NEW YORK SOCIETY FOR GASTROENTEROLOGY & ENDOSCOPY
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GI Bleeding Emergencies & Novel Techniques

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Motus GI

OVESCO

Medtronic

Olympus

VTI Technology

Enterasense

Cook

Objectives:

1. Review the guideline-based risk stratification tools for upper and lower GI bleeding.

2. To discuss novel endoscopic devices in GI bleeding related to:
    - Detection
    - Treatment
    - Visualization

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Risk Stratification

Risk Stratification: UGIB

- Risk stratify patients using the ***Glasgow Blatchford Score (GBS).***
- GBS score ≤ 1 confers a very low ≤1% risk of transfusion, hemostatic intervention or death.
- Patients with a GBS ≤ 1 can be referred for outpatient follow-up.
- For patients with a GBS ≥ 2, endoscopy should be performed within 24 hours of presentation.

Risk factors at admission	Factor score
Blood urea nitrogen (mg/dL)	
18.2 to <22.4	2
22.4 to <28.0	3
28.0 to <70.0	4
≥70.0	6
Hemoglobin (g/dL)	
12.0 to <13.0 (men); 10.0 to <12.0 (women)	1
10.0 to <12.0 (men)	3
<10.0	6
Systolic blood pressure (mm Hg)	
100–109	1
90–99	2
<90	3
Heart rate (beats per minute)	
≥100	1
Melena	1
Syncope	2
Hepatic disease[a]	2
Cardiac failure[a]	2

[a]Hepatic disease and cardiac failure were not defined in the original report of the Glasgow-Blatchford score. One more recent study defined hepatic disease as known history, or clinical and laboratory evidence, of chronic or acute liver disease and cardiac failure as known history, or clinical and echocardiographic evidence, of cardiac failure (6).

Laine L et al. Am J Gastroenterol. 2021.

Risk Stratification: LGIB

- Risk stratify patients using the ***Oakland Score (OS)*.**

- An OS ≤ 8 predicts a 95% probability of safe discharge defined as the absence of:
  - Rebleeding
  - pRBC transfusion
  - Therapeutic intervention
  - 28-day readmission
  - Death

- For hospitalized patients, perform a <u>non-emergent colonoscopy</u> if there is ongoing bleeding and a high-quality colonoscopy has not been performed with 1 year.

Oakland score	
Age, yr	
<40	0
40–69	1
>70	2
Sex	
Female	0
Male	1
Previous LGIB 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 (mm Hg)	
50–89	5
90–119	4
120–129	3
130–159	2
>160	0
Hemoglobin (g/dL)	
3.6–6.9	22
7.0–8.9	17
9.0–10.9	13
11.0–12.9	8
13.0–15.9	4
>16.0	0

Sengupta N et al. Am J Gastroenterol. 2023.

Novel Tools in Bleeding Detection

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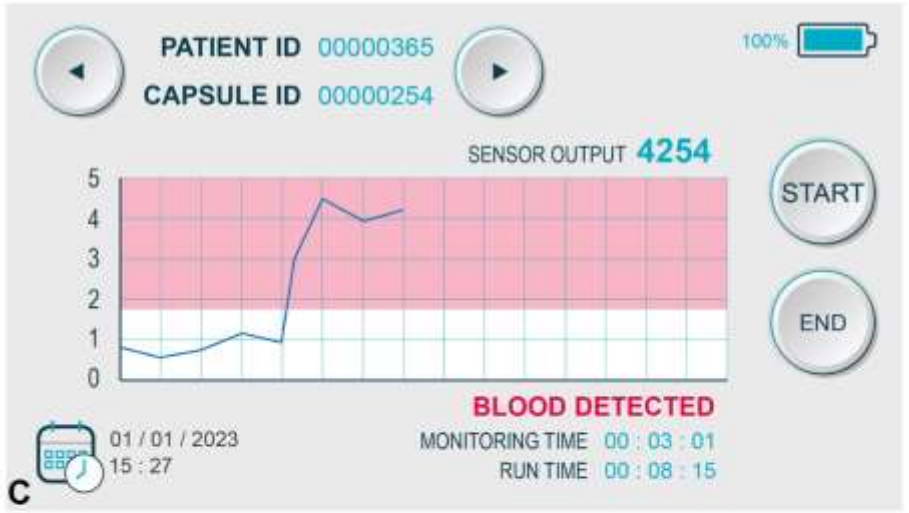
Blood-Sensing Capsule:

