH use.
  - BP 100/60 with orthostatic changes; bloused 1L NS → 105/65. Initial Hemoglobin is 9.2.

- <u>Orders</u>:
  - Q4hr vitals, 2 large bore IV's
    - → bolus crystalloid to maintain SBP >90
  - Serial CBCs; Type & Cross
    - → PRBC transfusion if Hgb <8 (would be <7 if did not have CAD hx)
    - → Hold ASA but do <u>not</u> need to give Platelets
  - IV PPI
    - → 80mg bolus followed by 8mg/hr infusion
  - NPO
  - GI consultation
  - Consider IV Erythromycin ~ 30 min prior to endoscopy (d/w GI)
  - **EGD** performed → non-bleeding clean based ulcer visualized in the gastric antrum

ENDOSCOPY IN NON-VARICEAL UGIB

- Timing
  - Within 24 hours of admission, after hemodynamic resuscitation & optimization of other medical problems
  - High risk features (tachycardia, hypotension, bloody emesis or NG aspirate while in hospital) → consider within 12 hours (may improve outcomes)

- Endoscopic Diagnosis & Findings (Stigmata)

ENDOSCOPY IN NON-VARICEAL UGIB

- Timing: within 24 hours (if high risk features, ideally within 12 hours)
- Endoscopic Diagnosis & Findings (Stigmata)
- Forrest Classification (PUD):

Image credit: Forrest et al. Lancet. 1974.

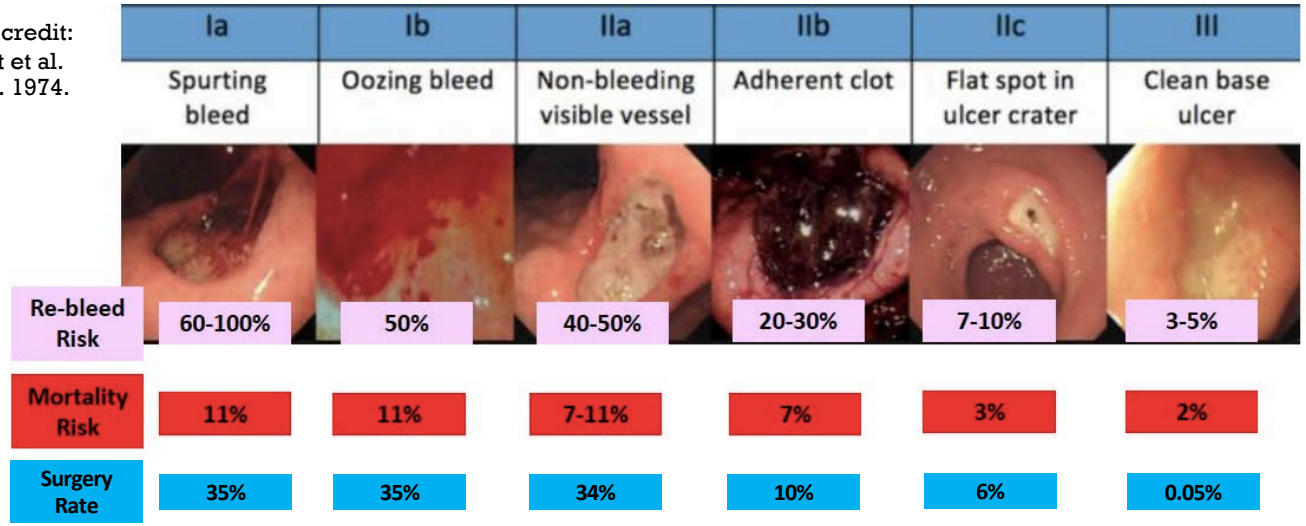


Table 2. Classification and prevalences of stigmata of recent hemorrhage in 2,401 patients hospitalized with bleeding ulcers at 72 US endoscopy centers (48)

Stigmata of hemorrhage	Forrest classification	Prevalence
Active spurting bleeding	IA	12% (spurting + oozing)
Active oozing bleeding	IB	
Non-bleeding visible vessel	IIA	8%
Adherent clot	IIB	8%
Flat pigmented spot	IIC	16%
Clean base	III	55%

Laine & Jensen. ACG Practice Guidelines. Am J Gastroenterol. 2012.

MANAGEMENT OF UGIB (PUD)

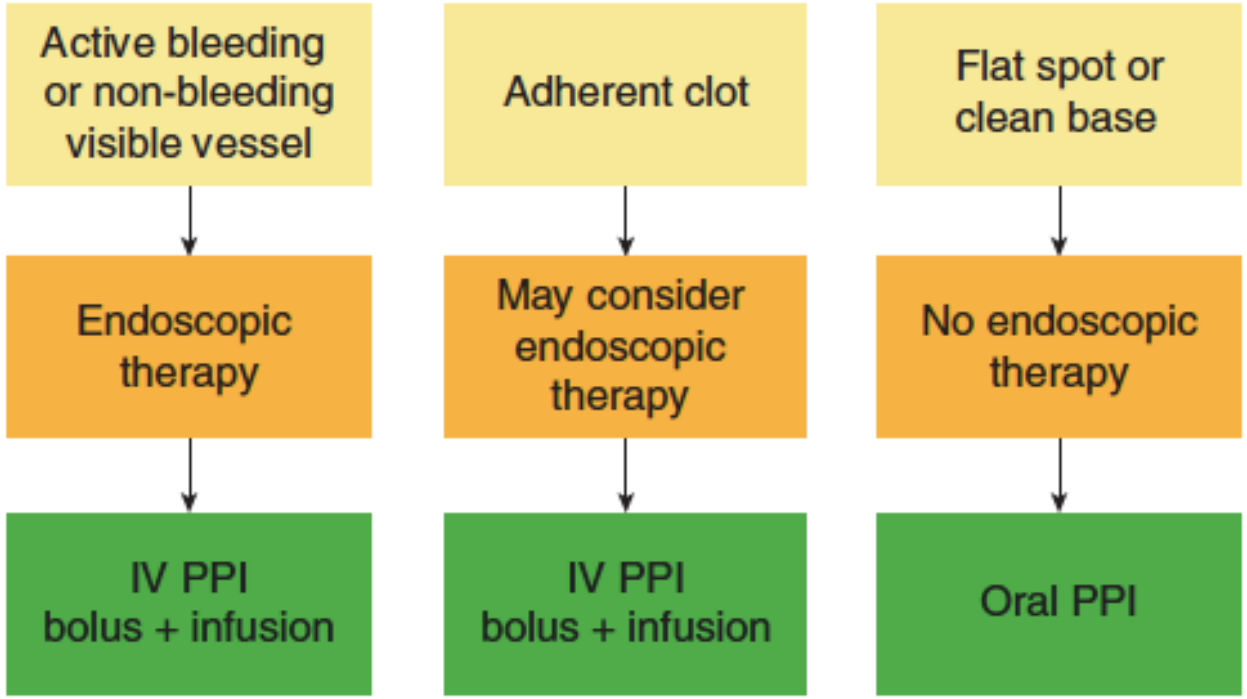
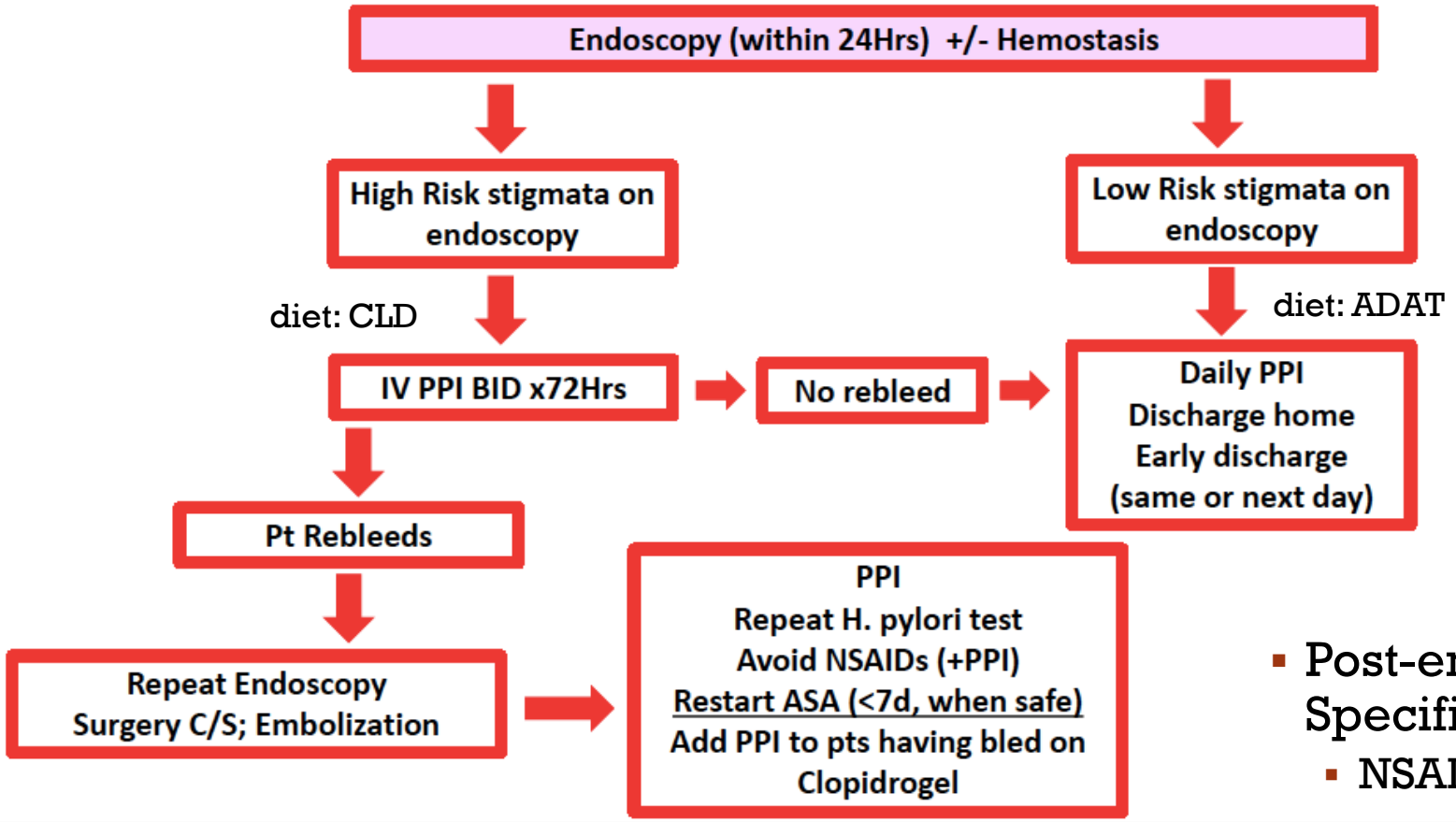


