Massive Hemorrhage

HARMAN S. GILL

AVERA CORE LECTURE SERIES

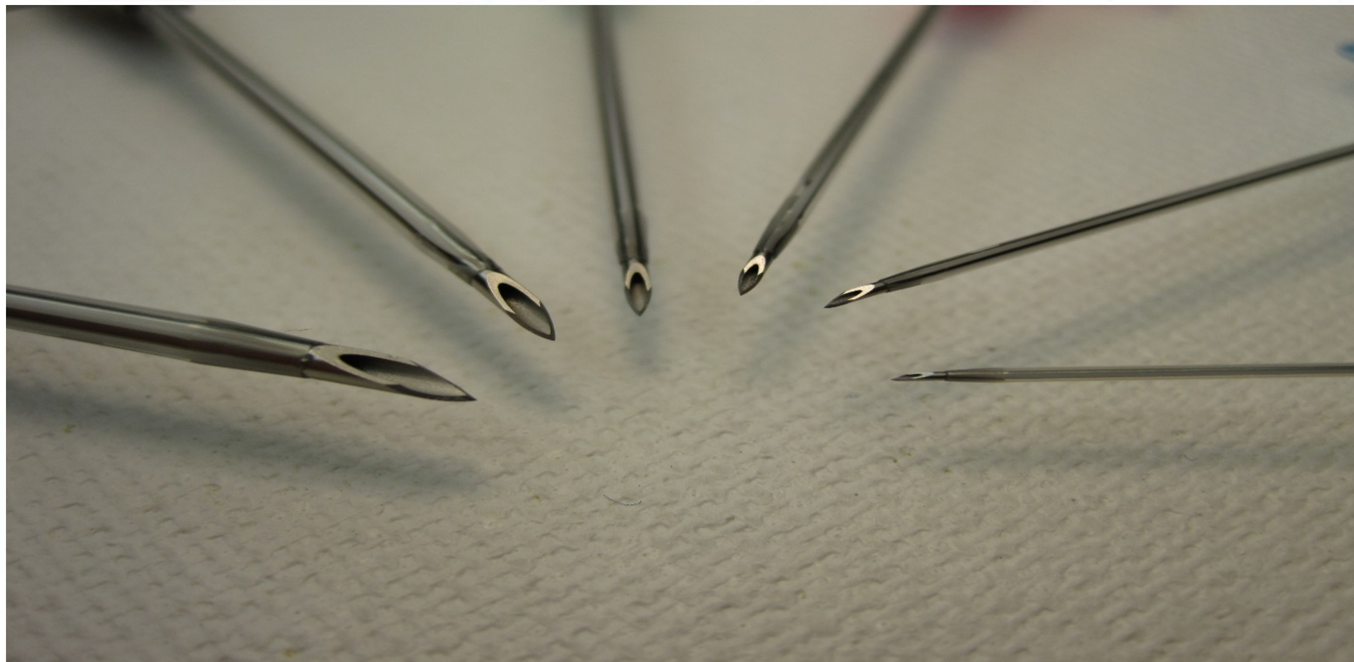
Hypovolemic Shock

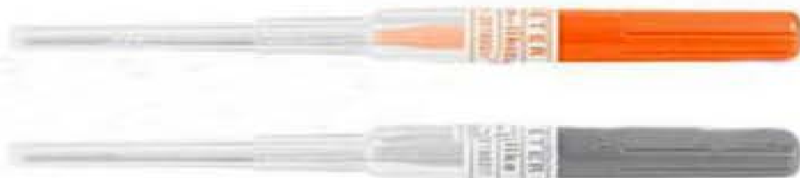
Classification of Hemorrhage				
Class	**I**	**II**	**III**	**IV**
Blood loss (mL/% blood vol)	<750 (<15%)	750-1,500 (15%-30%)	1,500-2,000 (>30%)	>2,000 (>40%)
Heart rate	<100	>100	>120	>140
Systolic blood pressure (mm Hg)	Normal	Normal	<90	<70
Pulse pressure (mm Hg)	Normal or decreased	Decreased	Decreased	Decreased
Capillary refill	<1	1-2	>2	Absent
Respiratory rate (breaths per min)	<20	20-30	30-40	>40
Urine output (mL/hr)	>30	20-30	5-15	Negligible

EMNote.org

IV Cannula Sizes & Colors

Gauge	Indications
14G	Trauma, surgical procedures
16G	Trauma, surgical procedures
18G	Trauma, quick blood transfusion
20G	Normal IV or blood transfusion
22G	Children, older adults
24G	Neonates, children, old elderly
26G	Neonates