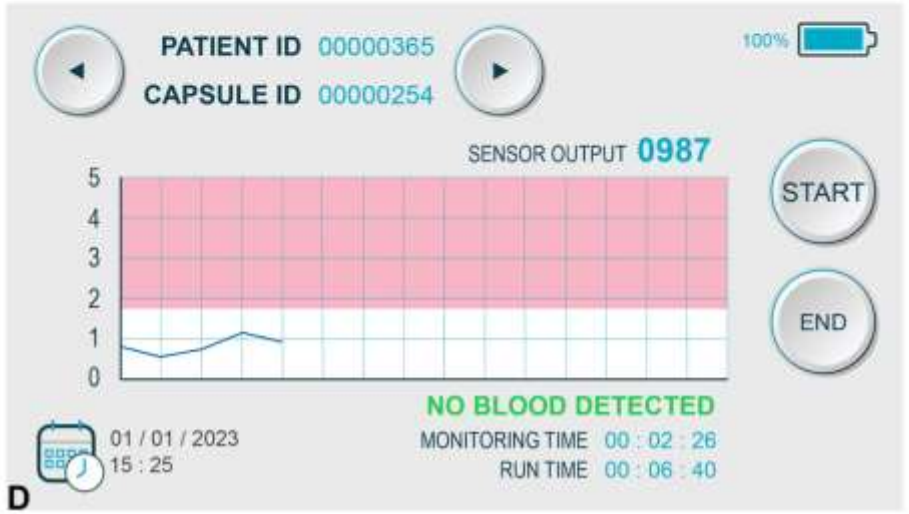
11x27mm

A

B



C



D

Akiki K et al. Gastrointest Endosc. 2024.

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Features and Use:

- Optical sensor capsule that detects blood by measuring the absorption of multiple light wavelengths.
- The pill is ingested with water and the patient lays left lateral for 10 min.
- Results display in real-time as “blood detected” or ”no blood detected”.
- Contraindications are similar to other swallowed GI capsules: dysphagia, achalasia, esophageal diverticulae, implantable cardiac devices, motility disorders, strictures.

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Akiki K et al. Gastrointest Endosc. 2024.

Preferred Clinical Uses:

1. Risk stratification for patients with suspected UGIB.

2. To distinguish an upper vs. lower GI bleeding source.

3. Triage of patients who are not medically optimized for endoscopy.

4. Assess for true rebleeding.

A novel blood-sensing capsule for rapid detection of upper GI bleeding: a prospective clinical trial

Karl Akiki, MD,[1] Tala Mahmoud, MD,[1] Mohammad H. Alqaisieh, MD,[1] Lea N. Sayegh, MD,[1] Kristin E. Lescalleet, DO,[1] Barham K. Abu Dayyeh, MD, MPH,[2] Louis M. Wong Kee Song, MD,[2] Mark V. Larson, MD,[2] David H. Bruining, MD,[2] Nayantara Coelho-Prabhu, MBBS,[2] Navtej S. Buttar, MD,[2] Robert E. Sedlack, MD,[2] Vinay Chandrasekhara, MD,[2] Cadman L. Leggett, MD,[2] Ryan J. Law, DO,[2] Elizabeth Rajan, MD,[2] Ferga C. Gleeson, MB, BCh,[2] Jeffrey A. Alexander, MD,[2] Andrew C. Storm, MD[2]

- Safety and efficacy of the blood-sensing capsule in patients with upper GI bleeding
- Findings on the sensor were compared to EGD performed within 4 hours
- Prospective, open-label, single-arm study
- 126 patients (ED/outpatient) at a single tertiary care center

Akiki K et al. Gastrointest Endosc. 2024.

