

# **Non-Variceal Upper Gastrointestinal Bleeding**

Brooks D. Cash, MD

Chief, Division of Gastroenterology, Hepatology, and Nutrition

Visiting Professor of Medicine

McGovern Medical School

Co-Director, Ertan Digestive Disease Center

Memorial Hermann TMC

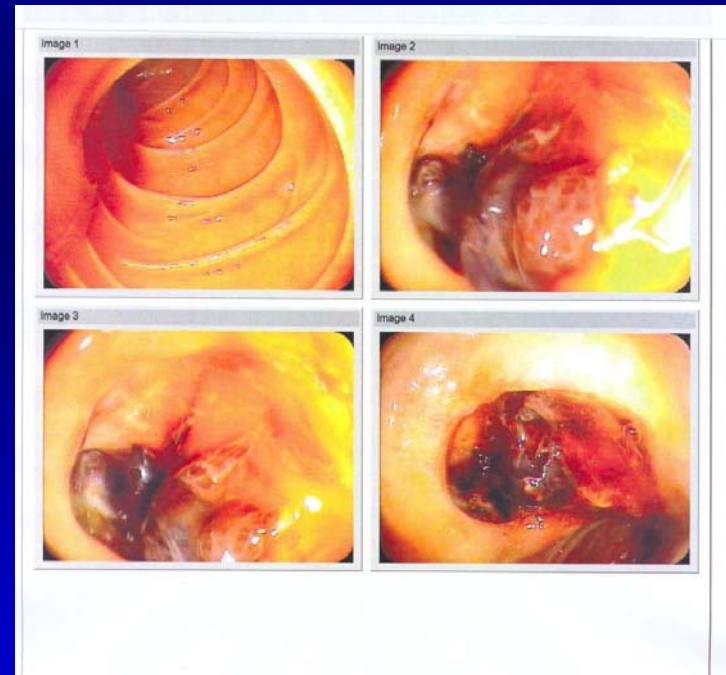
Houston, TX

# Acute Upper GI Bleeding: A Lethal Disease

## Outcomes include

- Death
- Cardiac Arrest
- MI
- CVA
- Injury (E.G. Fx, Head)
- Seizures
- Surgery or angiography
- Rebleeding

ASA-associated DU eroding into artery



# General Approach to the patient with Acute Upper GI Bleeding

- Guiding Principles
  - Restoration and/or maintenance of hemodynamic stability
    - Blood products if needed (Maintain Hgb >7)
  - Nasogastric lavage (varices are NOT a contraindication)
  - Antisecretory medications
  - Endoscopy with hemostasis (timing varies)
  - Surgery if necessary

# Symptoms and Signs

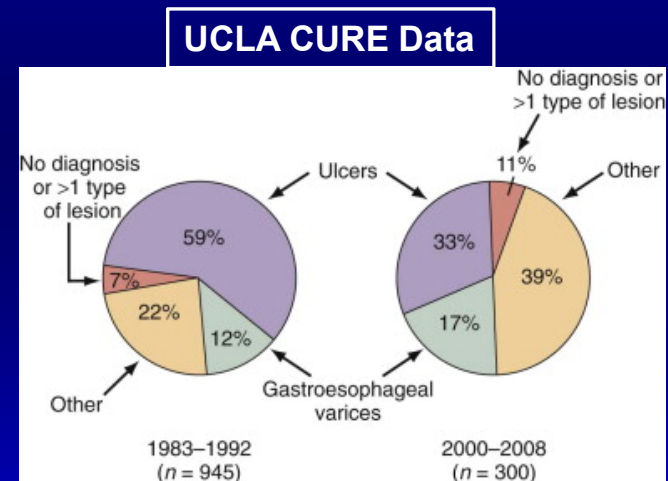
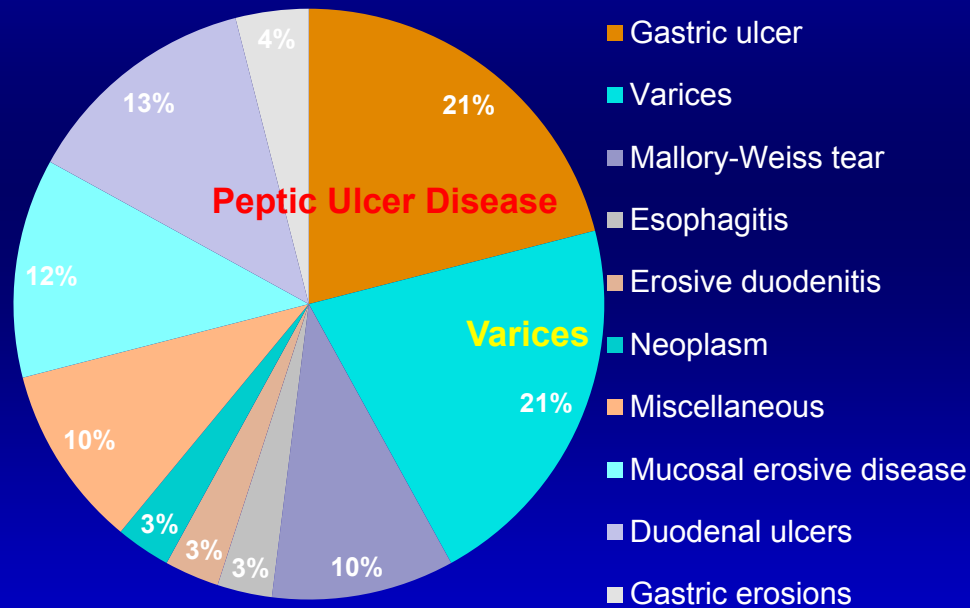
## Upper GI Bleed

- Hematemesis
- Melena/hematochezia
- Lightheadedness/Syncope

# Physical Exam

- Vital signs: numbers and character
- Mucus membranes
- Stigmata of cirrhosis
- Digital rectal exam (DRE)
- Skin
- Mental status

# Etiology of Upper GI Bleeding (UGIB): Changing Epidemiology



# Medical Clues on Etiology of UGIB

Bleeding etiology	Historical clues
Mallory-Weiss tear	Emesis before hematemesis, alcoholism
Esophageal ulcer	Odynophagia, GERD, esophagotoxic pill ingestion
Peptic ulcer	Epigastric/RUQ pain, NSAID or aspirin use
Stress gastritis	Patient in an ICU, gastrointestinal bleeding occurring after admission, respiratory failure, multiorgan failure
Varices, portal gastropathy	Alcoholism, cirrhosis
Gastric antral vascular ectasia	Renal failure, cirrhosis
Malignancy	Recent involuntary weight loss, dysphagia, cachexia, early satiety
Angiodysplasia	Chronic renal failure, hereditary hemorrhagic telangiectasia
Aortoenteric fistula	Known aortic aneurysm, prior abdominal aortic aneurysm repair

*Abbreviations:* GERD, gastroesophageal reflux disease; NSAID, nonsteroidal anti-inflammatory drug; RUQ, right upper quadrant.

# GI Bleed: Prognostic Factors

- Initial assessment of an acute upper GI bleed can predict risk of mortality and complications:

- Age >60 years
- Transfusion requirement of >6 units of blood
- Shock
- Presence of comorbidity (hepatic, renal, pulmonary disease, cancer, CHF)
- Ongoing bleeding
- Low systolic BP
- Elevated INR
- Erratic mental status
- Major stigmata of recent hemorrhage

