342 ACHALASIA IN CHILDREN: AN INCREASING AND MORE SEVERE PROBLEM? A SINGLE CENTRE EXPERIENCE

N. Thapar, N.M. Croft, N. Meadows, D. Evans. *Dept of Adult and Paediatric Gastroenterology, Medical and Dental School of St Bartholomew's, Queen Mary, University of London, London EC1A 7BE, UK*

Background: Achalasia in children is a rare disorder of oesophageal motility characterised by abnormal relaxation of the Lower Oesophageal Sphincter (LOS) and peristalsis. Among all ages the incidence is estimated to be between 0.03 -1.1 per 100 000 population / year. In this review we report 6 children who presented within a period of 18 months.

Methods: Retrospective case review.

Results: 6 children presented with achalasia over an 18/12 period (5 over 1 year), comprising 3 males and 3 females with ages ranging from 7/12 to 14 yrs (median 10 yrs). Prior to diagnosis there was a median 2 month duration of symptoms (range 2—12/12) including dysphagia, vomiting, feeding problems, pain and weight loss. On presentation a diagnosis of achalasia was made on barium swallow, and oesophageal perfusion manometry performed on all cases. Mean LOS pressure ranged from 37.5—70 mmHg (mean 50) with typical loss of LOS relaxation and absent peristalsis. Nifedipine was used as the first line agent with symptomatic improvement in 2 of the 6 for 2—4 weeks. Botulinum Toxin (BTX) was used as second line (endoscopic injection into LOS; <2 years-50 units / quadrant, >2 years-100 units /quadrant). All 6 had good clinical response within one week, lasting up to 3 months (median 8 weeks). 4 had repeat BTX injection (2 awaiting) with similar response. Of these 3 had repeat oesophageal manometry showing a mean reduction in LOS pressure of 40mmHg (35—50) from diagnosis but no improvement in peristalsis. One has had successful surgery and the other two referred.

Discussion: This yearly incidence of achalasia is considerably higher than the 1 - 2 expected from the centre's referral population. This may be partly explained by underdiagnosis, and we suggest barium studies as a first line investigation for recurrent or acquired vomiting, dysphagia or feeding difficulties. If available, oesophageal manometry is a valuable tool for diagnosis and monitoring treatment response. Nifedipine has no benefit. To our knowledge this is the first report of the use of Botulinum Toxin in children with achalasia in the UK, and the biggest single centre use. The short lived effects warrant repeat dosage at shorter intervals or combination with other therapy e.g. balloon dilatation. Surgery remains the definitive treatment.

343 THE MISSING ¹³C LABEL IN THE MIXED TRIACYLGLYCEROL BREATH TEST IS NOT IN THE STOOL

S.C. Ling¹, C. Slater¹, T. Preston², L. Weaver¹. ¹University of Glasgow, Dept of Child Health, Yorkhill, Glasgow; ²Isotope Biochemistry Laboratory, SUERC, East Kilbride, UK

Background: The ¹³C-mixed triacylglycerol (¹³C-MTG) breath test is a measure of intraluminal fat digestion. In normal digestion 20–40% of the ¹³C label is recovered in breath. The fate of the remaining 60–80% is unknown. It may be excreted in stool, or remain in slow-turnover carbon pools within the body. In this study, we aimed to identify the proportions of the ingested label that were excreted in stool and breath following ingestion of ¹³C-MTG by children with cystic fibrosis (CF).

Methods: 8 children with CF and 2 healthy controls ingested 20 mg/kg (CF) or 10 mg/kg (control) ¹³C-MTG with a standard breakfast, and their normal enzyme replacement therapy. Breath samples were collected at baseline, then half-hourly for 6 hours and hourly for a further 4 hours. All stools were collected from baseline to day 5. CO₂ production rate was measured hourly using an indirect calorimeter. ¹³C enrichment of breath samples was measured by isotope ratio mass spectrometry (IRMS) and the cumulative percent dose recovered (cPDR) in 10 hours was calculated. Total ¹³C of the Jeejeebhoy faecal fat extract from each stool was measured by combustion-IRMS, and the ¹³C enrichment and concentration of the TBDMS derivative of octanoic acid was measured by GC/MS after hydrolysis of the fat extracts. Stool 5 day cPDR was calculated.

Results: Mean (SD) cPDR in breath was 33 (13)% for children with CF and 45% for controls. Mean (SD) cPDR in stool by

combustion-IRMS and GC/MS, respectively, was 0.66 (0.61)% and 0.26 (0.20)% for children with CF and 1.41 and 4.18% for controls.

Conclusions: Ingestion of ¹³C-MTG by children with CF is followed by almost complete intestinal absorption of the digested substrate. The label not identified in breath must remain in the body, and the variation of cPDR in breath is therefore largely due to factors other than the variation in efficiency of lipolysis.

- Slater C *et al.* Analysis of TBDMS ¹⁻¹³C-palmitic acid in stool samples by gas chromatography-mass spectrometry with electron impact ionisation: comparison with combustion isotope-ratio mass spectrometry *J Chromatog B: Biomed Sci Applic* 1998;716:1–6.

Endoscopy Posters: 344–377

344 ENDOSCOPY IN ANTICOAGULATED PATIENTS: A POSTAL SURVEY OF CURRENT PRACTICE IN WALES

K. Ragunath, L.A. Thomas, P.D. Duane. *Dept of Gastroenterology, Morriston Hospital, Swansea, South Wales, UK*

Background: In the setting of endoscopy in an anticoagulated patient, the endoscopist must assess the risk of complications related to intercurrent bleeding or thrombosis and plan the endoscopic procedure accordingly. A recent survey across the Northern region of England revealed a huge variation in practice. This is not surprising in the absence of a national guideline. Recently the American Society for Gastrointestinal Endoscopy (ASGE) has published guidelines on this subject.

Aim: To survey the current practice of endoscopy in anticoagulated patients among endoscopists across Wales using the ASGE guidelines as a benchmark.

Methods: A postal questionnaire was sent to all endoscopists identified from each endoscopy department across Wales irrespective of qualification and experience. The questionnaire was constructed based on the ASGE guidelines as follows. (1) *Procedure risk*- bleeding related to an endoscopic intervention carried out in the setting of anticoagulation, and (2) *Condition risk*- a thromboembolism event related to interruption of anticoagulation for a particular condition. *High-risk procedures were*- polypectomy, dilatation, endoscopic sphincterotomy, PEG, laser ablation/coagulation and all the rest were low risk procedures. *High-risk conditions were*- mechanical prosthetic valve, atrial fibrillation with underlying heart disease, recurrent thromboembolism and the rest were low risk conditions.

Results: A total of 90 questionnaires were sent and we received, 58 (52%) replies. There were 33 consultants, 7 middle-grade doctors, 4 general practitioners, 13 trainees and 1 nurse endoscopist. Twenty-seven (47%) respondents considered endoscopic biopsy as a high-risk procedure. Twenty-nine (50%) considered bioprosthetic valve as a high-risk condition. Twenty-four (41%) did not consider atrial fibrillation with underlying heart disease and recurrent thromboembolism as a high risk condition and 8 (14%) considered atrial fibrillation without underlying heart disease as a high risk condition. Six (10%) would not use intravenous heparin after stopping warfarin in high-risk conditions. All except 2 (3%) considered PEG as a high-risk procedure. Two (3%) would stop NSAIDs one week before high-risk endoscopic procedures.

Conclusion: Opinion was divided as to whether to take endoscopic biopsies or not in a patient on warfarin although evidence shows that the risk of bleeding in warfarinised patients is negligible provided the INR is within the therapeutic range. Likewise there is an equal division of opinion as to whether bioprosthetic valve is a high-risk condition or not. It is noteworthy that a significant proportion of respondents (41%) did not consider atrial fibrillation with underlying heart disease and recurrent thromboembolism as a high-risk condition. This survey further confirms previous evidence that there is a huge variation in practice among endoscopists in UK. There is need for a national guideline to streamline the endoscopy practice in anticoagulated patients.

345 ENDOSCOPY IN PATIENTS TAKING ASPIRIN AND WARFARIN: A SURVEY OF BRITISH SOCIETY OF GASTROENTEROLOGY MEMBERS

A. Heaney, T.C.K. Tham. *Division of Gastroenterology, Ulster Hospital Dundonald, Belfast, UK*

Patients attending for endoscopy are often on aspirin and / or anticoagulant therapy for medical reasons. Recent guidelines by the American Society of Gastrointestinal Endoscopy offer advice regarding management of these patients in the peri-endoscopic period.

Aim: To identify current practice and knowledge of guidelines in members of the British Society of Gastroenterology (BSG).

Methods: 645 questionnaires were sent to BSG members.

Results: 483 (75%) questionnaires were returned, of these 327 (68%) members performed endoscopy and were included in the subsequent analysis. 237 (72%) of questionnaires were returned from physicians, 84 (26%) from surgeons and 6 (2%) other. 305 (93%) of questionnaires were returned from the consultant grade, 14 (4%) from SpRs and 8 (3%) from others. Total number of endoscopy years experience was 5865 years, mean 18 years. 97% of members performed OGD, 92% flexible sigmoidoscopy (FS), 90% colonoscopy and 55% ERCP.

Aspirin and warfarin were discontinued for elective endoscopy by 2% and 19% of members performing OGD respectively, 4% and 21% performing FS, 8% and 40% performing colonoscopy and 17% and 73% performing ERCP. The time scale varied for stopping (1-14 days) and recommencing (0-14 days) these agents following the procedures. Members were asked if they would biopsy a patient attending for endoscopy on aspirin or warfarin, 95% and 36% would at OGD respectively, 95% and 34% would at FS and 94% and 35% would at colonoscopy. 19 members would biopsy on warfarin without knowledge of INR. 21% of members were aware of complications arising from biopsy whilst on these agents. Members were asked if they were aware of any guidelines in this area, 87% replied no, 12% yes and 1% no reply. Members were asked if they thought guidelines would be helpful, 75% replied yes, 13% possibly, 9% no and 3% no reply.

Conclusions: There appears wide variation regarding management of these patients and a lack of awareness about recent published guidelines. We feel that it is timely for local guidelines to be produced so that endoscopists' can practice evidence base medicine in this area.

