



UPPER GASTROINTESTINAL BLEEDING

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INTRODUCTION

- UGIB is considered medical emergency and require admission to hospital for urgent diagnosis and management. It is a common cause of emergency admission to hospital.
- UGIB vs LGIB= 5:1. **Incidence:** 170/100,000/yr. (US data). More common in males. Over 350,000 US hospitalization/yr.; cost \$ 1 billion/yr.
- Despite a decrease incidence of ulcer disease and improvements in the management of UGIB, **mortality** remains high at **6-10%**, which increase in the elderly. Patients die rarely from exsanguinations but from complications of an underlying disease. Self-limited in 80% of patients.
- Patients are usually stratified into having either Variceal or Non-variceal sources of UGIB, as the two have different treatment algorithms and prognosis: **Variceal:** Look for evidence of chronic liver disease such as jaundice, spider naevi, ascites and so on. **Non-variceal:** Any previous history of PUD, NSAIDs, anticoagulants, dyspeptic symptoms.

UpperGI Bleeding

Non variceal Upper GI bleeding 90%

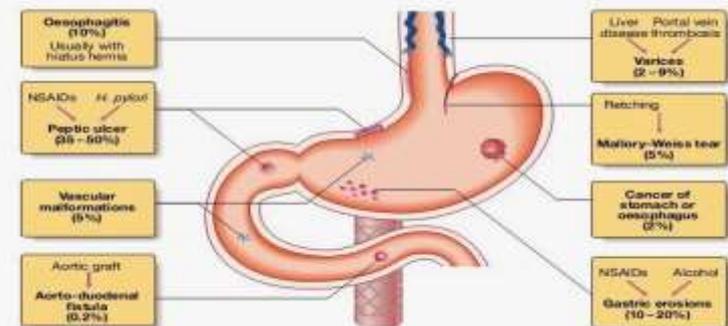


Variceal bleeding 10%



CAUSES

Pathology	Risk factor	Frequency (%)
Peptic Ulcer: Duodenal Ulcer; Gastric ulcer	H. pylori; NSAIDs	35-50
Gastric erosions; hemorrhagic gastropathy	Alcohol; NSAIDs	10-20
Esophageal varices; gastric varices	Liver disease; portal vein thrombosis	2-9
Erosive Esophagitis; esophageal ulcer	Usually with hiatus hernia	10
Mallory-Weis tear	Retching	5
Vascular malformation: Dieulafoy lesion; Hereditary telangiectasia (Osler-Weber-Rendu syndrome; angiodyplasia; gastric antral vascular ectasia (watermelon stomach).	Hereditary	5
Esophageal; gastric cancer		2
Aorto-enteric fistula	Aortic graft; primary	0.2
Portal gastropathy; Blood dyscrasia; coagulopathies; alcohol & drugs (anti-platelets; anticoagulants; aspirin; NSAIDs; SSRIs; steroids); Hemobilia; Hemosuccus pancreaticus; Pseudoxanthoma elasticum; trauma; foreign body; peri-ampullary ca; duodenitis; anastomotic ulcer; Crohn; severe superior mesenteric artery syndrome; Cameron lesions; Non-GI source (epistaxis), Factitious bleeding; unknown		10



OTHER CAUSES (1)

- **Drugs: NSAIDs:** 50% of patients > 60 yr. presented with UGIB has history of NSAIDs; **Steroid therapy:** rarely may cause **Cushing's ulcer**; Poorly controlled **Anticoagulant therapy**; **SSRIs** (Selective serotonin reuptake inhibitors): double the rate of UGIB.
- **Stress ulcer:** fortunately uncommon, associated with high mortality.
- **Acute mucosal ulceration (stress gastritis):** often multiple and not extend through muscularis mucosa. Diffuse and typically involve the gastric body and fundus. More frequently seen in the following conditions (shock, sepsis, surgery, trauma, burn, renal or respiratory failure, and jaundice). It is due to imbalance between aggressive and protective mucosal factors. Both H2-blockers and antacid are effective in prevention. Stress gastritis and mucosal ulceration are historically associated with (1) **head injuries** with associated elevations in intracranial pressure and (2) **burn injuries**. These stress ulcers are called **Cushing ulcer** and **Curling ulcer**, respectively.
- **Mallory–Weiss syndrome:** Account for **5-15%** of all cases of UGIB, and are relatively common in **alcoholics**. Bleeding from a laceration in the mucosa at the gastric cardia or GEJ. This is usually caused by severe vomiting because of alcoholism or **bulimia**, but can be caused by any condition which causes **violent vomiting and retching** such as food poisoning. Forceful vomiting, retching, coughing or straining may create a rapid increase in the gradient between intragastric and intrathoracic pressures → gastric mucosal tear from the forceful distension of the GEJ. The tear **involves the mucosa and submucosa but not the muscular layer** (contrast to **Boerhaave syndrome** which involves all the layers). It often presents as an episode of hematemesis after violent retching or vomiting, but may also be noticed as melena, and a history of retching may be absent. In most cases, the bleeding stops spontaneously after 24–48 hours, but endoscopic or surgical treatment is sometimes required. The condition is rarely fatal.
- **Hemobilia:** is usually associated with **intraductal neoplasm, trauma, or iatrogenic injury** such as percutaneous liver biopsy and cystic artery pseudoaneurysm. Suggested by jaundice, RUQ pain & UGIB. May be confirmed at endoscopy but often require angiography. Angiographic therapy is the treatment of choice, although occasionally surgical therapy is necessary.
- **Hemosuccus pancreaticus:** most commonly due to a **splenic artery pseudoaneurysm** in patients with **CP, pseudocyst**, but rarely due to **pancreatic duct malignancy**.

OTHER CAUSES (2)

- **Dieulafoy lesion:** is characterized by a **large tortuous arteriole** most commonly in the gastric submucosa that erodes and bleeds. **75-95% occur in the proximal stomach, usually on the lesser curvature and within 6 cm of GEJ**, although they have been reported to occur throughout the GIT. It can cause UGIB, but is relatively uncommon. It is thought to cause < 5% of all GI bleeds in adults. It is also called "**caliber-persistent artery**" or "aneurysm" of gastric vessels. However, unlike most other aneurysms, these are thought to be developmental malformations rather than degenerative changes.
- **Cameron lesion:** is a **linear erosion or ulceration of the mucosal folds lining the stomach where it is constricted by the thoracic diaphragm in persons with large hiatal hernias**. The lesions may cause chronic blood loss resulting in iron deficiency anemia; less often they cause acute bleeding. Treatment of anemia includes iron supplements and PPI acid suppression. Surgical hernia repair is sometimes needed.
- **Angiodysplasia/ectasia:** whether sporadic or secondary, is **the most common vascular anomaly seen in the GIT**. They are **dilated tortuous vessels in the mucosa & submucosa**. May be due to intermittent obstruction of the submucosal veins because of the colonic wall tension, which is highest in the cecum. May be sporadic, usually developing in the elderly or may be found in association with a number of disorders including **renal failure, cirrhosis, the CREST syndrome, radiation injuries, von Willebrand's disease and aortic stenosis**. May occur anywhere in the GIT, but are more commonly found in the colon (**most common in the cecum & ascending colon**), followed by the small intestine and the stomach. These lesions usually lead to occult blood loss, but can also cause overt GI bleeding.
- **Gastric antral vascular ectasia (GAVE, watermelon stomach)** : characterized by **rows or stripes of ectatic (distensible) mucosal blood vessels that emanate from the pylorus and extend proximally into the antrum**. It is an uncommon cause of chronic UGIB or iron deficiency anemia. Occasionally may present as acute UGIB (melena and/or hematochezia). The condition is associated with dilated small blood vessels in the pyloric antrum. The dilated vessels result in intestinal bleeding. It is also called **watermelon stomach** because streaky long red areas that are present in the stomach may resemble the markings on watermelon. GAVE is associated with a number of conditions, including **portal hypertension, chronic kidney failure, and collagen vascular diseases**. It also occurs particularly with **scleroderma**, and especially the subtype known as systemic sclerosis. GAVE is treated commonly by means of an endoscope, including **argon plasma coagulation and electrocautery**. Since endoscopy with argon photocoagulation is "usually effective", surgery (antrectomy) is usually not required.

RISK FOR UGIB

- **Acute Illness:**

1. Shock
2. Respiratory failure
3. Head trauma
4. Thermal injury

- **Chronic Conditions:**

1. Renal dysfunction
2. Liver diseases
3. Coagulopathy
4. *Helicobacter pylori*

- **Drugs:**

1. Anticoagulants
2. Antiplatelets agents
3. NSAIDs
4. SSRIs

- **Devices:**

1. Mechanical ventilation
2. Renal –replacement therapy
3. Extracorporeal life support

Upper GI Bleed

- **History**
 - PUD, prior bleeds, EtOH, prior surgical/endoscopic interventions (marginal ulcers), liver disease (varices), tumor, prior radiation
 - Meds – NSAIDs, anti-platelets, anticoagulation
 - ROS – epigastric pain (PUD), retching (Mallory-Weiss tear), odynophagia/dysphagia (esophageal ulcer)
- **Physical Exam**
 - Look for evidence of hypovolemia (tachycardia/hypotension)
 - Abdominal exam
 - Rectal exam
 - Guaiac?!
- **Accurate H&P allows for proper assessment of bleeding severity, volume status, risk factors, and triage decision**



CLINICAL FEATURE

- **Past history:** dyspepsia, alcohol or NSAIDs ingestion, weight loss may suggest the cause.
- **Hematemesis:** Vomiting of blood, could be: digested blood in the stomach (coffee-ground vomitus that indicate slower rate of bleeding) or fresh/unaltered blood (gross blood and clots, indicates rapid bleeding). More common with lesions in the esophagus and stomach.
- **Melena:** Stool consisting of partially digested blood (black tarry, semi solid, shiny and has a distinctive odor, when present it indicated that blood has been present in the GIT for at least 14 hr. The more proximal the bleeding site, the more likely melena will occur. More common with lesions distal to the pylorus. The black color of melena stool is caused by hematin, the product of enzymatic degradation and oxidation of heme (Fe in hemoglobin) by intestinal and bacterial enzymes during passage through ileum and colon. Foul smelling, black (not dark) (make sure patient is not on iron or bismuth medication).
- **Hematochezia:** It is defined as passage of bright-red blood or maroon stools from the rectum. Bright red blood may come out unchanged in the stool. Usually represents a lower GI source of bleeding, however, an upper GI lesion may bleed so briskly (> 1L blood loss) that blood does not remain in the bowel long enough for melena to develop. When hematochezia is the presenting symptom of UGIB, it is associated with hemodynamic instability and low hemoglobin. Present if profuse UGIB.
- **Signs of severe acute blood loss:** Pallor, clammy skin, tachycardia, and hypotension.
- **Signs & symptoms of the underlying disease** (e.g. liver disease, malignancy)
- **BUN/Cr:** usually > 30:1 ratio. Secondary to blood protein absorption or pre-renal azotemia.
- **Positive Guaiac.**
- The diagnosis of UGIB is assumed when hematemesis is documented. If absent, an upper source for bleeding is likely if there is melena or positive gastrocult test or endoscopic image of gastric or duodenal ulcer with stigmata of recent hemorrhage (e.g., visible vessel).

MANAGEMENT

- Four steps:

1. Resuscitation.
2. Initial Assessment & Triage.
3. Establishment of a diagnosis (Endoscopy).
4. Management of specific conditions.

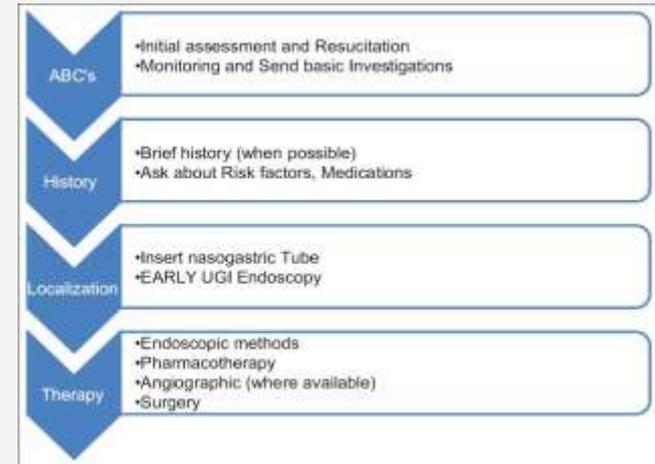
- Initial assessment, resuscitation and triage:

- UGIB may have different clinical presentations:

- Hematemesis or hematochezia with hemodynamic instability,
 - Melena or rectal bleeding without hemodynamic compromise.
 - Patients may have chronic GI bleeding with asymptomatic iron-deficiency anemia, or hemoccult-positive stool on screening for colorectal cancer.