Figure 1. Recommended endoscopic and medical management based on stigmata of hemorrhage in ulcer base. IV, intravenous; PPI, proton pump inhibitor.

Laine & Jensen. ACG Practice Guidelines. Am J Gastroenterol. 2012.

- GI doc:
  - ACG guidelines for endoscopic therapy (injection, clips, etc).
- Hospitalist:
  - Post-endoscopy medical management
    - PPI
    - Specific PUD-related factors
    - Restarting meds for chronic conditions
  - Diet
  - Discharge planning

MANAGEMENT OF UGIB (PUD)



- Low Risk Stigmata =
  - Flat pigmented spot
  - Clean based ulcer

- Post-endoscopic management: Specific PUD-related factors
  - NSAIDs, ASA, H. pylori, malignancy

Image credit: Magdalena Espinoza, MD

POST-EGD MANAGEMENT OF UGIB (PUD)

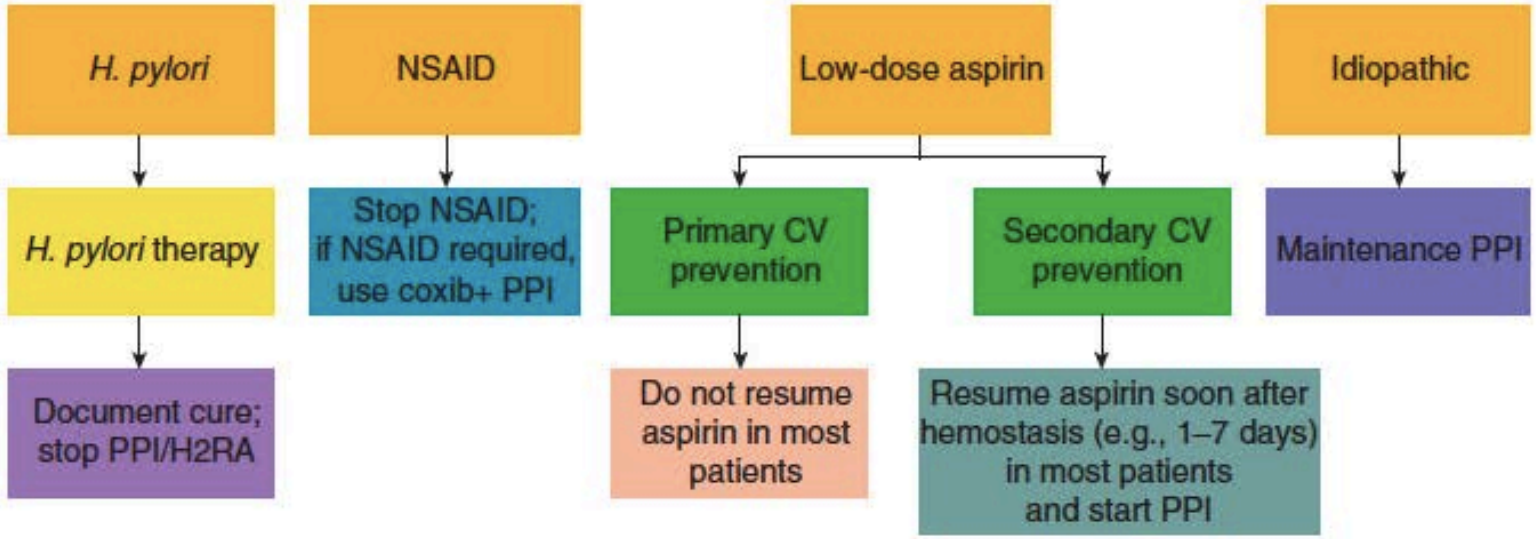


Figure 2. Recommended management to prevent recurrent ulcer bleeding based on etiology of ulcer bleeding. CV, cardiovascular; H2RA, histamine-2 receptor antagonist; NSAID, non-steroidal anti-inflammatory drug; PPI, proton pump inhibitor.

Laine & Jensen. ACG Practice Guidelines. Am J Gastroenterol. 2012.

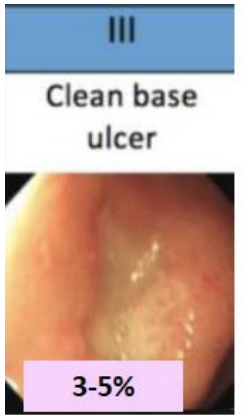
- ASA reduces mortality by 10-fold over 30 days in CV disease
- ASA increases bleeding risk by 2-fold

- *Many on low dose ASA don't actually need it*

CASE 1 (cont'd)

Risk assessment:
- Glasgow-Blatchford Score: 12 points (likely to require medical intervention)
- Pre-endoscopy Rockall Score: 3 points (11% mortality prior to endoscopy)
- AIMS65 Score: 0 points (0.3% in-hospital mortality)

- 75 y/o woman with coffee ground emesis. No syncope. +Melena on DRE.
  - h/o HTN on beta blocker and CAD on **ASA**. +**NSAID** & **EtOH** use.
  - BP 100/60 with orthostatic changes; bloused 1L NS → 105/65. Initial Hemoglobin is 9.2.



- Pre-endoscopic management:
  - Hemodynamic stabilization
  - Serial CBC's with transfusion threshold of 8 (CAD)
  - IV PPI. ASA held.
- EDG: Non-bleeding **clean based ulcer** in the gastric antrum. Bx neg for H.pylori/malignancy
- Post-endoscopy "Complete" Rockall Score: 4 points (Intermediate Risk = 5.3% mortality)
- Post-endoscopic management:
  - ADAT
  - PO PPI
  - Restart ASA once hemostasis achieved (Hgb stable)
  - Discharge following morning

CASE 2

- 58 y/o male with PMH of NASH Cirrhosis presents with multiple episodes of hematemesis over the past 8 hours. Initial evaluation in the ED reveals a BP of 80/50, HR 120. Hemoglobin 9.5. He is bloused 2L saline and admitted to you.

- PMH/Meds: NASH Cirrhosis. On Lactulose, Lasix/Aldactone. No NSAIDs, ASA, AC.
- SocHx: No Tobacco/EtOH/Drug use

- Exam:
  - BP 90/55, HR 102, RR 12, Afebrile
  - Alert & Oriented. +Stigmata of chronic liver disease
  - Maroon blood mixed with stool on DRE.

