for cardia tumours ($p < 0.001$). Of the 22 patients with a preoperative endoscopic diagnosis of high-grade dysplasia (HGD) invasive ACA was found in the resected specimen in 59% (13/22). Pathological depth of tumour invasion was in-situ in 9 (14%) mucosal in 19 (30%) and submucosal in 36 (56%). 51% (28/55) of patients with mucosal and submucosal ACA had evidence of adjacent multi-focal HGD. Nodal metastases were found in 13% (8/64) all of whom had submucosal disease. Nodal disease occurred in 50% (6/12) of submucosal cardia tumours compared to only 8% (2/24) of submucosal oesophageal tumours ($p < 0.01$). Overall 30-day mortality was 6% with three and five year survival rates of 87% and 77% respectively. There was no significant difference in survival rates between in-situ, mucosal and submucosal lesions ($p = 0.65$) nor between node positive and node negative tumours ($p = 0.45$).

Conclusions: Endoscopic treatment modalities should be applied with caution given the multifocal distribution of dysplasia and its association with underlying invasive ACA. The incidence of nodal disease from submucosal ACA indicates that surgery should remain the mainstay of treatment. Irrespective of depth of invasion, surgery provides excellent long-term survival.

Stomach/Duodenum Posters: 112-142

112 EFFECT OF *HELICOBACTER* GASTRITIS ON GASTRIC ANTIBIOTIC SECRETION IN MAN

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Introduction: Subgroup analysis of *Helicobacter* eradication trials suggests that patients with more severe gastritis have a higher rate of treatment success.

Aim: To test the hypothesis that *H. pylori* gastritis increases gastric secretion rates of metronidazole, amoxicillin and clarithromycin by studying patients before and after treatment.

Methods: 22 patients and 9 healthy volunteers underwent gastroscopy to diagnose gastritis and *H. pylori* status. Subjects received a intra-gastric phenol red infusion and an intravenous antibiotic infusion, after a five day pretreatment with omeprazole and an overnight fast. Samples of plasma and gastric juice were obtained for 4 hours and later analysed by HPLC. Pyloric losses were corrected for by phenol red recovery. 9 patients returned at least 6 months later for a gastroscopy to confirm resolution of their gastritis, followed by a further naso-gastric sampling session.

Results: Gastric clearance of antibiotics (ml/min) (table 1).

Abstract 112, Table 1

Antibiotic	Amoxicillin	Clarithromycin	Metronidazole
<i>H. pylori</i> -ve volunteers	0.270 ± 0.205	6.61 ± 2.82	1.85 ± 1.03
<i>H. pylori</i> +ve patients	0.434 ± 0.418	5.66 ± 6.14	1.76 ± 0.76
<i>H. pylori</i> -ve patients post-treatment	0.362 ± 0.361	10.18 ± 7.70	-

Conclusions: Contrary to expectations, *Helicobacter* gastritis did not significantly increase gastric antibiotic transfer. This may be due to the large inter-subject variability in gastric antibiotic secretion rates, which limits the usefulness of human experiments for examining gastric antibiotic secretion mechanisms. PV Sherwood was supported by an Astra Research Fellowship.

113 EFFECTS OF GENOTYPICALLY DIFFERENT STRAINS OF *HELICOBACTER PYLORI* ON HUMAN MICROVASCULAR ENDOTHELIAL CELL PROLIFERATION IN VITRO

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Background/Aims: *H. pylori* infection is associated with delayed healing of peptic ulcers. Ulcer healing is dependent upon angiogenesis or new blood vessel formation. Proliferation of endothelial cells (ECs) is a crucial process in angiogenesis. This study aimed to determine whether genotypically different strains of *H. pylori* inhibited the proliferation of ECs *in vitro*.

Methods: Three *H. pylori* strains were tested on human dermal microvascular ECs (HuDMECs): a *cagA*+ *vacA* s1/m1 (toxigenic) strain, its *VacA*- (non-toxigenic) isogenic mutant and a *cagA*- *vacA* s2/m2 (non-toxigenic) strain. *Campylobacter jejuni* and *Escherichia coli* were also tested. An MTT assay quantified overall HuDMEC viability. Dual staining using Hoescht and Propidium Iodide distinguished between apoptosis/necrosis and allowed total viable cell counts to be determined. HuDMECs were seeded into 96 well plates and exposed to 50µl aqueous extracts of bacteria or PBS. The two assays were performed after 24, 48, 72 and 96 hours.

Results: Cell viability and total cell number increased significantly ($p < 0.01$) at all time points upto 96 hrs in both PBS and *E. coli* treated cells. However, no increases in viability or total cell number were observed at any time point with *H. pylori* or *C. jejuni* treated cells. This anti-proliferative effect observed with *H. pylori* and *C. jejuni* was not accompanied by apoptosis or necrosis.

Conclusion: All *H. pylori* strains decreased the proliferation of HuDMECs due to a cytostatic but not cytotoxic effect. This effect also appears to be associated with the *Campylobacter* family. Inhibiting the proliferation of ECs would prevent angiogenesis at the ulcer site. This may explain the delay in ulcer healing associated with *H. pylori* infection.

114 ANTIMICROBIAL SUSCEPTIBILITY PATTERNS OF *HELICOBACTER PYLORI* ISOLATED IN SCOTLAND

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Helicobacter pylori is the principal cause of chronic active gastritis and peptic ulcer disease. Multi-drug antimicrobial therapies include combinations of proton pump inhibitors and one or several antimicrobial agents. Resistance of *H. pylori* to antimicrobial agents has been associated with treatment failure. Between December 1999 and August 2000, we obtained 243 antral biopsies from patients undergoing endoscopy in Edinburgh. A total of 67 *H. pylori* strains were isolated (27.6%). Antimicrobial susceptibility patterns of amoxycillin (AMX), ciprofloxacin (CIP), clarithromycin (CLA), erythromycin (ERY), tetracycline (TET) and metronidazole (MTZ) were determined by E test. Mutations in the 23S rRNA conferring macrolide resistance were investigated by PCR and DNA sequencing. MIC₅₀ and MIC₉₀ values are shown below. Resistance to clarithromycin and erythromycin was found in 12% (8/67) and 13% (9/67) of the *H. pylori* strains, respectively. All clarithromycin-resistant isolates had erythromycin MIC of >256 mg/L. Metronidazole resistance was demonstrated in 6 isolates (9%). Two of them had clarithromycin and erythromycin resistance. Tetracycline resistance (intermediate) was found in one of the 67 isolates (1.5%). Resistance to amoxycillin and ciprofloxacin was not detected.

Abstract 114, Table 1

	AMX	CIP	CLA	ERY	TET	MTZ
MIC ₅₀ (mg/L)	<0.016	0.032	<0.016	0.023	0.023	<0.016
MIC ₉₀ (mg/L)	0.02	0.06	3	>256	0.064	0.75

Mutations in the 23S rRNA gene were examined in the nine macrolide-resistant *H. pylori* strains. Seven of the nine isolates had mutation at position 2143 (A to G). Two of the seven isolates had an additional T to C mutation at either position 2182 or 1934. Mutation at position 2182 (T to C) has previously been found not to be associated with macrolide resistance. However, the mutation at position 1934 has not previously been reported. Of the nine isolates, one carried only a T to C mutation at position 2182 and one had no mutation in the 23S rRNA, implying that other mechanisms are responsible for the resistance in these strains. The results show that macrolide resistance, occurring by different mechanisms, is currently found in 13% of our *H. pylori* isolates.

115 COST EFFECTIVENESS OF HELICOBACTER PYLORI ERADICATION IN PATIENTS ON LONG-TERM H₂ RECEPTOR ANTAGONISTS. A LARGE PROSPECTIVE STUDY IN GENERAL PRACTICE

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Objectives: To assess the economic and symptomatic benefits of *Helicobacter pylori* (HP) eradication in primary care in patients maintained on long-term H₂ receptor antagonists (H₂RA).

Design: Prospective study.

Setting: Six practices in the Humberside area.

Subjects: 1100 patients identified to be on long-term H₂RA in the six practices.

