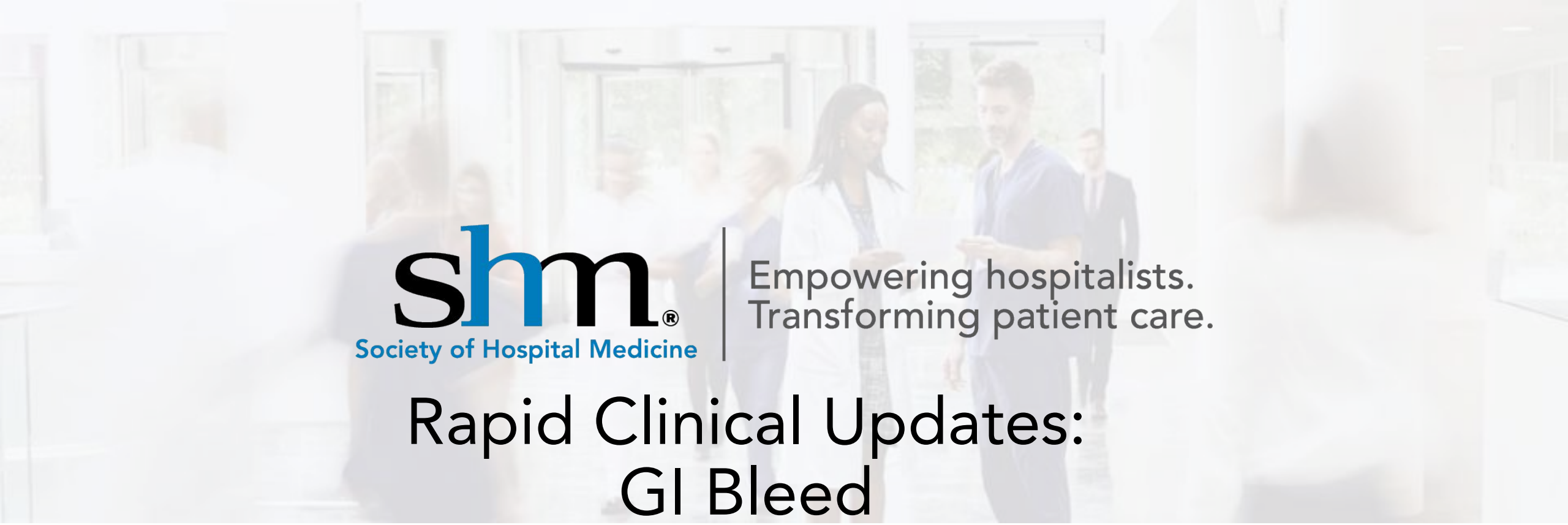


Society of Hospital Medicine

Empowering hospitalists.
Transforming patient care.

Rapid Clinical Updates: GI Bleed

Benjamin Verplanke, MD FACP FHM	Marijeta Pekez, MD
Clinical Assistant Professor of Medicine Section Chief of Hospital Medicine NYU Langone Health Division of Hospital Medicine	Assistant Professor of Medicine Medical Director Gastroenterology Clinic Associate Program Director, Gastroenterology Fellowship University of Kentucky Division of Gastroenterology and Hepatology

Dr. Jagriti Chadha, MD, MPH, SFHM

- Associate Professor at the University of Kentucky, Division of Hospital Medicine
- Medical Director, Physician Development, DHM
- Associate Vice Chair Faculty Development, Internal Medicine
- SHM Education Committee member

Society of Hospital Medicine

Benjamin Verplanke, MD FACP FHM

- Clinical Assistant Professor of Medicine
- Section Chief of Hospital Medicine
- NYU Langone Health
- Division of Hospital Medicine

Society of Hospital Medicine

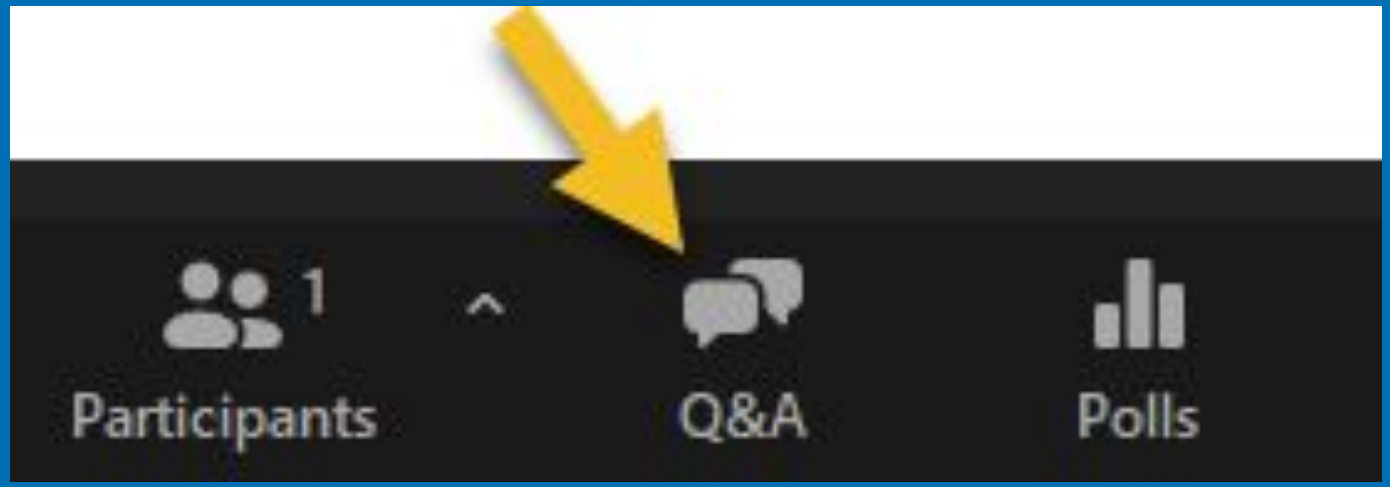
Marijeta Pekez, MD

- Assistant Professor of Medicine
- Medical Director Gastroenterology Clinic
- Associate Program Director, Gastroenterology Fellowship
- University of Kentucky
- Division of Gastroenterology and Hepatology

shm
Society of Hospital Medicine

Please submit questions using Q&A feature

We will have Q&A time after



Society of Hospital Medicine

Financial Disclosures

None

Society of Hospital Medicine

Learning Objectives

Discuss updates in Upper GI Bleeds (2021 ACG guidelines)

Discuss updates in Lower GI Bleeds (2023 ACG guidelines)

Society of Hospital Medicine

Presentation Format

Intern

Resident

Attending

Society of Hospital Medicine

Case 1

45M with no significant past medical history who presents with CC of fatigue.

The ED calls you for admission because he has a hemoglobin of 9g/dl

Society of Hospital Medicine

Case 1

45M with no significant past medical history who presents with CC of fatigue.

He works in construction and has been suffering from back pain and was taking naproxen which has helped.

Upon further questioning he admits to having black tarry stools for the past week which he attributed to stealing his friend's lunch at work.

Society of Hospital Medicine

Case 1: Significant Objective Findings

HR is 101, BP is 100/60

Hgb is 9 g/dl (no baseline)

Platelets 301

BUN 30

INR 1.1

Society of Hospital Medicine

Case 1: What do you do?

1. Discharge patient with next day follow up
2. Start IV pantoprazole bolus and drip
3. Start oral high dose PPI BID
4. Call GI consult

Society of Hospital Medicine

CLINICAL GUIDELINES

ACG Clinical Guideline: Upper Gastrointestinal and Ulcer Bleeding

Laine, Loren MD, FACG[1,2]; Barkun, Alan N. MD, FACG[3]; Saltzman, John R. MD, FACG[4]; Martel, Myriam MSc[2]; Leontiadis, Grigorios I. MD, PhD[5]

Author Information

The American Journal of Gastroenterology: May 2021 - Volume 116 - Issue 5 - p 899-917
doi: 10.14309/ajg.0000000000001245

Society of Hospital Medicine

Burden of GI Bleeds

Of all GI diseases, GI bleed was the most common cause of hospitalization in 2012.

500,000 hospitalizations

2.2 million hospital days

$5 billion direct costs

2.1% hospital deaths

~80% of patients with UGIB get admitted.

UGIB had all-cause readmission rate of 14%.

Of all acute GI bleeds, UGIB accounts for ~75%

PUD accounts for **40%** to **50%** of UGIB.

Society of Hospital Medicine

Back to the Guidelines

To Admit or Not To Admit

Society of Hospital Medicine

Back to the Guidelines

We suggest that patients presenting to the emergency department with UGIB who are classified as very low risk, defined as a risk assessment score with <1% false negative rate for the outcome of hospital-based intervention or death (e.g., Glasgow-Blatchford score= 0–1), be discharged with outpatient follow-up rather than admitted to hospital (conditional recommendation, very-low-quality evidence).

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

Society of Hospital Medicine

Glasgow-Blatchford Bleeding Score (GBS)

Stratifies upper GI bleeding patients who are "low-risk" and candidates for outpatient management.

When to Use | Pearls/Pitfalls | Why Use

Hemoglobin	Norm: 12 - 17	g/dL
BUN	Norm: 8 - 20	mg/dL
Initial systolic BP	Norm: 100 - 120	mm Hg
Sex	Female	Male
Heart rate ≥100	**No 0**	Yes +1
Melena present	**No 0**	Yes +1
Recent syncope	**No 0**	Yes +2
Hepatic disease history	**No 0**	Yes +2
Cardiac failure present	**No 0**	Yes +2

Society of Hospital Medicine

Hemoglobin	9	g/dL ⇆
BUN	30	mg/dL ⇆
Initial systolic BP	100	mm Hg
Sex	Female	**Male**
Heart rate ≥100	No 0	**Yes +1**
Melena present	No 0	**Yes +1**
Recent syncope	**No 0**	Yes +2
Hepatic disease history	**No 0**	Yes +2
Cardiac failure present	**No 0**	Yes +2

13 points

A GBS greater than zero suggests a "High Risk" GI bleed that is likely to require "medical intervention": transfusion, endoscopy, or surgery. A higher GBS also correlated with a higher likelihood of needing intervention (scores ≥6 are associated with >50% risk of needing intervention)

Copy Results | Next Steps »»

Society of Hospital Medicine

Rounds continued…

- Patient came to the floor after ER gave 1L LR bolus
- HR 90 bpm
- BP 110/60
- Has two IVs
- “The blue ones”- Intern (prelim)
- Appears comfortable
- Repeat Hgb 7.8 g/dl
- Venous lactate 1.2
- Meds given: None

Society of Hospital Medicine

Meds given: None

Society of Hospital Medicine

Meds given: None

Society of Hospital Medicine

“Ok, so what was your thought process?”