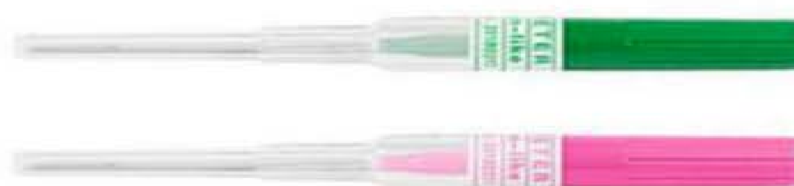
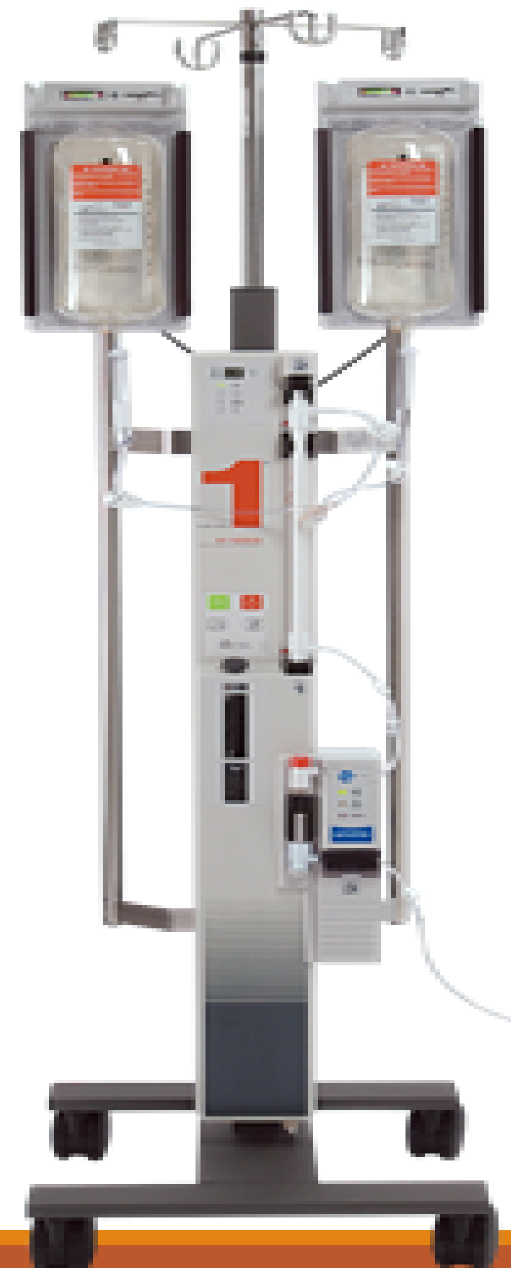
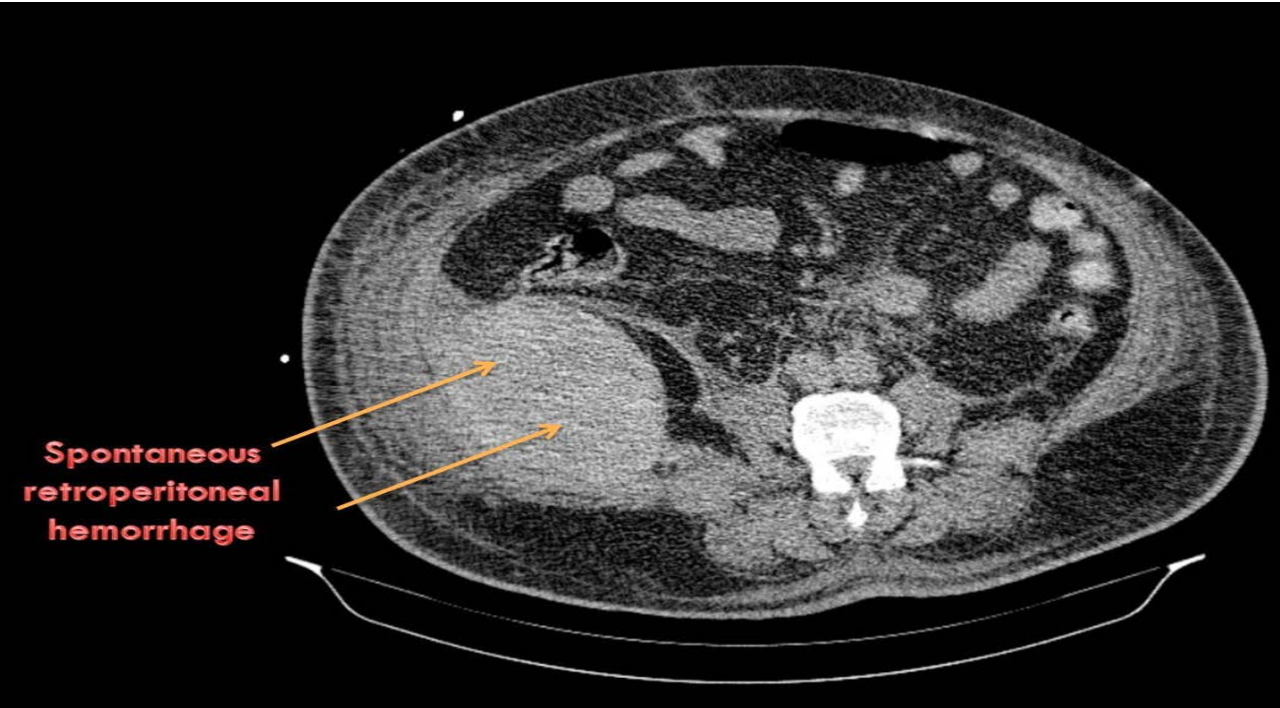


Table 1. Mean Flow Rates and Mean Time to Empty by Catheter Type

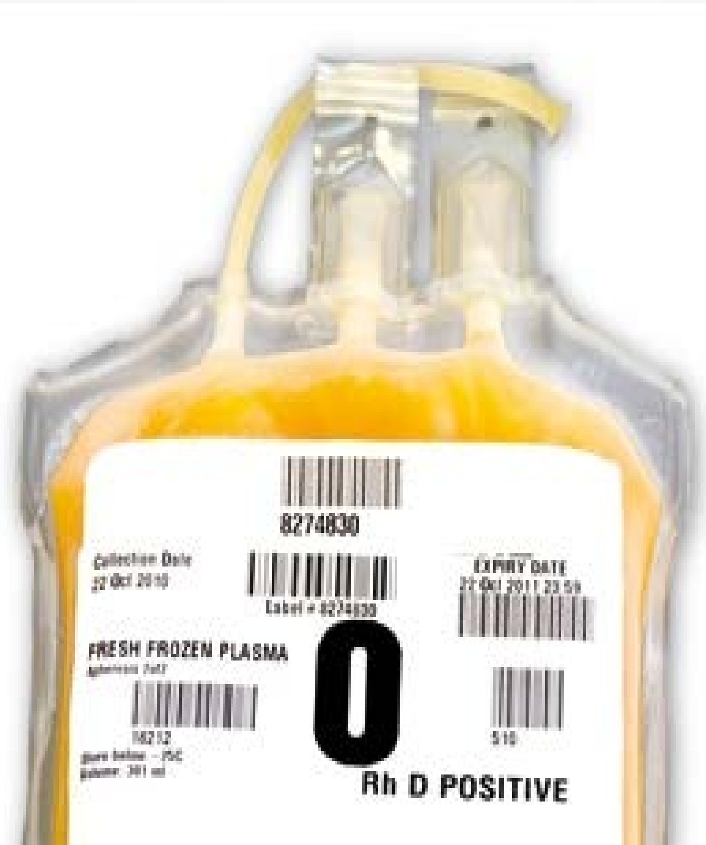
Catheter Type	Gravity Trial Time to 1L NS (min:sec)	Gravity Trial Flow Rate (ml/min)	P-Value Compared w/ TLC3 Gravity	Pressure Trial Time to 1L NS (min:sec)	Pressure Trial Flow Rate (ml/min)	P-Value Compared w/ TLC3 Pressure
Triple Lumen (distal port)	19:45	50.648	<>	15:45	63.47	<>
Triple Lumen (2 ports)	12:33	79.707	<>	11:01	90.806	.08
Triple Lumen (all ports)	8:44	114.405	N/A	6:54	145.001	N/A
16 ga PVC	7:36	131.675	.069	6:26	155.44	.076
6 Fr CVC	7:26	134.63	.002	6:16	159.433	.311
14 ga PVC	7:00	142.971	.001	6:02	165.746	.008
8.5 Fr CVC	6:12	161.435	.007	5:16	189.673	.020