346 IRON DEFICIENCY ANAEMIA IN PRE-MENOPAUSAL WOMEN

J. Sayer¹, S. Cullen¹, M. Rees¹, R. Long², R. Chapman¹. ¹John Radcliffe Hospital, Headington, Oxford; ²City Hospital, Nottingham, UK

Iron deficiency anaemia in pre-menopausal women is usually attributed to menorrhagia. However, patients with no history of menorrhagia are often referred for gastro-intestinal investigations to exclude blood loss from the gut. We looked at the usefulness of endoscopic investigations to identify aetiological factors in iron deficiency anaemia in pre-menopausal women.

All pre-menopausal women with iron deficiency anaemia referred to the gastrointestinal clinic were invited to participate. The study was approved by the local ethics committees and all patients gave written informed consent. All patients had upper gastrointestinal endoscopy, including duodenal biopsies and either colonoscopy or barium enema examination. Patients were asked to complete a seven-day, diet diary and to provide two complete menstrual blood loss collections. These were measured using the alkaline haematin method.

Abstract 346, Table 1

Cause	No. of patients
Blood donation	5
Dietary iron deficiency	12
Menorrhagia	7
Gastrointestinal causes	
Oesophagitis	1
Peptic ulceration	2
Coeliac disease	4
Colonic angiodysplasia	1
Carcinoma of colon	1
Colonic adenoma	1
Inflammatory bowel disease	2
Non-steroidal anti-inflammatory drug	1
Warfarin	1

Forty-five women took part in the study. Sixteen completed diet diaries and seventeen provided menstrual loss collections. Contributing aetiological factors are listed in the table.

Seven patients had more than one contributing aetiology and in 6 patients no aetiological cause could be identified.

We conclude that pre-menopausal women with no clear history of menorrhagia should undergo gastrointestinal investigations to rule out malignant and pre-malignant gastrointestinal disease. However, patients should also be questioned about diet and blood donation as these are also important contributing factors in the aetiology of iron deficiency in these patients.

347 DO SINISTER SYMPTOMS PREDICT SERIOUS ENDOSCOPIC FINDINGS IN DYSPPEPTIC PATIENTS?

K.E.L. McColl, L.S. Murray, D. Gillen, A.A. Wirz, A. Dickson, E. Henry, J. Fletcher. *Western Infirmary, Glasgow, Scotland, UK*

Introduction: Early endoscopy is recommended for investigating dyspeptic patients when sinister symptoms (i.e. weight loss, dysphagia, persistent vomiting, family history of gastric cancer or history of gastric surgery) are present. This is based upon the assumption that serious pathology will be more prevalent in patients with such symptoms.

Aims: To compare endoscopic findings in patients referred for investigation of dyspepsia with and without sinister symptoms.

Methods: As part of a large prospective trial, 923 patients aged <55 years referred for investigation of dyspepsia unrelated to NSAID usage, had their symptoms recorded by a standard questionnaire prior to investigation. 215 had one or more sinister symptoms and were endoscoped. Of the 708 without sinister symptoms, half were randomised to endoscopic examination as part of the trial protocol. The endoscopic diagnosis in the 215 (mean age = 38y) with and 352 (mean age = 35y) without sinister symptoms was compared.

Results: Those with and without sinister symptoms had a similar prevalence of normal endoscopy (49% vs 56%), DU (6.9% vs 8.0%), GU (4.4% vs 3.9%) and oesophagitis Gd I (12.5% vs 13.3%) and GdII (2.3% vs 2.0%) and gastric cancer (0% v 0%). In routine biopsies, low grade MALToma was found in one patient without, and subtotal villous atrophy in one patient with sinister symptoms. Serious oesophageal disease was the only finding more prevalent in those with (6/216) versus without (0/352) sinister symptoms (p<0.05). This consisted of Gd III oesophagitis, Barrett's oesophagus and oesophageal cancer in 2, 3 and 1 patient(s) respectively. Five of the 6 patients with severe oesophageal pathology had dysphagia as their sinister symptom. Dysphagia was reported by 39.5% of those with sinister symptoms. The prevalence of severe oesophageal pathology in those with dysphagia was 5/85 (6%).

Conclusions: (1) Sinister endoscopic findings are rare in the absence of sinister symptoms; (2) sinister symptoms indicate an increased prevalence of serious oesophageal pathology; (3) Dysphagia is the most important sinister symptom.

348 "DRIVERS" AND "INHIBITORS" FOR REFERRAL OF UPPER AND LOWER DIGESTIVE SYMPTOMS FROM PRIMARY CARE

P.A. Cann, C.S. Cornford¹. *South Cleveland Hospital, Middlesbrough; ¹G.P. Newlands Medical Centre, Middlesbrough, UK*

The ever increasing demand for gastroenterology (GI) services from primary care necessitates clearer understanding of primary > secondary referral dynamics. This need is made more urgent because of current initiatives to fast-track higher risk groups e.g. "2 week rule", to reduce overall waiting times and also to inform the efficient and consensual development of open access and direct booking services. Some "drivers" or triggers for referral are easy to understand and predictable—others are more subtle and may not be recognised well in secondary care. It is at least as important to identify the "inhibitors" for referral, in order to reduce the risk of our patients suffering delayed diagnosis / management.

Secretaries in 2 primary care group practices identified patients, aged 40 years or more, who had consulted with appropriate symptoms. Consecutive patients with upper (U) and lower (L) GI symptoms were noted for each GP. This produced 113 valid consultations—55 U (mean age 59 yr—60% female) & 58 L (57 yr—67% f.). 33% of U were referred (18% open access / 15% clinic) vs. 38% of L (19% / 19%).

Each GP was seen later by the GP author and asked to reconstruct decision processes, according to a structured interview with both closed and open questions. Transcripts were analysed using the software package "QSR NUD*IST", with respect to themes and categories. Some obvious drivers e.g. dysphagia & rectal mass resulted in universal referral—others had varied power (% in consultation / % > referral) e.g. weight loss (2.5% / 33%), NSAID/aspirin (13% / 14%), rectal bleeding (29% / 55%), diarrhoea (38% / 41%), patient reassurance (6% / 100%). Family history did *not* feature as a key driver. Use of time to defer decision was employed in 29% U / 19% L (> referral in 31% / 0% of those cases). Key inhibitors were (% in consultation): plausible explanation (25%), short duration (22%), long duration (11%), no weight loss (12%), no sinister features (8%), normal blood tests (6%).

Conclusion: Insights of this kind are invaluable for establishing local and national educational needs and framing primary / secondary consensual guidelines / structures. Particular concern arises from the *lack of importance attached to family history* and the degree of false security arising from the *absence* of worrying / alarm / late symptoms.

349 VARIATION IN METHODS OF INVESTIGATION FOR IRON DEFICIENCY ANAEMIA WITHIN A DISTRICT GENERAL HOSPITAL

R.C. Prudham¹, C. Babbs², L. Smith³. ¹North Manchester General Hospital; ²Hope Hospital, Salford; ³Dept of Clinical Audit, Royal Oldham Hospital, UK

Iron deficiency anaemia is a common finding across all age groups. The diagnosis may be made in any adult specialty.

Aim: To establish current methods of practice in the investigation of this condition.

Methods: The patients were identified retrospectively by identifying low serum ferritin values from haematology department work sheets over a period of 12 months between July 1996 and July 1997. Patient records were then retrieved and analysed. Investigations performed were recorded for each patient, and in the case of colonoscopy, whether a complete examination had been performed (caecal intubation). Patients under the gynaecology department and patients under 16 years were excluded.

Results: 100 patients were identified with low ferritins (age range 16–87 yrs). 83% of these were female. 20 patients were found to have a gynaecological or haematological cause for low ferritin. 52 of the remaining 80 patients underwent gastroscopy. 12 patients underwent colonoscopy, of which 7 examinations were declared as complete. 4 other patients underwent flexible sigmoidoscopy and double contrast barium enema, 2 had barium enema alone. Thus 11% of patients had documented evidence of complete colonic imaging. 3 colonic tumours were found, 5 upper GI neoplasms were found and of the 15 patients in whom duodenal biopsies were taken, 3 had histological evidence of coeliac disease.

Conclusions: A low proportion of patients appeared to be undergoing complete colonic investigations, however 2 of these patients were diagnosed with colonic cancer. Although only 15% of patients had duodenal biopsies performed, a high proportion, 20% were positive for coeliac disease. We therefore suggested a departmental protocol be devised to standardise investigation and to encourage referral for colonoscopy where there was no haematological or gynaecological cause for iron deficiency, in the absence of an upper GI neoplasm.

350 VETTING COLONOSCOPY REQUESTS CAN SUBSTANTIALLY REDUCE WORKLOAD

A.J.K. Piotrowicz, C.A. Paddon-Smith, S.J. Uren, A.A. Patel, D.S. Rampton. *The Royal London Hospital, Whitechapel, London, UK*

Background: To avoid increased waiting list lengths created by the expanding demand for colonoscopy, endoscopy units are under pressure to use resources more efficiently. One possible strategy to limit the number of colonoscopies performed would be to accept only referrals complying with previously agreed indications.

Aims: To determine whether reviewing request forms prior to booking could reduce the colonoscopy workload without overlooking serious pathology.

Methods: 162 consecutive colonoscopy request forms were analyzed retrospectively. The patient's age, sex, reason for referral and referring clinical group were recorded. The outcome of each examination was recorded from the endoscopy database. If the indication for colonoscopy was anaemia then the hospital PAS system

was searched for a record of the ferritin and red cell indices at the time of referral. The appropriateness of the indications for each request was then reviewed by a single consultant gastroenterologist blinded to the outcome of the test.

Results: 80% of requests came from GI/General Surgery clinical groups. The three most frequent indications were: change in bowel habit (25%); rectal bleeding (20%); abdominal pain (9%). These accounted for 54% of all indications. Colonoscopy was thought not to be indicated in 25(15%) of referrals when reviewed by a GI consultant. 23 of these were referred by GI/General Surgery clinical groups. Of patients judged to have an inappropriate indication 22 (88%) had a normal result at colonoscopy; the remaining 3(12%) were patients over the age of 75 who had polyps. 25(15.4%) patients were referred with anaemia. 16(64%) did not have evidence of iron deficiency and of these 1(6.25%) had angiodysplasia and 1(6.25%) had polyps. In those patients with proven iron deficiency anaemia 1(11%) had malignancy, 1(11%) had polyps and 2 (22%) had diverticulosis.