Interventions: Identifying HP status using serology. HP positive patients were then offered standard seven-day proton pump based triple therapy, followed by a urea breath test (UBT) to confirm HP eradication.

Main outcome measures: Improvement in dyspepsia symptom scores, impact on amount of H₂RA being consumed, and economic benefits.

Results: Sixty-three (297) percent of the patients tested had a positive serology for HP, the majority of whom (58%, 172) had prior evidence of peptic ulcer disease. The mean duration of therapy and mean time since endoscopy/barium studies was significantly longer in patients with peptic ulcer disease compared to their counterparts with non-ulcer dyspepsia and gastro-oesophageal reflux disease. After successful HP eradication, on an intention to treat basis 62% of the patients could either stop or significantly reduce dosage of their H₂RA. There was also significant reduction ($p < 0.00001$) in the mean dose of H₂RA being consumed and severity of symptoms at the end of the study period.

Conclusion: Almost two thirds of patients on long-term H₂RA will have a positive serology for HP, the majority of who will have peptic ulcer disease. In 60% of cases HP eradication led to significant improvement in symptom scores and reduction in dosage of H₂RA being consumed. Cessation or reduction in long-term H₂RA prescribing is cost effective.

116 DOES HELICOBACTER PYLORI ERADICATION LEAD TO GASTRO-OESOPHAGEAL REFLUX ? A LARGE PROSPECTIVE STUDY IN PRIMARY CARE

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Background: *Helicobacter pylori* (HP) eradication is widely recommended in patients with peptic ulcer and treatment may also be useful in some patients with non-ulcer dyspepsia (NUD). It has been suggested recently that gastro-oesophageal reflux may follow HP eradication.

Aim: To assess patterns of dyspepsia in HP positive patients on long-term H₂ receptor antagonists (H₂RA) in primary care, with special emphasis on the prevalence of gastro-oesophageal reflux after HP eradication.

Patients and methods: A population of patients receiving long-term H₂RA were identified from the computerised records of 6 practices. Dyspeptic symptoms (abdominal pain, indigestion, heartburn, nausea/vomiting, and bloating) were noted and their severity graded as none (0), mild (1), moderate (2) and severe (3) to give a minimum symptom score of 0 and maximum score of 15. The dyspeptic symptoms were further classified into one of the four categories: ulcer-like, reflux-like, dysmotility-like and unspecified. HP status was determined by using standard serological method and those with a positive test were offered a standard one-week HP eradication therapy followed by a urea breath test to confirm HP eradication. Patients were followed up at 0 weeks, 6 weeks, 6 months and 12 months. At each visit the severity of symptoms, nature of dyspepsia and symptom score were recorded.

Results: 297 patients on long-term H₂RA with a positive serology for HP were studied. 58% had documented peptic ulcer disease, 19% had non-ulcer dyspepsia and 5% had gastro-oesophageal reflux disease. Successful HP eradication was achieved in 250 patients (84%). 247 patients completed the one-year post HP eradication follow up. At entry 75% of the patients had unspecified dyspepsia and only 1% were dyspepsia free. At the end of one year 43% were symptom free ($p < 0.00001$). HP eradication also resulted in significant improvement in mean symptom scores (6.5 ± 0.4 vs. 2.1 ± 0.1 ,

$p < 0.00001$). 129 patients (57%) had some degree of reflux prior to HP eradication that persisted in only 31 patients at 12 months ($p < 0.00001$). Only two (0.6%) patients both of whom had duodenal ulcer developed new onset reflux symptoms after HP eradication, which were mild in both the patients and required no treatment.

Conclusion: Unspecified dyspepsia is the commonest type of dyspepsia in HP positive patients on long-term H₂RA, irrespective of endoscopic diagnosis. Most reflux symptoms noted after HP eradication were also present prior to HP eradication. Denovo gastro-oesophageal reflux symptoms are uncommon after HP eradication.

117 AN AUDIT OF ¹³C-UREA BREATH TEST SELF TESTING

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Background: The ¹³C-urea breath test (¹³C-UBT) is a reliable, safe, non-invasive and accurate test for the diagnosis of *Helicobacter pylori*. It is the most accurate test for evaluating *H. pylori* status following eradication therapy. Since 1998 the Pylobactell kit has been available as a ¹³C-UBT for use in routine clinical practice. The kit is licensed as a medicinal product and is available as a Prescription Only Medicine. The Pylobactell kit contains all the components for carrying out the test, apart from the test meal. A suitable test meal is 200ml pure orange juice. Usually the ¹³C-UBT is performed in the hospital under the supervision of a nurse.

Aim: To assess the ability of patients to successfully perform the ¹³C-UBT in their own home using the Pylobactell kit. To assess the reliability of the results of ¹³C-UBT performed at home. To test patient's satisfaction with home testing.

Audit design: Patients referred to the hospital were audited. Each patient performed two ¹³C-UBT: the first at home and the second at the hospital. The samples were sent blinded for analysis to BSIA analysis centre. Patients were required to complete two questionnaires, one at the time of the home test and one at the hospital.

Results: 50 patients were sent Pylobactell kits. 31 patients responded to the audit.

Data was analysed using a paired t-Test to examine the results between breath testing at home and in the hospital. There was no significant difference between the results collected at home or in the hospital ($p = 0.82$). Out of 31 patients audited, only 1 patient's result did not correspond (+ve at home, -ve at the hospital).

Conclusions: Home ¹³C-UBT is a practical possibility. 100% of patients audited found the Pylobactell test kit easy to use. 81% found the instructions easy to follow. 91% were able to perform the test without any help.

118 TESTING FOR AND ERADICATION OF *H. PYLORI* INFECTION IN PATIENTS WITH BLEEDING PEPTIC ULCERS

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Background: *H. Pylori* (HP) infection should be sought and treated in patients with peptic ulcer bleeding. Successful HP eradication should be confirmed to prevent further bleeding episodes.

Aim: To review the testing for and management of HP infection in patients with bleeding peptic ulcers managed by general physicians.

Methods: Patients presenting with gastrointestinal haemorrhage and endoscopic evidence of peptic ulcer from January 1998 to January 2000 had their casenotes reviewed. NSAID use, assessment of HP status at initial endoscopy, treatment of HP infection and confirmation of HP status after eradication were studied.

Results: 110 patients (mean age 64 years, range 20-92 years, m:f 71:39) with bleeding peptic ulcers (GU 42, DU 60, GU+DU 8, NSAID related 50) were identified. NSAIDs were continued in 6 cases. HP status was established in 74% (79 / 110). 91% (72 / 79, 48 HP positive, 24 HP negative) were managed appropriately according to their HP status. 12 of the 31 (39%) patients whose HP status was unknown received empirical HP eradication therapy. 7 patients were not available for follow-up. HP testing and treatment is summarised:

Overall 26% (27 / 103) were confirmed to be HP negative over the follow-up period (median (range), 14 (1-25) months). Successful HP eradication was documented in only 24% (12 / 51) of patients HP positive at initial endoscopy.

Conclusion: Assessment of HP status in patients with bleeding peptic ulcers is inadequately performed by endoscopists. Although

Abstract 118, Table 1

HP status	Positive	Negative	Not assessed
No. of patients	53	26	31
HP eradication prescribed	48	2	12
Available for follow-up	51	26	26
Confirmed HP negative	12	8	7

most patients who had HP status assessed were treated appropriately, success of eradication therapy was confirmed in the minority of patients.

119 WHEN IS INITIAL ENDOSCOPY FOR DYSPEPSIA IN PATIENTS OF 50 YEARS OF AGE AND OVER COST-NEUTRAL? EXTRAPOLATION BASED ON RESULTS OF A PRIMARY CARE-BASED RCT

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Introduction: Dyspepsia may be managed initially either by endoscopic investigation and treatment based on the findings, or by empirical prescribing. An RCT has shown that at one year initial endoscopy is probably cost effective at £1728 per patient 'cured'. As the initial cost of endoscopy was partly recouped by reductions in prescribing of proton pump inhibitors, we aimed to estimate the time point when the cumulative cost of initial endoscopy was equivalent to usual management. At this point initial endoscopy would be 'cost-saving' even if the benefit in symptoms was not maintained.