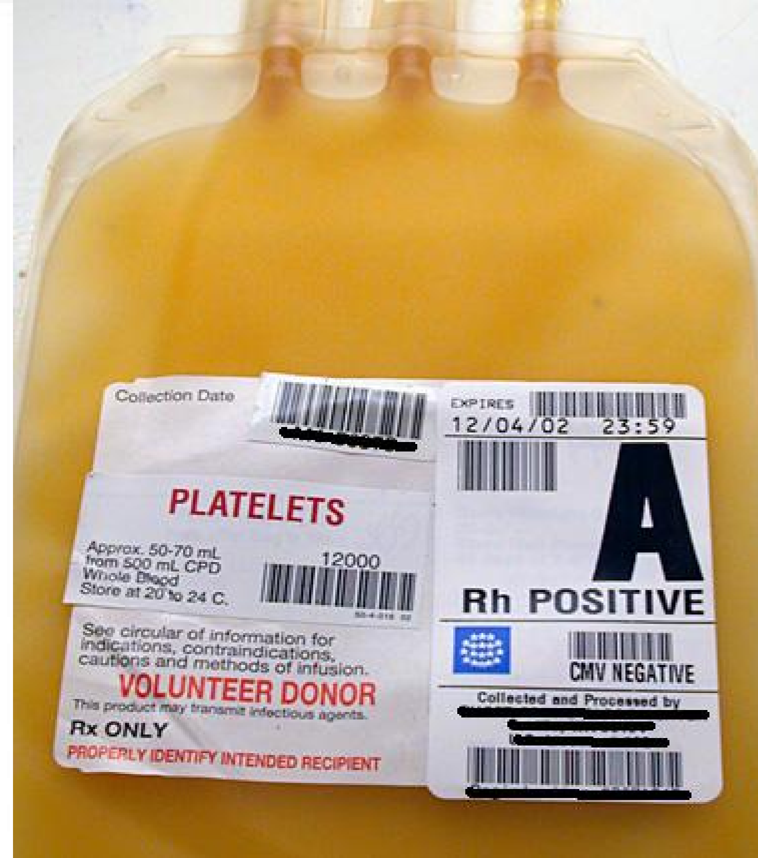


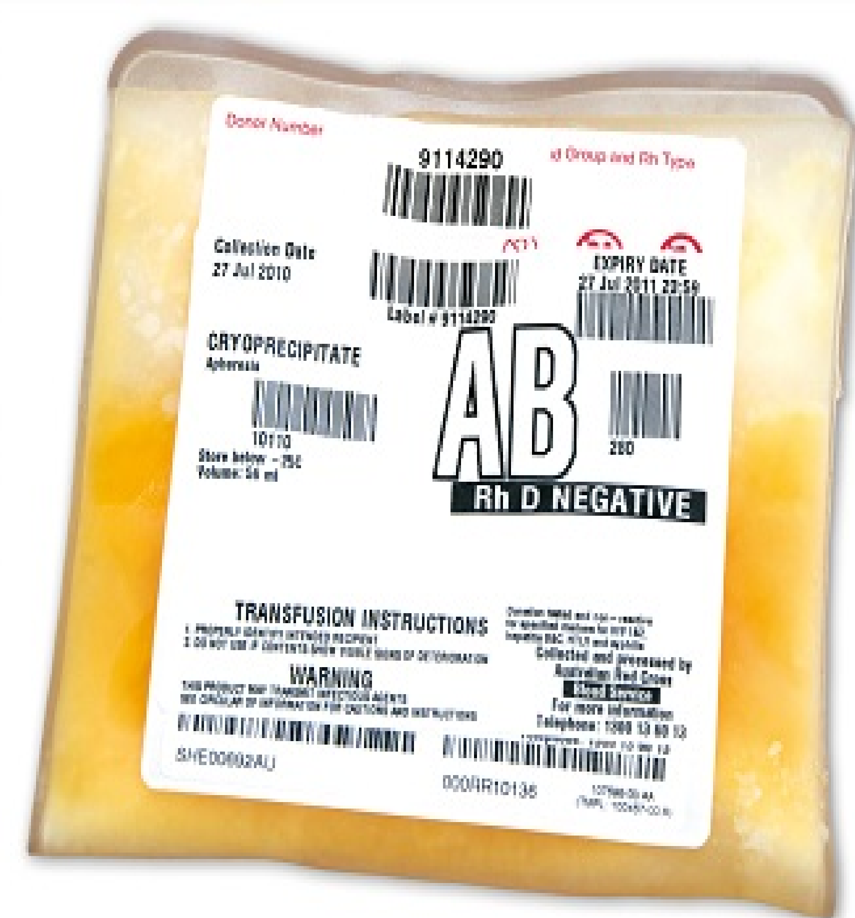
AKILA JIBRIN


Spontaneous
retroperitoneal
hemorrhage

DEA 4 UNIVERSAL
PACKED RED CELLS

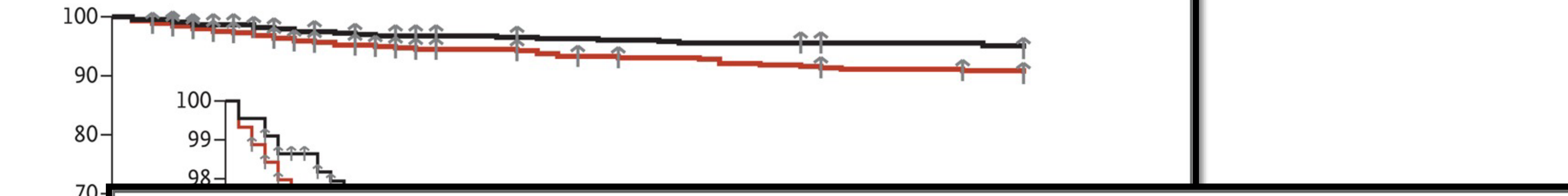






LOW ratio, balanced, transfusion

A Survival, According to Transfusion Strategy



Overall Survival (%)