“We could not reach a recommendation for or against pre-endoscopic PPI therapy for patients with UGIB.”

“So Dr V, what do you think we should do?”

Society of Hospital Medicine

Society of Hospital Medicine

EBM

1. Lau JY, Leung WK, Wu JCY, et al. Omeprazole before endoscopy in patients with gastrointestinal bleeding. N Engl J Med 2007;356:1631-40.

2. Daneshmend TK, Hawkey CJ, Langman MJ, et al. Omeprazole versus placebo for acute upper gastrointestinal bleeding: Randomised double blind controlled trial. BMJ 1992;304:143-7.

3. Hawkey GM, Cole AT, McIntyre AS, et al. Drug Treatments in upper gastrointestinal bleeding: value of endoscopic findings as surrogate end points. Gut 2001;49:372-9.

4. Naumovski-Mihalic S, Katicic M, Colic-Cvlje V, et al. Intravenous proton pump inhibitor in ulcer bleeding in patients admitted to an intensive care unit. Gastroenterology 2005;128(suppl 4):W1578.

Back to the Guidelines…ESGE

ESGE recommends initiating high dose intravenous proton pump inhibitors (PPI), intravenous bolus followed by continuous infusion (80mg then 8mg/hour), in patients presenting with acute UGIH awaiting upper endoscopy. However, PPI infusion should not delay the performance of early endoscopy (strong recommendation, high quality evidence).

“It’s Saturday, we don’t know how soon he will get the endoscopy, so let’s start the PPI, now.”

"Ok Dr. V, we can start the IV pantoprazole. He has two IVs so should we give anything else in that other IV?"

Prokinetic Use

Erythromycin- antibiotic that has pro-motilin activity which increases gastrointestinal motility

Helps propel blood and clots to allow better visualization on endoscopy

2012 Guidelines: "*Intravenous infusion of erythromycin (250 mg ~30 min before endoscopy) should be considered to improve diagnostic yield and decrease the need for repeat endoscopy. However, erythromycin has not consistently been shown to improve clinical outcomes (Conditional recommendation, moderate-quality evidence).*"

Society of Hospital Medicine

Prokinetic Use

2021 Guidelines: “We suggest an infusion of erythromycin before endoscopy in patients with UGIB (conditional recommendation, very-low-quality evidence).”

What changed?

Society of Hospital Medicine

Prokinetic Use

2021 Guidelines: "We suggest an infusion of erythromycin before endoscopy in patients with UGIB (conditional recommendation, very-low-quality evidence)."

What changed?

Annals of Gastroenterology

Ann Gastroenterol. 2016 Jul-Sep; 29(3): 312–317.
Published online 2016 May 20. doi: 10.20524/aog.2016.0045
PMCID: PMC4923816
PMID: 27366031

Pre-endoscopic erythromycin administration in upper gastrointestinal bleeding: an updated meta-analysis and systematic review

Rubayat Rahman,[a] Douglas L. Nguyen,[b] Umair Sohail,[a] Ashraf A. Almashhrawi,[a] Imran Ashraf,[a] Srinivas R. Puli,[c] and Matthew L. Bechtold[a]

shm
Society of Hospital Medicine

Prokinetic Use

Outcome	Analysis outcome	95% confidence interval	P-value	I^2 (%)
Units of blood transfused	−1.06*	−2.24 to 0.13	0.08	89
Length of hospital stay	−1.75*	−2.43 to −1.06	<0.01	0
Duration of procedure	−4.94*	−12.42 to 2.54	0.20	96
Need for emergent surgery	1.11**	0.27-4.67	0.88	44

*mean difference; **odds ratio

"Yes let's start IV erythromycin an hour prior to him going for endoscopy"

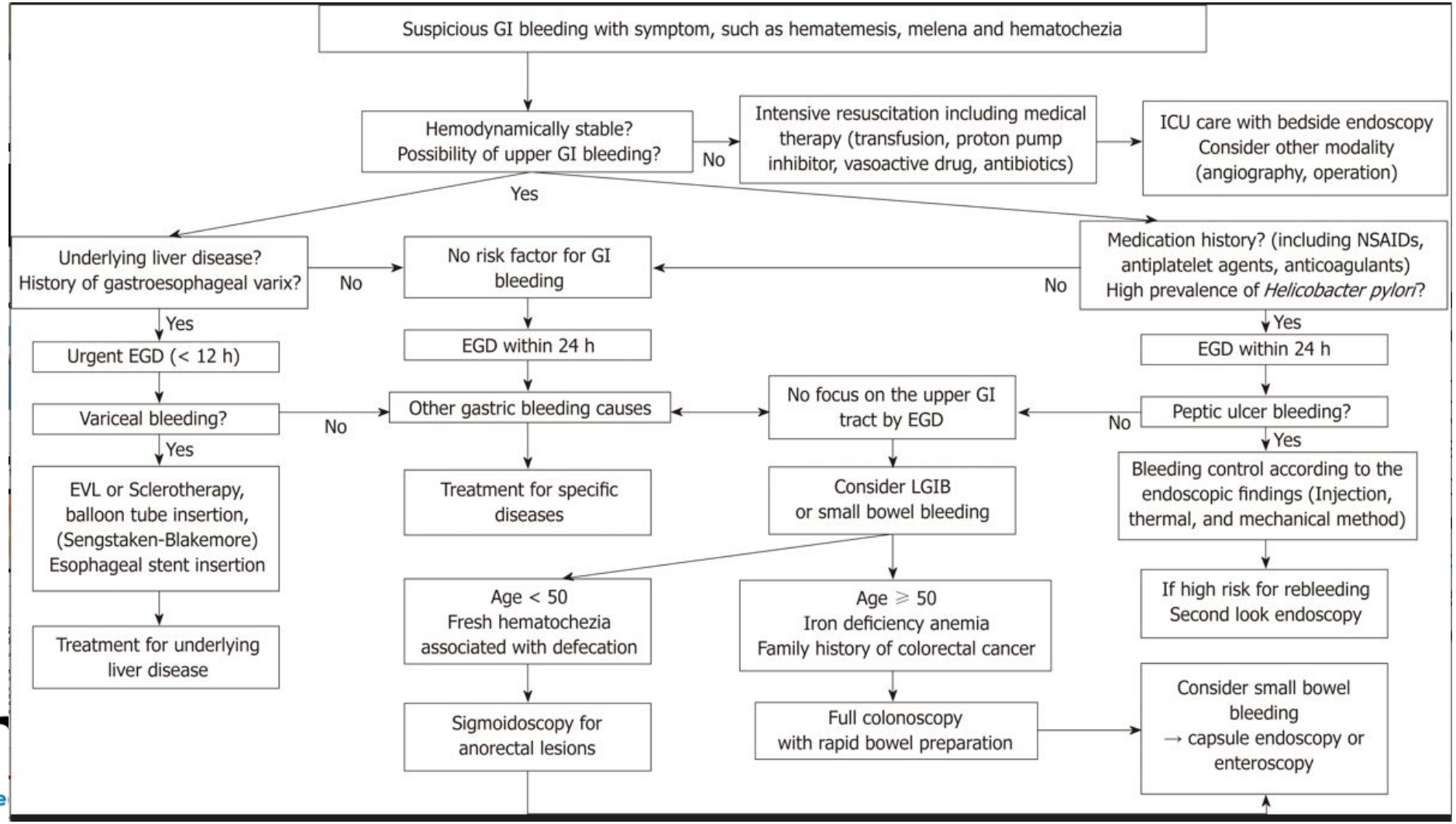
Causes of upper gastrointestinal bleeding

Common causes	Other Causes
Peptic ulcer disease (gastric or duodenal)	Hemosuccus pancreaticus
Gastric of esophageal varices	Cameron lesions
Erosive esophagitis	Hemobilia
Tumors	Aortoenteric fistula
Angioectasias	Anastamotic bleeding
Mallory Weiss tear	AVMs
Gastric or duodenal erosions	Acute esophageal necrosis
Dieulafoy lesion	Atrial – esophageal fistula
	Gastric antral vascular ectasia
	Portal hypertensive gastropathy

Causes of acute small bowel and lower gastrointestinal bleeding by category

Type	Causes
Anatomic	Diverticulosis, including Mechel's diverticulum
	NSAID-induced enterocolopathy
	Antiplatelet or anticoagulant induced entercolopathy
	Stercoral ulceration (solitary rectal ulcer syndrome)
	Anal fissure
Vascular	Ischemic colitis
	Hemorrhoids
	Angiodysplasias (angioectasias)
	Colorectal varices
	Postpolypectomy bleeding
	Radiation telangiectasia or proctitis
	Dieulafoy lesion
Neoplastic	Colorectal polyps
	Colorectal and anal cancers
	Small bowel tumors, including gastrointestinal stromal tumors
	Metastatic or direct invasion from other cancer
Inflammatory	Inflammatory bowel disease
	Infectious colitis

Flowchart of assessment and management of patients with suspicious gastrointestinal bleeding.



Society of Hospital Me

THERAPEUTIC ROLE OF ENDOSCOPY

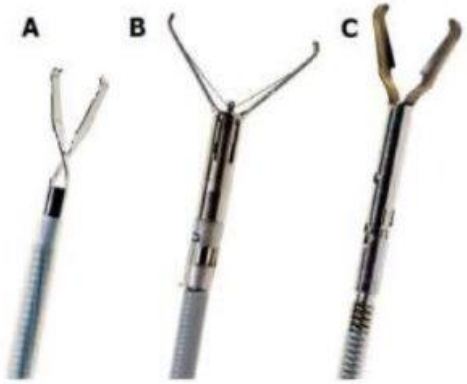
Methods of endoscopic hemostasis for acute UGIB and LGIB include:

- Injection (usually diluted epinephrine or a special sclerosing agent),
- contact and non-contact thermal devices (unipolar or bipolar electrocoagulation, heater probes, and argon plasma coagulation), and
- mechanical devices (endoscopic clips and band ligation)

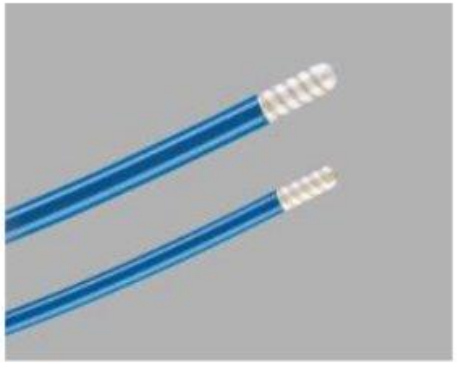
The choice of a hemostasis method is generally determined by the cause and location of GIB, the ability to access the site, and the experience of the endoscopist.