Results:

Sensitivity	92.9% (p=0.02)
Specificity	90.6% (p<0.001)
Positive Predictive Value	74.3%
Negative Predictive Value	97.8%

- No adverse events or deaths
- All capsules were excreted

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Akiki K et al. Gastrointest Endosc. 2024

What’s “New” in Hemostasis?

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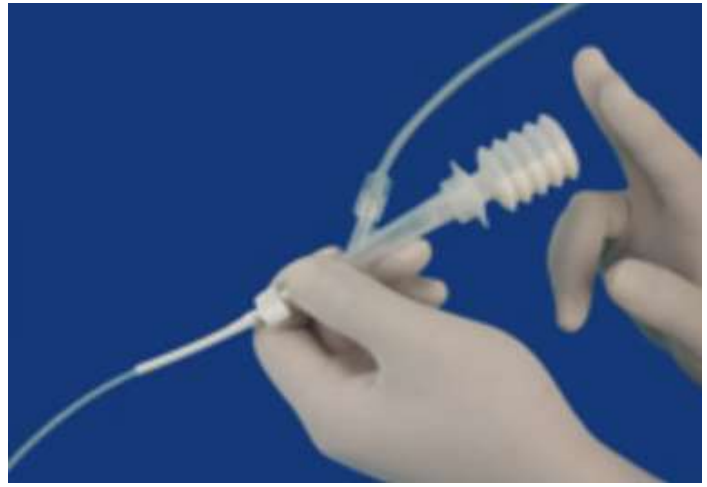
Hemostatic Powder Sprays:

TC-325

UI-EWD

AMP



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Hemostatic Powder Sprays: Guidelines

- The 2021 ACG UGIB Guidelines recommend the use of hemostatic powder spray for patients with actively bleeding ulcers (conditional recommendation, very-low to moderate-quality evidence).

- The 2021 ESGE suggests that in patients with persistent bleeding refractory to standard hemostasis modalities, the use of a topical hemostatic spray/powder…should be considered (weak recommendation, low quality evidence).

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Laine L et al. Am J Gastroenterol. 2021.
Gralnek IM et al. Endoscopy. 2021.

Hemostatic Powder Sprays

Advantages	Disadvantages
• Non-contact • Non-thermal • Non-specific • Non-positional • Atraumatic • Diffuse • Versatile use (primary, combination, rescue or preventative)	• Limited durability • Snow globe effect • Catheter clogging • High pressure delivery • Single use system • Volume of powder • Cost

	TC-325	UI-EWD	AMP
Material	Inert mineral powder composed of bentonite	Inert mineral powder composed of succinic anhydride and oxidized dextran	Absorbable modified polymers (AMP) derived from plant starch
Mechanism of Action	-Adhesive and cohesive seal of the bleeding site. -Aggregates platelets and coagulation factors	-In the presence of water forms a hydrogel that is adhesive to tissue.	-Forms gel matrix through rapid absorption of water -Concentrates RBCs, platelets, coagulation factors. -Activates fibroblasts and growth factors

Jiang SX et al. Endosco Int Open. 2022.
Paoluzi OA et al. Medicina. 2023.

	TC-325	UI-EWD	AMP
Air Source	CO2	Air	Air with an external compressor
Catheter Size	7F or 10F	7.5F	7F
Volume	20G	3G (up to twice)	3G or 5G
Blood Required?	Yes	No	Yes
Indication / FDA Approval	Upper / Lower GIB	Upper GIB	Upper / Lower GIB

