Acute Upper GI Bleeding: How do we improve care?

Dr John Morris
EQIP 2016
Endoscopy Quality Improvement Programme
Annual 30-day mortality

Ahmed A et al
Weekend effect for UGIB in Scotland
WJG October 14, 2015, Volume 21, Issue 38
Mortality

Ahmed A et al
Weekend effect for UGIB in Scotland
WJG October 14, 2015, Volume 21, Issue 38
# Upper GI Bleeding Audit

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>14%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Rebleeding</td>
<td>16%</td>
<td>13%</td>
<td>23%</td>
</tr>
<tr>
<td>Varices</td>
<td>4%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Risk Score</td>
<td></td>
<td>19%</td>
<td>34%</td>
</tr>
<tr>
<td>Transfusion</td>
<td></td>
<td>43%</td>
<td>31%</td>
</tr>
<tr>
<td>OGD &lt;24hrs</td>
<td></td>
<td>50%</td>
<td>65%</td>
</tr>
</tbody>
</table>

3. NCEPOD. Time to Get Control, 2015.
Time to Get Control?
A review of the care received by patients who had a severe gastrointestinal haemorrhage

“reveals a situation of which we should be ashamed “
Bertie Leigh, Chair NCEPOD
Key Recommendations

1. Only hospitals with 24/7 on site endoscopy admit GI bleeds
2. In hospitals that do not admit GI bleeds a 24/7 network for access to endoscopy service should exist
3. Discuss management of major bleeds within 1 hour with senior clinician on call
4. Service should include 24/7 access to a specialist, GI bleed service, endoscopy, IR and surgery
You need a endoscopy to establish a diagnosis and treat, but not to manage the patient

Patient admitted with haematemesis almost immediately admissions team refer for emergency endoscopy....
A QI program involves systematic activities that are organized and implemented by an organization to monitor, assess, and improve its quality of health care. Endoscopy has standards and ongoing audit for most KPIs.
How to make a difference?
BSGE UGI Bleed EQIP

A&E
- Resuscitation
- Assessment

Admissions
- Pre-endoscopy
- Clotting, PPI, Prokinetic, Antibiotics, Terlipressin

GI ward
- Endoscopy service provision
- 24/7

Endoscopy
- Quality of endotherapy – technique and judgements
- Training

GI ward
- Follow-up management and rebleeding

Multiple stakeholders, Management issues, JAG
Where to make a difference: BSGE UGI Bleed EQIP

- **A&E**
  - Resuscitation
  - Assessment

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  - 24/7

- **Endoscopy**
  - Quality of endotherapy – technique and judgements
  - Training

- **GI ward**
  - Follow-up management and rebleeding

Multiple stakeholders, Management issues, JAG
Intervention:

Develop and implement an evidence-based quality bundle

- Target first 24 hours care/emergency staff
- Refine Bundle/Quality standard (Delphi process)
Stakeholders: BSGE UGI Bleed EQIP

- AUGIS
- Society of Acute medicine
- National blood transfusion
- JAG (QA Training)
- Patient Representative
- Industry
2018 UK AUGIB Bundle
(to be performed within 24h)

**RECOGNITION**
Haematemesis, melaena or coffee ground vomiting

**RESUSCITATION**
Trigger bundle and record if performed
- Perform NEWS as indicated
- Commence IV crystalloid
- Transfuse if Hb <70g/L, aim for 70-100g/L

**RISK ASSESSMENT**
- Calculate Glasgow-Blatchford Score (GBS): enter value
  - Consider discharge if GBS 0 or 1
- If cirrhosis/suspected variceal bleed, give terlipressin 2mg QDS and antibiotics as per local protocol
- Continue aspirin
- Suspend all other antithrombotics

**RX**
- Referral for endoscopy to be undertaken within 24h of presentation
- Refer to GI specialist if varices or requiring therapeutic endoscopy