60
50
40
30
20
10
0

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

0.1 1.0 10.0

Restrictive Strategy Better | Liberal Strategy Better

PERMISSIVE HYPOTENSION

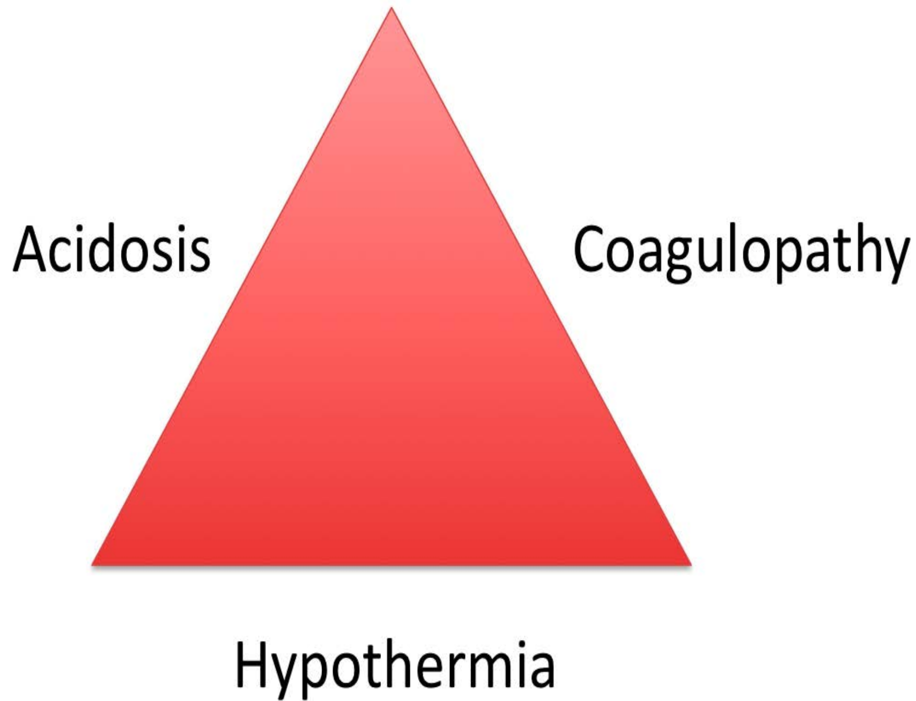


Table 1: Traditional classification of hypothermia & revised classification for trauma patients

Degree of hypothermia	Traditional classification (°C)	Trauma classification (°C)
Mild	32–35	34–36
Moderate	28–32	32–34
Severe	20–28	< 32

- Mihata RG, Bonk JA, Keville MP. Resuscitation of the patient with massive upper gastrointestinal bleeding. EM Crit Care. 2013:3(2):1–12.
- Gerecht R. The lethal triad: Hypothermia, acidosis and coagulopathy create a deadly cycle for trauma patients. JEMS. 2014;39(4):56–60. Cardenas A, Gines P, Uriz J, et al.
- Renal failure after upper gastrointestinal bleeding in cirrhosis: Incidence, clinical course, predictive factors, and short-term prognosis. Hepatology. 2001;34(4):469–475.
- Bendtsen F, Krag A, Moller S. Treatment of acute variceal bleeding. Dig Liver Dis. 2008;40(5):328–336.
- Beeson J, Starnes T. Add a little salt: Permissive hypotension in trauma resuscitation. JEMS. 2013;38(4):36–43.

Case 1

- 88,m comes in for malaise
- Pale, BP – 100/60, baseline HTN, guaic positive exam
- Hg of 6
- No liver disease
- No known coagulopathy

Table 2—*Causes of Acute Upper GI Bleeding in Adults*

Etiologies of UGIB	% of all UGIB
Most common lesions	
1. Peptic ulcer disease	
Duodenal ulcer	30–37
Gastric ulcer	15–20
-*H pylori* associated	
-Drug-induced ulcers	
-Stress induced	
2. Varices	5–10
-Esophageal	
-Gastric	
3. Portal hypertensive gastropathy	5–10
4. Mallory-Weiss tear	3–7
5. Erosive esophagitis	2
Less common lesions	
1. Neoplastic lesions	1–4
2. Vascular malformations, eg, gastric antral vascular ectasia	0.5–2
3. Dieulafoy's lesion: aberrant large-caliber submucosal vessel eroding the overlying epithelium	1
4. Pill-induced esophagitis: alendronate, KCL	<1
5. Aortoenteric fistula	<1
6. Infectious esophagitis or gastritis, eg, herpes, CMV, HIV, *Candida*	

Infectious esophagitis: <1%.

Priorities?

Table 4—*Risk of Recurrent UGIB Based on Index Endoscopy Findings*

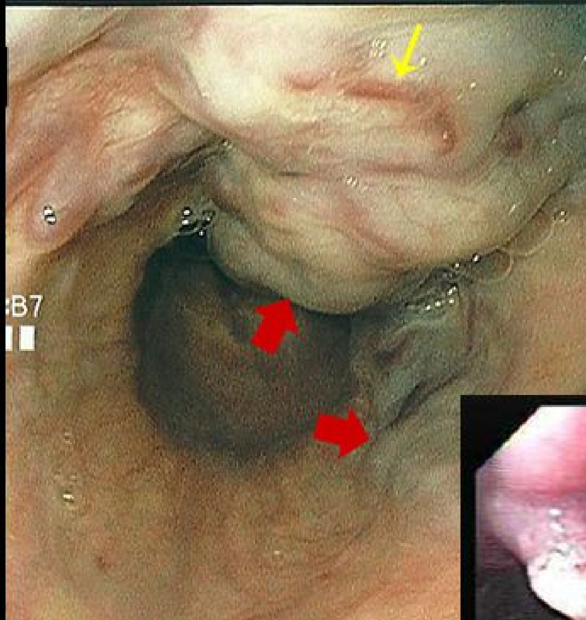
EGD Feature	Risk of Recurrent Bleeding, %
Clean ulcer base	<5
Flat spot	10
Adherent clot	22
Nonbleeding visible vessel	45
Actively bleeding visible vessel	55

PPI → stabilize clot & promote hemostasis.

