# NON-VARICEAL UPPER GASTROINTESTINAL BLEEDING RECENT GUIDELINES, RISK STRATIFICATION AND PARADIGMS

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**ABSTRACT**

Despite recent advances in the treatment of upper gastrointestinal bleeding (UGI) lesions, mortality and morbidity have remained high. The introduction of scoring systems and novel endoscopic techniques have improved patients outcomes. Although guidelines for managing UGIB have been developed they have not been implemented ubiquitously. The authors offer a point of view in relation to the management of the non variceal UGIB with emphasis on the risk stratification, paradigms that have suffered changes or have been revalidated over the years, newly introduced pharmacological agents and timing of endoscopy.

**Keywords:** GI bleeding, risk stratification, endoscopy

## INTRODUCTION

Upper gastrointestinal bleeding (UGIB) remains an important cause of morbidity and mortality with a big economical impact over health systems. (1,2) The intricacies of managing UGIB cases led to the introduction of novel endoscopic techniques, the application of modern risk stratification scoring systems and the use of potent pharmacological agents improving the outcomes in these patients.

The initial assessment and resuscitation remains crucial in reducing mortality; a correct risk assessment will predict the need for endoscopic therapy, surgical intervention, need for transfusion, probability of rebleeding and requirement for ICU admission (3,4).

## INITIAL ASSESSMENT AND RESUSCITATION

Ill patients often arrive at the Emergency Departament with altered mental status and a precarious general condition requiring immediate assessment and rapid initiation of resuscitative measures. The authors recommend a systematic approach using the ABCDE system promoted in various Acute Care Manuals and incorporated by the Royal Colleges of Surgeons in the CCrISP assessment algorithm. (5).

While the purpose of this paper is mainly to focus on the changing paradigms related to the management of the non variceal upper GI bleeding, a coherent and comprehensive approach of the topic must contain an overview of the most recent guidelines, including the initial assessment and work up.

**A – Airway.** A patient who is able to engage in a conversation and has no signs of CNS( Central Nervous System) dysfunction will have a patent airway and good brain oxygenation. If the GI bleeding generates large clots, these could be aspirated into the trachea or block the oropharynx. Identification and treatment of airway compromise is fundamental to the survival of the patient and requires a quick "look", "listen", "feel" and "treat" approach. Look for central cyanosis suggestive of inefficient hematosis. An obstructive pattern of respiration, abdominal breathing and use of accessory muscles would suggest the presence of a foreign body or vomitus/ blood in the airway. Listen for abnormal sounds like stridor, hoarseness, gurgling and feel for air movement in inspiration and expiration. If any of the above mentioned are present the immediate objective is to achieve airway patency and ensure appropriate oxygenation to prevent tissue damage. Give 15 liters of humidified oxygen via a reservoir bag, use suction or remove the solid foreign bodies. Simple maneuvers like chin lift and jaw thrust can help.

**B – Breathing.** Blood has an irritative effect on the stomach and often triggers vomitus which could

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lead to aspiration pneumonia and respiratory compromise. In this section one should focus on assessing the inspiration depth, respiratory rate and the saturation level by pulse oximetry. Percussing and auscultating the thorax might reveal dullness and lack of breath sounds. It is vital to consider that pulse oxyimetry does not detect hypercarbia. If simple maneuvers are ineffective, assisted ventilation should be considered.

**C – Circulation.** Any blood loss could precipitate a state of hypovolemic shock and any hypotensive patient assessed for GI bleeding should be consider hypovolaemic until proven otherwise. Hematosis requires both ventilation and circulation, hence the imperative of maintaining tissue perfusion in the bleeding patient. All patients need to have two large bore cannulas and receive an initial fluid bolus of cristaloids of 20 ml/kg if hypotensive, 10ml/kg if normotensive and 5 ml/kg in patients with known cardiac failure. At this stage one should consider fluid replacement based on the 3:1 rule for cristaloid replacement and 1:1 rule for coloids including blood. All patients who are actively bleeding and have platelets less than 5x109 /l should be considered candidates for platelets transfusion. Patients with INR values above 1.5 should receive fresh frozen plasma. Patients on coumarinic derivates who are actively bleeding are candidates for prothrombin complex and those with no active bleeding should be managed according to the local guidelines. Insert a urinary catheter for urinary output monitoring aiming to achieve at least 0,5 ml/kg/h. Bloods for full hematology and biochemistry panels, coagulation and group and cross match should be sent. Transfusion should be initiated at levels of hemoglobin less than 9 g/dl in the high risk patients and less than 7 g/dl in the noncomorbid population.

