CLINICAL EFFECTIVENESS & EVALUATION UNIT

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UK Comparative Audit of Upper Gastrointestinal Bleeding and the Use of Blood

December 2007

Royal Infirmary of Edinburgh

National Comparative Audit of Blood Transfusion

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Executive Summary

Acute Upper Gastrointestinal Bleeding (AUGIB) is the commonest reason for emergency admission to UK hospitals with a gastrointestinal disorder [Laine L, 1993]. It also occurs frequently in patients already in hospital for other reasons, and has been shown to carry a particularly high risk of morbidity and mortality in this group. Provision of emergency care including therapeutic endoscopy is central to the management of AUGIB. AUGIB accounts for over 13% of all Red Blood Cell (RBC) transfusions in the UK [Wallis, 2006]. The appropriateness of transfusions in this group has never been investigated on a large scale. In 1993/4 Rockall *et al* carried out a large multi-centre prospective audit of AUGIB in four health regions in England [Rockall, 1997]. This 2007 audit aims to compare the organisation of care, the process of care and outcomes from AUGIB with data from the previous audit, and to measure current practice against audit standards for all key areas of management, including transfusion. The relationships between service provision and outcomes are examined.

Data were collected from 217 hospitals, with 208 hospitals supplying 6750 cases for inclusion in the audit, and 205 hospitals providing organisational data. Consecutive cases were identified prospectively between 1st May and 30th June 2007. 12% of cases were incomplete and could not be used. **Hospital audit support to complete this national audit was highly variable and too frequently absent, which had a substantial impact on the number of completed cases submitted from some hospitals.**

Results

- 6750 cases were analysed: median age 68 years; 82% (5547) new admissions, 16% (1099) inpatients.
- Mortality overall was 10% (675/6750) - a reduction from 14% in the previous audit in 1993/4 [Rockall, 1995 (A)]. Mortality among inpatients was 26% (288/1099) and 7% (379/5547) in new admissions – both reduced from the previous audit.
- Varices were identified in 8% (544/6750) of all cases – increased from 4% from the audit in 1993/4 [Rockall, 1995 (A)]. They were diagnosed in 11% of those endoscoped.
- 2% (127/6750) of cases had surgery for AUGIB – a reduction from 7% in the previous audit in 1993/4 [Rockall 1997].
- 43% (2922/6750) of cases received at least one red blood cell transfusion for AUGIB
- 59% (3973/6750) of cases presented out of hours, with 20% (1328/6750) presenting between midnight and 8am.
- The majority of cases presented to general medicine, and 42% of inpatient bleeds were in under the care of general medicine.
- 26% (1746/6750) of patients did *not* have an inpatient endoscopy for AUGIB, 17% (304/1746) of whom died without having an endoscopy.
- 17% (840/5004) of *first* endoscopies were performed out of hours. Of patients who presented to the 83 hospitals where there was no out of hours endoscopy on call rota, 13% (254/1980) of *all* endoscopies were out of hours, indicating a substantial "good will" component to essential care.
- Mortality unadjusted for case mix was unrelated to whether or not hospitals had an out of hours on call endoscopy rota.
- 79% (4380/5547) of new admissions were discharged within 28 days of presentation with a median length of stay of 4 days following AUGIB in this group.
- Of new admissions with AUGIB, 11% (575/5384) for whom a date of admission was recorded) were still alive in hospital 4 days or more after admission, and did *not* have an endoscopy during their admission (this number excludes those who had surgery or radiology for AUGIB without endoscopy).

The standards used in this report are all available and referenced in Appendix 2.

Organisation of Care

1. Standard:

"Facilities for undertaking gastrointestinal endoscopy for all patients admitted with acute UGI bleeding should be available, and urgent endoscopy should be available in high risk patients."

Although nearly all hospitals have facilities for performing emergency endoscopy on site (99%), only 56% of hospitals in the audit (106/189 with access to endoscopy facilities out of hours) have an out of hours emergency endoscopy rota. Of the patients who presented to these hospitals without official endoscopy on call rotas, 13% (254/1980) underwent endoscopy out of hours. This reflects the "ad hoc" and "goodwill" service provision in these hospitals.

2. Standard:

"There should be an appropriately trained therapeutic endoscopist with nursing support and availability of equipment for achieving haemostasis. Capability for placing a Sengstaken-Blakemore or Minnesota tube in patients with uncontrolled variceal haemorrhage is required."

The majority of consultants (74%) on call for emergency endoscopy were regarded as competent at the basic haemostatic techniques. However, the majority of those not regarded as competent at all four procedures (see Organisational audit questionnaire, Appendix 4) were reported not to be competent at either variceal banding or placement of Sengstaken-Blakemore or Minnesota balloon tamponade for varices.

3. Standard:

"Guidelines should be available for the transfusion management of patients with massive haemorrhage."

49% (101/205) of hospitals reported having transfusion guidelines for patients with major haemorrhage in their hospital. It is possible that some other hospitals do have transfusion guidelines, but their distribution and availability may be inadequate, such that the consultant lead completing the organisational audit tool is unaware of them. The dissemination of clinical guidelines to the appropriate people and places is just as important as having them at all.

Process of care

1. Standard:

"Patients with AUGIB to be admitted by or referred early to specialist medical or surgical gastroenterology."

13% (722/5547) of new admissions with AUGIB were admitted directly under GI bleeding/gastroenterology teams. Of the remainder, 31% (1476/4825) of patients had their care subsequently transferred to GI bleeding/gastroenterology teams. Inpatients with AUGIB had their care transferred in 17% (188/1099) of cases, with only 11% (109/958) of those not already under gastroenterology having their care transferred there, even though this group of patients has the highest mortality and highest risk of continued bleeding.

2. Standard:

"Patients to be assessed for bleeding severity and categorised into high, medium or low risk."

Only 19% (1250/6750) of cases in the audit had a risk score recorded in the medical notes.

3. Standard

"Circulating volume to be restored using crystalloid or colloid. Initial resuscitation should not be with red blood cells unless ongoing haematemesis with shock."

There was wide variation in practice regarding resuscitation, and documentation was poor. 33% (2241/6750) of patients received RBC transfusion within 12 hours of presentation, and in 8% (514/6750) this was the only fluid replacement documented as used.

4. Standard

"Endoscopy to be performed within 24 hours of presentation in all medium and high risk cases."

The median (IQR) time from presentation to endoscopy was 23 (12-51) hours. For patients with pre-endoscopy Rockall score of 3 or more (i.e. medium to high risk patients), median (IQR) time to endoscopy was 23 (11-55) hours.

Having a medium to high pre-endoscopy risk score appears to have no impact on the time to endoscopy. It is disappointing that there has been no significant rise in the proportion of high risk cases receiving early endoscopy since the 1993/4 audit [Rockall, 1997].

5. Standard

"Haemostatic therapy to be administered to varices, ulcers with active bleeding or non-bleeding visible vessel. Endoscopy to be repeated if further bleeding or high risk lesion at first endoscopy."

65% of patients presenting with AUGIB with varices at endoscopy (338/520) received haemostatic therapy at endoscopy. 76% of actively bleeding ulcers (598/789), and 92% of non-bleeding visible vessels (292/318) received endoscopic therapy. In all categories, the number of repeat endoscopies was low, with less than a third of cases getting repeat procedures. The reasons for these low levels of therapy and repeat procedures need investigation.

6. Standard

"Parenteral vitamin K to be administered to those on warfarin with active bleeding..."

48% (225/473) of patients with AUGIB who were on warfarin received vitamin K. 28% (133/473) of patients on warfarin with AUGIB received FFP at some stage during the episode, and in 31/133 (23%) of these, no vitamin K or other clotting factors were used. FFP alone is not recommended for reversal of coagulopathy in this group.

7. Standard

"Proton pump inhibitor (PPI) therapy should be started in patients with peptic ulcer active bleeding or non-bleeding visible vessel at endoscopy after endoscopic therapy."

"Vasopressin analogues to be started in those with known or suspected variceal haemorrhage."

Intravenous PPIs were started in 70% of patients with an ulcer who received endoscopic therapy at the first endoscopy (460/656), and were also administered to 16% of patients where no ulcer was documented (147/928). Vasopressin analogues were started in 44% of all cases with varices or portal hypertensive gastropathy seen at the first endoscopy (266/601).

8. Standard

"Transfuse red blood cells if haemodynamically unstable and/or haemoglobin <10g/dL at time of presentation with suspected acute upper GI bleeding."

5% (345/6750) of all patients received RBC transfusion (15% of all 2241 RBC transfusions within 12 hours of presentation) when they were haemodynamically stable and had a haemoglobin (Hb) above 10g/dL or no Hb recorded.

9. Standard

"In those actively bleeding correct platelets if <50 x 10^9."

42% (79/189) of platelet transfusions were to patients with a platelet count ≥50 x 10^9, or to patients who had no platelet count recorded prior to the transfusion.

10. Standard

"In those actively bleeding correct INR if >1.5x normal or prothrombin time (PT) >3 seconds prolonged"

FFP was given to 7% (503/6750) of all cases of AUGIB and in 27% (138/503) of these, FFP was not indicated.

Recommendations

General

On presentation, risk assessment using a validated scoring system should be a standard of care (and recorded) as there is a strong relationship between such assessments and outcome of AUGIB.

Patients with significant AUGIB, in particular those at high risk – inpatients, elderly, and those with high risk scores, should where appropriate, be referred early to specialist care.

Greater attention to medical therapies after endoscopy is needed to ensure timely and appropriate use of proton pump inhibitors (PPI) and vasopressin analogues. Hospitals should monitor their use of PPIs to avoid excessive use, and the reasons for the low use of vasopressin analogues need to be identified.

Endoscopy

Reasons for delay in endoscopy need to be identified, and service provision needs to be assessed to ensure those at high risk have access to early endoscopy.

Endoscopy for AUGIB should be performed by someone competent in endoscopic therapy for both non-variceal and variceal bleeding. Patients with high risk lesions should have a repeat endoscopy planned with the potential for repeat therapy available.

In view of the increasing proportion of AUGIB due to varices, all consultants providing emergency endoscopy should be competent in at least one method of haemostasis for varices (including balloon tamponade). Investigation is needed into the reasons (organisational and/or care process) why a third of patients with varices and AUGIB do not have a therapeutic procedure performed.

Transfusion

Fluid replacement strategies need clarifying and guidelines for the appropriate use of blood components in AUGIB need reviewing, as a collaboration between gastroenterologists and transfusion specialists, e.g. BSG and British Committee for Standards in Haematology (BSCH).

The process of completing transfusion guidelines (for RBC, platelets and FFP) should include the development of strategies for disseminating them amongst gastroenterologists and clinicians caring for those with AUGIB.

Clinicians should be reminded of the risks of transfusion and the need to document the clinical indication for transfusion in all cases.

The reasons underlying the apparent high levels of inappropriate transfusion need to be investigated.

Clinical research is required to develop a stronger evidence base for transfusion in AUGIB.

Conclusions

This is the first UK wide audit of AUGIB and the use of blood transfusion, providing valuable data to clinicians and hospital managers as to current practice in AUGIB. The majority of patients with AUGIB are elderly and have significant medical co-morbidities. Unadjusted mortality overall has declined from 14% to 10% since the 1993/4 audit (from four health regions), despite an increase in the proportion of patients with variceal bleeding since the previous audit. Blood transfusion is common, and inappropriate transfusion more common for platelet and FFP transfusions than for red blood cells. The use of therapeutic endoscopy and medical therapies after endoscopy is disappointingly low. The relationships between service provision and outcomes (in particular with reference to interventions and outcomes in emergency endoscopy) need more detailed investigation.

Introduction

Why is this audit necessary?

In 1995 Rockall *et al* reported a large audit of patients who presented with acute upper gastrointestinal bleeding (AUGIB) to four health regions in England. The audit addressed the incidence and mortality of AUGIB, and in a subsequent paper, a risk assessment tool - the 'Rockall score'- was described [Rockall, 1996 (A)]. Mortality from AUGIB at the time of the audit was 14% overall, with inpatient bleeding mortality 33% [Rockall, 1995]. 14 years on, considerable changes have occurred in the prevention, diagnosis, and management of AUGIB, and the impact of these changes on incidence and outcomes needs to be assessed. Helicobacter Pylori and its eradication is now much more widely appreciated, the complications of non-steroidal anti-inflammatory drugs (NSAIDs) are well known, and strategies for decreasing their toxicity are widely employed. Endoscopic therapy is now frequently undertaken when appropriate, and the value of powerful acid suppressing drugs is well established. Guidelines, based on the Rockall score, for identifying high and low risk patients, and focusing intensive supportive therapy on the high risk patient, may have also influenced patient outcomes [BSG, 2002]. This audit provides an opportunity to close the audit cycle by referring to the results from the 1993/4 audit (see page 14), and reviewing significant changes since then.

AUGIB accounts for over 13% of red blood cell (RBC) transfusions in hospitals in the UK [Wallis, 2006]. Several studies have demonstrated wide variation in practice in the use of red cells in surgery, and the same is likely to be the case in medical specialities.

There is little information regarding the appropriateness of transfusion or the effect of RBC administration upon outcome in AUGIB. A randomised controlled trial in intensive care patients demonstrated that those patients who were subject to liberal RBC transfusion had worse outcomes than those on a restricted transfusion policy. The study suggested a transfusion threshold of 7g/dL in non-bleeding patients with no significant cardio-respiratory co-morbidity. A recent observational study in cardiac surgery also demonstrated an association between RBC transfusion and adverse clinical outcomes including infection, ischaemic postoperative morbidity, length of stay and mortality [Murphy, 2007].

A threshold of 10g/dL in actively bleeding patients is the current recommendation for the transfusion management of AUGIB [BSG, 2002], although there are no randomised controlled clinical trials to confirm this is best practice. The thresholds that are currently being used by clinicians for blood transfusion (which probably vary widely between individuals and institutions) need to be identified; the impact of transfusion upon re-bleeding rates and mortality is unclear, and we do not know whether management decisions based upon "transfusion requirements" are appropriate. This audit provides comparisons between practices in different hospitals, and helps evolve an evidence base for appropriate blood transfusion in patients with AUGIB. It may also identify areas for further research in this area.

Aims

- to survey the organisational arrangements for the management of AUGIB, and to assess adherence to UK published guidelines
- to audit the process of care in the UK for AUGIB and identify those areas where practice could be improved to be more in line with clinical standards
- to audit the transfusion management of AUGIB with respect to indications for blood transfusion such as: presenting clinical features, haematological laboratory findings, and risk of rebleeding according to validated clinical scoring systems
- to examine the extent of variation in practice with respect to each of the above
- to assess the validity and utility of scoring systems for risk assessment in AUGIB
- to work with participating hospitals and stakeholders to achieve a reduction in the variation in clinical care (including the use of blood transfusion) of patients with AUGIB.

What does this audit want to report?

- an analysis of the current care pathways for patients presenting with AUGIB
- clinical outcomes for patients with AUGIB presenting to UK hospitals
- patient factors and aetiological factors in AUGIB that identify those at high risk of re-bleeding or death from AUGIB (including those used in Rockall score)
- the relationship between emergency gastroenterology service provision and clinical outcomes
- an analysis of the influence of Hb and other triggers on the usage of blood
- an analysis of the relationship between use of blood transfusion and clinical outcomes
- data to participating hospitals for comparative purposes, and to stakeholders as required.

What does this report include?

This report provides participating hospitals with their data regarding the organisation and process of care for patients presenting with AUGIB. Hospital data are presented alongside data for the whole of the UK for easy comparison. Preliminary analyses of the relationships above are included, along with guidance as to how these should be interpreted, and recommendations for changes to practice. More detailed analyses with further UK recommendations will be presented at a later date.

Who are the principal stakeholders?

NHS Trusts in England, Wales, Scotland & Northern Ireland
British Society of Gastroenterology
Royal College of Physicians
NHS Blood and Transplant
Blood Services in Scotland, Wales and Northern Ireland

Methods

How were NHS Trusts recruited?

All NHS Trusts in England, Northern Ireland and Scotland were contacted about the audit with a letter to the Medical Director in December 2006. Trusts in Wales were invited to participate via our nominated contact within the Welsh Blood Service.

A letter explaining the reason for the audit, the purpose of the audit, the proposed timescale, and the proposed dataset to be collected, was sent from the Project Leads to the Chief Executive, Medical Director and Clinical Audit Manager in each NHS Trust. Electronic copies of this letter were sent via email to Trust Transfusion Laboratory Managers, Transfusion Practitioners, and Consultant Haematologists with responsibility for blood transfusion.

Notices advertising the audit were put in the British Society of Gastroenterology (BSG) newsletter, on the BSG website and on the National Comparative Audit of Blood Transfusion web page. The audit was also advertised at the BSG annual conference in March 2007.

Non-responders were sent a reminder letter in February 2007 and the endoscopy lead in those hospitals from whom no response was received was telephoned or emailed by the project group clinical audit lead (where the name was available from the BSG).

209 NHS hospitals in England, 22 in Scotland, 17 in Wales and 9 in Northern Ireland were invited to participate. Of these, 223 (87%) agreed to participate with data received from 217 hospitals (84% of all hospitals invited). (See Appendix 1 for participating sites).

Nature and size of the case sample for this audit

Sites were asked to identify all cases of AUGIB within a 2 month period, from 1st May to 30th June 2007, to include new admissions with AUGIB, and patients who had an AUGIB whilst in hospital for another reason. Every identified case or potential case was registered for inclusion, and where possible and appropriate, complete data entered for all. The nominated audit lead for each hospital was asked to decide whether every identified case in the audit period had definitely had an AUGIB. They were encouraged to discuss cases with the nominated consultant lead in the hospital, or with the Clinical Audit Lead if in doubt. In those hospitals with a high incidence of UGI bleeding, a minimum of the first 60 cases was requested to be entered in full.

All patients in the consecutive sample were to be audited even if they had not received a blood transfusion. Cases were excluded if they were under 16 years of age, or if the audit lead in the hospital did not think there was sufficient evidence of a genuine AUGIB. Duplicate cases, based on hospital, admission date and time, year of birth and Full Blood Count (FBC) values, were removed from the submitted dataset.

Organisational data were requested from the clinical lead for endoscopy in each participating hospital.

Pilot

Both the patient audit tool and the organisational audit tool were piloted in January 2007 by 6 hospitals representing a mix of district general hospitals and large teaching hospitals (one with a liver transplant unit). Feedback from these was noted and minor changes were made to the layout and wording of some questions. Additions to the help texts were also made. Changes were not significant enough to warrant re-piloting. A technical pilot of the electronic data capture took place in April 2007.

All the potential methods for case identification were assessed over a 3 week period in two hospitals (one district general hospital, and one large teaching hospital). The methods which yielded the most genuine cases were then recommended to participating hospitals.

Audit standards and criteria

A set of audit standards was created by the project group based on published guidelines and trial papers. The standards are divided into those relating to the organisation of care and those

relating to the care process. The standards were reviewed by the Endoscopy Section of the BSG and by lead consultants in Blood Transfusion. Where published evidence was unavailable, standards are based on consensus of best practice of the Project Group and Blood Transfusion experts. These standards were published on the BSG website in June 2007 and can be found in Appendix 2.

Data collection

Paper organisational audit tools were completed and returned to the Project Officer for entry into an MS Excel database. For the cases of AUGIB identified in the audit period, data entry was directly onto the audit tool webpage designed for purpose at www.nbscollection.co.uk/audit/login. Participating hospitals were provided with unique login identifiers and passwords, and were given printable versions of the audit questions and help notes. The website closed on 6th August 2007.

Audit report

Data were received from the website in Microsoft Excel spreadsheets, and were transferred to SPSS for cleaning and analysis.

- Duplicate cases were removed from the database, and cases classified as
    - "AUGIB, include in main analyses"
    - "Exclude, not AUGIB"
    - "AUGIB but incomplete"
    - "Insufficient data to decide whether if AUGIB" (see table 1 page 15)

Note the raw data sent to sites as requested, includes all data entered onto the web tools, and so for many hospitals includes more cases than are reported here in the main analyses.

- 19 hospitals were contacted for additional information on 822 of the 1090 incomplete/insufficient cases (these 19 hospitals all had 20 or more cases in these categories). 12 hospitals responded. The most frequent problems with obtaining and entering data in full, were;
    - "lack of time" (368 cases – 7 hospitals),
    - "inability to track the case notes" (193 cases – 6 hospitals).

