Guidelines For The Evaluation And Management Of Upper Gastrointestinal Bleeding

Acute upper gastrointestinal (GI) bleeding is a relatively common and high-risk clinical presentation in the emergency department (ED) that leads over a quarter of a million hospitalizations in the United States annually. Three recently published guidelines on the evaluation and management of upper GI bleeding are reviewed in this issue. Although not intended specifically for emergency physicians, the guidelines present recommendations relevant to emergency medicine, focusing on the medical management, risk stratification, and disposition of patients presenting with symptoms consistent with upper GI bleeding.

Practice Guideline Impact

• Patients should be risk stratified using the Blatchford score, which is based on features including hemodynamic status, comorbidities, and laboratory test results. Low-risk patients (Blatchford score of 0) can be considered for early discharge from the ED without endoscopy.
• The risks of overttransfusion as well as undertransfusion of packed red blood cells should be recognized. A restrictive transfusion policy, targeting a hemoglobin of 7 g/dL, may be appropriate. Higher transfusion targets should be considered for high-risk groups with evidence of intravascular volume depletion or cardiovascular comorbidities.
• A pre-endoscopic proton pump inhibitor may be used to decrease the need for endoscopic therapy, but it does not improve clinical outcomes.
Risk Stratification: There are a number of issues important to the emergency clinician managing a patient with upper GI bleeding. One relevant clinical question is how to risk stratify patients upon presentation to identify those who can be safely discharged home versus those who are anticipated to need an intervention (blood transfusion, endoscopy, or surgery). Two of the guidelines reviewed in this issue recommend using the Blatchford score (see Table 1) to risk stratify patients prior to endoscopy and to consider discharging low-risk patients (ie, Blatchford score of 0). Be aware that these recommendations are based on a low level of evidence. The Blatchford score can also be used to help communicate risk to patients in order to facilitate their participation in the clinical and disposition decision making.

Table 1. The Blatchford Scoring System

<table>
<thead>
<tr>
<th>Risk Marker at Admission</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Urea (mmol/L)</td>
<td></td>
</tr>
<tr>
<td>≥ 6.5 but &lt; 8.0</td>
<td>2</td>
</tr>
<tr>
<td>≥ 8 but &lt; 10</td>
<td>3</td>
</tr>
<tr>
<td>≥10 but &lt; 25</td>
<td>4</td>
</tr>
<tr>
<td>≥ 25</td>
<td>6</td>
</tr>
<tr>
<td>Hemoglobin (g/L) for Men</td>
<td></td>
</tr>
<tr>
<td>≥ 120 but &lt; 130</td>
<td>1</td>
</tr>
<tr>
<td>≥ 100 but &lt; 120</td>
<td>3</td>
</tr>
<tr>
<td>&lt; 100</td>
<td>6</td>
</tr>
<tr>
<td>Hemoglobin (g/L) for Women</td>
<td></td>
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<tr>
<td>≥ 100 but &lt; 120</td>
<td>1</td>
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<tr>
<td>&lt; 100</td>
<td>6</td>
</tr>
<tr>
<td>Systolic Blood Pressure (mm Hg)</td>
<td></td>
</tr>
<tr>
<td>100-109</td>
<td>1</td>
</tr>
<tr>
<td>90-99</td>
<td>2</td>
</tr>
<tr>
<td>&lt; 90</td>
<td>3</td>
</tr>
<tr>
<td>Other Markers</td>
<td></td>
</tr>
<tr>
<td>Pulse ≥ 100 beats/min</td>
<td>1</td>
</tr>
<tr>
<td>Presentation with melena</td>
<td>1</td>
</tr>
<tr>
<td>Presentation with syncope</td>
<td>2</td>
</tr>
<tr>
<td>Hepatic disease</td>
<td>2</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>2</td>
</tr>
</tbody>
</table>

For a patient with acute upper gastrointestinal bleeding, add scores for each risk marker to derive a total score ranging from 0 to 23. If no value applies for a particular marker, score 0. A score of 0 is the clinical cutoff above which patients are considered to be at risk of needing an intervention. 