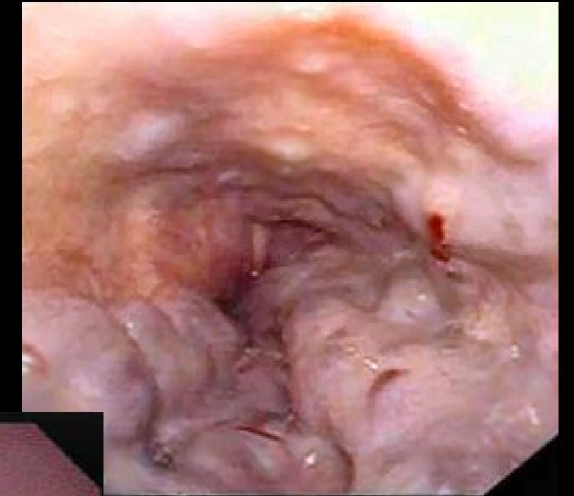
High dose – 80 bolus with cont drip of 8/hr for 72 hr prevents further bleeding after endoscopy

Erythromycin – helps to see. No actual benefit

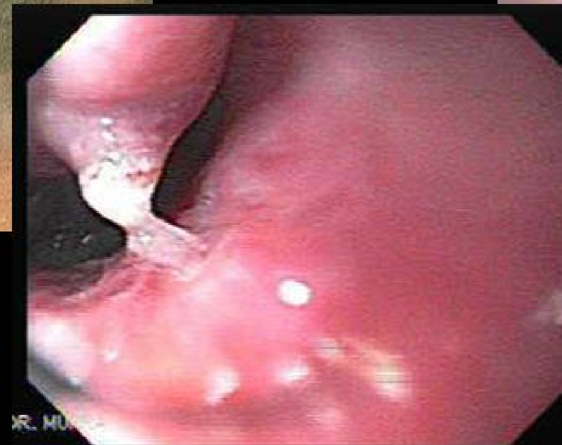
High Risk Stigmata



Red wale sign



Cherry red spot



Nipple sign

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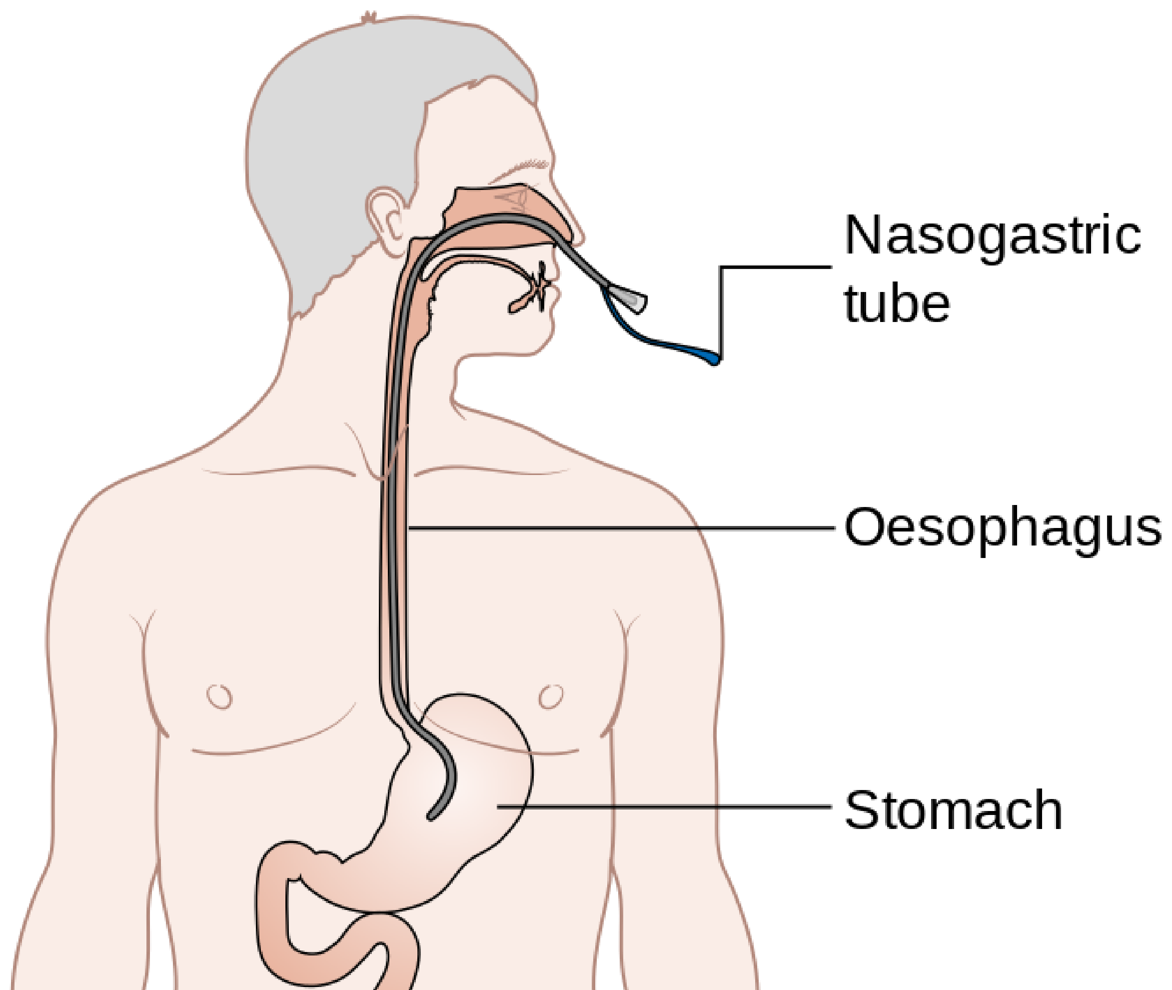