- Patients presenting to the ER with hemodynamic instability require rapid clinical assessment:

- Intravenous access with at least **two large-bore lines**.
 - Nasogastric tube placement (controversial).
 - Determination of hematocrit and coagulation studies, and type and cross for blood products.
 - Patients with altered mental status should undergo endotracheal intubation for airway protection.
 - Emergent evaluation by a gastroenterologist should be requested.
 - The patients should be stabilized before proceeding to urgent endoscopy.



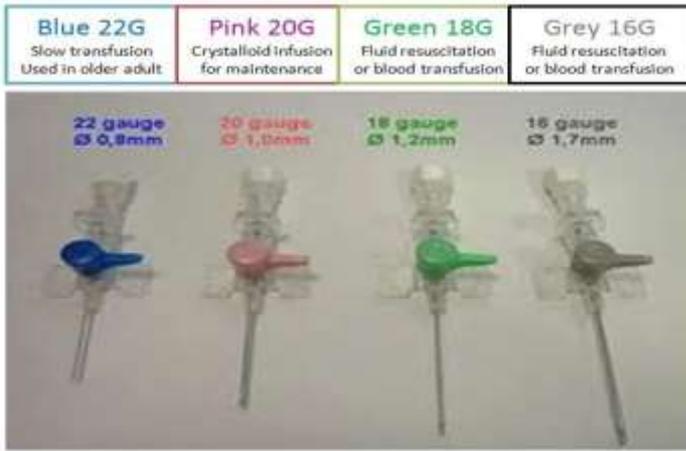
RESUSCITATION

1. Measure BP and HR & repeat measurement hourly.
2. Admission (if SBP < 100 or HR > 100 → ICU admission).
3. NPO: for 24 hr.
4. Complete bed rest.
5. IV access with **two large bore cannula** (IV lines).
6. Draw blood samples for Basic investigations:
 - A. CBC (Hg level).
 - B. U & E.
 - C. LFT.
 - D. PT, PTT.
 - E. Blood group and cross match.
7. IV colloids or crystalloids. Plasma expanders: e.g. Hess solution.
8. Start blood transfusion.
9. CVP line
10. Insert Foley's catheter and monitor the urine output hourly.
11. Insert NG tube (controversial). (NG aspirate may be negative in 10% of bleeding DU due to edema or pylorospasm; the sensitivity of NG aspirate of assessing active bleeding is 79%; NG may cause trauma or dislodge a clot!).
12. Endoscopy after stabilization for diagnosis & treatment.
13. IV PPI therapy for bleeding ulcer.



Controversial pre-endoscopy actions

- Naso-gastric tube placement with aspiration
 - Presence of fresh blood is a sign of high-risk lesion (low sensitivity and specificity) → need for urgent endoscopic therapy
 - Reduction of quantity of blood → better visibility during endoscopy
- Use of prokinetic agents (erythromycin or metoclopramide) intravenously 20 to 120 minutes before endoscopy in patients with severe bleeding
 - Reduction of quantity of blood → better visibility during endoscopy



Needle Gauges for Injections Size Chart



Types of Needles for Injection

SPECIFICATIONS

Gauge	Colour Code	Ext. Dia. mm	Length mm	Flow Rate ml/min
14G	Orange	2.1	45	240
16G	Grey	1.8	45	180
18G	Green	1.3	32/45	90
20G	Pink	1.1	32	60
22G	Blue	0.9	25	36
24G	Yellow	0.7	19	20
26G	Violet	0.6	19	13

Color	Gauge Size	External Diameter (mm)*	Length (mm)*	Water Flow Rate (mL/min)*	Recommended Uses
 Orange	14G	2.1 mm	45mm	~240 mL/min	Trauma, Rapid blood transfusion, Surgery ¹
 Gray	16G	1.8 mm	45mm	~180 mL/min	Rapid fluid replacement, Trauma, Rapid blood transfusion ¹
 Green	18G	1.3 mm	32mm	~90 mL/min	Rapid fluid replacement, Trauma, Rapid blood transfusion ¹
 Pink	20G	1.1 mm	32mm	~60 mL/min	Most infusions, Rapid fluid replacement, Trauma, Routine blood transfusion ¹
 Blue	22G	0.9 mm	25mm	~36 mL/min	Most infusions Neonate, pediatric, older adults Routine blood transfusion ¹
 Yellow	24G	0.7mm	19mm	~20 mL/min	Most infusions Neonate, pediatric, older adults, Routine blood transfusion, Neonate or Pediatric blood transfusion ¹
 Purple	26G	0.6 mm	19mm	~13 mL/min	Pediatrics, Neonate ¹

BRITISH SOCIETY OF GASTROENTEROLOGY RECOMMENDATIONS

- We recommend that patients with hematemesis, melena, or coffee ground vomiting in the absence of an alternate diagnosis (e.g., bowel obstruction) trigger the acute upper gastrointestinal bleeding (AUGIB) bundle.
- We recommend that patients with suspected AUGIB should have urgent observations performed using a validated early warning score such as the National Early Warning Score (NEWS).
- **We recommend all patients with AUGIB be commenced on intravenous fluids. We recommend in hemodynamically unstable patients a crystalloid solution as a bolus of 500 mL in less than 15 min.**
- **We recommend that red blood cell transfusion should follow a restrictive protocol (trigger: Hb <70 g/L; target: 70–100 g/L). A higher trigger should be considered in patients with ischemic heart disease or hemodynamic instability.**
- We recommend that patients with AUGIB with ongoing hemodynamic instability are referred for critical care review.
- We suggest that **platelets** should be given in active acute upper GI bleeding with a platelet count $\leq 50 \times 10^9/L$, as per major hemorrhage protocols.
- We recommend the **Glasgow-Blatchford Score** (GBS) is calculated at presentation with AUGIB.
- We recommend that patients with GBS ≤ 1 at presentation are considered for outpatient management.
- We recommend **intravenous terlipressin** is given to all patients with suspected **cirrhosis/variceal bleeding**. However, caution should be exercised in patients with ischemic heart disease or peripheral vascular disease.
- We recommend giving **intravenous antibiotics** as per local protocol to patients with suspected **cirrhosis/variceal bleeding**.
- We recommend continuing aspirin at presentation.
- We recommend **interrupting P2Y12 inhibitors** until hemostasis is achieved unless the patient has coronary artery stents, in which case, a decision should be undertaken after discussion with a cardiologist. (P2Y12 receptor blockers are a group of antiplatelet drugs. This group of drugs includes: Clopidogrel, Ticlopidine, Ticagrelor, Prasugrel, and Cangrelor).
- We recommend **interrupting warfarin therapy** at presentation.
- We recommend **interrupting direct oral anticoagulant therapy** at presentation.
- We recommend **endoscopy** is offered to patients admitted with suspected AUGIB within 24 hours of presentation. Patients with ongoing hemodynamic instability will require more urgent endoscopy after resuscitation.
- We suggest that the endoscopy report should be reviewed by the ward team.
- We suggest that all patients with varices or those requiring endoscopic therapy are referred to a specialist gastroenterology service.
- We recommend patients with bleeding from ulcers with high-risk stigmata at endoscopy receive **high-dose intravenous proton pump inhibitor (PPI) therapy**; high-dose oral PPIs may be considered as an alternative.
- We recommend patients with AUGIB in whom antithrombotic therapy is interrupted have a clear plan for resumption.

TERLIPRESSIN

- Synthetic Vasopressin (Anti-diuretic hormone), used in variceal bleeds and hepatorenal syndrome.
- Mechanism of action: Slowly cleaved to vasopressin + intrinsic vasoconstrictor effect of its own.
- Dose: 2 mg IV followed by 1-2 mg every 4-6 hours, until bleeding is controlled, for up to 72 hours.
- Contraindications: Vascular disease (esp. coronaries), chronic nephritis. (Caution in asthma, epilepsy, migraine, renal impairment, pregnancy)
- Side Effects: Fluid retention, pallor, tremor, headache, nausea, vomiting, coronary artery constriction, peripheral ischemia, hypersensitivity reactions.
- Alternative/additional therapies: Vasopressin, Octreotide, Sclerotherapy, Balloon tamponade, Band ligation, TIPS.



VASOPRESSIN AND TERLIPRESSIN

- **Vasopressin** (Pitressin) is a **nonselective vasoconstricting agent that causes a reduction of splanchnic blood flow and thereby a reduced portal pressure**. Vasopressin, which is associated with severe vascular complications, has been largely replaced by other vasoconstrictors such as its synthetic analogue, triglycyl-lysine vasopressin (**terlipressin**).
- **Terlipressin** has fewer side effects and a longer biological half-life, allowing its use as a bolus intravenous injection (**2 mg every 4 hours for the initial 24 hours, then 1 mg every 4 hours for the next 24–48 hours**). Terlipressin has been shown to control bleeding in about 80% of cases and is the only pharmacologic therapy proven, to reduce mortality from acute variceal hemorrhage. In patients with esophageal variceal bleeding, a 24-hour course of terlipressin was shown to be as effective as a 72-hour course when used as adjunct therapy to successful variceal band ligation.
- In a randomized study, terlipressin was compared to norepinephrine in regard to effects on creatinine clearance and urine flow in septic patients; the authors concluded that renal function was improved with both drugs. Terlipressin decreases oxygen consumption. Because it has been speculated that terlipressin might exhibit anti-inflammatory effects that decrease oxygen demand of the tissues, this reduction of oxygen consumption may be interpreted as a positive consequence of terlipressin action. Terlipressin is the drug of choice in hepatorenal syndrome: It reverses hepatorenal syndrome in half of the treated patients and appears to be safe and well tolerated
- **Terlipressin** is an analogue of vasopressin used as a vasoactive drug in the management of low blood pressure. It has been found to be effective when norepinephrine does not help.
- Indications for use include norepinephrine-resistant septic shock and hepatorenal syndrome. In addition, it is used to treat bleeding esophageal varices.

BMP, CMP, TEG

A **basic metabolic panel (BMP)** is a test that measures **eight** different substances in the blood. Other names: chemistry panel, chemistry screen, chem 7, electrolyte panel.

It provides important information about the body's chemical balance and metabolism. A BMP includes tests for the following:

1. **Glucose.**
2. **Calcium.**
3. **Sodium, potassium, carbon dioxide, and chloride.**
4. **BUN and creatinine.**

A **comprehensive metabolic panel (CMP)**: includes the same eight tests as a BMP, **plus six** more tests, which measure certain proteins and liver enzymes. The additional tests are:

1. **Albumin.**
2. **Total protein.**
3. **ALP (alkaline phosphatase).**
4. **ALT (alanine transaminase).**
5. **AST (aspartate aminotransferase).**
6. **Bilirubin.**

Thromboelastography (TEG) is a method of testing the efficiency of blood coagulation. It is a test mainly used in surgery and anesthesiology, although increasingly used in resuscitations in Emergency Departments, intensive care units, and labor and delivery suites. More common tests of blood coagulation include prothrombin time (**PT**) and partial thromboplastin time (**aPTT**) which measure coagulation factor function, but TEG also can assess **platelet function**, **clot strength**, and **fibrinolysis**, which these other tests cannot.

Thromboelastometry (TEM), previously named rotational thromboelastography (ROTEG) or rotational thromboelastometry (ROTEM), is another version of TEG in which it is the sensor shaft, rather than the cup, that rotates.