Conclusions: The vetting of colonoscopy request forms together with efforts to educate even specialist referring clinicians could substantially reduce the demand and waiting time for colonoscopies. In this hospital declining to perform colonoscopies deemed inappropriate would allow safe cancellation of 1 list of 6–7 colonoscopies every week.

351 IRON-DEFICIENCY ANAEMIA—A NURSE LED CLINIC AND THE 2 WEEK WAIT

A.J.M. Davis, D. Bowman, H.A. Shepherd. *Royal Hampshire County Hospital, Winchester, Hampshire, UK*

Introduction: Studies suggest that iron-deficiency anaemia (IDA) is caused by gastrointestinal malignancy in 10–20% of cases. In 1998 an analysis of historical data from our institution revealed that 20 patients with gastrointestinal cancer who were initially referred with IDA had an average wait of 11 weeks (median 8 weeks) from referral to diagnosis. In December 1998 we therefore established a nurse led IDA clinic and here we evaluate the results of the first 100 patients.

Methods: Local GPs were notified of the new clinic and were encouraged to refer patients directly. The patients were seen by a clinical nurse specialist who followed an established protocol to elicit a medical history and undertake a limited physical examination. Following discussion with a Consultant Gastroenterologist appropriate investigations were initiated.

Results: All 100 patients were seen within 2 weeks of referral. 15 patients had no further gastrointestinal investigations (5 refused investigation, 2 had prohibitive co-morbidity and 8 were referred directly to other specialists because of normocytic anaemia, menorrhagia and recurrent epistaxis). Of the 85 patients investigated 73 (86%) had an OGD and colonic investigation (67 had colonoscopy and 6 had barium enema). 8 patients with obvious symptoms or signs (eg. dysphagia) had only the relevant area investigated and 4 patients with clinical features of small bowel disease had an OGD and barium follow-through study.

All patients had initial investigations within 6 weeks. At initial assessment 15 patients were thought to have worrying symptoms or signs and were investigated within 2 weeks. Overall nineteen patients were found to have gastrointestinal cancer (17 colonic, 2 oesophageal). In these 19 patients the mean time from GP referral to diagnosis was 4 weeks and 79% had a diagnosis within 3 weeks.

Conclusion: This nurse-led open access IDA clinic greatly improved our referral to diagnosis time for patients with gastrointestinal malignancy. As recent recommendations include IDA is an indication for urgent referral (i.e. within 2 weeks) we would suggest other institutions audit their IDA data and consider developing such a service.

352 WHAT IS THE OPTIMAL CLINICAL BACKGROUND FOR A NURSE ENDOSCOPIST?

J. McCallum¹, H. Ellis², P.S. Rooney¹. ¹Royal Liverpool University Hospital, Prescot Street, Liverpool; ²University of Central Lancashire, UK

Introduction: There has been some debate regarding the most appropriate clinical background for nurses undertaking endoscopy, with some coming from an endoscopy-unit background and some who are colorectal nurses with no previous endoscopy experience. A six-month course was developed to facilitate the theoretical knowledge and practical skills relating to flexible sigmoidoscopy and

the management of colorectal diseases. The hypothesis was that the endoscopy nurses would produce better results in relation to the endoscopic skills but that the colorectal nurses would demonstrate a better understanding of colorectal disease management.

Methods: Retrospective analysis was undertaken to establish whether the nurses' clinical background determined probable success in different aspects of the course. Results of three theoretical assessment methods were used to ascertain whether any difference existed between the two groups. Two of these methods assessed endoscopic skills theory, (an oral viva and written exam), and a short answer exam was used to test knowledge of colorectal disease. The mean scores for each assessment method were noted for the two groups. The course had a total of 23 students of which 12 were colorectal nurses and 11 endoscopy nurses. Three were male, of which two were endoscopy nurses, as were nine of the 20 females. The ages ranged from 25–49 with a mean of 36 years.

Results: No significant difference existed between the two groups in the endoscopy assessments. However there was statistical significance in the colorectal module results with $p = 0.0284$.

Conclusion: Whilst there was no significant difference between endoscopy and colorectal nurses in their ability to deal with theoretical issues related to endoscopy, there was a variation regarding colorectal disease management that can be linked to clinical background with the colorectal nurses demonstrating a greater depth of knowledge in this area. These findings would support the view that colorectal nurses, with no previous experience of working in an endoscopy-unit setting, can make capable nurse endoscopists whilst also possessing an in-depth knowledge of colorectal disease management.

353 THE DEVELOPMENT OF A NURSE LED PRACTICAL TRAINING PROGRAMME FOR TRAINEE NURSE ENDOSCOPISTS

M.Vance¹, A. Field², D.J. Swain¹, B.P. Saunders¹. ¹Wolfson Unit for Endoscopy, St Mark's Hospital, Watford Road, Harrow, Middlesex; ²St Mark's Hospital, Watford Road, Harrow, Middlesex, UK

Background: Currently trainee nurse endoscopists must perform a minimum of 100 endoscopic procedures under Consultant supervision prior to providing an autonomous endoscopy service. There are currently recognised documented difficulties with facilitating adequate training for clinicians in endoscopic practice due to a shortage of protected training sessions. This shortage has meant that trainee nurse endoscopists are not having individual protected training sessions but are competing with registrars for training slots.

Aims: To assess the ability of a trained nurse endoscopist in flexible sigmoidoscopy and colonoscopy to replace the Consultant as principle trainer, providing a complete practical training programme for trainee nurse endoscopists.

Methods: 2 trainee nurse endoscopists, with no previous experience of endoscopy, received practical flexible sigmoidoscopy training from the nurse endoscopist for all procedures. At set intervals the trainee attended consultant lists for assessment of skills and endoscopic knowledge. All procedures were video recorded. On completion of the training programme an expert panel blindly assessed 10 of the complete procedures for assessment of accuracy and endoscopic technique on withdrawal using the published Rex scoring system.

Results: The nurse trainees have completed their training programme. All videos assessed by the expert panel were passed for accuracy and endoscopic technique on withdrawal, mean overall pass rate 26.25 (75%) (maximum score = 35).

Conclusion: The nurse endoscopist is effective as principle trainer for trainee nurse endoscopists in providing a complete practical training programme in flexible sigmoidoscopy.

354 PERFORMANCE AND COMPLICATIONS OF UPPER GASTROINTESTINAL ENDOSCOPY BY A CLINICAL NURSE SPECIALIST

M.A. Watson, P.M. Matthews, J. Quinlan, P.J. Jeffery, P.F. Down. Dept of Gastroenterology and Gastrointestinal Surgery, West Dorset Hospitals NHS Trust, Williams Avenue, Dorchester DT1 2JY, UK

Introduction: There are few published data regarding the ability of a clinical nurse specialist to perform upper GI endoscopy. In our unit a nurse practitioner was trained in gastroscopy in accordance with the guidelines of the BSG, the UKCC, and Trust policy. We describe our experience of 2038 cases performed in the first 3 years by a single nurse.

Methods: The cases were identified from the reporting software Endoscribe, 30 day complications from hospital activity from the patient administration database and patient notes, and all pathology for the 2038 cases recovered and scrutinised.

Results: Only 16% of patients had sedation, 94% of these having Midazolam 5mg or less. In 36 people (1.8%) intubation failed (1 pouch, 1 tumour), intubation was achieved in 6 out of 11 repeated. A second opinion was requested on 34 cases and in 13 people a repeat was required for clarification. 2 people had chest infections, 4 people had angina, and 1 had heart failure. 3 deaths may have been related to endoscopy: 1 MI, 1 collapse, and 1 rebleed – all patients over 90 years of age. 17 people had cancer: in 5 people this was only diagnosed at a scheduled repeat: in 3 of these it may have been seen but not recognised, but a repeat ordered nevertheless.

Discussion: Low rates of sedation may have minimised sedation related complications. Morbidity and mortality were within recorded rates for medical endoscopists. The observed death rate from cardio-respiratory causes was no higher than expected for the population. With appropriate supervision and cautious protocol upper GI nurse endoscopy can be effective and safe.

355 AUDIT: TO DETERMINE THE DEGREE OF INFORMED CONSENT IN PATIENTS ATTENDING A DGH DAY UNIT FOR OGD, COLONOSCOPY OR FLEXIBLE SIGMOIDOSCOPY

L. Williams, H. Behi, M.J. Dew. Gastroenterology Unit, Prince Philip Hospital, Llanelli SA14 8QF, UK

Achieving informed consent is not an isolated event and should ideally be obtained by the endoscopist prior to the test date and include written material. Effective communication of sufficient information is necessary. This audit examines the degree of consent in competent adults attending a day unit.

109 patients were interviewed after giving written consent (67 day case, 42 open access endoscopy). 97% understood which investigation was being performed and the site to be examined. 66% acknowledged that they had received written information (75% by letter) but all were appropriately prepared for an investigation. 93% said they had spoken to a health care professional (78% to a nurse) but each had signed a consent form with a doctor. 88% had good understanding of what was to happen during the test and 90% following the test. 34% had poor understanding of the benefits of the test (40% of open access patients, 33% of day cases). 75% had little or no idea of any associated risks (80% of open access patients, 70% of day cases).

Conclusion: The audit demonstrated patients' poor understanding of the benefits and risks of procedures, especially for the open access service. Improvements should include consent forms containing this information being sent to patients. Consent needs to be multidisciplinary, involving the referring clinician, endoscopic nurses as well as the endoscopist.

356 A PROSPECTIVE COMPARISON OF THE BSG AND A STANDARD NHS MANAGEMENT EXECUTIVE CONSENT FORM FOR ENDOSCOPY

A.J. Brooks, S. Pathmakanthan, M.E. McAlindon. Gastroenterology and Liver Unit, Royal Hallamshire Hospital, Sheffield, UK

Background: There is a move toward providing more information to enable informed consent. An example consent form recently published by the BSG is more explicit in outlining risks of endoscopic procedures than previously used forms (Gut, 1999).