Tools available to the endoscopist

Injector Needle

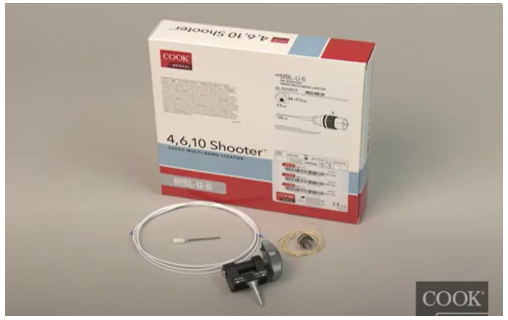


TTS Clips



Contact Bipolar Probe

Coagulation Forceps



Ovesco OTSC

STERIS Padlock

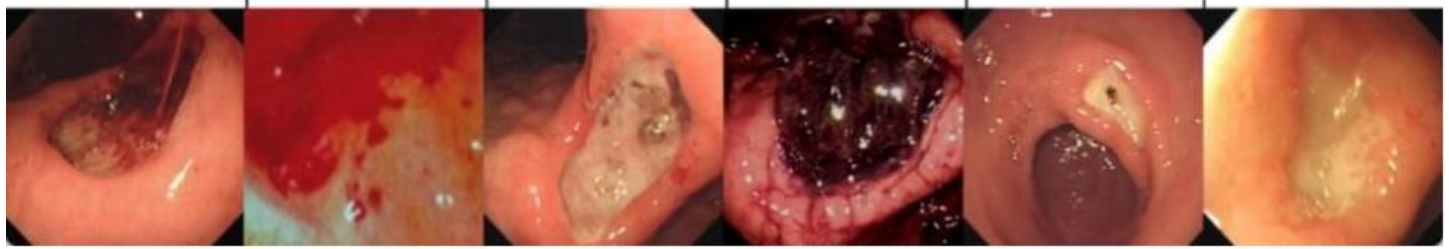
NexPowder

Society of Hospital Medicine

Forrest classification

Forrest Classification		
Stage	**Characteristics**	**Re-bleeding**
Ia	Spurting Bleed	60 - 100 %
Ib	Oozing Bleed	50%
IIa	Non-Bleeding Visible Vessel	40 - 50 %
IIb	Adherent Clot	20 - 30 %
IIc	Flat Spot in ulcer crater	7 - 10 %
III	Clean Base Ulcer	3 -5 %

Ia	Ib	IIa	IIb	IIc	III
Spurting bleed	Oozing bleed	Non-bleeding visible vessel	Adherent clot	Flat spot in ulcer crater	Clean base ulcer



Society of Hospital Medicine

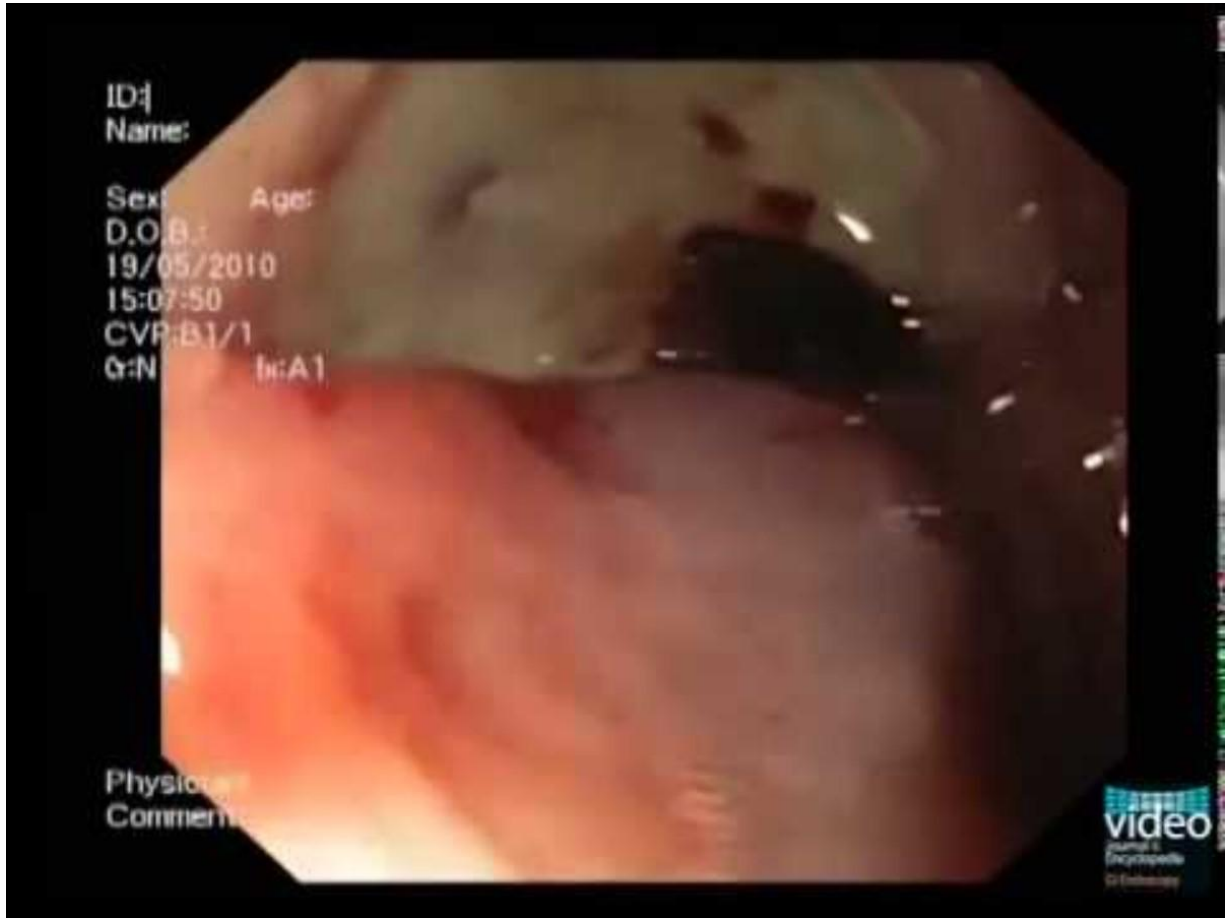
Hemostatic modality	Certainty of evidence	Strength of recommendation
Bipolar electrocoagulation	moderate	Strong (recommended)
Heater probe	moderate	Strong (recommended)
Injection of absolute ethanol	moderate	Strong (recommended)
Through-the-scope clips	Very-low to low	Conditional (suggest)
Argon plasma coagulation	Very-low to low	Conditional (suggest)
Soft monopolar electrocoagulation	Very-low to low	Conditional (suggest)
Epinephrine injection - not alone but with another hemostatic modality	Very-low to moderate	Strong (recommended)

Two recent modalities have been the cap-mounted clips and topical hemostatic agents

Laine, AJG, 2021

The Cochrane review in 2014 evaluated 19 RCTs with 2033 patients and concluded that the second bleeding control method significantly reduced the risk of rebleeding and emergency surgery compared to epinephrine injection therapy alone

Endoscopic Management of Nonvariceal Upper Gastrointestinal Bleeding



Society of Hospital Medicine

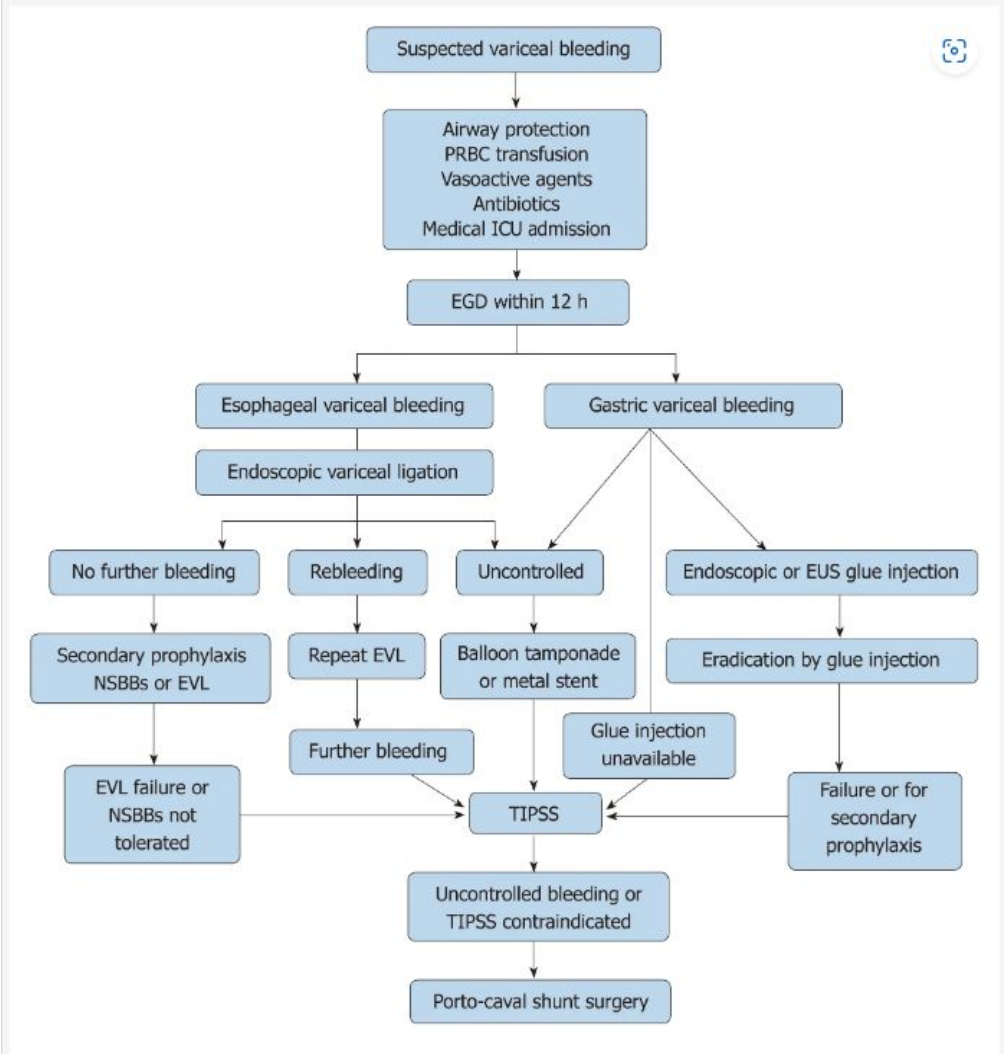
Variceal bleeding

It is important to stabilize patients prior to endoscopic treatment for variceal bleeding and to maintain an intravenous line for hemodynamic stability and a hemoglobin level of at least 7-8 g/dL through blood volume resuscitation – DO NOT overtransfuse!