  54 cases were reported by hopsitals after further review as definitely *not* cases of AUGIB and the hospital audit teams had intended to "exclude" them using the online audit tool. The classification of these cases was not changed retrospectively. 47 cases classified as "insufficient data to decide" were identified as definite cases of AUGIB, but were incomplete and therefore not included in the final analysis.
- Each INCLUDED case was then classified according to presentation type ('new admission', 'established inpatient' or 'other').

Dates and times of events in the episode were checked and cleaned, (e.g. ensuring discharge dates were after admission dates), and free text comments about presentation and diagnoses were read and reclassified where possible.

- Rockall scores were calculated from the year of birth (i.e. age as of 1/1/07), presenting haemodynamic state (Q23) and medical co-morbidities (Q27). Post-endoscopy Rockall scores were calculated for all but 15 cases, where data for the first inpatient endoscopy were available (see Appendix 3). Hospital audit leads were contacted for clarification of case data where necessary.

The project group acknowledge there was enormous variation in the level of support available from hospital clinical audit departments. This is disappointing, because audit of clinical outcomes should be a core purpose of the audit department and a Trust management responsibility. The variable levels of missing cases and incomplete data almost certainly reflect this, but the amount of data acquired is also a tribute to the hard work of many clinicians working in their own time to complete the audit.

How to read this report

The report is structured so that individual hospitals can compare their data to the national statistic for the key audit standards. In some cases, the individual hospital numbers are small, and so caution in interpretation is required. For some tables the national numbers are small, so individual hospital data has not been reported (e.g. surgery). Most of the tables are derived directly from questions in the audit, and where possible the question number has been inserted into the table. The audit questionnaire is available in Appendix 4 for reference.

There may be areas in the report where clinicians feel their site data is incorrect, or think it mis-represents their current practice. If this is the case, we recommend reviewing the cases that were submitted to the audit (the individual site raw data can still be provided, and/or the hospital case identifier(s) should be able to use the linkage record to identify the patients). It may be useful to decide whether the cases provided for the audit were all meant to be included, and whether there were any significant omissions. It may be possible to obtain Hospital Episode Statistics (HES) data to review exactly how many cases presented during the audit period, and examine the reasons why individual cases may not have been entered in the audit We anticipate in many hospitals the number of cases entered in the audit will be significantly less than the number of cases actually presenting in the two month period. This may be useful information to obtain to provide to clinical audit departments, to help with planning of future local and UK audits of AUGIB.

The 1993/4 audit of acute upper gastrointestinal haemorrhage

Throughout this 2007 audit report, reference is made to the audit of AUGIB carried out in 1993/4 under the auspices of the BSG, The Royal College of Surgeons, the Association of Surgeons of Great Britian and Ireland, and the Royal College of Physicians of London. This section summarises the key findings of this 1993/4 audit.

Methods

This was a prospective multi-centre survey and audit examining all admissions and inpatients with AUGIB in hospitals in four health regions (North West Thames, Trent, West Midlands, and South West Thames). Data were collected onto paper forms which were then read electronically. The audit was carried out in two phases with recommendations made to participating sites between the audits. After the first phase, the Rockall score was developed and this was validated on the cases identified in the second audit period.

Key findings reported in the literature

- incidence of AUGIB 103/100,000 adults [Rockall, 1995 (A)]
- median age 71 years [Rockall, 1995 (A)]
- overall mortality 14% (11% in emergency admissions and 33% in inpatients). Mortality increased with age to 39% in those over 80 years [Rockall, 1995 (A)]
- 53% had significant co-morbidity at presentation; 6% having significant liver disease. 8% of patients were managed in high dependency unit [Rockall, 1997]
- 35% of patients had diagnosis of peptic ulceration, 4% varices, and 4% malignancy [Rockall 1995 (A)]
- a risk score based on age, haemodynamic status, co-morbidity, diagnosis and endoscopic stigmata of recent haemorrhage was developed, with maximum score 11 [Rockall 1996 (B)] (see Appendix 2)
- low scores (2 or less) had low risk of re-bleeding (4.3%) and death (0.1%). Median Length of Stay (LOS) for low risk patients was 4 days. LOS increased with risk score, to median LOS 10 days for score >=8 [Rockall 1996 (B)]
- 81% had endoscopy (phase 1), 50% within 24 hours. 190 (out of 1800 who had endoscopy) had high risk lesions (11%). 75% of these received endoscopic therapy [Rockall, 1997]
- 8% had surgery in phase 1; surgical mortality was 26% in phase 1 [Rockall, 1997]
- risk standardisation to correct for variation in case mix resulted in apparently significant differences in mortality rates between hospitals becoming insignificant [Rockall, 1995 (B)].

Key differences between the 1993 audit and the 2007 audit

- 4 health regions included in 1993/4 – UK wide in 2007
- different methods of data collection - paper based in 1993/4, online in 2007
- more systematic collection of medications, co-morbidities and endoscopic procedures in 2007
- more consistent audit support available to participating sites in 1993/4.

The difference in sample size, populations, and data collection may impact on the ability to make some specific comparisons, but certainly the 1993/4 BSG audit, provides a valuable baseline against which major changes can be measured.

Initial Results of the UK Comparative Audit of Upper Gastrointestinal Bleedingand the Use of Blood 2007

Organisational audit

Organisational data were submitted by 205 hospitals. 200 hospitals submitted data to both organisational and process audits. 212 hospitals submitted data to the process audit. 217 submitted data to one or other of the audits.

Process audit

212 hospitals submitted 8939 cases, median (IQR): 37 (19-56), range: 1-160.

12% (1099/8939) were found subsequently by the hospital audit lead not to have had an acute UGI bleed. 12% (890+200=1090/8939) were potential cases to be included, but for local reasons data were not entered in full (see page 12).

Feedback from participating hospitals highlighted that some cases of AUGIB were not registered for inclusion in this audit. This limits the value of the data for measuring incidence of AUGIB, and clearly reflects the difficulty some hospitals had in finding the necessary resources to carry out the audit in full. It is not possible to tell from the entered cases, whether the cases were genuinely consecutive, or whether there were some that were missed and not started at all. Aside from going back to individual site HES data, this will not be easy to establish for the UK data, but for local hospital feedback it may be a useful exercise.

The main analysis thus comprises 6750 cases with AUGIB from 208 hospitals, median (IQR): 31 (16-43), range: 1-118.

TABLE 1

	Cases submitted[1]	Insufficient data to decide if AUGIB[2]	Cases excluded as subsequently found not to be AUGIB[3]	AUGIB but incomplete data[4]	AUGIB included in main analysis
National	8939	890	1099	200	6750
Your site	29	0	0	0	29

1. Number excludes any duplicate cases submitted.
2. Number represents cases where it was not known how the patient presented with their AUGIB and no other information about the case was provided.
3. This is the number of cases excluded by local audit leads as they subsequently found them not to be AUGIB cases.
4. Presented with AUGIB but rest of the form was incomplete.

Cases not entered in full

There were 2189 cases (8939-6750) omitted from the final analysis. These 2189 cases were patients of similar median age and gender distribution to those included (see table 2). Confirmed AUGIB patients omitted due to incomplete data (n=200) comprised a similar mix of presentation types as for AUGIB patients included in the main analysis (n=6750), although there was a slightly higher proportion of inpatient AUGIB (24% vs. 16%).

TABLE 2

	Insufficient data to decide if AUGIB[1] (890)		Cases excluded as subsequently found not to be AUGIB[2] (1099)		AUGIB but incomplete data[3] (200)		**AUGIB included in main analysis (6750)**	
% (n) Female	43%	372/857	49%	541/1095	49%	98/199	41%	2739/6748
Median (IQR) Age in years	70	50-81	73	53-82	74	52-83	68	49-81
Presentation Type:	%	N	%	N	%	N	%	N
Acute admission with overt upper GI bleeding	54	477	31	344	71	142	82	5547
Upper GI bleeding in established inpatient	15	134	7	79	24	47	16	1099
Other	1	12	58	639	5	10	2	104
Not known	30	267	3	37	0.5	1	-	0

1. Number excludes any duplicate cases submitted
2. Number represents cases where it was not known how the patient presented with their AUGIB and no other information about the case was provided.
3. This is the number of cases excluded by local audit leads as they subsequently found them not to be AUGIB cases.
4. Presented with AUGIB but rest of the form was incomplete.

Section 1 – Principal Findings

The main analysis comprises 6750 cases of AUGIB from 208 hospitals (170 England, 8 Northern Ireland, 17 Scotland, 12 Wales, and 1 Isle of Man). 4 hospitals submitted cases which were all either excluded or incomplete.

Median (IQR) per hospital was 31 (16-43) cases, range 1-118. 62 hospitals had 1-19 cases, 78 had 20-39 cases, 47 had 40-59 cases and 21 had 60 or more cases. 59% (4009/6750) of included cases were male.

1.1 Age

TABLE 3

	National Audit (6750)		Your site (29)	
Median AGE	68		67	
IQR AGE	49-81			
AGE range	16-104		20 - 94	
Age group*	%	N	%	N
<30	6	414	3	1
30-59	31	2103	38	11
60-79	35	2334	24	7
80+	28	1898	34	10

*Age not known for 1 case

In the 1993 audit 27% of patients were aged 80 or over at presentation [Rockall, 1995 (A)].

1.2 Transfusion

TABLE 4

	National (6750)		Your site (29)	
	%	N	%	N
Patients receiving any red blood cell transfusion for UGI bleeding episode*	43	2922	76	22

* Obtained by combining responses from two audit questions – (1) Q24 asking about Red Blood Cell (RBC) transfusion within 12 hours and (2) If RBC transfusion data were provided for anytime during the episode (RBC 1-10).

The percentage of patients with AUGIB receiving red blood cell transfusion has never been measured in such a large audit before. It is clearly important to ensure this high proportion of patients receiving RBC transfusion is receiving it with good clinical indication. (See Section 8 for transfusion data).

1.3 Pre-endoscopy Rockall score (computed using audit data for all included patients. See Appendix 3)

TABLE 5

Rockall score	National (6750)		Your site (29)	
	%	N	%	N
0	18	1240	10	3
1	16	1065	14	4
2	14	946	14	4
3	16	1088	7	2
4	19	1257	17	5
5	11	757	31	9
6	5	335	3	1
7	1	62	3	1

1.4 Endoscopy

TABLE 6

Total number of inpatient endoscopies for AUGIB (Q46)	National Audit (6750)		Your site (29)	
	%	N	%	N
None	26*	1746	0	
One	65	4413	76	22
Two	7	500	24	7
Three	1	71	0	
More than 3	0.3	20	0	

*Of these, 17% (304/1746) died and 22% (389/1746) had an outpatient endoscopy planned. Other reasons identified for not having endoscopy are discussed in more detail in Section 5.

1.5 Rockall score* (post-endoscopy score computed using audit data for all included patients who had inpatient endoscopy, using data from first endoscopy. See Appendix 3.)

TABLE 7

Rockall score*	National (5004 with first endoscopy)		Your site (29)	
	%	N	%	N
0	5	228	0	
1	12	592	7	2
2	12	588	10	3
3	13	645	14	4
4	16	810	0	
5	15	749	17	5
6	11	549	14	4
7	8	393	14	4
8	6	283	21	6
9	3	127	0	
10	0.4	21	3	1
11	0.1	4	0	
Not computed		15		

*Not computed for 15 cases because endoscopy was incomplete.

The audit in 1993/4 showed a similar distribution of patients across the scores (5.6% score 0, 11.0% score 1, 12.8% score 2, 15.9% score 3) [Rockall, 1996 (B)]. However more patients in the 2007 audit had high Rockall scores with 9.5% having score ≥8 compared with 5.1% in the 1993/4 audit. This may reflect differences in case ascertainment, recording of co-morbidities, and identification and recording of endoscopic diagnoses. It may also represent a genuine change in case-mix.

1.6 Endoscopic therapy

32% (1550/4869) had endoscopic stigmata of recent haemorrhage *(first endoscopy only)*.

TABLE 8

Were any therapeutic endoscopic procedures undertaken?* (Q77)	National Audit		Your site	
	%	N	%	N
1st Endoscopy		(5004)		(29)
Yes	23	1172	62	18
No	75	3770	38	11
Not known	1	62	0	

*14% (684) had an ulcer base injection, 6% (323) had either variceal sclerotherapy (53) or variceal banding (283). See Section 5.5.3 for further details.

1.7 Endoscopic diagnoses

TABLE 9

Any abnormality found on 1st, 2nd or 3rd endoscopy? (Q67, Q100, Q133)	National Audit (5004)		Your site (29)	
	%	N	%	N
	83	4139	93	27
Oesophagitis	24	1177	21	6
Gastritis / Erosions	22	1091	10	3
Ulcer	36	1826	48	14
Erosive duodenitis	13	640	3	1
Malignancy	4	187	0	0
Mallory-Weiss syndrome	4	213	3	1
Varices	11	544	14	4
Portal hypertensive gastropathy	5	275	10	3
Vascular ectasia	3	130	17	5
NO CAUSE FOUND	17	865		

Peptic ulcer is still the commonest endoscopic diagnosis, and was identified in 27% (1826/6750) of all patients (including those who did not have endoscopy). The proportion of patients with varices has increased significantly since the audit in 1993/4, when varices made up 4% of cases [Rockall, 1995 (A)]. Note in this audit overall (i.e. including those without endoscopy), varices were diagnosed in 8% (544/6750).

1.8 Outcomes

TABLE 10

Which of the following were the outcomes of the AUGIB in this patient*?	National Audit (6750)		Your site (29)	
	%	N	%	N
Death during admission	10	675	7	2
UGI bleed having surgery or radiological intervention to control	3	201	3	1
Continued bleeding and/or re-bleeding after first endoscopy	13	668/5004	10	3/29
Alive in hospital at 28 days	16	1107	3	1
Discharged alive <=28 days after presentation	73	4908	90	26
Discharged alive <=28 days after presentation without endoscopy	17	1161	0	0

* This table was derived by examining the endoscopy, surgery and radiology data, and the final outcome data entered in Q181. The categories are *not* mutually exclusive (i.e. some patients may have re-bled, had surgery and be alive in hospital and therefore be counted in 3 rows).

Of new admissions with AUGIB, 79% (4380/5547) were discharged within 28 days of presentation.

Note the mortality data here does not include patients who died after discharge following their AUGIB. The most significant difference between these outcomes and those from the 1993/4 audit is the reduction in the proportion of patients going for surgery (see Section 7).

1.9 Mortality

TABLE 11

	Overall (6750)		Acute admission with overt AUGIB (5347)		AUGIB in established inpatient (1099)		Other (104)	
	%	N	%	N	%	N	%	N
Death	10	675	7	379	26	288	8	8

The number of deaths associated with AUGIB has reduced since the first audit in 1993/4 where overall mortality was 14% and inpatient mortality 33% [Rockall, 1995 (A)]. This may be a reflection of the difficulty some sites had obtaining all cases for inclusion in the audit, and as previously noted, the methods of data collection and the populations being measured in this audit are different to those in the first audit in 1993. However, the Rockall scores of the two populations are comparable, and with the marked increase in the proportion of varices, this reduction in mortality must be regarded as probably real and certainly encouraging.

Section 2 – Organisation of Care

Organisational audit data were returned by 205/257 (80%) of all hospitals invited i.e. 205/223 (92%) of participating hospitals (See Appendix 4 for organisational questionnaire).

Your site **did** return the organisational questionnaire. The complete quality standards for the organisation of care for AUGIB can be found in Appendix 2.

2.1 Initial care/resuscitation

Standard:

"Facilities should be available for resuscitation including level 2 care beds, and staff skilled in the management of patients presenting with circulatory collapse."

TABLE 12

Does your hospital have the following on site?(Q1):	National Audit (205) %	N	Your site
High dependency unit (HDU) / level 2 care?			
Yes	91	187	
No	8	16	Yes
Not known	1	2	
Intensive therapy unit (ICCU) / level 3 care?			
Yes	95	194	
No	5	10	Yes
Not known	0.5	1	
Neither of the above	2	4/189	

It is a concern that there are *any* hospitals in the UK managing patients with AUGIB that report not having high level care beds.

2.2 Availability of endoscopy

Standard:

"Facilities for undertaking gastrointestinal endoscopy for all patients admitted with acute UGI bleeding should be available, and urgent endoscopy should be available in high risk patients."

All hospitals but one in the audit have an endoscopy unit on site.

TABLE 13

Is out of hours endoscopy accessible on site? (Q11)	National Audit (205) %	N	Your site
Yes	92	189	
No	7	15	Yes
Not known		1	

TABLE 14

If out of hours endoscopy is accessible on site, is there an endoscopy out of hours consultant on-call rota? (Q18)	National Audit (189) %	N	Your site
Yes	56	106	Yes
No	44	83	

TABLE 15

If yes, how many consultant endoscopists are on the out of hours rota?(Q18)	National Audit (106)		Your site
	%	N	
<3	4	4	6
3-5	34	36	
6-8	42	44	
9-11	16	17	
12-13	4	4	
Not known	1	1	

Although nearly all hospitals have facilities for performing emergency endoscopy on site, it is concerning that only 56% of hospitals in the audit have an out of hours emergency endoscopy rota. Of the patients who presented to the hospitals without such consultant on call rotas, 13% (254/1980) underwent endoscopy out of hours (see Section 5.5.1). This reflects the "ad hoc" and "goodwill" service provision by consultants in these hospitals.

Standard:

> *"There should be capability for applying endoscopic haemostatic therapies including banding or injection for varices, and injection and/or thermal therapy, and/or endoscopic clips for non-variceal bleeding."*
>
> *"This includes an appropriately trained therapeutic endoscopist with nursing support, and availability of equipment for achieving haemostasis. Ability to place a Sengstaken-Blakemore or Minnesota tube in patients with uncontrolled variceal haemorrhage is required."*

99% of hospitals with out of hours endoscopy accessible on site (188/189), have facilities for providing endoscopic therapy.

TABLE 16

If out of hours endoscopy accessible on site, is there an on-call endoscopy nurses' rota? (Q14)	National Audit (189 with out of hours endoscopy)		Your site
	%	N	
Yes	40	76	Yes
No	60	113	

TABLE 17

If out of hours endoscopy is accessible on site, are registrars on the rota always supervised with the consultant present in the endoscopy room? (Q20)	National Audit (189 with out of hours endoscopy)		Your site
	%	N	
Yes	64	41	Yes
No	36	23	
N/A		74	
Not known		51	

The Joint Advisory Group (JAG) guidelines regarding training in (therapeutic) endoscopy state

> "*Trainees must ensure they have adequate on-site supervision at all times, for procedures that they have not yet gained a certificate of competence in, as defined in the curriculum*"
>
> and that trainees
>
> "*may only undertake independent endoscopy once they have been formally assessed as competent by two independent observers.*" [JAG, 2004]

The organisational audit did not request details of trainees' competence, and so the number of unsupervised trainees stated here may include some who have been assessed as competent. Of note, not all consultant endoscopists in the audit were recorded as competent at all therapeutic haemostatic procedures.

Many out of hours endoscopies are not performed in the endoscopy unit, and are often staffed by nurses who are not from endoscopy. Less than half of hospitals report having endoscopy nurse assistance available out of hours, and many consultants completing the audit commented on this as of particular concern (see page 26).

TABLE 18

Total number of consultants on-call for endoscopy in UK (Q19)	**Number (%) reported as capable of all 4 therapeutic procedures * (Q19a)**	
	%	N
638#	74	469

* These were listed as ulcer haemostasis, varices sclerotherapy, varices banding and placement of balloon tamponade.

The 638 excludes known double counting of consultants across neighbouring hospitals within the same Trust. The 74% was computed assuming that any unknown data for a consultant equated to a 'no'. Therefore this 74% is likely to underestimate. If these unknowns are regarded as 'yes', then the 74% increases to 84% (533/638).

The majority of consultants on call for emergency endoscopy are competent at the basic haemostatic techniques. The majority of those who were not regarded as competent at all 4 procedures were not deemed competent at either variceal banding or placement of a balloon tamponade. In view of the increasing proportion of AUGIB due to varices, all consultants on call for emergency endoscopy need to be competent in at least one method of haemostasis for varices.

2.3 Surgery

Standard:

"A surgical team should be available on site..."

TABLE 19

Does your hospital have the following on site: Acute surgical admissions unit?* (Q1b)			
	National Audit (205)		Your site
	%	N	
Yes	73	150	
No	25	52	Yes
Not known	1	3	

* It is acknowledged that some hospitals may have acute general surgical teams on site without necessarily having an acute surgical admissions unit.