Aims: To compare patients' attitudes to the BSG consent form with those to a standard NHS Management Executive (operation consent) form.

Methods: Consecutive patients were given written information quantifying complications and asked to study the two consent forms after having their procedure.

Results: 140 gastroscopy and 57 colonoscopy patients were studied (52% male, median age 53 (range 19–93)). 61% of gastroscopy and 46% of colonoscopy patients felt that the right amount of information was given on the BSG compared to 36% ($P < 0.001$) and 18% ($P = 0.001$) respectively on the standard NHS form. 29% of gastroscopy and 53% of colonoscopy patients felt that insufficient information was given on the BSG form, compared to 56% ($P < 0.001$) and 61% (NS) respectively on the standard NHS form. Only 1% of colonoscopy patients felt that the BSG form contained too much

information, compared to 21% for the NHS form ($P=0.001$). 32% of gastroscopy and 61% of colonoscopy patients wanted to know about uncommon complications (<0.1%). The patients had all been consented using the BSG form which lists all endoscopic procedures and their risks: this confused 30% of gastroscopy and 62% of colonoscopy patients. However 60% of gastroscopy ($P<0.001$) and 67% of colonoscopy patients ($P<0.001$) preferred the BSG to the standard NHS consent form.

Conclusions: 1) Patients want more information about the risks of endoscopic procedures in order to provide informed consent. 2) More patients felt that the BSG form provided adequate information. 3) The example BSG consent form may need further clarification to avoid confusion over which procedure is being performed, but in spite of this, 4) patients preferred the BSG to the standard NHS consent form.

357 SELF EXPANDABLE METAL STENTS (SEMS) FOR MALIGNANT AND BENIGN COLONIC OBSTRUCTION

N. Suzuki, M. Marshall, A. Akle, S. Halligan, B.P. Saunders. *Wolfson Unit for Endoscopy, St Mark's Hospital, Watford Road, Harrow, Middlesex, UK*

Background: SEMS have been described as a useful procedure for both palliation of malignancy and as a "bridge to surgery" in acute obstruction. Little data exists on their use in benign obstruction.

Methods: A retrospective case note review was performed of all patients who had undergone colonic stent insertion (CSI) over a 45-month period (Dec 1996-Sep 2000). The site/nature & degree of obstruction (partial or complete), type of stent used, rate of successful decompression (symptomatic resolution/radiological improvement), complications (early (<30 days), late), and long-term stent patency were recorded.

Results: CSI was performed in 21 patients using a combined endoscopic/radiological approach. The majority of patients had acute malignant obstruction secondary to a left-sided tumour (18) (4 complete; 14 partial) with a partially obstructing lesion in the transverse colon in one case. 2 patients had benign disease, one with a post-surgical stricture after sigmoid colectomy for diverticular disease and one with a descending colon Crohn's stricture. Strictures were successfully negotiated in 18/21, in 3 cases the stricture was reached but a guide-wire could not be passed. In the 18 successful cases, initial guidewire passage across the stricture was achieved through-the-scope in 16 but only with the use of semi-steerable angiographic catheters in 2 cases. Types of stent used: Wallstent® (10), Ultraflex® (5) and Bard® memotherm stent (3). Successful colonic decompression was achieved in 100%. Early complications occurred in 6/18 patients (33%) (stent migration (3), perforation (requiring sigmoid colectomy) (1), minor self-limiting rectal bleeding (1) and focal ulceration (1)) with late complications in 2/18 (11%) cases due to re-obstruction (150 and 425 days post-procedure). In both cases repeat stent insertion was successful. Of the 18 patients in whom stent insertion was successful 6 remain alive (2 benign stricture; 4 malignant) with 2 patients having had radical surgery (median follow-up 6 months (1-12)). In the 12 patients who died (median survival 4.5 months (2-17)) the stent remained patent without further obstructive episodes.

Conclusions: In our experience stenting is a useful procedure both for treatment of colonic malignant obstruction and for selected cases of benign obstruction. A high technical success rate for stent deployment can be achieved with a combined radiological/endoscopic approach.

358 EXPANDABLE METALLIC STENTS—EFFECTIVE PALLIATION OF MALIGNANT PYLORIC AND DUODENAL OBSTRUCTION

A. Shand¹, D. Grieve², J. Brush², K. Palmer¹, I. Penman¹. ¹Gastrointestinal Unit and ²Dept of Radiology, Western General Hospital, Edinburgh EH4 2XU, UK

Introduction: Vomiting due to malignant obstruction of the pylorus or proximal small intestine is an extremely distressing symptom and almost impossible to palliate pharmacologically. Patients are often unfit for even minimally invasive bypass surgery. We present our initial experience of self-expanding metallic stents which offer a non-surgical alternative.

Patients: Between April 1999 and August 2000, 11 patients (6 male, mean age 67.5 yrs, range 55-87), presented terminally-ill with

intractable vomiting due to malignant pyloric or duodenal obstruction. All patients were deemed unfit for surgical bypass procedure.

Methods: Outcome measures were time to discharge post-procedure, overall survival time, percentage of survival time spent out of hospital, and need for readmission or repeat procedures. Hospital records were examined for this information. This was augmented by telephone inquiry to patients GP and to the local Hospices. In all cases, a Wallstent enteral® stent (Boston Scientific) was inserted under sedation using a combined endoscopic and fluoroscopic approach.

Results: There were no complications of stent insertion. Mean time to discharge was 12.6 days (range 4-55). Mean survival 71.7 days (18-159) with a mean 69% (13-100) of that time spent outwith hospital. 6/11 patients required readmission to hospital or hospice, 3 due to vomiting. There were 3 stent failures, 2 requiring balloon dilatation, 1 re-stent with a covered Ultrastent®. 5/11 patients required no further inpatient care.

Discussion and conclusions: The combined endoscopic/fluoroscopic procedure was easy to perform and well tolerated. Our stent failures were due to an exuberant, hyperplastic mucosal reaction rather than tumour recurrence. The uncovered Wallstent® offered excellent results in these cases. Patients can be discharged promptly and cared for at home during their final illness. The precise role of palliative stenting is poorly defined and we suggest that there is a need for a randomised, multi-centre trial of enteral stenting versus minimally invasive surgical bypass.

359 ERCP TRAINING IN THE UK AT PRESENT AND THE LIKELY IMPACT OF JAG RECOMMENDATIONS

I.A. Murray, S. Pathmakanthan, R. Heeley, M.T. Donnelly. *Dept of Gastroenterology, Northern General Hospital, Herries Road, Sheffield S5 7AU, UK*

Background: To improve endoscopy training in the UK, the Joint Advisory Group on Gastrointestinal Endoscopy (JAG) have published guidelines which must be satisfied before an endoscopy unit is accredited for training. This study determines the likely impact of these guidelines for endoscopic retrograde cholangiopancreatography (ERCP) training.

Method: An anonymous postal survey of 292 Endoscopy Units to determine whether the Unit provided training in ERCP and its compliance with JAG recommendations.

Results: 178 Units replied (61.0%), 151 (84.8%) of whom were performing ERCPs. The service was almost exclusively Consultant led, mainly by gastroenterologists (63.1%) but also surgeons (33.5%) and radiologists (3.4%). 73% of Units provide ERCP training, although less than 50% of these perform 250 procedures per annum, the minimum number required for accreditation for ERCP training by JAG. 56.9% of ERCPs performed were therapeutic. 61.6% of DGHs and 75.5% of teaching hospitals provide training in ERCP. The number of trainees per centre was related to the number of procedures performed annually. Of those Units which perform the required number of ERCPs, 80% hold regular radiology meetings, another requirement for JAG accreditation. Most Units plan to continue providing ERCP.

Conclusions: Most Endoscopy Units in the UK provide ERCP training, but if JAG recommendations become mandatory, only a few centres will be permitted to continue, resulting in future restrictions in the number of trained ERCP practitioners. The numbers of ERCPs performed and hence accredited centres, may be further reduced by the increasing use of MR cholangiopancreatography.

360 AUDIT OF ERCP IN A SMALL UNIT

P.J. Mullen. *The Princess Elizabeth Hospital, Guernsey*

Guernsey has a population of about 60,000, which would be expected to produce an approximate annual requirement of only 40 ERCPs. In order to assess whether such a small number of procedures is adequate to maintain acceptable standards, audit, with particular reference to success and complication rates, has been performed ever since ERCP was established as a core service in April 1996.

From 1st April 1996 to 10th October 2000, 156 patients underwent 213 procedures (47 per year). These comprised 156 prime indications, 30 clinically indicated repeats, e.g. stent change, and 27 repeat attempts after initial failure. All but 5 procedures were performed by a single operator.

The mean age (range) was 67.5 (15–100) years, with 23.7% aged 80 or more. 66.0% were female patients. The main indications were: choledocholithiasis (54.1%), neoplasia (18.9%) and pancreatitis (7.5%). 114 (73.1%) of the patients received therapy (ES 77, stent 37).

A success was defined as full completion of diagnostic/therapeutic aims. There were 186 indications, of which 141 (75.8%) were successfully managed at the first-attempt. A further 22 were successfully managed following repeat attempts, giving an overall success-rate of 87.6%. Annual success-rates have risen to a plateau of approximately 82% and 91% respectively.

Complications have occurred in 17 cases (8.0%), of which 4 (1.9%) have been severe and 1 (0.5%) fatal. The incidence of pancreatitis has been low (4, 1.9%), with only one case being severe. There has, however, been a relatively high incidence of severe post-ES bleeding (3/77, 3.9%). There have been 4 cases of sepsis (1.9%) and 3 perforations, only one of which was clinically significant. The fatality was a consequence of respiratory arrest in a patient with severe acute pancreatitis.

In conclusion, ERCP can be performed in a small unit with success and complication rates that compare favourably with published data.