Administration of prophylactic antibiotics such as intravenous quinolone or ceftriaxone is also necessary and could lower systemic bacterial infection and reduce mortality.

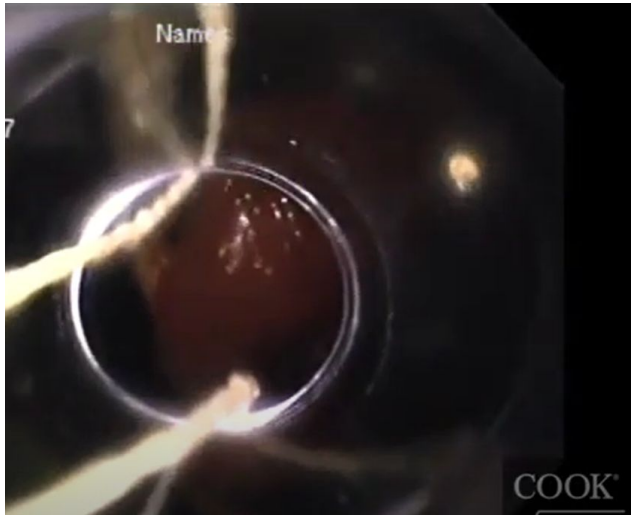
Vasoactive drugs such as octreotide, somatostatin, and terlipressin are recommended to be administered as soon as possible.

Algorithm for the management of acute variceal bleed.



Society of Hospital Medicine

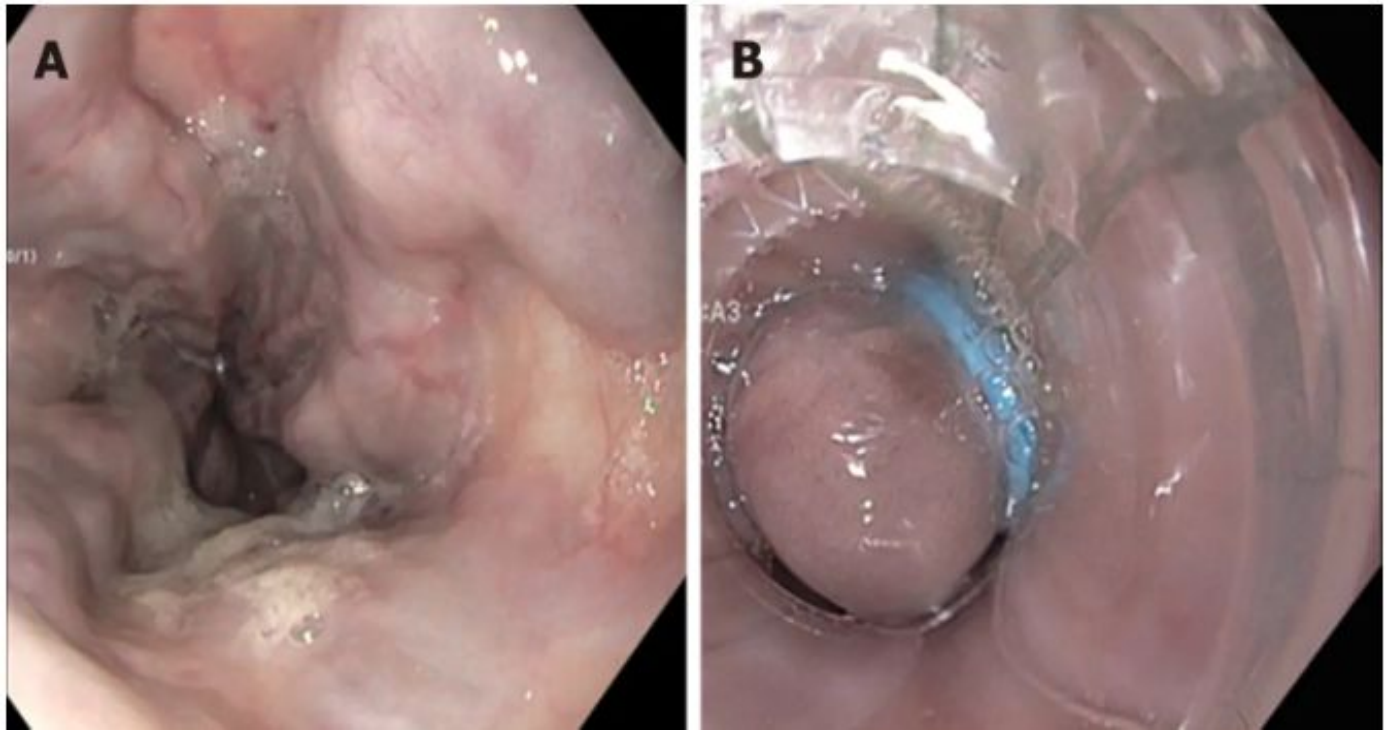
Band ligation device, how to install?



shm
Society of Hospital Medicine

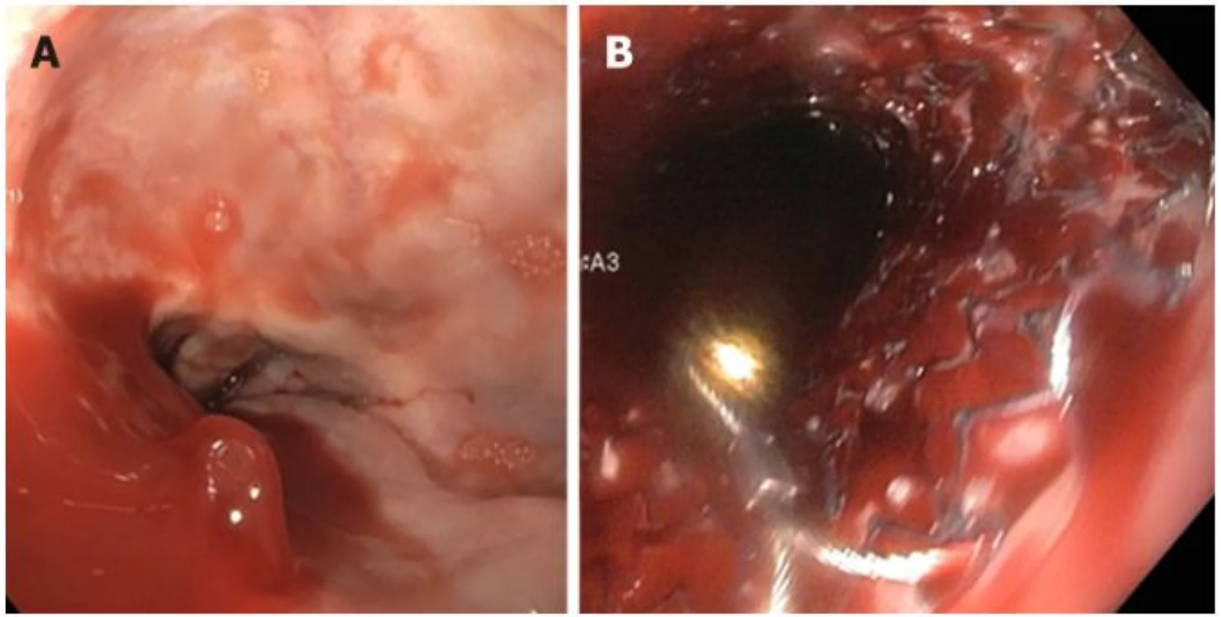
Endoscopic variceal ligation (EVL) is the treatment of choice for esophageal variceal bleeding and secondary prevention.

The diagnosis of variceal bleeding in the setting of active bleeding is based on the appearance of bleeding varices, stigmata of recent bleeding including an adherent clot over varix or platelet plug called by white nipple marks, or presence of varices without definite active bleeding focus



Society of Hospital Medicine

Metal stents for the treatment of bleeding esophageal varices. A: Bleeding esophageal varix before stenting; B: Esophageal varix after metal stent.