UK ACUTE UPPER GI BLEEDING BUNDLE



sam
THE SOCIETY FOR ACUTE MEDICINE



bsg BRITISH SOCIETY OF
GASTROENTEROLOGY



AUGIS
Association of Upper Gastrointestinal Surgeons of
Great Britain and Ireland

UK Acute Upper GI Bleeding Bundle

(to be performed within 24h)

RECOGNITION

↓

RESUSCITATION

↓

RISK ASSESSMENT

↓

R_x (Treatment)

↓

REFER

↓

REVIEW

If reported:
Haematemesis, melaena or coffee ground vomiting

Trigger bundle and record if performed

Perform NEWS as indicated

Commence IV crystalloid

Transfuse if Hb <70g/L, aim for 70-100g/L

Calculate Glasgow-Blatchford Score (GBS): enter value →

- Consider discharge if GBS 0 or 1

If suspected cirrhosis/variceal bleed, give terlipressin 2mg QDS and antibiotics as per local protocol

Continue aspirin

Suspend all other antithrombotics

Referral to ensure that endoscopy is performed within 24h of presentation

Refer to GI specialist if varices or requiring therapeutic endoscopy

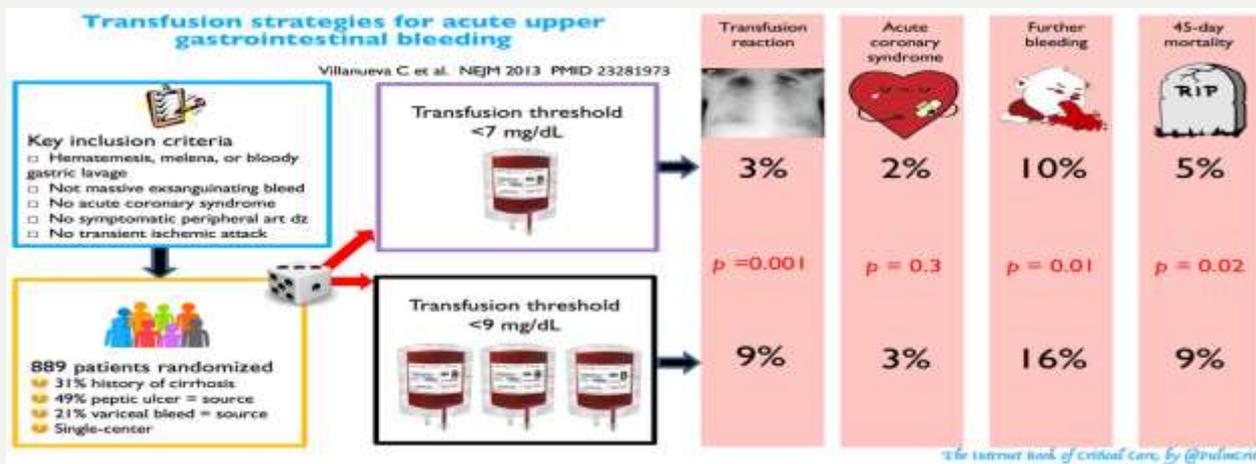
Review endoscopy report

PPI if high risk ulcer post-endoscopy

Post-haemostasis antithrombotic plan

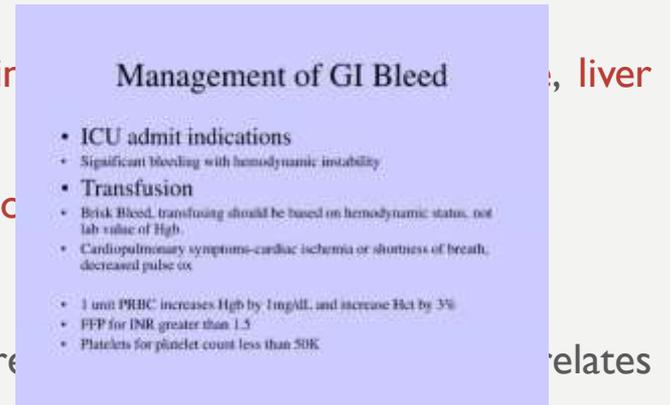
Y/ N/ NA

Haemodynamic instability? Think Major Haemorrhage Protocol +/- critical care review



INITIAL ASSESSMENT & TRIAGE:

- To identify patients with non-variceal UGIB at greatest risk for mortality and rebleeding. Patients may be categorized as low, intermediate and high risk.
- **Pre-endoscopy scoring systems:**
 1. **Blatchford Score:** BP, BUN level, Hemoglobin, liver disease, heart failure.
 2. **Clinical Rockall score:** patient's age, shock & coagulopathy.
- **Post-endoscopy scoring system:**
 1. **Complete Rockall score:** Clinical Rockall score plus endoscopic findings. Correlates well with mortality & risk of rebleeding.
- Risk factors associated with increased mortality, recurrent bleeding, the need for endoscopic hemostasis, or surgery: Age > 60; severe comorbidity; active bleeding (e.g. witnessed hematemesis, red blood per NG tube, fresh blood per rectum); hemodynamic instability (hypotension); red blood transfusion > 6 units; severe coagulopathy.



Management of GI Bleed

- ICU admit indications
 - Significant bleeding with hemodynamic instability
- Transfusion
 - Bleed. transfusing should be based on hemodynamic status, not lab value of Hgb.
 - Cardiopulmonary symptoms-cardiac ischemia or shortness of breath, decreased pulse ox
 - 1 unit PRBC increases Hgb by 1mg/dL, and increase Hct by 3%
 - FFP for INR greater than 1.5
 - Platelets for platelet count less than 50K

ROCKALL RISK SCORE (1)

- Rockwall's score:

Variable	Score
Age	0-2
Presence of Shock	0-2
Comorbidity	0-3
Diagnosis	0-2
Endoscopic Stigmata of Recent Hemorrhage	0-2

Rockall Risk Score for rebleeding & death after admission to The hospital for Acute UGIB (2)

Variable	Score			
	0	1	2	3
Age (years)	<60	60-79	≥ 80	
Shock Pulse rate SBP (mmHg)	“No shock” < 100 ≥ 100	“Tachycardia”, ≥ 100 ≥ 100	“Hypotension” < 100	
Comorbidity	No Major comorbidity		Cardiac failure, ischemic heart disease, any major comorbidity	Renal or liver failure, disseminated malignancy
Diagnosis	Mallory-Weiss tear or no lesion identified and no SRH/blood	All other diagnosis	Malignant lesion of Upper GIT	
Major SRH	None or dark spot only		Blood in the UGIT, adherent clot, visible or spurting vessel	

Rockwall Risk Score (3)

Score	% of Total	Rebleeding	Death
0	5.6	4.9	0
1	11	3.2	0
2	12.8	5	0.3
3	15.9	12.2	2
4	17.8	13.8	4.2
5	14.5	16.9	7.9
6	9.4	29.4	15.1
7	8	39.6	19.8
>8	5.1	47.7	39.1

Rockall Risk Score (4)

Score	Mean Hospital Stay (days)
0	3.7
1	4.1
2	6.1
3	7.6
4	9.3
5	10.8
6	10.6
7	12.7
>8	15.3
Total	8.6

Risk-Stratification Tools for Upper Gastrointestinal Hemorrhage

A Blatchford Score

At Presentation	Points
Systolic blood pressure	
100–109 mm Hg	1
90–99 mm Hg	2
<90 mm Hg	3
Blood urea nitrogen	
6.5–7.9 mmol/liter	2
8.0–9.9 mmol/liter	3
10.0–24.9 mmol/liter	4
≥25 mmol/liter	6
Hemoglobin for men	
12.0–12.9 g/dl	1
10.0–11.9 g/dl	3
<10.0 g/dl	6
Hemoglobin for women	
10.0–11.9 g/dl	1
<10.0 g/dl	6
Other variables at presentation	
Pulse ≥100	1
Melena	1
Syncope	2
Hepatic disease	2
Cardiac failure	2

B Rockall Score

Variable	Points
Age	
<60 yr	0
60–79 yr	1
≥80 yr	2
Shock	
Heart rate >100 beats/min	1
Systolic blood pressure <100 mm Hg	2
Coexisting illness	
Ischemic heart disease, congestive heart failure, other major illness	2
Renal failure, hepatic failure, metastatic cancer	3
Endoscopic diagnosis	
No lesion observed, Mallory–Weiss tear	0
Peptic ulcer, erosive disease, esophagitis	1
Cancer of upper GI tract	2
Endoscopic stigmata of recent hemorrhage	
Clean base ulcer, flat pigmented spot	0
Blood in upper GI tract, active bleeding, visible vessel, clot	2

Blatchford scores from 0 to 23, with higher scores indicating higher risk

The Rockall score :

- Used clinical and endoscopic criteria
- The scale ranges from 0 to 11 points, with higher scores indicating higher risk.

BLATCHFORD SCORE

<ul style="list-style-type: none"> • Blood Urea Nitrogen(mmol/L) 6.5 – 7.9 2 8 – 9.9 3 10 – 24.9 4 ≥25 6 	<ul style="list-style-type: none"> •Other markers Pulse ≥ 100 (per min) 1 Presentation with melena 1 Presentation with syncope 2 Hepatic disease 2 Cardiac failure 2
<ul style="list-style-type: none"> • Haemoglobin (g/dL) for men 12–12.9 1 10–11.9 3 <10 6 	<ul style="list-style-type: none"> •Score from 0 to 23 •Scores ≥ 6 – 50% risk of needing an intervention.
<ul style="list-style-type: none"> • Haemoglobin (g/dL) for women 10–11.9 1 <10 6 	<ul style="list-style-type: none"> Score is "0" if : •Hemoglobin level >12.9 g/dl(men) or >11.9 g/dl(women)
<ul style="list-style-type: none"> • Systolic BP (mm Hg) - 100–109 1 - 90–99 2 - <90 3 	<ul style="list-style-type: none"> •Systolic blood pressure >109 mm Hg •Pulse <100/minute •BUN level <6.5 mmol/L •No melena or syncope •No liver disease or heart failure

Blatchford O, Murray WB, Blatchford M. (2001) 316:1318-21.

University of Leicester



Glasgow-Blatchford Score

Endoscopy Risk Marker	Score	Additional Risk Marker	Score
Blood Urea		Systolic BP (mmHg)	
• 165-180	2	• < 100-109	1
• 180-200	3	• 80-89	2
• 200-220	4	• < 80	3
• ≥ 225	6		
Hemoglobin (g/L) for Men		Other Markers	
• 112.0-129.9	1	• Pulse <100 (per min)	1
• 110.0-129.9	2	• Presentation with melena	1
• 112.0	6	• Presentation with syncope	2
		• Hepatic disease	2
		• Cardiac failure	2
Hemoglobin (g/L) for Women			
• 110.0-129.9	1		
• 112.0	6		

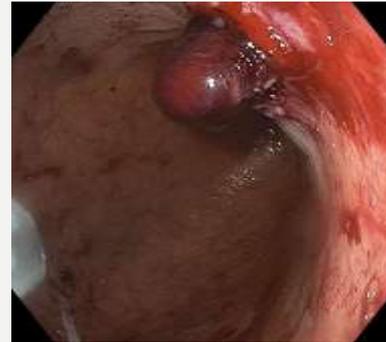
ESTABLISHMENT OF A DIAGNOSIS

- The foundation of diagnosis and management of patients with an UGIB is an endoscopy. After stabilization, upper GI endoscopy: under minimum sedation with wide pore suction channel endoscope.
- Advantage of early endoscopy (within 24 hours):
 1. Identify the bleeding **site**.
 2. Assess the **rate** of bleeding.
 3. **Therapeutic** hemostatic procedures “adrenaline, laser diathermy, heater probe...”
 4. Reduction in blood transfusion requirement.
 5. Identify patients who are **not suitable for surgery**.
 6. Decrease in the need for surgery.
 7. Shorter length of hospital stay