361 A ONE YEAR 30 DAY AUDIT OF DAY CASE ERCP SHOWS IT TO BE SAFE AND COST EFFECTIVE PROVIDED A SIMPLE 6 HOUR POST PROCEDURE DISCHARGE PROTOCOL IS FOLLOWED

D. Nylander¹, H.C. Mitchison¹, G.D. Bell². ¹Dept of Gastroenterology, Sunderland Royal Hospital, SR4 7TP; ²Medical Sciences Faculty, Sunderland University, UK

Background: A recent North American ERCP study of same-day discharge endoscopic biliary sphincterotomy (ES) provides a helpful (if rather complicated) multivariate risk analysis for complications. Their readmission rate following ES was 12%, with 79% of complications occurring within 6 hours of the procedure (*Gastrointest Endosc* 1999;49:580). Day case ERCP is not common practice in the UK. No guidelines based on British experience exists as to the optimal post procedure period of observation.

Aims: To prospectively audit our Day case ERCPs in which we used a simple 6 hour post procedure discharge protocol.

Methods and results: From 1 May 1999 to 31 April 2000, our unit (DGH serving a population of 330,000) carried out 221 ERCPs. We carried out a 30 day post procedure audit of the 70 patients deemed suitable for the procedure to be performed as a day case. These 70 patients 1) had all been seen in outpatients, 2) lived within a 30 min car drive of the hospital and 3) had a sensible adult to overnight. The 70 patients had a total of 89 ERCPs of which 53 (59.6%) were therapeutic (35 ES, 18 stent insertions and 3 mechanical lithotripsies). The nurses on the Day Ward had instructions to report any significant abdominal pain or worrying change in vital signs to the medical team and send off a serum amylase and Hb request if necessary. They fed the patients 4 hours post procedure and 2 hours later, ask the gastroenterology team to confirm fitness for discharge. 9 patients required admission during the 6 hour observation period (pancreatitis 5, cholangitis 2, bleeding 1 and pain and vomiting 1). The readmission rate was only 1/89 (1.1%) and occurred in a patient who bled 3 days post ES.

Conclusion: Day case ERCP in selected cases is safe and cost effective. Our simple protocol ensures that a) most complications are detected in the 6 hours post procedure and b) readmissions are infrequent.

362 PUSH ENTEROSCOPY IN COELIAC DISEASE, ENDOSCOPIC AND HISTOLOGICAL FINDINGS

M. Priest, J.F. Mackenzie, A.J. Morris. *Dept of Gastroenterology, Royal Infirmary, Glasgow, UK*

Introduction: Endoscopic small bowel biopsy is the investigation of choice in the investigation of coeliac disease (CD) and the endoscopic appearances of this condition are well documented. We report a retrospective review of appearances at push enteroscopy compared with the histological results of biopsies taken during those procedures.

Methods: 97 procedures were carried out on 78 patients (27 male, 51 female, mean age 50.7 years) with CD. The indication for enteroscopy was: investigation of malabsorption n=18, repeat small bowel biopsy n=57, and refractory sprue n=22.

Results: Comparison of enteroscopic appearances with histology:

Abstract 362, Table 1

Enteroscopic appearances	Histology		
	Histologically normal (n=11)	Minor villous blunting (n=31)	Subtotal villous atrophy (n=55)
Normal	6 (54.5%)	12 (38.7%)	2 (3.6%)
Mild features of CD	4 (36.4%)	8 (25.8%)	2 (3.6%)
Classical features of CD	1 (9.1%)	11 (35.5%)	51 (92.7%)

Ulceration was seen in 8 patients (10.3%) of which 6 were being investigated for refractory sprue. In 5 cases the histological diagnosis was enteropathy associated T cell lymphoma (EATL), 2 patients had ulcerative jejunitis (UJ), and 1 patient had an adenocarcinoma in the proximal jejunum. In only 1 case (12.5%) was ulceration identified within reach of a standard endoscope.

Conclusions: Push enteroscopy is a useful tool in the management of CD. The classical endoscopic features of CD are recognised throughout the proximal small bowel, however minor changes in villous architecture remain more difficult to detect endoscopically. Small bowel biopsy remains essential for diagnosis and disease follow up. Enteroscopy is particularly useful in the investigation of patients with suspected complications of CD (EATL, UJ and small bowel adenocarcinoma).

363 A SIMPLE GRADING SCALE TO ASSESS ERCP TECHNICAL DIFFICULTY: AN ATTEMPT TO PRODUCE QUALITATIVE OUTCOME DATA

K. Ragunath¹, L.A. Thomas¹, W.Y. Cheung², D.G. Richards³, P.D. Duane¹. *Depts of ¹Gastroenterology, ²Radiology and ³School of Postgraduate Studies, Morriston Hospital, Swansea, UK*

Background and objective: ERCP is a highly advanced endoscopic procedure that requires considerable training and experience to perform effectively and safely. It varies from a simple diagnostic to a highly specialised interventional procedure. Simple outcome measures such as success and complication do not reflect the actual competence of the department doing these procedures. A grading scale to assess the technical difficulty can improve the accuracy of outcome data.

Methods: A technical difficulty grading scale for ERCP procedures was constructed and applied prospectively to all ERCP procedures over a 12 month period. Grade I: simple diagnostic, Grade II: standard biliary sphincterotomy, balloon sphincteroplasty, removal of extra-hepatic stones $\leq$ 1 cm using basket or balloon, Grade III: precut sphincterotomy, large stones $>$ 1cm, intrahepatic stone removal, mechanical lithotripsy, stricture dilatation, cytology, stent/nasobiliary drain insertion, Grade IV: sphincter of oddi manometry, ERCP after Billroth II surgery, combined procedures (PTC & ERCP) other advanced bile duct therapeutic procedures and all pancreatic duct therapeutic procedures.

Results: There were 306 ERCPs in 243 patients from 1st Sept'99 to 30th Aug'00, male: 162, female: 194, age range 17–97, mean 70 years. Overall success of 241 (79%) with complications in 13 (4%): bleeding 5 (1.6%), cholangitis 1 (0.3%), pancreatitis 5 (1.6%), perforation 2 (0.7%). Success rate was highest for Grade I 48/55 (87%), followed by Grade II and III 186/240 (78%) compared to Grade IV procedures 7/11 (63%). Our findings indicate a statistically significant linear trend towards a lower success rate from Grade I to IV ($p = 0.045$). Complications were similarly low in Grade I, II and III procedures 12/295 (4%) compared to Grade IV procedures 1/11(9%). However, the numbers were too small for test of statistical significance.

Conclusion: Success and complications in ERCP are influenced by technical difficulty of the procedure. Further validation work is needed for this grading scale. Outcome data incorporating a grading

Abstract 363, Table 1

Procedure	Number (%)	Success (%)	Complications (%)
Grade I	55 (18)	48 (87)	2 (4)
Grade II	87 (28)	65 (75)	3 (5)
Grade III	153 (50)	121 (79)	7 (5)
Grade IV	11 (4)	7 (63)	1 (9)
Total	306	241 (79)	13 (4)

scale such as the one used in this study gives more accurate information when auditing the qualitative outcomes of ERCPs performed. This can provide a platform for structured objective evaluation.

364 EMERGENCY (OUT OF HOURS) UPPER GI ENDOSCOPY SERVICE IN THE UK

J.L.H. Wong, S.H. Hussaini, H.R. Dalton. *Cornwall Gastrointestinal Unit, Royal Cornwall Hospital, Cornwall, Peninsula Medical School TR1 3LJ, UK*

Background: There are few data on the availability of emergency endoscopy out of normal working hours in the UK. The aims of this study were to find out: (i) the number of endoscopy units providing out of hours endoscopy and (ii) the practical issues of running the service.

Methods: A postal questionnaire was sent to 470 consultant gastroenterologists working in 268 Hospital endoscopy units. Some questionnaires were also distributed at local and international gastroenterology meetings. The questionnaire specifically addressed the number of units providing emergency endoscopy (outside 9am-5pm Mon-Fri), staffing of on-call rota, written request guidelines, facilities for endoscopy, specialised nursing support and reasons for delay in establishing a formal service.

Results: 295 (63%) questionnaires were returned, of which 282/295 (96%) respondents from 188/268 (70%) units were suitable for analysis. In total 162/188 (86%) units perform emergency endoscopy: (i) informal on call rota (n=86) with a mean number of gastroenterologists per unit of 2 and (ii) formal on-call rota (n=76) with 3 gastroenterologists per unit. In contrast, in the 26 Units with no emergency out of hours endoscopy service, the mean number of gastroenterologist was 2 per unit. Manpower for the on-call rota consists of consultant medical gastroenterologists (142/162 units) and/or gastrointestinal surgeons (106/162) with 8 (5%) units staffed by non-consultants alone. Written guidelines for emergency endoscopy request were present in 80/162 (49%) units. 18 units have fixed week-end lists, with 5 operating both Saturday and Sunday. Emergency endoscopy takes place in endoscopy units in 90 (56%) units and/or operating theatre 92 (57%). On-call endoscopy nursing support was available only in 72 (44%) units. The major reasons for deferring a formal on-call service (n=63) were: (i) lack of medical manpower (37%), (ii) lack of nursing support (27%) (iii) lack of funding (30%).

Conclusions: Less than 50% of endoscopy units in the UK have a formal arrangement for emergency (out of hours) endoscopy. The factors negatively influencing development in this area include: (i) lack of funding (ii) medical and nursing manpower issues.

365 A REALISTIC PHANTOM OF THE OESOPHAGUS FOR 3D ENDOSCOPIC ULTRASONOGRAPHY

S. Inglis¹, K.V. Ramnarine¹, R. Watson¹, J.N. Plevris². ¹Dept of Medical Physics, ²Centre for Liver and Digestive Disorders, University of Edinburgh, Royal Infirmary of Edinburgh, Edinburgh EH3 9YW, UK

Introduction: EUS is now an established modality for staging of upper GI malignancy. There is a need for a multi-purpose phantom for quality assurance, teaching, and research.

Aim: The development and evaluation of an anthropomorphic oesophageal phantom for endoscopic ultrasound B-mode and 3D imaging.