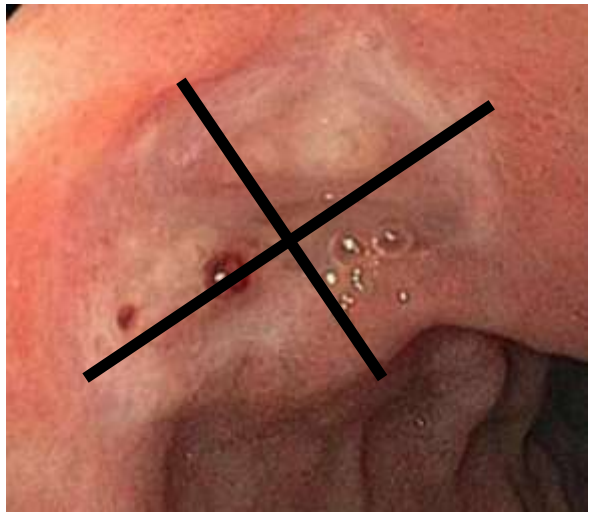
Jiang SX et al. Endosco Int Open. 2022.
Paoluzi OA et al. Medicina. 2023.

Hemostatic Gels: TDM-621

- Topical hemostatic gel composed of a specific sequence of amino acids.
- When activated the gel self-assembles into beta protein sheets forming a scaffold similar to human extracellular matrix.
- Effective on blood or body fluid which activates use.
- Transparent gel without scatter
- No catheter clogging
- No animal/plant products or preservatives
- Prefilled 1 mL – 3 mL – 5mL syringes

Branchi F et al. Surg Endosc. 2022.
Paoluzi OA et al. Medicina. 2023.

Endoscopic Doppler Probe (EDP):



GUIDELINES	The role of EDP is still under evaluation.
PRACTICAL USES	1. When deciding between stigmata (visible vessel v. flat pigmented spot). 2. To determine the optimal site of endoscopic therapy. 3. To map the trajectory of bloodflow. 4. To assess the effectiveness of hemostasis.
SUMMARY OF EVIDENCE	Arterial flow within ulcer bases has been associated with higher rates of ulcer rebleeding. • RCT: For patients with PUD and all stigmata of hemorrhage, the EDP reduced 30 days rebleeding. • Meta: Reduces rebleeding, surgery, and bleeding related mortality when compared to standard therapy.

Jensen DM et al. Gastroenterology. 2017.
Bhurwal A et al. Expert Rev Gastroenterol Hepatol. 2021.

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Over-the-Scope Clip (OTSC):

GUIDELINES	Patients with known peptic ulcer disease previously treated with standard therapy who experience rebleeding (secondary therapy).
PRACTICAL USES	1. Severe & hemodynamically significant GI bleeding. 2. Patients with large or deeply cratered ulcers not amenable to treatment with standard techniques.
SUMMARY OF EVIDENCE	• RCT and Prospective studies (Primary Therapy): improved hemostasis compared to standard therapy. • RCT (Secondary Therapy): improved hemostasis compared to standard therapy.

Jensen DM et al. Clin Gastroenterol Hepatol. 2021.
Meier B et al. Gut. 2022.
Lau JYW et al.. Ann Intern Med. 2023.
Schmidt A et al. Gastroenterology. 2018.