Hemodynamic Resuscitation: Early hemodynamic resuscitation goals are also the subject of ongoing study, and the best approach for all but exsanguinating bleeds is still not clear. The NICE guideline discussed the risks of overt transfusion, but only the ACG guideline provided a specific target hemoglobin level (7 g/dL), reflecting a restrictive transfusion approach unless there were signs of intravascular volume depletion or cardiovascular comorbidities. All of the guidelines emphasized the low levels of evidence supporting these recommendations and the need to take into account the full clinical picture.

Controversies In Management: One area of disagreement among societies and individual practitioners is what, if any, pharmacologic therapies need to be given in the ED to patients with suspected nonvariceal upper GI bleeding. The controversy stems from the fact that most patients presenting with nonvariceal upper GI bleeding will likely not have reduced morbidity or mortality from the initiation of proton pump inhibitor therapy prior to endoscopy, despite this being standard practice in the United States. A recent Cochrane review concluded that the risk of 30-day mortality was unchanged (odds ratio [OR], 1.1; 95% confidence interval [CI], 0.8-1.7), as was the risk of rebleeding (OR, 0.8; 95% CI, 0.6-1.1) or surgery (OR, 1.0; 95% CI, 0.7-1.4).\(^6\) Initiation of proton pump inhibitor therapy prior to endoscopy significantly reduced endoscopic therapy at index endoscopy (OR, 0.7; 95% CI, 0.5-0.9). These guidelines' recommendations differ because of the relative weight that the guideline development committees placed on different outcomes, including cost-effectiveness. The British NICE guideline, which \textit{EM Practice Guidelines Update} editors scored as the highest-quality guideline of the 3 (using the AGREE II instrument), recommended against the initiation of proton pump inhibitors prior to endoscopy. The ACG guideline, which we also gave moderately high scores for methodology, “conditionally” recommended the use of proton pump inhibitor therapy to reduce rates of endoscopic therapy but not to reduce morbidity or mortality. The emergency clinician’s decision to use proton pump inhibitors can be made in conjunction with local consultants.

Endoscopy: Being familiar with national specialty society recommendations for the timing of endoscopy could allow the emergency clinician to communicate more effectively with the endoscopist. While the NICE guideline recommends offering endoscopy to an unstable patient immediately after resuscitation, the United States-based guidelines consider “urgent” endoscopy for unstable patients to be carried out within 12 hours (ACG) or even 24 hours (ASGE). As there is little evidence to guide the timing of endoscopy, knowledge of these recommendations may help to set expectations regarding the availability of off-hours endoscopy. The recommendations also underscore the importance placed by professional GI societies on resuscitating the unstable patient prior to endoscopy, which may be at odds with the emergency clinician’s desire to get the patient the “definitive” treatment for upper GI bleeding.

Airway Management: None of the guidelines reviewed here provided any recommendations for airway management, including when and how to intubate the bleeding patient for airway protection or indications for intubation prior to endoscopy.
Methodology Of The Guidelines

The author of this issue of *EM Practice Guidelines Update* graded and compared for strength of methodology the 3 guidelines using the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument. (See Table 2.) (For more information on the AGREE II instrument, go to the AGREE Trust website at http://www.agreetrust.org/). Overall, the NICE guideline is notable for its use of a rigorous and transparent approach and for basing recommendations (where possible) on meta-analyses and the balance of benefits, harms, and cost. Although the NICE guideline carefully presents the evidence used to derive the recommendation, it does not actually rate the strength of the recommendation. The guideline’s development was commissioned and funded by the National Clinical Guideline Centre (a government agency in the United Kingdom) and was written by a large interdisciplinary group.

The Standards of Practice Committee of the American Society for Gastrointestinal Endoscopy (ASGE) wrote the ASGE guideline with the intent of providing practical recommendations for endoscopists. No other stakeholders were involved. A conflict-of-interest declaration is a part of the document, and it noted that the 2 physicians involved in producing the guideline did have consulting involvement with multiple medical device companies. Their development process was less well documented than in the NICE guideline. Literature search terms and search limitations were not revealed. The link between strength of evidence and strength of recommendation was not always clear.

The ACG guideline was developed by 2 member physicians. There is no documentation of involvement of other stakeholder groups. A conflict-of-interest declaration is included in the document, and it stated that 1 author served as a consultant with multiple pharmaceutical and medical device companies and the other author had been the recipient of several research grants from several medical device companies. Recommendation statements are graded for both strength of evidence and strength of recommendation, but a strong recommendation did not have to be based on a high level of evidence.