CASE 2 (cont'd)

- Labs in ED:
  - WBC 3.1; Hgb 9.5; Hct 29; Plts 85
  - PT 21; INR 2.1
  - BUN 60; Cr 1.2; T. bili 5.8; Transaminases & Alk Phos upper limits of normal; Albumin 2.9
  - Troponin: 0.08

- Pt with another episode of hematemesis in the ED after your assessment
- Repeat vitals: 85/52, HR 110

- Repeat Labs at 4 hours:
  - WBC 3.2; Hgb 7.7; Hct 23.1; Plts 65

PROGNOSTIC FACTORS IN UGIB (at admission)

- Age >60
- Comorbidities:
  - Hepatic, renal, and/or pulmonary disease
  - CHF
  - Cancer
- Ongoing bleeding & Hematochezia in UGIB
- Transfusion requirements >6 units PRBCs
- Shock
- Low systolic BP
- Elevated PT
- Encephalopathy

Scoring Tool	Component Elements	
Glasgow-Blatchford Score	Hgb (M vs. F cutoffs) BUN Systolic BP (initial) HR ≥ 100	Melena Syncope Liver disease hx Cardiac failure hx
Pre-endo Rockall Score	Age Shock Comorbidities	
AIMS65	Albumin < 3 INR > 1.5 Alteration in Mental Status SBP ≤ 90 Age ≥ 65	

CASE 2 (cont'd)

- Risk assessment:
  - Glasgow-Blatchford Score: 16 points (high risk)
  - Pre-endoscopy Rockall Score: 5 points (39.6% mortality prior to endoscopy)
  - AIMS65 Score: 3 points (10.3% in-hospital mortality)

Guiding Principles

- Restore/maintain hemodynamic stability
- Blood products
- Pre-Endoscopic medical therapy
- Endoscopy within 24 hours
- Post-Endoscopic medical therapy

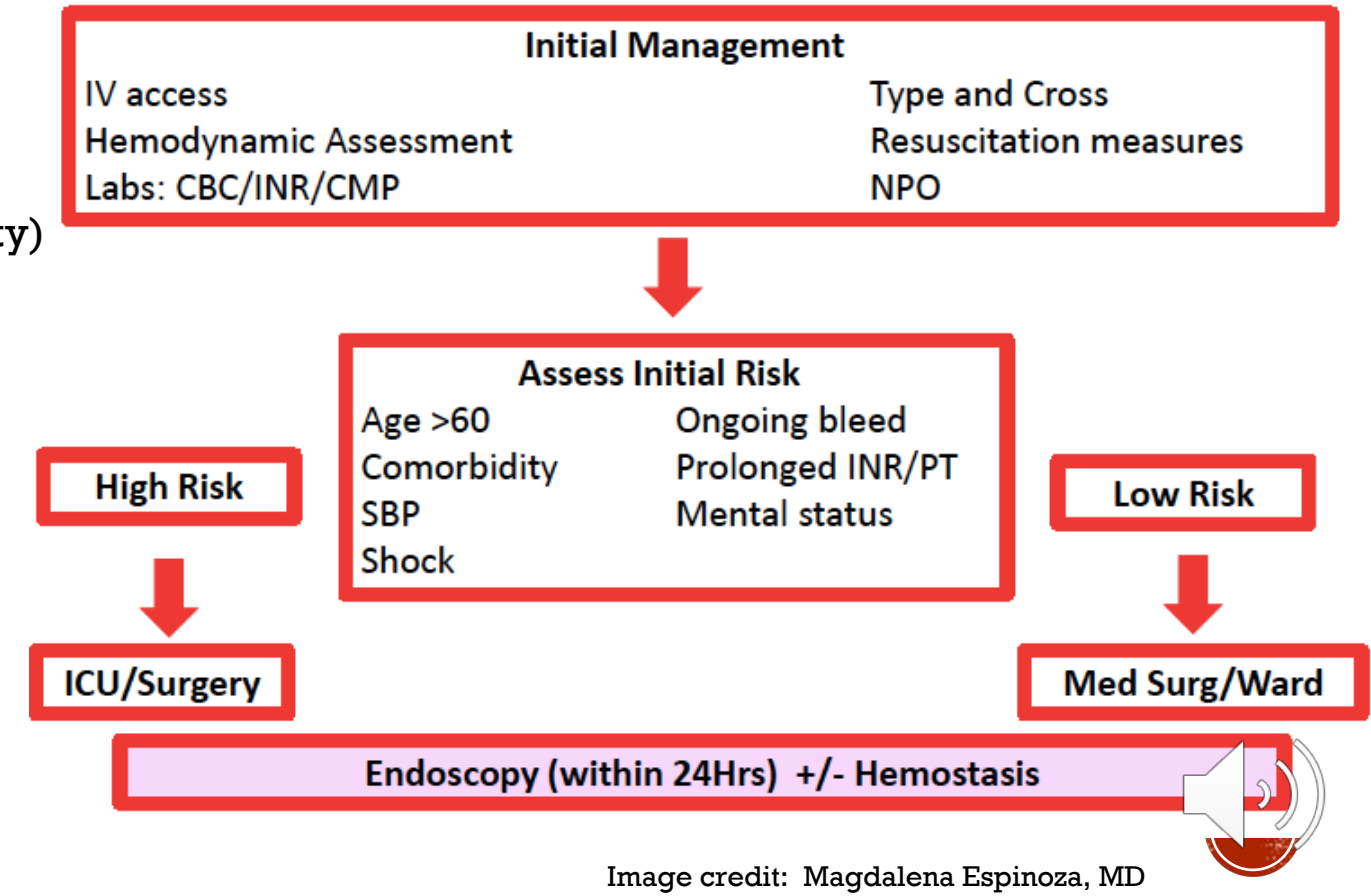


Image credit: Magdalena Espinoza, MD

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- Orders: ICU admission, NPO, GI c/s (stat)

CASE 2 (cont'd)

Guiding Principles

- Restore/maintain hemodynamic stability
- Blood products
- Pre-Endoscopic medical therapy
- Endoscopy within 24 hours
- Post-Endoscopic medical therapy

- Orders: ICU admission, NPO, GI c/s (stat)
- 2 large bore IV's, fluid boluses
- Serial CBCs, Type & Cross
- PRBC Transfusion stat + additional units on hold
  - what about the Restrictive Transfusion Approach? Yes, but …
  - Other blood products - correction of coagulopathy/thrombocytopenia?
    - It depends…

PRE-ENDOSCOPIC MEDICAL THERAPY: UGIB IN PATIENTS WITH CIRRHOSIS

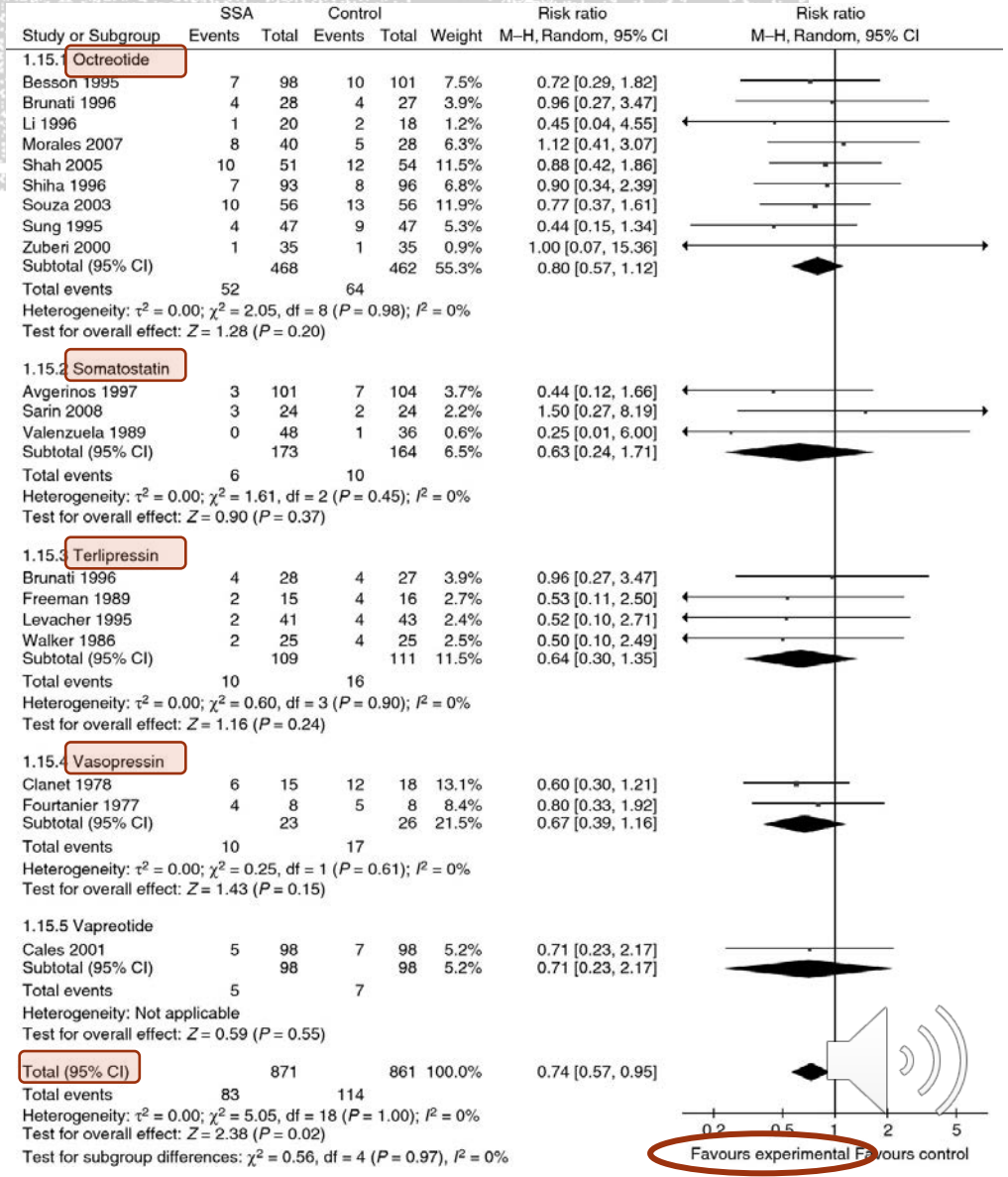
- Proton Pump Inhibitors
- Vasoactive Drugs: Octreotide (Somatostatin analogue)
- Antibiotics
- Prokinetic therapy (Erythromycin)