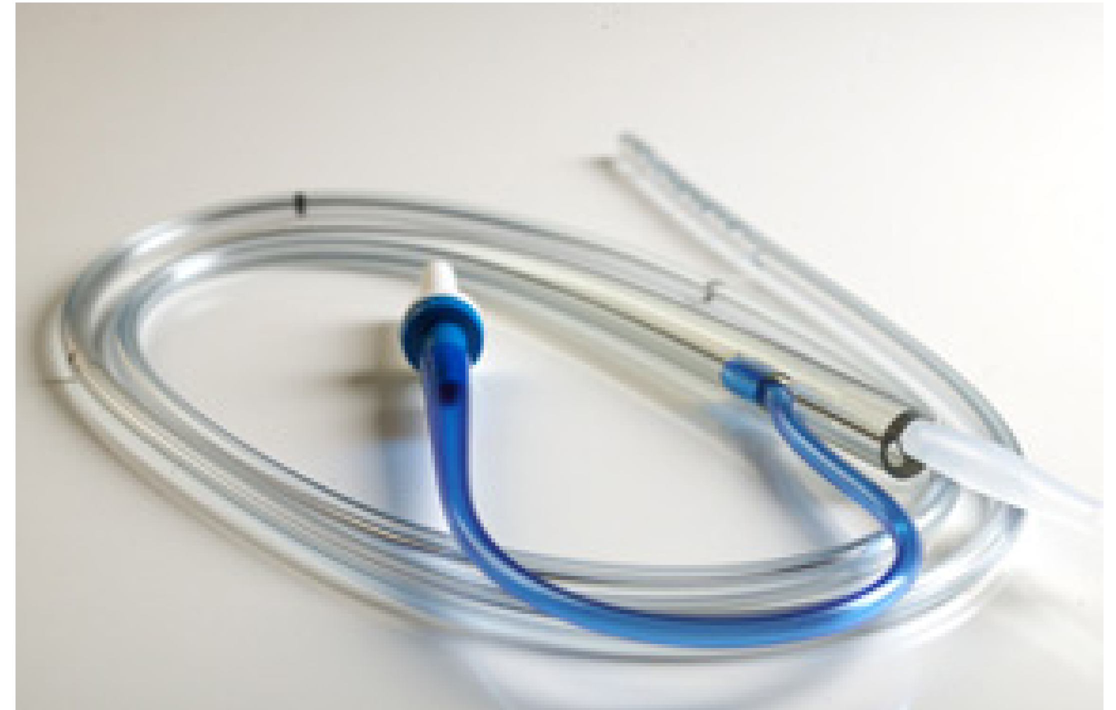

Earlier time to endoscopy

Indicative of high risk lesions

Does not affect mortality

10-15% of bleeding DU do not reflux into stomach

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Prophylactic tracheal intubation for upper GI bleeding: A meta-analysis

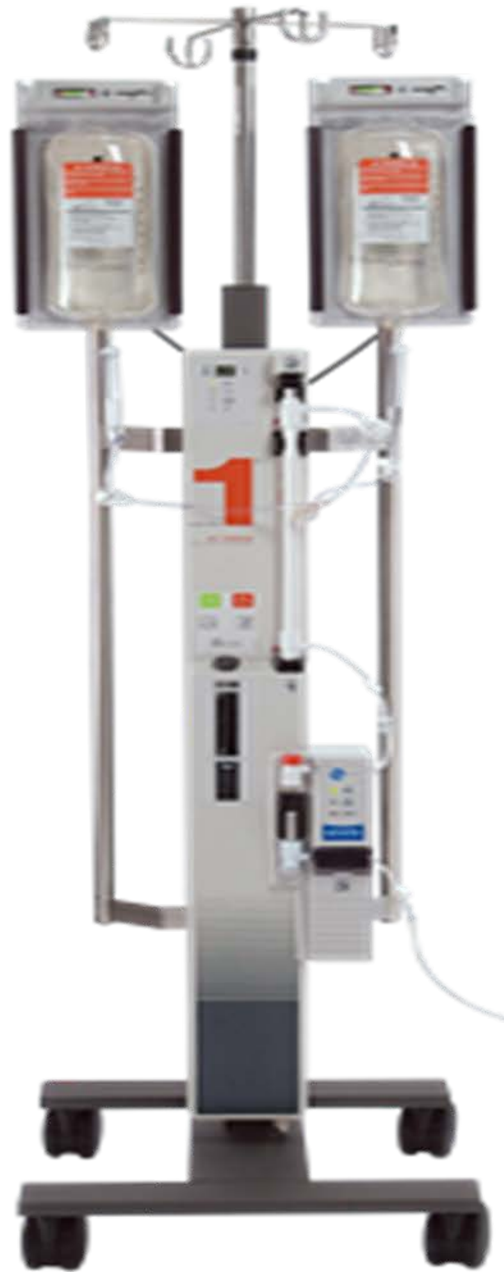
CONCLUSION—Pneumonia within 48 h is more likely in UGIB patients who received prophylactic endotracheal intubation prior to endoscopy.

Endotracheal intubation for airway protection during endoscopy for severe upper GI hemorrhage

Conclusion: Frequent use of endotracheal intubation for airway protection during EGD for upper GI bleeding requiring intensive care unit admission did not significantly change the relatively high frequency of acquired pneumonia or cardiopulmonary events, but may have prevented the rare fatal episode of massive aspiration. Endotracheal intubation may benefit selected patients with upper GI bleeding, but its specific role remains unclear, and alternative methods of airway protection should be investigated. (Gastrointest Endosc 2003;57:58-61.)

Case 2

- 46,m comes in for hematemesis
- Pale, BP – 90/50, HR – 125, altered
- Hg of 8
- Alcoholic cirrhosis
- No coags back yet