**REFER**
- Review endoscopy report
- PPI if high risk ulcer post endoscopy
- Post-haemostasis antithrombotic plan

**REVIEW**

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

**Patient Details / Label**
Name: [ ]
DOB: [ ]
Hospital No.: [ ]
Date: [ ]
UK AUGIB Bundle

**RECOGNITION**

If reported:
Haematemesis, melaena or coffee ground vomiting

Trigger bundle and tick if performed:
Perform NEWS as indicated
Commence IV crystalloid
Transfuse if Hb <70g/L, aim for 70-100g/L

**RESUSCITATION**

**RISK ASSESSMENT**

Calculate Glasgow-Blatchford Score (GBS)
- Consider discharge if GBS 0 or 1
TRANSFUSION IN UGIB

Villanueva C, Transfusion strategies for AUGIB, NEJM 2013; 368:11-21
“High risk”
...don’t need a score
### Glasgow-Blatchford Score

<table>
<thead>
<tr>
<th>Criteria on admission</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood urea (mmol/l)</td>
<td></td>
</tr>
<tr>
<td>6.5 - &lt;8.0</td>
<td>2</td>
</tr>
<tr>
<td>8.0 - &lt;10.0</td>
<td>3</td>
</tr>
<tr>
<td>10.0 - &lt;25.0</td>
<td>4</td>
</tr>
<tr>
<td>≥25</td>
<td>6</td>
</tr>
<tr>
<td>Hemoglobin (g/dl) for men</td>
<td></td>
</tr>
<tr>
<td>12.0 - &lt;13.0</td>
<td>1</td>
</tr>
<tr>
<td>10.0 - &lt;12.0</td>
<td>3</td>
</tr>
<tr>
<td>&lt;10.0</td>
<td>6</td>
</tr>
<tr>
<td>Hemoglobin (g/dl) for women</td>
<td></td>
</tr>
<tr>
<td>10.0 - &lt;12.0</td>
<td>1</td>
</tr>
<tr>
<td>&lt;10.0</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 (per 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>

NICE CG141 2012
COMPARING RISK SCORES
# GLASGOW-BLATCHFORD SCORE

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<tr>
<td>Hepatic disease</td>
<td>2</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>2</td>
</tr>
</tbody>
</table>

**NICE 2012:**

"Consider early discharge for patients with a pre-endoscopy Blatchford score of 0"
UK AUGIB Bundle

- If suspected variceal bleed, give terlipressin 2mg QDS and antibiotics
- Continue aspirin
- Suspend all other antithrombotics

- Referral for endoscopy to be undertaken within 24h of presentation
- Refer to GI specialist if requiring therapeutic endoscopy

- Review endoscopy report
- IV PPI if high risk ulcer post endoscopy
- Post-haemostasis antithrombotic plan

If haemodynamically unstable*, consider activating major haemorrhage protocol and arranging critical care review.

*Active bleeding where blood pressure or pulse cannot be normalised or who need rapid intravenous fluids to maintain haemodynamic stability
4.3.1: We recommend continuing aspirin at presentation.

Level of evidence: Moderate
Level of recommendation: Strong
Agreement: 90% Agreement
Bundle recommendation: Continue aspirin

When should I contact on call endoscopist?
Laursen SB, Relationship between timing of endoscopy and mortality in patients with peptic ulcer bleeding: a nationwide cohort study, GIE 2016 (in press)
TIMING OF ENDOSCOPY

Unstable patients (n=2933)

12-24hrs optimal

Important to resuscitate and optimise

Laursen SB, Relationship between timing of endoscopy and mortality in patients with peptic ulcer bleeding: a nationwide cohort study, GIE 2016 (in press)
PUD: Forrest Classification and Rebleeding Risk

### WHO TO TREAT

<table>
<thead>
<tr>
<th>Forrest</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Treat</td>
</tr>
<tr>
<td>2a</td>
<td>Treat</td>
</tr>
<tr>
<td>2b</td>
<td>Lift and see</td>
</tr>
<tr>
<td>2c</td>
<td>Don’t treat</td>
</tr>
<tr>
<td>3</td>
<td>Don’t treat</td>
</tr>
</tbody>
</table>

