1998 to June 2000 were notified on the monthly report card distributed to all consultant gastroenterologists and gastrointestinal surgeons. The reporting doctor then completed a questionnaire detailing the age and clinical presentation of the patients, tumour site, hormone assay level, and method of treatment. Survival data were obtained at the end of the study period. 244 cases were reported, including 32 prevalent cases and 2 inappropriate tumours. 57% of these cases had questionnaires completed, producing 106 cases for analysis. 64 had symptoms attributable to the hormonal effects of the tumours, such as peptic ulceration or diarrhoea, and 42 had non-hormonal symptoms such as bowel obstruction, or extra-gastrointestinal symptoms such as rash or confusion. The commonest tumours producing hormonal GI symptoms were carcinoids (n=44, 69%), presenting with diarrhoea as the main symptom in 83%. Other symptoms included flushing, weight loss or abdominal pain. 80% had liver metastases demonstrated at presentation. Gastrinomas accounted for 20% (n=13) of the tumours, presenting with peptic ulceration in 77%, and diarrhoea in 62%. Other tumours identified were VIPomas, pheochromocytomas, thyroid medullary tumours, insulinomas, glucagonomas, somatostatinomas, hyperparathyroid tumours, and spindle cell tumours. 78% of all patients were alive at the end of the study period. Carcinoid syndrome was the commonest neuroendocrine condition causing gastrointestinal symptoms. Diarrhoea appears to be a more common presenting symptom of gastrinomas than has previously been appreciated. With a series of tumours as large as in any previous UK survey, the BSG monthly surveillance system shows promising potential.

188 T CELL RECEPTOR ZETA (CD3/TCR- ζ) CHAIN EXPRESSION IN TUMOUR INFILTRATING LYMPHOCYTES IN COLORECTAL CANCER

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Background: CD3 lymphocytes co-express TCR- ζ chain, and ζ chain expression is essential for signal transduction and activation of CD3 lymphocytes. Alterations in CD3/TCR- ζ chain expression might disrupt internal signal transduction, resulting in deficient T cell activation. This might be a novel mechanism by which cancers escape from immune control despite the presence of tumour infiltrating lymphocytes (TILs). However, whether ζ chain is downregulated in cancer patients remains controversial.

Aim: To examine CD3- ϵ chain and ζ chain expression in TILs in colorectal cancer (CRC) and in adjacent unaffected mucosa from patients with CRC.

Methods: Paraffin sections from 30 colorectal cancer specimens (7 Dukes's A, 10 Dukes's B, 12 Dukes's C and 1 Dukes's D) and unaffected adjacent colon were studied. Immunohistochemical staining was performed on consecutive sections with antibodies specific for CD3- ϵ chain or ζ chain. Positively stained areas were quantified using image analyser (in μm^2) in ten fields for each specimen. Pilot experiment confirmed that this method was as accurate as individual cell counting but simpler. Statistical differences were calculated using the Mann-Whitney test.

Results: Loss of ζ chain expression was observed in only one patient. In all other cases expression of ζ chain correlated with CD3 - ϵ chain, and the number of CD3 - ϵ^+ and ζ^+ lymphocytes were almost equal. In addition, CD3 - ϵ^+ and ζ^+ lymphocytes were seen more frequently in non-cancerous tissue than in tumours. The median areas of CD3 and ζ chain positive staining (μm^2 /10 fields) in different Dukes' stages are shown in the table.

Abstract 188, Table 1

		Dukes' stage		
		A	B	C
Normal	CD3	3878	2794	3541
	Zeta	3829	2712	3486
Tumour	CD3	2825	1581	2593
	Zeta	2711	1524	2523
Significance level (normal v tumour)	CD3	0.34	0.09	0.04
	Zeta	0.34	0.09	0.04

Conclusion: Loss of ζ chain expression is uncommon in TILs from patients with colorectal cancer and is unlikely to be a mechanism for immune escape in all CRC patients.

189 BUTYRATE: FOOD FOR COLONIC CANCER CELLS ?

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Background: In vivo, colonocytes have a local energy source in the form of butyrate (a short chain fatty acid produced by bacterial fermentation in the colonic lumen) and receive glucose and glutamine from the vasculature. The preferred fuel source for these colonocytes is butyrate. In vitro, colonic tumor cell lines preferred energy source is debatable, as most tissue culture media do not contain butyrate but a variety of other energy sources. We investigated the metabolism of butyrate, glucose and glutamine in 5 different colonic cell lines and 2 cell lines originating from outside the colon. Two of the 5 colonic cell lines (HT29 and CaCO-2) were established from a primary tumour whereas COLO-205, LoVo, SW620 are established from metastatic deposits.

Aim: To compare butyrate metabolism in colonic epithelial cancer cell lines derived from primary cancer and metastases.

Method/Results: Cell lines were maintained in serum-free media and incubated with either [^{14}C (U)]-glutamine, [^{14}C (U)]-glucose or n- [^{14}C] butyrate. Oxidation was measured by trapping 14 CO_2 released on sodium hydroxide-saturated filter paper and counted. Results of butyrate metabolism are shown in the table.