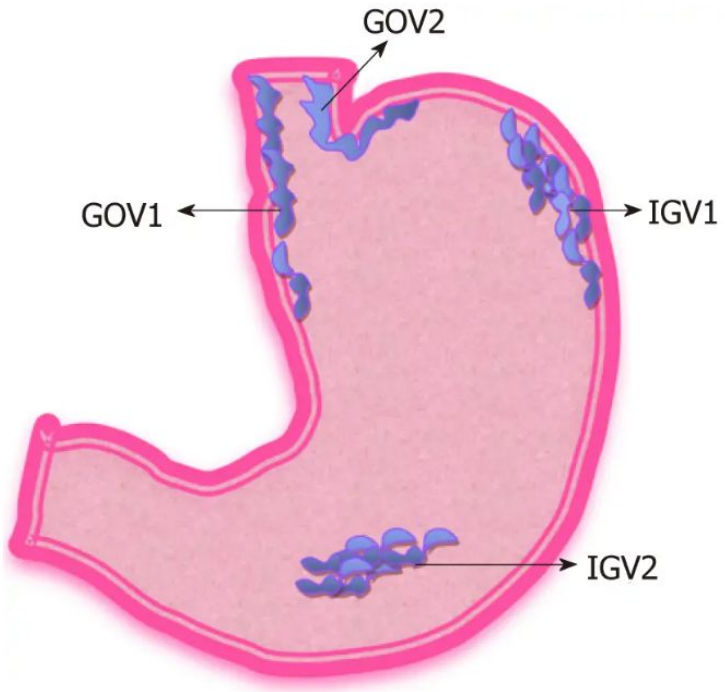


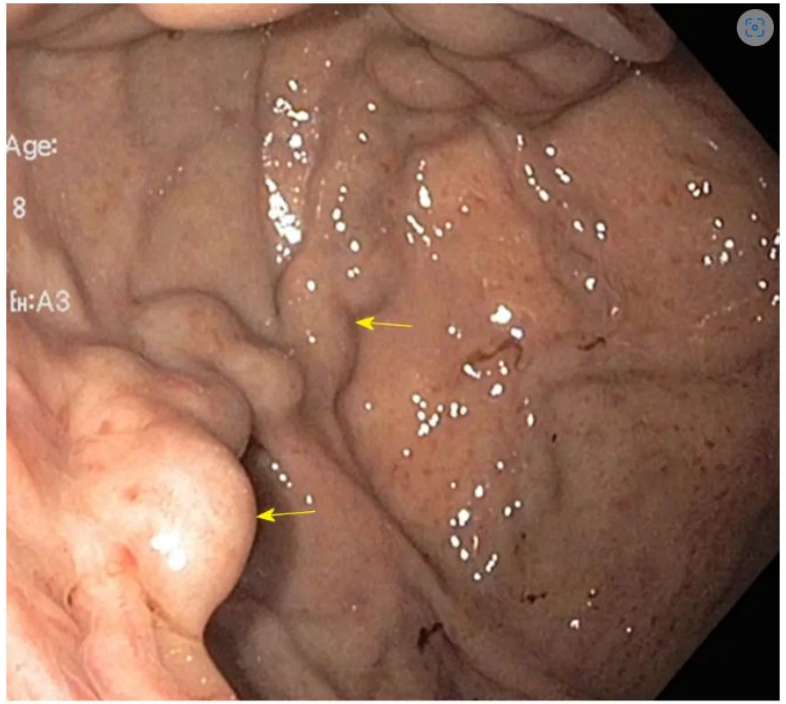
The esophageal stent, which was mainly used for luminal GI stenosis, has been used in place of balloon in refractory variceal bleeding, showing statistically significant rate of treatment success and bleeding control

Society of Hospital Medicine

Gastric varices

Sarin classification of gastric varices





Society of Hospital Medicine

Hemostatic powder spray TC-325

Recent guidelines have suggested use of TC-325 as a temporizing measure that should be followed by use of a second definitive hemostatic modality .

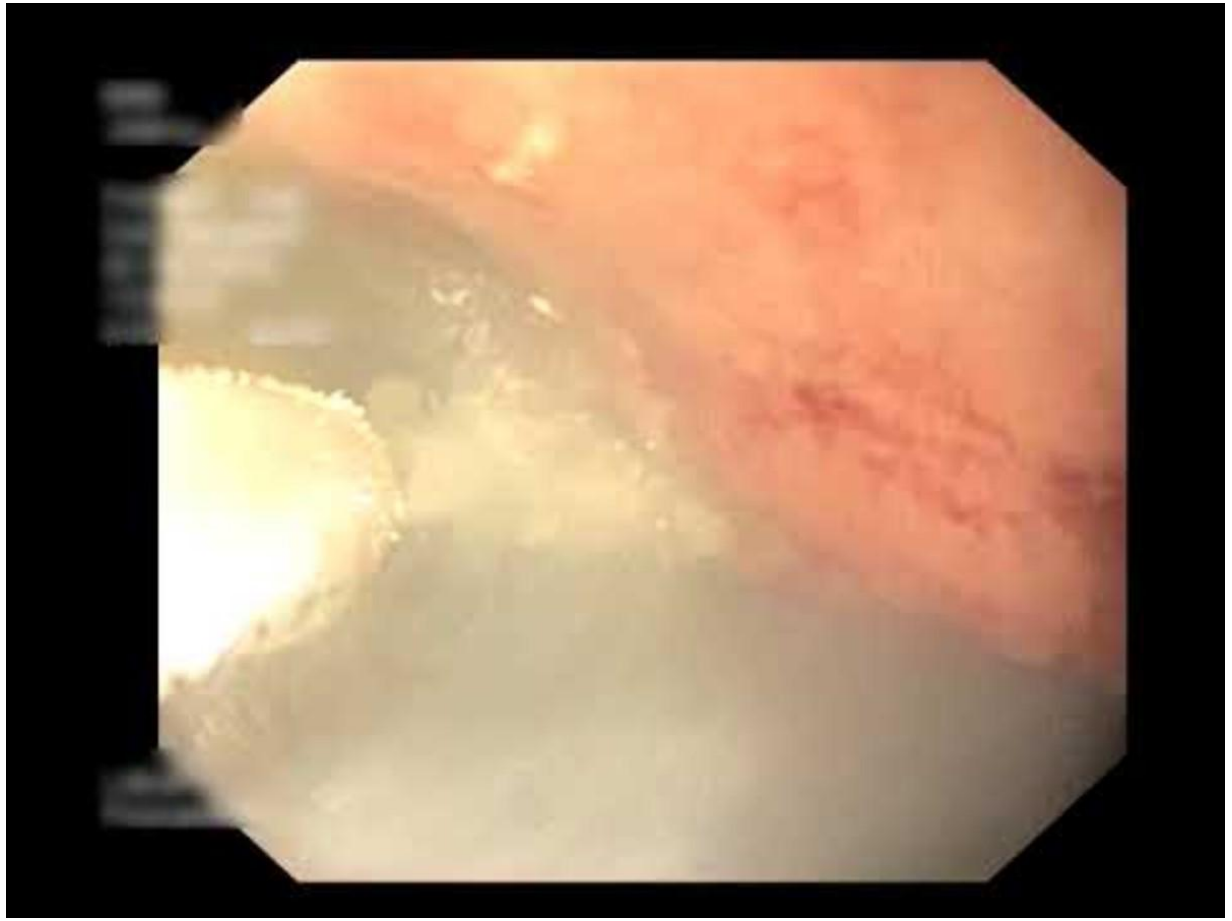
This is based on the fact that TC-325 powder sloughs off the mucosa and is eliminated from the GI tract within 24 hours after application and further bleeding is common in observational studies of TC-325: e.g., 31% (95% CI 26%–37%) in a meta-analysis of 18 observational studies and 2 RCTs

Very few approaches have been helpful for malignant bleeding - no guideline recommendations for this population

Hemospray®
Endoscopic
Hemostat Animation

Society of Hospital Medicine

Hemospray used to control a bleeding Neuroendocrine tumor in stomach



Society of Hospital Medicine

ENDOSCOPY FOR CRITICALLY ILL PATIENTS WITH SUSPECTED GIB

Patients in the intensive care unit (ICU) often have GIB from a variety of reasons.

GIB in the ICU is an important event with serious complications that increase morbidity and mortality.

Management of GIB in the ICU is difficult because most patients have complex poor prognostic factors; in most cases, they cannot be transferred to the endoscopy center.

Therefore, bedside endoscopy is a good option for these patients

Case Continued

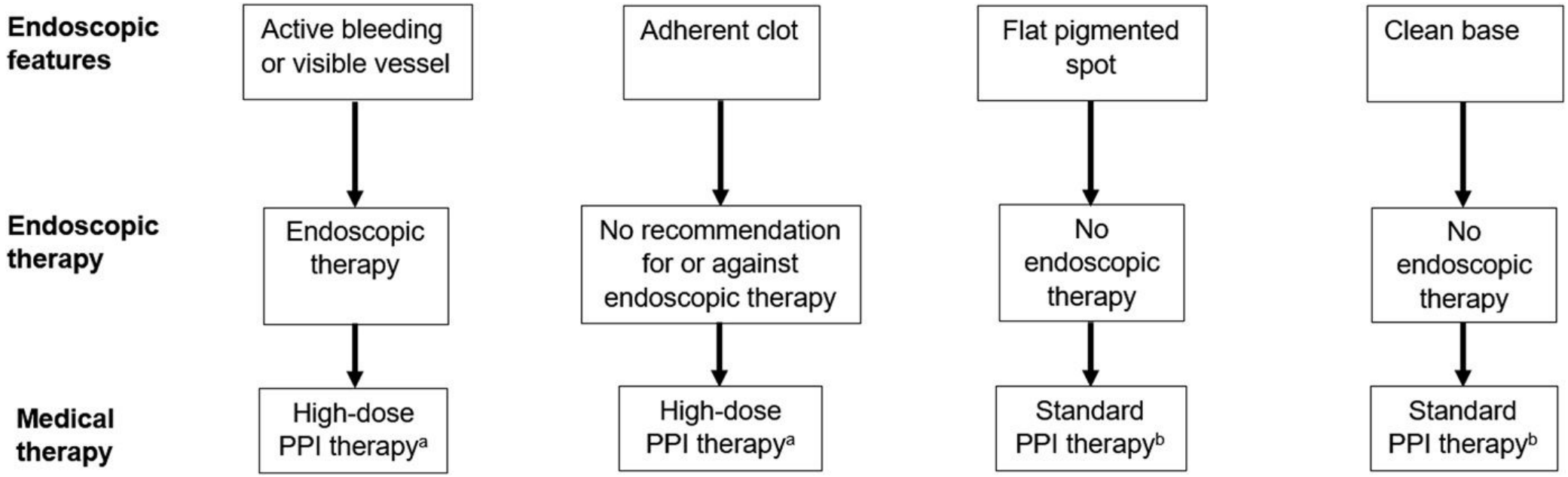
-GI scoped the patient and found a clean based ulcer in the duodenum

“One clean based ulcer identified in the proximal duodenum. Stable for medical floor. Start PPI. Discharge as per medical team”

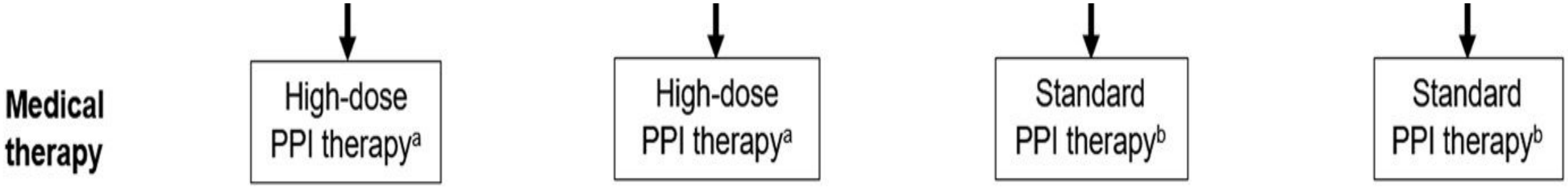
What dose PPI do you discharge on?