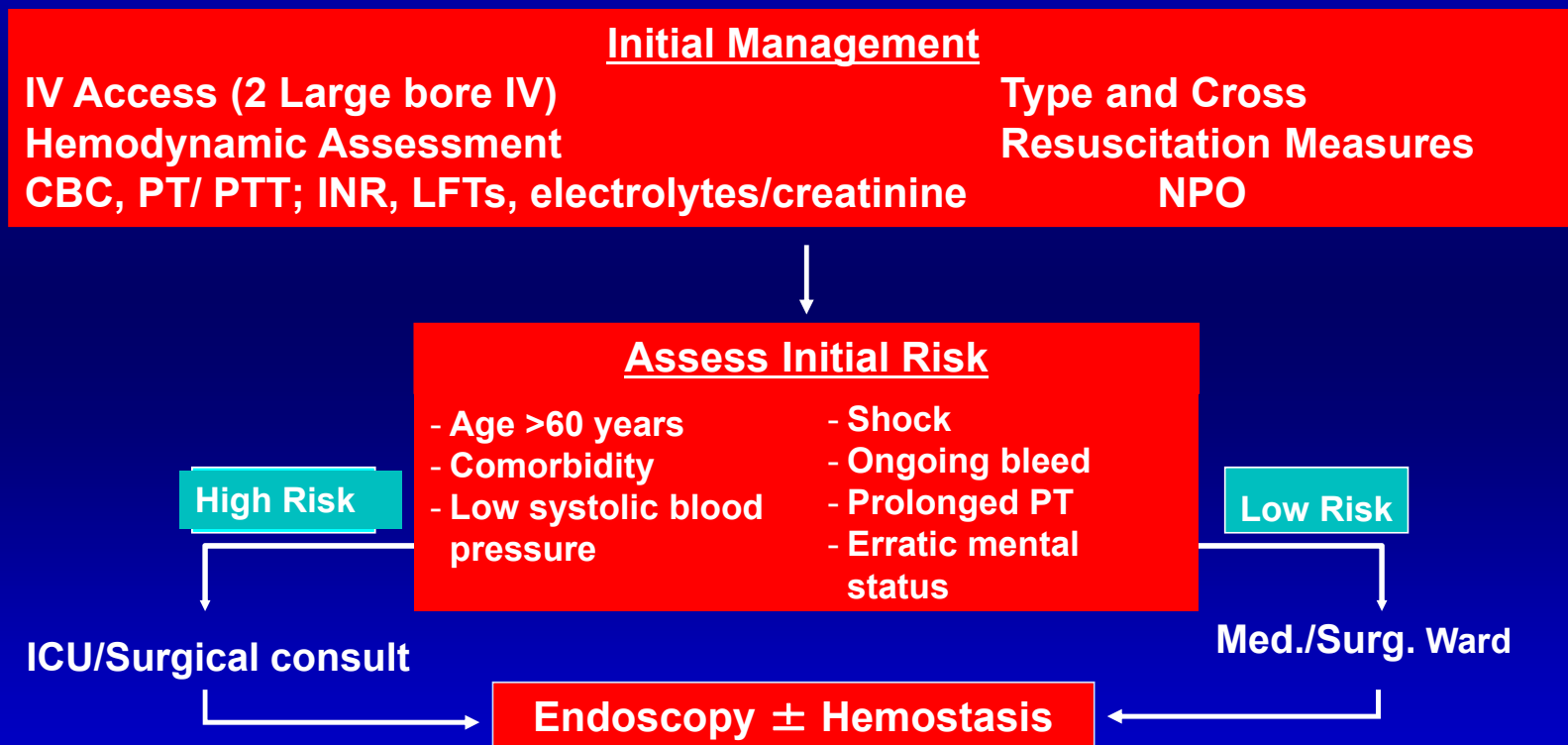
Silverstein FE, et al. *Gastrointest Endosc.* 1981;27:80–93.

Rockall TA, et al. *Gut.* 1996;38:316–321.

Kollef MH, et al. *Crit Care Med.* 1997;25:1125–1132.

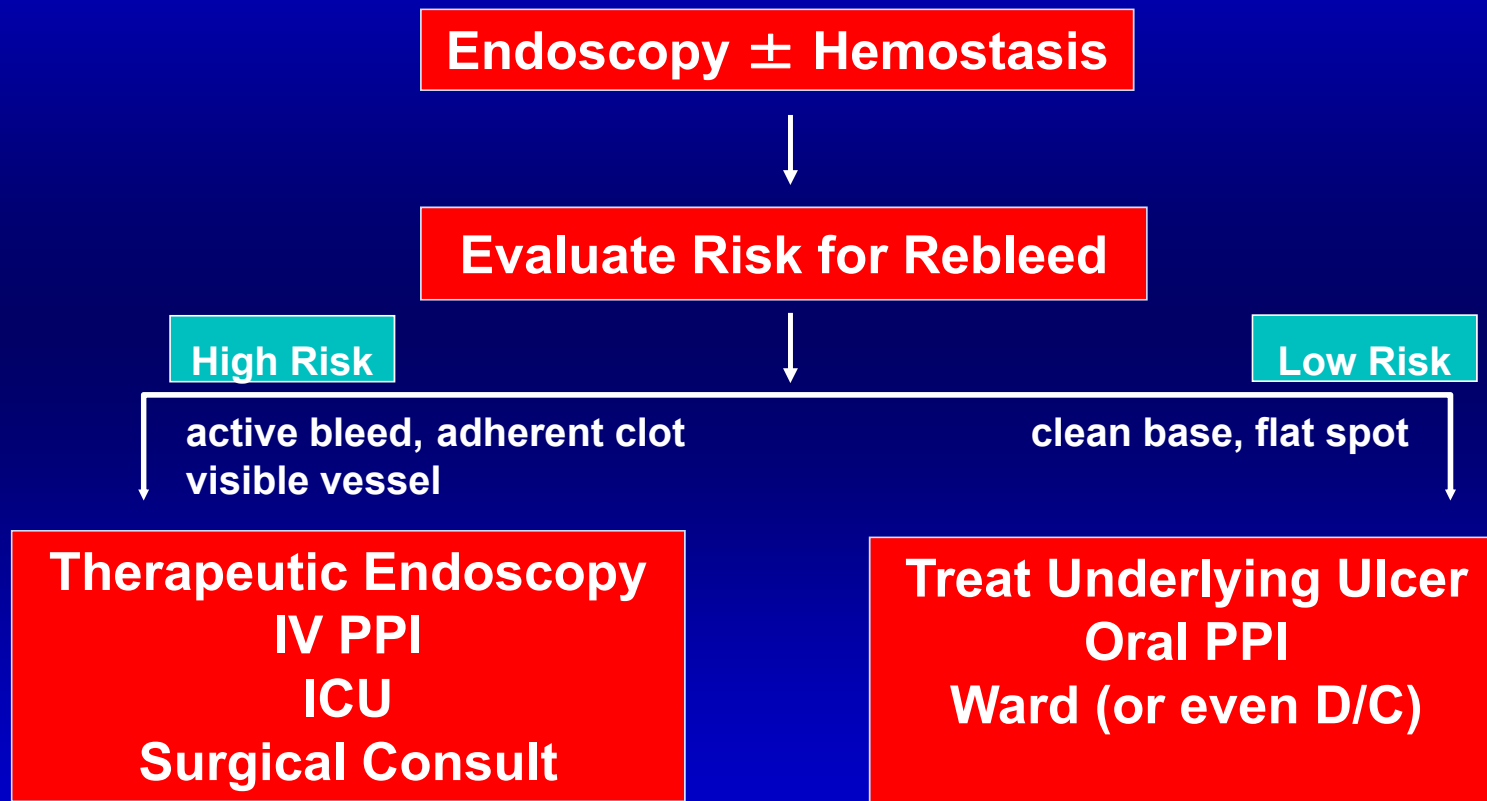


# Management of Acute GI Bleeding



Adapted from Laine L, et al. *N Engl J Med.* 1994;331:717.

# Management of Acute GI Bleeding (cont' d)



# Resuscitation - I

- Initiate ABC's of Emergency Care
- Establish IV access:
  - 2 large bores (ideally at least 18-gauge peripheral IVs)
  - in MICU, may place triple-lumen or Cordis catheter
- Replace intravascular volume
  - if hypotensive and/or orthostatic, give NS/LR boluses
  - if anemic (Hgb  $\leq$ 7 g/dL), give PRBCs
  - may need FFP (for coagulopathy) and/or platelets (for thrombocytopenia/ $<$ 50K or dysfunction from chronic antiplatelet agents usage) if massive GI bleed

# Resuscitation - II

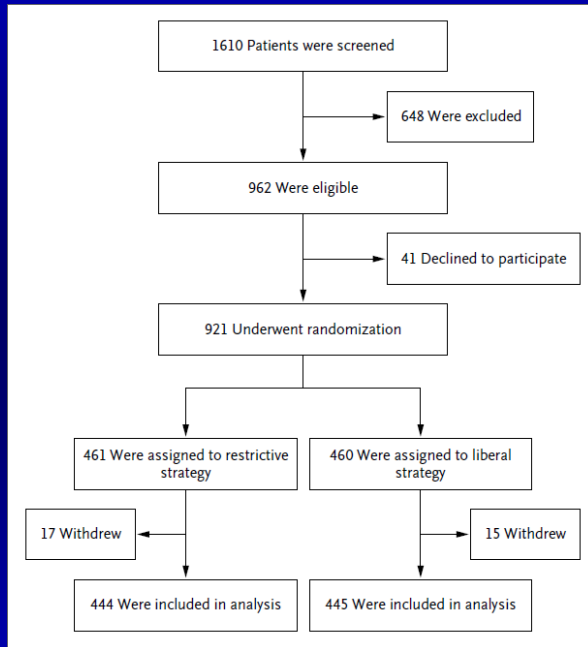
## Transfusion Strategies for Acute Upper Gastrointestinal Bleeding

Càndid Villanueva, M.D., Alan Colomo, M.D., Alba Bosch, M.D., Mar Concepción, M.D., Virginia Hernandez-Gea, M.D., Carles Aracil, M.D., Isabel Graupera, M.D., María Poca, M.D., Cristina Alvarez-Urturi, M.D., Jordi Gordillo, M.D., Carlos Guarner-Argente, M.D., Miquel Santaló, M.D., Eduardo Muñiz, M.D., and Carlos Guarner, M.D.