Methods: An agar based tissue mimicking material was used to construct the phantom. Different combinations of the Al₂O₃ (3 and 0.3µm) and SiC (400 grain) particles were used to produce the layers of the oesophagus. Two, 3 and 5 mm cylindrical channels were constructed to assess calliper accuracy. Cylindrical spirals, cones and ellipsoids were used to mimic the tumours, cysts and lymph nodes. The Olympus EU-M30 / GF-UM20 scope were used to acquire images at 7.5 and 12 MHz. Image sensitivity and contrast measurements were performed on the B-mode images and were assessed visually. 3D volumes were reconstructed from the B-mode images of the structures within the phantom and a comparison was made between the actual and measured 3D volumes. The acoustical properties of the phantom components were assessed using a scanning acoustical macrocope and the pulse echo substitution technique for attenuation and speed of sound measurements.

Results: A realistic 3 layer model of the oesophagus was constructed, with acoustical properties of the phantom components between 0.1-0.5 dB/cm.MHz for the attenuation, relative backscatter

power between -6 to 10 dB relative to the normal tissue mimic, with speed of sound of 1540 m/s. Calliper measurement by the endoscopist resulted in a maximum error of 5% from the true diameter. The sensitivity of the image was high enough for a 2mm diameter fluid filled channel to be clearly observed in the image obtained by scanning. 3D representations of the phantoms were volume rendered from the B-mode images and preliminary volume measurements of the objects resulted in a maximum error of 5%.

Conclusions: The phantom had appropriate acoustical properties and produced images similar to those obtained during actual patient scanning. Our phantom can provide a practical standard for quality assurance, teaching, and 3D research.

366 FLEXIBLE SIGMOIDOSCOPY IN SYMPTOMATIC PATIENTS - THERE ARE SIGNIFICANT BENEFITS TO USING A PAEDIATRIC COLONOSCOPE IN FEMALE PATIENTS

G.D. Bell¹, I. Crighton², J. Corson³, K. Burn³, J.S. Bladen⁴, S. Dogramadzi⁵, C. Allen⁶, R.S. Rowland⁶, W. Atkin⁷. ¹Sunderland University Medical Sciences Faculty; ²Dept of Surgery, Sunderland Royal Hospital; ³School of Computing, Engineering and Technology, University of Sunderland; ⁴JSB Medical Systems Ltd, Sheffield; ⁵Dept of Electrical and Electronic Engineering, Newcastle University; ⁶School of Information Systems, University of East Anglia, Norwich; ⁷St Marks Hospital, London, UK

Background: Flexible sigmoidoscopy (FS) is used to investigate colorectal symptoms as well as for CRC screening. Women experience more pain and have a lower insertion depth than men.

Aims: To establish if using a 'floppier' paediatric endoscope conferred any benefit over an adult colonoscope in symptomatic patients.

Methods: Flexural rigidity measurements confirmed that the Olympus 11.2 mm diameter PCF240I colonoscope (P-C) was significantly 'floppier' (P<0.001) than either the Olympus CF240L or CF230L adult colonoscopes (A-C). We conducted a trial of 'Fast Track' surgical FS in 210 patients allocated alternatively to P-C or A-C. Magnetic Endoscope Imaging plus 'painometer' was used to study depth of insertion, anatomical segment of the colon reached and number of episodes of discomfort/pain.

Results: There were 99 patients in the P-C group (52 female) and 100 in the A-C group (41 female) (11 exclusions). Female patients had more pain (P<0.0002) and a lower median insertion depth (P<0.0001) than males. In a) all females and b) those with a hysterectomy the P-C permitted a greater insertion depth (P<0.02 and P<0.001, respectively) than the A-C.

Conclusion: At FS, the use of floppier instruments such as the P-C merits more detailed evaluation especially in women with a past history of pelvic surgery.

367 EVALUATION AND VALIDATION OF A VIRTUAL REALITY BASED FLEXIBLE SIGMOIDOSCOPY TRAINER

V.K. Datta, M. Mandalia, S.D. Mackay, A.W. Darzi. *Academic Surgical Unit, Imperial College School of Medicine, St Mary's Hospital, London, UK*

Introduction: Gastrointestinal endoscopy is currently taught by hands on training in the clinical setting. There are no adequate cadaveric or synthetic models to facilitate training. The Pre-Op (HT Medical) is a computer based virtual reality simulator for flexible sigmoidoscopy. It is able to record many different parameters of performance. There are six clinical modules.

Methods: Forty-five subjects participated in the study divided into three groups: novice (never performed lower GI endoscopy), intermediate (between 5- 50, median 30), and trained (more than 200, median 747). Subjects received identical familiarisation and training on simulation modules 1 and 2, and were then assessed on module 4, which they attempted three times. Results are expressed as the geometric mean and 95% confidence intervals. Mann-Whitney U tests were used to compare each of the groups in turn.

Results: There was a significant difference between all three groups with respect to % mucosa visualised procedural time and the efficiency ratio (%mucosa/ time). In addition, the novice group had a lower instrument path length score compared to the other two groups.

Conclusions: The results show that the Pre-Op virtual reality simulator is a valid discriminator of flexible sigmoidoscopic experience. Its effect on training needs to be explored.

Abstract 367, Table 1

	Time (sec)	% mucosa visualised	Path length (cm)	Efficiency ratio
Trained (T)	288 (158-604)	84.8 (75.5-94.1)	166 (76-245)	0.32 (0.19-0.50)
Intermed (I)	319 (157-481)	77.8 (66.5-89.1)	139 (37-241)	0.29 (0.14-0.43)
Novice (N)	475 (199-751)	71.0 (63.6-78.4)	80 (28-132)	0.16 (0.05-0.27)
Mann-Whitney	NvI p<0.01 IvT p<0.01	NvI p<0.01 IvT p<0.01	NvI p<0.01	NvI p<0.01 IvT p<0.05

368 THE IDEAL FLEXIBLE SIGMOIDOSCOPE? A RANDOMISED PROSPECTIVE COMPARISON OF THREE INSTRUMENTS OF VARYING FLEXIBILITY

S.G. Shah¹, H.J. Pearson², B.P. Saunders¹. ¹Wolfson Unit for Endoscopy, St Mark's Hospital, Watford Road, Harrow, Middlesex; ²Diana, Princess of Wales Hospital, UK

Background: Most endoscopists perform flexible sigmoidoscopy using a 60cm instrument with the aim of reaching at least the descending colon, if not the splenic flexure. In reality, the descending colon is infrequently visualised (<40% of the time), with failure to examine the entire sigmoid colon, in up to 24% (*Endoscopy* 1999;31:227-31).

Aims: To compare anatomical depth of insertion and patient discomfort, using a conventional 60cm flexible sigmoidoscope (60FS), a standard 130cm paediatric colonoscope (PC), and a 100cm 'ultra-flexible' narrow calibre Olympus prototype endoscope (100FS), at routine non-sedated flexible sigmoidoscopy.

Methods: Consecutive non-sedated flexible sigmoidoscopy examinations were randomised to be performed using one of three instruments (60FS, PC, 100FS). All patients were prepared using two sachets of Citramag (35g magnesium citrate) & a low-residue diet for 24hr. Using MEI the anatomical depth of insertion after 60cm of instrument had been inserted, and the maximum insertion depth was determined. Patient discomfort was scored using a 100mm VAS.

Results: 52 consecutive patients were studied, 18 randomised to 60FS (7 male, mean age 53.3yr [sd 10.6]), 17 to PC (8 male, mean age 56.2yr [sd 13.1]), and 17 to 100FS (8 male, mean age 59.3yr [sd 18.3]). After 60cm of instrument had been inserted, the descending colon (DC)/splenic flexure (SF) was reached in 3/18 (17%) patients in the 60FS group, 9/17 (53%) patients in the PC group, and in 10/17 (57%) patients in the 100FS group (p=0.0231). Failure to examine the entire sigmoid colon (ie. to reach the sigmoid-descending junction) occurred in 8/18 (44%) patients in the 60FS group due to either pain (6) or atypical spiral looping (2) in association with previous hysterectomy/diverticular disease, in 3/17 (18%) patients in the PC group due to pain (1), atypical spiral looping (1) or looping within a long sigmoid colon (1), and in 3/17 (18%) patients in the 100FS group due to looping in a long sigmoid colon (2) and pain (1). (p=0.1464). Mean patient pain scores were similar in the 3 study groups.

Conclusions: Both the paediatric colonoscope and the 100cm narrow calibre, 'ultra-flexible' endoscope perform significantly better than standard 60cm instruments, enabling deeper intubation at 60cm.

369 4-YEAR OUTCOMES OF AN OPEN ACCESS COLONOSCOPY SERVICE

A. Douglass, A. Bhagwat, J. Greenaway, Z. Suvakovic, P. Cann. *Endoscopy Centre, South Cleveland Hospital, Middlesbrough, UK*

Introduction: The Open Access Colonoscopy (OAC) Service offers a full (F) endoscopy to patients aged 45 years or over with a change in bowel habit, or a limited (L) procedure to the splenic flexure, to all patients with rectal bleeding only. Limited investigations are converted into a full examination if significant distal pathology is found.

Aim: To examine the outcomes and trends in the first 4 years of the service (May 1996-April 2000).

Results: (expressed for each calendar year / part year—96,97,98,99,00).

For each year, when limited examinations were converted to view the caecum after finding pathology below splenic flexure, the yield was 1%.

Abstract 369, Table 1

	96	97	98	99	0
No. of procedures	160	453	742	1043	303
% Male	46	50	53	46	45
% > 45 years	78	72	77	79	77
Mean wait (days)	18	21	56	66	44
% Requiring full	58	56	59	52	53
<i>Symptoms at referral as % of total (for under 45/over 45)</i>					
Rectal bleeding (alone)	53/36	74/41	80/35	70/37	67/44
Constipation	8/26	3/23	2/20	1/22	1/16
Diarrhoea	5/7	1/7	1/12	1/11	1/10
<i>Findings as % of total endoscopies (all and % in over 45 yrs group)</i>					
Adenomatous polyps	9(7)	13(11)	8(8)	8(7)	12(10)
IBD	8(8)	7(4)	4(2)	3(2)	4(3)
Carcinoma	3(3)	4(4)	4(3)	3(3)	2(2)

Conclusions: Uptake of OAC has grown steadily but the proportional yield of significant pathology has remained constant and worthwhile. Full colonoscopy after detecting distal pathology has a low extra yield. The proportion of young patients referred with rectal bleeding alone has increased but there is a low yield in this group.