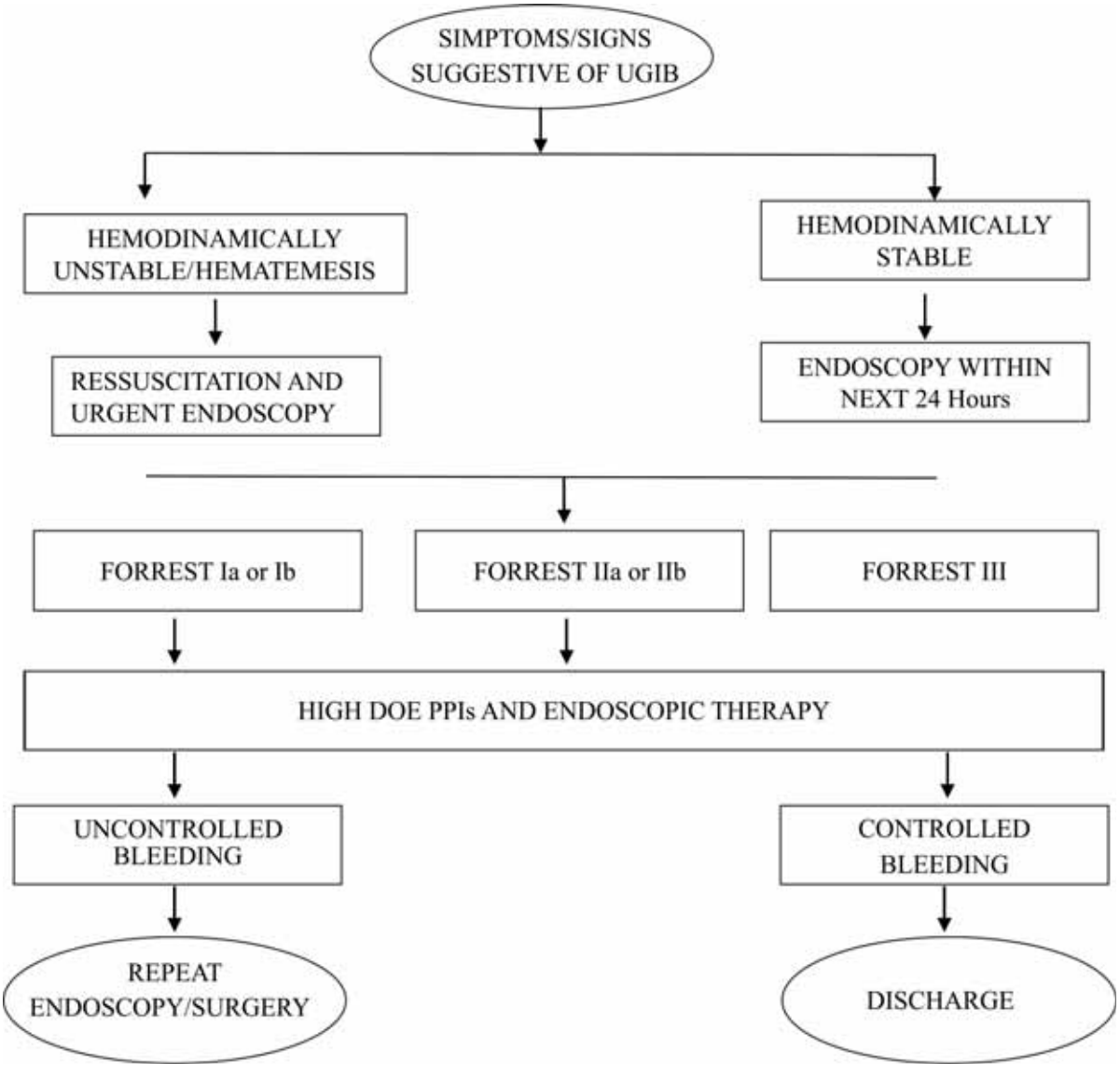


***FIGURE 1.*** *Management of UGIB*

**D – Disfunction of the CNS.** A simple AVPU (A-alert, V-responsive to verbal stimulus, P-responds only to pain, U-unresponsive) system or a Glasgow coma scale will rapidly assess the neurologic status of the patient having in mind that any disfunction could be caused by hypoxia, hypercarbia, decreased cerebral perfusion and comorbid conditions.