Improving Endoscopic Visualization in GI Bleeding

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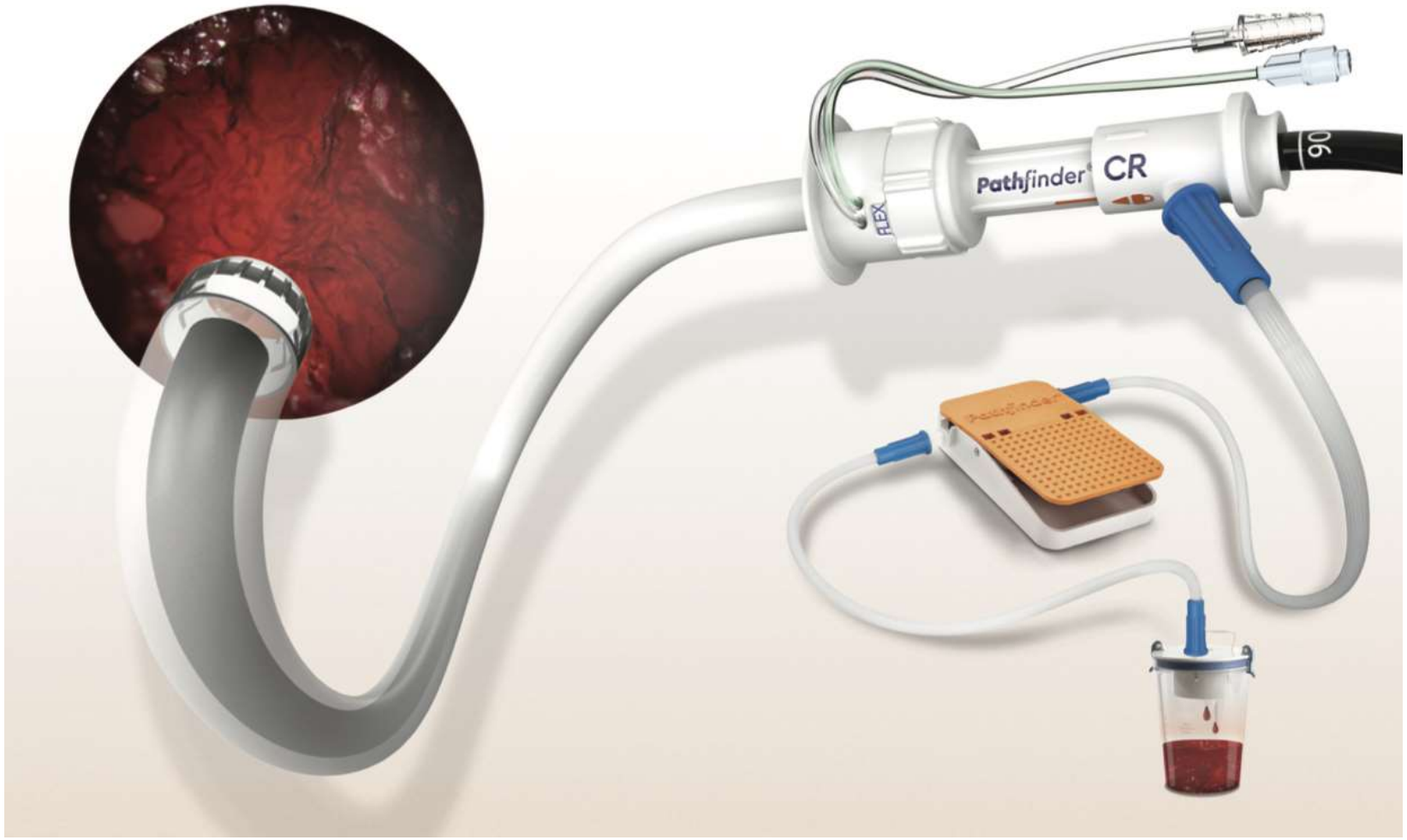
Clot Suctioning & Cleansing: Device 1