PRE-ENDOSCOPIC MEDICAL THERAPY: ACUTE VARICEAL UGIB

- Proton Pump Inhibitors
- Vasoactive Drugs: **Octreotide** (Somatostatin analogue), Terlipressin (Vasopressin analogue)
  - Splanchnic vasoconstriction → decreases portal blood flow
- A
- P ycin)

Octreotide	>>	Vasopressin
Somatostatin	>>	Vasopressin
Octreotide	=	Somatostatin
Octreotide	=	Terlipressin
Terlipressin	=	Somatostatin
Terlipressin	=	Vasopressin

Better Hemostasis (no difference in mortality)

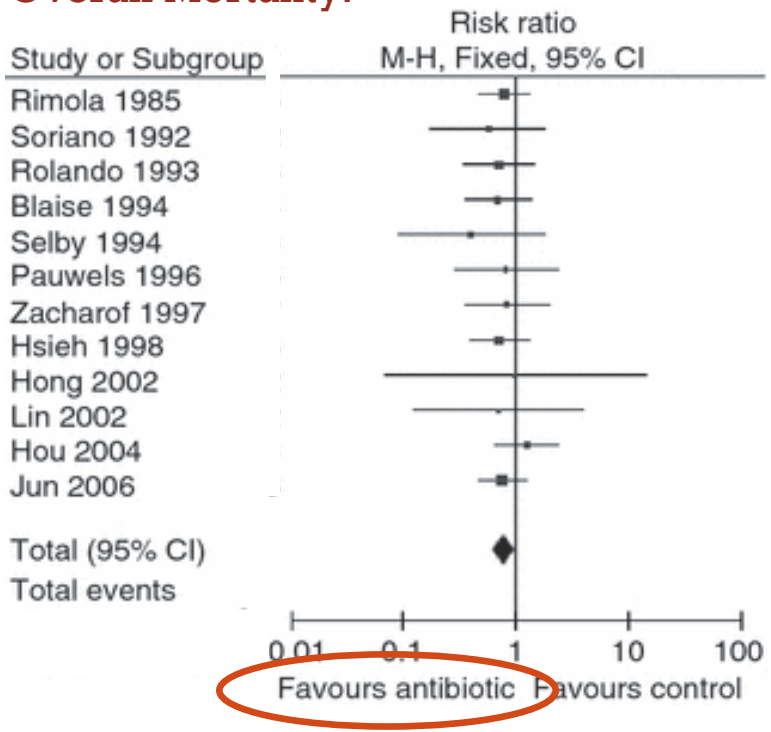


Wells et al. Aliment Pharmacol Ther 2012.

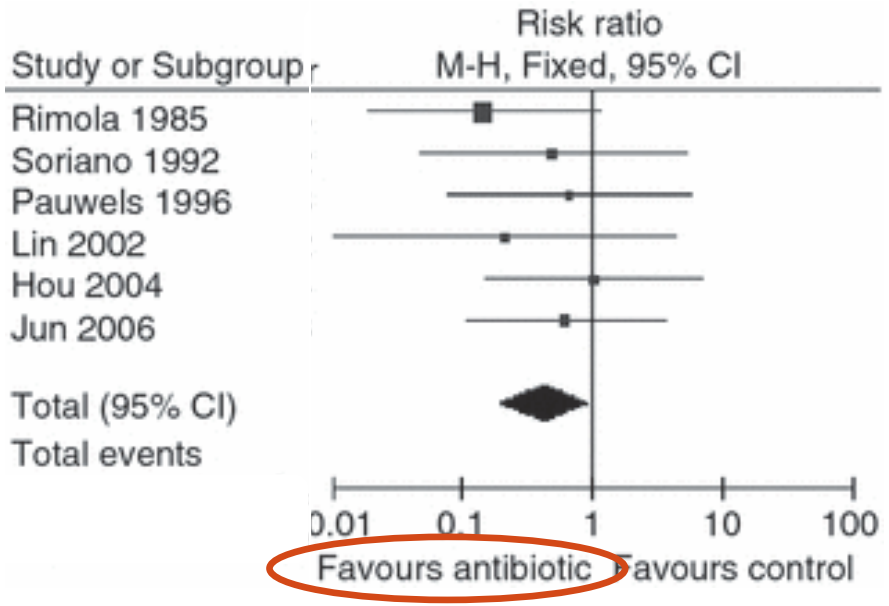
PRE-ENDOSCOPIC MEDICAL THERAPY: ACUTE VARICEAL BLEED

- **Antibiotics** → Ceftriaxone

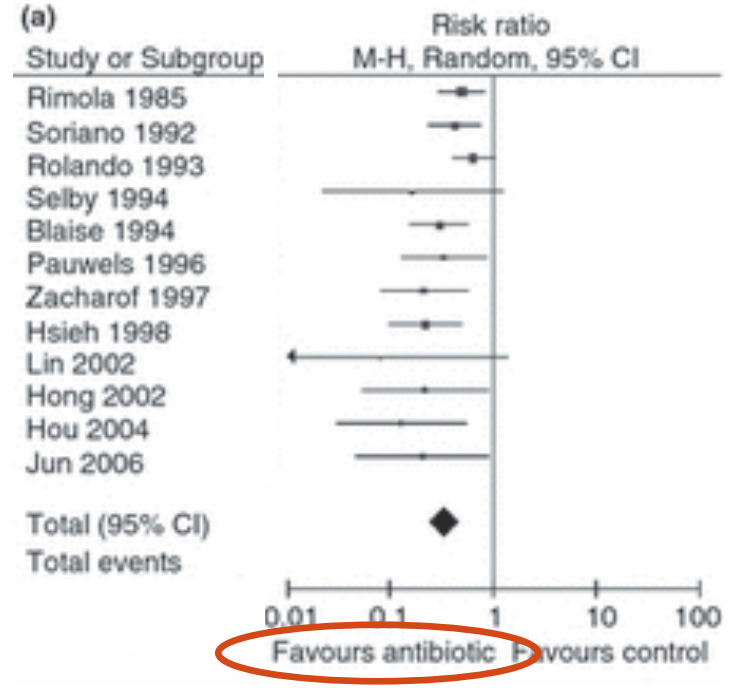
Overall Mortality:



Mortality due to Bacterial Infections:



Bacterial Infections:



Chavez-Tapia et al. Aliment Pharmacol Ther 2011.

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- AIMS65 Score: 3 points (10.3% in-hospital mortality)

- 58 y/o male w/ Cirrhosis with multiple episodes of hematemesis; +hematochezia on DRE.
  - BP 80/50, HR 120; bloused 2L → BP 90/55, HR 102. Initial Hgb 9.5, Plts 85, INR 2.1
  - Ongoing bleeding. BP 85/52, HR 110. Repeat Hgb 7.7, Plts 65

- Orders:
  - ICU admission, NPO, GI c/s (stat)
  - 2 large bore IV's, fluid boluses for goal SBP >90
  - Serial CBCs, Type & Cross
  - Transfuse 1unit PRBCs + keep additional units on hold
    - Guidelines recommend against FFP; no rec for/against Plt transfusion, *threshold usually 50.*
  - **Octreotide** 50mcg bolus stat, then 50mcg/hr
  - **Ceftriaxone** 1gm q24hrs
  - IV PPI
  - Consider Erythromycin prior to endoscopy (d/w GI)
  - EGD performed ASAP

ENDOSCOPY IN ACUTE VARICEAL BLEED

- Esophageal varices
- Gastric varices → more difficult to manage

- High risk stigmata:
  - Actively bleeding/oozing varices
  - **Red wale signs** → red patches or strips on the varices
    - Increased risk of bleeding or sign of recent bleeding
  - Small varices laying on larger ones (varices on varices)

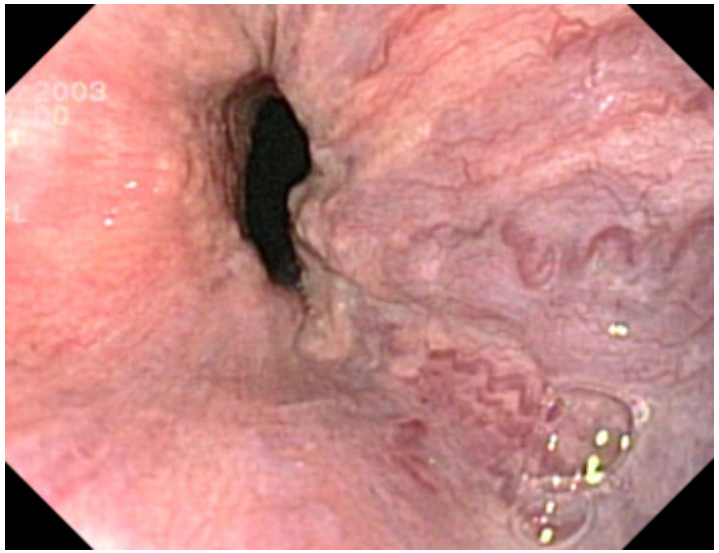


Image courtesy of https://www.endoscopy-campus.com

- GI doc: Endoscopic therapy options → band ligation, ~~sclerotherapy~~, occlusion with tissue glue (cyanoacrylate), EUS-guided coil occlusion