**E – Exposure –** Full exposure of the patient and a complete medical assessment after adressing the initial stages of resuscitation will allow an accurate diagnosis, obtaining supplementary clinical data and easier access for therapeutic maneuvers.

A patient who requires intervention for maintaining homoeostasis is consider an unstable patient and requires urgently a diagnosis and definitive care.

## Risk stratification and scoring systems

Different risk assessment scores have been developed over the past years in order to stratify patients according to the likelihood of rebleeding, death, need for clinical, endoscopic or surgical intervention and requirement of ICU admission. These systems have originated from empirical associations between the complications seen in the bleeding patient related to the level of hemoglobin, age, endoscopic findings, stigmata of hemorrhage, the size and the location of the bleeding lesion. Some of these scoring systems are based on endoscopic variables only, like the Forest classification, while others have mixed elements or rely on clinical data only, like the GBS score (6,7).

***TABLE 1.*** *The Forest classification*

| I. Active Bleeding | II. Stigmata of recent haemorrage | III. Lesions without signs of recent haemorrhage |
|---|---|---|
| **Ia**: Spurting haemorrhage | **IIa**: Vissible vessel | |
| **Ib**: Oozing haemorrhage | **IIb**: Adherent clot | |
| | **IIc**: Hematin covered lesion | |

Developed more than four decades ago to predict mortality in UGIB patients, the Forrest classification not only stratifies the risk of death, but predicts the probability of rebleeding.

In addition to that several studies have demonstrated that the need for endoscopic therapies and surgical interventions could be also predicted by this scoring system. This simple classification divides UGIB lesions in 6 categories which can be grouped in high risk and low risk lesions. High risk lesions such as Forrest Ia- spurting haemorrhages, Forrest Ib- oozing haemorrhagies, Forrest IIa- non bleeding visible vessel and Forrest IIb- adherent clots have higher rebleeding rates and need surgical treatment, hence the higher mortality rates in this cohorts of patients. Forrest IIc- hematin onulcer base and Forrest III- clean ulcer base are considered low risk and usually do not require endoscopic nor surgical intervention. De Groot in a Norwegian study on 397 patients reiterated the predictive value of rebleeding of the Forrest classification but showed that mortality was not predicted precisely; some authors suggest that this is because the mortality is more closely linked to the number and severity of co- morbidities rather than the achievement of haemostasis.

***TABLE 2.*** *The Rockal score*

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| **Age** | <60 | 60-79 | >80 | |
| **Shock** | Pulse <100 BP> 100 | Pulse >100 BP < 100 | Pulse < 100 BP < 100 | |
| **Comorbidities** | None | | Heart failure/ Ischemic heart disease | Renal failure Liver failure Disseminated malignancy |
| **Endocopic signs of bleeding** | None/dark spots | | Blood/ adherent clot/Visible or spurting vessel | |
| **Diagnosis** | Mallory Weiss/ no finding | All other diagnoses | Upper Gi malignancies | |

The Rockall score was developed 20 years ago in order to predict mortality due to UGIB. Several studies have validated its correlation with the probability of death, but not with the risk of rebleeding. This score consists of clinical (age, haemodinamic status, comorbid conditions) and endoscopic variables (stigmata of recent bleeding and endoscopic diagnosis) and ranges from 0 to 11. It is used successfully to triage between patients that require admission and those requiring management in the community. A patient with a score of 0 can be safely managed in the community while the statistics changes for patients with higher scores. A score above 2 requires admission, those with scores up to 4 can be managed on a general word having mortality rates of 3.2%, and patients with scores greater than 4 have mortality rates up to 22% and should be managed in ICU. (12,13)

***TABLE 3.*** *The GBS score*

| | |
|---|---|
| Blood urea (mmol/L) | |
| • 6·5-7·9 = 2 points | • 2 |
| • 8·0-9·9 = 3 points | • 3 |
| • 10·0-25·0 = 4 points | • 4 |
| • >25·0 = 6 points | • 6 |
| Haemoglobin for men (g/L) | |
| • 120-129 =1 points | • 1 |
| • 100-119 = 3 points | • 3 |
| • <100 = 6 points | • 6 |
| Haemoglobin for women (g/L) | |
| • 100-119 =1 point | • 1 |
| • <100 = 6 point | • 6 |
| Systolic blood pressure (mm Hg) | |
| • 100-109 | • 1 |
| • 90-99 | • 2 |
| • <90 =3 point | • 3 |
| Other markers Pulse | |
| • >=100/min | • 1 |
| • presentation with melaena = 1 point | • 1 |
| • presentation with syncope = 2 point | • 1 |
| • hepatic disease* = 2 point | • 2 |
| • cardiac failure** =2 point | • 2 |
| | • 2 |