The BSG guidelines recommend early consultation with surgical colleagues for high risk patients [BSG, 2002]. In the 1993/4 audit, surgical intervention for AUGIB was much more common than has been found in this audit (8% vs. 2% - see Section 7 [Rockall, 1997]). Those who are deemed to be at high risk of requiring surgery may be transferred to hospitals where this facility is readily available. The results of the present audit, with very few cases now receiving surgery for AUGIB may have implications for the organisation of acute services in some sites.

2.4 Availability of Transfusion

Standard:

"There should be rapid availability of blood products 24/7...."

TABLE 20

Is your transfusion laboratory on site?(Q5)	National Audit (205)		Your site
	%	N	
Yes	95	195	
No	4	9	Yes
Not known	0.5	1	

TABLE 21

If your transfusion laboratory is on site, are on call laboratory staff on site at all times (24 hours/day, seven days/week)? (Q6)	National Audit (195)		Your site
	%	N	
Yes	94	184	
No	6	11	Yes
Not known	0.5	1	

From NHSBT records, all but one of the English hospitals in the audit have transfusion laboratories on site. These discrepancies may be explained by a misunderstanding of the question, or by the fact that some gastroenterologists are not aware of the transfusion facilities available in their hospitals. On-call transfusion services vary as reported above. Those sites which do not have laboratory transfusion staff on site at all times, all commented that blood products were readily accessible in an emergency. The arrangements included the provision of several units of O RhD negative blood, the use of a nearby hospital's laboratory on call service, and / or the return from home of an on call laboratory scientist.

2.5 Guidelines and Audit

Standard:

"Local hospital guidelines should be available for the management of patients with acute gastrointestinal haemorrhage."

TABLE 22

Does your hospital have written guidelines for the management of upper gastrointestinal bleeding (non-variceal and/or variceal)? (Q22)	National Audit (205)		Your site
	%	N	
Yes	80	165	
No	18	37	Yes
Not known	1	3	

It is encouraging that most hospitals managing patients with AUGIB have specific guidelines available for their care.

Standard:

"Guidelines should be available for the transfusion management of patients with massive haemorrhage."

TABLE 23

Does your hospital have written guidelines for blood transfusion in patients with major haemorrhage?* (Q24)			
	National Audit (205)		Your site
	%	N	
Yes	49	101	
No	42	87	Yes
Not known	8	17	

*either contained within AUGIB guideline or as separate document.

The fact that only 49% of hospitals report having transfusion guidelines is of concern. It is possible that some other hospitals do have transfusion guidelines, but their distribution and availability may be inadequate. The dissemination of clinical guidelines to the appropriate location and staff is just as important as having them at all.

Standard:

"There should be audit of local outcomes of emergency admissions for acute UGI bleeding with review of outcomes."

TABLE 24

Do you audit upper GI bleeding in your hospital? (Q8)			
	National Audit (205)		Your site
	%	N	
Yes	84	172	No
No	16	33	

Feedback from running this audit suggests very variable levels of audit support were available to hospitals taking part. Given this variation, there is a very good level of local hospital audit of AUGIB taking place.

2.6 Free text comments from Organisational Audit

"Please use the box below for the single most important comment regarding endoscopy services for upper GI bleeding in your hospital"

Examples of free texts from those sites that have "Out of Hours" consultant on call rota

"Our main deficiency is the lack of nursing support"

"Absence of trained endoscopy assistants"

"Cohorting care of upper GI bleeding in a single ward or ward area would improve the quality of care, and almost certainly the outcome of patients admitted with acute GI bleeding"

"A very closely integrated endoscopy radiology surgery inter-relationship"

"It's quick and efficient"

"Out of hours trained endoscopy nurses would be very useful"

Examples of free texts from those sites that do not have "Out of Hours" consultant on call rota

"No formal rota for OOH service due to inadequate numbers..."

"The surgeons deal with our out of hours bleeds, one "expert" endoscopist and none can band /inject varices"

"Consultant delivered service"

"No patient has ever come to harm from GI bleed as a result of our provision of service. The push towards centralization of services disadvantages patients, well managed in their local hospital"

"There are only 2 consultants trained to deal with varices"

"If a patient is too unstable to transfer then the 2 therapeutic endoscopists even when not on call will help out if possible"

"No formal funding for out of hours endoscopy for the doctors"

"A goodwill rota with 2 consultants. Random phone calls to see if anyone available to scope"

"All OOH emergency endoscopy is provided on an ad hoc basis by consultant gastroenterologists, and on-call surgeons, with a single nurse. This is unacceptable"

Section 3 – Presentation and Initial Care

3.1 Presentation

TABLE 25

What type of presentation was this? (Q5)	National Audit (6750)		Your site (29)	
	%	N	%	N
Acute admission with overt upper GI bleeding	82	5547	90	26
Upper GI bleeding in established inpatient	16	1099	10	3
Other / not known*	2	104	0	

*Includes admissions from endoscopy, transfers from other hospitals, and in some cases it was not clear where the patient had presented.

The audit in 1993/4 had 84% acute admissions with AUGIB and 14% inpatient bleeds [Rockall, 1995 (A)].

3.1.1 Timing of presentation with AUGIB

The timing of presentations is divided into 3 groups.

"In Hours" is regarded as between 8am and 5pm Monday to Friday.

"Out of Hours1" (OOH1) is from 5pm to midnight Monday to Friday, and 8am to midnight Saturday and Sunday.

"Out of Hours2" (OOH2) is from midnight to 8am all days.

For established inpatients these timings refer to the time of bleed and *not* the time of admission to hospital. For new admissions the time is recorded as the time the patient presented to hospital (i.e. the time recorded on the printed admission document / A&E record NOT the time written in the notes when the patient was first seen).

TABLE 26

	National Audit								Your site					
	Acute admissions		Established inpatients		Other type		Total		Acute admissions		Established inpatients		Other type	
	%	N	%	N	%	N	%	N	%	N	%	N	%	N
In hours	40	2215	33	359	40	42	39	2616	19	5	0			
OOH1	41	2288	28	311	44	46	39	2645	35	9	67	2		
OOH2	19	1040	25	272	15	16	20	1328	46	12	33	1		
Not known	0.1	4	14	157	-	0	2	161	0		0			
Total		5547		1099		104		6750		26		3		

60% of patients present out of hours, with 34% of these presenting after midnight. This may have implications for acute care service provision.

3.1.2 Clinical area at presentation

TABLE 27: NEW ADMISSIONS

In which area was the patient managed on admission with upper GI bleed? (Q13)	National Audit (5547)	
	%	N
Medical admissions unit / assessment unit	63	3471
General medical ward	21	1145
Surgical admissions unit / assessment unit	2	131
General surgical ward	4	223
Elderly care ward	1	60
Designated GI bleed unit	1	69
HDU – level 2 care	1	71
ICCU –level 3 care	1	55
A&E observation ward	4	208
Other	2	103
Not known	0.2	11

*The most frequently stated locations for "other" new admissions were A&E (48), CCU/cardiology (10), haematology (7), oncology (6) and renal (6).

TABLE 28: ESTABLISHED INPATIENTS

In which area was the patient managed at the time of presentation with inpatient UGI bleed? (Q13)	National Audit (1099) %	N
Medical admissions unit / assessment unit	15	168
General medical ward	37	402
Surgical admissions unit / assessment unit	2	19
General surgical ward	14	157
Elderly care ward	10	107
Designated GI bleed unit	1	8
HDU – level 2 care	3	28
ICCU –level 3 care	4	41
A&E observation ward	0.2	2
Other	15	165
Not known	0.2	2

*The most frequently stated locations for "other" inpatient bleeds were orthopaedics (72), CCU/cardiology (25), renal (16) and stroke (14).

From the organisational audit: 7% (15/201) of hospitals have a dedicated acute UGI bleeding unit.

3.2 Specialist Referral

Standard

"Patients with acute UGI bleeding to be admitted by or referred early to specialist medical or surgical gastroenterology."

TABLE 29: NEW ADMISSIONS

Which team managed the patient on admission with UGI bleed? (Q15)	National Audit (5547) %	N	Your site (26) N
GI bleeding / gastroenterology	13	722	18
General medicine	72	3994	5
General surgery	7	411	
Care of elderly	4	228	
ICCU – anaesthetics	0.6	34	3
Other*	3	153	
Not known	0.1	5	

*The most frequently occurring free-text for other was 'A&E' (101), 'other medical specialty' (32).

TABLE 30: ESTABLISHED INPATIENTS

Which team managed the patient at the time of the inpatient UGI bleed? (Q15)	National Audit (1099) %	N
GI bleeding / gastroenterology	13	141
General medicine	42	463
General surgery	15	168
Care of elderly	13	139
ICCU – anaesthetics	3	36
Other*	14	151
Not known	0.1	1

*The most frequently occurring free-text for other was 'orthopaedic' (66), 'other medical specialty' (42) 'cardiology (21).

TABLE 31 NEW ADMISSIONS

If the care was transferred to another team for the management of the UGI bleed after admission, who took over the care? (Q18)	National (1917 transfers) %	N
GI bleeding / gastroenterology	77	1476
General medicine	8	149
General surgery	5	97
Care of elderly	5	87
ICCU – anaesthetics	3	56
Other*	2	30
Not known	1	22

*The most frequently occurring free-texts for other transfers were: 'transfer to another hospital' (10) and 'hepatology' (6).

TABLE 32 ESTABLISHED INPATIENTS

If the care was transferred to another team for the management of the UGI bleed after admission, who took over the care? (Q18)	National (188 transfers) %	N
GI bleeding / gastroenterology	58	109
General medicine	10	18
General surgery	11	21
Care of elderly	5	9
ICCU – anaesthetics	13	25
Other	2	3
Not known	2	3

*The "other" transfers of care were: 'transfer to different hospital' (1), 'hepatology' (1) and 'oncology' (1).

Inpatients with AUGIB appear to be referred to gastroenterology less than the new admissions. Data from previous audits (and from this one) indicate they are at much higher risk than new admissions. This lower referral pattern may be explained by shared care in some instances which this audit would not have picked up. Of note, ICCU/anaesthetics are involved in the management of inpatients who bleed, much more than with new admissions (13% of transfers in inpatients vs. 3% in new admissions), which possibly reflects the degree of instability and significant other co-morbidities in this group.

3.3 Laboratory Investigations

Standard

"Full blood count, urea and electrolytes, liver function tests and coagulation screen should be measured at presentation with acute UGI bleeding."

TABLE 33

	National Audit (6750) %	N	Your site (29) %	N
Number with recorded full blood count (FBC)	92	6233	100	29
Same day as presentation	87	5304/6129		
Next day	7	424/6129		

* Median time from baseline to first FBC was 0.9 hours

TABLE 34

	National Audit (6750) %	N	Your site (29) %	N
Number with recorded biochem profile (BCP) *	90	6084	100	29
Same day as presentation	84	4997/5967		
Next day	8	502/5967		

*Refers to Urea and Electrolytes and Liver Function Tests together.

TABLE 35

	National Audit (6750)		Your site (29)	
	%	N	%	N
Number with recorded clotting screen (CS)	82	5516	100	29
Same day as presentation	80	4333/5434		
Next day	11	599/5434		

Audit feedback suggested some difficulty for lots of audit teams in obtaining the data regarding the timing of blood tests, so these tables may under-report the number of patients having these investigations. It is however of concern that we can report only 92% (6233/6750) of patients having had a FBC recorded at all for the episode of AUGIB. Blatchford *et al* demonstrated the importance of blood urea as part of a risk assessment score based entirely on clinical measurements [Blatchford, 2000]. Patients with significant hepatic impairment are known to have increased risk of poor outcomes from AUGIB, and so measurement of basic synthetic liver function tests including coagulation profile are required in all cases.

Standard

"Blood group and antibody screen to be obtained at time of presentation."

TABLE 36

	National Audit (6750)		Your site (29)	
	%	N	%	N
Number with blood group and save sample taken (Q152)	84	5654	97	28

TABLE 37

	National Audit (6750)		Your site (29)	
	%	N	%	N
Blood cross match requested at presentation (Q153) (units)	37	2498	79	23
1	0.3	8		
2	21	517		6
3	12	302		
4	39	984		7
5	2	46		
6	12	294		7
>6	4	98		2
Not known	10	249		1

A considerable amount of blood is requested for cross match at the time of presentation. It is not possible from the dataset to clearly identify how much of this cross matched blood was actually transfused during the AUGIB episode, as for many cases no detailed transfusion data (including the timing of transfusions) were provided.

3.4 Risk Assessment

Standard

"Patients to be assessed for bleeding severity and categorised into high, medium or low risk (using Rockall or other validated risk score)."

TABLE 38

Does your hospital routinely calculate and document a risk score (e.g. Rockall or Blatchford scores) for patients with suspected upper GI bleeding? (Q4)	National Organisational Audit (205)		Your site
	%	N	
Yes	50	102	
No	49	101	Yes
Not known	1	2	

TABLE 39

	National Audit (6750)		Your site (29)	
	%	N	%	N
Was a Rockall score recorded prior to any endoscopy? * (Q29)	17	1154	3	1
Was a Blatchford score recorded prior to any endoscopy? * (Q29)	2	107	0	0

*Both Rockall and Blatchford scores were recorded for 11 patients.

Despite clear UK guidelines recommending risk assessment for all acute presentations with upper GI bleeding [BSG, 2002], only 19% of cases had a score clearly recorded in the medical notes. This may relate to the use and dissemination of guidelines (or lack of them), and is likely also to relate to the clinical area where the patient presented. Many hospitals now use acute admission proformas, and some of those submitted to the audit contain the Rockall or Blatchford score calculators. The use of risk scores for inpatient AUGIB was lower than for the new admissions, 15% (160/1099) of established inpatients having a risk score calculated compared with 20% (1086/5547) of new admissions. This is despite inpatients being at increased risk of poor outcomes.

3.5 Resuscitation

Standard

"Circulating volume to be restored using crystalloid or colloid. Initial resuscitation should not be with red blood cells (RBC) unless ongoing haematemesis with shock."

TABLE 40

Which of the following did the patient receive on admission or at initial presentation with UGI bleeding within the first 12 hours? (Q24)	National Audit (6750)		Your site (29)	
	%	N	%	N
Intravenous fluid (colloid and or crystalloid) alone	49	3320	34	10
Red blood cell transfusion alone*	8	514	7	2
Intravenous fluid and Red Blood Cell transfusion	26	1727	55	16
Neither of the above	3	213	0	
Not known	14	976	3	1
Other (as stated in free-text)# either alone or in addition to any of the above.	7	454	17	5
Other - FFP		123		
Other - Platelets		27		
Other - Nothing		158		
Other - others		174		

*See Section 8 for more detail re RBC transfusions

#These other fluids were not listed specifically as options – sites volunteered this data. These data may therefore under-represent the use of these fluids.

The data from this question demonstrate wide variation in practice. They also show how difficult this information is to obtain from the medical and nursing records with 14% unable to provide data. RBC transfusion should not be used in resuscitation unless the patient has clear evidence of ongoing haematemesis or shock, in which circumstances intravenous fluids would usually be administered simultaneously. If the patient was haemodynamically stable at presentation, the early use of RBC transfusion at all, has to be questioned.

Standard:

> *"Facilities should be available for resuscitation including level 2 care beds, and staff skilled in the management of patients presenting with circulatory collapse."*

28% (35/126) of patients presenting with circulatory collapse (BP<70 on admission) and 5% (186/3499) of those with initial Rockall score >2 were managed in level 2 or level 3 beds (designated GI bleed unit, HDU or ICCU).

In the 1993/4 audit, 9% of all patients (10% of those with initial Rockall score >2) were managed in "high dependency areas" [Rockall 1997]. These "high dependency areas" included emergency admissions units, HDU, ICCU, coronary care units, GI bleeding units and liver units. In the report the authors state that

> *"All of these would be expected to have more intensive nursing and monitoring facilities than would normally be found on a general ward".*

If we include all these ward locations in the analysis for the 2007 data, 63% (2219/3499) of patients with pre-endoscopy Rockall score >2, were managed in these areas. The assumptions about levels of nursing and monitoring that were recorded in 1993/4 may no longer be appropriate however. Some haemodynamically unstable patients are being managed in HDU areas, but there is still room for improvement. Further investigation of the facilities used in monitoring these patients at high risk, and the impact of this on their eventual outcomes may be warranted.

The recommendations of the NCEPOD report "Scoping our Practice" [NCEPOD, 2004] regarding endoscopy for patients with AUGIB state:

> *"Optimising the patient's pre-endoscopy condition will reduce both morbidity and mortality. Early involvement of an anaesthetist/intensivist if necessary, will assist this".*

Section 4 - Patient Descriptors

4.1 Clinical presentation

TABLE 41

How did the patient present with their UGI bleed? *(Q9)	National Audit (6750)	
	%	N
Fresh blood haematemesis	38	2577
Melaena	49	3318
Shock/syncope	6	433
Coffee ground vomit	27	1801
Blood up Nasogastric tube	0.3	17
None of above	1	198
Other#	4	262
Section left blank		8

* Data includes patients who presented with more than one of these symptoms.
# Includes anaemia (acute or symptomatic) (105), fresh PR bleed (45).

The presenting symptoms formed the basis of the inclusion in the audit (see page 12). The Project Group decided that if full data had been entered for a case, the local clinical lead must have decided the case was genuine, even if they did not present with any of the symptoms / signs given as options in the audit questionnaire. These cases have therefore all been included.

4.2 Co-morbidity

The table below reports the co-morbidities of the *new admissions* with AUGIB. (The inpatients who bled presented in hospitals with diverse inpatient populations (e.g. some tertiary centres for surgical specialties), and so the co-morbidities in these patients will not reflect the general population).

TABLE 42

Did the patient have any of the following co-morbidities?* (Q27)	National Audit (5547)		Your site (26)
NEW ADMISSIONS	%	N	N
Ischaemic heart disease	16	892	4
Cardiac failure	4	232	3
Respiratory disease	10	543	4
Dementia	5	295	1
Stroke	7	362	3
Cancer / malignancy	7	398	2
Documented cirrhosis	9	484	2
Renal disease	6	352	6

* Note the above table considers 'not known' as 'no'

46% (2549/5547) of new admissions had at least one medical co-morbidity at the time of presentation with AUGIB. 14% (783) had more than one. In the audit in 1993, 53% of new admissions with AUGIB had at least one significant co-morbidity [Rockall, 1995 (A)]. It must be noted that the questions regarding co-morbidities were less specific in the 1993/4 audit.

Rockall scores

Sections 1.3 table 5, and Section 1.5 table 7 on pages 17-18 provide details of Rockall scores at presentation and after endoscopy.

4.3 Medications

95% (5262/5547) of new admissions with AUGIB had a record of the medications at the time of their presentation.

TABLE 43

NEW ADMISSIONS	National Audit (5262 with record)		Your site	
	%	N	%	N
Aspirin	27	1406	35	9
Warfarin	7	372	8	2
NSAID	12	648	4	1
SSRI antidepressant	9	480	8	2
Clopidogrel	5	243	8	2
Dipyridamole	1	66	0	0
Low molecular weight heparin	1	55	0	0
Proton Pump Inhibitor	30	1575	42	11

* Note the above table considers 'not known' as 'no'

There are well established relationships between the use of aspirin, use of NSAIDs and AUGIB [Henry, 1996; Lanas, 2006]. More recently there has been evidence suggesting an interaction between SSRI antidepressants and NSAIDs associated with higher risk of AUGIB [Mort R, 2006]. It is well known that there is high use of low dose aspirin as prophylaxis for cardiovascular diseases, and in this audit over a quarter of all patients with AUGIB had received aspirin in the preceding week.

4.4 Smoking

TABLE 44

Does/did the patient smoke? (Q22)	National Audit (6750)		Your site (29)	
	%		%	N
Yes, current smoker	26	1745		
Not known	18	1234	28	8

4.5 Alcohol

TABLE 45

Is there a recorded history of alcohol abuse?* (Q21)	National Audit (6750)		Your site (29)	
	%	N	%	N
Yes	26	1745	38	11
No	74	4964	62	18
Not known	1	41	0	

* Defined in help text as more than 14 units per week for females and more than 21 units per week for males.

The number of patients with a recorded history of alcohol abuse is high, although it is acknowledged the definition of "alcohol abuse" used in this audit may be regarded by some as too broad. It is interesting that this information was much more fully recorded than smoking history.