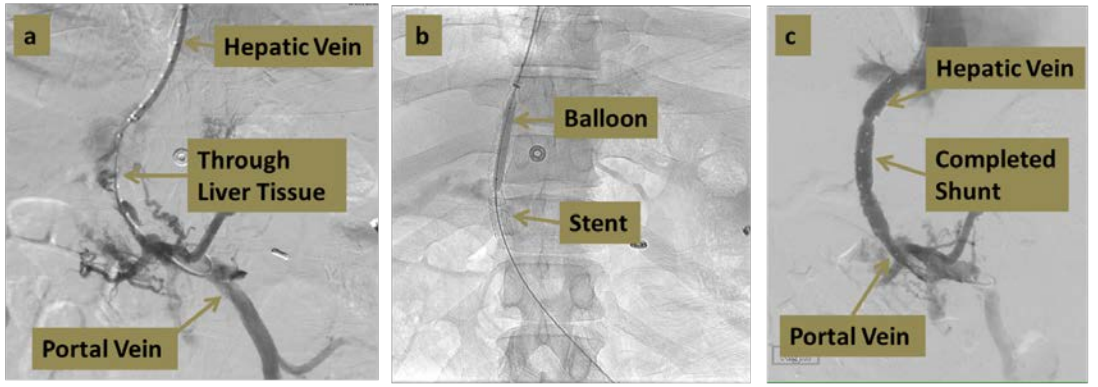
CASE 2 (cont'd)

Risk assessment:
- Glasgow-Blatchford Score: 16 points (high risk)
- Pre-endoscopy Rockall Score: 5 points (39.6% mortality prior to endoscopy)
- AIMS65 Score: 3 points (10.3% in-hospital mortality)

- 58 y/o male w/ Cirrhosis with multiple episodes of hematemesis; +hematochezia on DRE.
  - BP 80/50, HR 120; Ongoing bleeding → ICU
  - Hgb 9.5 → 7.7, Plts 85 → 65, INR 2.1
- Pre-endoscopic management:
  - Hemodynamic resuscitation
  - PRBC transfusion + additional units on hold; serial CBC's
  - Octreotide bolus + gtt; IV PPI; IV Ceftriaxone
- EGD: non-bleeding esophageal varices w/ red wale sign + oozing gastric varices
  - EV's banded. Ongoing slow oozing from GV's.
- What next?

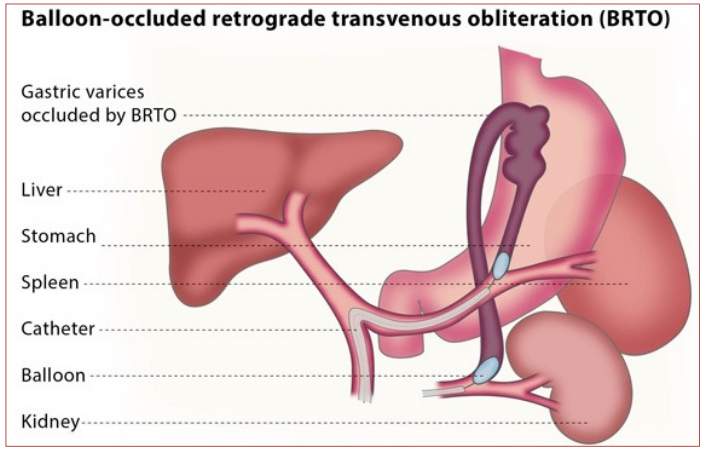
ADVANCED MANAGEMENT: VARICEAL BLEEDING

- Interventional Radiology
  - Transjugular Intrahepatic Portosystemic Shunt (**TIPS**)
    - Image courtesy of: UCLA Interventional Radiology. https://www.uclahealth.org/radiology/ir/transjugular-intrahepatic-portosystemic-shunt-tips



a) Stent extending from the hepatic vein, through liver tissue and into the portal vein.
b) Expansion of the stent through the liver tissue by inflation of a balloon.
c) Completed shunt allowing blood to flow directly from the portal vein to the hepatic vein.

  - Balloon Occluded Retrograde Transvenous Obliteration (**BRTO**)
    - Image courtesy of: Cardiovascular and Interventional Radiological Society of Europe (CIRSE). https://www.cirse.org/patients/ir-procedures/balloon-occluded-retrograde-transvenous-obliteration-brto/



CASE 2 (cont'd)

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  - BP 80/50, HR 120. Hgb 9.5 → 7.7, Plts 85 → 65, INR 2.1. Ongoing bleeding. → ICU
- Pre-endoscopic management:
  - Hemodynamic resuscitation
  - PRBC transfusion + additional units on hold; serial CBC's
  - Octreotide bolus + gtt; IV PPI; IV Ceftriaxone
- EGD: non-bleeding esophageal varices w/ red wale sign + oozing gastric varices
  - EV's banded. Ongoing slow oozing from GV's.
- IR: Successful TIPS
- Post-endoscopic/IR management:
  - Cont Octreotide gtt for 3 days
  - Cont Ceftriaxone for 7 days
  - D/C PPI
  - Restrictive transfusion approach (goal Hgb ≥ 7)
  - CLD → ADAT
  - Management of post-TIPS hepatic encephalopathy
  - Discharge with outpatient GI follow-up for repeat EGD

CASE 3

- 65y/o M with h/o HTN on HCTZ who presents to the ED with several episodes of hematochezia & fatigue. Initial evaluation reveals BP 105/65, HR 110 and maroon stools on DRE. He is bloused 1L saline and admitted to you.

- What are important components of your history and exam that will guide your diagnostic and management plan? What labs do you want?

LGIB: ETIOLOGIES & KEY ELEMENTS

Lower GI Bleed (n = 187)

Etiology	Frequency	Percent of Total (%)
Diverticulosis	76	41
Not identified	38	20
Colitis, NOS	14	7
AVM	13	7
Cancer	11	6
Ischemic colitis	9	5
Polyp	9	5
Hemorrhoid	8	4
Ulcer	5	3
Other	3	1
IBD	1	<1

Whelan et al. JHM 2010.

20-55% Diverticulosis
7% Other/Unknown
2-7% Other Colitis
2-3% Angiodysplasia
6% Neoplasia
16% Ischemic colitis
11% Hemorrhoids, etc
1-2% Radiation Colitis
3% Post-polypectomy
3% IBD

Strate, LL et al. Gastroenterol Clin N Am 2005.

- Distinguishing LGIB vs UGIB
  - Stool color
  - BUN (or BUN:Cr ratio)
  - NG lavage
    - Reserved for pt's with brisk bleeding if don't anticipate EGD
  - EGD = gold standard, especially if hemodynamic instability
- Severity/Risk Assessment
  - AIMS65, Blatchford, & Rockall scores all for UGIB
  - No single clinical risk scoring tool has been shown to have the broadest predictive ability in LGIB *

* Tapaskar et al. Gastrointestinal Endoscopy 2019.

PROGNOSTIC FACTORS IN LGIB

- Admission Hgb & Albumin
- Age > 60
- Comorbid illnesses
  - Hepatic, renal, and/or pulmonary disease
  - CHF
  - Cancer
- Hemodynamic instability
- Overt rectal bleeding
- Exposure to anticoagulation/antiplatelet agents
- Encephalopathy
- Elevated Cr

Table 3. Risk factors for poor outcome in patients with LGIB

Study	Risk factor	Odds ratio	95% CI
Kollef *et al.*[a] (14)	Continuing hemorrhage	3.1	2.4–4.1
	Systolic blood pressure <100 mm Hg	3.0	2.2–4.1
	Prothrombin time >1.2 control	2.0	1.5–2.6
	Altered mental status	3.2	1.5–6.8
	Unstable comorbid illness[b]	2.9	1.9–4.4
Strate *et al.* (15,16)	Heart rate >100 b.p.m.	3.7	1.8–7.6
	Systolic blood pressure <115 mm Hg	3.5	1.5–7.7
	Syncope	2.8	1.1–7.5
	Non-tender abdomen	2.4	1.2–4.9
	Bleeding in first 4 h of hospitalization	2.3	1.3–4.2
	Aspirin use	2.1	1.1–3.8
	>2 comorbid conditions[c]	1.9	1.1–3.4
Velayos *et al.* (17)	Initial hematocrit <35%	6.3	2.2–16.7
	Abnormal vital signs after 1 h	4.3	1.4–12.5
	Gross blood on initial rectal exam	3.9	1.2–13.2
Newman *et al.*[d] (18)	Hematocrit <35%	4.7	1.7–13.0
	Bright red rectal bleeding	3.5	1.7–7.1
	Age >60 years	2.3	1.05–4.9
Newman *et al.*[e] (18)	Creatinine > 150 μM	10.3	2.4–43.5
	Age >60 years	4.2	1.8–10.0
	Abnormal hemodynamic parameters	2.1	1.0–4.6
	Rebleeding	1.9	1.0–3.8
	Smoking	0.5	0.2–1.0

b.p.m., beats per minute; CI, confidence interval; LGIB, lower gastrointestinal bleeding.
[a]Included both upper or lower gastrointestinal bleeding.
[b]Unstable comorbid disease defined as any organ system abnormality that ordinarily would require intensive care unit admission.
[c]According to the Charlson Index, a validated, weighted score of comorbid disease.
[d]Predictors of severe bleeding.
[e]Predictors of adverse outcome.