Endoscopic therapy should only be delivered to actively bleeding lesions, non-bleeding visible vessels and, when technically possible, to ulcers with an adherent blood clot.
Endotherapies:

Injection:
  Tamponade, vasoconstriction, occlusion
Thermal:
  Heater probes, APC, Lasers
Mechanical:
  Clips
Topical applications/sprays:
ENDOTHERAPY FOR NVUGIB

Current optimum for bleeding peptic ulcer:

DUAL Endoscopic therapy
HAEMOSTATIC SPRAYS

Indications

• Access difficulty
• Failed therapy
• Bridge or holding measure
  • Inexperience
  • Lack/Failure of devices
  • Orphan indications (e.g. malignant bleeding, post band ulcers)
  • No IR available

May change
Endoscopic outcomes
CASE 3 – REBLEEDING DU (FORREST 1A) DESPITE DUAL THERAPY

What next?
## Hemospray Efficacy

<table>
<thead>
<tr>
<th></th>
<th>Hemospray monotherapy</th>
<th>Standard endoscopic therapy + Hemospray second line therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td><strong>Haemostasis</strong></td>
<td>47/55 (85%)</td>
<td>8/8 (100%)</td>
</tr>
<tr>
<td><strong>Rebleed</strong></td>
<td>7/47 (15%)</td>
<td>2/8 (25%)</td>
</tr>
<tr>
<td><strong>(7 days)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>3/55 (5%)</td>
<td>1/8 (13%)</td>
</tr>
<tr>
<td><strong>(7 days)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† SEAL registry, J Clin Gastroenterol 2013
Cost of Failed Haemostasis

HONG KONG Protocol
Double-Blind Placebo-Controlled

Forrest I, IIA ulcers
Adrenaline injection
plus 3.2mm Heater Probe treatment

Omeprazole
80 mg iv bolus
+ 8 mg/hr for 72 hrs.

Placebo
Results: **Recurrent bleeding**

![Bar chart showing cumulative rebleeding rate over time for Omeprazole and Placebo groups.](chart)

- **72 hr**
  - Omeprazole: 5%
  - Placebo: 24%

- **7-day**
  - Omeprazole: 7%
  - Placebo: 26%

- **30-day**
  - Omeprazole: 8%
  - Placebo: 27%

*\(p < 0.001\)*

**ITT analysis**

*Lau et al NEJM 2000*
Intravenous or oral PPI post endoscopic therapy?

- Intravenous PPI improves hemostasis in Bleeding Peptic Ulcer post endoscopy. *(HK protocol)*
  
  *Lau et al NEJM 2000*

- Asia Pacific consensus on AUGIB update 2018  *Gut 2018*

“Consider oral PPI as adjunct to endotherapy. No RCT powered to confirm high dose oral PPI as effective as IV PPI”
Trainee led Implementation project

6 week data collection period: First round
03/09/2018 - 14/10/2018

3 week education and promotional period in all contributing centres. Implementation of bundle.
15/10/2018 – 04/11/2018

6 week data collection period following bundle implementation: Second round
05/11/2018 – 14/12/2018

- Grand rounds
- Global emails
- Visits to A+E/AMU
- Bundle placed on intranet and attached to OGD request forms

Regular contact between all centres and study team during project.
Feedback obtained from all centres during and at end of study period.
Remember the GI Bleeding Bundle!
Complete checklist for all relevant patients

- **Recognition**
  - If reported: Haematemesis, melena or coffee ground vomiting
  - Trigger bundle and tick if performed:
    - Perform NEWS as indicated
    - Commence IV crystalloid
    - Transfuse if Hb <10g/L, aim for 70-100g/L

- **Resuscitation**
  - Calculate Glasgow-Blatchford Score (GBS)
  - Consider discharge if GBS 0 or 1

- **Risk Assessment**
  - If suspected variceal bleed, give terlipressin 2mg Q6H and antibiotics
  - Continue aspirin
  - Suspend all other antithrombotics