1. Not ready for discharge, needs 3 days of continuous IV PPI
2. Not ready for discharge, needs 3 days of Intermittent IV PPI
3. Not ready for discharge, need to repeat CBC
4. Discharge on oral omeprazole 40mg BID
5. Discharge on oral omeprazole 40mg Daily

Antisecretory therapy after endoscopic hemostatic therapy for bleeding ulcers



Society of Hospital Medicine



- 80-mg bolus followed by 8-mg/hr infusion for 3 days
- 40mg 2 to 4 times daily for 3 days, given orally if feasible, and an initial bolus of 80mg may be appropriate

- Oral PPI once-daily

Society of Hospital Medicine

- Patient is feeling fine after endoscopy
- Hemoglobin is now 9.2g/dl
- You prescribe omeprazole 40mg daily for 6 weeks
- Patient left at 9am
- Your 4th DBN this week!

Society of Hospital Medicine

Nothing

…well a new admission

Case 2

66F with significant past medical history of atrial fibrillation on apixaban, who presents with CC of BRBPR.

The ED calls you for admission because she has a hemoglobin of 8g/dl

Society of Hospital Medicine

Case 2

66F with significant past medical history of atrial fibrillation on apixaban, who presents with CC of BRBPR.

Compliant with her apixaban 5mg twice a day

Last colonoscopy 13 months ago with no polyps seen

She is feeling fatigued

Society of Hospital Medicine

Case 2

66F with significant past medical history of atrial fibrillation on apixaban, who presents with CC of BRBPR.

- **HR 101**
- **BP is 101/50 (baseline is 120/86)**
- **Hgb is 8 g/dl**
- **Platelets 301**
- **BUN 20**
- **INR 1.7**

Society of Hospital Medicine

Case 2: What do you do?

1. **Discharge patient with next day follow up**
2. **Get CT angiogram**
3. **Give FFP**
4. **Call GI consult**

Society of Hospital Medicine

CLINICAL GUIDELINES

Management of Patients With Acute Lower Gastrointestinal Bleeding: An Updated ACG Guideline

Sengupta, Neil MD[1]; Feuerstein, Joseph D. MD[2]; Jairath, Vipul MD, PhD[3]; Shergill, Amandeep K. MD[4]; Strate, Lisa L. MD, MPH[5,6]; Wong, Robert J. MD, MS (GRADE Methodologist)[7,8]; Wan, David MD[9]

Author Information

The American Journal of Gastroenterology 118(2):p 208-231, February 2023. | **DOI:** 10.14309/ajg.0000000000002130

Society of Hospital Medicine

Scoring Calculator

- Oakland Score
- Score of 8 or less predicated 95% probability of safe discharge
- Originally designed on UK data
- Externally validated in US population with 98% sensitivity

Society of Hospital Medicine

Scoring Calculator

“We suggest using risk stratification tools (e.g., Oakland score <8) to identify low-risk patients with LGIB who are appropriate for early discharge and outpatient diagnostic evaluation. Risk scores should be used to supplement but not replace clinician judgment” (Conditional recommendation, low-quality evidence)”

Society of Hospital Medicine

Age, years	<40 0	40-69 +1	≥70 +2
Sex	Female 0	Male +1	
Previous lower GI bleeding admission	**No 0**	Yes +1	
DRE findings	**No blood 0**	Blood +1	
Heart rate, bpm	**<70 0**		
	70-89 +1		
	90-109 +2		
	≥110 +3		
Systolic blood pressure, mmHg	50-89 +5		
	90-119 +4		
	120-129 +3		
	130-159 +2		
	≥160 0		
Hemoglobin, g/L (g/dL)	36-69 (3.6-6.9) +22		
	70-89 (7-8.9) +17		
	90-109 (9-10.9) +13		
	110-129 (11-12.9) +8		
	130-159 (13-15.9) +4		
	≥160 (16) 0		

Age, years	<40 0	**40-69 +1**	≥70 +2
Sex	**Female 0**	Male +1	
Previous lower GI bleeding admission	**No 0**	Yes +1	
DRE findings	**No blood 0**	Blood +1	

Heart rate, bpm	<70	0
	70-89	+1
	90-109	**+2**
	≥110	+3
Systolic blood pressure, mmHg	50-89	+5
	90-119	**+4**
	120-129	+3
	130-159	+2
	≥160	0
Hemoglobin, g/L (g/dL)	36-69 (3.6-6.9)	+22
	70-89 (7-8.9)	+17
	90-109 (9-10.9)	**+13**
	110-129 (11-12.9)	+8
	130-159 (13-15.9)	+4
	≥160 (16)	0

Hemoglobin, g/L (g/dL)	36-69 (3.6-6.9)	+22
	70-89 (7-8.9)	+17
	90-109 (9-10.9)	**+13**
	110-129 (11-12.9)	+8
	130-159 (13-15.9)	+4
	≥160 (16)	0

20 points

Oakland Score (ACG guideline)

50-62 %

Probability of safe discharge (absence of rebleeding, blood transfusion, therapeutic intervention, 28 day readmission, or death). Discharge NOT recommended. Consider admission with further workup and resuscitation as necessary.

Copied

Next Steps

Society of Hospital Medicine

Rounds continued…

- Patient came to the floor after ER gave 1L LR bolus
- HR 110 bpm
- BP 100/60
- Has two IVs
- “The green ones”- Intern (prelim)
- Appears comfortable
- Repeat Hgb still 8 g/dl
- Venous lactate 1.2
- Meds given: IV pantoprazole

Society of Hospital Medicine

“Hematochezia associated with hemodynamic instability may be indicative of an UGIB source, and an upper endoscopy should be performed if the suspicion is high to exclude a proximal source of bleeding.”

Elevated BUN:Cr can be helpful in differentiating UGIB vs. LGIB. Studies have demonstrated a ratio of >30 can have a positive LR of 7.5 for UGIB

Case 2

66F with significant past medical history of atrial fibrillation on apixaban, who presents with CC of BRBPR.

HR 101

BP is 101/50 (baseline is 120/86)

Hgb is 8 g/dl

Platelets 301

BUN 20—Creatinine 1.2 (baseline)

INR 1.7

Society of Hospital Medicine

“Should we reverse her?”

The Anticoagulants – Mechanisms of action

DAOCs (direct acting oral anticoagulants)

-Direct acting thrombin inhibitor

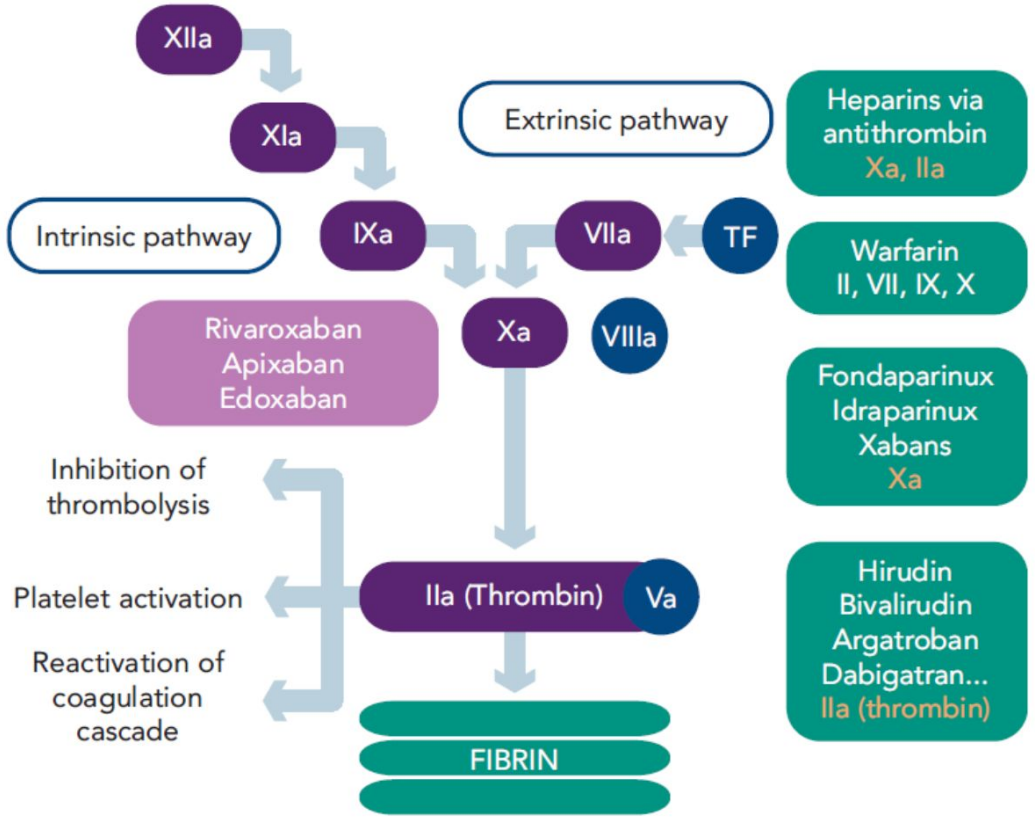
- Dabigatran (Pradaxa) t ½ 12-17 hrs

-Factor Xa inhibitors

- Rivaroxaban (Xarelto) t ½ 5-9 hrs
- Apixaban (Eliquis) t ½ 8-15 hrs
- Edoxaban (Lixiana/Savaysa) t ½ 6-11 hrs

-VKA (Vitamin K antagonist)

- Warfarin (Coumadin) t ½ 20-60 hrs



Society of Hospital Medicine

How do we counteract their effects

Blood and blood products

- PRBCs and platelets
- PCC (prothrombin complex concetrate) 3F-PCC and 4F-PCC, clotting factors II, VII, IX, X
- FFP (fresh frozen plasma)
- Vitamin K – cofactor for key cascade prteins (II, VII, IX, X)