Strate & Gralnek. Am J Gastroenterol 2016

CASE 3 (cont'd)

- 65y/o M presents to the ED with hematochezia & fatigue. Initial evaluation reveals BP 105/65, HR 110 and maroon stools on DRE. He is bloused 1L saline and admitted to you.

- HPI: No abd pain, no pain with defecation, no similar prior episodes. No F/C. +Frequent loose stools but no watery diarrhea. No recent travel; has never had a C-scope
- PMH/Meds: HTN on HCTZ. No h/o CAD, malignancy, autoimmune, renal, or liver disease
- SocHx: occasional EtOH use

- Exam: BP 110/70, HR 96 after bolus. Normal mentation, no stigmata of chronic liver disease
- Labs: WBC 6.8, Hgb 10.5, Hct 31.5, Plts 180. PT/INR normal. BUN 18, Cr 1.2, normal LFTs, Albumin 4.1

CASE 3 (cont'd)

- Risk factors:
  - Age >60
  - Blood on DRE
  - Hemodynamic instability
  - Initial Hct <35 (Hgb < 11.5)
- More Reassuring:
  - No significant comorbid illnesses
  - Improved hemodynamic status after volume resuscitation
  - Normal Albumin
- Orders:
  - 2 large bore IV's, bolus to maintain SBP > 90
  - Serial CBCs, Type & Cross
  - NPO, GI c/s

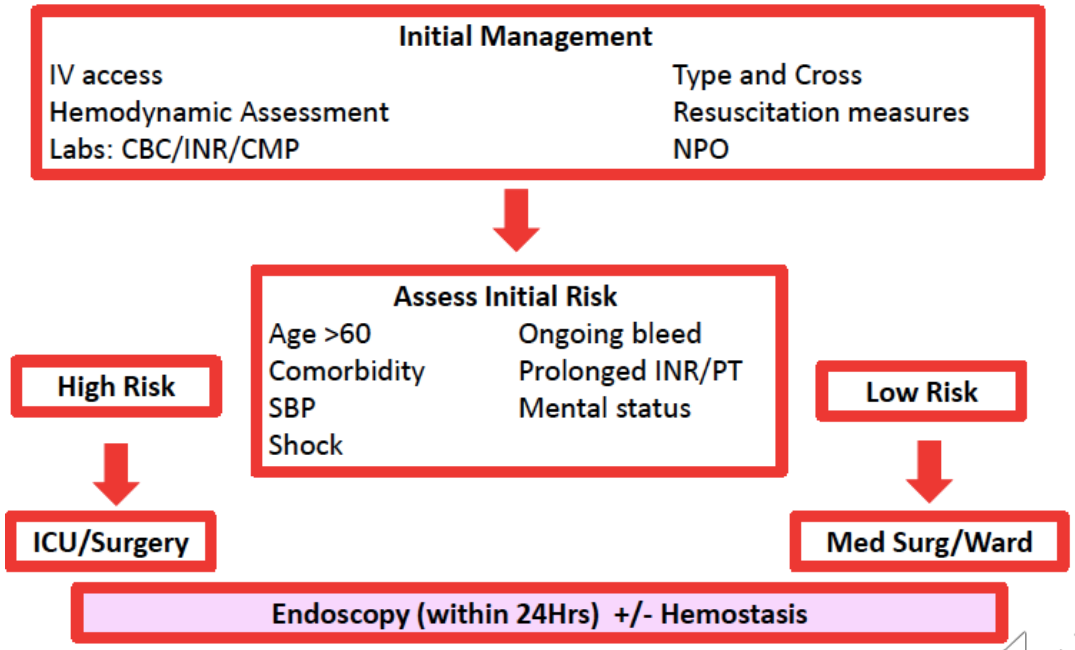
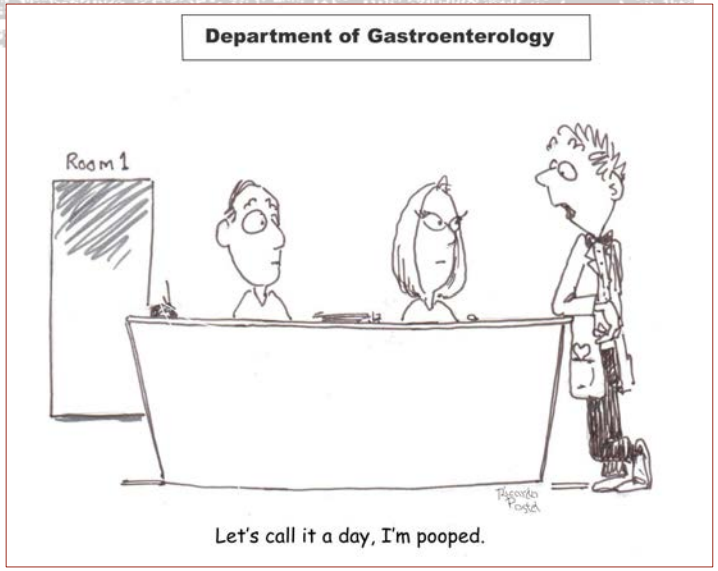


Image credit: Magdalena Espinoza, MD

MANAGEMENT OF LGIB



Guiding Principles

- Restore/maintain hemodynamic stability
- Blood products
- Pre-Endoscopic medical therapy
  - Management of anticoagulant medications & comorbidities
- Endoscopy within 24 hours
  - Consider EGD if hematochezia & hemodynamic instability (brisk UGIB)
  - Colonoscopy
- Post-Endoscopic medical therapy
  - Prevention of recurrent LGIB

MANAGEMENT OF LGIB

Guiding Principles

- Restore/maintain **hemodynamic stability**
- **Blood products**
  - Restrictive Transfusion Approach (threshold Hgb ≤ 7)
  - Consider threshold ≤ 8-9 in pts with massive bleeding or cardiac disease
  - Platelet transfusion if Plts < 50
- Pre-Endoscopic medical therapy
  - Management of anticoagulant medications
- Endoscopy within 24 hours
  - Consider EGD if hematochezia & hemodynamic instability (brisk UGIB)
  - Colonoscopy
- Post-Endoscopic medical therapy
  - Prevention of recurrent LGIB

MANAGEMENT OF LGIB

Guiding Principles

- Restore/maintain hemodynamic stability
- Blood products
- Pre-Endoscopic medical therapy
  - Management of anticoagulant medications
  - Management of comorbid conditions
- Endoscopy within 24 hours
  - Consider EGD if hematochezia & hemodynamic i
  - Colonoscopy
- Post-Endoscopic medical therapy
  - Prevention of recurrent LGIB

- Pt on **antiplatelet agent**
  - Platelet transfusion <u>not</u> indicated unless life-threatening
- Pt on **Warfarin**
  - Goal INR <2.5 prior to endoscopy (if possible) in case endoscopic therapy needed
  - INR does not predict rebleeding
- Pt on **DOAC**
  - Time most important
  - Reversal agent if severe ongoing bleed, ingestion, renal disease

MANAGEMENT OF LGIB

- Risk assessment
- Stabilization/blood
- GI:
  - Colonoscopy as diagnostic & therapeutic tool
- Early IR / Surgical consultation:
  - Severe bleeding with ongoing instability & intolerant of prep