Endoscopic finding



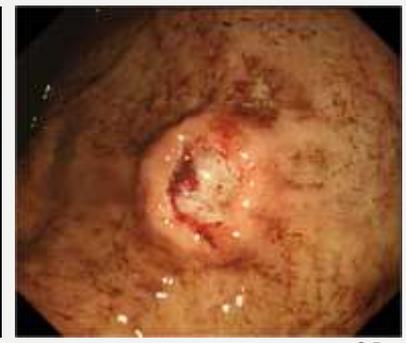
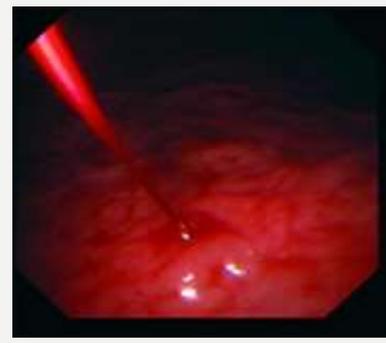
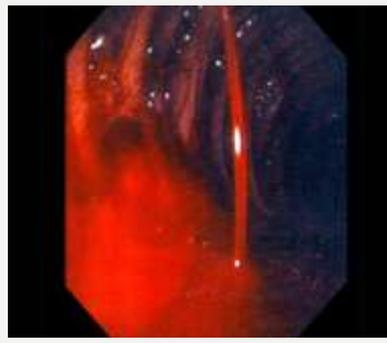
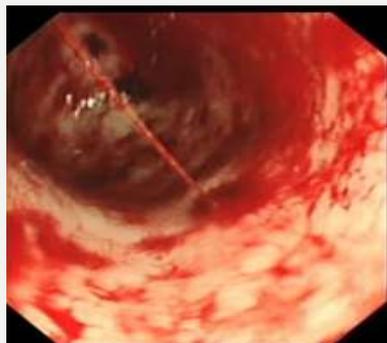
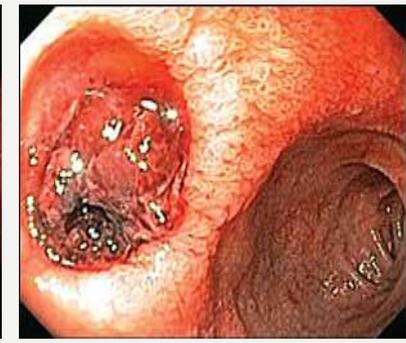
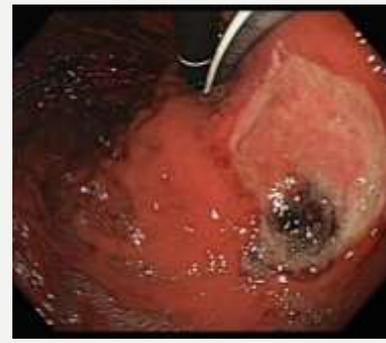
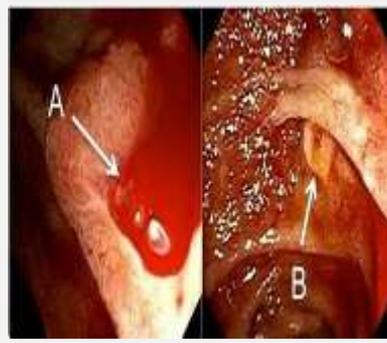
Stigmata of recent hemorrhage



(Forrest classification)

<ul style="list-style-type: none"> • Forrest 1a - Spurting bleeding 	<ul style="list-style-type: none"> • Forrest 1b - Non-spurting active bleeding 
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University of Queensland



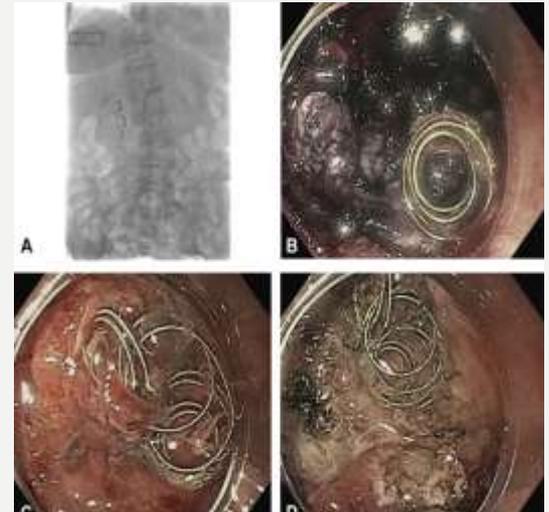
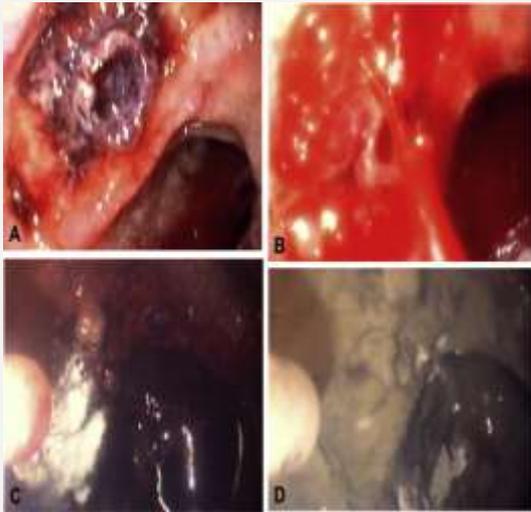
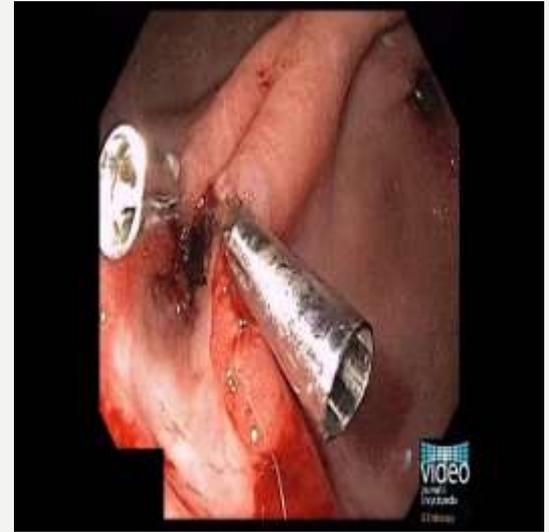
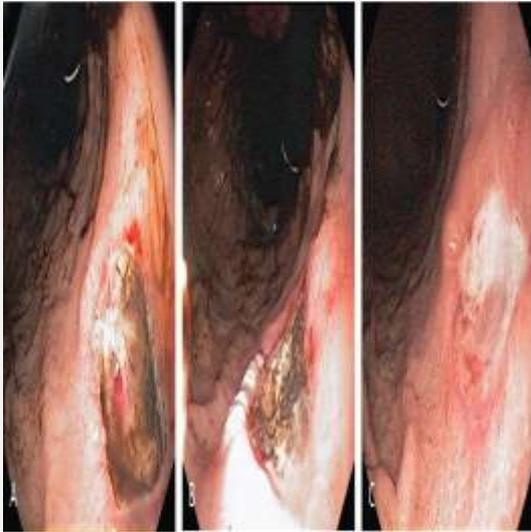
ENDOSCOPIC TREATMENT MODALITIES:

- The nature of the visible vessel could be: a vessel; a pseudoaneurysm; or a clot.
- Topical treatment include: tissue adhesives (cyanoacrylate), blood clotting factors (thrombin, fibrinogen), vasoconstriction drugs (epinephrine), collagen, Ferromagnetic tamponade.

Endoscopic treatment modalities		
Injection	<ul style="list-style-type: none"> ➤ Adrenaline (1:10000) ➤ Sclerosants (ethanolamine, ethanol, polidocanol) ➤ Pro-coagulants (thrombin, fibrin) ➤ Cyanoacrylate 	<p>-----</p> <p>Most commonly used for variceal UGIB</p>
Thermal Devices	<ul style="list-style-type: none"> ➤ Heater probes ➤ Electrocautery probes ➤ Argon plasma coagulation ➤ Lasers photocoagulation 	
Mechanical Therapy	<ul style="list-style-type: none"> ➤ Clips ➤ Band ligation 	<p>-----</p> <p>Modality of choice for variceal UGIB</p>

Meta-analyses have found that combination therapy (adrenaline + 2nd modality) is superior to adrenaline alone in treating high risk stigmata lesions (reducing risk of rebleeding, mortality and surgery).

Endoscopic therapy



Angiographic therapy: Embolization

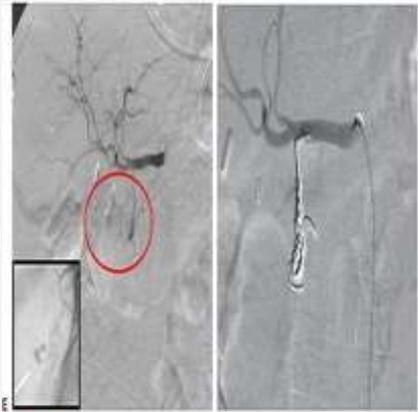


Figure 18 Continued **E** Repeat celiac arteriogram reveals active extravasation of iodinated contrast from the superior pancreaticoduodenal artery. **F** Coil embolization of the gastroduodenal artery.

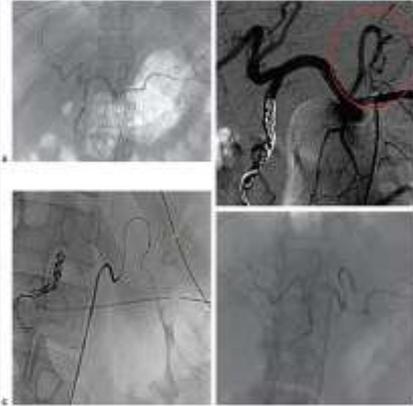
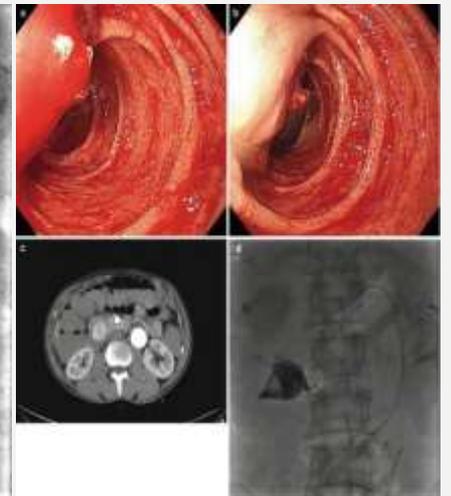
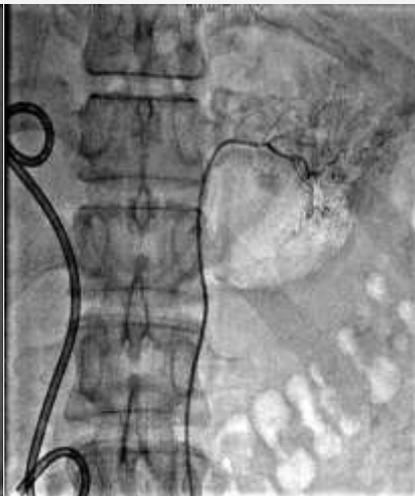
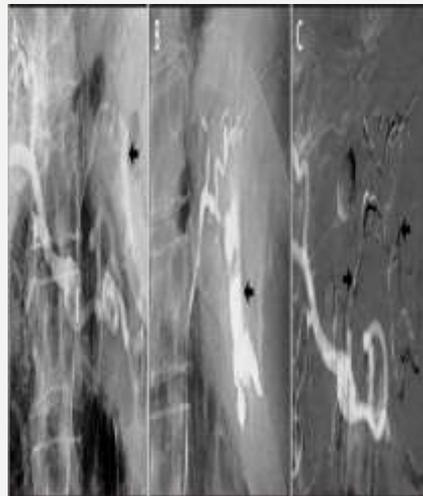
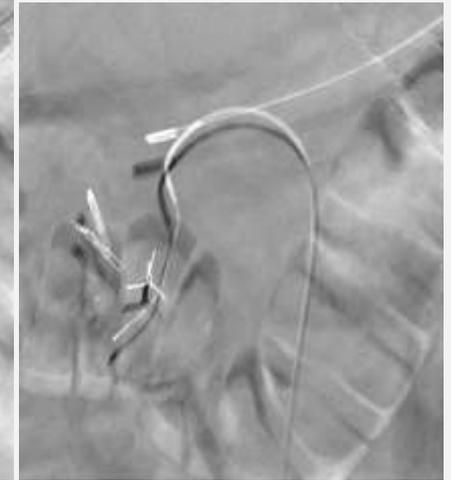


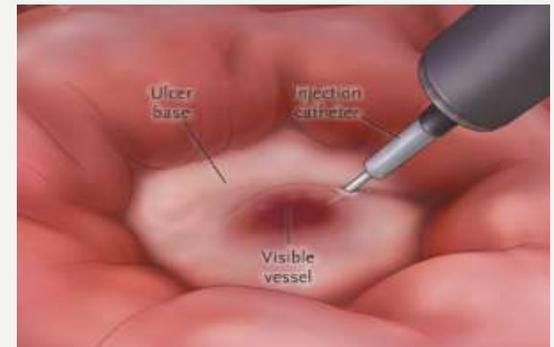
Figure 19 Embolization found an aneurysm along the lower course of the coil with active bleeding from a middle vessel. **A** Celiac arteriogram shows persistent coil embolization of the GDA but no active extravasation. **B** Close inspection of the gastric artery reveals visualization and possible occlusion of left gastric artery branches. **C** Superoinferior view of the stomach in quarter-split view confirms and reveals active extravasation (arrow). **D** Coil embolization of the left gastric artery. The patient continued to bleed despite technically successful embolization. This necessitated urgent intervention. Due to embolization of both the GDA and left gastric artery, their gastroduodenal and gastric junctions were partially compromised.