Relevant portions of the 3 guidelines are abstracted and compared, by specific recommendations, beginning on page 5.

Table 2. Comparison Of Upper Gastrointestinal Bleeding Management Guideline Methodologies, According To AGREE II Criteria*

<table>
<thead>
<tr>
<th>AGREE Guideline Quality Domains</th>
<th>NICE</th>
<th>ASGE</th>
<th>ACG</th>
</tr>
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<tbody>
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<td>Scope and purpose</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Stakeholder involvement</td>
<td>7</td>
<td>3</td>
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<td>Rigor of development</td>
<td>7</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Clarity of presentation</td>
<td>7</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Applicability</td>
<td>7</td>
<td>1</td>
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<tr>
<td>Editorial independence</td>
<td>7</td>
<td>4</td>
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<tr>
<td>Overall guideline quality</td>
<td>7</td>
<td>4</td>
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<tr>
<td><strong>EM Practice Guidelines Update Quality Domains</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Relevance to emergency medicine</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

Abbreviations: AGREE, Appraisal of Guidelines for Research and Evaluation; ACG, American College of Gastroenterology; ASGE, American Society for Gastrointestinal Endoscopy; NICE, National Institute for Health and Clinical Excellence.

*Notes:
- The *EM Practice Guidelines Update* editors used the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument (http://www.agreetrust.org/) to grade each guideline on 23 items in the 6 domains.
- Each item was assigned a score from 1 to 7 (with 1 = strongly disagree that it fulfills item criteria and 7 = strongly agree that it fulfills item criteria), and the editors’ scores were averaged. Table 2 displays the composite score for each domain for each guideline. The overall guideline quality score is an aggregate of the domain scores. The scores are color-coded for easier reference, with green representing a 6 or 7 score, yellow representing a 4 or 5 score, and red representing a 1, 2, or 3 score.
- The score for relevance to emergency medicine (also out of 7), is not part of the AGREE instrument, but it reflects the judgment of the editors of *EM Practice Guidelines Update*. 
Strength Of Recommendation For Guideline Organizations

NICE: Strength of evidence was determined by assigning a rating by study design and then downgrading based on specified criteria. A final rating of very low, low, moderate, or high was assigned. The guideline development group did not explicitly grade the strength of their recommendations, but they did select 10 key priorities for implementation, based on the fact that the recommendations would: (1) have a high impact on outcomes that are important to patients, (2) have a high impact on reducing variation in care and outcomes, (3) lead to a more efficient use of NHS resources, (4) promote patient choice, and (5) promote equality.

ASGE: The strength of the evidence was classified as 1 of the following:
- High: Further research is very unlikely to change our confidence in the estimate of effect.
- Moderate: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- Low: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- Very low: Any estimate of effect is very uncertain.

The strength of individual recommendations was based on both the aggregated evidence quality and an assessment of the anticipated benefits and harms:
- Weaker recommendations are indicated by phrases such as “We suggest…”
- Stronger recommendations are typically stated as “We recommend…”

ACG: The strength of the evidence was classified as 1 of the following:
- High: Further research is very unlikely to change our confidence in the estimate of effect.
- Moderate: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- Low: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- Very low: Any estimate of effect is very uncertain.

Use Of Clinical Risk Scores For Management And Disposition Decisions In Initial Evaluation Of Patients With Upper GI Bleeding

NICE
- Use the following formal risk assessment scores for all patients with acute upper gastrointestinal bleeding:
  - The Blatchford score at first assessment, and
  - The full Rockall score after endoscopy. (Priority recommendation, low- to very-low-quality evidence)
- Consider early discharge for patients with a pre-endoscopy Blatchford score of 0. (Priority recommendation, low- to very-low-quality evidence)

ACG
- Risk assessment should be performed to stratify patients into higher-risk and lower-risk categories, and it may assist in initial decisions such as timing of endoscopy, time of discharge, and level of care. (Conditional recommendation, low-quality evidence)
- Discharge from the ED without inpatient endoscopy may be considered in patients with urea nitrogen < 18.2 mg/dL; hemoglobin ≥ 13.0 g/dL for men, 12.0 g/dL for women; systolic blood pressure ≥ 110 mm Hg; pulse < 100 beats/min; and absence of melena, syncope, cardiac failure, and liver disease, as they have < 1% chance of requiring intervention. (Conditional recommendation, low-quality evidence)