**N Engl J Med 2013;368:11-21.**

In summary, we found that a restrictive transfusion strategy, as compared with a liberal transfusion strategy, improved the outcomes among patients with acute upper gastrointestinal bleeding. The risk of further bleeding, the need for rescue therapy, and the rate of complications were all significantly reduced, and the rate of survival was increased, with the restrictive transfusion strategy. Our results suggest that in patients with acute gastrointestinal bleeding, a strategy of not performing transfusion until the hemoglobin concentration falls below 7 g per deciliter is a safe and effective approach.

# Resuscitation - III

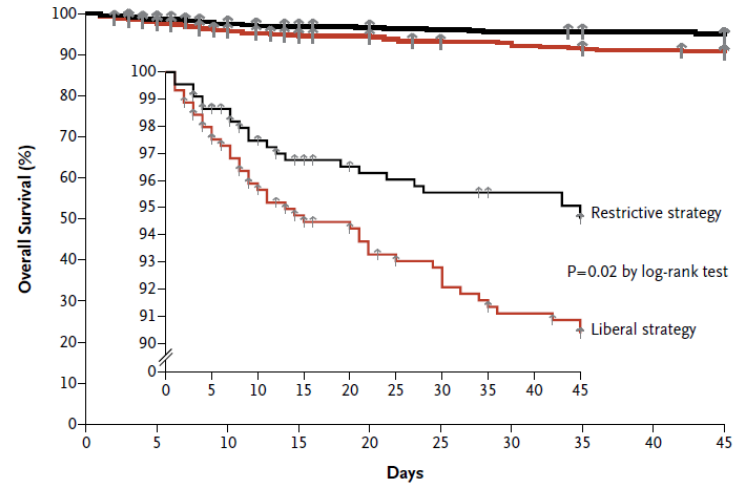


## Key Points

Keep Hb  $\leq 7$  g/dL for low-risk patients

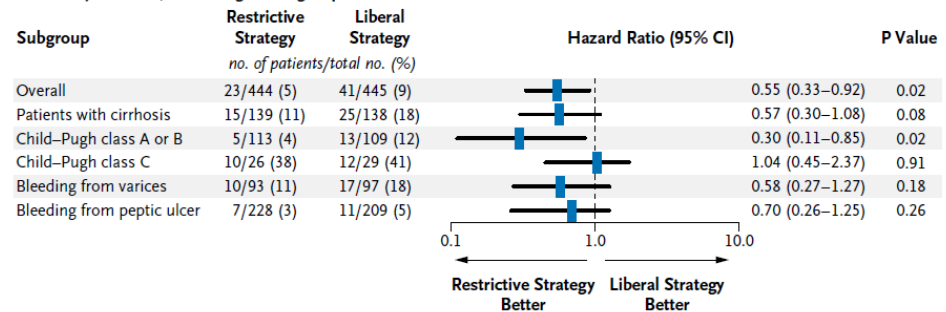
Keep Hb  $\leq 10$  g/dL for high-risk patients

**A Survival, According to Transfusion Strategy**



No. at Risk	0	5	10	15	20	25	30	35	40	45
Restrictive strategy	444	429	412	404	401	399	397	395	394	392
Liberal strategy	445	428	407	397	393	386	383	378	375	372

**B Death by 6 Weeks, According to Subgroup**



# Pre-endoscopy Management - I

- Nasogastric intubation and NG lavage (even if varices may be present)
- No role of occult blood testing of NG aspirate (or frankly bloody stool)
- Interpretation of aspirate:
  - bright red, clots = active UGIB
  - coffee grounds = slow bleeding, may have stopped, localizes to upper GI source
  - clear = indeterminate (NOT a guarantee that the bleeding has stopped); ~18% of patients with UGIB source
  - bilious = bleeding has stopped; ~18% of patients with UGIB source
- Contraindications
  - Facial trauma, nasal bone fracture
  - Known esophageal abnormalities (strictures, diverticuli)
  - Ingestion of caustic substances, esophageal burns
  - In general, esophageal varices are NOT a contraindication to NG tube placement

## Pre-endoscopy Management - II

- IV Erythromycin 250 mg (or azithro) bolus 30-60 min before EGD
- Initiate PPI drip: 80 mg bolus followed by 8 mg/h infusion
- No role for H<sub>2</sub>-receptor antagonists
- Initiate Octreotide drip (if suspecting variceal bleeding): 50 µg bolus followed by 50 µg/h infusion
  - Initiate Somatostatin drip (if octreotide not available): 250 µg bolus followed by 500 µg/h infusion
- Consider EGD within 6-12 h (or at least before 24 h)

# Acute UGIB: Differential Diagnosis

- Peptic ulcer disease
  - Gastric ulcer
  - Duodenal ulcer
- Mallory-Weiss tear
- Portal hypertension
  - Esophagogastric varices
  - Gastropathy
- Esophagitis
- Dieulafoy's lesion
- Vascular anomalies
- Hemobilia
- Hemorrhagic gastropathy
- Aortoenteric fistula
- Neoplasms
  - Gastric cancer
  - Kaposi's sarcoma



# Bleeding Peptic Ulcer

- 250,000-300,000 admissions / year
- \$2.5 Billion in costs
- Re-bleeding rate after hemostasis about 20%
- Mortality remains 5 – 14%