MANAGEMENT OF SPECIFIC CONDITIONS

I. BLEEDING PEPTIC ULCER:

- **Medical treatment:**
 - Proton pump inhibitor
- **Endoscopic therapy (hemostasis):**
 1. **Injection therapy:** Adrenaline (1/10,000) or sclerosant injection.
 2. Heat probes.
 3. Bipolar diathermy.
 4. **Laser photocoagulation:** using the Nd-YAG laser.
 5. **Metallic clips application.**
- **Angiographic therapy:**
 - **Angiographic Embolization.**
- **Surgical treatment; indications:**
 - Continued bleeding.
 - Recurrence of bleeding after endoscopic therapy.
 - Patient > 60 yr. who need > 6 units of blood for stabilization.



PEPTIC ULCER BLEEDING: CLASSIFICATION

Peptic ulcer bleeding:

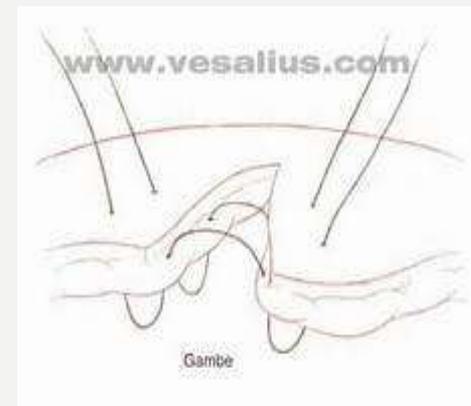
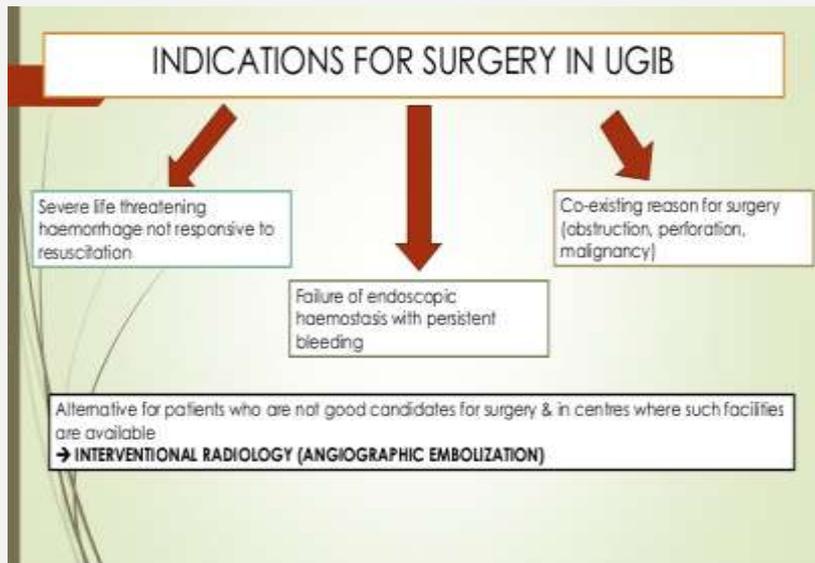
- Good prognosis: 80% stop spontaneously.
- Low mortality (2%) unless rebleeding occurs (25% of patients, 10% mortality).
- Endoscopic predictors of rebleeding (Forrest Classification): Spurt or ooze, visible vessel, fibrin clot.
- Patient can be sent home, if clinically stable, bleed is minor, no comorbidities, endoscopy shows clean ulcer with no high risk predictors of rebleeding.
- Esophageal varices have a high rebleeding rate (55%) and mortality (29%).

Forrest Prognostic Classification of Bleeding Peptic Ulcers

Forrest Class	Type of Lesion	Risk of Rebleed (%)
I	Arteria bleeding (oozing / spurting)	55-100
IIa	Visible vessel	43
IIb	Sentinel clot	22
IIc	Hematin covered flat clot	10
III	No stigmata of hemorrhage	05

SURGICAL ASPECTS IN TREATMENT

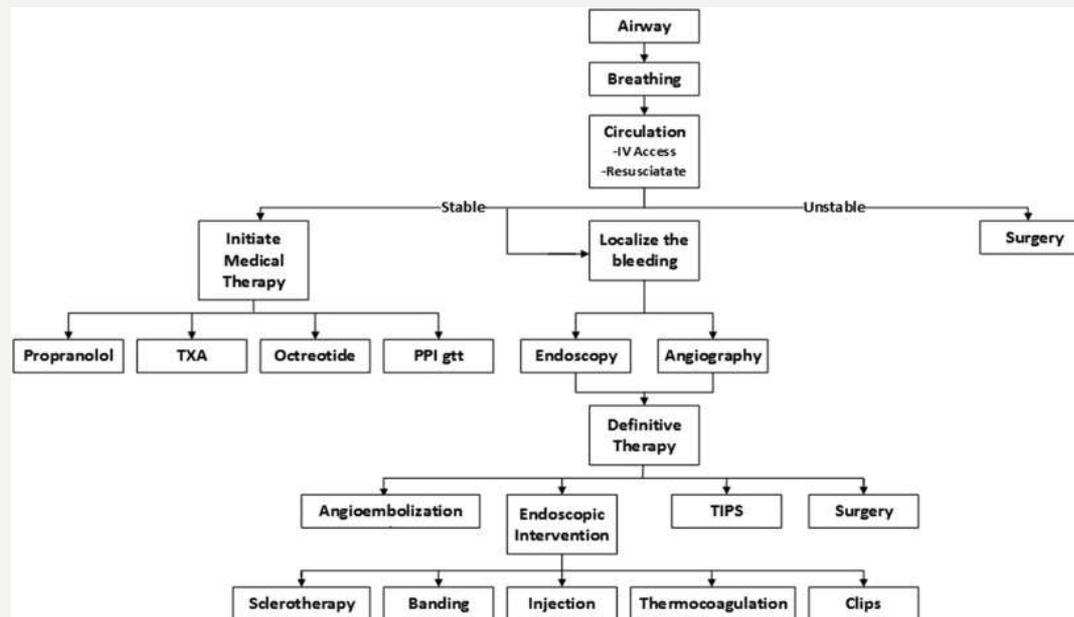
- Due to advances in medications and therapeutic endoscopy techniques and angiographic therapy, UGIB is now usually treated without surgery.
- Surgery is indicated if endoscopic therapy or embolization failed.
- DU is treated by **vagotomy + pyloroplasty + undersewing** of the bleeding ulcer.
- If DU is large and pyloroplasty is difficult, **polya gastrectomy** should be done.
- For bleeding GU → **Billroth I gastrectomy**.
- If the bleeding site is not recognized at endoscopy → the operation should be initiated by gastrotomy.

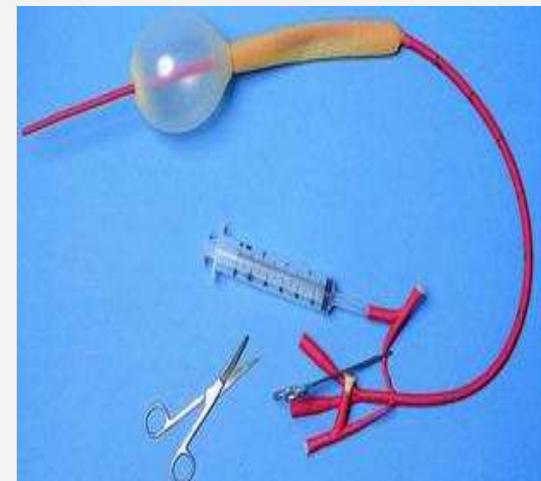
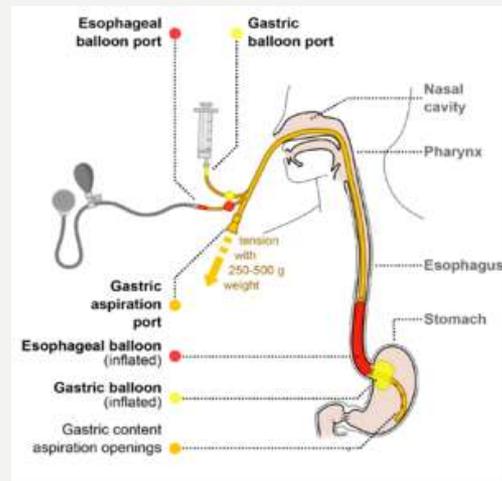
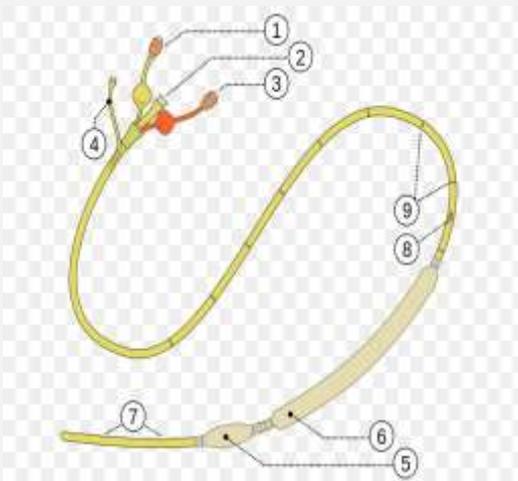
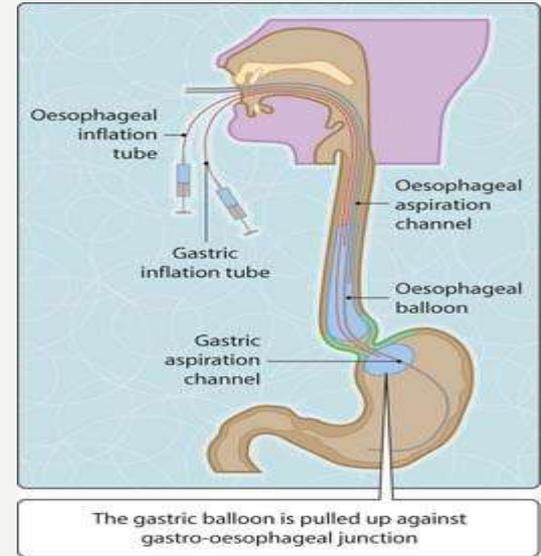
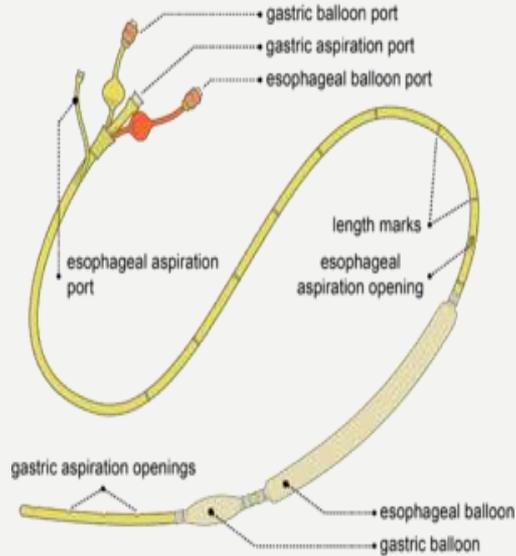


MANAGEMENT OF SPECIFIC CONDITIONS

2. ESOPHAGEAIVARICES

- High mortality and morbidity and high recurrence rate.
- Initial treatment: Rubber band ligation or Injection sclerotherapy “ethanolamine or polidocanol.” And: vasopressin infusion “vasoconstrictor” should be tried.
- If failed → Blakemore-Sengstaken tube should be tried.
- If failed → TIPS
- If failed → Esophageal transection + gastric devascularization “Sugiura procedure”.