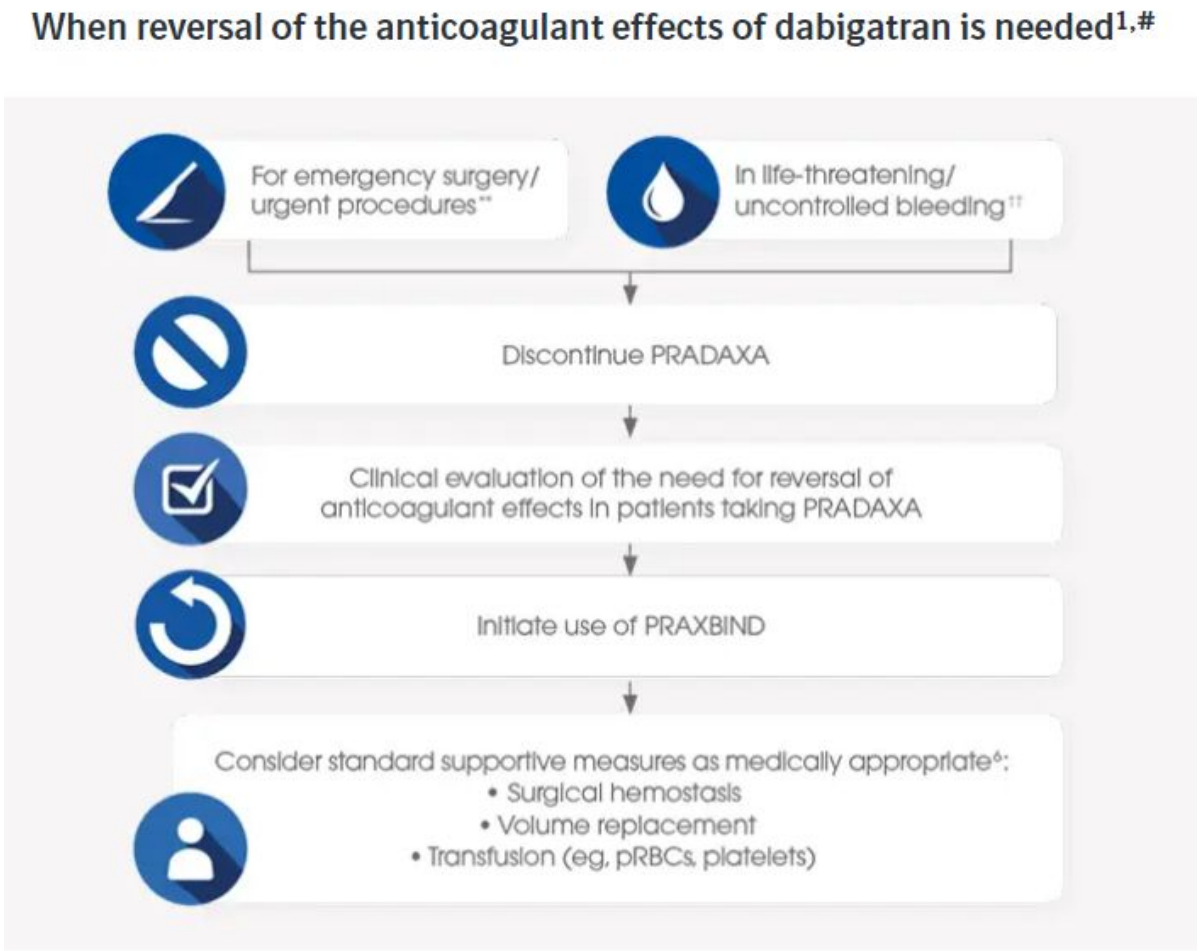
Specific reversal agents

- Idarucizumab (Praxbind) for dabigatran
- Andexanet (Andexxa) for apixaban and rivaroxaban

Society of Hospital Medicine

Idarucizumab (Praxbind)

- Reversal agent for Dabigatran
- Monoclonal antibody fragment
- Binds specifically to dabigatran/metabolites
- Neutralizes the anticoagulant effect within minutes
- No procoagulant effect (but pt still has their baseline indication for AC)
- Allows thrombin to resume its role in the coagulation cascade
- Cost >$5000 / 100 ml vial
- No adjustment for renal or hepatic impairment
- No contraindications, but need caution in patients with high thrombotic risk



Society of Hospital Medicine

Andexanet (Andexxa)

Reversal agent for rivaroxaban and apixaban

Acts as a factor Xa (FXa) decoy that:

- Binds directly to the free-floating factor Xa (FXa) inhibitors rivaroxaban and apixaban with high affinity
- Sequesters factor Xa (FXa) inhibitors
- Rapidly reduces free plasma concentration of the factor Xa (FXa) inhibitors rivaroxaban and apixaban, which neutralizes their anticoagulant effect

Cost $ 3000 / 100 ml vial

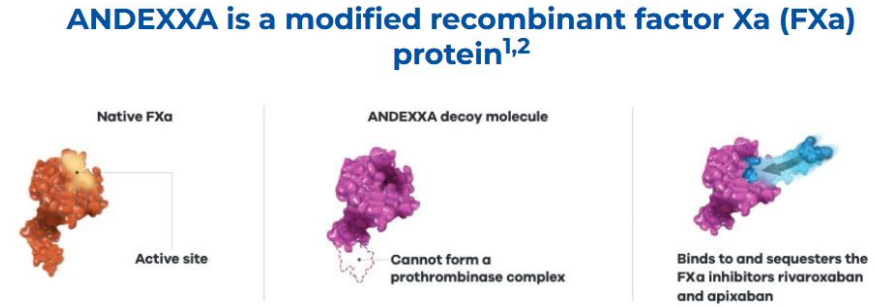
- (low dose 9 vials $29,700, high dose 18 vials $59,400)

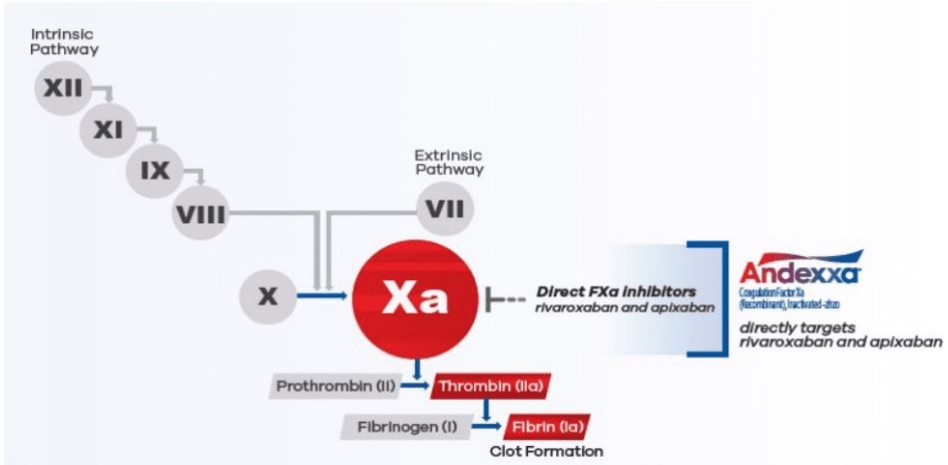
No adjustment for renal and hepatic impairment

No contraindications

Warnings

- Caution in patients with significant ischemic and cardiac risk





Society of Hospital Medicine

Determining the dose

- Specific factor Xa (FXa) inhibitor: rivaroxaban or apixaban[1]
- Strength of last factor Xa (FXa) inhibitor dose taken[1]
- Time since last factor Xa (FXa) inhibitor dose[1]

Drug *FXa Inhibitor*	**Dose** *Strength of Last Dose*	**Time** *Since Last Dose Taken*	
		<8 Hours or Unknown	*≥8 Hours*
Xarelto® (rivaroxaban)	≤10 mg	Low dose	Low dose
	>10 mg or unknown	High dose	
Eliquis® (apixaban)	≤5 mg	Low dose	Low dose
	>5 mg or unknown	High dose	

Society of Hospital Medicine

Assessment of Anticoagulation Effect

Warfarin – INR

DOACs

- Normal coagulation testing not helpful in DOAC effect
- DOAC screen
- TT (thrombin clotting time (quantitative dabigatran level)
- Anti factor Xa assay

Suspected DOAC

- PT/INR
- aPTT/TT

Society of Hospital Medicine

Appropriate use required initial assessment of bleeding!

1. **Major life-threatening bleeding**

   Hypovolemic shock or severe hypotension requiring pressors or surgery

   AND

   Decrease in hgb of > 5 g or requiring > 5 units PRBCs

2. **Major non-life threatening**

   Hospitalized or under observation with acute overt GI bleeding with melena, hematochezia, hematemesis

3. **Minor clinically significant**

   Requiring assessment by health care or requiring less invasive therapy

   Not requiring interruption of AC

4. **Minor**

   Manage conservatively

Society of Hospital Medicine

Major life-threatening bleeding

1. Resuscitation 2.

Warfarin	4F-PCC- Consider in pts with life threatening bleeding - INR substantially exceeding therapeutic range - Massive blood transfusion undesirable
	FFP – consider in these patient if PCC unavailable
	Vitamin K (IV or oral) consider in patient with INR > 10
DOACs	Last dose of DOAC within 24 hrs of presentation
	Idarucizumab – consider for dabigatran effect
	Andexanet – consider for rivaroxaban / apixaban effect Dose depends of timing ▯ >8 hrs – low dose dolus / infusion ▯ <8 hrs (or unknown) - high dose bolus / infusion

Society of Hospital Medicine

Major Non life-threatening bleeding

1. Resuscitation 2.

Warfarin	FFP Suggest against use - Biologic plausibility - Low cost - Very low certainty evidence
	PCC (prothrombin complex concentrate) - Could not reach recommendation - PCC preferred over FFP – if needed - More rapid correction of INR with PCC than FFP
	Vitamin K - Suggest against use - No evidence that prevents further bleeding or improves mortality - Oral 18-24 hrs - IV 4-6 hrs
DOACs	Idarucizumab – Suggest against use
	Andexanet – Suggest against use
	PCC – suggest against use

Society of Hospital Medicine

Timing and Safety

-Timing

- Lower GI bleeding – recent recs – Within 24hrs of presentation not shown to improve rebleeding outcome (AJG 2023)
- Upper GI bleeding – EGD within 24 hrs (independent of coagulation status) (NEJM 2020)
- Consider promotility drug (check QT) for better visualization

-Should you wait for normalization of INR?

- Preference and comfort level of the endoscopist
- Hemostatis successful in high INRs and no difference in outcomes with therapeutic and supratherapeutic INRs
  - Successful hemostasis in INRs to 2.7 (AJG 2007)
  - Rebleeding rate same for pts with INR 2-3.9 and pts with INR > 4.0 (GIE 2008)
  - INR not correlate with risk of rebleeding (APT 2011)
  - No significant difference in therapeutic outcomes between pts with therapeutic and supratherapeutic INRs (AM J Ther 2016)

REINITIATION OF ANTITHROMBOTIC AGENTS AFTER ELECTIVE ENDOSCOPY

There is consensus that antithrombotic therapy should be resumed upon completion of the procedure.

The benefits of immediate reinitiation of antithrombotic therapy for the prevention of thromboembolic events should be weighed against the risk of hemorrhage associated with the specific agent, the time to onset of the medication, and on procedure-specific circumstances (eg, risk of bleeding after sphincterotomy, polypectomy, or EMR).