- **Refer**
  - Referral for endoscopy to be undertaken within 24H of presentation
  - Refer to GI specialist if requiring therapeutic endoscopy

- **Review**
  - Review endoscopy report
  - IV PPH if high risk ulcer post endoscopy
  - Post-bleed antithrombotic plan

If haemodynamically unstable, consider activating major haemorrhage protocol and arranging critical care review.
*Active bleeding where blood pressure or pulse cannot be normalised or who need rapid intravenous fluids to maintain haemodynamic stability.*
<table>
<thead>
<tr>
<th>Site</th>
<th>Total patients</th>
<th>Pre bundle</th>
<th>Post bundle</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI</td>
<td>113</td>
<td>50</td>
<td>64</td>
</tr>
<tr>
<td>QEUH</td>
<td>113</td>
<td>55</td>
<td>58</td>
</tr>
<tr>
<td>RAH</td>
<td>80</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>FVRH</td>
<td>76</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Crosshouse</td>
<td>70</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>Hairmyres</td>
<td>23</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Dumfries and Galloway</td>
<td>37</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>RIE</td>
<td>32</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>St Johns</td>
<td>10</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>VHK</td>
<td>82</td>
<td>39</td>
<td>42</td>
</tr>
<tr>
<td>Borders</td>
<td>17</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Ninewells</td>
<td>107</td>
<td>53</td>
<td>59</td>
</tr>
<tr>
<td>ARI</td>
<td>85</td>
<td>58</td>
<td>27</td>
</tr>
<tr>
<td>Dr Grays</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Raigmore</td>
<td>43</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>893</strong></td>
<td></td>
<td></td>
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</tbody>
</table>
RESULTS: Demographics and bundle use

<table>
<thead>
<tr>
<th>Variable</th>
<th>TOTAL</th>
<th>Pre-bundle period</th>
<th>p-value</th>
<th>Post-bundle period</th>
<th>Bundle not used</th>
<th>p-value</th>
<th>Bundle used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEMOGRAPHIC VARIABLES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of patients</td>
<td>893</td>
<td>459 (51.4%)</td>
<td>n/a</td>
<td>434 (48.6%)</td>
<td>205 (53.4%)</td>
<td>n/a</td>
<td>179 (46.6%)</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>64.5 years</td>
<td>64.7 [63.0-66.4]</td>
<td>0.772</td>
<td>64.4 [62.7-66.0]</td>
<td>65.8 [63.4-68.1]</td>
<td>0.043</td>
<td>62.2 [59.5-64.8]</td>
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<tr>
<td>Missing data n = 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
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<tr>
<td>Missing data n = 3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New admissions</td>
<td>76%</td>
<td>336 (73.9%)</td>
<td>0.172</td>
<td>336 (77.8%)</td>
<td>150 (73.2%)</td>
<td>0.012</td>
<td>150 (83.8%)</td>
</tr>
<tr>
<td>Existing inpatients</td>
<td>24%</td>
<td>119 (26.2%)</td>
<td>96 (22.2%)</td>
<td>55 (26.8%)</td>
<td>29 (16.2%)</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Glasgow Blatchford score</td>
<td>6.9</td>
<td>6.3 [0-19]</td>
<td>0.011</td>
<td>7.4 [0-20]</td>
<td>7 [0-18]</td>
<td>0.141</td>
<td>8.0 [0-20]</td>
</tr>
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<td>Missing data n = 480</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varices</td>
<td>78 (8.7%)</td>
<td>27 (7.3%)</td>
<td>0.007</td>
<td>51 (13.3%)</td>
<td>24 (13%)</td>
<td>0.733</td>
<td>24 (14%)</td>
</tr>
</tbody>
</table>

Total number of patients: 893 (24.2% inpatients)
Bundle used in 41.2% of all patients in the post-bundle period (range 0% - 80.4%)
REFERRAL SOURCE (N=887)

- 76% Outpatient
- 24% Inpatient
Referral source by time period & bundle use

Sum of Inpatients  Sum of Outpatients

p-value: 0.172

Pre-bundle: 119  336
Post-bundle: 96  336
Not used: 29  150
Used: 55  150

p-value: 0.012
Was Blatchford score (GBS) documented before endoscopy?