74% (5004/6750) of patients underwent upper gastrointestinal endoscopy for AUGIB. 1746 patients did *not* have inpatient endoscopy, and in 47% of these (814/1746) there was no obvious explanation.

Of the remainder not having inpatient endoscopy:

- 17% (304/1746) died without having an endoscopy
- 1% (18/1746) had surgery or radiological intervention without endoscopy
- 5% (96/1746) took their own discharge against medical advice without endoscopy
- 22% (389/1746) were known to have had endoscopy planned as an outpatient
- 7% (125/1746) were specifically categorised for no active treatment or investigation when they first presented with AUGIB.

Of new admissions with AUGIB, 11% (575/5384) were still alive and in hospital four days or more after admission and did not have inpatient endoscopy. This excludes those who had surgery or radiology for AUGIB without endoscopy.

65% (4413/6750) of all patients had one endoscopy during the admission, 9% (591) had more than one, and for 1% (86) the total number of endoscopies was unknown.

5.1 Timing of endoscopy

Standard

"Endoscopy to be performed within 24 hours of presentation in all medium and high risk cases."

The median (IQR) time from presentation to endoscopy was 23 (12-51) hours.

TABLE 46

Time from presentation to first endoscopy	National Audit (5004)		Your site (29)	
	%	N	%	N
Within 24 hours*	50	2515	76	22
24-71 hours	30	1512		6
72+ hours	17	846		1
Time (hh:mm) not known	3	131		

* 6% of these (145/2515) had time of endoscopy *before* time of presentation with AUGIB, median 8 hours IQR 2-13 hours earlier.

TABLE 47 ALL CASES WITH PRE-ENDOSCOPY ROCKALL SCORE OF 3 OR MORE

Time from presentation to first endoscopy	National Audit (2675)		Your site	
	%	N	%	N
Within 24 hours	50	1331	83	15
24-71 hours	29	768		3
72+ hours	19	495		
Time (hh:mm) not known	3	81		

Having a medium-high risk pre-endoscopy Rockall score (i.e. 3 or more) appears to have no impact on the time to endoscopy.

5.2 Monitoring

Standard

"Pulse oximetry monitoring should be used in all sedated patients."

For all endoscopies, 97% (3450/3563) of sedated patients (those recorded as receiving any of Midazolam, Diazemuls, Pethidine, Fentanyl and any mention of significant other sedatives in free-text) had pulse oximetry measured.

Monitoring of sedated patients with pulse oximetry is consistent for all endoscopies. The use of sedation is higher in second and third endoscopies. This might be expected, with patients being more likely to require endoscopic therapy at second and third endoscopy.

Standard

"ECG and blood pressure monitoring should be available for high risk patients."

TABLE 48

Which of the following monitoring facilities are used during emergency and out of hours endoscopy? (Q16)	National Audit (205) %	N	Your site
ECG	47	96	Yes
Blood pressure	80	165	-

TABLE 49

Which of the following were monitored during this endoscopy? (1st Endoscopy only) (Q64)	National Audit Pre-endoscopy Rockall score ≤ 2 (2329) %	N	Pre-endoscopy Rockall score 3-4 %	N	Pre-endoscopy Rockall score 5+ %	N
ECG	9	192/2095	13	213/1650	22	163/758

Monitoring in endoscopy, in particular ECG monitoring of those at high risk, does not appear to be used consistently. From the organisational audit, only 47% of hospitals have ECG monitoring available in emergency endoscopy, and only 22% of those at high risk (pre-endoscopy Rockall score 5 or more) before the first endoscopy received it (table 49). In light of the National Confidential Enquiry into Patient Outcomes and Death (NCEPOD) report in 2004, this needs to be addressed, and high risk patients identified and monitored more intensively in endoscopy.

5.3 Endoscopic Diagnoses

All patients with endoscopy

TABLE 50

Any abnormality found on 1st, 2nd or 3rd endoscopy?	National Audit (5004) %	N	Your site (29) %	N
Any abnormality	83	4139	93	27
Oesophagitis	24	1177	21	6
Gastritis / Erosions	22	1091	10	3
Ulcer	36	1826	48	14
Erosive duodenitis	13	640	3	1
Malignancy	4	187	0	0
Mallory-Weiss syndrome	4	213	3	1
Varices	11	544	14	4
Portal Hypertensive Gastropathy	5	275	10	3
Vascular ectasia	3	130	17	5
Any stigmata of recent haemorrhage Q72, 105, 138	32	1592	55	16

Compared to the 1993/4 audit, [Rockall, 1995] the proportion of patients with any endoscopic abnormality has increased (83% in 2007 vs. 75% in 1993). Of note only 4% had varices in 1993/4 compared to 8% (544/6750) in this audit (11% of those having endoscopy – see table 50). There are many possible explanations for this increase in varices. In this audit six of the seven liver transplant centres provided 211 (3%) cases. It is likely these hospitals had high numbers of patients with variceal haemorrhage. In the 1993/4 audit two transplant centres participated (it is not recorded how many cases and what proportion of the total number they were). Patients with varices may have been subject to selection bias (if not all consecutive cases were included), as patients with variceal haemorrhage may be more likely to be remembered by staff, and more likely to have received transfusion and/or endoscopy, which were all methods for case identification in this audit. It is also possible with the increase in

alcohol related liver disease, that there has been a genuine increase in the incidence of AUGIB from varices.

5.3.2 Diagnoses in specific sub-groups

TABLE 51

Endoscopic diagnoses (1st, 2nd OR 3rd endoscopy)	National Audit "current smokers" (Q22) (1297)		National Audit "excess alcohol" (Q21) (1331)		National Audit "on aspirin" (Q20a) (1479)	
	%	N	%	N	%	N
Any abnormality	85	1101	88	1174	84	1245
Oesophagitis	26	343	28	369	22	319
Ulcer	30	388	26	349	48	703
Gastritis/Erosions	25	320	23	304	24	362
Erosive duodenitis	17	220	17	223	12	173
Mallory Weiss	6	79	6	75	4	64
Malignancy	2	27	1	16	4	53
Varices/PHG	19	250	36	479	3	47
Vascular Ectasia	2	29	2	22	2	30
Any stigmata of recent haemorrhage Q72, 105, 138	30	386	37	491	33	488

Varices are more common in both smokers and those with alcohol excess, and ulcers more common in those on aspirin. These three risk factors are clearly associated with endoscopic abnormalities and thus these patients need to be identified early.

5.4 Endoscopic Therapy

Standard

"Haemostatic therapy to be administered to varices, ulcers with active bleeding or non-bleeding visible vessel."

Standard

"Endoscopy to be repeated if further bleeding or high risk lesion at first endoscopy."

TABLE 52

	National Audit (5004)		Your site (29)	
	%	N	%	N
Did the patient have evidence of continued or re-bleeding after the first endoscopy? (Q40, 41)	14	668/4916	10	3/29
If yes, did they receive repeat endoscopy?*	49	324/668	33	1/3

1550 patients had stigmata of recent haemorrhage at endoscopy (ALL endoscopies combined)

TABLE 53

(AT FIRST ENDOSCOPY) How many of the patients with the following endoscopic diagnoses received endoscopic therapy? (Q77)	National Audit		Your site
	%	N	N
Oesophageal Varices (Q68)		520	3
Therapy	65	335/517	3
Repeat Endoscopy	33	170/520	1
Actively bleeding ulcer* (Q68-70 & Q72)		789	9
Therapy	76	598/789	9
Repeat Endoscopy	21	165/789	3
Non bleeding visible vessel (Q73B)		318	5
Therapy	92	292/318	5
Repeat Endoscopy	21	68/318	2

* These diagnoses combine oesophagus, stomach and duodenum as appropriate at first endoscopy

It is surprising that for one-third (35%, (517-335)/517) of patients presenting with AUGIB with oesophageal varices at the first endoscopy, no endoscopic therapy was provided. This is not in

line with the BSG guidelines for the management of variceal haemorrhage [Jalan, 2000]. However, this may be consistent with the findings of the organisational audit, that 26% of consultant endoscopists performing out of hours endoscopy, are not able to perform all therapeutic procedures. This is an area that needs attention and might be a measure for the quality of the out of hours endoscopy service for future audits.

There are very low rates of repeat endoscopy amongst patients with varices and other high risk lesions. Some of these patients may have died before repeat endoscopy, and some may have taken their own discharge. It may also reflect lack of appreciation amongst clinicians of the evidence relating to the value of second look endoscopy and of banding ablation programmes for patients with varices.

5.5 Endoscopy National Statistics

These results are not measured against specific standards, but do provide an overview of endoscopy in AUGIB. Site-specific data is not provided in every section.

5.5.1 General Information

TABLE 54

Who was the lead endoscopist for this procedure? (Q58)	National Audit FIRST Endoscopy (5004)		Your site FIRST Endoscopy (29)	
	%	N	%	N
Consultant Gastroenterologist	43	2151	83	24
Consultant surgeon	8	385	0	
SpR / Research / Clinical fellow supervised	13	666	3	1
SpR / Research / Clinical fellow unsupervised	19	974	14	4
Staff grade / associate specialist	9	448	0	
Nurse Endoscopist	4	183	0	
Other*	2	121	0	
Not known	2	76	0	

* The most frequent free text "other" was GP endoscopist (37), other medical endoscopist (72)

Results for 2nd and 3rd endoscopies are broadly similar to the first endoscopy. 145 patients attended endoscopy as outpatients and were *then* admitted with AUGIB, which may explain in part, the wide variety of endoscopists performing the first procedure in AUGIB.

TABLE 55

When was the endoscopy performed? (Q53, Q43)	National Audit FIRST Endoscopy (5004)		Your site FIRST Endoscopy (29)	
	%	N	%	N
In hours	82	4109	62	18
Out of hours 1	14	698	38	11
Out of hours 2	3	142	0	
Not known	1	55	0	

Results for 2nd and 3rd endoscopies are broadly similar to the first endoscopy. Overall 17% of endoscopies for AUGIB are carried out "out of hours" with 3% being done between midnight and 8am (for definitions of "out of hours" see page 27). Of patients who presented to hospitals where there is no out of hours endoscopy on call rota (N=83/205 hospitals), 13% (254/1980) had their endoscopy out of hours, with 2% (33/1980) occurring between midnight and 8 am.

TABLE 56

Where were the endoscopies performed (all 1, 2 & 3)? (Q55, Q88, Q121)	In hours (4657)		Out of hours 1 (794)		Out of hours 2 (167)	
	%	N	%	N	%	N
In main endoscopy department	94	4381	68	543	57	95
In emergency theatre	3	125	23	183	32	54
On ICCU / HDU (combined)	2	80	5	43	7	11
On GI bleeding unit	0.7	32	0.4	3	0.6	1
A&E	-	0	1	8	1	2
Other wards (medical/surgical)	0.4	19	1	7	0.6	1
Other	0.2	7	0.3	2	0.6	1
Not known	0.3	13	1	5	1	2

Time of endoscopy not known for 67 of 5685 endoscopies

Endoscopies performed out of hours, and in particular those performed through the night (OOH2), are less likely to be carried out in the main endoscopy department. From the free text comments in the audit, it seems to matter less to the endoscopists *where* the endoscopy is performed, but rather which staff are available to assist in emergency endoscopy. The lack of and need for experienced staff to assist out of hours, who are familiar with the equipment and endoscopic techniques used, was repeatedly reported (see Section 2.6 page 26).

TABLE 57

In how many of the endoscopies performed out of hours did the patient have stigmata of recent haemorrhage?

Stigmata of recent haemorrhage? (Q72, Q105, Q138)	In hours (4657)		Out of hours 1 (794)		Out of hours 2 (167)	
	%	N	%	N	%	N
Yes	29	1347	48	379	55	92
No	69	3223	51	401	41	68
Not known	2	87	2	14	4	7

Time of endoscopy not known for 67 of 5685 endoscopies

Patients referred for endoscopy out of hours have more stigmata of recent bleeding.

TABLE 58

In how many of the endoscopies performed out of hours did the patient receive endoscopic therapy?

Did the patient receive endoscopic therapy? (Q77,110,143)	In hours (4657)		Out of hours 1 (794)		Out of hours 2 (167)	
	%	N	%	N	%	N
Yes	23	1085	38	305	42	70
No	76	3558	61	481	57	96
Not known	0.3	14	1	8	0.6	1

Time of endoscopy not known for 67 of 5685 endoscopies

Patients being referred for out of hours endoscopy are receiving endoscopic therapy at higher rates than those having endoscopy performed in hours.

5.5.2 Sedation

4% (204/5004) of patients received a general anaesthetic (GA) for their endoscopy. These are excluded from the sedation results in the table below. Of the patients who did *not* receive a GA (or whose GA status is unknown), 123 (3%) had an anaesthetist present at the time of endoscopy.

TABLE 59

	National Audit FIRST Endoscopy (5004)		National Audit SECOND Endoscopy (590)		National Audit THIRD Endoscopy (91)		Your site FIRST Endoscopy (29)	
	%	N	%	N	%	N	%	N
		4837*		529		73		25
Which of the following were administered for the endoscopy? (Q62, Q95, Q128)								
Midazolam	67	3219	73	385	88	64	96	24
Pethidine	1	46	3	16	3	2		
Fentanyl	1	67	3	17	3	2		4
Diazemuls	0.3	14	0.3	2	-	0		
One of the above	65	3138	68	362	84	61	80	20
More than one of the above	2	104	5	29	5	4	16	4
None of the above	33	1595	26	138	11	8	4	1
Other (stated by auditor)#	11	536	18	95	12	11		

* Denominator (GA cases excluded)

Almost all (73% 1st, 68% 2nd, 67% 3rd) of the "others" as stated by the auditor were topical anaesthetics. Buscopan was recorded in 96 patients.

5.5.2.1 Sedation Doses

Midazolam was the most commonly used sedation for endoscopy in AUGIB. The table below shows the frequency of each dosage administered for the endoscopies reported in the audit. GA cases have been excluded.

TABLE 60

	National Audit FIRST Endoscopy (5004 patients)		Your site FIRST Endoscopy (29)	
	%	N	%	N
		4837*		25
Midazolam given	67	3219		24
Dose of Midazolam known (mg) (Q62)		3208		24
Median dose		3mg		4 mg
>5mg	5	148	33	8

* Denominator (GA cases excluded)

Sedation reversal

36 patients required sedation reversal with flumazenil. 22/36 (61%) of these were aged over 80 years. Midazolam was given in 91% of these cases, with the median dose being 3 mg.

Complications

Complications of endoscopy were reported in 65 (1%) patients. The most frequently occurring complications were "Desaturation" (10), "Cardiac event" (11), "Pneumonia" (10).

The BSG guidelines on safety and sedation during endoscopic procedures, recommend that "*5mg midazolam should usually be the maximum dose given, and that elderly patients are given 1-2mg initially with a sensible pause to observe effect*" [BSG, 2006]. Practice in this audit was generally in accordance with the guidelines, with less than 5% of patients receiving more than 5mg of midazolam.

5.5.3 Endoscopic therapies

19% (1275/6570) of patients received endoscopic therapies during the 3 endoscopies recorded in the audit.

TABLE 61

	National Audit						Your site	
What endoscopic therapeutic procedures were administered? (Q77,Q78)	FIRST Endoscopy (5004)		SECOND Endoscopy (590)		THIRD Endoscopy (91)		FIRST Endoscopy (29)	
	%	N	%	N	%	N	%	N
Data known		4942		580		91		29
Any therapeutic procedure	24	1172	43	250	51	46	62	18
Ulcer base injection	14	684	16	92	13	12		9
BICAP / heater probe	4	186	5	31	4	4		1
Endoclip(s) applied	3	148	5	29	8	7		2
Glue injection	0.1	7	1	6	4	4		1
APC	2	93	4	23	4	4		2
Variceal sclerotherapy	1	53	3	19	9	8		1
Variceal banding	6	283	15	91	20	18		2
Others	2	77	6	34	7	6		4
More than one of above (excluding variceal therapies)	6	315	8	47	5	5		4

There were 77 "other therapies" reported at the first endoscopy including:

- Adrenaline injection to non-ulcers e.g. to angiodysplastic lesions, Mallory-Weiss tears, polyps and tumours (38 patients)
- Balloon tamponade tube placement (14 patients).

The number of endoscopic therapies increases with the number of endoscopies as might be expected (if those with high risk lesions at first endoscopy receive repeat endoscopy). The number of therapeutic procedures has increased since the first audit where 7.5% of patients received endoscopic therapy at the first endoscopy [Rockall, 1997].

There is now good evidence that using more than one endoscopic therapy for non-variceal AUGIB reduces the rate of re-bleeding [Vergara M, 2007]. It is therefore surprising that in only 5-8% of cases was more than one therapeutic procedure performed.

Varices

Variceal banding was used consistently more often than variceal sclerotherapy (6% vs. 1% at first endoscopy). In patients having repeat endoscopy, the percentage receiving therapy for varices increased from 7% at first endoscopy, to 19% at the second endoscopy and 29% at the third.

5.5.4 Re-bleeding

668 (13%) patients had evidence of ongoing or further bleeding following the first endoscopy. 47% (308/656) of these had received endoscopic therapy, with 218 (71% of those 308 who had endoscopic therapy) receiving a single mode of haemostatic therapy, 87 (28%) receiving combination therapy, (e.g. injection and thermocoagulation or clipping), and an unknown approach in 3 patients. The rate of ongoing or further bleeding was 27% (218/807) in *all* those receiving single modality haemostatic therapy at the first endoscopy, 26% (87/335) in the combination therapy group, and 9% (348/3707) in those who did not receive any therapy at the first endoscopy.

Section 6 – Additional Medical Management

6.1 Medications contributing to AUGIB

Standard

" NSAIDs should be stopped at presentation with UGI bleeding"

TABLE 62

Was the NSAID stopped at presentation? (Q27k)	National Audit %	National Audit N	Your site %	Your site N
Patients on NSAID		751		1
NSAID stopped	92	691/725	100	1/1

90% (1627/1808) of patients on aspirin had their aspirin stopped at the time of presentation. A recent study from Hong Kong demonstrated an increased mortality when aspirin was discontinued [Sung, 2006], with no significant risk of re-bleeding, transfusion and surgery for AUGIB. It is not clear at present what best practice is regarding aspirin.

Standard

"Parenteral vitamin K to be administered to those on warfarin with active bleeding, or those with supratherapeutic anticoagulation and active bleeding."

TABLE 63

	National Audit(6750) %	National Audit(6750) N	Your site (29) %	Your site (29) N
Patients on warfarin* (Q20d)	8	473/6266	7	2/28
Warfarin stopped (Q20e)	87	400/459	100	2/2

* This includes inpatients and new admissions

TABLE 64

Patients on warfarin (Q20d)	National Audit (473) %	National Audit (473) N	Your site %	Your site N
INR >=5 (CS1)	30	128/430	50	1/2
Receiving Vitamin K <24h	50	225/451*	50	1/2
Receiving prothrombin complex <24h	5	21/451	0	0/2
Receiving cryoprecipitate <24h	4	17/451	0	0/2
Receiving FFP (FFP1) <24h#	11	50/451	0	0/2

*Q33 completely blank for 22/473 cases, hence denominator of 451.
#Receiving FFP <24h is counted from the free-text section in Q33d. It does not therefore incorporate all FFP. This information is recorded later in Section 8.3.

Of the 50 patients on warfarin who received FFP *within the first 24 hours*(bottom row of table 64), 39 also received vitamin K, 1 received vitamin K and prothrombin complex, and 10 received FFP alone.

Overall, 28% (133/473) of patients on warfarin received FFP *at some stage during the episode of AUGIB*, and in 23% of these (31/133) no other therapy (i.e. vitamin K, prothrombin complex or cryoprecipitate) was given (data not shown).

The guidelines recommend vitamin K is used to treat supratherapeutic anticoagulated patients, or anticoagulated patients with bleeding [Baglin, 2006]. Prothrombin complex concentrate can be used if the patient is actively bleeding, or at risk of serious morbidity, to replace clotting factors rapidly. Fresh frozen plasma should not be used on its own in anticoagulated patients, as large volumes are required to achieve a less effective therapeutic response. In patients who are not bleeding, simply stopping the warfarin may be sufficient.

6.2 Medications to treat AUGIB

Standard

"Proton pump inhibitor (PPI) therapy should be started in patients with peptic ulcer active bleeding or non-bleeding visible vessel at endoscopy after endoscopic therapy."