Abstract 189, Table 1

Cell line	$\mu\text{mol CO}_2/\text{mg protein} \pm \text{S.E.M.}$
HT29 colon	40.2 $\pm$ 1.2
CaCO-2 colon	37 $\pm$ 6.8
COLO-20 colon	8.7 $\pm$ 0.2
LoVo colon	7.7 $\pm$ 0.9
SW620 colon	4.5 $\pm$ 0.5
Oe33 oesop	0
Hep-G2 liver	399 $\pm$ 52

Conclusion: Colonic cell lines from a primary tumour origin showed a greater ability to metabolise butyrate when compared to those from a secondary source. All colonic cell lines preferred butyrate as an energy source rather than glucose or glutamine.

190 PLASMA BIG ET-1 - A TUMOUR MARKER FOR UPPER GASTRO-INTESTINAL TRACT CANCERS

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Introduction: Endothelin-1 (ET-1), the most potent vasoactive peptide has been associated with the development of various cancers. This study was performed to assess whether plasma big endothelin levels (big ET-1), a stable precursor of ET-1 could be used as a tumour marker in upper gastro-intestinal tract cancers.

Patients and methods: Plasma concentration of big ET-1 was measured in 26 patients with proven upper gastro-intestinal cancers prior to any treatment from February 2000 to August 2000 and in 20 age/sex matched controls. Plasma samples were analysed within 2 months of collection using sandwich enzyme linked immuno-assay (Biomedica, Austria).

Results: Median plasma levels of big ET-1 in patients with gastro-oesophageal cancer 3.6 pg/ml [range 1.3–30.2 pg/ml] (gastric cancer n=9, oesophageal cancer n=5) were significantly elevated compared to median plasma levels of big ET-1 in controls 2.1 pg/ml [range 1.2–13.4 pg/ml] p=0.005 (Mann-Whitney). However, median plasma levels of big ET-1 in patients with pancreatic cancer (n=12) 3.1 pg/ml [range 1.5–8.1] were not significantly elevated compared to controls (table 1).

Abstract 190, Table 1

Groups	Median plasma levels (pg/ml)	Range (pg/ml)	Mann-Whitney
1 Controls	2.1	1.2–13.4	
2 Gastro-oesophageal cancer	3.6	1.3–30.2	p=0.005
3 Pancreas	3.1	1.5–8.1	ns

Conclusion: Plasma big ET-1 levels were significantly elevated in gastro-oesophageal cancer patients but not in pancreatic cancer patients. Plasma big ET-1 levels could be used as a tumour marker to detect the presence of gastro-oesophageal cancers.

Colorectal/Anorectal Posters: 191-220

191 NON-STARCH POLYSACCHARIDE INTAKE AND THE PREVALENCE OF CONSTIPATION IN FREE-LIVING AND INSTITUTIONALISED OLDER PEOPLE

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Background: Diagnosis of functional constipation using Rome II criteria includes an assessment of stool frequency, straining and sensation of incomplete evacuation. Few studies have compared the prevalence of these bowel function measurements in free-living (FL) and institutionalised (INS) elderly people.

Aim: To compare non-starch polysaccharide (NSP) intake and the prevalence of functional constipation according to three of the Rome II diagnostic criteria between FL and INS elderly people.

Methods/Results: 23 FL volunteers (48% male, mean age 75 years) and 13 INS volunteers (20% male, mean age 88 years) were recruited. NSP intake was measured using the 4-day weighed inventory method. Bowel habit was recorded by volunteers in a 7-day bowel habit diary. Results are shown in the table.

Abstract 191, Table 1

Parameter		FL	INS
NSP (g/d)	mean (sd)	15.9 (5.7)	6.6 (1.9)***
Stool frequency	%	4	15**
(<3n/week)	No.	1	2
Straining to start	%	32	69*
(>25% occasions)	No.	7	9
Straining to finish	%	20	61*
(>25% occasions)	No.	5	8
Incomplete Evacuation	%	8	46**
(>25% occasions)	No.	2	6

Significantly different between FL and INS: *p<0.05, **p<0.01, ***p<0.001.

Conclusions: This study suggests that the prevalence of functional constipation is higher in INS than in FL subjects. The higher prevalence of constipation in the INS may be due to the low intake of NSP. This research was fully sponsored by Reckitt Benckiser Healthcare.

192 THE ANTEGRADE CONTINENCE ENEMA (ACE) PROCEDURE IMPROVES QUALITY OF LIFE IN CHRONIC CONSTIPATION AND FAECAL LEAKAGE

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Introduction: The Malone reversed appendicocaecostomy was first introduced in 1993 for the treatment of faecal leakage in children and is well established in paediatric surgery. We describe our experience of 10 adults who have undergone an appendicocaecostomy to facilitate ACE for chronic constipation and faecal leakage.