Editorial Comment
All 3 guidelines discuss the use of clinical prediction rules to identify patients who are at low or high risk of needing an intervention (transfusion, endoscopy, or surgery), but only NICE and ACG provide formal
recommendations. Based on a low level of evidence, they recommend using the Blatchford score (see Table 1) for early risk stratification. The utility for emergency clinicians is that the Blatchford score uses data available prior to endoscopy. The best available evidence indicates that all patients who present with an acute upper GI bleed and a Blatchford score > 0 merit admission for endoscopy. On the other hand, patients with a Blatchford score of 0 have a < 1% chance of requiring intervention, and a small series found no complications in this group of low-risk patients being discharged from the ED.

Recommendations For Fluid Resuscitation And Administration Of Blood Products

NICE
- Transfuse patients with massive bleeding with blood, platelets, and clotting factors in line with local protocols for managing massive bleeding. (Consensus of guideline committee)
- Base decisions on blood transfusion on the full clinical picture, recognizing that overtransfusion may be as damaging as undertransfusion. (Very low-quality evidence)
- Do not offer platelet transfusion to patients who are not actively bleeding and are hemodynamically stable. (Consensus of guideline committee)
- Offer platelet transfusion to patients who are actively bleeding and have a platelet count of < 50 x 10^9/L. (Consensus of guideline committee)
- Offer fresh frozen plasma to patients who have either:
  - A fibrinogen level of < 1 g/L
  - A prothrombin time (international normalized ratio) or activated partial thromboplastin time > 1.5 times normal (Consensus of guideline committee)
- Offer prothrombin complex concentrate to patients who are taking warfarin and actively bleeding. (Consensus of guideline committee)
- Treat patients who are taking warfarin and whose upper GI bleeding has stopped in line with local warfarin protocols. (Consensus of guideline committee)
- Do not use recombinant factor Vlla except when all other methods have failed. (High- to low-quality evidence)

ASGE
- We recommend that patients with upper GI bleeding be adequately resuscitated before endoscopy. (Very low-quality evidence)

ACG
- Hemodynamic status should be assessed immediately upon presentation and resuscitative measures should begin, as needed. (Strong recommendation, low-quality evidence)
- Blood transfusions should target hemoglobin ≥ 7 g/dL, with higher hemoglobins targeted in patients with clinical evidence of intravascular volume depletion or comorbidities such as coronary artery disease. (Conditional recommendation, low-to-moderate-quality evidence)

EditorialComment
Evidence guiding the hemodynamic resuscitation of patients with upper GI bleeding is limited. Patients with unstable vital signs and signs of massive hemorrhage require immediate critical interventions, and they do not present a conundrum for the emergency clinician. The plan of action is less clear in other cases. Hemoglobin levels (which are not a real-time measure of blood loss) are only somewhat useful in determining whether or when to transfuse a patient. Red cell transfusion is not a low-risk intervention, and the “damages” alluded to in the NICE recommendation above include a possible increased risk of rebleeding. This concern is further supported by a randomized controlled trial published subsequent to these guidelines that found a higher risk of rebleeding in the liberal-strategy transfusion group compared to the restrictive-strategy group. The ACG guideline is the only guideline that provides a specific target hemoglobin (7 g/dL) for transfusions, but this is based on low-to-moderate-quality evidence of the benefit of a restrictive transfusion policy.