# Gastric ulcers presenting with acute upper GI bleeding

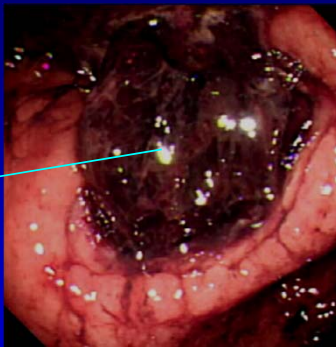
spurt



Visible vessel



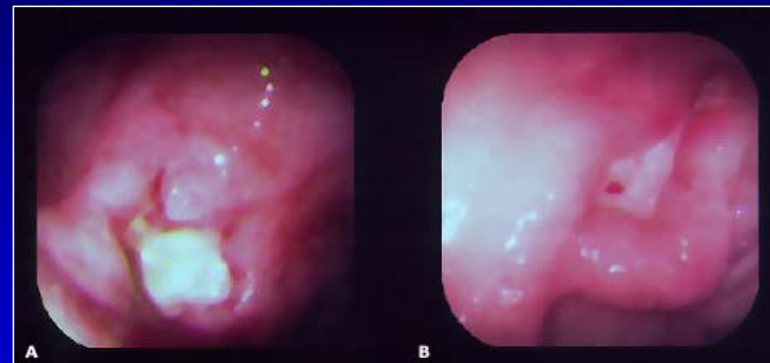
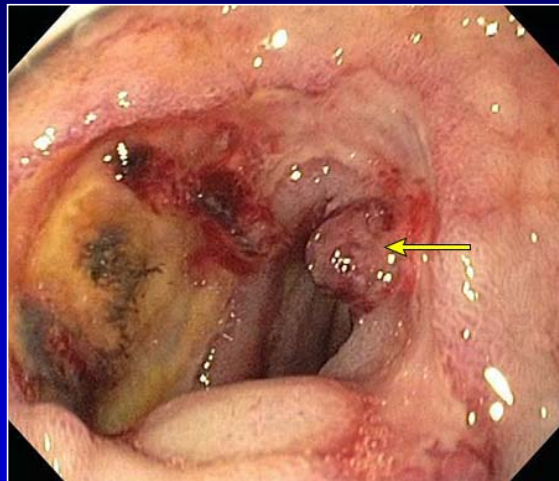
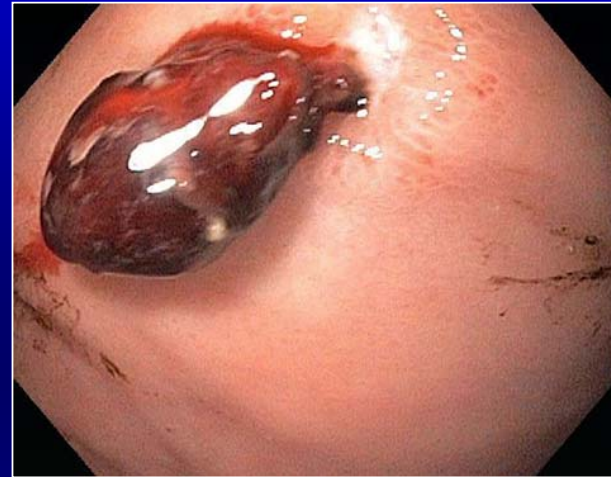
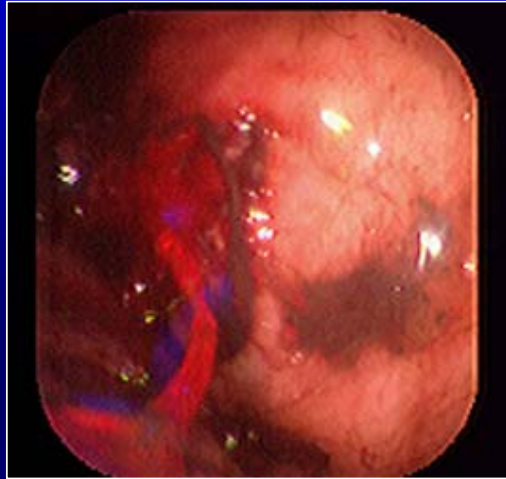
adherent clot



Spots  
Dots

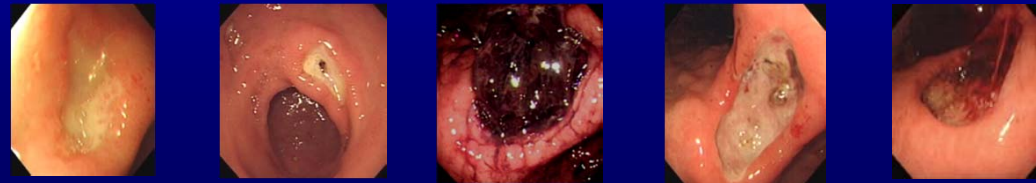


# Gastro-Duodenal Ulcers-Variety Stigmata



# GI Bleed: Risk of Rebleeding

Clean Base   Flat Spot   Adherent Clot   NBVV\*   Active Bleed



<b>Prevalence (%)</b>	42	20	17	17	18
<b>Rebleeding risk (%)</b>	5	10	22 †	43 †	55 †
<b>Mortality (%)</b>	2	3	7	7	11

\*Nonbleeding visible vessel. † Endoscopic therapy recommended.

Adapted from Laine L, Peterson WL. *N Engl J Med.* 1994;331:717–727.

## Medical Therapy for Non-Variceal UGI Bleeding

- Proton pump inhibitors (PPIs)
  - IV
  - PO
- Histamine-2 receptor antagonists
  - Minor benefit for GUs, ineffective for DUs
- Somatostatin or its analog, octreotide
  - Option when cause of bleeding is unclear prior to endoscopy (PPIs favored for PUD)

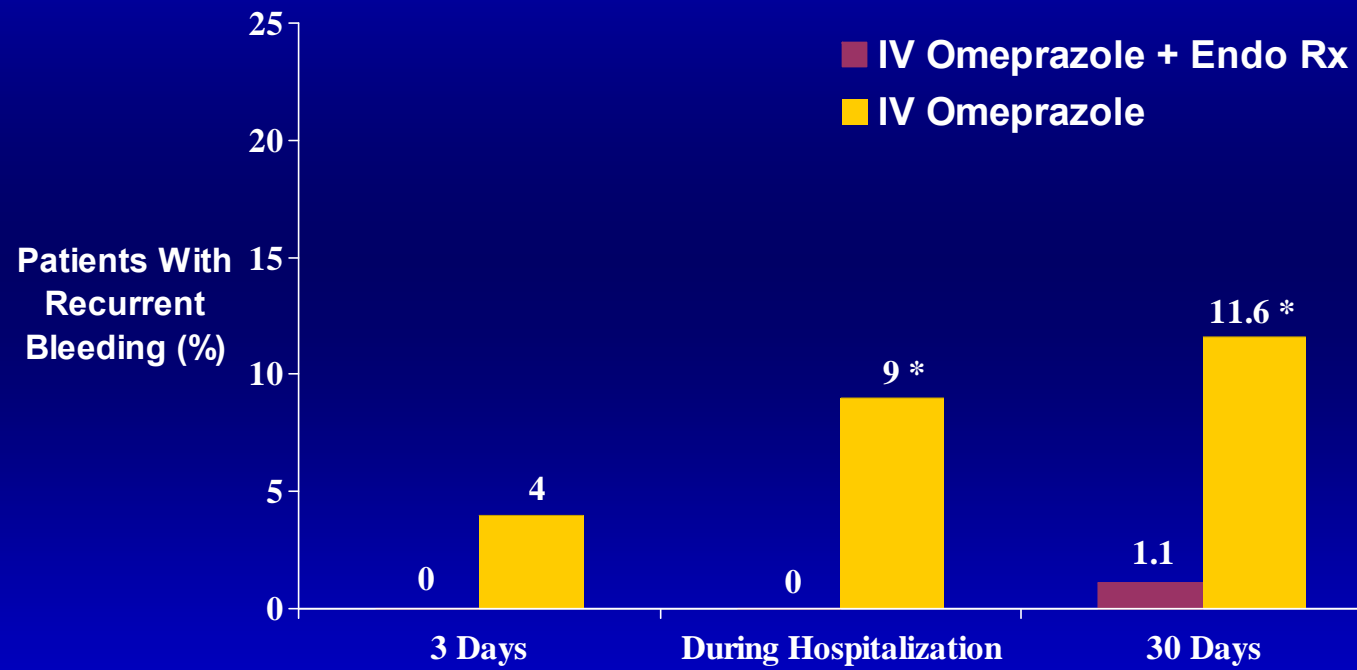
Javid G, et al. Am J Med. 2001;111:280

Collins and Langman, New Engl J Med 1985; 313: 660

Levine et al, Aliment Pharmacol Ther 2002; 16: 1137

\* $P=0.02$ ; † $P=0.17$ ; ‡ $P=0.98$

## IV PPI Therapy Alone is Insufficient



\* $P < 0.05$ .