## The GBS score

The GBS score is used to predict the need for intervention, consisting of clinical variables only and has an excellent negative predictive value for patients who do not require further interventions, in this respect being superior to the Rockall score. Stanley demonstrated that the GBS was superior to the Rockall in predicting the need for transfusion and equally precise in the prediction of the need for surgeries and endoscopic treatment (9,10,11).

## Challenging paradigms

With increasing popularity of evidence based medicine the assessments and clinical decisions are supposedly taken more confidently in a unitary manner providing similar levels of care in units implementing evidence based guidelines.

When clinical researchers and contributing colleagues cannot reach to a consensus or studies are missing in a specific field, differences and local practices are implemented with various results. There is also the situation of conflicting evidence and biased research papers which lead to non-endorsed clinical practices.

Over the years some paradigms have been changed, abandoned, others reinforced.

## PPI s

The introduction of PPIs has reduced dramatically the need for surgical interventions in peptic ulcer disease because of their efficacy in reducing the acid secretion of the stomach. This feature allows the maintenance of a gastric ph above 6 promoting clot formation and impeding fibrinolysis. (14) There are studies and guidelines suggesting that in UGIB a STAT dose of PPIs followed by an infusion of 8 mg/h for the next 72 hours would be the most beneficial approach. Recently newer studies suggested that BD doses of PPIs are as effective as the continuous infusions promoting a cheaper and simpler way of delivering the PPIs.

## Nasogastric tubes (NG tubes)

Have been used to assess gastric content in order to diagnose UGBI and to wash the stomach before endoscopy. Some authors have used NG tubes for intermittent lavage with cold saline in order to achieve hemostasis. Various studies showed no benefit from continuous lavage the positive predictive value of the nasogastric aspirate in diagnosing the bleeding was reported as high as 93% by Luck on a big retrospective cohort, but the negative predictive values are very poor as per a study performed by the ASGE, which demonstrated clear NG aspirates in up to 15.6 % of patients with bleeding UGIB lesions (13).

## Tranexamic acid

Tranexamic acid has been shown to reduce bleeding through its antifibrinolytic effects hence the idea of its uses in UGIB. Several studies have demonstrated a decrease in mortality associated with its use, but no effect in relation to the need for endoscopic or surgical intervention. There is currently no role for the tranexamic acid in the management of the upper Gi bleeding, but larger studies with cohorts up to 8,000 patients are undergoing (15,16).

## Prokinetiks

The rationale of using prokinetics in UGIB is related to the increased gastric emptying which allows improved visualization at the time of endoscopy. The main prokinetics studied were Metoclopramid and Erythromicyn. While Erythromycin has proven to be superior to Metoclopramide in terms of gastric emptying and improved visualization, NG lavage showed equal results when compared to the use of Erythromycin.

## Miscellaneous remarks

During our documentation research, we encountered several studies about the use of somatostatin

for the non variceal bleeding which demonstrated no role for this drug in the current practice despite its properties to reduce the splanhnic blood flow.

Liberal transfusion was found to be less beneficial to the judicious use of blood products starting transfusions at 7 g/dl in the non-comorbid population and at 9 g/dl in the comorbid population.

All patients with a Rockall score of more than 0 need to be offered endoscopy in the first 24 hours of admission if stable and urgently if unstable.

Repeat endoscopy was found beneficial in all studies, reducing the risk of rebleeding but conferring no survival benefits compared to the control cohort. Repeat endoscopy was found to be safe.

Eradication of Helicobacter Pylori in the acute phase of the bleeding is not necessary before oral intake can be reestablished, but studies demonstrated a reduction of recurrent bleeding rates.

## CONCLUSIONS

UGIB patients are complex and can be very sick requiring urgent diagnosis and definitive treatment. A rapid initial assessment, correct risk stratification and implementation of validated guidelines will improve the outcomes of these patients. The medical and surgical armamentarium is continually expanding allowing for paradigms to change, disappear or be revalidated.

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