Methods: Patients with dyspepsia over the age of 50 years were randomised to initial 'open access' endoscopy or usual management. Monthly cumulative costs per patient were calculated for the first 2 years following entry to the trial. Costs included dyspepsia medication, courses of *H. pylori* eradication therapy, GP consultations, outpatient attendances and investigative procedures. The cost difference declined from £181 at 3 months to £112 at 24 months. This decrease in cost difference over time was modelled using regression analysis. A projection of cost difference at 5 years, discounted at 3% per annum, was estimated from the best fitting model. A sensitivity analysis to the annual discount rate for costs from 0% and 6% was performed.

Results: The trend in cost differences was best explained by a linear model ($R^2=0.89$). Model: Cost difference = $173.74 - 3.1 \times \text{Month}$. By 4 years 6 months (95% CI - 4 years 2 months - 4 years 11 months) the initial cost of investigation had been recouped. Discounting costs at 0% and 6% per annum changed this threshold to 4 years 8 months and 4 years 6 months respectively.

Conclusions: Initial endoscopy in dyspeptic patients over the age of 50 may be a cost-saving intervention at 5 years.

120 DYSPEPSIA PATIENTS ON THERAPY REMAIN SYMPTOMATIC WITH IMPAIRED QUALITY OF LIFE

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Despite the scale of prescribing for dyspepsia, little is known about the symptom profile or quality of life of patients receiving maintenance therapy in the community.

Aim: to measure symptoms and quality of life in dyspeptic patients receiving regular acid suppression therapy in the preceding 12 months.

Methods/Results: 4003 such patients were invited to attend a nurse led community dyspepsia clinic and 2353 attended. Exclusions were patients receiving < 3 prescriptions/12 months, patients on therapy in whom cessation of therapy would be inappropriate, and those previously receiving proven successful *H. pylori* eradication. Symptoms were assessed using the Glasgow Dyspepsia Severity Score (GDSS) and a digestive disease specific quality of life tool (DDQoL). ^{13}C Urea Breath Testing was performed and 50.8% were positive.

Conclusion: Despite PPI or H₂RA therapy dyspeptic patients remain surprisingly symptomatic and have poor quality of life. Young patients, females, and those on PPI therapy with non-ulcer dyspepsia have highest symptom scores. Age, drug and diagnostic categories had no adverse effect on quality of life. There is considerable room for improvement of dyspepsia symptoms in the community.

Abstract 120, Table 1

		GDSS	DDQoL
Age	<45	9.31*	3.57
	>45	8.08	3.53
Sex	Male	7.95	3.65
	Female	8.55*	3.44*
Drug	PPI	8.54*	3.64
	H ₂ RA	7.87	3.45
	Both	9.29*	3.38
Diagnosis	Ulcer	7.59	3.57
	Non-ulcer	8.62*	3.49
	Not investigated	8.44*	3.55

*p<0.01 Multivariate linear regression analysis.

121 SYMPTOMS AND QUALITY OF LIFE IN DYSPEPSIA: A COMPARISON OF CONTINUOUS AND INTERMITTENT THERAPY

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Over 2.6 million prescriptions for acid suppression therapy were dispensed in 1999 in Scotland. Patients may receive either continuous or intermittent therapy.

Aim: to assess the factors determining continuous versus intermittent therapy and correlate these with symptoms.

Patients/Methods: 2353 patients receiving ≥ 3 prescription / year attended a community based nurse led dyspepsia clinic. Symptom scores and disease specific quality of life measures were performed using the Glasgow Dyspepsia Severity Score (GDSS) and the Digestive Disease Quality of Life (DDQoL) respectively. Carstairs Deprivation Index was used to assign social class.

Results: 58.2% were on continuous therapy and 41.8% were on intermittent therapy. The average number of prescription/year was 7.45.

Abstract 121, Table 1

	% on continuous therapy	P Value	Odds ratio (95% CI)
Social Class			
1-2	75.8	<0.001	1.0
3-5	55.7		0.41 (0.3-0.58)
6-7	59.2		0.48 (0.35-0.67)
Drug Group			
PPI	63.3	<0.001	1.0
H ₂ RA	54.4		1.16 (0.93-1.44)
H ₂ RA & PPI	66.1		1.01 (0.79-1.29)

In this multivariate logistic regression analysis pattern of prescribing did not differ in relation to diagnosis, age or sex. In a separate multivariate linear regression analysis continuous therapy was associated with low GDSS, $P<0.05$. There was no correlation between prescribing pattern and DDQoL scores.

Conclusions: 41.8% of patients receiving regular (≥ 3 prescriptions/year) acid suppression therapy are on intermittent treatment. Patients from social class 1 & 2 and those receiving PPI therapy are more likely to be on continuous treatment. Continuous treatment was associated with lower symptom severity scores.

122 THE APPROPRIATENESS OF MEASURING THE BENEFIT OF DYSPEPSIA MANAGEMENT IN TERMS OF QUALITY ADJUSTED LIFE YEARS

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Introduction: Cost-effectiveness analyses are often used to assess the health economics of dyspepsia management. This type of analysis is helpful in establishing the most efficient strategy (technical efficiency) but not whether the amount of money spent on managing dyspepsia is appropriate (allocative efficiency). Determining the cost/quality adjusted life year (QALY) gained from dyspepsia management and comparing it with other health care strategies would inform health care decision makers on whether the amount being spent on dyspepsia is appropriate.

Methods: Patients attending an open access endoscopy service were interviewed with the Leeds Dyspepsia Questionnaire and the Euroqol (a validated tool for measuring QALYs). These questionnaires were completed again six months after the endoscopy.

Results: 200 patients were recruited to the study (mean age 50 years, range 18–79 years, 48% male) and 165 (83%) were followed up at 6 months. The mean QALY score at baseline was 0.78 (95% CI = 0.75 to 0.81). There was no gender difference in QALYs and there was a trend for QALYs to be negatively correlated with age (-0.002 /year 95% CI = 0 to -0.004). Patients with peptic ulcer disease (9%) or oesophagitis (35%) had significantly lower QALY compared to those with a normal endoscopy (0.70 versus 0.79; mean difference 0.1 (95% CI = 0.01 to 0.19)). There was an increase in QALY score of 0.012 6 months after endoscopy but this was not statistically significant (95% CI = -0.02 to 0.05 QALY). 45 patients (27%) were cured of their dyspepsia at six months. These patients had an increase of 0.03 in their QALY score compared with 0 in those that continued to have dyspepsia but this difference was not statistically significant (mean difference = 0.03 95% CI = -0.05 to 0.11). There was also no statistical difference in the change in QALY score between those with peptic ulcer or oesophagitis and those with a normal endoscopy.

Conclusion: QALYs as measured by the Euroqol are too insensitive to be used as a tool to investigate dyspepsia.

123 RABEPRAZOLE VS OMEPRAZOLE IN 7-DAY, TRIPLE-THERAPY *H. PYLORI* ERADICATION REGIMENS FOR PEPTIC ULCER

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Introduction: Triple-therapy with a proton pump inhibitor (PPI), clarithromycin and amoxicillin or metronidazole is the treatment of choice for *H. pylori* eradication. Because PPIs vary in their time to and extent of maximum acid inhibition whilst optimal intragastric pH may differ for amoxicillin or metronidazole, the efficacy of regimens may vary according to the PPI used. Rabeprazole is a potent PPI with a very rapid on-set of maximum efficacy.

Methods: We studied the equivalence of two 7-day rabeprazole based regimes (rabeprazole 20mg bd and clarithromycin 400mg bd with amoxicillin 1g bd (RCA) or with metronidazole 400mg tds (RCM) as the supplementary antibiotic with equivalent regimens using omeprazole 20mg bd (OCA or OCM) in 345 patients with peptic ulcer disease and a positive *H. pylori* urease test. Eradication was defined as a persistently negative ¹³C urea breath test 4 and 12 weeks after completion of treatment. Factorial analysis was used to determine the overall efficacy of rabeprazole compared to omeprazole and the comparative efficacies of metronidazole and amoxicillin.