Motus GI

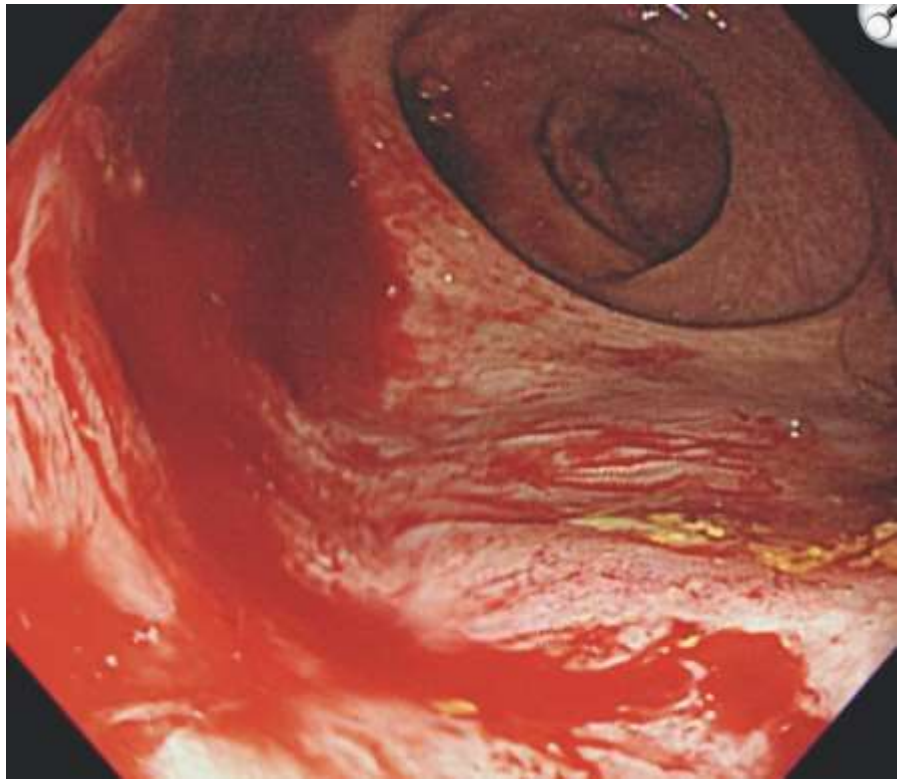
Clot Suctioning & Cleansing: Device 2



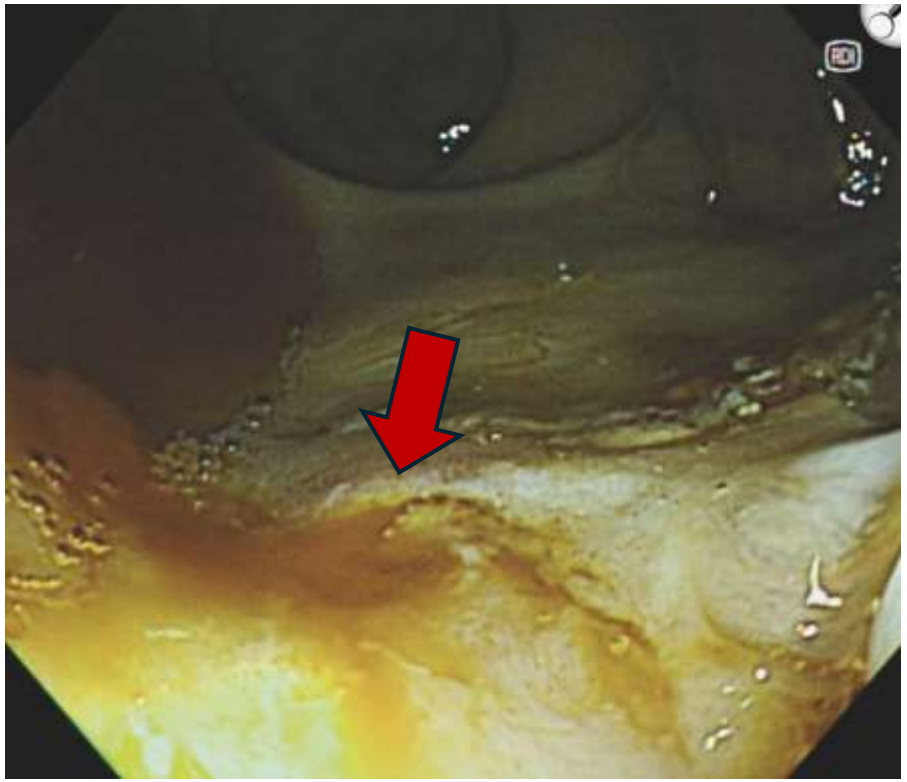
Neptune, Pathfinder CR

Red Dichromatic Imaging:

White Light Image



Red Dichromatic Image



Huang CW et al. Endoscopy. 2024.

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Take Home Points:

- Regularly incorporate the use of risk stratification tools into your decision making.
- Familiarize yourself with the existing and emerging evidence that supports the use of novel endoscopic devices in GI bleeding.
- Continue to explore and adopt the use of endoscopic devices that facilitate the diagnosis and treatment of GI bleeding.

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