**GBS Recorded by Time Period (n=817)**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-bundle</td>
<td>163</td>
</tr>
<tr>
<td>Post-bundle</td>
<td>225</td>
</tr>
</tbody>
</table>

**p-value: <0.001**

**GBS Recorded by Bundle Use (n=368)**

<table>
<thead>
<tr>
<th>Bundle Use</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not used</td>
<td>86</td>
</tr>
<tr>
<td>Used</td>
<td>122</td>
</tr>
</tbody>
</table>

**p-value: <0.001**
Target Hb stated (yes/no) by time period & bundle use

- Pre-bundle: 53
- Post-bundle: 78
- Not Used: 34
- Used: 35

p-value: 0.083
p-value: 0.039
Transfusion threshold appropriate (yes/no) by time period & bundle use

<table>
<thead>
<tr>
<th></th>
<th>Pre-bundle</th>
<th>Post-bundle</th>
<th>Not Used</th>
<th>Used</th>
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<tbody>
<tr>
<td>P-value</td>
<td></td>
<td>0.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-bundle</td>
<td>58</td>
<td>83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-bundle</td>
<td></td>
<td></td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td></td>
<td>0.880</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RESULTS: Re-bleeding plan

<table>
<thead>
<tr>
<th>BUNDLE VARIABLES</th>
<th>Pre-bundle</th>
<th>p</th>
<th>Post-bundle</th>
<th>Bundle not used</th>
<th>p</th>
<th>Bundle used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-bleeding plan documented</td>
<td>121 (33.2%)</td>
<td>&lt;0.001</td>
<td>196 (50.7%)</td>
<td>83 (44.9%)</td>
<td>0.028</td>
<td>95 (56.55%)</td>
</tr>
<tr>
<td>Bundle not in notes</td>
<td></td>
<td></td>
<td></td>
<td>Bundle not in notes</td>
<td>0.011</td>
<td>106 (56.99%)</td>
</tr>
<tr>
<td>Bundle in notes</td>
<td></td>
<td></td>
<td></td>
<td>73 (43.4%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Significant improvement in documentation of a re-bleeding plan following implementation of bundle.
- Data missing in 141 patients
Length of stay (in days) by time period & bundle use

**Length of Stay by Time Period** (n=626)

- Pre-bundle: 7.3 days
- Post-bundle: 7.4 days

**Length of Stay by Bundle Use** (n=303)

- Not used: 8.4 days
- Used: 6.9 days

- p-value: 0.551
- p-value: 0.049
Mortality by time period & bundle use

Deaths by Time Period (n=893)

Pre-bundle: 40
Post-bundle: 36

Deaths by Bundle Use (n=384)

Not used: 25
Used: 9

p-value: 0.014

p-value: 0.822
Acute Upper GI Bleeding: How do we improve care?

• Improve pre and post endoscopy care of AUGIB patients (UK Bundle)

• Structured training for trainee and established consultants (Course)

• Re-Examine how GI bleed service delivered in UK

john.morris@ggc.scot.nhs.uk
Effective endotherapy of GI Bleeding patients in UK?

- UK Audit, 6750 patients (2007)
  - 38% High Risk Bleeders received dual therapy
  - 42% mortality

**Acute upper gastrointestinal bleeding in the UK: 2007 UK audit**
*Hearnshaw et al, Gut 2011*

**Guidelines**
- SIGN 2008
- Many, many more 2010-2012
Intervention: Implementation

Develop and implement evidence based quality bundle: Scotland/SSG

- Sept 2018  audit current practice
- Oct 2018  Implement AUGIB bundle
- Nov 2018  Repeat audit

- National programme supported by Stakeholders (Newcastle/Midlands)