Results: The overall *H. pylori* eradication rate was 87% for patients receiving rabeprazole (per protocol) versus 85% for omeprazole (difference 2%, 95% CI -7.2% – 9.7% , not significant). On intention to treat, the overall eradication rate was 77% for rabeprazole versus 75% for omeprazole. In the amoxicillin subset rabeprazole had a higher eradication rate than omeprazole (per protocol) (95% CI -0.7% , $+20.4\%$). Analysis revealed a significant statistical interaction between the individual PPIs and the supplementary antibiotic used ($p=0.017$, intention to treat). Eradication rates are shown in the table.

Abstract 123, Table 1

	RCA	OCA	RCM	OCM
PP	94%	84%	79%	86%
ITT	84%	69%	69%	79%

Conclusions: This pivotal phase III study shows that rabeprazole based regimes are highly effective in *H. pylori* eradication. In particular, eradication rates were especially high with RCA, consistent with previous phase II findings. The differential effect of rabeprazole on the efficacy of amoxicillin and metronidazole has not been shown for a PPI previously and should be treated with caution because it appears statistically implausible and could be a chance finding, but warrants further pragmatic and mechanistic study.

124 REBOUND ACID HYPERSECRETION AFTER RANITIDINE IS NOT DUE TO IMPAIRED INHIBITORY CONTROL

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Introduction: We have previously reported that there is significant rebound basal and GRP-stimulated acid hypersecretion after ranitidine treatment. GRP stimulates secretion of both stimulatory and inhibitory acid secretory hormones. The GRP-stimulated rebound acid hypersecretion after treatment therefore raises the possibility that the phenomenon may be due to impairment of oxyntic inhibitory control.

Aim: To determine whether rebound acid hypersecretion after ranitidine is due to impaired oxyntic inhibitory control of acid secretion.

Methods/Results: 14 *H. pylori*-negative healthy subjects were studied both before and after treatment with ranitidine 300mg/day for 8 weeks. Each subject was studied with basal, Gastrin-17 and CCK-8 stimulated MAO and GRP-stimulated acid secretion studies.

Abstract 124, Table 1

	Before ranitidine	After ranitidine
BAO (mmol h ⁻¹)	2.8 (0–13.7)	5.0 (0.6–17.3)*
AO to GRP 40pmol Kg ⁻¹ h ⁻¹ (mmol h ⁻¹)	5.0 (1.2–11.6)	10.2 (3.2–25.7)*
% CCK-8 MAO/ G-17 MAO	28.9% (5.8–60.1)	26.9% (8.3–48.2)

All values are medians (range); *indicates significantly greater than pre-ranitidine at $p<0.006$

Discussion: We have confirmed that there is significant basal and GRP-stimulated rebound acid hypersecretion after ranitidine. CCK-8 acts equipotently with gastrin at the CCK_B/gastrin receptor on the ECL cell to stimulate acid secretion and also on the CCK_A receptor on oxyntic D cells to inhibit acid secretion. Impairment of inhibitory control would therefore manifest itself as an increased ratio of CCK MAO to G-17 MAO. No such change is found from before to after treatment. This is consistent with there being no impairment of inhibitory control of acid secretion.

Conclusion: Rebound acid hypersecretion after ranitidine is not due to impairment of oxyntic inhibitory control. The exact mechanism remains unclear, although it is most likely to be due to increased responsiveness of the H2 receptor to histamine.

125 ULCER CURED, SYMPTOMS RELIEVED?

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Introduction/Aim: We compared omeprazole-based and ranitidine bismuth citrate (RBC)-based *H. pylori* triple therapy, of which relatively little is known, assessed long-term (1y) outcome, and the impact of eradication (erad) on subsequent symptoms.

Methods: Patients with endoscopy-proven healed DU or GU and positive rapid urease & ¹⁴C-urea breath tests (UBT) were randomly allocated to receive twice daily for 7 days RBC 400mg+metronidazole (MET) 400mg and either clarithromycin 500mg (RMC), tetracycline 400mg (RMT) or amoxicillin 1g (RMA), or omeprazole 20mg+amoxicillin 1g + MET 400mg (OAM). Antibiotic susceptibility was assessed by disc diffusion.

Abstract 125, Table 1

	RMC n %	RMT	RMA	OAM	Total
Wk 0	84	80	80	83	327
Wdrawn AE	0	1	0	3	4
8w erad	67/84(80)	48/80(60)	55/80(69)	61/83(73)	71%
MET susc	65/80(81)	38/58(66)	48/67(72)	50/64(78)	78%
MET res	2/4 (50)	10/22(45)	7/13 (54)	11/19(58)	52%
Recrudesc	12/67(18)	6/48 (13)	11/55(20)	12/61(20)	18%
1y erad	55/84(65)	42/80(53)	44/80(53)	49/83(59)	58%

Erad = negative UBT at 8w.

Mean dyspepsia scores: Wk 0 6.4, erad (8w,1y) 2.1, 1.9; failed erad 2.4, 1.6. During 1y follow-up after erad (n=190) 34% required H2RA or PPI (2/3 for pre-existing reflux). Endoscopy at 1y in 109/129 followed off treatment showed lesions in 30% (15 with newly developed esophagitis, only 1 with DU) but with little or no symptoms.

Discussion: 1. RMC: slightly higher erad at 8w but differences narrowed by 1y and were about 1/5th lower. 2. Erad rates were lower than in our previous studies, unexplained by antibiotic resistance alone. 3. UBT at 1y, not 8w, may prove a better marker of treatment efficacy. 4. Symptom scores diminished both at 8w & 1y but were similar with or without erad. 5. Pre-existing reflux was the main reason for restarting H2RA/PPI. 6. Peptic ulcer was cured but new esophagitis, mainly silent, developed in 14%.

Conclusion: RMC and OAM are similarly effective but eradication rates are much less at 1y than at 8w. 2.Reduction of symptoms seems independent of eradication. This work was supported by Glaxo Wellcome.

126 ROLE OF NURSE LED CLINICS IN THE COMMUNITY: POTENTIAL TO IMPROVE CARE AND REDUCE ACID SUPPRESSANT DRUG COSTS

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Background: Costs of acid suppressant drugs (ASD) account for 12% of GPs' budget. The largest portion of this is for maintenance therapy. However, there is no consistent policy for reviewing the need for long-term therapy.

Aim: To evaluate the impact of nurse led review clinics (RC) in patients receiving long-term acid suppression.

Method: Criterion of long-term acid suppression was defined as those receiving more than 8 weeks of treatment in previous 12 months. Initial trawl of patients was from computer records followed by notes search to establish investigations performed and findings. Patients were invited by post to attend clinic to have drug review according to local guidelines and appropriate life style advice. Prescribing data was obtained from Prescription and Pricing Authority.

Results: Total practice population was 10,725 and 256 (prevalence 2.4%) long-term ASD users were identified. Ninety-three (36.32%) patients attended the clinic. The change in treatment was audited one year later. The following table shows change in treatment in the clinic and one year afterwards:

Abstract 126, Table 1

Treatment	Review in clinic		One year later	
	No.	%	No.	%
Stop	29	31.18	28	30.11
Step up	2	2.15	3	3.23
Step down	38	40.86	29	31.18
No change	24	25.81	33	35.48
Total	93		93	

Only half (6) of the patients with peptic ulcer disease accepted eradication treatment. The practice's pre-intervention (May 98-Apr 99) ASD costs were £97,940 and were the top drugs prescribed. One year (May 99-Apr 00) post intervention costs were reduced by £13,660 (-13.94%) to £84,280 and ranked number four.

Conclusion: Structured nurse led life style advice and drug review clinics, based on clear guidelines, produced a sustained reduction in ASD costs and was acceptable to patients.

127 PROTON PUMP INHIBITORS: UNDERSTANDING THE PRESCRIBING BEHAVIOUR OF GENERAL PRACTITIONERS

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Introduction: The introduction of a new class of powerful and effective drugs is recognised as a denominator of upward pressure on drug budgets. PPIs, introduced in 1987, account for £300 million annually, mainly in primary care. We aimed to get a better understanding of the prescribing behaviour of GPs using qualitative methodology.