TABLE 65: IV PPI following FIRST ENDOSCOPY (5004)

	Receiving IV PPI (intravenous bolus and or intravenous infusion) Q39			
	National Audit		Your site	
	%	N	%	N
Ulcer receiving endoscopic therapy (Q77)	70	460/656	89	8/9
Ulcer with active bleeding or visible vessel (Q73)	71	434/609	89	8/9
Non-bleeding ulcer (Q72)	16	147/928	20	1/5
Ulcer documented (Q68, 69, 70)	39	681/1745	64	9/14
No ulcer documented (Q68, 69, 70)	16	534/3259	40	6/15
Total	24	1215/5004		15/29

Intravenous (iv) PPI was given to 48% (3225/6750) of all patients in the audit (including those who did not have an endoscopy). 89% (2885/3225) of these were given iv PPI *prior* to any endoscopy. 6% (308/5004 - denominator is those having endoscopy) were given or continued on iv PPI despite not receiving endoscopic therapy nor having an endoscopic high risk lesion. This suggests high levels of inappropriate use of iv PPI.

PPI treatment initiated prior to endoscopy in patients with upper gastrointestinal bleeding significantly reduces the proportion of patients with stigmata of recent haemorrhage at index endoscopy. However, there is no evidence that early PPI treatment affects clinically important outcomes, such as mortality, re-bleeding or the need for surgery [Dorward S, 2006].

Standard

"Vasopressin analogue to be started in those with known or suspected variceal haemorrhage."

TABLE 66

Endoscopic diagnoses (FIRST Endoscopy)	**Receiving vasopressin analogue Q39**	
	National Audit	
	%	N
Oesophageal varices	49	247/503
Gastric varices	60	40/67
Portal Hypertensive Gastropathy	38	97/254
Duodenal varices	50	3/6
Any of the above	44	266/601

The use of vasopressin analogues is low in patients with all endoscopic diagnoses associated with portal hypertension, and reasons for such low use need to be identified.

Section 7 – Surgery and Radiology

A surgical team was involved in the management of 19% (1255/6614) of patients. 2% (127/6750) received surgery for AUGIB. Additional surgical data were provided for some patients where the surgery was not for the management of the AUGIB, and these data have not been included in the analyses.

84 patients (1%) received radiological input (see Section 7.7), and 10 patients received both surgery and radiology for AUGIB. Please note the number of patients that had surgery and or radiology is very small, so only the national statistics, not site-specific data are provided.

Patients having surgery (median age 73 years) and radiology (median age 71 years) were older than those not requiring surgery (median age 68 years).

7.1 Rockall score prior to surgery/radiology

5004 patients had a record of inpatient endoscopy. The "post-endoscopy Rockall score" was therefore not available for 1746 patients (26%). In 15 patients the first endoscopy was incomplete.

TABLE 67

Post-endoscopy Rockall score		**Number undergoing surgery (Q51)**		**Number undergoing radiology (Q52)**	
	Patients (5004)	%	N	%	N
0-2	1408	0.2	3	0.9	13
3-5	2204	1.9	41	1.2	27
6-8	1225	4.2	51	2.2	27
9-11	152	8.6	13	4.6	7
Not known	15	-	0	6.3	1
No endoscopy	1746	1.1	19	0.5	9

Note, 10 patients had both radiological and surgical intervention for their AUGIB

As the Rockall score increases so the proportion undergoing surgery and or radiology increases. Compared with the 1993 audit the numbers and percentages are very small (392/5810 (7%) underwent surgery for AUGIB in the 1993 audit [Rockall, 1997]).

7.2 Endoscopy prior to surgery

Patients who had more than one endoscopy had an increased likelihood of having surgery or radiology (or both) to control their AUGIB.

TABLE 68

Number of endoscopies		Number of patients having surgery		Number having radiology	
	Patients (6750)	%	N	%	N
None	1746	1.1	19	0.5	9
One	4413	1.7	74	0.9	41
Two	500	5.4	27	3.8	19
Three or more	91	7.7	7	16.5	15

7.3 Transfusion prior to surgery/radiology

114/127 (90%) patients who underwent surgery for AUGIB received a RBC transfusion during the episode. The median (mean) number of units transfused in this group was 4 (6) compared with 3 (3) in the patients not having surgery. 44% (46/105) of patients having surgery had 5 or more units transfused compared with 10% (237/2442) of patients not having surgery.

Surgery

7.4 Indications for surgery

TABLE 69

What was the reason for surgery? (Q158)	National Audit (127)	
	%	N
Further/uncontrolled bleeding	71	90
Stigmata of recent haemorrhage/high risk	13	16
Malignancy	4	5
Peritonitis/perforation	12	15
Other*	9	12

* "Others" included failed endoscopic therapy (1), unknown cause of bleeding (1), Gastrointestinal stromal tumour (GIST) (1), intra-abdominal haemorrhage (1).

TABLE 70

What surgical procedure was performed? (Q160)	National Audit (127)	
	%	N
Under-run or over-sew of ulcer	63	79
Partial gastrectomy	9	12
Excision of ulcer	5	6
Other	17	22
Not recorded	6	8

The most frequently occurring "others" were "exploratory laparotomy" (4), "over-sew of varix" (2), "oesophageal transection" (2).

7.5 Timing of surgery and who performed it

Surgery for AUGIB is performed more frequently "out of hours" (61% vs. 39% "in hours"). (See page 27 for definitions). In 11% (14/127) of cases the time of surgery was not recorded.

Consultant surgeons perform 74% (90/121) of surgery for AUGIB, with SpR / research fellows/clinical fellows performing 20% (24/122). The circumstances in which this surgery was performed by trainees need to be reviewed.

7.6.1 Surgical complications

Post-operative complications were recorded in 55% (64/117) of cases.

TABLE 71

Which post-opertaive complications occurred for this episode of AUGIB? (Q166)	National Audit (127)	
	%	N
Recorded		117
Pneumonia	21	25
Renal Failure	13	15
Liver failure	6	7
DVT	1	1
Stroke	1	1
PE	2	2
Significant cardiac event	9	10
Sepsis	12	14
Wound dehiscence	2	2
Wound infection	2	2
Duodenal fistula	1	1
Other *	23	27
1 or more of above	55	64
None of the above	45	53

* "Other" included death (6), Clostridium difficile (2), Urinary tract infection (2)

7.6.2 Mortality

Patients undergoing surgery for AUGIB has a mortality of 30% (38/127).

Surgery is undertaken far less frequently for AUGIB than in the previous audit, but remains the reserve of the elderly, high risk patients. It has high complication and mortality rates.

Radiology

7.7 Procedures performed

TABLE 72

Radiological Intervention (Q168-Q172)	National Audit (84)	
	%	N
Diagnostic angiography	45	38
Therapeutic angiography	26	22
TIPSS	7	6
Other	15	13
Not known	18	15

The "other" texts were all different and included "CT guided thrombin embolisation", "endovascular stenting", and "TIPSS dilatation".

7.7.1 Mortality

Patients undergoing radiological intervention for AUGIB had a mortality of 17% (14/84).

Section 8 - Blood Transfusion

8.1 Red Blood Cells

The BSG guidelines for the management of non-variceal upper gastrointestinal haemorrhage recommend that red blood cells (RBC) are transfused when:

> *"Bleeding is extreme as judged by active haematemesis and / or haematemesis with shock....When the haemoglobin concentration is less than 100g/L* (except in those with chronic anaemia)." [BSG, 2002]

A multi-centre randomised controlled trial of transfusion in non-bleeding critical care patients [Hebert, 1999], recommends RBCs be transfused:

> *"If the haemoglobin is <7g/dL in haemodynamically stable non-bleeding patients.....If the haemoglobin is <8g/dL in haemodynamically stable non-bleeding patients aged >65years, and in those with significant cardio-respiratory co-morbidities."*

An ongoing Cochrane systematic review of RBC transfusion in AUGIB will identify how much good quality data is available on this subject [Hearnshaw, 2007]. At the present time it is very hard to establish the appropriateness of RBC transfusion in AUGIB. Assessing whether a patient is "actively bleeding" or not at the time of transfusion is sometimes difficult, and the haemoglobin value alone at presentation may not accurately reflect blood loss and or help decision-making about the need for RBC transfusion.

A **Hb of >10g/dL** has been used as a cut off for inappropriate transfusion in those patients who **did not present with signs or symptoms of shock** (BP<100), as per BSG guidelines [BSG, 2002]. RBC transfusion is not indicated in haemodynamically stable patients where *no* haemoglobin value is available. Transfusion in those who are haemodynamically unstable at presentation with acute bleeding, is regarded as appropriate. For patients who have stopped bleeding but are regarded as being at high risk of re-bleeding or death, a top-up transfusion to a haemoglobin of 10g/dL is reasonable. It is important to exclude those patients who for religious or cultural reasons refuse blood component transfusion. In this audit 55 cases (1%) were Jehovah's Witnesses and 31% (17/55) of these were transfused within 12 hours of presentation, 47% (26/55) during the episode as a whole, rates that are consistent with those for the whole audit population. They were included in these analyses.

Standard

> *"Transfuse red blood cells if haemodynamically unstable and or haemoglobin <10g/dL at time of presentation with suspected acute UGI bleeding."*

8.1.1 Transfusion within first 12 hours

TABLE 73

Hb at presentation (FBC1g/dL)	Haemodynamic status at presentation	Transfused within 12 hours (Q24)			
		National Audit		Your site	
		%	N	%	N
<7	Hypotensive (systolic BP<100)	93	214/229	100	2/2
	Systolic BP>=100	90	493/545	100	4/4
	Not known	71	10/14		/0
7-8	Hypotensive (systolic BP<100)	93	124/134	100	1/1
	Systolic BP>=100	77	305/398	80	4/5
	Not known	75	3/4		/0
8.1-10	Hypotensive (systolic BP<100)	72	156/216	50	1/2
	Systolic BP>=100	46	440/955	50	3/6
	Not known	38	8/21		/0
>10	Hypotensive (systolic BP<100)	32	93/287	100	2/2
	Systolic BP>=100	7	**230**/3378	14	1/7
	Not known	2	1/42		/0
No Hb value	Hypotensive (systolic BP<100)	65	41/63		/0
	Systolic BP>=100	29	**115**/402		/0
	Not known	13	8/62		/0
	ALL PATIENTS	33	2241/6750	62	18/29

The median time from baseline to first the full blood count (FBC) was 0.9 hours.

5% (345/6750) of all patients received transfusion when they were haemodynamically stable and had a haemoglobin above 10g/dL or no Hb recorded (highlighted bold in the table). These are regarded as inappropriate transfusions.

25 patients who were both haemodynamically unstable and had haemoglobin of 8g/dL or less (229-214 for Hb <7g/dL (=15) *PLUS* 134-124 for Hb 7-8g/dL (=10)), did *not* receive RBC transfusion, despite it being clinically indicated.

8.1.2 Rockall score

Is there a relationship between the use of RBC transfusions and risk score (Rockall score) for AUGIB?

TABLE 74

Rockall score (final)	National Audit		Your site	
	Transfused RBC *first 12 hours* Q24B		Transfused RBC *first 12 hours*	
	%	N	%	N
0-2	20	279/1408	60	3/5
3-5	38	831/2204	56	5/9
6-8	61	747/1225	64	9/14
>8	76	116/152	100	1/1
No endoscopy*	15	267/1746		/0

*Note patients who did not have an endoscopy (1746) cannot have a final Rockall score calculated.

From the UK data, the higher the Rockall score for AUGIB the higher the percentage of patients receiving transfusion.

8.1.3 Re-bleeding

Is there a relationship between RBC transfusion and re-bleeding?

TABLE 75

Rockall score (final)	National Audit					
	Did the patient receive RBC transfusion *during episode* of AUGIB*?		If yes, was there evidence of ongoing or further bleeding after first endoscopy? (Q40, Q41)		If no, was there evidence of ongoing or further bleeding after first endoscopy? (Q40,41)	
	%	N	%	N	%	N
0-2	27	379/1408	13	47/373	2	22/1007
3-5	52	1142/2204	18	202/1125	3	27/1041
6-8	76	929/1225	32	292/917	4	12/288
>8	80	122/152	45	54/121	37	11/30
No endoscopy	20	349/1746	-	-	-	-

* This includes any RBC transfusion including those received in the first 12 hours.

These data suggest that transfusion, independent of the patient's risk of re-bleeding (as obtained by Rockall score), is associated with an increased risk of re-bleeding. For all Rockall scores the rate of re-bleeding is higher in the transfused group. This is possibly due to "confounding by indication" i.e. the clinical judgement that transfusion was appropriate, might reflect the clinician's judgement that there was *already* ongoing or re-bleeding. A randomised controlled trial in 1986 (which has never been repeated) demonstrated a higher rate of re-bleeding in those receiving early RBC transfusion [Blair, 1986]. This is a key area for further investigation.

8.2 Platelets

Standard

"In those actively bleeding, correct platelets if <50 x 10^9."

Platelets were transfused to 189 patients. 61% (213/352) of patients with AUGIB with a platelet count < 50 x 10^9, did not receive a platelet transfusion.

TABLE 76

Rockall score (final)	National Audit				Your site	
	Did the patient receive a platelet transfusion during episode?		If yes, was the platelet count <50 x 10^9prior to transfusion*?		Did the patient receive a platelet transfusion?	If yes, was the platelet count <50 x 10^9 prior to transfusion?
	%	N	%	N	N	N
0-2	0.6	8/1408	83	5/6	0	
3-5	2.6	58/2204	60	33/55	1	0
6-8	7.8	96/1225	59	54/92	2	1
>8	8.6	13/152	67	8/12	1	1
No endoscopy	0.8	14/1746	71	10/14	0	
ALL	2.8	189/6750	61	110/179*	4	2

*For ten patients no platelet count was recorded prior to platelet transfusion.

The higher the Rockall score the higher the proportion of patients receiving platelet transfusion.

In 42% (79/189) (189-110 =79 (from bottom row of table) / all patients receiving platelets =189) of platelet transfusions the platelet count was above 50x10^9/L or not recorded, so these are regarded as inappropriate transfusions. A very similar percentage (around 40%) of inappropriate platelet transfusions was found in the RCP/NHSBT National Comparative audit of platelet transfusions:

(http://blood.co.uk/library/pdf/Audit_of_platelet_use_in_St_Elsewheres.pdf).

Further investigation is warranted into the reasons why so many patients are receiving seemingly inappropriate platelet transfusions.

8.3 Coagulopathy

Please see Section 6.1 for data on patients who were taking warfarin.

Standard

"In those actively bleeding correct INR if >1.5x normal or PT > 3 seconds prolonged."

Coagulation abnormalities

15% (1017/6750) of *all* patients had an INR of >1.5 (or PT > 3 seconds prolonged if no INR recorded, or PT> 18 seconds if no control PT supplied). Excluding those on warfarin, there were 550 patients who had an INR >1.5 or PT > 3 seconds prolonged.

FFP use

FFP was given to 503 (7%) patients in total, 24% (121/503) of whom were on warfarin.

TABLE 77

Rockall score (final)		National Audit				Your site	
		Did the patient receive a FFP transfusion?		If yes, was the INR >1.5, or the PT >3secs prolonged before transfusion*?		Did the patient receive a FFP transfusion?	If yes, was the INR >1.5, or the PT >3secs prolonged before transfusion?
		%	N	%	N	N	N
Not on Warfarin:							
ROCKALL	0-2	0.7	9/1254	78	7/9	0	
	3-5	5	101/1854	65	64/99	0	
	6-8	16	171/1048	62	101/163	3	2
	>8	23	28/124	57	16/28	0	
No endoscopy		2	34/1500	69	22/32	0	
Warfarin		26	121/473	96	111/116	1	1
Warfarin Not Known		8	39/484	67	24/36	0	
TOTAL		7	503/6737#	71	345/483		

* For 20 patients no INR or PT was recorded prior to FFP transfusion

13 patients (*not* on warfarin) did not have Rockall score completed despite having endoscopy (see Section 1.5). The denominator for this total is therefore 6750-13= 6737.

20 patients receiving FFP (4% of all FFP transfusions), did not have an INR or PT recorded. 71% (345/483) of those receiving FFP who had an INR recorded, had an INR >1.5 (or PT > 3 seconds prolonged).

In 27% (138 (i.e. 483-345 from bottom row of table)/503) of patients receiving FFP transfusion the INR was <1.5 or the PT was ≤3 seconds prolonged, indicating that the FFP transfusion was inappropriate. Further investigation of the reasons given for FFP transfusion in these patients is required.

57% (314/550) of patients with an INR >1.5 (or PT > 3 seconds prolonged) who were not on warfarin (see coagulation abnormalities section above), did *not* receive FFP transfusion where this may have been appropriate (data not shown in table 77). Further investigation into the reasons for not transfusing these patients may also be required.

Other treatments used (data not shown)

Cryoprecipitate was given to 86 of 6750 patients within 24 hours. 64/86 were patients on warfarin, with 49/64 having an INR >1.5, or a PT >3 seconds prolonged. This indicates some patients received cryoprecipitate when either no INR was recorded, or the INR was not >1.5.

Prothrombin complex was given to 24 of 6750 patients within 24 hours. 21 were patients on warfarin, 2 were not warfarin, and for 1 patient warfarin status was not known.

Section 9 – Outcomes

9.1 Age, Diagnosis and Mortality

TABLE 78

NATIONAL AUDIT	Acute admissions						Established inpatients						Other type		Total	
Endoscopic diagnoses (1st 2nd OR 3rd)	Age <60 Mortality		Age 60–79 Mortality		Age ≥ 80 Mortality		Age <60 Mortality		Age 60–79 Mortality		Age ≥ 80 Mortality		Mortality		Mortality	
	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Any abnormality	3.7	48/1302	4.9	64/1295	8.6	69/799	22	29/134	18	54/302	23	58/248	2.9	2/69	7.8	324/4139
Oesophagitis	2.0	8/396	3.2	11/348	3.6	7/194	16	7/45	14	14/98	21	18/84	-	0/12	5.5	65/1177
Gastritis/Erosions	2.0	7/349	1.8	6/326	7.2	16/221	21	7/33	22	16/74	28	18/64	-	0/24	6.4	70/1092
Ulcer	3.8	16/425	4.6	29/627	10	43/416	18	9/49	20	27/138	26	38/146	-	0/25	8.9	162/1826
Erosive duodenitis	1.5	4/264	3.3	6/181	6.4	6/94	13	2/16	20	9/46	21	6/28	-	0/11	5.2	33/640
Malignancy	18	3/17	12	10/81	16	9/58	33	1/3	33	4/12	27	4/15	-	0/1	17	31/187
Mallory-Weiss syndrome	-	0/95	3.9	3/77	19	4/21	33	1/3	20	2/10	33	2/6	-	0/1	4.7	10/213
Varices and PHG	9.8	37/376	9.4	13/139	15	3/20	39	16/41	46	12/26	50	4/8	29	2/7	14	87/617
Vascular ectasia	22	4/18	11	5/47	5.0	2/40	20	1/5	11	1/9	25	2/8	-	0/3	12	15/130
Endoscopy	3.3	53/1588	4.6	70/1529	8.5	84/990	19	30/158	17	61/365	23	71/305	2.9	2/69	7.4	371/5004
No endoscopy	3.3	23/703	12	38/320	27	111/416	40	12/30	35	29/83	54	85/158	17	6/35	17	304/1746
All patients	3.3	76/2291	5.8	108/1849	14	195/1406	22	42/188	20	90/448	34	156/463	7.7	8/104	10	675/6750

Age not known for 1 patient. (Note patients can have more than one endoscopic diagnosis and therefore appear in more than one row of the table)

Of those without endoscopy who died (N=304) and for whom we have a date of death, 48% (136/281) died within 2 days of presentation. Of all patients known to have died within 2 days of presentation (N=199), two thirds (68%, 136/199) did not have an endoscopy.

Comparisons can be made using these data with the data from Rockall *et al* which are summarised on page 14. The differences in the way the data were collected and the populations studied must be considered however.

9.2 Length of stay (to discharge or inpatient death)

This is the length of stay (LOS) following the *presentation* (not the date of admission necessarily) with AUGIB.