In the inpatient setting:

In patients at high risk for thromboembolism, UFH or LMWH should be restarted as soon as "bleeding stability allows" and continued until the INR reaches an appropriate therapeutic level.

- UFH may be restarted 2 to 6 hours after a therapeutic procedure.
- The optimal time to restart LMWH after endoscopy has not been determined.

The 2012 ACCP guidelines recommend delaying reinitiation of LMWH 48 to 72 hours after surgery in patients believed to be at high risk for bleeding adverse events.

There are no data to inform optimal timing of resumption of NOACs after endoscopic procedures.

Because these agents have a short onset of action, if a NOAC cannot be restarted within 24 hours after a high-risk procedure because of concern regarding the adequate hemostasis, then thromboprophylaxis (ie, UFH bridge) should be considered for patients at high risk for thromboembolism.

Cardiac ASA should not be discontinued in most cases.

Other APAs should be resumed once hemostasis has been achieved

shm
Society of Hospital Medicine

“Should we reverse her?”

No we can just hold the apixaban

Case 2

66F with significant past medical history of atrial fibrillation on apixaban, who presents with CC of BRBPR.

Nurse calls and patient just had a large bloody bowel movement with clots

Blood pressure is 90/60 with a Heart Rate of 110

Mentating normally and cap refill is < 2sec

Society of Hospital Medicine

Decision Time

- Call GI
- Call RRT
- Get CTA
- Stop the Pantoprazole gtt

CT Angiography

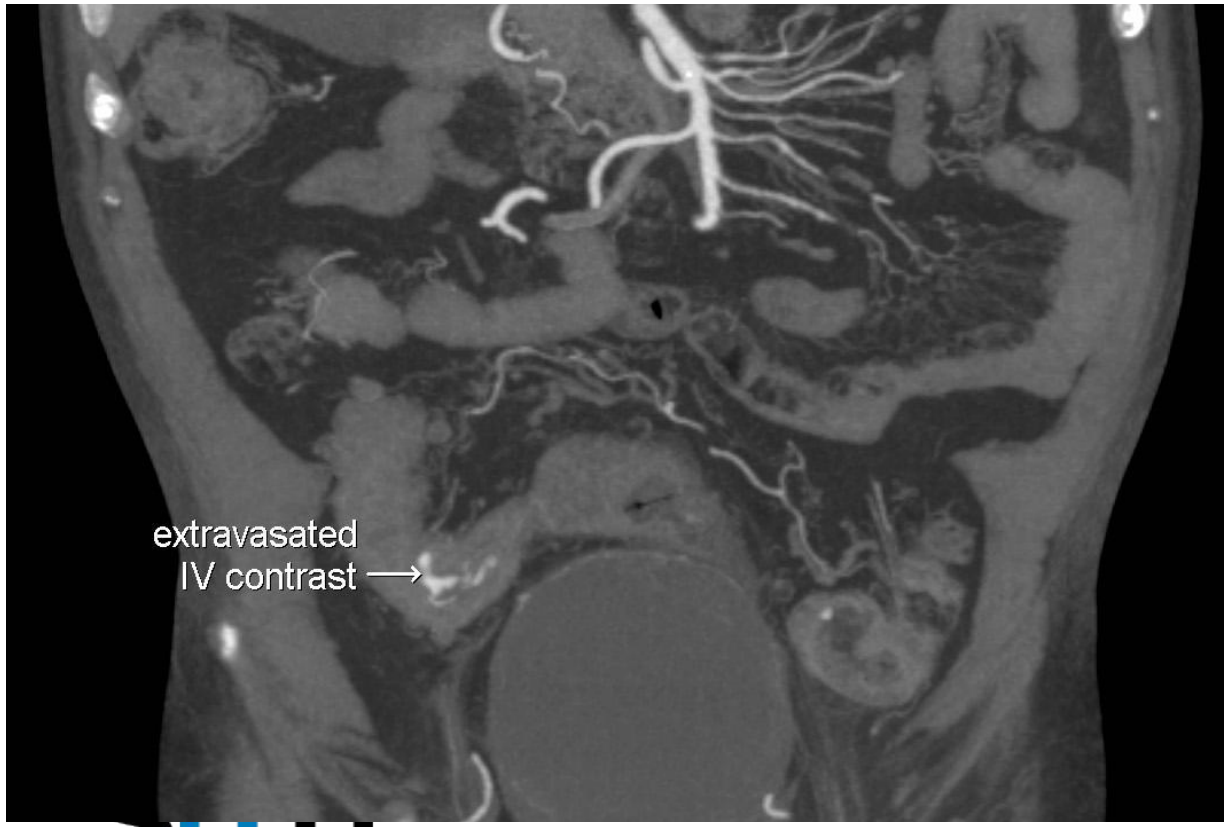
We suggest performing a CTA as the initial diagnostic test in patients with ongoing hemodynamically significant hematochezia. However, CTA is of low yield in patients with minor LGIB or those in whom bleeding has clinically subsided.

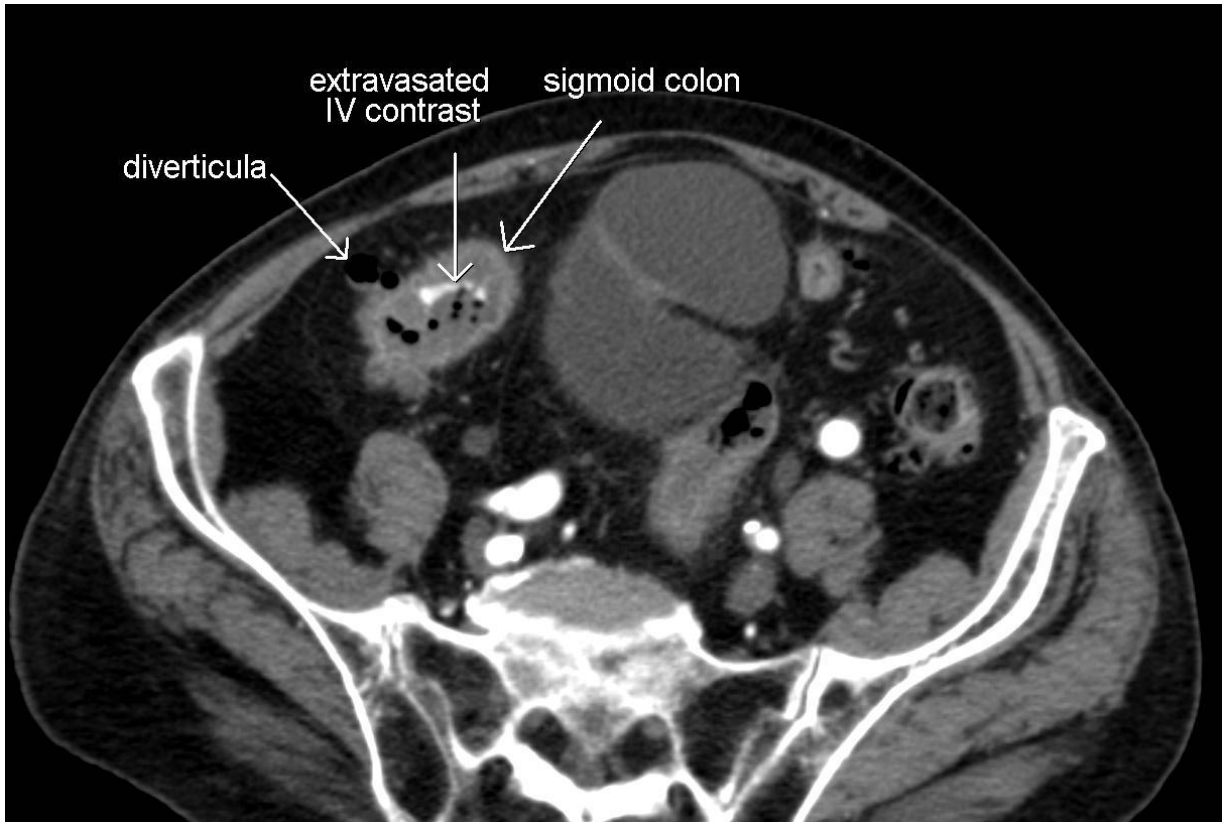
(Conditional recommendation, low-quality evidence)

CT Angiography

- Can detect bleeding rate of 0.3 to 0.5ml/min
- Retrospective data suggest a nearly 80% of patients with an initial negative CTA have no further clinical or radiologic evidence of rebleeding

CT Angiography





Society of Hospital Medicine

https://radiologyacrossborders.org/diagnostic_imaging_pathways/imaging-pathways/gastrointestinal/gastrointestinal/acute-gastrointestinal-bleeding#images

We recommend that patients who have a CTA demonstrating extravasation be promptly referred to interventional radiology for transcatheter arteriography and possible embolization. For specialized centers with experience in performing endoscopic hemostasis, a colonoscopy can also be considered after a positive CTA.

(Strong recommendation, moderate quality evidence)

Transcatheter Angiography vs. Colonoscopy

Transcatheter Angiography	Colonoscopy

Society of Hospital Medicine

Transcatheter Angiography vs. Colonoscopy

Transcatheter Angiography
• Often lower GIBs bleed intermittently • Ideally perform TA within 90 minutes of a positive CTA for best yield • Consider alerting Interventional Radiology while getting CTA to allow prep time • If bleeding is seen in UGI tract then perform urgent EGD rather than TA.

Society of Hospital Medicine

Transcatheter Angiography vs. Colonoscopy

Colonoscopy
• Recommendation to perform a nonemergent inpatient colonoscopy • Early colonoscopy can decrease length of stay, but may increase risk of recurrent bleeding and hospital readmission

Society of Hospital Medicine

Transcatheter Angiography vs. Colonoscopy

Transcatheter Angiography	Colonoscopy
• Often lower GIBs bleed intermittently • Ideally perform TA within 90 minutes of a positive CTA for best yield • Consider alerting Interventional IR while getting CTA to allow prep time • If bleeding is seen in UGI tract then perform urgent EGD rather than TA.	• Recommendation to perform a nonemergent inpatient colonoscopy • Early colonoscopy can decrease length of stay, but may increase risk of recurrent bleeding and hospital readmission

- Patient received IR embolization
- No further bleeding episodes after procedure
- Apixaban was restarted
- Patient safely discharged at 12:05pm

Thank you

Society of Hospital Medicine