Method: Focus groups comprising of 20 randomly selected GPs, and a non-random group (purposive sample) of 10 GPs, 15 GP registrars and 5 academic general practitioners were used. Following transcription, content analysis and interpretation was performed using standard qualitative methods (constant comparative; comprehensive data set analysis; deviant case analysis).

Results: Specific categories identified from the analysis included: knowledge and understanding of PPIs as a class of drugs; factors influencing the decision to prescribe them; conditions for which are considered appropriate; long-term prescribing; concerns regarding cost, safety, benefits and risks; views on PPIs being lifestyle drugs; patients' ideas, concerns and expectations; difficulties around practice prescribing and review processes; the role of *helicobacter pylori*; step-up vs step-down therapy; gastroscopy referral and non-pharmacological measures.

Discussion: Most GPs had a good working knowledge and understanding of PPIs. However, there was a variation in their levels of knowledge regarding indications for PPIs and justifications for using them. Extreme opinions were held by some GPs and attitudes were influenced by the type of practice (training, inner city) personal experiences, and medico-legal concerns. The study revealed the pluralistic prescribing pattern of GPs with PPIs. This variability is likely to have been influenced by a multiplicity of factors. It follows that guidelines alone are unlikely to be the major influence in altering prescribing behaviour

128 PROTON PUMP INHIBITORS IN HOSPITAL PRACTICE: NICE OR NOT

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Introduction: Anti-secretory drugs (ASDs) are one of the most widely prescribed group of drugs in hospital practice. In 1996 a hospital audit of ASD use was carried out to accompany the introduction of a locally agreed prescribing protocol (Gut 1997; 40(S1): A59). This audit showed the increasing use of PPIs (45% of ASDs prescribed at that time) and that, despite introduction of an ASD protocol, 51% of patients did not have a licensed indication for their prescribed medication. In July 2000 the National Institute for Clinical Excellence (NICE) published 'Guidance on the Use of PPIs in the Treatment of Dyspepsia'. An audit was performed in September 2000 to determine the current use of PPIs and the proportion of treatments adhering to this new guidance.

Methods: On three consecutive Tuesdays in September 2000, all acute medical patients prescribed ASDs were identified. Their case-notes were reviewed to identify whether these drugs were being appropriately prescribed according to the NICE guidance document. Appropriate indications include: peptic ulcer disease, *H. pylori* eradication, co-prescription with non-steroidal anti-inflammatory drugs, severe gastro-oesophageal reflux disease, and Barrett's oesophagus.

Results: 329 acute medical patients were identified. 80 patients (24%) were taking ASDs and 50 of these had been prescribed a PPI. PPI use has significantly increased ($p<0.05$) from 45% to 63% of ASDs since the previous audit in 1996. Only 16 patients (28%) had a recognised indication for the use of a PPI in accordance with the NICE guidelines.

Conclusions: This audit has confirmed the widespread use of ASDs in hospital and the continued increase in PPI use. Despite the earlier introduction of a local protocol and the recent NICE guidance the majority (72%) of patients are prescribed PPIs outwith the current guidelines. The implications of this audit are that closer adherence to the NICE guidelines and continued audit could potentially offer a substantial reduction in the usage of PPIs and their associated drug costs.

129 RHEOLOGICAL STUDIES OF BREAKDOWN AND REFORMATION OF GASTRIC MUCUS GEL DEMONSTRATES ITS UNIQUE FLOW PROPERTIES WHICH ARE ESSENTIAL TO THE MAINTENANCE OF AN INTACT PROTECTIVE BARRIER

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Introduction: We have previously demonstrated the presence of two distinct gastric mucus gels, termed shear resistant and shear compliant, which have the putative functions of protective barrier maintenance and lubrication respectively. Here we have investigated rheologically the shear resistant mucus gel barrier and its ability to recover gel properties following stress induced breakdown.

Methods: All measurements were carried out using a Bohlin CVO50 rheometer fitted with 25mm diameter serrated, parallel plates operating in oscillatory mode. Shear resistant pig gastric mucus gels were subjected to repeated up down stress sweeps in the range 0.15-500 Pa.

Results: Fresh shear resistant mucus gels ($n=12$) with phase angle values (a measure of gel strength) in the range $5-10^\circ$ were tested. Typically samples showed breakdown and recovery occurring in the range 75–150 Pa. With each gel there was remarkable consistency during repeat breakdown cycles, e.g. over 5 repeat cycles mean breakdown stress 126 Pa (range 125–127), mean recovery stress 121 Pa (range 119–122). Repeated breakdown did not lead to any loss of the elastic modulus (G') in the reformed gel.

Discussion: The adherent mucus gel barrier has been shown to possess great resilience to shear induced damage, being able to recover its gel properties after repeated stress induced breakdown. This ability is necessary for the maintenance of an intact and continual mucus gel barrier particularly when subjected to the mechanical stresses resulting from the digestive process.

130 IN VIVO VISUALISATION OF GAVISCON ALGINATE RAFTS USING ECHO-PLANAR MAGNETIC RESONANCE IMAGING

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Background: Liquid Gaviscon (LG) and Gaviscon Advance (GA) are established alginate formulations used in the treatment of GERD.

Aims: To evaluate the use of ultra-fast echo-planar magnetic resonance imaging (EPI) in assessing non-invasively the formation, location and retention of intragastric alginate rafts of LG and GA in healthy subjects. Secondly, to evaluate the feasibility of using transverse relaxation time T2 measurements to monitor changes in the physicochemical properties of the rafts.

Methods: In vitro studies were carried out to optimise the test meal and the imaging sequences. 20min after a small fat preload, 6 healthy subjects ingested 500ml of a liquid meal containing 150ml lemon juice. They then received a dose of either 20ml LG or 10ml GA in 2 separate sessions. They were imaged at 15min intervals using single-shot EPI on a 0.5 T dedicated scanner. T2 measurements were obtained using a multi-echo EPI sequence. Subjects were kept supine on the scanner bed outside the magnet between scans. The volume and T2 values were calculated at each time point for both the raft and the liquid meal.

Results: (mean(SEM)) The rafts were clearly visible in the EPI images. It was possible to observe raft formation in all experiments for both LG and GA. They were seen reacting with the stomach contents at the bottom of the stomach body (which is the lowest region of the stomach in the supine position) and progressively floating. 45min after dosing the raft volumes were 61(8)ml for LG and 66(2)ml for GA. After the meal emptied a raft was still seen in the stomach in 60% of cases for LG and in 100% of cases for GA, suggesting a longer raft retention for GA. 3D volume reconstructions of raft and meal were produced and showed the raft spatial distribution within the gastric lumen in detail. T2 measurements were able to assess dynamic changes in the raft properties in vivo.

Conclusion: EPI shows great potential in monitoring Gaviscon raft formation and flotation in vivo, non-invasively and with high spatial resolution. The EPI investigation was well tolerated and could allow serial studies and comparisons of different product formulations. This work was supported by Reckitt Benckiser Healthcare.

131 EFFECTS OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS ON HUMAN MICROVASCULAR ENDOTHELIAL CELL PROLIFERATION IN VITRO

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Background/Aims: Non-steroidal anti-inflammatory drugs (NSAIDs) are associated with delayed healing of peptic ulcers. Ulcer healing is dependent upon angiogenesis or new blood vessel formation. Proliferation of endothelial cells (ECs) is a crucial process in angiogenesis. This study aimed to determine whether NSAIDs inhibited the proliferation of ECs *in vitro*.

Methods: Indomethacin (1×10^{-3} – 10^{-7} M) and aspirin (1×10^{-3} – 10^{-7} M) were tested on human dermal microvascular endothelial cells, (HuDMECs). HuDMECs were seeded into 96 well plates and exposed to 50µl of aspirin, indomethacin or vehicle controls. An MTT assay quantified overall HuDMEC viability. Dual staining using Hoechst /

Propidium Iodide distinguished between apoptotic and necrotic death and allowed total cell counts to be determined. The assays were performed after 24, 48, 72 and 96 hrs.