MANAGEMENT OF SPECIFIC CONDITIONS

3. GASTRIC EROSIONS

- IV proton pump inhibitor.
- Endoscopic hemostasis procedures.
- Total gastrectomy for persistent bleeding “high mortality”

4. MALLORY-WEISS TEAR

- Treatment is usually supportive as persistent bleeding is uncommon because in most cases the bleeding stops spontaneously. However **cauterization** (Endoscopic application of thermal probes) or **local injection of adrenaline** to stop the bleeding may be undertaken during the index endoscopy procedure. If all other methods fail, high gastrotomy can be used to ligate the bleeding vessel (**direct suturing**). Wide wedge resection of the artery and bleeding site is preferable to oversewing the artery in the area of the mucosal defect. Patients who are poor surgical candidates may respond to angiographic embolization. Very rarely embolization of the arteries supplying the region may be required to stop the bleeding. The tube will not be able to stop bleeding as here the bleeding is arterial and the pressure in the balloon is not sufficient to overcome the arterial pressure.



Mallory–Weiss tear affecting the esophageal side of the gastroesophageal junction

MANAGEMENT OF SPECIFIC CONDITIONS

5. ESOPHAGITIS

- IV proton pump inhibitor in severe cases.

6. Tumors

- Hemostasis then elective surgery.

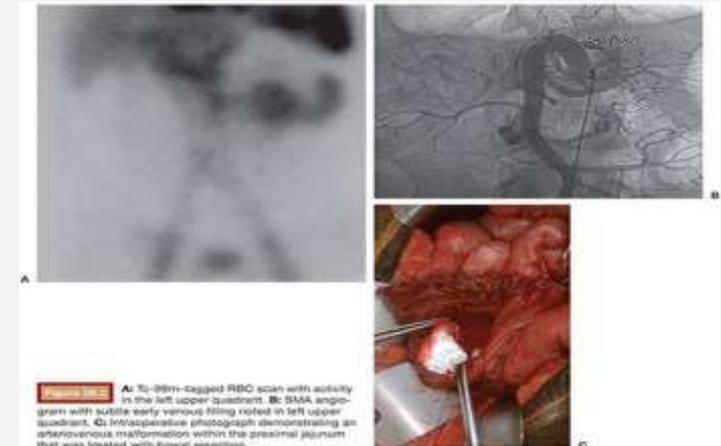
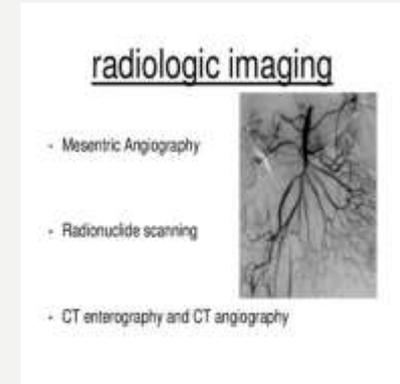
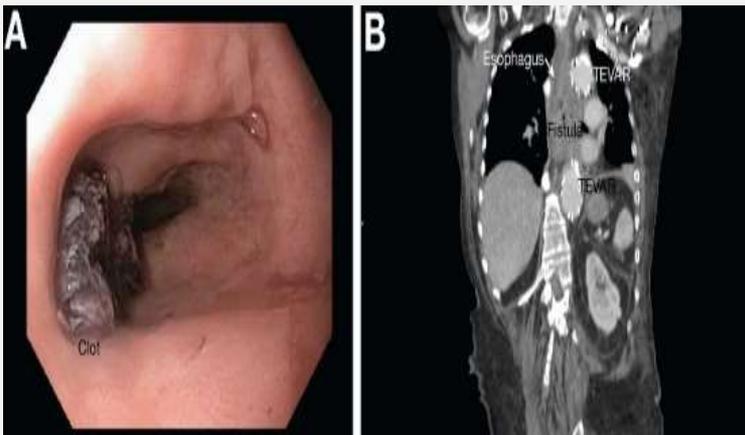
7. Vascular malformations “Dieulafoy lesion”

- Endoscopic hemostasis.

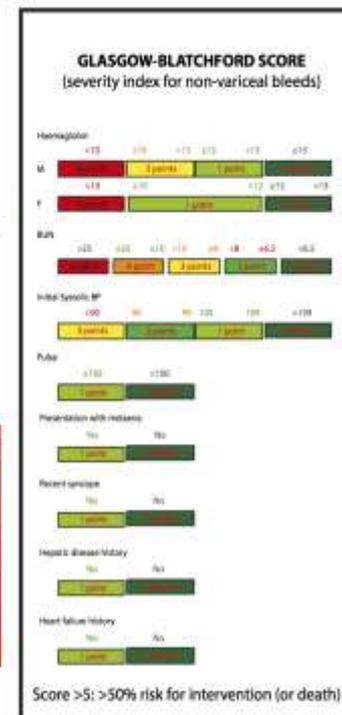
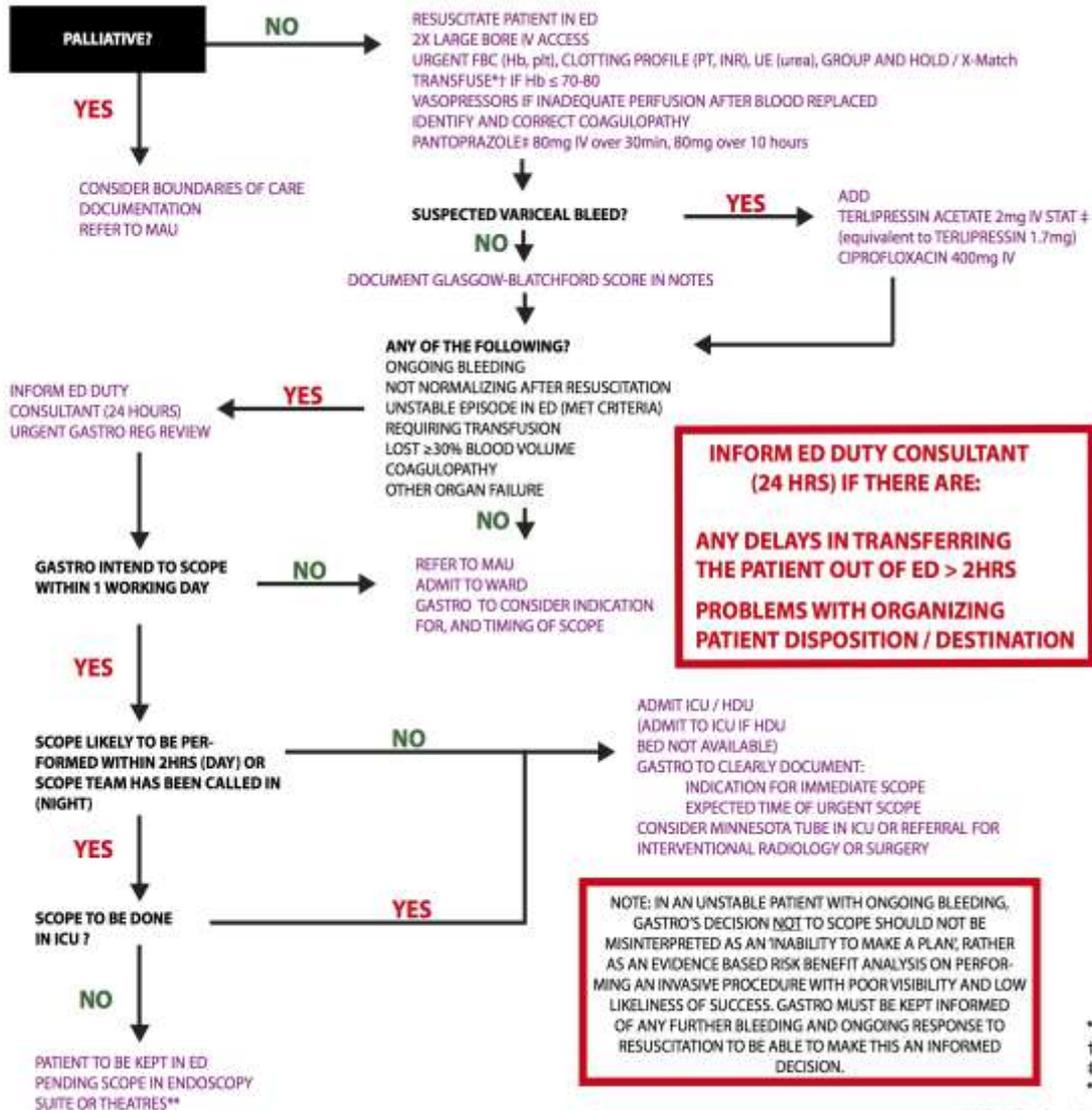
8. Angiodysplasia:

- Usually apparent at endoscopy, at which time therapy with laser or thermal probes may be applied. Bleeding that is refractory to endoscopic or medical therapy is an indication for surgical resection.

9. Aortoenteric fistula:



UPPER GI BLEED PROTOCOL SCGH ED



MET CRITERIA

AIRWAY	THREATENED
BREATHING	36 < RR < 5
CIRCULATION	140 < HR < 40 SBP < 90
NEUROLOGY	GCS FALL > 2 SEIZURE REPEAT / PROLONGED

* Consider higher value if underlying comorbidities or suggestion of ongoing bleeding

† Check Jehovah's Witness status

‡ Guideline MB0302

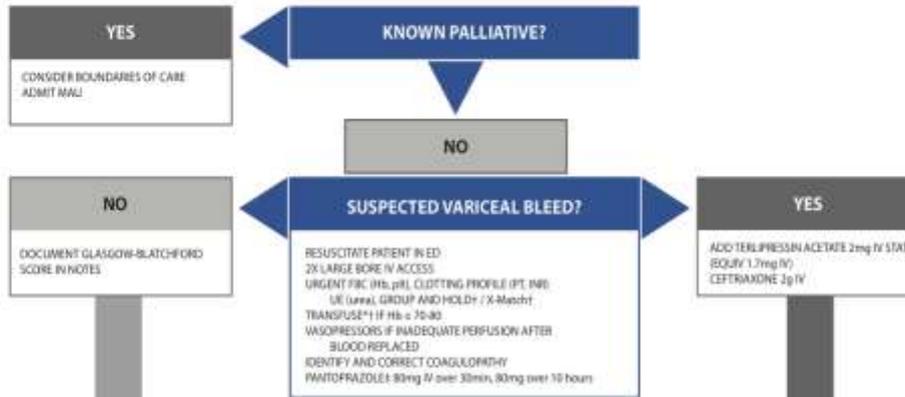
** Consider theatres if anaesthetics involved / airway issues

Guideline developed in conjunction with ED / Gastroenterology / ICU 5/2014 v 1.0



UPPER GI BLEED PROTOCOL SCGH ED v2.1

Order	Order Set	Order	Order Set
Lab	Urea, Creatinine, Bilirubin, INR, PT, PTT, Hemoglobin, Hematocrit, Platelets	Urea, Creatinine, Bilirubin, INR, PT, PTT, Hemoglobin, Hematocrit, Platelets	Urea, Creatinine, Bilirubin, INR, PT, PTT, Hemoglobin, Hematocrit, Platelets
Med	IV Normal Saline 0.9% 1L	IV Normal Saline 0.9% 1L	IV Normal Saline 0.9% 1L
Med	IV PPI (e.g., Pantoprazole 40mg IV)	IV PPI (e.g., Pantoprazole 40mg IV)	IV PPI (e.g., Pantoprazole 40mg IV)
Med	IV Transfusion (if Hb < 70-80)	IV Transfusion (if Hb < 70-80)	IV Transfusion (if Hb < 70-80)
Med	IV Vasopressors (if inadequate perfusion after blood replaced)	IV Vasopressors (if inadequate perfusion after blood replaced)	IV Vasopressors (if inadequate perfusion after blood replaced)
Med	IV Anticoagulants (if applicable)	IV Anticoagulants (if applicable)	IV Anticoagulants (if applicable)
Med	IV Antibiotics (if indicated)	IV Antibiotics (if indicated)	IV Antibiotics (if indicated)



GLASGOW-BLATCHFORD SCORE

(severity index for non-variceal bleeds)

Parameter	Score
Hemoglobin	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
BUN	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
Initial systolic BP	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
Age	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
Presence of comorbidities	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
Shock index	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
Rectally passed blood	0-1 (Green), 2-3 (Yellow), 4-5 (Red)
Heart failure history	0-1 (Green), 2-3 (Yellow), 4-5 (Red)

Score > 4 = >50% risk for intervention (or death)

MET CRITERIA

AIRWAY	THREATENED
BREATHING	SpO ₂ < 92%
CIRCULATION	MAP < 65
NEUROLOGY	GCS FALL > 2 SEIZURE REPEAT / PROLONGED
URINE	< 100ML IN 3 HRS

NOTE: IN AN UNSTABLE PATIENT WITH ONGOING BLEEDING, GASTRO'S DECISION TO SCOPE SHOULD NOT BE MISINTERPRETED AS AN INABILITY TO MAKE A PLAN, RATHER AS AN EVIDENCE BASED RISK-BENEFIT ANALYSIS ON PERFORMING AN INVASIVE PROCEDURE WITH POOR VISIBILITY. IN AN UNSTABLE PATIENT, GASTRO MUST BE KEPT INFORMED OF THE ONGOING RESPONSE TO RESUSCITATION TO BE ABLE TO MAKE THIS AN INFORMED DECISION.