Adapted from: Sung et al, *Ann Intern Med.* 2003; 139: 237

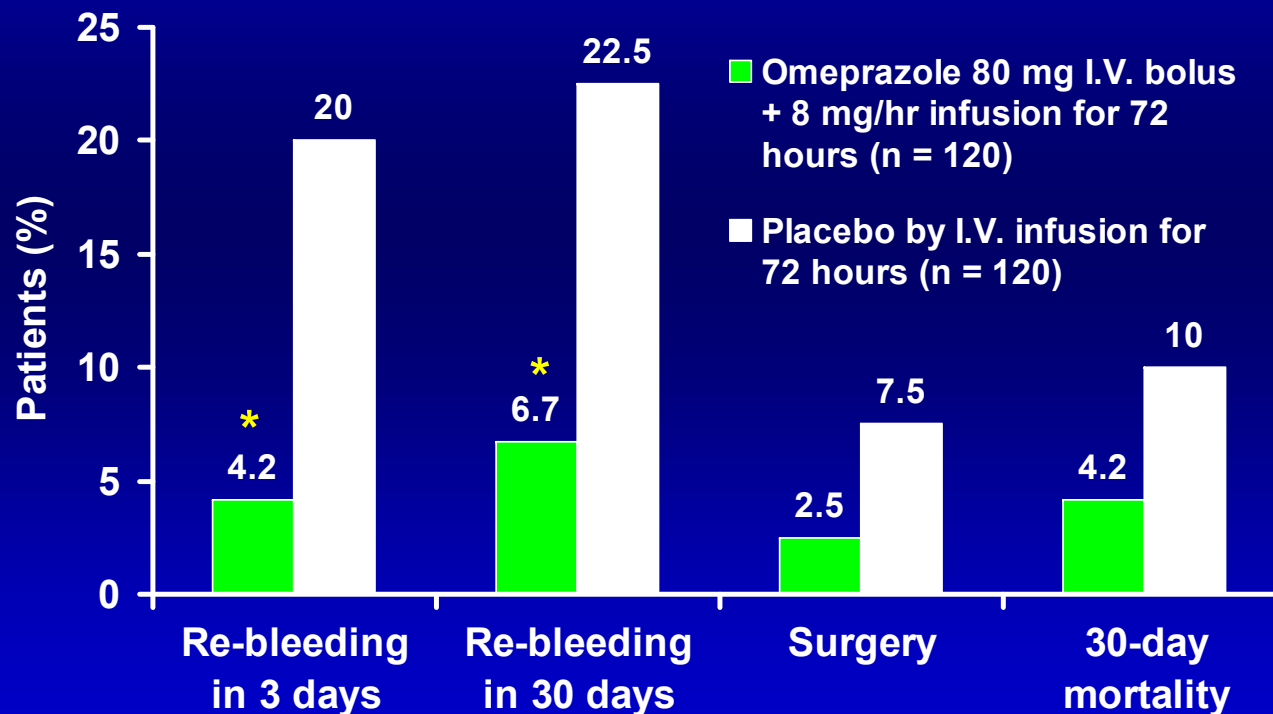
# Endoscopic hemostasis: Efficacy in nonvariceal UGI bleeding

- 30 RCTs reviewed
  - Almost all patients had bleeding ulcers
  - Thermal, laser and injection therapy all decreased
    - re-bleeding (OR 0.38)
    - surgery (OR 0.36)
    - mortality (OR 0.55)
- in patients with active bleeding or visible vessels, but not those with flat spots or adherent clot.

Cook et al. *Gastroenterology* 1992;102:139

## Randomized Placebo-Controlled Comparison of IV PPI in Bleeding Peptic Ulcer

- All patients had actively bleeding vessel or a non-bleeding visible vessel (NBVV) and received endoscopic therapy

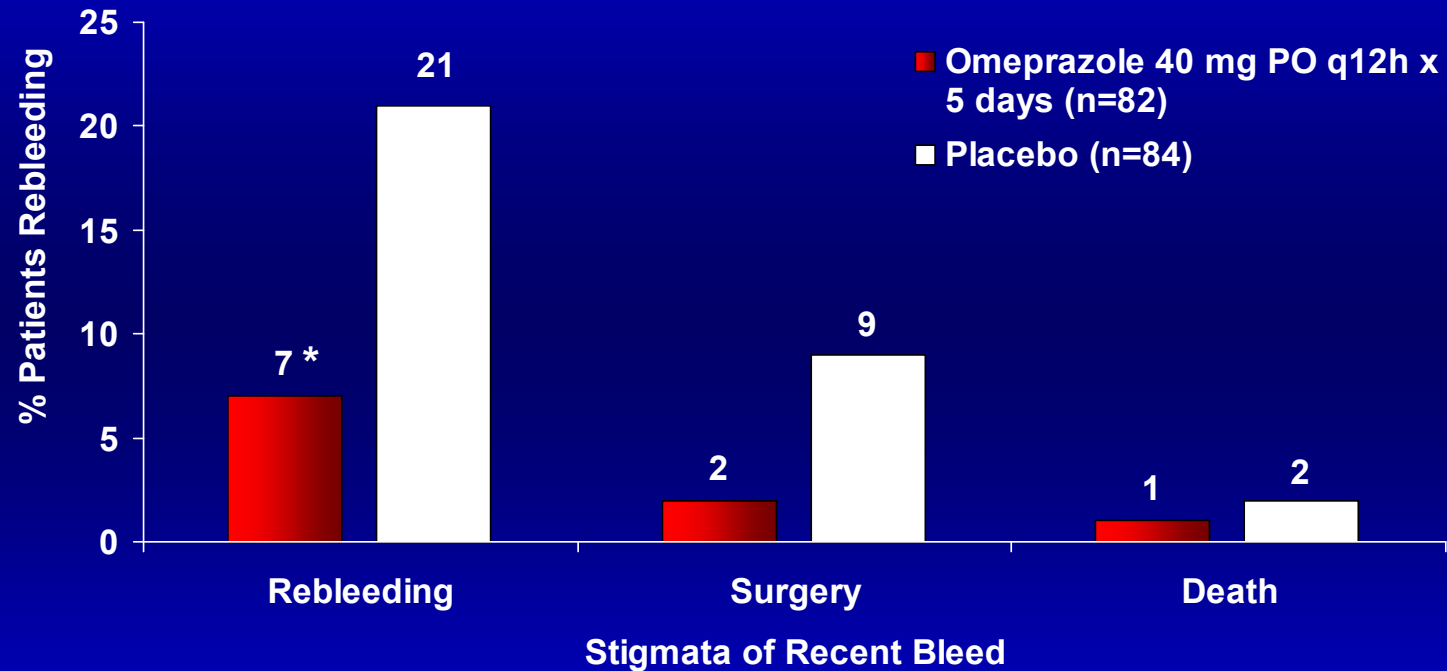


\*  $p < 0.001$  vs. placebo

Adapted from: Lau et al, *N Engl J Med.* 2000; 343: 310



# Oral PPIs as an Adjunct to Endoscopic Therapy

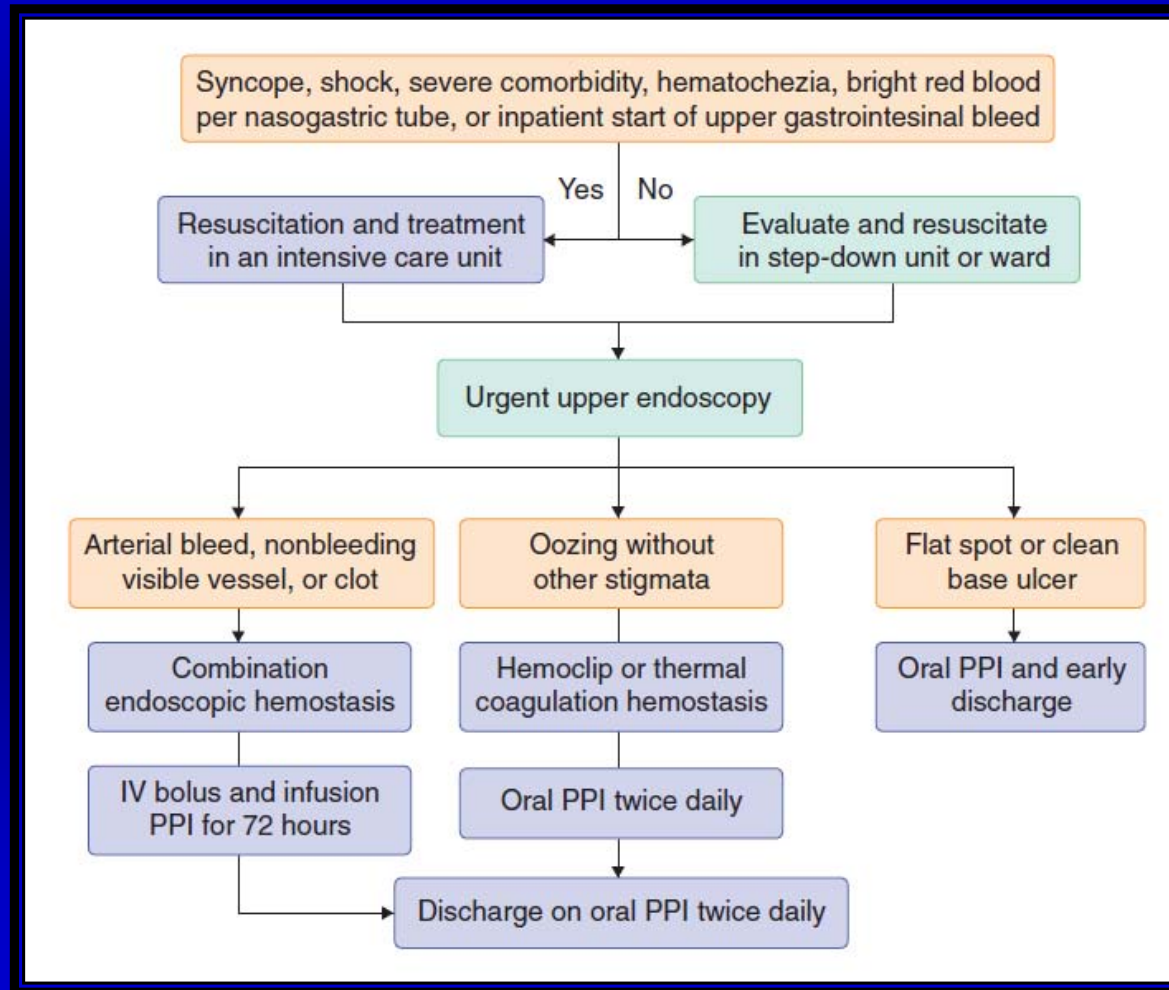


- Treatment reduced rates of rebleeding ( significantly) as well as surgery and mortality (not significantly)

\* $P < 0.05$

Modified from Javid G, et al. *Am J Med.* 2001;111:280.