370 LARGE SESSILE COLONIC POLYPS: SHOULD ENDOSCOPIC RESECTION BE FIRST-LINE THERAPY?

J.C. Brooker, C.J. Thapar, S.G. Shah, C.B. William, B.P. Saunders. *Wolfson Unit, St Mark's Hospital, Northwick Park, London, UK*

Introduction: Complete endoscopic resection of large (>2cm), sessile colonic adenomas can be technically difficult and has led some endoscopists to refer patients straight for surgery.

Aims: To review the outcomes for the endoscopic resection of large (>2cm) sessile and broad-based colorectal polyps by two specialist colonoscopists (BPS & CBW) at a single UK centre.

Methods: An endoscopy database search was performed to identify all sessile or broad-based polyps >2cm diameter diagnosed between 1/1995 and 7/2000. Polyps containing cancer were only included if endoscopic resection had been attempted.

Results: During the 67 month study period, 99 sessile or broad-based polyps (median size 30[20-80]mm) were seen in 95 patients (median age 66[25-85] years; 54 males). 38 polyps were located proximal to the splenic flexure. 86 were benign adenomas, with severe dysplasia present in 24. There were 6 cancers (4 Dukes 'A'; 1 Dukes 'B'; stage not available in one patient who declined surgery). There were 4 IBD-associated dysplastic lesions, one benign-appearing polyp with no histology available and two were non-neoplastic. Of 93 benign lesions, endoscopic resection was technically successful in 78 (piecemeal resection in 73; saline assisted in 38). 53 have been followed up at least once with no evidence of recurrence (median number of colonoscopies to achieve resection: 1 [1-4]), follow-up is pending in 20 and 5 patients have been lost to follow up. In 9/93 cases endoscopic resection was unfeasible at the 1st colonoscopy and was not attempted, with subsequent referral for surgery. In 6/93, endoscopic resection was attempted but was unsuccessful after median 2 [1-3] attempts, with subsequent referral for surgery. Endoscopic resection was also attempted for 6 polyps which were later confirmed to be cancers. Of these, 4 were Dukes 'A' cancers and one was successfully managed by piecemeal resection, with clear follow-up. Surgery was performed in 3 of 4, and in one, no residual cancer was found. The Dukes 'B' cancer was diagnosed when surgical resection was performed after 3 attempts at endoscopic polypectomy (with benign histology) had failed. There were no serious complications. 6 patients had minor, self-limiting procedural bleeding and 2 experienced pain and were conservatively managed.

Conclusion: Colonoscopic polypectomy is effective and safe for excision of large benign colonic adenomas and should be considered first-line therapy.

371 PATIENTS RESPONSE TO VIRTUAL COLONOSCOPY COMPARED TO FIBRE OPTIC COLONOSCOPY

D.A. Nicholson¹, D. Ware², C. Summerton², R. Mehan¹. ¹Dept of Radiology, Hope Hospital, Stott Lane, Salford; ²Dept of Gastroenterology, Trafford General Hospital, Trafford, Manchester, UK

Purpose: Virtual Colonoscopy (VC) is a new CT based method for detection of colorectal polyps and cancer. For VC to become established as a diagnostic test it must be well tolerated and accepted by patients.

Methods: Patients undergoing evaluation of colonic symptoms underwent VC prior to FC. All patients had standard colonic cleansing/preparation. The data for VC is acquired by performing a CT scan of the abdomen/pelvis after air insufflation and intravenous Buscopan. The CT examination generally takes less than 15 minutes. FC was performed using standard intravenous sedatives and muscle relaxants after the CT. Before and after both tests patients completed a Questionnaire concerning their symptoms of discomfort/pain, abdominal bloating, anxiety and overall preference of techniques. The patients were asked to score each variable on a 100 point scale. Two control groups also filled out the questionnaires: Patients undergoing only FC or barium enema.

Results: To date 84 patients have been evaluated. Regarding symptoms of discomfort and pain; 32% of patients experienced no difference with either technique. 50% found FC more comfortable than VC with only 18% tolerating VC better than FC. Regarding patient preference scores 16% patients had no preference, 24% preferred FC whereas 60% would prefer a VC in the future.

Conclusion: The on-going results from this study will be presented including comparison with the control groups. To date it appears patients experience more discomfort/pain with regard to VC compared to FC. However patients prefer VC when asked to choose between these two techniques of colonic imaging.

372 COLONOSCOPY: CAECUM OR BUST?

N. Galletly, A. Gibbons, K. Tonge, S. LaBrooy, G. Holdstock. *Dept of Gastroenterology, Hillingdon Hospital, Uxbridge, Middx, UK*

Endoscopy of the colon is either a colonoscopy or a flexible sigmoidoscopy. Much has been made of the need for visualisation of the caecum if colonoscopy is the examination requested and endoscopy units and endoscopists are judged on their colonoscopy completion rates. Flexible sigmoidoscopy on the other hand reaches only the splenic flexure. Many units, including ours, use colonoscopes for all examinations and stop at the descending colon or splenic flexure if the examination requested is a flexible sigmoidoscopy. We propose a different way of looking at endoscopy of the large bowel that breaks from the sigmoidoscopy/colonoscopy dichotomy. The importance of reaching the caecum is assessed by the endoscopist prior to the procedure and expressed as a score of 1 to 4. A score of 1 indicates that visualisation of the caecum is not necessary and 4 that reaching the caecum is essential. Thus 1 would correlate with flexible sigmoidoscopy and 2-4 with colonoscopy. We applied this method to 267 endoscopic examinations of the large bowel and calculated crude and adjusted completion rates (in which cases of non-completion due to strictures, poor bowel prep and scope failure were excluded) for each score. In addition we recorded the incidence of pathology found beyond the splenic flexure for all complete examinations.

Results: 27.7% of cases were given a score of 1, 22.5% a score of 2, 32.2% a score of 3 and 17.6% a score of 4. In all patients in whom 'colonoscopy' was attempted (scores 2-4) the crude completion rate was 79.8% and the adjusted rate was 87.5%. In those in whom total colonoscopy was deemed to be essential (score 4) the crude completion rate was 89.6% and the adjusted rate 100%. In examinations in which the caecum was reached, no pathology beyond the splenic flexure was found in those given scores of 1 or 2. 5 of 56 (8.9%) of patients scored as 3 had right-sided pathology as did 5 of the 32 (15.6%) patients given a score of 4.

Conclusion: We have proposed a new way of looking at endoscopy of the colon based on the perceived importance of reaching the caecum and demonstrated high completion rates in those in whom visualisation of the caecum was deemed essential.

373 BENEFITS OF ILEOSCOPY IN PATIENTS UNDERGOING COLONOSCOPY—A DGH AUDIT

D. Durai, I. Salam. *Dept of Gastroenterology, West Wales General Hospital, Carmarthen, UK*

Intubation of the terminal ileum during colonoscopy although well described is not routinely performed. In our unit we attempt ileoscopy in selected patients presenting with chronic diarrhoea, strong suspicion or known IBD, abnormal small bowel Barium studies, or any other suspected small bowel pathology. We performed a retrospective clinical audit to assess whether ileoscopy was beneficial in the above group of patients presenting for colonoscopy in our unit.

All colonoscopies performed since Jan 1998 to Oct 2000 (period since SpR has been attached for training) were analyzed. Total colonoscopies performed were 850. Caecal intubation was achieved in 92%.

Ileoscopy was attempted only in selected group of patients with chronic diarrhoea, strong suspicion or known IBD, abnormal small bowel Barium studies, or other suspected small bowel pathology who we felt would benefit from ileoscopy. Of these 364 underwent successful ileoscopy. Abnormal ileoscopy were reported in 66 patients - overall positive ileoscopic findings of 18%. Ileoscopic appearance of Crohn's ileitis was found in 25 patients of which 6 patients had only terminal ileal Crohn's with normal colonic appearance. There were 5 terminal ileal Crohn's strictures, 8 cases of biopsy proven backwash ileitis in patients with pan-ulcerative colitis, 1 case of Crohn's ileocaecal fistula. 4 cases of recurrent small bowel Crohn's following previous surgery. There was 1 patient with abnormal terminal ileum on small bowel barium but ileoscopy was normal. There were 21 patients with nonspecific ileal inflammation and 2 patients with terminal ileal non-specific ulcers.

Our data suggests that Ileoscopy is helpful in selected group of patients with IBD and chronic diarrhoea. We suggest that an attempt at terminal ileal intubation will be beneficial in selected patients. Terminal ileal intubation may be a useful maneuver to improve endoscopic skills especially for Specialist Registrar training. However local workload and time restraints have to be taken into account.

374 IS TERMINAL ILEAL INTUBATION ESSENTIAL TO ENSURE COMPLETE COLONOSCOPY?

A.P. Malalasekera, K.I. Deen. *Dept of Surgery, Faculty of Medicine, Kelaniya, Sri Lanka*

Introduction: Traditionally, the standard for ensuring total colonoscopy has been terminal ileal intubation and histological confirmation of ileal mucosa. The additional step of terminal ileal intubation is time consuming. Fluoroscopy to confirm caecal intubation is an alternative but requires additional equipment and bears the risk of irradiation. Our hypothesis was that visualisation of the appendix orifice and ileocaecal valve, as a composite landmark, is sufficient to ensure complete colonic intubation.

Patients and methods: Fifty consecutive patients (female—20, male 30; median age—44 years; range—18 to 73 years) who required terminal ileoscopy as part of total colonoscopy were examined after standard bowel preparation and midazolam sedation. The caecum was intubated, the ileocaecal valve and appendix orifice visualised by the colonoscopist and endoscopy nurse assistant and these landmarks photographed. The terminal ileum was intubated and mucosal biopsies obtained for histology. Confirmation of total colonic intubation using visual landmarks was compared with terminal ileal histological confirmation.