Evidence based management

Broad Spectrum Abx for 5-10 d

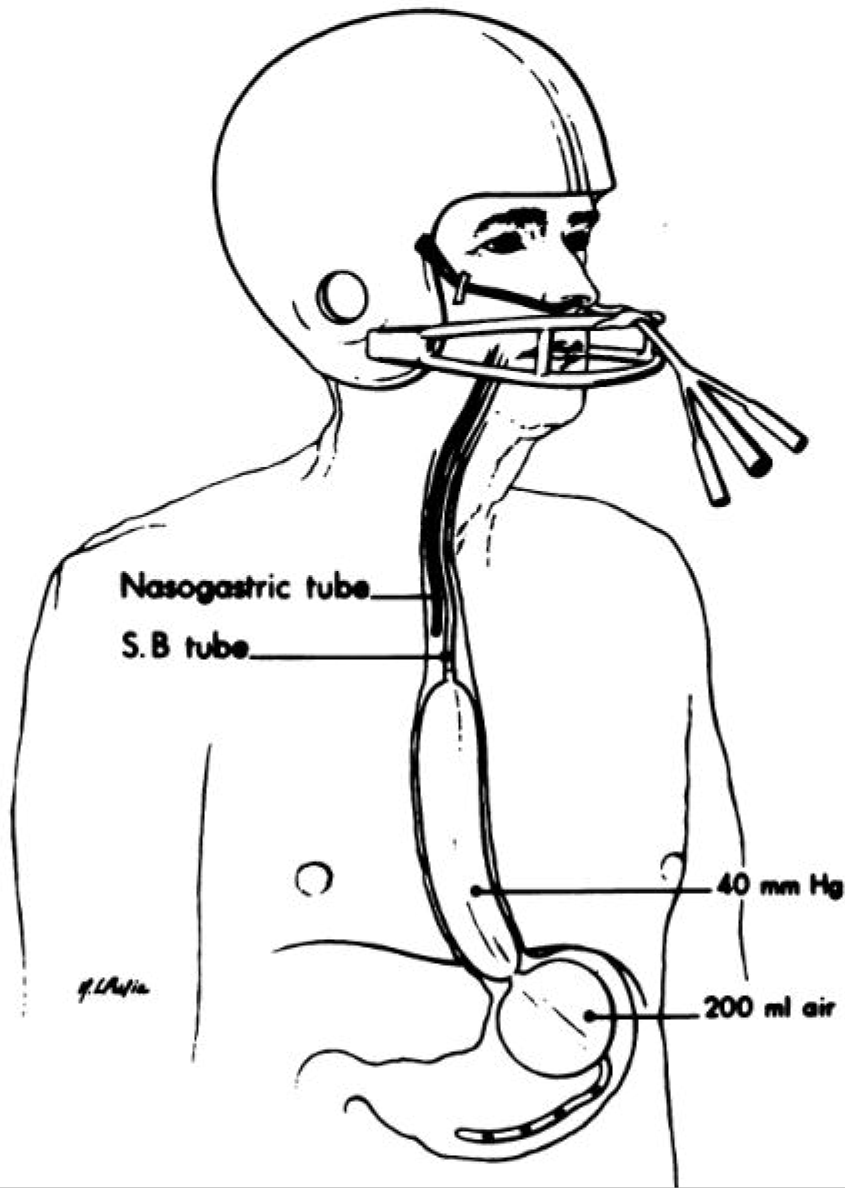
- Dec infection RR – 0.40 (CI: 0.32-0.51)
- Dec mortality RR = 0.75 (CI: 0.55 – 0.95)

Meta Analysis Scand J Gastro 2003

Benefit	No benefit
Antibiotics – dec infxn, Inc survival	Sucralfate
EGD – Dec Bleed, rebleed	rFVIIa
Vasoactive drugs – Dec transfusion & bleed	
Beta blockers – dec bleed & rebleed	

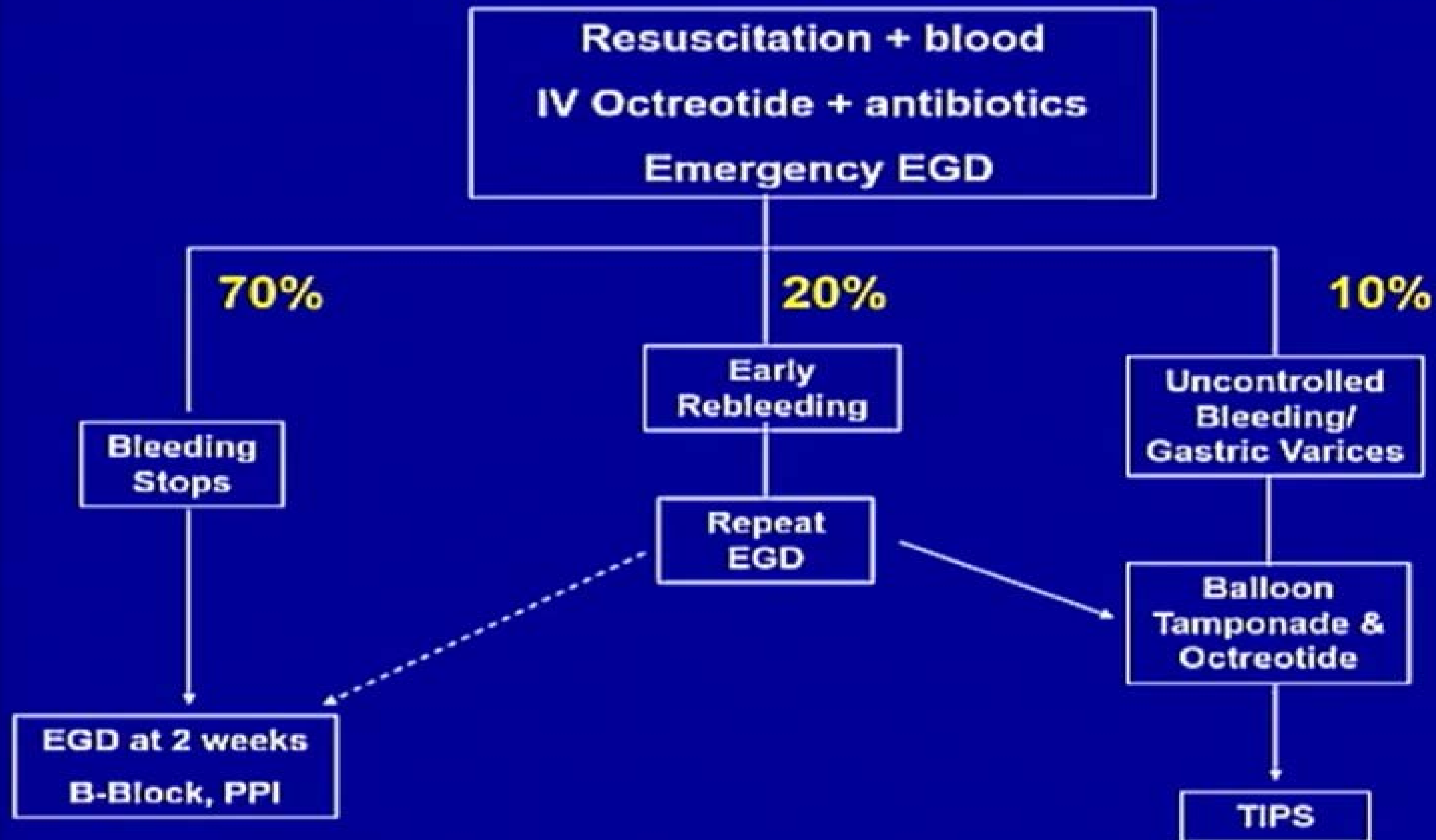
Re-bleed: defined as 4u pRBC's or ↓SBP within 6 hrs