Results: Cell viability and total cell number increased significantly ($p<0.05$) at all time points upto 96 hrs in controls. However, there was a significant decrease in cell viability and total cell number for indomethacin (1×10^{-3} M ; $p<0.05$) and aspirin (1×10^{-3} M ; $p<0.01$) at 72 and 96 hrs. This anti-proliferative effect observed was accompanied by significant necrosis with indomethacin at 72 ($p<0.05$) and 96 hrs ($p<0.01$) but not with aspirin.

Conclusion: High concentrations of both NSAIDs inhibit the proliferation of endothelial cells *in vitro*. This effects appeared to be induced by a cytotoxic mechanism for indomethacin but by a cytostatic mechanism for aspirin. Inhibiting the proliferation of ECs would prevent angiogenesis at the ulcer site. This may explain the delay in ulcer healing associated with the use of NSAIDs.

132 A PHASE II STUDY OF G17DT IN GASTRIC CARCINOMA

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Introduction: Gastrin is an endocrine and autocrine growth factor for gastric carcinoma. G17DT is an anti-gastrin immunogen.

Aims: To determine (i) antibody response, (ii) tolerability and (iii) efficacy of G17DT at raising functional G17 antibodies.

Method: G17DT was administered to 52 patients with gastric adenocarcinoma. In 47 patients this was given at weeks 0, 2 and 6 by im injection to the thigh in the following doses, 12 at 10 µg, 12 at 100µg and 23 at 250µg. An immunoassay was performed to determine the ability of G17DT-immunised patients' sera to inhibit binding to gastrin/CCKB receptors on the rat pancreatic tumour cell line AR42J. Displacement was then compared to a positive control rabbit anti-human G17 serum.

Results: By week 12 of the study (i) 6/11 (54.6%) evaluable patients achieved an antibody response in the 10 µg group, 9/13 (69.2%) in the 100µg group, and 19/22 (86.4%) in the 250µg group. Antibody response was not affected by age ($p=0.3$, odds ratio (OR) 0.68) or disease stage ($p=0.98$, OR 1.02). The antibodies were mainly of the IgG isotype. (ii) G17DT was well tolerated in 50/52 patients. However, one patient developed swinging pyrexia which settled after 3 days, and a second developed a sterile abscess which resolved following aspiration, (iii) The immunoassay confirmed the ability of G17DT antibodies raised in patients to displace iodinated gastrin from CCKB receptors and that the level of displacement was related to antibody titre.

Conclusion: G17DT is a simple and well tolerated method of raising functional antibodies to G17 in patients with gastric carcinoma.

133 A MINIMUM ESTIMATE FOR THE INCIDENCE OF GASTRIC CANCER IN EASTERN KENYA

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Introduction: There has been a renewed interest in gastric cancer incidence rates in Africa due to the reported discrepancy between high prevalence rates of *Helicobacter pylori* infection and low cancer incidence rates. Yet reliable estimations of cancer incidence rates in Africa are extremely difficult to obtain, with very few established cancer registries. This study documented the available information concerning incident cases of gastric cancer in part of Kenya's Eastern Province between 1991 and 1993.

Method: The records of all major health facilities in four administrative districts of Kenya's Eastern Province for the years 1991 to 1993 were reviewed for cases of gastric cancer. Population data was calculated from the 1989 national census. Incidence rates from the same area of Kenya were available from earlier studies to establish a trend over a 28 year period.

Results: Over the 3 year period, 200 cases of gastric carcinoma were identified. The mid 1992 population in the four districts was calculated to be 1,256,567. The annual average crude incidence rate was

found to be 7.0 (95%CI 5.8–8.2) per 100,000 for males and 3.7 (CI 2.8–4.5) per 100,000 for females. From these figures, the World Age Standardised Rates were calculated to be 14.3 (CI 11.8–16.8) per 100,000 for males and 7.1 (CI 5.4–8.8) per 100,000 for females. A tenfold increase in the indirectly standardised incidence rate between the periods 1965–70 and 1991–3 was noted.

Conclusion: Recent incidence rates for gastric carcinoma in this part of Kenya are comparable to Western European figures and similar to those recorded in other highland regions of Africa. There is likely to be underascertainment of cases especially among the population aged over 65 years.

134 ASSOCIATION OF GASTRIC POLYPS WITH PROTON PUMP INHIBITOR THERAPY

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Introduction: Since 1992 there have been a few reports of the association of gastric polyps with the use of proton pump inhibitors (PPI). We describe our series of patients with gastric polyps which is one of the largest reported in the literature.

Method: This was a retrospective study. The hospital coding database provided a list of patients with a diagnosis of gastric polyps made between January 1998 and December 1999. The following was obtained from review of the patients' hospital notes: demographics and drug history, reason for gastroscopy and the findings, dates of previous gastroscopies with their findings (particularly the presence or absence of gastric polyps).

Results: In total 1958 patients had gastroscopies in the 2 year period. Of the total patients, 341 had been using PPI therapy for various durations and 33 were found to have polyps. In 7 (3 male, 4 female, aged between 43 and 77) of these 33 patients there were documented previous gastroscopies which identified no gastric polyps at a time when the patients had not been using PPI therapy. In these cases it was assumed that the growth of the polyps was associated with the PPI. The incidence of PPI-related polyps was $7/341 \times 100 = 2\%$. The mean duration of treatment with a PPI was 48 months (range 2–188). Six patients developed fundic gland polyps: one patient had a single, 4mm pedunculated polyp on the lesser curve/ upper body of the stomach, two had multiple, 2–4 mm sessile polyps in the fundus, 2 others had multiple 3–5mm pedunculated polyps along the greater curve/ upper body and one had multiple 2–6mm sessile and pedunculated polyps along the greater curve/ upper body. One patient developed a single 6mm pedunculated metaplastic polyp at the cardia. Six patients had reflux disease of varying severity. One patient was investigated because of recurrent abdominal pain. All 7 patients were *Helicobacter pylori* negative and non-smokers.

Conclusion: The PPI-associated incidence of gastric polyps is approximately 2% and most of these polyps are of the fundic gland/cystic type. The clinical significance of such polyps is uncertain and requires further follow up.

135 PROSPECTIVE ANALYSIS OF THE TWO WEEK RULE FOR URGENT REFERRAL OF SUSPECTED UPPER GI CANCER

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Aim: To assess the effectiveness and compliance with the Two Week Rule (TWR), a new government initiative which requires patients with suspected upper gastrointestinal (GI) malignancy to be seen by a specialist within 2 weeks of referral by the General Practitioner (GP).

Method: All patients referred by GPs for first three months of the TWR initiative were analysed. In addition a clinical nurse specialist (CNS) examined all other GP referrals and upgraded some to TWR. Comparison between the GP and specialist assessment of TWR patients was made. Data was collected from referral letters, case notes and South West London cancer network referral forms. Data from 45 patient referrals was analysed.

Results: 80% of referrals were received within 24 hours. 11% were referred using the standard TWR referral proforma and 69% were upgraded by CNS. 89% were seen by the specialist within two week period. Following consultation median period to diagnosis was 9 days. There were discrepancies between GP and specialist in assessment of symptoms but not in identifying risk factors.

Abstract 135, Table 1

Symptom	GP referral letter	Consultant
Dyspepsia > 2wks age > 55 + risk factor	22%	13%
Onset dyspepsia < 1 year ago	18%	9%
Continuous symptoms since onset	16%	13%
Dysphagia	11%	7%
Weight loss	24%	18%
Iron def anaemia Hb < 10g/dl	7%	7%
Vomiting	7%	2%

Median period from consultation to gastroscopy was 9 days. Only 2 patients (4%) had a final diagnosis of malignancy and in this group median number of 14 days elapsed before first treatment.

Conclusion: The uptake of TWR referral forms by GPs is very low but the hospital is meeting its commitment to see most TWR patients within two weeks. Both GPs and nurse triage appear to over read alarm symptoms. This may lead to inappropriate referrals. Better awareness of appropriate urgent referral criteria is needed in order to ensure that resources for this initiative are used efficiently.