TABLE 79

	Acute admissions (5547)		Established inpatients (1099)		Other type (104)		Total (6750)		Your site (All patients) (29)	
LOS	%	N	%	N	%	N	%	N	%	N
Same day as presentation	6	351	2	17	12	12	6	380	0	
1-3 days	33	1817	11	123	19	20	29	1960	21	6
4-7 days	25	1371	16	172	22	23	23	1566	38	11
8-28 days	21	1171	34	373	27	28	23	1572	38	11
> 28 days	15	823	32	356	20	21	18	1200	3	1
Not known	0.3	14	5	58	-	0	1	72	0	
Median LOS	5 days		14 days		7 days		6 days			

The majority of new admissions with AUGIB are discharged within 1 week of presentation.

TABLE 80

	Initial Rockall score <2		Initial Rockall score 2+		Final Rockall score <3		Final Rockall score 3+	
LOS	%	N	%	N	%	N	%	N
Same day as presentation	11	261	3	119	6	79	1	40
1-3 days	42	978	22	982	43	609	19	676
4-7 days	20	472	25	1094	24	335	27	981
8-28 days	12	267	29	1305	14	196	31	1116
> 28 days	13	304	20	896	12	173	20	729
Not known	1	23	1	49	1	16	1	39
Median LOS	3 days		8 days		4 days		8 days	

9.3 Outcomes related to out of hours endoscopy availability

There was little difference in median LOS in those hospitals *with* an "out of hours" emergency endoscopy on call rota (6 days, n=3476) compared with those hospitals *without* "out of hours" emergency endoscopy on call rota (5 days, n=2789).

TABLE 81

Which of the following were outcomes of the AUGIB in this patient*?	Patients in hospitals with OOH on call endoscopy rota (3499)		Patients in hospitals without OOH on call endoscopy rota (2821)	
	%	N	%	N
Death during admission	9	322	10	293
UGI bleed having surgery or radiological intervention to control	3	111	3	80
Continued bleeding and/or re-bleeding after first endoscopy	14	368/2721	13	255/2001
Alive in hospital at 28 days	17	591	5	134
Discharged alive ≤ 28 days after presentation	73	2557	73	2063
Discharged alive ≤28 days after presentation, without endoscopy	14	505	20	571

*This table was derived by examining the endoscopy, surgery and radiology data, and the final outcome data entered in Q181. The categories are *not* mutually exclusive (i.e. some patients may have re-bled, had surgery and be alive in hospital and therefore be counted in 3 rows).

Recommendations

General

On presentation, risk assessment using a validated scoring system should be a standard of care (and recorded), as there is a strong relationship between such assessments and outcome of AUGIB.

Patients with significant AUGIB, in particular those at high risk - inpatients, elderly, and those with high risk scores, should where appropriate, be referred early to specialist care.

Greater attention to medical therapies after endoscopy is needed to ensure timely and appropriate use of proton pump inhibitors (PPI) and vasopressin analogues. Hospitals should monitor their use of PPIs to avoid excessive use, and the reasons for the low use of vasopressin analogues need to be identified.

Endoscopy

Reasons for delay in endoscopy need to be identified, and service provision needs to be assessed to ensure those at high risk have access to early endoscopy.

Endoscopy for AUGIB should be performed by someone competent in endoscopic therapy for both non-variceal and variceal bleeding. Patients with high risk lesions should have a repeat endoscopy planned with the potential for repeat therapy available.

In view of the increasing proportion of AUGIB due to varices, all consultants providing emergency endoscopy should be competent in at least one method of haemostasis for varices (including balloon tamponade). Investigation is needed into the reasons (organisational and / or care process) why a third of patients with varices and AUGIB do not have a therapeutic procedure performed.

Transfusion

Fluid replacement strategies need clarifying and guidelines for the appropriate use of blood components in AUGIB need reviewing, as a collaboration between gastroenterologists and transfusion specialists, e.g. BSG and British Committee for Standards in Haematology (BSCH).

The process of completing transfusion guidelines (for RBC, platelets and FFP) should include the development of strategies for disseminating them amongst gastroenterologists and clinicians caring for those with AUGIB.

Clinicians should be reminded of the risks of transfusion and need to document the clinical indication for transfusion in all cases.

The reasons underlying the apparent high levels of inappropriate transfusion need to be investigated.

Clinical research is required to develop a stronger evidence base for transfusion in AUGIB.

Action points

Further analyses of relationships between outcomes and service provision are ongoing. However, the action points below do not need to be delayed until these become available.

Project group

- Carry out further analysis of the relationships between service provision (including use of specialist referral, endoscopy availability, endoscopic therapies) and clinical outcomes.
- Identify and assess potential additional factors for use in risk assessment tools.
- Review and revise the audit tools, audit methods and recruitment strategies prior to the next UK audit within 3 years.

Trust Management / Endoscopy Consultant Leads

- Review local arrangements for managing patients with AUGIB, including the provision of out of hours care. For those sites where out of hours endoscopy is not routinely available, care pathways ought to be defined.
- Report results of audit locally to e.g. acute care physicians, endoscopy staff, UGI surgeons, hospital transfusion committees and "hospital at night" teams.
- Ensure provision of a risk-score calculator for AUGIB in all clinical areas.
- Work with Hospital Transfusion Committee to produce local guidelines for transfusion in AUGIB.
- Ensure local referral pathways for AUGIB are clear and disseminated.
- Review local audit results for: endoscopic therapy, repeat endoscopy and use of medical therapies, and look at adherence to UK guidelines. Consider strategies to improve adherence working with e.g. endoscopy staff, on-call endoscopists, trainees and acute care physicians.

BSG

- Collaborate with BCSH to produce guidelines for transfusion in AUGIB.
- Use the audit data to justify out of hours care for patients developing major AUGIB.
- Disseminate the findings of the audit to all senior and trainee gastroenterologists and through the Federation of Gastroenterology and Hepatology Associations and Societies, to all those involved in the management of AUGIB.

Hospital Transfusion Committees

- Review local audit data for transfusion in AUGIB, and consider strategies to reduce inappropriate transfusion locally.
- Develop local guidelines for the transfusion management of AUGIB with endoscopy consultant leads, pending national guidelines.

BCSH/BSG

- Develop UK guidelines for the appropriate use of blood components in AUGIB, to include strategies for guideline dissemination.

Discussion

This is the largest dataset of AUGIB ever reported in the UK, and provides valuable information about current practice. The national statistics are from large numbers of cases, representing a variety of hospitals, and provide a good "snapshot" of care in AUGIB. It is hoped individual hospitals will be able and willing to review their site data in light of the "UK picture", and make local and regional suggestions for change to improve adherence to guidelines where appropriate, and further improve patient outcomes.

There were areas of this audit that proved difficult, both for the audit teams in hospitals, and for the project group. Feedback was received from nearly all participating sites, and it is hoped it will be possible to change the audit methodology based on this, to improve hospital uptake, the audit process, and audit numbers next time. This section reports the most commonly encountered problems, and methods to improve the audit experience for all participants in the future.

Timing

> *Many hospitals reported there was insufficient warning of the audit to be able to recruit local audit support and set up the necessary case identification processes.*
> *Timing the audit data collection period over the summer months with many staff taking annual leave, and junior doctors involved with job application processes, meant the majority of data collection and entry in many sites either being done by consultant leads, audit department staff (where available), or junior staff being extremely stretched to meet the audit target for data entry. Many sites felt this contributed to low numbers of cases.*

Any repeat audits will be advertised further in advance of the data collection period (ideally at least one year), and invitations to participate will again be copied to audit departments. Ideally data collection will not be over June/July/August. Now contact details for a consultant gastroenterologist in nearly all UK hospitals are available, advanced warning of any future audits ought to be easier.

Case identification

> *Many sites thought it would be easier to identify cases for inclusion retrospectively to thus ensure they were all definite AUGIB, and to ease case-note tracking and data collection.*

Prospective consecutive case identification attempts to minimise selection biases, and can provide more representative "snapshot" data. Possible solutions to the problems of case note tracking include extending the period of data entry following case identification (from 5 weeks to e.g. 3 months), or to identify consecutive cases retrospectively using HES data and specify codes for inclusion.

Questionnaire complexity and length

> *The most frequent concern from audit teams, was the length of the audit questionnaire, and consequently the time taken to complete the data entry.*

The questionnaire was based on that used in the audit in 1993/4, and the majority of questions remained unchanged. Some of the questions regarding surgery were omitted from this audit, and additional questions regarding endoscopic therapy were added to reflect change in practice.

In order to accurately assess and review risk in AUGIB, detail was needed on medical co-morbidities, laboratory investigations and endoscopic findings. It was felt to be important to collect data on potential aetiologies of AUGIB, including medications.

The transfusion data were collected in a similar way to previous NHSBT audits. The documentation of blood transfusion including the timing of transfusion and laboratory

investigations prior to and after transfusion, are important data in establishing the appropriateness of the transfusion. Poor access to detailed information about blood transfusion reported by many audit teams, could be overcome by the use of electronic systems for the hospital transfusion process. Although such systems are available, very few trusts have funded and implemented them.

In order to maximise the amount of complete data, the online audit tool had a number of compulsory fields set, which had to be completed for the case to submit. These were limited to those questions that identified the case as genuine AUGIB, and those questions required to calculate a Rockall score both pre and post endoscopy. Outcome data were also required for all submitted cases.

To provide participants with meaningful and powerful feedback, case mix had to be measured, so that adjustments for severity of bleeding could be made. In order to do this detailed patient data were required. All the data in the compulsory fields were used in compiling this report.

Data on endoscopy, in particular the timing of endoscopies and details of sedation, monitoring and procedures will be used to help identify significant variation in practice, and to identify areas where there are clear associations with patient outcome. There are UK guidelines in this area and the audit was designed to examine adherence to these.

The poor response rate helped to identify some questions that were clearly difficult to answer. These will be reviewed and where possible omitted from any subsequent audits. Where important, additional help notes will be provided to assist audit teams in finding the answers.

Online data entry – delays and concerns re lost data

> *During June the Project Manager was alerted to the fact that the audit website was slow, and data entry often took hours to complete due to delays in moving between sections of the audit, and in saving submitted data.*

In some sites this problem was due to the local server, and by simply transferring to a different network to enter data, the website speed improved. For many however, the frustration of data entry became intolerable. The website engineers had to reconfigure the process of downloading submitted data. In order to do this, the audit tool was temporarily taken down. Due to these delays, an additional week was allowed for data entry. The project group are confident that data were not lost during this process as data contributed by hospitals was backed up to a secure data storage facility daily. There is now an established system in place for audits of this size to ensure this temporary problem does not recur.

Missing data

> *Feedback from participating hospitals highlighted that some cases of AUGIB were not registered for inclusion in this audit. This limits the value of the data for measuring the incidence of AUGIB, and clearly reflects the difficulty some hospitals had in finding the necessary resources to carry out the audit in full. It is not possible to tell from the entered cases, whether the cases were genuinely consecutive, or whether there were some that were missed and not started at all.*

Aside from going back to individual site HES data, the amount of true "missing data" will not be easy to establish for the UK, but for local hospital feedback it may be a useful exercise.

Missing data in completed cases have been reported as "not known" in the tables. Instances where missing data have been counted as "no" have been clearly recorded either in or below the tables.

The number of cases intially registered for inclusion but then excluded, provides an insight into the methods adopted for case identification. The majority of excluded cases were patients either presenting with iron deficient anaemia, or patients who had vomiting that was

not associated with AUGIB (e.g bowel obstruction). Identifying every case of AUGIB is virtually impossible, but it is hoped that initially capturing some that are then excluded is a far more thorough method than only collecting definite cases of AUGIB and risking missing some completely. If case identification remains prospective in any future audits, inclusion criteria will be more specifically defined so case identifiers and audit leads spend less time reviewing notes of patients subsequently excluded.

Conclusions

This is the first UK wide audit of AUGIB and the use of blood, providing valuable data to clinicians and hospital managers about current practice in AUGIB. Patients with AUGIB are elderly and have significant medical co-morbidities. Unadjusted mortality overall has reduced since the 1993/4 audit (from four health regions), despite an increase in the proportion of patients with variceal bleeding. Transfusion is common, and inappropriate transfusion more common for platelet and FFP transfusions than for red blood cells. The use of therapeutic endoscopy and medical therapies after endoscopy is disappointingly low. The relationships between service provision and outcomes (in particular with reference to interventions and outcomes in emergency endoscopy), needs further, more detailed investigation.

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Appendix 1

Participating Hospitals

ENGLAND	Consultant Lead	Audit Leads	Case Identifiers
Addenbrooke's Hospital	Dr E Cameron	Dr E Bird-Lieberman	Ms G Whiting, Mrs C Darler
Aintree University Hospital	Dr R Sturgess	Dr S Hood	
Airedale General Hospital	Dr C J Healey	Dr S Miller Dr I Khan	Ms C Booton
Alexandra Hospital, Redditch	Dr D Aldulaimi		Ms C Badger
Arrowe Park Hospital	Dr B Oates	Dr K Anim-Somuah	Ms E Scott Dr K Anim-Somuah
Barnet Hospital	Dr K H Tang	Dr S Mehta Dr H Williams Dr M Shah	Dr R Dissanayaka
Basildon University Hospital	Dr D Gertner	Dr Z Mazhar	Dr A Naeeb
Basingstoke & North Hampshire Hospital	Dr C Brooks	Dr M Gwiggner	Ms C Bagan
Bassetlaw District General Hospital	Dr J Sayer	Dr J Sayer	Dr G Hill Dr R Dawood
Bedford Hospital	Dr R Harvey	Dr A Wiles	Ms J West
Birmingham Heartlands Hospital	Dr T Ngatchu	Dr YS Aung Dr YT Aung	Sister K Upton
Blackpool Victoria Hospital	Dr C J Shorrock	Dr N Prasad	Ms J Porter
Bradford Royal Infirmary	Dr C Beckett	Dr C Flynn Ms L Nanson	Dr R King Dr N Patel, Dr M Thida Dr L Owen, Dr Y Kamal Dr C Taylor, Dr D Storey
Bristol Royal Infirmary	Dr A McCune	Mr P Sylvester	SN K Caddick, Dr M Dastaran
Broomfield Hospital	Dr C McCartney	Dr K Khalid	Ms H Clarke
Calderdale Royal Hospital	Dr A Verma	Dr G Singh	Ms J Mason
Chelsea & Westminster Hospital	Dr M Banks	Dr H Antoniades	Sister C Gosling
Cheltenham General Hospital	Dr J Anderson	Dr J Falvey	Ms V Coyle
Chesterfield Royal Hospital	Dr R Collin	Dr R Collin	Ms L Howlett
Chorley & South Ribble Hospital	Dr I Drake	Dr A Khawaja	Ms S Baxter, Dr H Hatab
City Hospital Birmingham	Dr M Anderson	Dr A Elagib	Mr J Singh
Colchester General Hospital	Dr D O'Riordan	Dr S Tanwar	Ms E Smith
Conquest Hospital	Dr M Whitehead	Dr N Rahman Dr M Blaszczynska	Mrs. G. Falconer
Countess of Chester Hospital	Mr D Monk	Dr H Dallow	Ms P Davenport-Ball
County Hospital, Hereford	Dr R Ransford	Dr R Desai	Ms V Bailey
Cumberland Infirmary	Dr D Burke	Dr S Nair	Mr R Messersmith
Darent Valley Hospital	Dr R Ede	Dr R Sweis	Mr L Delieu, Ms S Lockwood
Darlington Memorial Hospital	Mr K Gunning	Ms J Ryan	Mrs J Dent
Derby City Hospital	Dr R Cunliffe	Dr R Armstrong	Dr B Orford, Dr V Monnelly
Derriford Hospital, Plymouth	Dr A Copplestone	Dr M Metzner	Ms J Cooke
Dewsbury & District Hospital	Dr N Sivaramakrishnan	Dr V Hegde	Dr A Uddin

Diana, Princess of Wales Hospital		Dr S Moss	Dr Ghosh, Ms J Tickle Mr J Darley
Doncaster Royal Infirmary	Dr G James	Dr J Sayer	Dr R Westbrook
Dorset County Hospital	Dr S Bridger		Ms A Cocks
Ealing Hospital	Dr J Arnold	Dr J Arnold	Ms J Wilk
East Surrey Hospital	Dr J Stenner	Dr N Chong Dr C Shekhar	Ms S Cuming
Eastbourne District General Hospital	Dr A Dunk	Dr J Ryan	Ms G Falconer
Edith Cavell Hospital	Dr S Nair	Dr G Corbett	Ms K Bowen
Epsom General Hospital	Mr S Y Farhat	Dr S Moodie	Dr P Patel
Fairfield General Hospital	Dr N Haslam	Dr K Hng	Ms M Nolan
Freeman Hospital	Dr K Oppong	Dr V Mahesh	Mr S Stoker
Frenchay Hospital	Dr S Hughes	Dr J Shufflebotham	
Friarage Hospital	Dr J Hancock	Dr D Craig	Dr S Subramanian
Frimley Park Hospital	Dr S Langlands		
Furness General Hospital	Dr C Brown	Dr J Keating Dr P Ellel	Ms B Teague, Ms H Pratt
George Eliot Hospital	Dr G Wood	Dr P Sambaiah	Mr P Ryan
Good Hope Hospital	Dr C Lim	Dr C Lim Dr S Kothuri	Dr S Kothuri
Hammersmith Hospital	Prof. S Ghosh	Dr D Westaby Dr N Galletly	Ms J Camsell, Ms H Sklar, Mr A Thillanaiyagam
Hemel Hempstead General Hospital	Dr A King	Dr S Zeki	Ms S Gunn
Hexham Hospital	Dr E Phillips		Mr D Scott
Hinchingbrooke Hospital	Dr P Roberts	Dr M Thoufeeq	Ms B Anderson
Homerton University Hospital	Dr A Ballinger	Dr A Idowu	Ms R Halliday
Hope Hospital	Dr C Babbs	Dr K Peddi	Ms S Stickova
Huddersfield Royal Infirmary	Dr G Sobala	Dr J Alyousofi	Mr C Duffield
Hull Royal Infirmary	Dr M Dakkak	Dr H Reddy Dr Y Khiyar Dr D Leaning	Sister E Arksey, SN J Brady, Ms J Butler, Ms S Shepheard, Mr M Padgett, Ms D Pinchon
Ipswich Hospital	Dr M Bose	Ms A Sayer	Ms S Loftus, Ms P Bradley
James Cook University Hospital	Dr H Dallal	Dr H Dallal	Ms E Carter
James Paget University Hospital	Dr M Williams	Dr L Scovell	Mr S Wright
Jersey General Hospital	Dr D Ng	Dr E Wesley	
Kent & Canterbury Hospital	Dr S Barton	Dr F Muller	Ms P Young, Mr R Woods
Kent & Sussex Hospital	Dr A Harris	Dr T Demetriou	Ms A Davies
Kettering General Hospital	Dr A Chilton	Dr D Rogers	Dr J Cowdery
King George Hospital	Dr S Grainger	Dr U Afzal	Ms E Bradley
Kings College Hospital	Dr I Bjarnason	Dr K Jamil	Dr A Loganayagam
Kingsmill Hospital	Dr R Logan	Dr A Norman	Ms N Singleton
Kingston Hospital	Dr T Heymann	Dr S Ralphs	Ms D Sayers
Leeds General Infirmary	Dr S Everett	Dr M Barron	Dr R Henney, Dr A Costello Mr R Young
Leicester General Hospital	Dr J DeCaestecker		Mr C Barbrook
Leicester Royal Infirmary	Dr P Wrum	Dr S Tsao Dr J Williams	Mr C Barbrook
Lincoln County Hospital	Dr G Spencer	Dr S Foley	Ms S Sinha
Lister Hospital Stevenage	Dr M Carter	Dr P Trembling	Mrs T Sutton