# Management of UGIB: Non-Variceal



## Contraindications of Urgent Endoscopy in Acute UGIB

- When the risks to patient health or life are judged to outweigh the most favorable benefits of the procedure.
- When adequate patient cooperation or consent cannot be obtained.
- When a perforated viscus is known or suspected.

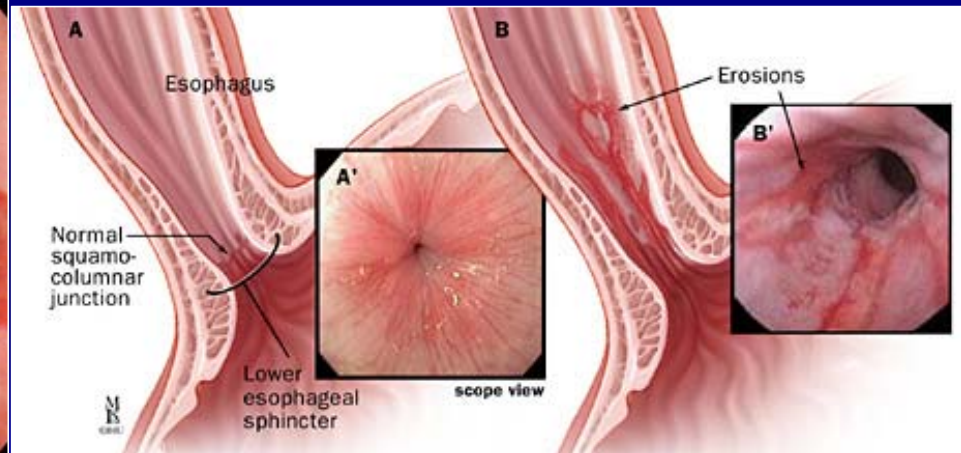
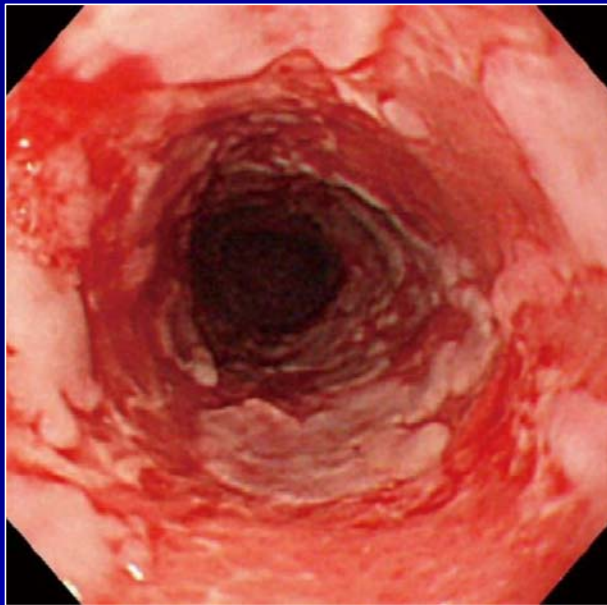
# Management of Patients with Ulcer Bleeding: ACG Practice Guidelines\*

\*Lists 30 recommendations for pre and post endoscopic management of patients with ulcer bleeding including follow up to prevent recurrent bleeding

<i>H. pylori</i>	<i>H. pylori</i> Therapy → Document Cure → Stop PPI/H2RA
NSAID	Stop NSAID → If NSAID required, use coxib+PPI
Low-dose aspirin	<ol style="list-style-type: none"> <li><u>Primary CV Prevention</u> Do not resume aspirin in most patients</li> <li><u>Secondary CV Prevention</u> Resume aspirin soon after hemostasis (e.g. 1- 7 days) in most patients and start PPI</li> </ol>
Idiopathic	Maintenance PPI

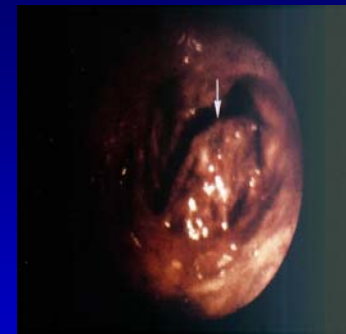
Adapted from: Laine L and Jensen D. Am J Gastroenterol 2012, 107:345-60

# Erosive Esophagitis



# Mallory Weiss tears

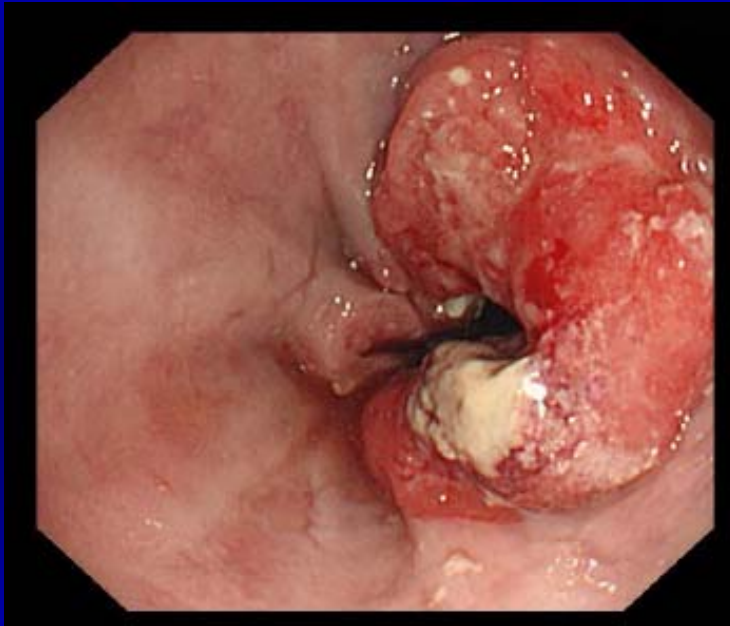
- Painless upper GI bleeding due to mucosal tear(s) near EG junction, usually on the gastric side.
- Contrasted with intramural hematoma and esophageal rupture (Boorhaave's)