136 HYPERCOAGULABILITY IN ACUTE PEPTIC ULCER HAEMORRHAGE

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Background: Patients with acute peptic ulcer haemorrhage (APUH) seem to have a hypercoagulable state, although this has not been well documented in the literature. It is unclear whether this response is partially reversed by blood transfusion.

Aims: To compare coagulation in patients with APUH with those undergoing venesection and to assess the effects of blood transfusion on these coagulation factors.

Methods: Fifty-two patients presenting with a significant upper GI bleed and found at endoscopy to have a peptic ulcer with active bleeding or a non-bleeding visible vessel were entered into the study. All patients received combined endoscopic therapy with heater probe and injection. Patients received blood transfusion according to local protocols. Blood samples were taken prior to endoscopy for analysis of Thrombin-antithrombin III (TAT), Fragment 1&2 (F1&2) and D-Dimers (DD). TAT is an indirect and F1&2 a direct means of monitoring the generation of thrombin; D-dimer can be used indirectly to assess the generation of fibrin. Blood samples were also taken post-treatment from 20 patients attending for routine venesection. TAT, Fragment 1&2 and D-dimer concentrations were determined by enzyme immunoassay using kits purchased from Dade Behring (Marburg, Germany).

Results: Patients with an acute GI bleed had significantly raised levels of TAT ($p=0.002$), F1&2 ($p<0.001$) and fibrinogen ($p=0.002$) as compared to the venesection group. Blood transfusion had no effect on the coagulation parameters.

Conclusion: Patient with an acute GI bleed have a hypercoagulable state which is not seen in patients undergoing venesection. This hypercoagulable state is not affected by blood transfusion.

137 INTENSITY OF MANAGEMENT IN ACUTE UPPER GI HAEMORRHAGE

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Despite advances in medical care, the mortality of elderly patients following acute upper GI haemorrhage remains high. We investigated the relationship between age-related mortality and intensity of management taking central venous pressure monitoring as a surrogate marker of treatment intensity.

Methods: We prospectively collected data on all consecutive cases of upper GI haemorrhage admitted to our institution over a 3-year period. Cases were subdivided into 3 age groups (0–59, 60–74 and 75+) and analysed with regards to outcome and intervention.

Results: Of the 1349 episodes 562 (41.7%) occurred in those aged 75+. This group received CVP monitoring less frequently than the 60–74 ($p=0.016$) or 0–59 ($p=0.003$) age groups and had a higher

2-week mortality ($p=0.006$ and $p<0.001$ respectively). The percentage of patients dying who received CVP monitoring fell with increasing age (44%, 21% and 13% respectively) despite the increase in mortality. Rebleeding rate was not significantly different between the groups. The 75+ age group underwent surgery less frequently than the 60–74 age group ($p=0.033$) but not the younger age group.

Abstract 137, Table 1

	0–59 years	60–74 years	75+ years
Episodes	469 (34.8%)	318 (23.6%)	562 (41.7%)
2-week mortality	16 (3.4%)	14 (4.4%)	54 (9.6%)
Rebleeding	98 (20.9%)	65 (20.4%)	103 (18.3%)
Surgery	12 (2.6%)	15 (4.7%)	12 (2.1%)
CVP	70 (14.9%)	45 (14.2%)	50 (8.9%)

Conclusions: The mortality associated with upper GI haemorrhage increases with age. This cannot be explained by more frequent rebleeding but could be partly explained by less aggressive monitoring of elderly patients who might be more vulnerable to the adverse effects of hypovolaemia and/or fluid overload.

138 PATIENT OUTCOME FROM AN ACUTE UPPER GASTROINTESTINAL BLEED IS RELATED TO RISK FACTORS AT PRESENTATION

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Background: Acute upper gastrointestinal haemorrhage (AUGIH) is a common emergency with mortality in excess of 10%. Retrospective analysis of a large number of cases has established the risk factors that independently predict the rebleeding and mortality risk for AUGIH [Rockall Score]. We present the results of the first prospective study assessing the usefulness of these criteria in determining length of hospital stay and outcome.

Methods: 137 consecutive patients (86 male, mean age 66) were admitted as emergencies with AGIH to a single centre over a 12-month period. Using the Rockall Score patients were allocated a risk score in Accident and Emergency (possible range 0–7). All patients were admitted and underwent endoscopy and a final total risk score obtained (possible range 0–11). Length of in-patient stay and, where appropriate, high dependency unit (HDU) stay were determined. End-points were determined as discharge from hospital, re-bleed, need for surgery and death.

Results: One patient (<1%) died, fourteen (10%) re-bleed and ten (7%) required surgery—all had post-endoscopy risk scores of 6 or greater. 64% (88/137) patients had a pre-endoscopy risk score of 2 or less and 39% (53/137) had a post-endoscopy score of 2 or less. Mean length of stay was 5 days. Length of stay correlated closely with pre- and post-endoscopy risk scores ($p=0.0048$ and 0.0044 respectively). 30% (41/137) patients were managed in a HDU, all of whom had post-endoscopy risk scores of 3 or above.

Conclusions: The risk score is an effective tool in determining the length of hospital and HDU stay, of re-bleeding and of death. No patients with a risk score of 2 or less were hospitalised for more than 3 days.

139 THE SIMPLIFIED ACUTE PHYSIOLOGY SCORE (SAPSII): IS THERE A ROLE IN ASSESSING PATIENTS WITH MEDICALLY REFRACTORY UPPER GASTROINTESTINAL BLEEDING?

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Introduction: Surgical intervention is effective in treating medically refractory upper gastrointestinal haemorrhage (UGIH). Selection of patients suitable for surgery, who will tolerate anaesthesia may be difficult and often involves subjective clinical judgement. The Simplified Acute Physiology Score (SAPSII) is a validated predictor of mortality in the intensive care setting.

Aim: We compared the SAPSII between patients who were accepted or declined for acute surgical intervention for UGIH.

Subjects and Methods: All patients referred for surgical intervention from July 1996–99 ($n=99$, mean age=69.5 years, 58.5% male) with non-variceal UGIH (predominantly peptic ulcer disease) in a single hospital. Classification was according to their surgical assessment: accepted or declined. SAPSII were retrospectively assessed at the time of referral for surgical intervention. This was converted into a mortality probability using multiple regression analysis. The clinical outcome was defined as either survival to discharge or death whilst an in-patient.

Results: Mean SAPSII for death=35.7 (R28–46, median=37). Mean SAPSII for survivors=30.1 (R15–53, median=31). No patient with a SAPSII <28 died. The 2 groups did not differ with respect to their SAPSII ($t=0.8$, $p=0.44$). Patients who were declined for surgery had a χ^2 increase in death compared to those who were accepted ($p=0.08$; Odds ratio 2.3 [95% CI 0.8–6.2]). The observed mortality was consistent with mortality predicted in the operative group but for those declined their actual mortality was twice that predicted.

Abstract 139, Table 1

	Accepted	Declined
Number	65	34
Mean SAPS II score (range 15–53)	31.7	30.2
Mortality probability	16%	15%
Pre-discharge mortality (%)	10 (13%)	10 (30%)

Conclusion: This is the 1st study to assess SAPSII in UGIH. Subjective clinical assessment may deprive some patients of a potentially life saving operation. Mortality predictions using SAPSII suggests that clinical selection criteria for patients undergoing surgery may be inconsistent.

140 AN AUDIT OF DUODENAL ULCER TREATMENT AFTER A BLEEDING EPISODE

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We have audited the practice of Helicobacter testing, treatment and follow up in patients who presented with bleeding duodenal ulcers in a District General Hospital over a five year period.

Methods: Using Endoscopy Department records all cases of acute gastrointestinal haemorrhage due to duodenal ulceration between January 1995 and December 1999 were identified. Information on Helicobacter pylori testing at the time of endoscopy (biopsy urease test, histology or serology) and subsequent treatment was obtained. Follow up of outcome of H. pylori eradication treatment was documented.