Macclesfield District General Hospital	Dr K Koss	Dr J Berry	
Manor Hospital	Dr S Manjunatha	Dr S Putta	Ms L O'Shea Dr H Padmanabhan
Mayday University Hospital	Dr M Mendall	Dr S Gupta	Dr V Gunasekera
Milton Keynes General Hospital	Dr R Madhotra	Dr C Akubine	Dr A Wahla
New Cross Hospital	Dr I Perry	Dr E Stretton	Ms D Pickford
Newark Hospital		Dr A Norman	Ms N Singleton
Newham University Hospital	Dr U Beejay	Dr Y Sharifi	Dr Y Sharifi, Dr M Crofts
Nobles Hospital	Dr S Stock		Ms G Hattersley
Norfolk and Norwich University Hospital	Dr R Tighe		
North Devon District Hospital	Dr A Moran	Dr C Sieberhagen	Mrs P Giles
North Manchester General Hospital	Dr X McFarlane	Dr A Conlin Dr J Iqbal	Ms M Nolan
North Middlesex University Hospital	Dr A Millar	Dr H Deeney, Dr R Dor	Ms K Thornton, Ms C Apps
North Tyneside Hospital	Dr M Hayat	Dr M Hayat,	Ms S Hope, Ms R Tate
Northampton General Hospital	Dr A Ogilvie	Dr A Ogilvie	Mrs A Jeffrey, Mrs M Kears Mrs S Fleckney
Northwick Park Hospital	Dr M Jacyna	Dr C Wadsworth	
Nottingham City Hospital	Dr K Teahon		
Peterborough Hospital	Dr S Nair	Dr G Corbett	Ms K Bowen, Dr S Harris, Dr M Surti
Pilgrim Hospital	Dr M Perry		Ms K Collier, Ms S Sinha
Pinderfields & Pontefract Hospitals	Dr S Shah	Dr D Vani Dr S Shah	Ms M Travis
Poole Hospital	Dr J Snook Dr N Sharer	Ms S Chessell	Mrs C Howard Ms J Delargy
Princess Alexandra Hospital	Dr R Phillips	Dr D Arokiananthan Dr A Fikree	Mr A Dixon
Princess Elizabeth Hospital, Guernsey	Dr P Mullen	Ms E Downey	Ms E Downey
Queen Alexandra Hospital, Portsmouth	Dr A Quine	Dr D Pearl	Mr T Johns
Queen Elizabeth Hospital, Birmingham	Dr R Walt	Dr T Iqbal	Dr M Heydtmann
Queen Elizabeth Hospital, Gateshead	Dr J Singh	Dr M Kasimanickam	Ms J Rutter
Queen Elizabeth Hospital, Kings Lynn	Dr A Dowds	Dr K Elamin Dr R Hariraj	
Queen Elizabeth Hospital, Woolwich	Dr A McNair Dr V Saxena	Dr J Dunn	Dr J Felber
Queen Elizabeth II Hospital, Welwyn Garden City	Dr P McIntyre	Dr A Kent	Ms L Sibthorpe, Ms F Mane Ms A Smout
Queen Elizabeth The Queen Mother Hospital	Dr A Piotrowicz	Dr K Manoj	Ms M Pickard
Queen Mary's Hospital, Sidcup	Dr H Curtis		Dr E Lanning
Queen's Medical Centre, Nottingham	Dr A Jawhari Prof R Logan	Dr J Bebb Dr T Monaghan Dr M Williams Dr J Thomas	
Queen's Hospital, Burton-upon-Trent	Dr A Palejwala		Ms A Joy
Queens Hospital, Romford	Dr P Premchand	Dr N Jawad Dr N O'Shea	Ms E Bradley, Ms M Haywood Mrs S Poulten
Rochdale Infirmary	Dr R George	Dr M El Sadig	Ms L Cooper

Rotherham Hospital	Dr P Basumani	Dr M Yousif	Ms L Bowden
Royal Albert Edward Infirmary	Dr P Bliss	Dr M Dibb	Mrs D Joyce, Ms L McCreery
Royal Berkshire Hospital	Dr J Simmons	Dr P Allan	Ms L Milsom
Royal Bolton Hospital	Dr G Lipscomb	Dr E Bolton	Ms K Shepard
Royal Devon and Exeter Hospital	Dr R Ayres	Dr V Pearce	Ms L Moore
Royal Free Hospital	Prof O Epstein	Dr R Njie	Ms L Boxer
Royal Hampshire County Hospital	Dr H Shepherd	Dr J Saunders Dr A Jamil	Ms F Geal
Royal Lancaster Infirmary	Dr C Brown	Dr C Selinger Dr C Henson	Ms B Teague, Ms H Pratt
Royal Liverpool University Hospital	Prof. A Morris Dr M Lombard	Dr L Turtle Dr C Musumba	Miss H Parry, Mr A Houghton Ms P Birch Ms J Machin
Royal Oldham Hospital	Dr B Rameh	Dr S Balakrishnan	Dr A Gebril
Royal Preston Hospital	Dr S Cairns	Dr M Musa Dr F Mohammed	Ms S Baxter
Royal Shrewsbury Hospital	Dr J Jones	Dr D Wozniak Dr L Petitt	Ms S Allen, Ms R Hayton
Royal Surrey County Hospital	Dr C Tibbs	Dr M Fullard	Ms T Mansfield
Royal Sussex County Hospital	Dr S Cairns	Dr P Blaker	Ms R Wheeler, Ms E Cox, Dr A McCelland Dr S Patel
Royal United Hospital	Dr D Robertson Dr J Linehan	Dr D Gavin	Sister T Thresher
Royal Victoria Infirmary,	Dr K Matthewson	Dr C Mountford	Mr S Stoker
Russells Hall Hospital	Dr B Jones	Dr I Williams	Ms K Obrenovic
Salisbury District Hospital	Dr J Loehry	Dr A Muddu	Ms M Thorrowgood
Sandwell Hospital	Dr C Cobb	Dr C Cobb	Dr C Cobb, Dr J Mannath
Scarborough General Hospital	Dr C Mitchell	Dr S Riyaz Dr J Storey	Mr B Ellison, Ms A McKee, Ms J Walker
Scunthorpe General Hospital	Dr P Mysore		Dr P Sutherland, Mr J Daws, Ms L Barsley
Selly Oak Hospital	Dr R Walt	Dr J Goh	Dr E Campbell
South Tyneside District Hospital	Dr S Panter	Dr J Khan Ms A Bartholomew	Ms N Lloyd
Southampton General Hospital	Dr M Wright		Dr V Gamba
Southend University Hospital	Dr G Bray	Dr J Goodhand	Ms Y Townsend
Southmead Hospital	Dr S Hughes	Dr M Musa	
Southport District General Hospital	Dr G Butcher	Dr M Fox Mr V Fletcher Dr A Bonnett	Mr T Heathcote
St George's Hospital	Mr R Leicester	Dr C Groves Dr S Musa	
St Helier Hospital	Dr S Zar	Dr C Tee, Dr M Afzal, Dr D Ghosh	
St James University Hospital	Dr G Robins	Dr J Hutchinson	Dr M Armstrong
St Mary's Hospital Paddington	Dr J Hoare		
St Peter's Hospital	Dr P Finch	Dr C Banks	Mrs A Clifford
Staffordshire General Hospital	Dr S Hearing	Dr B Theron	Ms A Worraker
Stamford & Rutland Hospital		Dr G Corbett	Ms K Bowen
Stepping Hill Hospital	Dr N Ahluwalia	Dr C Blood	Mr A Riley
Stoke Mandeville Hospital	Dr M Wheldon	Dr A Naziat, Ms S Cooper	Ms L Oswald

Sunderland Royal Hospital	Dr D Nylander		
Tameside General Hospital	Dr K Siddiqui		Ms M Tate
Taunton and Somerset Hospital	Dr P Thomas	Dr E Greig	Ms N Durant
The Great Western Hospital	Dr A Sternberg	Ms S Caldwell Ms N Basharat	Ms H Cooper
The Hillingdon Hospital	Dr G Holdstock		Mr M Troup
The Horton Hospital	Dr A Ellis	Dr R Palmer	
The John Radcliffe Hospital	Dr S Travis	Dr O Brain Dr J Corcoran	Mr L Rhodes Ms H Bainbridge
The Luton & Dunstable Hospital	Dr S Jain	Dr A Shankar	Mr D Grierson-Hill Ms E Morris
The Princes Royal Hospital Telford	Dr J Jones	Dr S Ahmed, Dr R Kontautaite	Ms R Hayton
The Royal Bournemouth Hospital	Dr P Winwood	Dr B Chadwick	Ms H Baker
The Whittington Hospital	Dr D Suri	Dr D Lindo	Ms L Kelly
Torbay Hospital	Dr J Lowes	Dr R Ramnarace	Mr M Francis, Mr S Pearce
Trafford General Hospital	Prof C Summerton	Dr Z Mehdi	
University College Hospital	Dr A Hatfield	Dr L Langmead	
University Hospital of Hartlepool	Dr J Vasani	Dr S Chatterjee	Ms J Butt
University Hospital of North Durham	Dr P Moncur	Ms D Watson	
University Hospital of North Staffordshire	Dr A Brind	Dr G Moran	Ms P Kelsall
University Hospital of North Tees	Dr M Rutter	Dr T Lee	Ms P Green Ms J Pearson
Wansbeck Hospital	Dr A Bhagwat	Dr D Waddington	Ms R Tate
Warrington Hospital	Mr M Brett	Dr S Narreddy	Ms V Brash
Warwick Hospital	Dr P C Hawker	Dr L Claridge	Ms R Walczak-Doughty
Watford General Hospital	Dr A Leahy	Dr Q Ainstee	Ms A Wood
West Cumberland Hospital	Dr Z Mahmood	Dr R Jaiswal	Sr M Linstead
West Middlesex University Hospital	Dr I Beveridge	Dr A Humphries Dr N Direzke	Ms M Wu
Westmorland General Hospital	Dr C Brown	Dr D Moothoos	Ms B Teague, Ms H Pratt
West Suffolk Hospital	Dr S Whalley		Dr K Sheikh, Ms L Watson
Weston General Hospital	Dr D R Parker	Dr T Valiani	Dr T McGavin
Wexham Park Hospital	Dr S Levi	Dr F Hossain	Ms B Johnston
Whipps Cross University Hospital	Dr A Sawyerr	Dr G Osuoha	Ms J Henderson
Whiston Hospital	Dr J Mclindon	Dr R Chandy	Mr B Collins
William Harvey Hospital	Dr D Austin	Dr A Dhiman	
Worcestershire Royal Hospital	Dr N Hudson	Dr D Adulaimi	Ms C Badger
Worthing Hospital	Dr K Thompson	Ms P Beacher	Dr S Kreise
Wycombe Hospital	Dr A McIntyre	Dr C Green Ms S Cooper	Ms L Oswald
Wythenshawe Hospital	Dr G Hyde	Dr R Keld Dr R Lim Dr P Smith	Mr G Biddlecombe Dr S Murugesan
Yeovil District Hospital	Dr Z Khan	Dr M Sproat	Ms C Mitchell
York Hospital	Dr J Turvill	Dr G Sivaji	Mrs M Norton

SCOTLAND	Consultant Lead	Audit Leads	Case Identifiers
Dumfries & Galloway Royal Infirmary	Dr F Ashkanani		Dr D Kidder Dr J K Apollos
Belford Hospital	Dr B Tregaskis		
Borders General Hospital	Dr J Fletcher, Dr C Evans		Ms L Hall
Gartnavel General Hospital	Dr D Gillen	Dr J MacDonald	
Glasgow Royal Infirmary	Dr J Morris		
Hairmyres Hospital	Dr T Reilly	Dr H Mackie	Dr G Masterton
Lorn & Islands District General Hospital	Dr S Yadav		
Ninewells Hospital	Dr N Reynolds		Dr H Younger, Dr M Groome
Perth Royal Infirmary	Dr N Reynolds	Dr J Cotton	Dr A Smith
Queen Margaret Hospital Dunfermline	Dr N Church	Dr H Jafferbhoy Mr A Macdonald	Ms C Gilvear
Royal Infirmary of Edinburgh	Dr C Blair Dr K Trimble	Dr D Gilbert	Ms D Needham
Southern General Hospital	Dr H Suzuki	Dr H Suzuki, Dr J Manning	
Stirling Royal Infirmary	Dr H Dalziel	Dr D Morales	Mr L Simpson
Stobhill Hospital	Dr A Cahill		
Victoria Hospital Kircaldy	Dr J Wilson	Dr K Vaidya, Dr G Birnie	
Victoria Infirmary Glasgow	Dr R Boulton-Jones	Dr G Naismith	Ms S Shields
Western General Hospital	Dr I Penman	Ms A Henderson	Dr J Ferguson
NORTHERN IRELAND			
Antrim Area Hospital	Dr C Rodgers	Dr H Ferguson	
Belfast City Hospital	Dr B Johnston Dr N McDougall	Dr G Morrison Dr N Kelly Dr C Ferguson	B Craig J Shaw-O'Doherty
Daisy Hill Hospital		Mr A Black	Mr E Smyth
Erne Hospital	Dr M Killen	Dr E Ghareeb	
Mid-Ulster Hospital	Dr N Patterson	Dr J Addley	
Royal Victoria Hospital	Dr S Atkinson		
The Ulster Hospital	Dr G Caddy	Dr P Allen	Ms J Hall, Dr C Lam, Dr Strzelecka, Ms B Allen
Tyrone County Hospital	Dr M Killen	Dr E Ghareeb	
WALES			
Bronglais General Hospital	Dr M Narain	Dr D Othman Dr S Manning	Ms M Edwards
Glan Clwyd Hospital	Dr I Finnie	Dr L Sunderraj	Ms E Hughes
Llandough Hospital	Dr J Green	Dr J Turner	Ms A Ball, Dr C Jones Dr S Clarke, Dr N Khan
Morriston Hospital	Dr P Duane	Dr K Tirou	Mrs A Parcell
Neath Port Talbot Hospital	Dr C Lai	Ms C Havard	Sister J Crowther
Nevill Hall Hospital	Dr P Neville	Dr C Pritchard	Dr C Hewkins
Prince Charles Hospital	Dr M Patel		Dr D Joy, Dr M Khanji, Mr Kumar
Singleton Hospital	Dr C Ch'ng	Dr C Hunt	
University Hospital of Wales	Dr B Hawthorne	Ms J Jones	Ms A Ball
Withybush General Hospital	Dr A Vaishnavi	Dr V Sankar	Ms C Williams
Wrexham Maelor Hospital	Dr T Mathialahan		Dr J Hender
Ysbyty Gwynedd Hospital	Dr W Ahmed	Dr J Gasem, Dr K Mottart	Ms T Jones

Appendix 2

Quality Standards for Organisation of Care

ESSENTIAL

Initial care/resuscitation

- facilities for resuscitation including level 2 care beds, and staff skilled in the management of patients presenting with circulatory collapse [1]
- surgical team available on site, or arrangements for safe transfer of high risk patients to units where therapeutic endoscopy available 24/7, if not available at site of presentation *(based on local factors, distance to nearest unit etc but all units must have a clear policy in place if endoscopy not available on site)* [2,3]
- availability of laboratory haematology/haemostasis testing (FBC, coagulation screen) 24/7 [4]
- local hospital guidelines for the management of patients with acute gastrointestinal haemorrhage [1].

Endoscopy

- facilities for undertaking upper gastrointestinal endoscopy for all patients admitted with acute UGI bleeding, and availability of urgent endoscopy in high risk patients [1] *(See above for patients who present with acute UGI bleed to unit where endoscopy not available)*
- capability for applying endoscopic haemostatic therapies including banding **or** injection for varices, **and** injection and/or thermal therapy, and/or endoscopic clips for non-variceal bleeding. This includes an appropriately trained therapeutic endoscopist with nursing support, and availability of equipment for achieving haemostasis [1,2]. Ability to place Sengstaken-Blakemore or Minnesota tube in patients with uncontrolled variceal haemorrhage.

Blood transfusion

- guidelines for the rapid provision of blood in emergencies [5]
- guidelines for the transfusion management of patients with massive haemorrhage [4]
- rapid availability of blood products 24/7, including:
- immediate availability of O RhD negative and O RhD positive blood [1,4]
- group compatible blood within 1 hour [6]
- FFP and cryoprecipitate within 1 hour [6]
- platelets within 3 hours [6]
- availability of haematology/transfusion advice 24/7 [4]
- routine and reference serology available 24/7 to provide compatible blood for patients with red cell antibodies [5]. Ideally this should be within 4 hours [6].

DESIRABLE

- audit of local outcomes of emergency admission for UGI bleeding with review of outcomes [7]
- participation in national / UK audit of UGI bleeding [7]
- surgical team available on site
- availability of TIPSS either in the unit or following reasonable transfer
- availability of endoscopy for patients with acute UGI bleeding on daily endoscopy list, for those who do not require out of hours endoscopy [8]
- nurses trained in the use of therapeutic endoscopic techniques to be available for all emergency endoscopy
- trainees to be under direct supervision for emergency endoscopy until passed as competent at interventional techniques for endoscopic haemostasis [9]
- a policy should be available for warfarin reversal [10]

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Quality Standards for Process of Care

ESSENTIAL

Initial care / resuscitation

- patients to be assessed for bleeding severity and categorised into high, medium or low risk (using Rockall or other validated risk score) [1]
- circulating volume to be restored using crystalloid or colloid (initial resuscitation should not be with red blood cells (RBC) unless ongoing haematemesis with shock, and should not be with albumin) [1,2]
- measurement of FBC / U&E / LFT / coagulation screen at presentation [3]
- blood group and antibody screen sample at time of presentation [3].

Pharmacological intervention

- oral antibiotics to be started in those with known or suspected variceal haemorrhage [4]
- parenteral vitamin K to be administered to those on warfarin with active bleeding, or those with supra-therapeutic anticoagulation and active bleeding [5, 6]
- NSAIDs to be stopped at presentation
- proton pump inhibitor therapy to be started in patients with peptic ulcer active bleeding or non-bleeding visible vessel at endoscopy after endoscopic therapy [7].

Endoscopy

- to be performed within 24 hours of presentation in all medium and high risk cases [8]
- pulse oximetry monitoring should be used in all sedated patients and ECG and blood pressure monitoring should be readily available for high risk patients [9]
- haemostatic therapy to be administered to varices, ulcers with active bleeding or non-bleeding visible vessel [10]
- endoscopy to be repeated if further bleeding or high risk lesion (as above) at first endoscopy [7].

Blood Transfusion

- transfuse RBC if continued haematemesis with shock [1]
- transfuse RBC if Hb < 7g / dL in haemodynamically stable non-bleeding patients[11]
- if age >65 years and or significant cardiac or respiratory co-morbidity, transfuse RBC if Hb <8g / dL in haemodynamically stable non-bleeding patients[11].

DESIRABLE

Initial care

- consider early discharge for those under 60 years and low risk [12]
- patients with acute UGI bleeding to be admitted by or referred early to specialist medical or surgical gastroenterology [13,14].

Pharmacological intervention

- vasopressin analogue to be started in those with known or suspected variceal haemorrhage [15]
- one week course of eradication therapy for those positive for H Pylori. Confirmation of H Pylori eradication is required. For all ulcers 4 weeks total ulcer-healing treatment (an additional 3 weeks PPI after H Pylori therapy) [16].

Endoscopy

- presence of stigmata of recent haemorrhage to be clearly documented as part of risk assessment [1]
- biopsy for H Pylori to be taken at initial endoscopy [17,18]
- all patients with gastric ulcer to receive repeat endoscopy after 6 weeks [1].

Blood Transfusion

- in those actively bleeding correct PT / INR if >1.5x normal [2]
- in those actively bleeding correct platelets if <50 $x10^9$ [19].