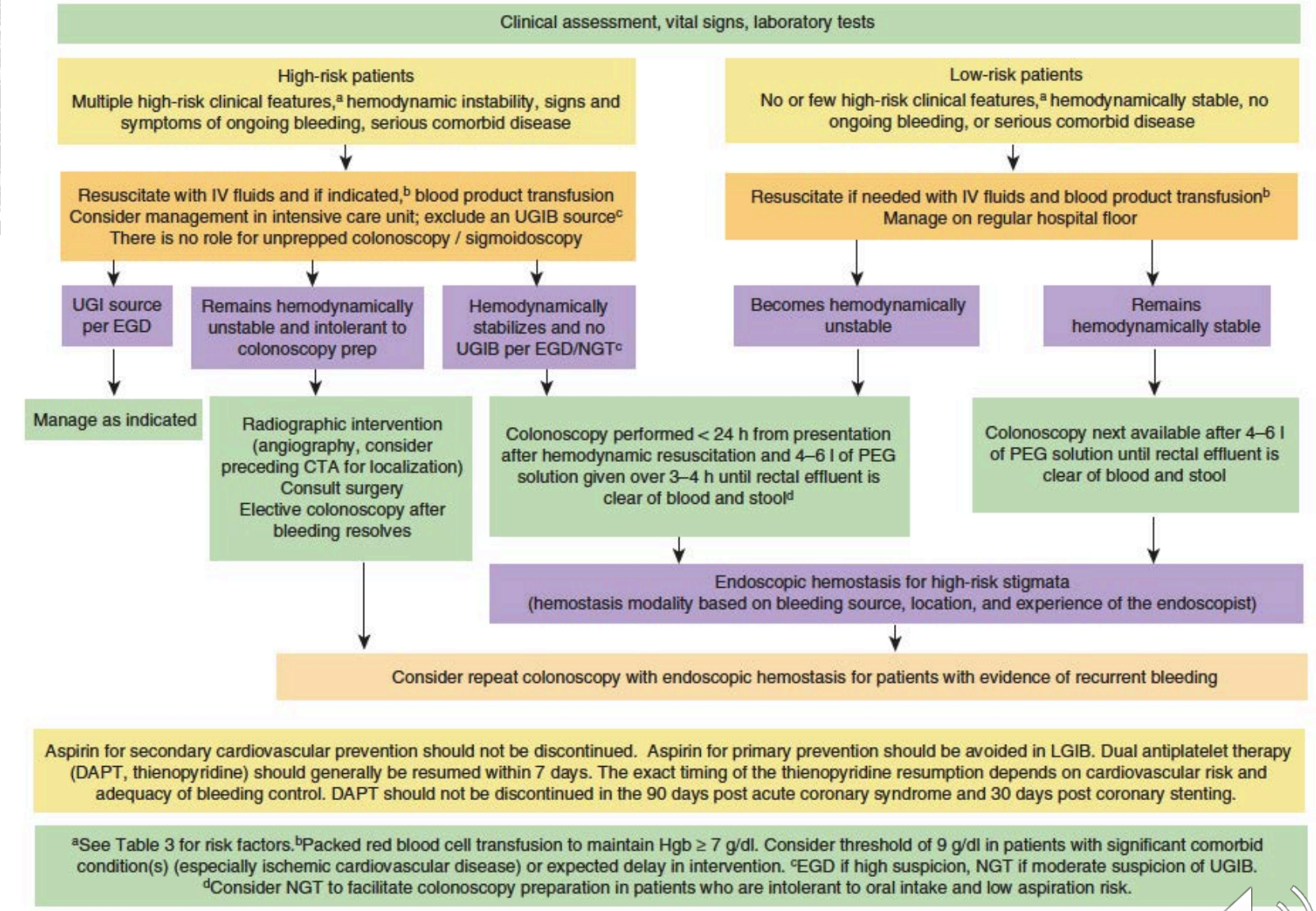


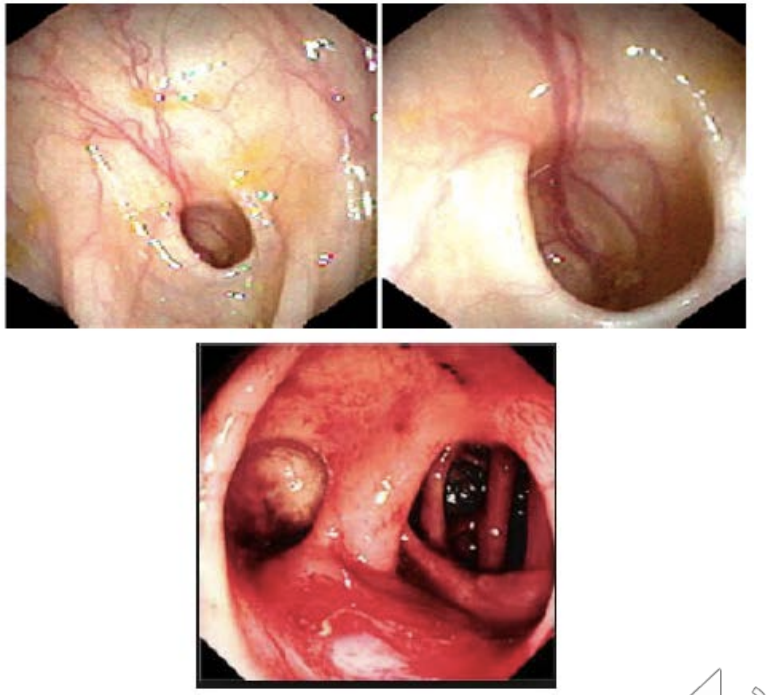
Figure 1. Algorithm for the management of patients presenting with acute LGIB stratified by bleeding severity. CTA, computed tomographic angio[illegible]y; DAPT, dual antiplatelet therapy; EGD, esophagogastroduodenoscopy; LGIB, lower gastrointestinal bleeding; NGT, nasogastric tube; PEG, polyethylene glycol; UGIB, upper gastrointestinal bleeding.

Strate & Gralnek. Am J Gastroenterol 2016

MANAGEMENT OF LGIB: C-SCOPE

- LGIB etiologies **most amenable to endoscopic hemostasis**
  - Diverticular bleed
  - Angiodysplasia
  - Post-polypectomy bleed

- Endotherapy techniques:
  - Injection
  - Contact thermal therapies (electrocoagulation, heat probe)
  - Noncontact thermal therapies (argon plasma coagulation)
  - Clipping
  - Band ligation



Diverticular bleeding

Image credit: Magdalena Espinoza, MD

MANAGEMENT: DIVERTICULAR BLEEDING

- Bleeding = rare complication of this common condition
- Deeper penetrating vessel (often arterial) becomes superficial → bleeds
- Presentation: painless hematochezia

- Candidates for endoscopic therapy – stigmata that predict high risk of re-bleed:
  - Active bleeding (spurting/oozing)
  - Non-bleeding visible vessel
  - Adherent clot on c-scope

- Self-limited ~70% of cases, but 40% overall rebleed risk

- Other therapeutic options:
  - IR → angiography & embolization
  - Surgery

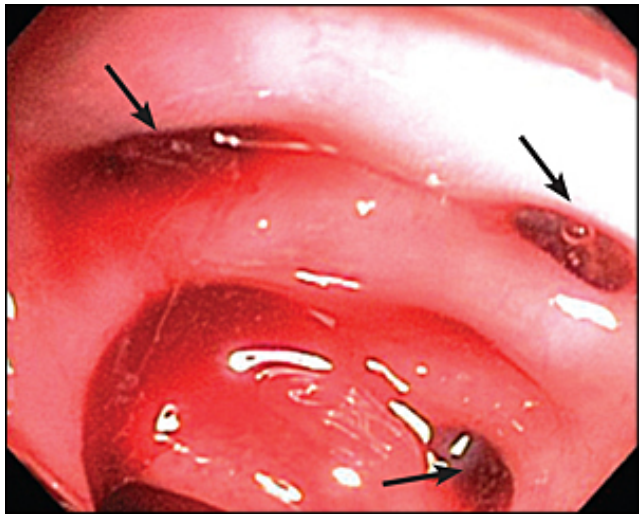


Image credit:
Wilkins et al. *Am Fam Physician* 2009. online https://www.aafp.org/afp/2009/1101/p977.html

MANAGEMENT: POST-POLYPECTOMY BLEEDING

- Immediate or Delayed (up to 29 days later)
- Immediate:
  - 2% of polypectomies
  - Larger polyps
- Delayed:
  - Often hours to days later
  - Higher risk if resuming prior antiplatelet agent or anticoagulation
  - Sloughing of eschar covering a vessel
  - Thermal necrosis deeper than visualized
- Risk Factors:
  - Larger polyp size (> 2cm)
  - Thick stalk
  - Right colon location
  - Resuming prior antiplatelet agent or anticoagulation
- Severity range: minor oozing to arterial pumping

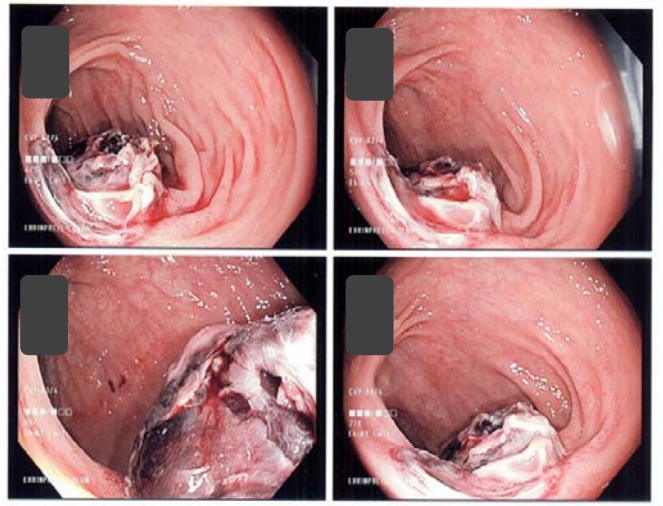


Image credit:
Kutaimy, Ravi, & Ehrinpreis. Delayed post-polypectomy bleeding case report, using cold snare technique. Poster No. P2215. *ACG 2019 Annual Scientific Meeting Abstracts.* San Antonio, Texas: American College of Gastroenterology.