ANY DELAYS OR PROBLEMS WITH DISPOSITION SHOULD BE URGENTLY ESCALATED TO ED DUTY CONSULTANT (24 HRS)

* Consider higher value if underlying comorbidity or progression of ongoing bleeding
 † Check Interval: 15 mins (also check WBC count on initial product)
 ‡ Gastroenterology Therapeutics Guidelines 2017
 ** Consider history of vasculopathy (stroke) / cirrhosis

DISPOSITION TO BE DETERMINED BASED ON GASTRO REG / GASTRO CONS URGENCY OF SCAN

SCOPE NOT URGENT

REFER TO MAU
ADMIT TO WARD
0800-2200 MAU TO INFORM GASTRO
2200-0800 MAU INFORM GASTRO AT 0800

SCOPE TO BE DONE >1 WORKING DAY

REFER TO MAU
ADMIT TO WARD
GASTRO TO DOCUMENT CLEARLY
REASON FOR NOT DOING MORE URGENTLY
ALTERED MET CRITERIA / TARGETS
CRITERIA TO ESCALATE TO URGENT SCOPE
EXPECTED TIME OF SCOPE / REASON FOR NOT SCOPING / BLUE FORM

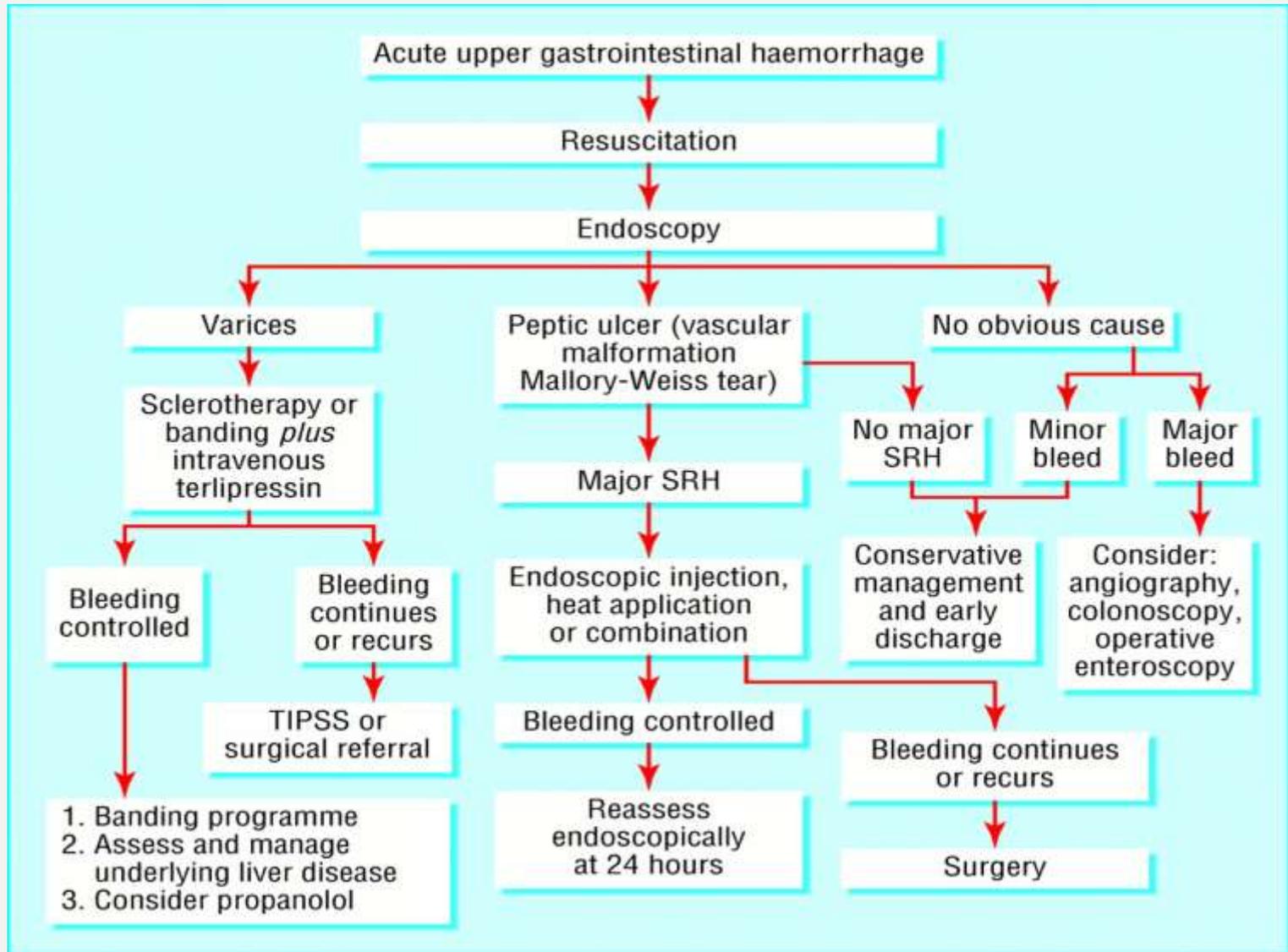
SCOPE TO BE DONE WITHIN 1 WORKING DAY

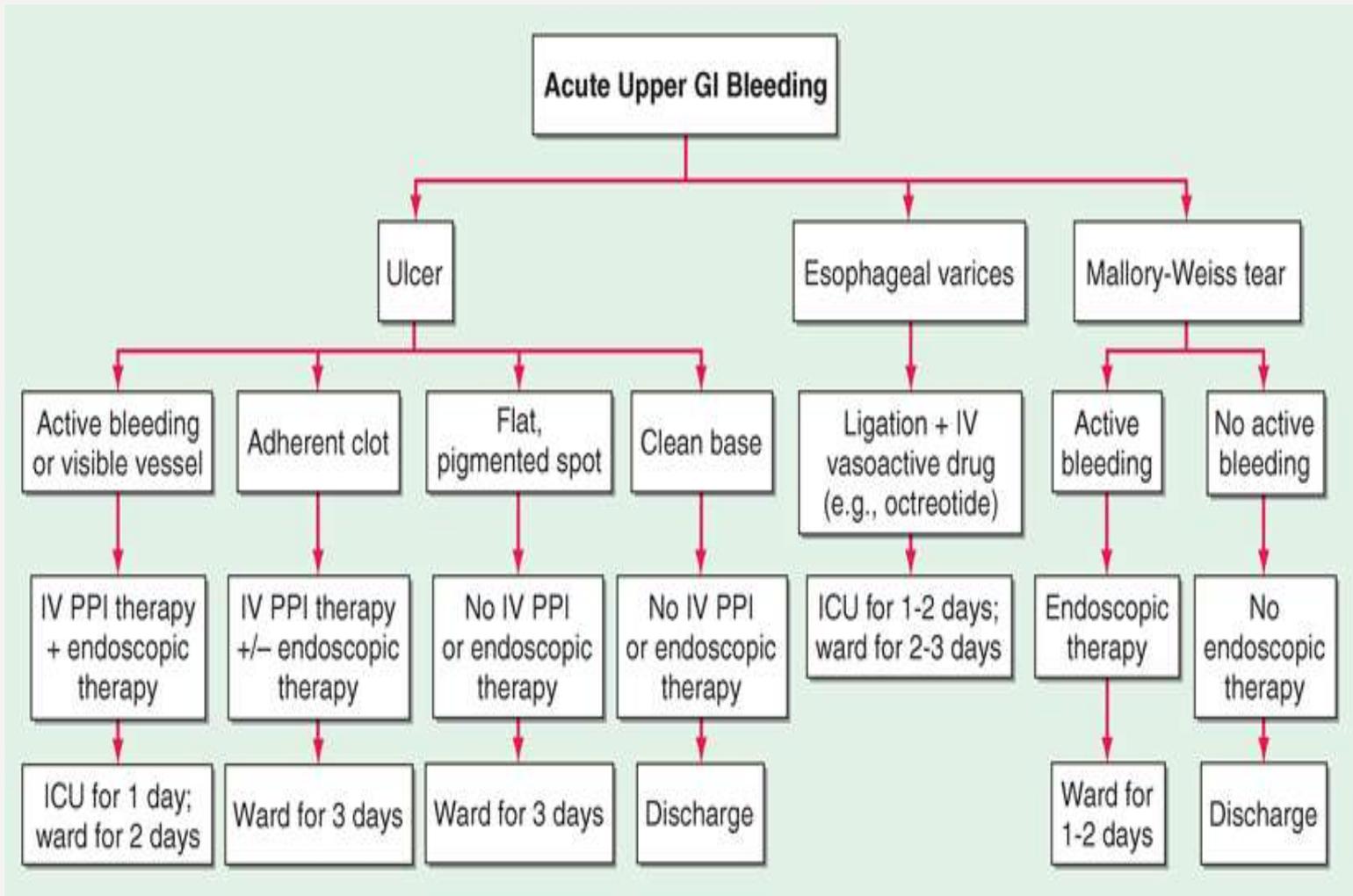
REFER TO ICU (ICU CAN DELEGATE TO HDU IF MORE APPROPRIATE)
GASTRO TO DOCUMENT CLEARLY
REASON FOR NOT DOING MORE URGENTLY
ALTERED MET CRITERIA / TARGETS
CRITERIA TO ESCALATE TO URGENT SCOPE
EXPECTED TIME OF SCOPE

SCOPE LIKELY TO BE DONE WITHIN 2HRS (DAY) OR SCOPE TEAM HAS BEEN CALLED IN (NIGHT)

SCOPE TO BE DONE IN ICU
REFER TO ICU (ICU CAN DELEGATE TO HDU IF MORE APPROPRIATE)
GASTRO TO DOCUMENT CLEARLY
INDICATION FOR IMMEDIATE SCOPE
EXPECTED TIME OF URGENT SCOPE
CONSIDER MINNESOTA TUBE IN ICU OR REFER TO INTERVENTIONAL RADIOLOGY / SURGERY