Use Of Proton Pump Inhibitors In Patients With Undifferentiated Or Confirmed Nonvariceal Upper GI Bleeding

NICE
- Do not offer acid-suppression drugs (proton pump inhibitors or H2 receptor antagonists) before endoscopy to patients with suspected nonvariceal upper GI bleeding. (Moderate- to low-quality and economic evidence with direct to partial applicability)
• Offer proton pump inhibitors to patients with nonvariceal upper GI bleeding and stigmata of recent hemorrhage shown at endoscopy. (Moderate- to very-low-quality evidence and economic evidence with direct applicability)

ASGE
• We recommend antisecretory therapy with proton pump inhibitors for patients with bleeding caused by peptic ulcers or in patients with suspected peptic ulcer bleeding who are awaiting endoscopy. (High-quality evidence)

ACG
• Pre-endoscopic intravenous proton pump inhibitors (eg, 80-mg bolus followed by 8-mg/h infusion) may be considered to decrease the proportion of patients who have higher-risk stigmata of hemorrhage at endoscopy and who receive endoscopic therapy. However, proton pump inhibitors do not improve clinical outcomes such as further bleeding, surgery, or death. (Conditional recommendation, high-quality evidence)
• If endoscopy will be delayed or cannot be performed, an intravenous proton pump inhibitor is recommended to reduce further bleeding. (Conditional recommendation, moderate-quality evidence)

Editorial Comment
It is important to distinguish between the 2 clinical subgroups in this section that are considered for acid suppression therapy. These groups include: (1) patients with suspected nonvariceal upper GI bleeding, and (2) patients with endoscopically confirmed nonvariceal upper GI bleeding. Each guideline group explained the rationale for their recommendation, and their different priorities yielded conflicting recommendations. The ASGE guideline is intended for use by clinical endoscopists, while the NICE guidelines are national recommendations that take into account relative benefit and harm, including cost. The ASGE recommendation to initiate proton pump inhibitors pre-endoscopy is based on a meta-analysis that demonstrated a significant reduction in rates of high-risk stigmata encountered during endoscopy and, hence, lower rates of endoscopic intervention in patients receiving proton pump inhibitors prior to endoscopy. In contrast, the NICE recommendation is based on the lack of overall mortality or morbidity reductions (rebleeding or risk of surgery) when proton pump inhibitors are initiated prior to endoscopy.

Pharmacologic Management Of Suspected Or Confirmed Variceal Upper GI Bleeding

NICE
• Offer terlipressin to patients with suspected variceal bleeding at presentation. Stop treatment after definitive hemostasis has been achieved, or after 5 days, unless there is another indication for its use. (Very low- to moderate-quality evidence from randomized controlled studies and economic evidence of direct applicability)

Editorial Comment
Terlipressin is not available in the United States, so there are no recommendations for its use in the United States-based ASGE and ACG guidelines. In the UK-based NICE guideline, the clinical question they asked was whether terlipressin (compared with placebo, somatostatin, or octreotide) was the best strategy, and they did not find evidence of superiority of the somatostatin or its analogue, octreotide, over terlipressin.

Antibiotic Prophylaxis For Confirmed Or Suspected Variceal Bleeds

NICE
• Offer prophylactic antibiotic treatment at presentation to patients with suspected or confirmed variceal bleeding. (Priority recommendation, low- to very-low-quality evidence from randomized controlled studies and economic evidence of partial applicability)

Editorial Comment
Mortality from variceal-related upper GI bleeding is approximately 20%, and secondary bacterial infections in this group of immunocompromised patients are believed to be an important contributor to mortality. A recent Cochrane review that included 12 trials (n = 1241) found that administration of antibiotics at the time of endoscopy was associated with both fewer infections (bacteremia, pneumonia, spontaneous bacterial peritonitis, and urinary tract infections) and an overall decrease in mortality.
Timing Of Endoscopy In Acute Upper GI Bleeding

NICE
• Offer endoscopy to unstable patients with severe, acute upper GI bleeding immediately after resuscitation. (Priority recommendation, consensus of the guideline committee)
• Offer endoscopy within 24 hours of admission to all other patients with upper GI bleeding. (Priority recommendation)

ASGE
• We recommend endoscopy to diagnose the etiology of acute upper GI bleeding. (Moderate-quality evidence) The timing of endoscopy should depend on clinical factors. Urgent endoscopy (within 24 h of presentation) is recommended for patients with a history of malignancy or cirrhosis, presentation with hematemesis, and signs of hypovolemia (including hypotension, tachycardia, and shock) and a hemoglobin < 8 g/dL.