MANAGEMENT: OTHER LGIB

- Angiodysplasia
  - Common features/risk factors:
    - Right colon
    - Elderly patients
    - h/o Radiation therapy
  - Occult bleeding or overt hematochezia
  - Tx: endoscopic therapy during c-scope

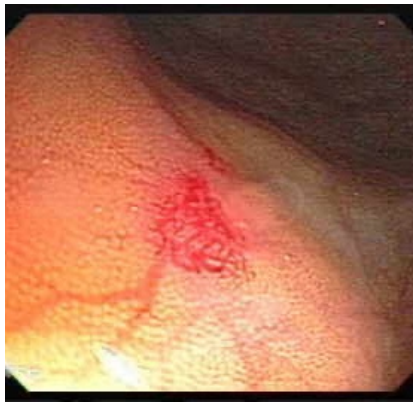


Image credit: Atlas of Gastrointestinal Video Endoscopy
https://www.gastrointestinalatlas.com/english/colonic_angiodysplasia.html

- Unable to achieve hemostasis via endoscopic therapy in:
  - Ischemic Colitis
  - Inflammatory bowel disease
  - Neoplasms

→

<u>Treatment</u>:
Supportive care
Medical management
Surgical management

CASE 3 (cont'd)

- 65y/o M with h/o HTN presents to the ED with hematochezia & maroon stools on DRE. No abd pain, no prior endoscopy, no h/o CAD, IBD, or cirrhosis. No leukocytosis fever, or watery diarrhea. Not on antiplatelets or anticoagulation.
  - BP 105/65, HR 110. Bloused 1L NS → 110/70, HR 96. Initial Hgb 10.5 → 9

- Pre-endoscopic management:
  - Risk assessment, Hemodynamic stabilization
  - Serial CBC's with transfusion threshold of 7
  - Hold home antihypertensive

- Colonoscopy: Left-sided colonic **diverticulosis with a non-bleeding visible vessel**; treated endoscopically

- Post-endoscopic management:
  - Clear liquids, supportive care
  - The following AM, pt with **recurrent massive hematochezia, hemodynamic instability, & Hgb drop to 6.5**

LGIB: NON-ENDOSCOPIC INTERVENTIONS

- Localization of Bleeding
  - Nuclear Scintigraphy (tagged RBC scan)
    - Slower rate of bleeding over longer period of time, but less accurate localization
  - CT Angiography
    - More brisk bleeding, but more accurate localization & more expedient
- Interventional Radiology
  - Angiography and embolization
- Surgical Intervention = last resort

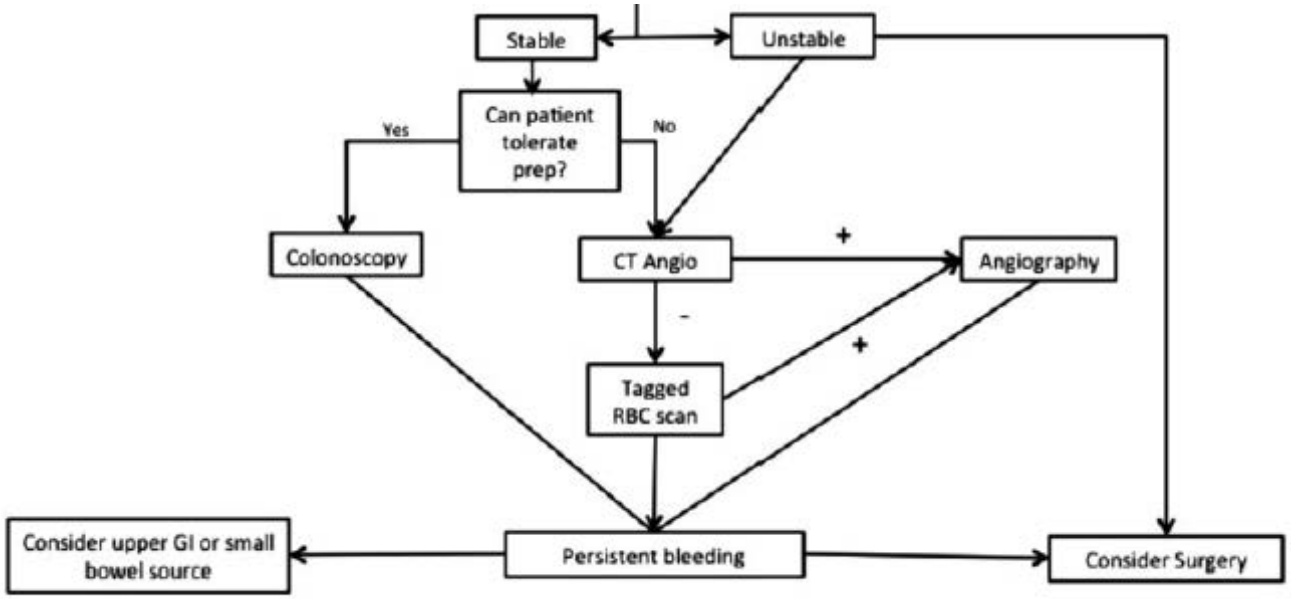


Fig. 1 Algorithm for the initial assessment and management of lower gastrointestinal breathing.

Serur et al. Clin Colon Rectal Surg 2020.

LGIB: LOCALIZATION & INTERVENTIONS

- General Approach
  - Endoscopy = superior
  - If ongoing brisk hematochezia prevents hemodynamic resuscitation & bowel prep before C-scope
    - → IR Angiography for localization & treatment
      - *or*
    - → CT Angio followed by IR embolization
  - If ongoing intermittent GI bleeding & unable to localize source with endoscopy or CT Angio, or unable to give IV contrast
    - → Tagged RBC scan

POST-PROCEDURAL MED MANAGEMENT: LGIB

Aspirin for secondary cardiovascular prevention should not be discontinued. Aspirin for primary prevention should be avoided in LGIB. Dual antiplatelet therapy (DAPT, thienopyridine) should generally be resumed within 7 days. The exact timing of the thienopyridine resumption depends on cardiovascular risk and adequacy of bleeding control. DAPT should not be discontinued in the 90 days post acute coronary syndrome and 30 days post coronary stenting.

[a]See Table 3 for risk factors.[b]Packed red blood cell transfusion to maintain Hgb ≥ 7 g/dl. Consider threshold of 9 g/dl in patients with significant comorbid condition(s) (especially ischemic cardiovascular disease) or expected delay in intervention. [c]EGD if high suspicion, NGT if moderate suspicion of UGIB. [d]Consider NGT to facilitate colonoscopy preparation in patients who are intolerant to oral intake and low aspiration risk.

Figure 1. Algorithm for the management of patients presenting with acute LGIB stratified by bleeding severity. CTA, computed tomographic angiography; DAPT, dual antiplatelet therapy; EGD, esophagogastroduodenoscopy; LGIB, lower gastrointestinal bleeding; NGT, nasogastric tube; PEG, polyethylene glycol; UGIB, upper gastrointestinal bleeding.

Strate & Gralnek. Am J Gastroenterol 2016

- Non-ASA NSAIDS should be avoided, particularly if 2/2 diverticulosis or angiodysplasia
- CV disease
  - Primary prevention: Avoid ASA
  - Secondary prevention: ASA should <u>not</u> be discontinued
  - If ACS within the past 90 days or stenting within the past 30 days, do <u>not</u> discontinue DAPT
  - Patients on DAPT not in group above → Resume non-ASA therapy asap and within at least 7 days

CASE 3 (cont'd)

- 65y/o M with h/o HTN presents to the ED with hematochezia & maroon stools on DRE. No abd pain, no prior endoscopy, no h/o CAD, IBD, or cirrhosis. No leukocytosis fever, or watery diarrhea. Not on antiplatelets or anticoagulation.
  - BP 105/65, HR 110. Bloused 1L NS → 110/70, HR 96. Initial Hgb 10.5 → 9
  - C-scope: Diverticulosis with non-bleeding visible vessel, s/p endoscopic therapy
  - Recurrent brisk bleed with hemodynamic instability & Hgb drop to 6.5; unable to tolerate repeat C-scope

- Post-endoscopic management in repeat bleed:
  - Hemodynamic stabilization with fluid boluses
  - Stat PRBC transfusion with additional units on hold; Serial CBC's
  - IR consultation
- IR: Performed **angiography and embolization** with successful hemostasis

- Post-IR management:
  - Clear liquids & ADAT, supportive care. No further bleeding; Hgb stable >7 after PRBC's
  - Discharged home several days later.

SUMMARY

- Guiding principles for hospitalist's management of acute GI bleeding:
  - Clinical evaluation and risk assessment
  - Restore/maintain hemodynamic stability
  - Blood products
  - Pre-Endoscopic medical therapy
  - Endoscopy within 24 hours
  - Post-Endoscopic medical therapy
  - Other subspecialty consultation (IR, Surgery) if ongoing brisk bleeding with hemodynamic instability not amenable to EGD and/or colonoscopy

THANK YOU!

- *Stay safe, stay healthy, & stay well!*