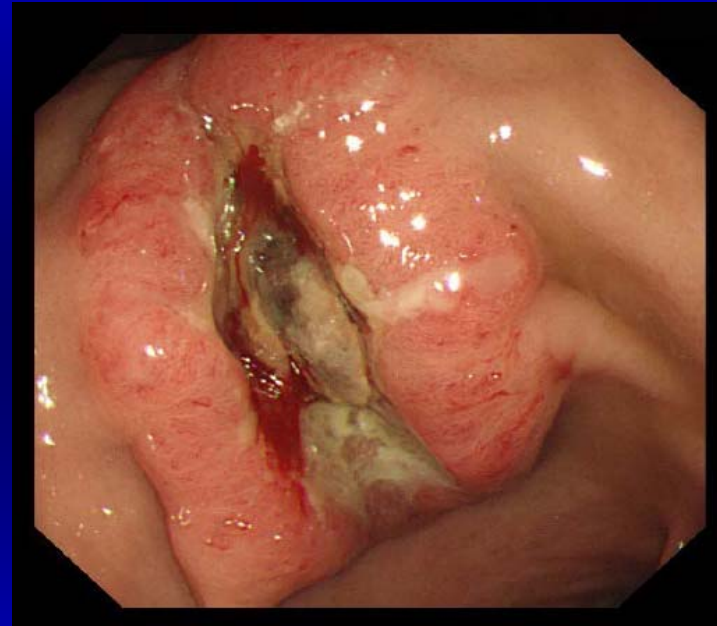
Photographs Courtesy Brian Fennerty, MD

# Upper GI Cancers: Esophageal and Gastric

**Esophageal Adenocarcinoma**



**Gastric Adenocarcinoma**



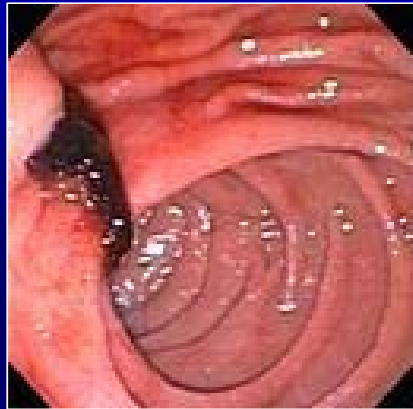


# Other Causes of UGIB

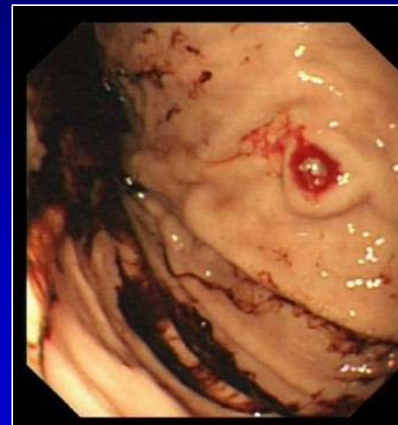
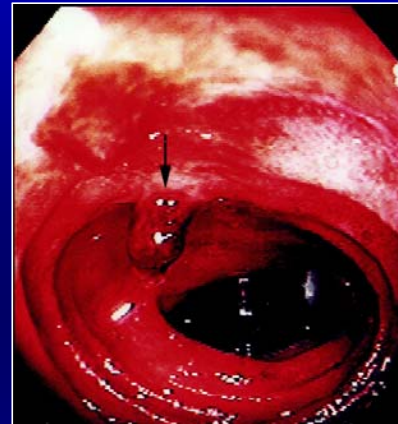
**Vascular Ectasia**



**Hemobilia**



**Dieulafoy's lesions**

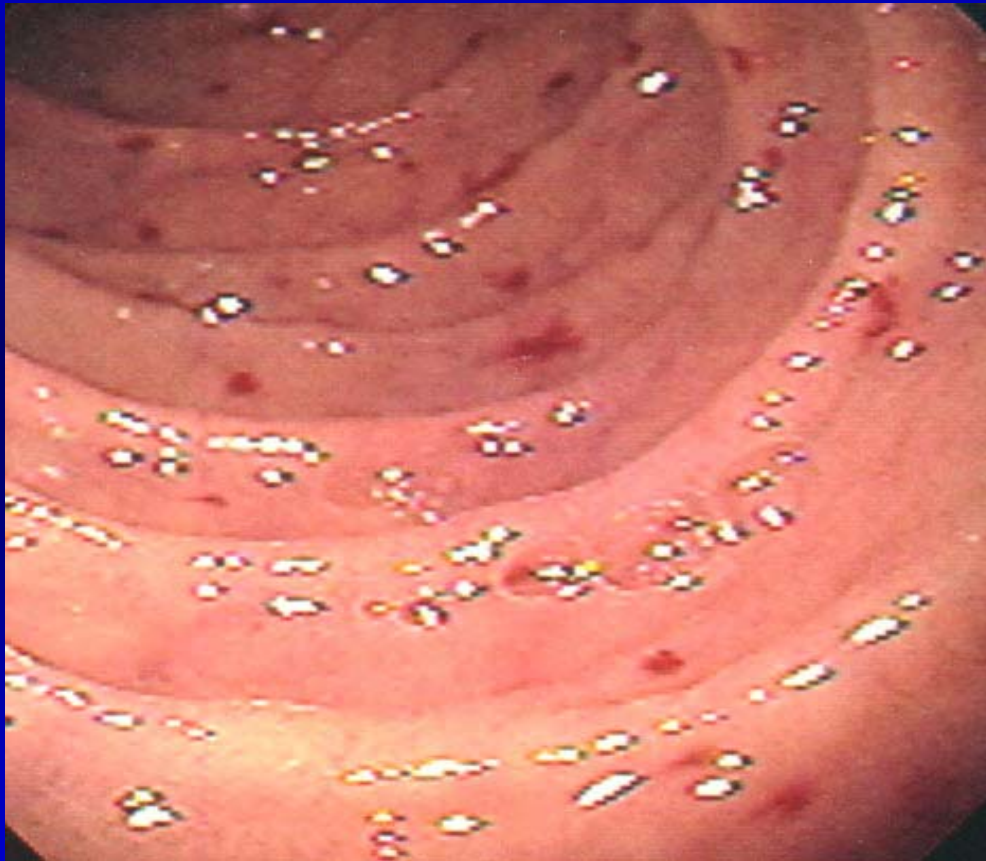




# Vascular lesions

- Vascular ectasias
  - angiodysplasia, telangiectasia
- Gastric Antral Vascular Ectasia  
 (“Watermelon stomach”)
- Dieulafoy’s lesion
- Portal hypertensive gastropathy
- Cameron’s lesions/erosions

# Duodenal Angioectasia



## Acquired

aging

portosystemic shunts

CREST

radiation

## Hereditary

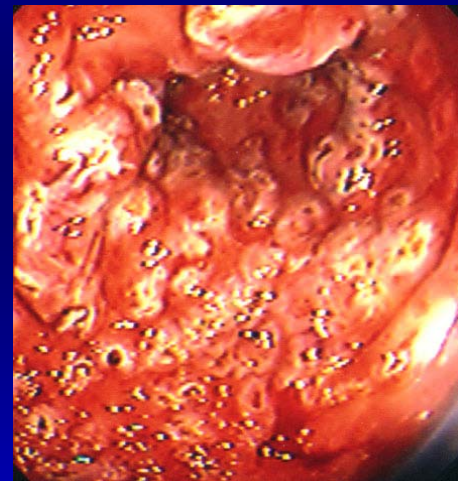
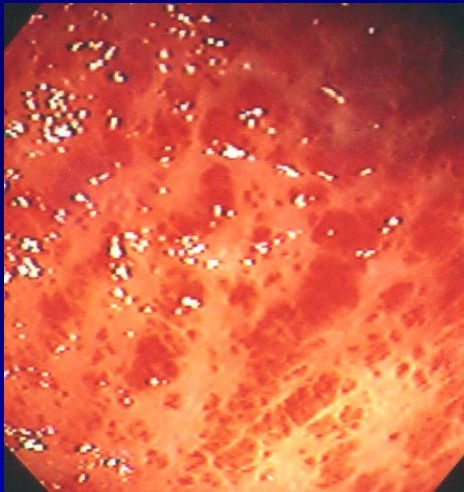
lips

nose

Photograph Courtesy Brian Fennerty, MD

# Gastric Antral Vascular Ectasia (GAVE)

## Before, during, and after Endoscopic Therapy



Photographs Courtesy Brian Fennerty, MD

## Dieulafoy's Lesion

- Abnormally large submucosal artery
- Proximal stomach (duodenum, elsewhere)
- Intermittent, painless massive bleeding
- Often difficult to identify endoscopically
- Endoscopic therapy (epinephrine, polidocanol) ultimately effective for hemostasis in 96%
- Long-term hemostasis in 85-90%
- Late (post-discharge) bleeding after successful endoscopic hemostasis uncommon
  - 5% or less after 2 years follow-up

Baettig et al Gut 1993; 34:1418

# Portal Hypertensive Gastropathy



## Cameron's Lesions

- Linear erosions in a hiatus hernia
- Usually sliding hernia
- Chronic or acute bleeding
- No abdominal pain, but may have reflux symptoms
- RX: Iron  $\pm$  PPI



Photographs Courtesy Brian Fennerty, MD

# Stress Ulcer Bleeding

- Patients admitted to an ICU demonstrate endoscopic evidence of GI damage within 24 hours
- Historically, GI bleeding occurred in approximately 15% of seriously ill ICU patients without prophylactic therapy
  - Much lower now with improved ICU care
  - Current incidence of clinically significant bleeding is 1.5% or less