SCOPE TO BE DONE IN ENDOSCOPY SUITE OR THEATRES
KEEP IN ED UNTIL ENDOSCOPY SUITE OR THEATRES READY **





Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: www.accessmedicine.com

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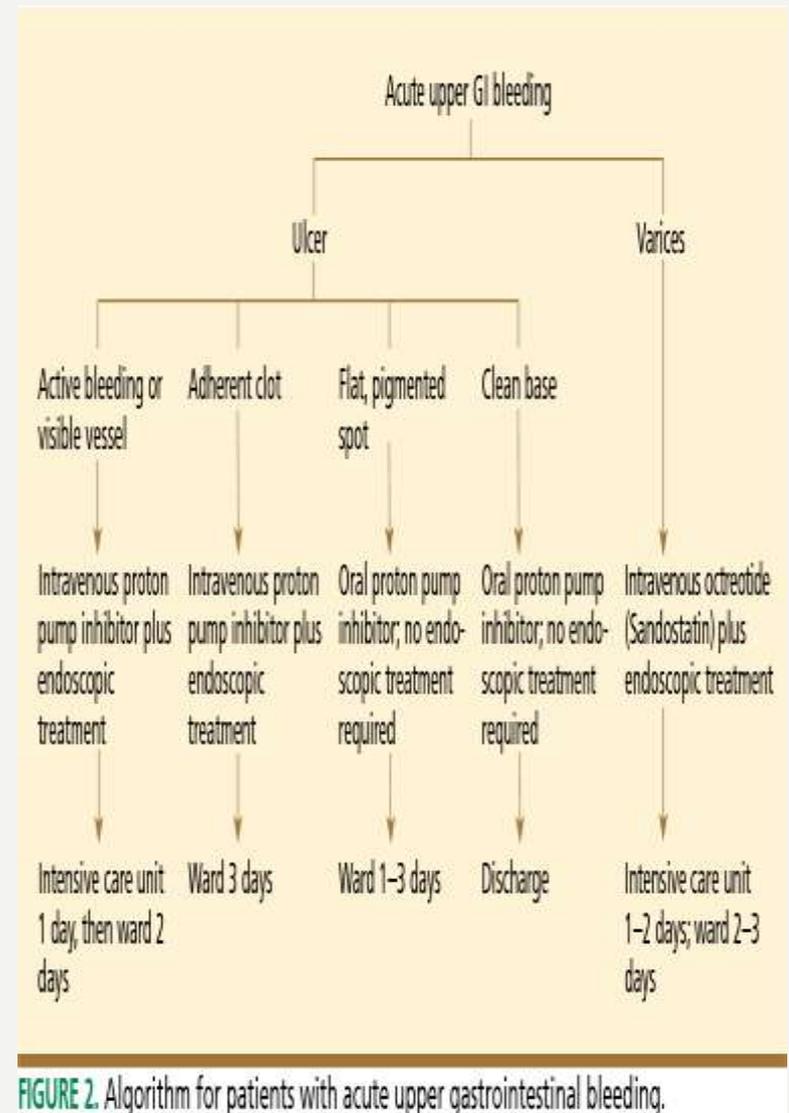
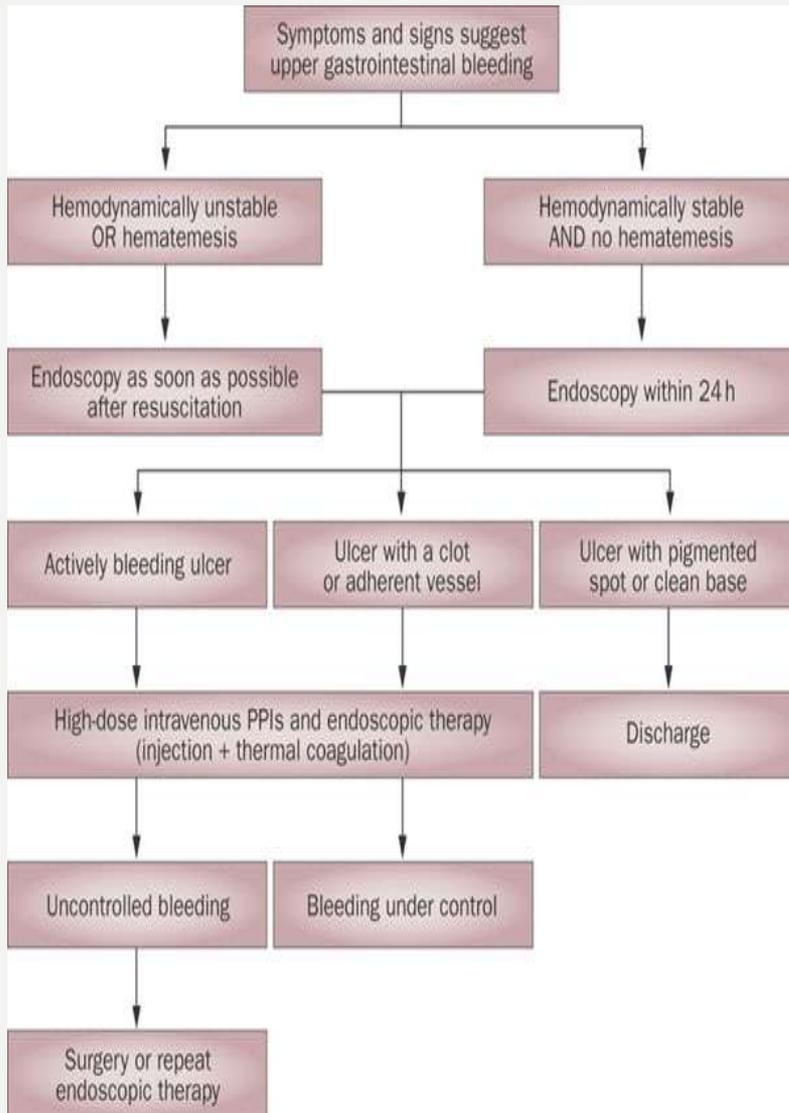
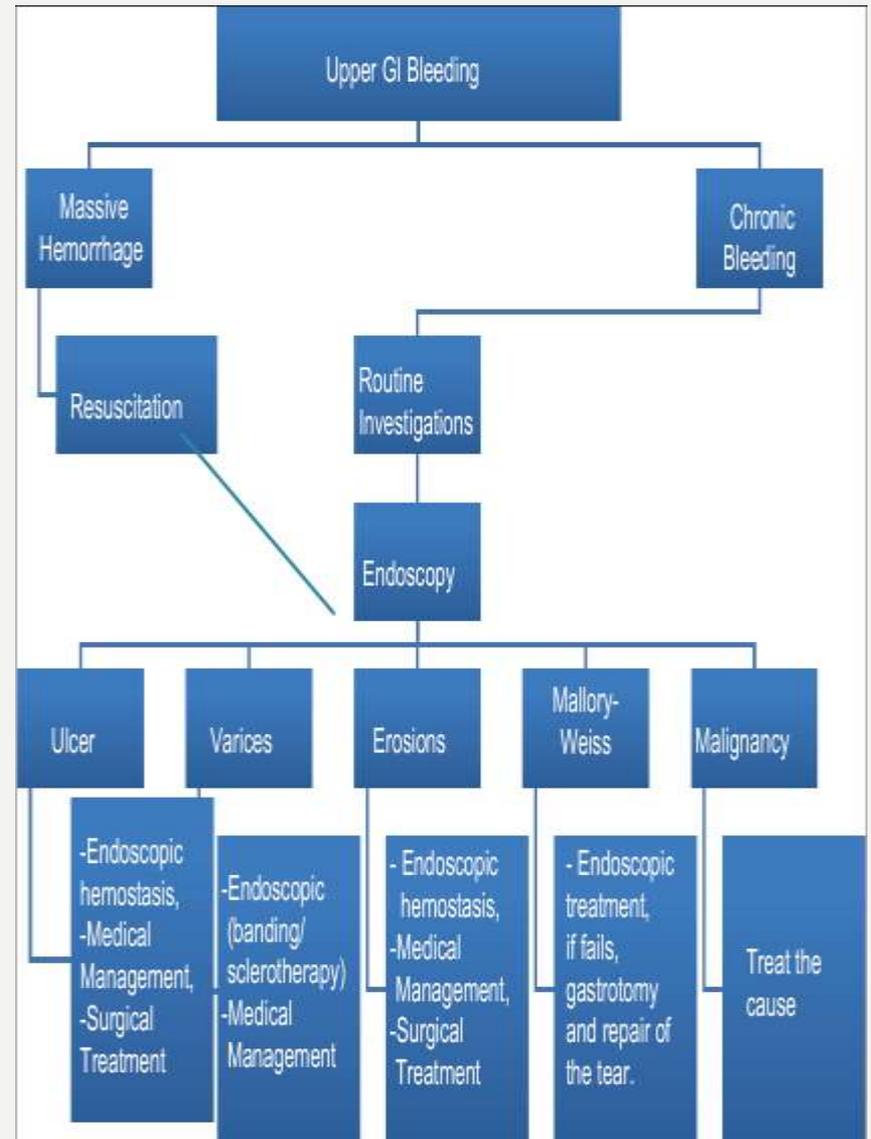
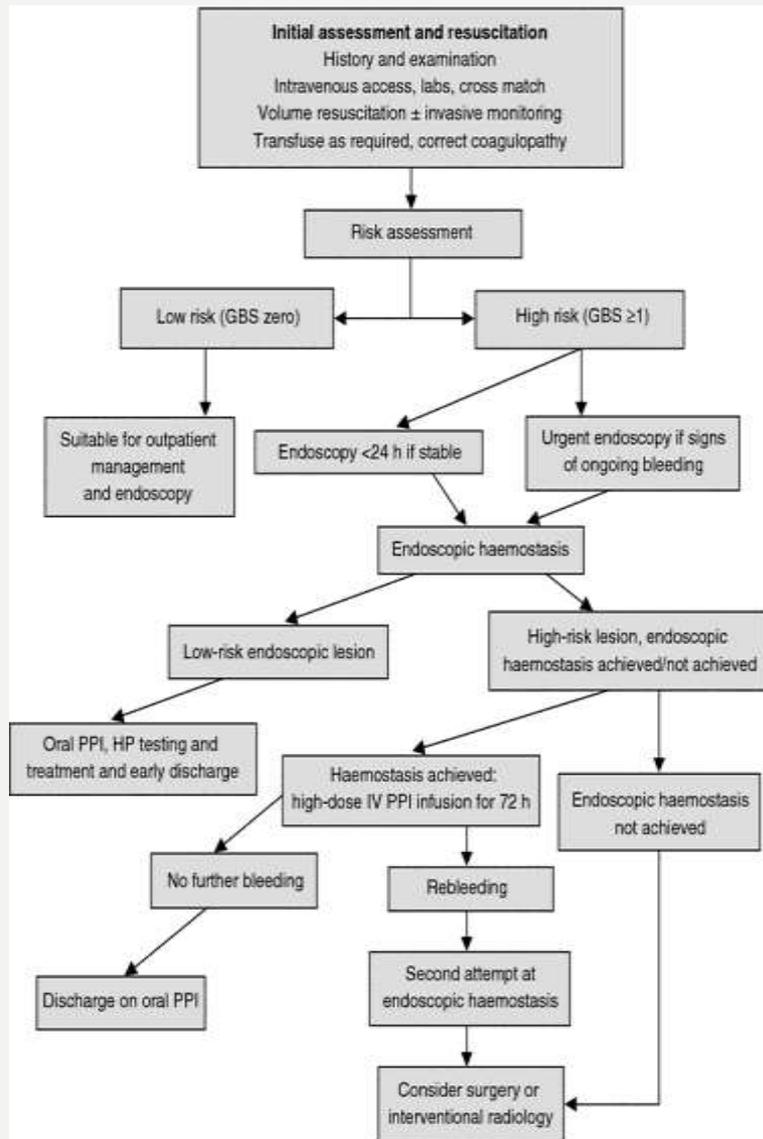


FIGURE 2. Algorithm for patients with acute upper gastrointestinal bleeding.



PREVENTION

- Stop smoking, avoid exposure to secondary smoke
- Avoid alcohol, caffeine
- Avoid Aspirin, heavy or regular use of medications.
- The approach for primary prevention of NSAIDs related mucosal injury has included avoiding the agent, using NSAIDs that are theoretically less injurious, and/or the use of concomitant medical therapy to prevent NSAID-induced injury. Prophylactic therapy may include: Misoprostol and PPI. Several nonselective NSAIDs that are associated with a lower likelihood of GI toxicity include diclofenac, aceclofenac, and ibuprofen.