- Octreotide –better than vasopressin and best with EGD.
- Restrictive transfusion



Salvage TIPS

- Persistent EV bleeding
- Gastric varices
- Stabilization



Management of Variceal Hemorrhage
Resuscitation + blood
IV Octreotide + antibiotics
Emergency EGD
70%
20%
10%
Bleeding Stops
Early Rebleeding
Uncontrolled Bleeding/ Gastric Varices
Repeat EGD
Balloon Tamponade & Octreotide
EGD at 2 weeks
B-Block, PPI
TIPS

Syncope…

- Elderly male admitted for Diverticulitis
- Find him in sitting in a pool of blood
- Hg drop 11 → 8 with orthostasis

Colon

Scope

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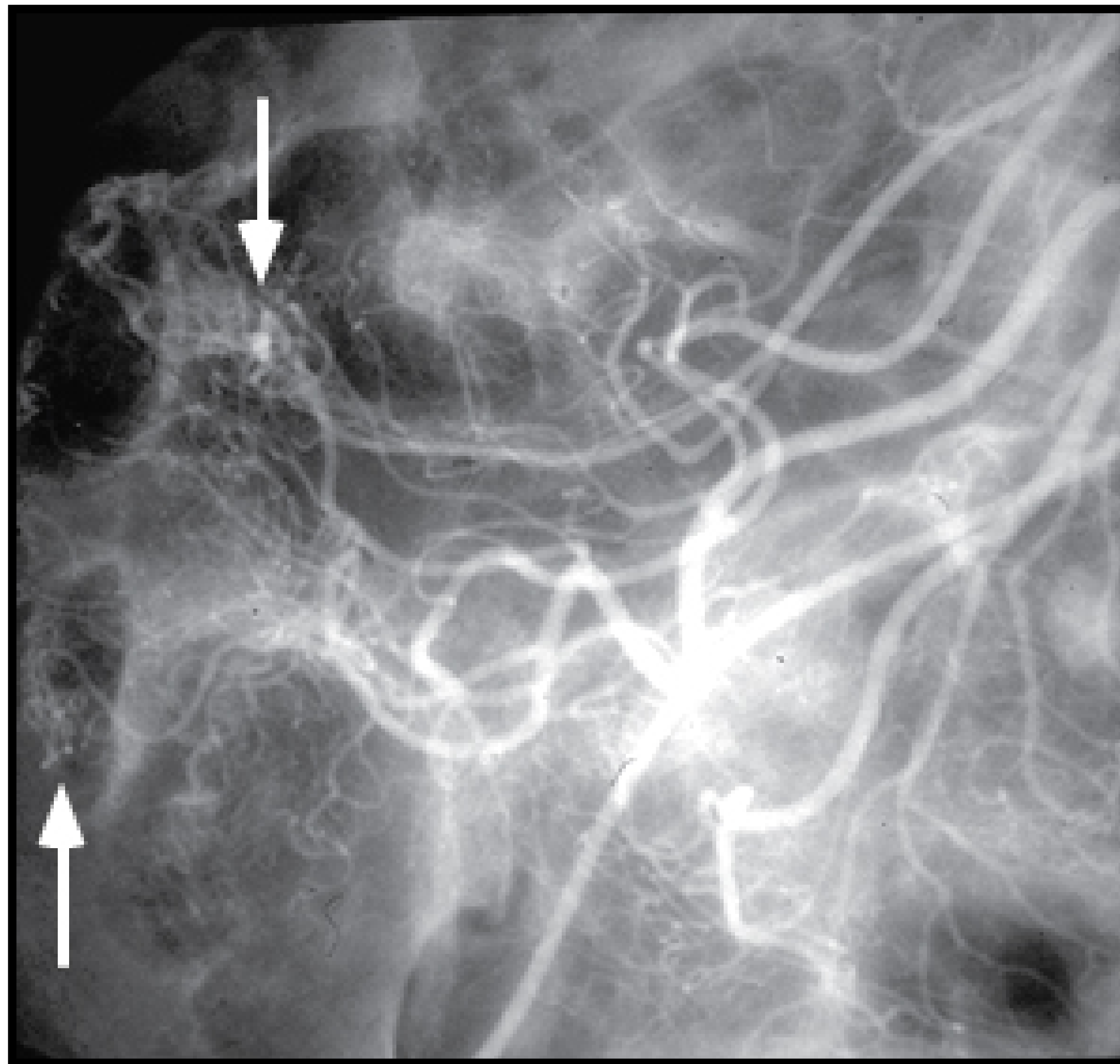

- ❑ 0.3 to 0.5 cc/min
- ❑ Available, fast, non invasive
- ❑ Higher sensitivity and specificity

Right
Anterior
10 min
1
10 min
2
30 min
3
Left
40 min
4
50 min
5
1 hour

- ❑ Rate of 0.1 to 0.5cc/min
- ❑ Most sensitive, but not specific
- ❑ Slow and involved

https://www.uptodate.com/contents/image?imageKey=GAST%2F79370&topicKey=GAST%2F2547&search=lower%20Gi%20bleeding&source=outline_link&selectedTitle=1~150
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Syncope…

- Elderly male admitted for Diverticulitis
- Find him in sitting in a pool of blood
- Hg drop 11 → 8 with orthostasis

Bad luck…

- 34,f, UC with acute onset bloody diarrhea
- Hr – 135, ↓ SBP, febrile, hg drop
- Shigella infection & 9 cm colon

Cant win..

- 67,m, intubated for 5 days in the setting of septic shock
- New onset A.fib for last 48 hrs
- Sudden bloody diarrhea
- Lactate 2 →8

But why..

- Patient with persistent non bloody diarrhea
- Nursing calls 20 minutes after placing rectal tube
- Patient acutely hemorrhaging from lacerated hemmorhoid