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Appendix 3

Computation of Rockall score

Question numbers refer to the main online audit tool (Appendix 4)

Age	
If Q1 <60yrs (1947)	score 0
If Q1 60 – 79 (1946 – 1928)	score 1
If Q1 >80 (1927 and below)	score 2
Shock	
If Q23ii ≥100	score 1
If Q23iii-v < 100	score 2
Co-morbidity	
If yes to 27a, 27b, 27c, 27d, 27f, 27g, 27e grade 1,2	score 2
If yes to 27k, 27l, 27h, 27e grade 3	score 3

Max pre-endoscopy score 7

Diagnosis	
If 177-180 is "no lesion", "no stigmata of recent haemorrhage" or "MW tear"	score 0
If 177-180 is malignancy	score 2
All other 177-180	score 1
Stigmata	
If 72 and 73iv,v,vi is NO	score 0
If 73i,ii,iii, or iv is YES	score 2

Max post-endoscopy score 11

Appendix 4

Audit dataset

Data item	Question
1	What is the patient's year of birth?
2	Date of admission this year
3	Time of admission (hour (24) minutes)
4	What is the patient's gender?
5	What type of presentation was this? Acute admission with overt upper GI bleeding Upper GI bleeding in established inpatient Other
6	Other, please state:
7	What was the date of presentation with the inpatient UGI bleed?
8	What was the time of presentation with the inpatient UGI bleed?
9	*How did the patient present with their UGI bleed?* Fresh blood haematemesis Melaena Shock /Syncope Coffee ground vomit Blood up Nasogastric tube None of the above Other
10	Other, please state:
11	From where was patient admitted? Own home Residential or nursing care Transfer from another acute hospital Transfer from another non-acute hospital Don't know Other
12	Other, please state:
13	In which area was the patient managed on admission with upper GI bleed or at time of inpatient upper GI bleed? General medical ward Medical assessment / admissions unit General surgical ward Surgical assessment / admissions unit Elderly care ward Designated GI bleed unit High dependency unit (Level 2 care) Intensive Care Unit (Level 3 care) A&E observation ward Don't know Other
14	Other, please state:
15	*Which team managed the patient on admission with upper GI bleed or at the time of the inpatient upper GI bleed?* *GI bleeding team and / or gastroenterology* General medical General surgical Care of the elderly

	ICCU/anaesthetics Other
16	Other, please state:
17	Was the patient's care transferred to another team for the management of the UGI bleed?
18	If yes, which team took over the care? (*select one*) GI bleeding team and / or gastroenterology General medical General surgical Care of the elderly ICCU/anaesthetics Other
19	Other, please state:
20	Do you have a record of the medication this patient was taking prior to their UGI bleeding episode? If yes please tell us which of the following (if any) the patient was taking 920a-20ac). If no, please go to Q21
20a	Aspirin?
20b	If yes, last prescribed aspirin dose
20c	If yes, was it stopped?
20d	Warfarin?
20e	If yes, was the warfarin stopped?
20f	Antidepressant?
20g	If yes, which antidepressant Amitryptilline Imipramine Doxepin Citalopram Escitalopram Fluoxetine Paroxetine Sertraline Dosulepin Clomipramine Lofepramine Dothiepin Mirtazapine Venlafaxine Trazodone St John's wort Other
20h	Was the antidepressant stopped?
20i	NSAID?
20j	If yes which one? Naproxen Ibuprofen Fenbufen Indomethacin Mefanamic acid Piroxicam Sulindac Tenoxicam Arthrotec Another NSAID
20k	Was the NSAID stopped?
20l	Selective COX II inhibitor
20m	If yes, which one Celecoxib Lumiracoxib Etoricoxib Meloxicam Parecoxib
20n	Was the COX II inhibitor stopped?
20o	Clopidogrel?

20p	If yes, was it stopped
20q	Dipyridamole?
20r	If yes, was it stopped?
20s	Fibrinolytic given within 72 hours of UGI bleed presentation?
20t	Glycoprotein IIb IIIa inhibitor?
20u	Was the Glycoprotein IIb IIIa inhibitor stopped?
20v	Proton pump inhibitor?
20w	If yes, was it stopped?
20x	HeliClear / HeliMet / or other HP eradication?
20y	Was HeliClear / HeliMet / or other HP eradication stopped?
20z	Low molecular weight heparin?
20aa	Was Low molecular weight heparin stopped?
20ab	Unfractionated heparin?
20ac	Was unfractionated heparin stopped?
21	Is there a recorded history of alcohol abuse?
22	Does / Did the patient smoke? Yes current smoker Yes ex smoker Non-smoker Don't know
23	On presentation with UGI bleed was the patient *(select one)* Not shocked [pulse <100, systolic BP ≥100] Tachycardic [pulse ≥100, systolic BP ≥ 100] Hypotensive [systolic BP < 100] Hypotensive [systolic BP <70] Hypotensive [systolic BP <50] Observations not available
24	Which of the following did the patient receive on admission or at initial presentation with UGI bleeding within the first 12 hours? (*Tick as many as apply)* Intravenous fluid (colloid and or crystalloid) Red blood cell transfusion Other Don't know
25	Other, please state
26	How many units of red blood cells were transfused within 12 hours of presentation with upper GI bleed?
	Did the patient have any of the following clinically significant co-morbidity? (If yes, please see help text for grading definitions)
27a	Ischaemic heart disease
27b	Cardiac failure
27c	If yes to 27a or 27b, did the patient have a positive troponin I or T measured during this admission?
27d	Respiratory disease
27e	Cancer / malignancy
27f	Stroke
27g	Dementia
27h	Documented cirrhosis
27i	If you said this patient has documented cirrhosis, do they/did they have ascites?

27j	If you said this patient has documented cirrhosis, do they/did they have encephalopathy?
27k	Renal disease
27l	If you said this patient has renal disease, are they on dialysis?
28	Does the patient have an underlying haematological condition
29	Was a Rockall or Blatchford risk score recorded *prior to any endoscopy* ?
30	If Rockall what was the score? (range 0-7)
30a	If Blatchford what was the score? (range 0-23)
31	Was this patient specifically categorised for no active treatment or investigation when they first presented with upper GI bleed?
32	Is / was the patient a Jehovah's witness, or did they refuse blood product transfusion?
33	Were any of the following used within the first 24 hours after UGI bleed? (Tick as many as apply) Vitamin K Cryoprecipitate Prothrombin complexes Recombinant factor VIIa None Other
34	Other, please state
35	Which of the following drugs were administered as a treatment for the UGI bleeding before endoscopy or before diagnosis was made? (tick as many as apply) PPI oral PPI intravenous boluses PPI intravenous infusion Vasopressin or analogue Antibiotics None Other
36	Other please state
37	Did the patient have a central line?
38	Was an upper GI endoscopy (OGD) performed for this episode of upper GI bleeding?
39	Which if any of the following were started or continued as treatment for the upper GI bleeding after the first endoscopy? PPI oral PPI intravenous boluses PPI intravenous infusion Vasopressin or analogue None
40	Did the patient have evidence of continued bleeding after the first endoscopy?
41	Did the patient have evidence of re-bleeding after the first endoscopy?
42	Did the patient remain for full active treatment after the first endoscopy?
43	Was the endoscopy repeated during the admission?

44	If yes, what was the reason for the repeat procedure (tick as many as apply) For check / repeat therapeutic procedure For further bleeding (continued or re-bleeding) Patient unstable and first procedure had to be abandoned Technical / equipment failure so first unsuccessful Inadequate views of whole upper GI tract at first endoscopy Don't know Other
45	Other please state
46	What was the total number of endoscopies for this episode / admission with upper GI bleeding?
47	Did this episode of upper GI bleeding result in any complications?
48	If there were complications what were they? Pneumonia Liver failure Renal failure Stroke DVT PE Perforation Significant cardiac event Other
49	Other please state
50	Was the surgical team involved in the management of the patient?
51	Was surgery undertaken?
52	Was radiological intervention used in the management of the upper GI bleeding?
53 (if 36 yes)	What was the date of the first inpatient endoscopy?
54	What was the time of the first inpatient endoscopy?
55	Where was this endoscopy performed (select one) In main endoscopy department In emergency theatre On ICCU On HDU On GI bleeding unit In A&E On medical ward On surgical ward Don't know Other
56	Other please state
57	Did the patient have a Sengstaken-Blakemore / Minnesota / Linton tube in place prior to endoscopy?
58	Who was the lead endoscopist for this procedure? Consultant gastroenterologist Consultant surgeon SpR / Research fellow / clinical fellow supervised SpR / Research fellow / clinical fellow unsupervised Associate specialist / staff grade Nurse endoscopist Don't know

	Other
59	Other please state
60	Was there an anaesthetist present at the time of endoscopy?
61	Did the patient receive a general anaesthetic for the endoscopy?
62	Which of the following were administered for the endoscopy? Please tick as many as apply and state dose Midazolam Flumazenil Diazemuls Pethidine Fentanyl None (i.e. unsedated) Other
63	Other please state
64	Which of the following were monitored during this endoscopy: ECG?
65	Pulse Oximetry?
66	Was there any record of significant desaturation during the procedure as recorded on the endoscopy report?
67	Were any abnormalities found at this endoscopy?
68	If yes, what were the major abnormalities identified in the oesophagus? Oesophagitis Ulcer Malignancy Mallory-Weiss Varices
69	If yes, what were the major abnormalities identified in the stomach? Gastritis / Erosions Ulcer Malignancy Mallory-Weiss Varices Vascular Ectasia Portal Hypertensive Gastropathy
70	If yes, what were the major abnormalities identified in the duodenum? Erosive duodenitis Ulcer Malignancy Haemobilia Varices Vascular ectasia
71	If there were any other abnormalities found at this endoscopy besides those shown above, please give details here
72	Were there any stigmata of recent haemorrhage
73	If yes, what were the stigmata of recent haemorrhage?(tick as many as apply) Blood in upper GI tract Visible vessel Spurting vessel Dark spot in ulcer base Red spot / wheal markings Nipple sign

	Adherent clot
74	If you told us an adherent clot was present, was it removed?
75	Were there any other stigmata of recent haemorrhage?
76	Other please state
77	Were any therapeutic procedures undertaken during this upper GI endoscopy?
78	If yes, what therapeutic procedures were undertaken? (tick as many as apply) Ulcer base injection sclerotherapy BICAP / heater probe Endoclip(s) applied Variceal injection / sclerotherapy Variceal banding Glue injection Argon Plasma Coagulation (APC) Don't know Other
79	Other please state
80	Did the endoscopist record the outcome of therapeutic procedures?
81	If yes, was haemostasis achieved?
82	Was a Rockall score calculated after this endoscopy
83	If yes, what was it?
84	Did this endoscopy result in any complications?
85	If yes, what were they?
ENDOSCOPY QUESTIONS AS PER 53-85 86 – 118 second endoscopy 119-151 third endoscopy (if 46 is TWO or THREE or THREE OR MORE)	

Answer questions 152-155 for all patients, and 156-167 for those patients who had surgery for their UGI bleeding, and 168-176 for those patients who had interventional radiology in the management of their UGI bleeding. Answer questions 177 to the end for all patients	
152	On admission or at presentation with UGI bleed did the patient have a group and save sample collected?
153	Was a cross match requested at the time of this sample?
154	If yes, how many units were cross-matched?
155	Did the patient receive any blood products (Human albumin solution, red blood cells, fresh frozen plasma, platelets) for the UGI bleed?
The following questions (156-167) relate to surgery performed for the episode of UGI bleeding and should only be answered if answered yes to Q51	
156	What was the date of the surgery?
157	What was the hour of surgery?
158	What was the reason for surgery? (tick as many as apply) For further or uncontrolled bleeding Stigmata of recent haemorrhage / high risk For malignancy For peritonitis / perforation Don't know Other
159	Other please state

160	What surgical procedure was performed? (please tick one) Under-run of ulcer Oversew of ulcer Excision of ulcer Excision of ulcer with vagotomy and pylorplasty Partial gastrectomy Don't know Other
161	Other please state
162	What was the grade of the lead surgeon who performed the operation? Consultant SpR / research fellow / clinical fellow supervised SpR / research fellow / clinical fellow unsupervised Associate specialist / staff grade Don't know Other
163	Other please state
164	What was the grade of the most senior anaesthetist present during surgery? (tick one) Consultant SpR / Research fellow /clinical fellow SHO Don't know Other
165	Other please state
166	Which post-operative complications occurred after surgery for this episode of upper GI bleeding? (tick as many as apply) Pneumonia Significant cardiac event Liver failure Stroke Sepsis Renal Failure PE Wound dehiscence Wound infection Duodenal fistula DVT None Other
167	Other please state
The following questions (168-176) refer to interventional radiology for the upper GI bleed and should only be answered if you answered yes to Q52	
168	Did the patient undergo diagnostic angiography?
169	Was source of bleeding identified?
170	Did the patient undergo therapeutic angiography and embolisation?
171	If yes, was bleeding controlled?
172	Did the patient undergo transjugular intra-hepatic porto-systemic shunt?
173	If yes, was bleeding controlled?
174	Did the patient undergo another different therapeutic radiological procedure?
175	If yes, what was it?
176	Was bleeding controlled?

To be answered for all cases	
177	What was the final diagnosis for the upper GI bleed relating to the oesophagus? Varices Oesophagitis Ulcer Malignancy Mallory-Weiss No cause identified / Don't know
178	What was the final diagnosis for the upper GI bleed relating to the stomach? Gastritis / Erosions Ulcer Malignancy Mallory-Weiss Varices Vascular Ectasia Portal Hypertensive Gastropathy No cause identified / Don't know
179	What was the final diagnosis for the upper GI bleed relating to the duodenum? Erosive duodenitis Ulcer Malignancy Haemobilia Vascular ectasia No cause identified / Don't know
180	Please state any other diagnosis made that relates to the oesophagus, stomach or duodenum. Otherwise please leave blank.
181	What was the final outcome of the UGI bleed in this patient? (tick one) UGI bleeding not requiring intervention or transfusion UGI bleeding requiring endoscopic intervention (including transfusion) to control UGI bleed requiring surgery or radiological intervention to control Uncontrolled UGI bleeding Death from another cause Death from UGI bleed
182	If the patient died, what was the date of death?
183	Is there a record of the patient's cause of death
	Cause of death 1a Cause of death 1b Cause of death 1c Cause of death 2
184	Is the patient still in hospital more than 28 days after the admission with or presentation with UGI bleed?
185	If no, what was the date of discharge?
186	Did the patient take his or her own discharge against medical advice?
187	Was an upper GI endoscopy (OGD) planned as an outpatient or for a later date (this could be first or repeat)?

Full Blood Count (FBC)

	Date of test result	Time of test result	Hb value (g/dl)	Platelet count x10^9
FBC1 First FBC recorded after presentation with UGI bleed				
FBC2 Lowest recorded haemoglobin during admission/ episode of UGI bleeding				XXXXXXXXXXXXX
FBC3 Lowest recorded platelet count during admission/episode of UGI bleeding			XXXXXXXXX	
FBC4 Last recorded FBC prior to discharge/death/transfer				

Clotting Screen Tests

	Result date	Result time	INR	Prothrombin time (Secs)	Control Values (Secs)
CS1 First INR/PT recorded after presentation with UGI bleeding					
CS2 Highest INR/PT during admission/UGI bleeding episode					

Biochemistry profile (BCP)

	Date of result	Time of result (if available)	Urea (mmol/L)	Creatinine (µmol/L)	Bilirubin (µmol/L)
BCP1 First biochemistry recorded after presentation with UGI bleed					

Transfusion Episodes RED CELLS

	Date of Transfusion	Time episode started*	Time episode finished	No. of units transfused	Haemoglobin before transfusion (g/dL)	Date of test	Time of test	Haemoglobin after transfusion (g/dL)	Date of test	Time of test
RBC1										
RBC2										
RBC3										
RBC4										
RBC5										
RBC6										
RBC7										
RBC8										
RBC9										
RBC10										

***A transfusion episode should be defined as all red blood cells consecutively transfused within a 24 hour period**

Transfusion Episodes Fresh Frozen Plasma (FFP)

	Date of Transfusion	Time episode started*	Time episode finished	No. of units of FFP transfused	INR/PT before transfusion (PT in seconds))	Date of test	Time of test	INR/PT after transfusion (PT in seconds)	Date of test	Time of test
FFP1										
FFP2										
FFP3										
FFP4										
FFP5										
FFP6										
FFP7										
FFP8										
FFP9										
FFP10										

***A transfusion episode should be defined as all FFP consecutively transfused within a 24-hour period**

Transfusion Episodes Platelets

	Date of transfusion	Time episode started*	Time episode finished	No. of pools of platelets transfused	Platelet count before transfusion (x 10^9))	Date of test	Time of test	Platelet count after transfusion (x 10^9)	Date of test	Time of test
PLT1										
PLT2										
PLT3										
PLT4										
PLT5										
PLT6										
PLT7										
PLT8										
PLT9										
PLT10										

***A transfusion episode should be defined as all platelets consecutively transfused within a 24-hour period**

Transfusion Episodes Platelets Human Albumin Solution

	Date of transfusion	Time episode started*	Time episode finished	No. of bottles of 4.5% human albumin transfused	No of bottles of 20% human albumin transfused
HAS1					
HAS2					
HAS3					
HAS4					
HAS5					
HAS6					
HAS7					
HAS8					
HAS9					
HAS10					

***A transfusion episode should be defined as all albumin consecutively transfused within a 24-hour period**

Organisational Audit Tool

General Hospital Details

1. Does your hospital have any of the following on site:

(please refer to help notes for definitions of these)

a). Acute medical / elderly care admissions unit?	Yes	No
b). Acute surgical admissions unit?	Yes	No
c). Designated GI bleeding unit?	Yes	No
d). High dependency unit (HDU) / level 2 care?	Yes	No
e). General intensive therapy unit (ICCU) / level 3 care?	Yes	No
f). Accident and Emergency?	Yes	No
2. Does your hospital receive tertiary referrals for UGI haemorrhage from other hospitals in the region?	Yes	No
3. Does your hospital have an on call interventional radiology service for UGI bleeding – e.g. angiography / TIPSS	Yes	No
4. Does your hospital routinely calculate and document a risk score (such as Rockall or Blatchford scores) for patients with suspected upper GI bleeding?	Yes	No
5. Is your transfusion laboratory on site?	Yes	No
6. If yes, are on call laboratory staff on site at all times (24 hours/day, seven days/week)?	Yes	No

7. If no, please describe the arrangements for obtaining blood in an emergency:

8. Do you audit upper GI bleeding in your hospital? *If yes, when was this last done? (please circle)*	Yes	No

within 3 months within 6 months within 12 months

>1 year ago > 5 years ago

Endoscopy facilities

9. Does your hospital have an endoscopy unit on site?	Yes	No

(If no, go to Q22)

10. Are there Monday-Friday defined emergency endoscopy slots for upper GI bleeding?	Yes	No
11. Is out of hours endoscopy accessible on site? *(If no, go to Q21).*	Yes	No

If yes –

12. Is this provided in the endoscopy department?	Yes	No

13. Where else is this service provided? *(Please tick as many as apply)*

Nowhere ☐ In theatre ☐ On the wards ☐ Other ☐

Other, please state:

14. Is there an on call endoscopy nurses rota? Yes No

15. Are all the nurses involved in out of hours endoscopy trained in the use of therapeutic endoscopy equipment? Yes No

16. Which of the following monitoring facilities are used during emergency and out of hours endoscopy? (Please tick as many as apply)

Pulse oximetry ☐ ECG ☐ Respiratory rate ☐ BloodPressure ☐

17. Does your endoscopy department have facilities for providing endoscopic therapy for UGI bleeding? (e.g. 1/10,000 adrenaline injection therapy/heater probe/band ligation/sclerotherapy) Yes No

18. Is there an endoscopist out of hours on call rota? Yes No

If no go to Q21

19. How many consultant endoscopists are on the rota? ☐

*For each consultant on the rota please complete the following table by indicating competence at therapeutic procedures in UGI bleeding. Please tick ✓ if competent, **X** if not competent and write **DK** if you do not know.*

19a

Consultant number	Ulcer haemostasis	Varices sclerotherapy	Varices banding	Placement of balloon tamponade for varices
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

20. Are registrars on the rota always supervised with the consultant present in the endoscopy room? Yes No n/a

21. Please use the box below for the single most important comment regarding endoscopy services for upper GI bleeding in your hospital.

Guidelines

22. Does your hospital have written guidelines for the management of upper gastrointestinal bleeding (non-variceal and/or variceal)? Yes No

If yes, please send a copy of the hospital guidelines to the freepost address provided

23. If yes, do these guidelines include the transfusion management of UGI bleeding? Yes No

24. Does your hospital have separate written guidelines for blood transfusion in patients with major haemorrhage? Yes No

If yes, please send a copy of the hospital guidelines to the freepost address provided

25. How are guidelines made available to medical and nursing staff?
(Please tick as many as apply for each set of guidelines. For specific locations, if possible please visit the site to see if guidelines are displayed **today**)

26. UGI bleeding guidelines

Provided in written format at hospital induction to all new doctors	26.1 ☐
Provided on hospital intranet	26.2 ☐
Displayed on wall in admissions units	26.3 ☐
Displayed on wall in all medical wards	26.4 ☐
Displayed on wall in all surgical wards	26.5 ☐
Displayed on wall in endoscopy	26.6 ☐
Specific teaching sessions provided at doctors induction	26.7 ☐
Provided in guidelines or protocol folder on wards (as listed above)	26.8 ☐
Other *(please state)*	

27. Transfusion guidelines

Provided in written format at hospital induction to all new doctors	27.1 ☐
Provided on hospital intranet	27.2 ☐
Displayed on wall in admissions units	27.3 ☐
Displayed on wall in all medical wards	27.4 ☐
Displayed on wall in all surgical wards	27.5 ☐
Displayed on wall in endoscopy	27.6 ☐
Specific teaching sessions provided at doctors induction	27.7 ☐
Provided in guidelines or protocol folder on wards (as listed above)	27.8 ☐
Other *(please state)*	