# Risk Factors for Clinically Important UGI Bleeding in ICU Patients

Risk Factors	Odds Ratio	P Value
<b>Respiratory failure</b>	<b>15.6</b>	<b>&lt;0.001</b>
<b>Coagulopathy</b>	<b>4.3</b>	<b>&lt;0.001</b>
Hypotension	3.7	0.08
Sepsis	2.0	0.17
Hepatic failure	1.6	0.27
Renal failure	1.6	0.26
Glucocorticoid administration	1.5	0.26
Organ transplantation	1.5	0.42
Anti-coagulant therapy	1.1	0.88
Enteral feeding	1.0	0.99

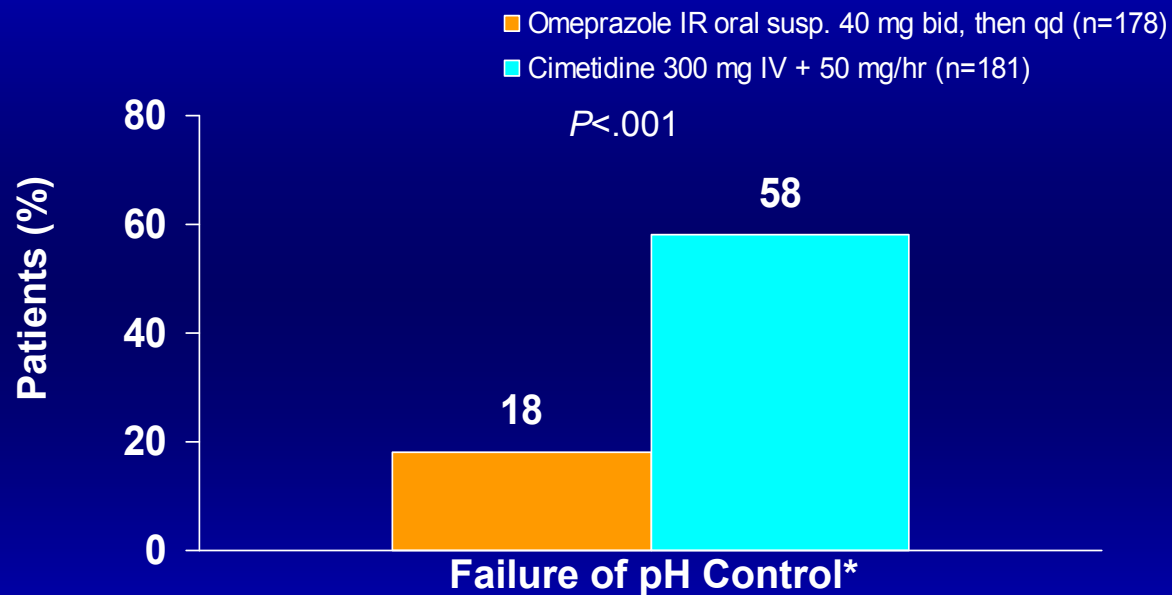
Adapted from: Cook et al, *N Engl J Med* 1994; 330: 377



# Gastric pH and Clinical Effect

Gastric pH	Clinical Effect	
>4	Pepsin inactivated	Stress Ulcer Prophylaxis
>6	Functional coagulation and platelet aggregation	Reduction of rebleeding after endoscopic intervention
>7	Pepsin denatured	

# Stress Ulcer Prophylaxis: H<sub>2</sub>RA vs PPI



**359 mechanically-ventilated ICU patients with 1 additional risk factor.  
UGI bleeding rate: 6.8% (cimetidine) vs. 4.5% (omeprazole) ⇒ noninferiority of PPI**

\*2 consecutive aspirates with pH ≤ 4  
Adapted from: Conrad et al, *Crit Care Med* 2005; 33: 760

## Question 1

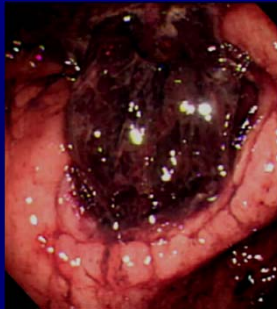
An 83-year-old woman presents with several episodes of hematemesis. Initial evaluation reveals a BP of 95/60 with orthostatic changes and maroon colored stools. There are no stigmata of chronic liver disease. Following resuscitation and admission to the ICU, she undergoes urgent upper endoscopy.

Which of the following endoscopic findings requires endoscopic intervention and intravenous PPI therapy?

## Question 1 (continued)

Which of the following endoscopic findings is associated with the greatest risk of rebleeding after endoscopic therapy?

a)



b)



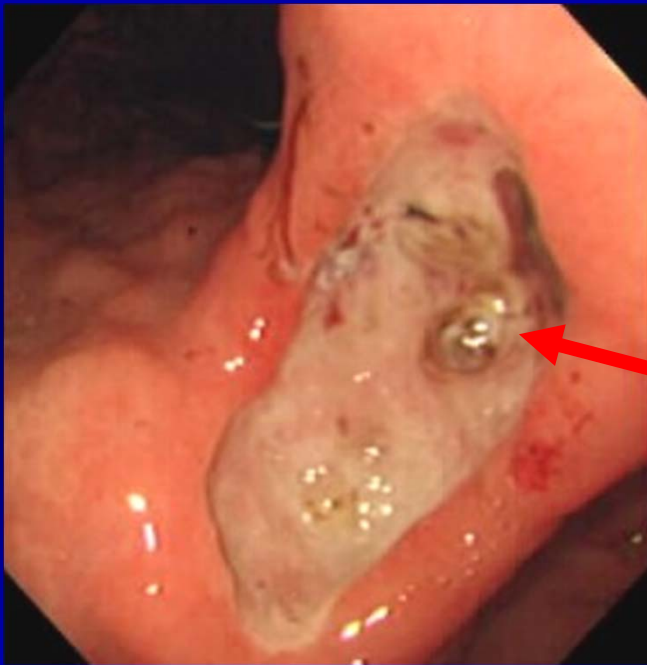
c)



d)



# Answer 1



**Non-bleeding  
visible vessel**

## Question 2

A 58 yr old male with coronary artery disease and a prior MI on ASA and a beta-blocker presented overnight to the ER with an upper GI bleed. Nasogastric aspiration revealed bright red blood. He was resuscitated with IV saline and an IV PPI drip was started. You are consulted for an urgent upper endoscopy the next morning. His Hgb is 12.2 mg/dl, platelet count is 150k, BUN is 20 mg/dl with a creatinine of 0.8 mg/dl and his INR is 1.1. EGD reveals a clean-based ulcer of the antrum.

Which one of the following statements regarding the pre-endoscopic administration of IV PPI therapy is correct:

## Question 2 (continued)

Which one of the following statements regarding the pre-endoscopic administration of IV PPI therapy is correct:

- a) It has been associated with a reduced likelihood of re-bleeding in patients with high risk stigmata at endoscopy
- b) It reduces the need for endoscopic intervention at endoscopy
- c) It improves visibility at endoscopy
- d) It is only of benefit prior to endoscopy in patients with variceal bleeding

## Answer 2

Which one of the following statements regarding the pre-endoscopic administration of IV PPI therapy is correct:

- a) It has been associated with a reduced likelihood of re-bleeding in patients with high risk stigmata at endoscopy
- b) It reduces the need for endoscopic intervention at endoscopy
- c) It improves visibility at endoscopy
- d) It is only of benefit prior to endoscopy in patients with variceal bleeding



## Question 3

A 76 year old man on 81 mg ASA for secondary prophylaxis after an MI 2 years ago (also taking a B-blocker and a lipid lowering agent) presents with a hemodynamically significant upper GI bleed. His ASA is held and he undergoes urgent EGD in the presence of an IV PPI continuous infusion to reveal an actively bleeding gastric ulcer. Hemostasis is achieved with epinephrine injection and placement of two clips.

Which of the following statements regarding his ASA therapy is correct?

## Question 3 (continued)

Which of the following statements regarding his ASA therapy is correct?

- a) His ASA therapy should not be restarted
- b) His ASA should be restarted after repeat EGD documents healing of the ulcer in 6-8 weeks time
- c) His ASA should be restarted before discharge
- d) He should be switched to coumadin instead of ASA

## Answer 3

Which of the following statements regarding his ASA therapy is correct?

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