Results: 98 episodes of bleeding duodenal ulceration in 97 patients were identified of which 64 were treated with an eradication regimen. 59 patients of the 64 survived for more than three months. 19 of the 59 patients were followed up by subsequent H.pylori testing and all were found to be negative. No attempt in the remaining 40 patients was made to establish the success or otherwise of H.pylori eradication treatment. Assuming a failure rate of 10% for standard eradication treatment at least four patients are likely to have remained infected with Helicobacter pylori. 34 patients out of 98 did not receive eradication treatment of which 25 survived for more than three months. Five patients received long-term acid suppression but 20 received only short-term acid suppression or no treatment at all. Therefore at least 24 patients out of 84 survivors (29%) were left at risk of recurrent peptic ulceration and possible haemorrhage.

Conclusion: In this hospital where patients with gastrointestinal haemorrhage are managed by a wide variety of teams, a significant number of survivors from bleeding duodenal ulcers are inadequately treated. A gastroenterology led service for GI bleeding is likely to improve on this position.

141 SURGERY FOR PEPTIC ULCER—ARE TRENDS STILL CHANGING?

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Background: Elective surgery rates for peptic ulcer have fallen significantly but a number of published series report that rates of emergency surgery for ulcer complications are increasing, and that mortality rates may be rising. This is thought to be due to increasing

age of patients with consequently increasing comorbidity, and the use of ulcerogenic medications. A number of studies have suggested that gastrectomy rather than under-running results in a reduction in post surgical rebleeding, and should be the emergency operation of choice.

Aims: To assess overall changes in patterns of ulcer surgery in Lothian over the period 1983–1998, with a more detailed analysis of surgery after failed endoscopic therapy for acute peptic ulcer bleeding in the years 1995–1999.

Methods: A retrospective analysis was performed using computerized data from the Lothian Surgical Audit database. Comparison was made with previously published historical controls.

Results: Between 1983 and 1998 377 operations for ulcer were carried out. For all ulcer operations the annual operation rate fell by 65% over the period. Vagotomy rates fell by 100%, whereas under-running rose by 85%. 84 patients underwent surgery for recurrent bleeding after endoscopic therapy between 1995 and 1999. The mean age was 68 years (range 21–93) and this remained constant. 76% of bleeds were from duodenal ulcers with 24% from gastric ulcers. Operation rate rose from 10 in 1995 to 21 in 1999. 82% of procedures were to under-run the bleeding point with 13% involving partial gastrectomy. This ratio remained constant. Rebleeding following surgery occurred on average in 12% and this was unrelated to type of operation or to time. Average mortality was 24% and was variable, showing no significant trend with time. Mortality rose in relation to age and post-operative rebleeding.

Conclusions: In Lothian patterns of ulcer surgery between 1983 and 1999 have followed those in other centres, with a change from predominantly elective vagotomy to predominantly emergency under-running. Significant increases in the age of the population requiring surgery for bleeding have not been demonstrated. In the last 5 years rates of emergency surgery for rebleeding after endoscopic therapy have increased slightly, but post surgical mortality has not shown a consistent increase and is comparable with other centres. Under-running has been the favoured emergency operation and this has not resulted in adverse outcomes.

142 THE MANAGEMENT OF GASTRIC VOLVULUS—A SINGLE SURGEONS' EXPERIENCE

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Introduction: A gastric volvulus is defined as an abnormal rotation of the stomach and an acute gastric volvulus is a rare surgical emergency that carries a high mortality and morbidity, while elective repair gives satisfactory results with a low morbidity and mortality. We report a single surgeon experience of 42 cases and discuss the diagnosis and management of this condition.

Methods: A retrospective review of 42 patients (26 Females) admitted from January 1993–December 1999 was undertaken. The mean age was 82 years (Range 47–92).

Results: Gastric volvulus was associated with paraoesophageal hernia (PH) in 27 cases and 1 diaphragmatic hernia. The remainder had intra-abdominal volvulus. Three patients presented acutely. Chronic volvulus was repaired electively. PH with volvulus was treated by cruroplasty, fundoplication and gastropexy. The remaining patients had gastropexy and colopexy (Four laparoscopic). Complications included oesophageal tear on reduction of the volvulus (2 acute, 2 chronic) - repaired with Thal patches. Splenectomy was performed for any splenic injury (n=10). There was one post-operative death from an MI. Post-operatively there was 1 PE and 1 pneumonia.

Conclusion: Gastric volvulus is a rare condition, but when recognized the outcome of both acute and chronic cases gives good results, even in high-risk patients.

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143 COST BENEFITS OF A NUTRITION TEAM

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Background: Over a third of hospitals in the United Kingdom have a nutrition support team (NST). A NST may need to prove that it gives its hospital financial and quality benefits.

Aims: To determine the cost benefits of a hospital nutrition team.

Methods: A NST that worked across the directorates of a teaching hospital started on 1st November 1999. Retrospective data was collected about all patients given parenteral nutrition (PN) the previous year. Prospective data was collected about all patients assessed and managed by the NST during its first year.

Results: In the pre-team year 82 patients were given PN for a mean of 8 days with a catheter-related sepsis rate of 75% (mean 11 PN patient days/infection). In the NST year 133 referrals were for parenteral feeding; of these, 78 received PN, 37 nasogastric feeding, 13 nasogastric feeding and 5 oral diet/supplements. The mean duration of PN was 10 days and the incidence of catheter-related sepsis fell gradually to 7% (mean 125 PN patient days/infection) during the last 3 months. Tangible cost savings (includes all equipment and medication costs but excludes nursing, medical and laboratory time, and bed occupancy costs) for the 55 patients in whom PN was avoided was calculated as £43,938 assuming 8 days of PN at £99/day. If the previous catheter-related sepsis rate of 75% had continued there would have been 36 more catheter-related infections. This would have given an estimated tangible cost of £8,496 (assuming £235/infection). Other cost benefits include a team-led service for bedside parenteral feeding-line and naso-jejunal tube insertion, reduced wastage of PN bags, increased use of standard PN bags and less frequent blood tests.

Conclusions: Although our NST did not significantly reduce the number of patients receiving PN; it show tangible cost savings of at least £52,434 in its first year by enterally feeding (mainly via naso-jejunal tube) 41% of patients referred for PN and by reducing the number of patients developing catheter-related sepsis. This saving is enough to justify the salary of a nutrition nurse specialist and dietitian.

144 NUTRITION TEAMS FUNCTIONING AS GATE-KEEPERS FOR INTRAVENOUS FEEDING IMPROVE THE COST AND QUALITY OF SERVICE

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Background: Intravenous feeding or parenteral nutrition (PN) is expensive and associated with a greater risk of complications than enteral feeding. The multidisciplinary nutrition support teams (NSTs) can advise on patient care and have been shown to improve cost and quality of care. However, NSTs act only in an advisory capacity in most hospitals in UK, with no documented evidence that such a function significantly influences prescribing practice by clinicians.

Aim: To assess whether a NST with prescribing authorisation on the use of PN can further improve cost and quality of nutrition support services.

Methods: A prospective audit was carried out on all PN requested +/- provided in non ITU patients over two 8-month periods: Sep 97 to Apr 98 and Sep 98 to Apr 99—the former when the NST was “advisory” and the latter when it had its prescribing mandate. Data recorded include indications for PN, duration of PN, and line sepsis. The PN provided was categorised into “appropriate”, “inappropriate” or “avoidable” according to previously published guidelines (*J Parenter Enteral Nutr* 1986;10:441–5). The costing data based on raw materials only was estimated to be £45 for a bag of PN over 24 hours.

Results: 110 referrals were made in the 1997/8 period and 72 in 1998/9. Of these 108(98%) and 45(62.5%) patients were fed intravenously, with 2(1.8%) and 27(37.5%) inappropriate requests refused respectively ($p<0.0001$). The proportion of “inappropriate” or “avoidable” PN were 47% and 24% for the two time periods ($p<0.05$). The total number of feeding days was 1082 and 544, at a cost of £48,690 and £24,480 respectively, leading to a saving of £24,210 over 8 months. Of those refused PN, there was a total of 291 days of alternative (enteral or oral) nutrition support at an estimated cost of £1309. Proven feeding line sepsis were 7(6.5%) and 2(4.5%) respectively.

Conclusion: NSTs controlling access to the use of intravenous feeding improve the cost and quality of nutrition support service.