ACG
• Patients with upper GI bleeding should generally undergo endoscopy within 24 hours of admission, following resuscitative efforts to optimize hemodynamic parameters and other medical problems. (Conditional recommendation, low-quality evidence)
• In patients who are hemodynamically stable and without serious comorbidities, endoscopy should be performed as soon as possible in a nonemergent setting to identify the substantial proportion of patients with low-risk endoscopic findings who can be safely discharged. (Conditional recommendation, moderate-quality evidence)
• In patients with higher-risk clinical features (eg, tachycardia, hypotension, bloody emesis, or nasogastric aspirate in hospital) endoscopy within 12 hours may be considered to potentially improve clinical outcomes. (Conditional recommendation, low-quality evidence)

Editorial Comment
“Early” endoscopy has been defined as occurring within 2 to 24 hours of presentation. Evidence is limited, but the AGE guideline surmises that the lack of clinical benefit argues against the need for endoscopy in an emergent setting (eg, during the night) for low-risk patients, citing observational data suggesting that higher-risk patients (Blatchford score > 12) may have a higher mortality with delays to endoscopy > 13 hours.

Use Of Prokinetic Agents In Nonvariceal Upper GI Bleeding

ASGE
• We suggest prokinetic agents in patients with a high probability of having fresh blood or a clot in the stomach when undergoing endoscopy. (Low-quality evidence)

ACG
• Intravenous infusion of erythromycin (250 mg approximately 30 min before endoscopy) should be considered to improve diagnostic yield and decrease the need for repeat endoscopy. However, erythromycin has not consistently been shown to improve clinical outcomes. (Conditional recommendation, moderate-quality evidence)

Editorial Comment
Prokinetic agents can help the endoscopist obtain better views during the procedure and locate the source of the bleed. The evidence is better for erythromycin than metoclopramide, but there is no effect on clinical outcomes. The prokinetic agent is most effective when administered within 2 hours of the procedure, and the decision to administer these agents should be made in conjunction with the endoscopist.

Nasogastric Tube Placement With Gastric Lavage

ACG
• Nasogastric or orogastric lavage is not required in patients with upper GI bleeding for diagnosis, prognosis, visualization, or therapeutic effect. (Conditional recommendation, low-quality evidence)

Editorial Comment
Nasogastric tube placement with gastric lavage is a painful procedure and is not useful for diagnosis or prognosis in upper GI bleeding. The use of an nasogastric tube for other reasons (eg, to decompress the stomach prior to intubation to reduce the risk of aspiration) was not addressed in these guidelines.
References


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1. The most common cause of upper GI bleeding is:
   a. Gastric varices
   b. Esophageal varices
   c. Duodenal ulcer
   d. Peptic ulcer

2. The use of proton pump inhibitors in the acute phase of upper GI bleeding has demonstrated a significant effect on which of the following:
   a. Mortality
   b. Risk of rebleeding
   c. Rates of surgical intervention
   d. Rates of endoscopic intervention

3. Which hemoglobin level has been suggested as a target for transfusing packed red blood cells in patients without hemodynamic instability or cardiovascular comorbidities?
   a. 4 g/dL
   b. 5 g/dL
   c. 6 g/dL
   d. 7 g/dL

4. Which therapy has been shown to decrease mortality in upper GI bleeding?
   a. Prokinetic agents in nonvariceal upper GI bleeding
   b. Proton pump inhibitors in nonvariceal upper GI bleeding
   c. Antibiotic prophylaxis in variceal upper GI bleeding
   d. Nasogastric lavage prior to endoscopy in nonvariceal upper GI bleeding
Current Guidelines For Management Upper GI Bleeding

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Goals: Upon completion of this article, you should be able to: (1) demonstrate medical decision-making based on the strongest clinical evidence, (2) cost-effectively diagnose and treat the most critical ED presentations, and (3) describe the most common medicolegal pitfalls for each topic covered.

Objectives: Upon completion of this article, you should be able to: (1) compare management recommendations for upper GI bleeding between 3 organizational guidelines; (2) conduct risk stratification for patients with upper GI bleeding based on best available tools and guideline recommendations; and (3) select appropriate treatment strategies for upper GI bleeding based on guideline recommendations and best evidence.

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<td>Percutaneous Coronary Intervention: Current Guidelines For The Emergency Department</td>
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<td>December 2012</td>
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<td>Current Guidelines For The Management Of Severe Sepsis And Septic Shock</td>
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<td>May 2013</td>
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