Results: The terminal ileum was intubated in all 50 patients. Indications for intubation were: right iliac fossa pain - 28%, altered bowel habits - 12%, bleeding per rectum - 6%, combination of above features - 38% and other - 16%. Endoscopy findings were: diverticulae - 10%, haemorrhoids - 4%, polyps 6%, colitis - 4% and normal 76%. There were no complications. Visual confirmation of total colonic intubation matched terminal histology in all patients. (Sensitivity and specificity of 100%.)

Conclusion: We believe that visual landmarks in caecal intubation are sufficient in confirming total colonic intubation. Terminal ileal intubation, merely for confirming caecal intubation, will increase colonoscopy time and is unnecessary.

375 PATIENTS WITH ACROMEGALY HAVE LONGER COLONS AND ARE MORE DIFFULT TO COLONOSCOPE THAN NORMALS

J.E. Painter¹, G.D. Bell², R.S. Rowland³, A.G. Renehan⁴, S.M. Shalet⁵, S.T. O'Dwyer⁴. ¹Dept of Gastroenterology, Sunderland Royal Hospital, Sunderland; ²Medical Sciences Faculty, University of Sunderland; ³School of Information Systems, University of East Anglia, Norwich; ⁴Depts of ⁵Surgery and ⁵Endocrinology, Christie Hospital, Manchester, UK

Background: A previous barium enema study suggested that patients with acromegaly have longer colons than normal patients and therefore might be more difficult to colonoscope. We have previously used a combination of magnetic endoscope imaging (MEI) and specially developed software to accurately measure the lengths of different sections of the colon at the time of colonoscopy (Med. Biol. Eng. Comput., 1999;37:673).

Aims: To establish if acromegalic colons are significantly longer than normal and if so whether colonoscopy is any more difficult.

Methods and results: We used our MEI system in a series of 25 patients with acromegaly (AP) and 45 patients without acromegaly (NP) who were colonoscoped by a single experienced endoscopist.

Total colonoscopy was recorded in 21 (84%) AP and in 43 (95.6%) NP using MEI. The median distance to the caecum in AP was 104cm (IQ range, 93.7–130.5) as compared to 87cm (79–100) in NP ($p=0.0009$, Mann Whitney U). The median maximum length of colonoscope inserted was 127.5cm (110–155.1) in AP compared to 110cm (105–120) in NP ($p=0.0023$). The greatest difference was in the median length of colonoscope inserted to reach the sigmoid-descending junction, 78.5cm (62.9–94.1) in AP compared to 51.3cm (42.4–61.5) in NP ($p<0.0001$). This was associated with greater complex looping in the sigmoid colon in AP (5/24) than in NP (1/44) ($p=0.0118$, chi square). The median time to the caecum was 772sec (613.5–1063) in AP compared to 563.5sec (400.8–853.6) in NP ($p=0.0267$, Mann Whitney U).

Conclusion: Patients with acromegaly are more difficult to colonoscope than normal patients because they have longer colons, which are more prone to loop formation.

376 PATIENT PAIN DURING COLONOSCOPY—AN ANALYSIS USING MAGNETIC ENDOSCOPE IMAGING (MEI)

S.G. Shah, C.J. Thapar, J.C. Brooker, C.B. Williams, B.P. Saunders. *Wolfson Unit for Endoscopy, St Mark's Hospital, Watford Road, Harrow, Middlesex, UK*

Background: Colonoscopy is generally perceived as being a painful procedure. Stretching of the peritoneal attachments from looping of the instrument shaft, overinsufflation, the degree of torque/force applied to the colonoscope shaft, and patient pain threshold are contributory factors.

Aims: To determine the frequency of pain episodes experienced and the corresponding colonoscopy configuration during colonoscopy.

Methods: Consecutive out-patients undergoing colonoscopy were studied. Patients with previous colonic resections were excluded. Procedures were commenced with buscopan only and patient sedation/analgesia self-administered whenever significant discomfort was experienced, using a PCA syringe pump. All 'demands' were correlated with the MEI record, which was subsequently analysed.

Results: Pain with the instrument tip in the rectum accounted for 1% of the total demands (5/675). 77% (521/675) of all demands occurred with the colonoscope tip in the sigmoid colon, coinciding with looping (340), stretching of the apex of the sigmoid colon (77), pulling back/shortening colon (30), straightening of a loop (27), sigmoid fixation (2), and with no visible loop (45). 7% (47/675) of demands occurred with the colonoscope tip in the descending colon, coinciding with sigmoid looping (31), straightening of a loop (10) or with a straight scope (6). 6% (39/675) of demands coincided with either recurrent sigmoid looping (28) or sigmoid stretch (11) at the splenic flexure. In the transverse colon 5% of the total demands (33/675) were secondary to either looping of the sigmoid anteriorly (12), deep transverse looping alone (7), both deep transverse & sigmoid looping (6), straightening of a loop (2), or no visible loop (5). Demands were least frequent in the proximal colon (4% of total (30/675)) and coincided with either sigmoid looping (10) or deep transverse/sigmoid looping (13) in the majority. 7 demands were associated either with straightening of a transverse loop or with no visible loop, with the colonoscope tip in the caecal pole.

Conclusions: The majority of pain/discomfort episodes (85%) experienced were due to looping of the colonoscope shaft, most frequently in the sigmoid colon, with overinsufflation being an infrequent cause (9%). Use of MEI may improve pain control by enabling the endoscopist to 'target' patient analgesia, pre-empting any pain episodes.

377 INTRINSIC ANTI-ENDOTOXIN ANTIBODY MAY BE PROTECTIVE IN INFLAMMATORY BOWEL DISEASE PATIENTS UNDERGOING COLONOSCOPY

P.J.D. Neilly, M. Eames, S.J. Kirk, K.R. Gardiner. *Dept of Surgery, Queen's University of Belfast and Royal Victoria Hospital, Belfast, UK*

Introduction: Bacteraemia and endotoxaemia may occur following lower gastrointestinal endoscopy. Endotoxaemia is a frequent feature of inflammatory bowel disease (IBD) but there is no apparent increase in morbidity following colonoscopy. This study investigates the hypothesis that anti-endotoxin antibody concentrations are elevated in IBD and may therefore protect patients undergoing colonoscopy.

Methodology: Forty-four patients requiring lower gastrointestinal endoscopy were investigated. Blood was taken before endoscopy to assess IBD severity, endotoxin and endotoxin-core antibody (EndoCAB) concentrations and bacteriological status. Further samples were

collected at 1 hour and 1 week after endoscopy for bacteriology and measurement of endotoxin and EndoCAB concentrations.

Results: Seven patients with disease other than colitis were excluded from study. Comparing normal and IBD patients before endoscopy there was no significant difference in the incidence of bacteraemia or endotoxaemia. Endotoxin concentrations were increased in controls 1 hour after endoscopy ($p=0.02$) but endotoxin concentrations were not significantly higher in colitics. The colitics however had a higher incidence of bacteraemia 1 hour after endoscopy ($p=0.05$), being most evident in those with severe disease ($p=0.01$). Compared with controls IBD patients had higher EndoCAB concentrations before, 1 hour and 1 week after endoscopy ($p<0.02$). Patients with more severe disease also had higher EndoCAB concentrations than those with mild disease 1 hour after endoscopy ($p=0.03$).

Conclusion: Antibodies to endotoxin are higher in IBD patients and systemic concentrations correlate with disease activity. No significant change in endotoxin concentrations in these patients following endoscopy, despite an increased incidence of bacteraemia, would suggest that anti-endotoxin antibodies have a protective effect.

Biliary Posters: 378–388

378 ENDOSCOPIC SURGERY FOR CHOLEDOCHOLITHIASIS WITHOUT SUBSEQUENT CHOLECYSTECTOMY—ANALYSIS OF LONG-TERM RESULTS

K. Nigam, R.H. Kennedy. *Dept of Surgery, Yeovil District Hospital, Yeovil, UK*

Aims: To analyse the results of endoscopic treatment of bile duct (BD) stones without subsequent cholecystectomy in patients over 64 years old or those unfit for surgery.

Methods: All consecutive patients undergoing endoscopic bile duct clearance during six years to 31.12.98 were analysed from various prospectively collected data sources. Statistical analysis—chi-squared test with Yate's correction.

Results: 174 patients were included (median age of 76 years) of whom 13 were <65 years but were unfit for surgery (age range 49–64). Successful endoscopic sphincterotomy (ES) was achieved in 93% of patients but 29 required surgery to clear the bile duct. Following endoscopic duct clearance, 143 patients were discharged with gallbladders in situ. Mean follow-up was 41.2 months. 15% required subsequent cholecystectomy (due to acute cholecystitis in 8 and recurrent biliary colic in 8 patients). 13% required further endoscopic BD surgery. There was no recurrence of biliary pancreatitis. 58% of patients in the age group 65–70 yrs at initial presentation required subsequent intervention (SI) as compared to 19.5% in patients over 70 (p value = 0.0003). Overall complication rate of ERCP/ES was 5%.

Conclusions: ERCP/ES alone without subsequent cholecystectomy is safe and effective for treating high-risk patients with cholelithiasis, effectively prevents recurrence of biliary pancreatitis and does not increase the risk of subsequent acute cholecystitis. Subsequent cholecystectomy rate of 15% is higher than <11% previously reported. More than 50% patients in 65–70 yrs age group will need further treatment after endoscopic BD clearance. Majority of SI take will place in first 2 years following endoscopic BD clearance. Rate of SI is not related to the length of follow-up. Comparison with laparoscopic bile duct surgery is needed.

379 GALLBLADDER ENLARGEMENT AFTER MAJOR SURGERY

P.V. Gallagher¹, S.T. Elliott², R.M. Charnley¹. *Depts of Surgery¹ and Radiology², Freeman Hospital, Newcastle upon Tyne NE19 2HP, UK*

Background: Altered gallbladder motility has been implicated in the pathogenesis of gallstones in conditions such as pregnancy or during parenteral nutrition. An increased incidence of gallstones occurs after certain major surgical operations. Alterations in gallbladder motility have not previously been studied in the peri-operative period.

Aim: To measure gallbladder motility in subjects undergoing major non-gastrointestinal surgery in the peri-operative period.

Methods: Subjects undergoing aortic surgery ($n=12$) and cardiac surgery ($n=19$) had fasting gallbladder volumes measured immediately before surgery and again after being established on a normal diet