Methods: 10 adults underwent appendicocaecostomy. They were retrospectively reviewed from case notes and stoma nurse records. Quality of life (QOL) was assessed in postoperative patients and compared with the cohort of patients awaiting the surgery using the validated SF-36 QOL survey.

Results: 10 patients (8 female) mean age 29 have undergone the procedure. 7 laparoscopically. 6 had a history of lifelong chronic constipation, 3 faecal leakage and 1 a mixed picture. Post operatively all recovered well from the initial procedure. All feel their presenting symptoms have improved but minor technical difficulties with the enema procedure are commonplace and good stoma therapist support is necessary. 2 had minor revision surgery of the stoma, 4 stricturoplasties and 1 became constipated again because of enema difficulties. QOL comparisons in the two groups has shown a significant improvement in the mean mental component score (MCS) on

the SF-36 from 36.28 to 48.0 (p=0.038) and an improvement albeit not statistically significant in the physical component scores (PCS) from 36.28 to 43.8 (p=0.099).

Discussion: Adult ACE procedure is technically simple and effective in the treatment of constipation and faecal leakage. Significant improvement in the mean mental component score measured by the SF-36 is achieved.

193 THE ROLE OF AN INTRA-ANAL TAMPON FOR FAECAL INCONTINENCE; PRELIMINARY RESULTS OF A PROSPECTIVE STUDY

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The surgical treatment of faecal incontinence is not always successful. Some patients continue to complain of incontinence after operation and others wish to explore non-operative means to improve their quality of life. We have assessed the efficacy and acceptability of an intra-anal tampon (IAT) in 50 patients studied prospectively with anal incontinence before and one month after the IAT using the Cleveland Clinic Incontinence Score (CIS) and the Minneapolis Quality of Life Score (MQOL). One patient could not tolerate the tampon and all except 6 patients reported some discomfort whilst 16 complained of perineal pain during its use. Nevertheless, CIS was significantly improved from 13.7 (7-18) to 11.9 (4-17) (p=0.007). Furthermore, MQOL also significantly improved for lifestyle from 18 (11-38) to 21.4 (15-39) (p=0.02) and for behaviour 13.5 (10-31) to 17.5 (11-32) (p=0.001) and for embarrassment 5.8 (3-11) to 7.1 (5-11) (p=0.02) but not for depression. Twenty six (52%) stated that they wished to continue to use the IAT because it improved their quality of life. Thirty patients reported that they would recommend the device to other people. This study has indicated that the IAT is safe but causes some discomfort but for those who continue to use the device quality of life is improved.

194 CAUSES AND TREATMENT OF MALE FAECAL INCONTINENCE

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Introduction: Faecal incontinence in women has been extensively studied however there are few data on causes and outcome in men with this condition.

Aims: To analyse the causes, treatment and effectiveness of treatment for faecal incontinence in men.

Methods: We retrospectively reviewed the casenotes of men investigated for faecal incontinence between 1995 and 1999. The aetiology of incontinence and the outcome of treatment was examined.

Results: Records of 42 men (mean age 57 years, range 14-79) were reviewed. 19 (45%) had a history of anal surgery (haemorrhoidectomy 9, fistula surgery 5, abscess drainage 2, stretch 1, sphincterotomy 1). Eight (19%) had neurological problems, 3 related to spinal surgery and 1 to trauma. Two patients had a rectal prolapse, 1 a megarectum and the cause was not clearly defined in the remaining 12 (29%). Follow-up data was available in 35 cases. Thirty (83%) were treated conservatively, of whom 27 (90%) achieved a satisfactory improvement or complete resolution. Only 5 patients had surgical intervention (prolapse repair 2, graciloplasty 1, sphincter repair 1, colostomy 1).

Conclusions: Anal sphincter damage after anorectal surgery was the commonest cause of faecal incontinence in this group. Overt neurological disease was common and the aetiology was unclear in a significant number. Simple conservative measures lead to a satisfactory outcome in the majority of patients.

195 CLOSED LATERAL SUBCUTANEOUS SPHINCTEROTOMY UNDER DIRECT ENDOSONOGRAPHIC CONTROL

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Closed lateral subcutaneous sphincterotomy (CLSS) is the procedure of choice for chronic anal fissure because healing rates are high but there is a small risk of transient or permanent impaired continence.

This study was undertaken to determine if CLSS under direct endosonographic control (CLSSEC) is more effective and safer than standard CLSS. Thirty patients had CLSSEC and 20 had CLSS. The groups were comparable for age, sex and duration of follow up, all patients underwent clinical and anorectal physiological evaluation before and three months after the operation. Endoanal ultrasonographic was used before and after operation to assess the completeness of sphincterotomy. Fissures healed in all CLSSEC patients, whereas 2 persisted or recurred after CLSS. Impaired continence to flatus or soiling at one month was observed in 7 (23%) after CLSSEC compared with 4 (20%) after CLSS. Only 1, a CLSSEC patient, had persistent impaired continence at three months. Ultrasound revealed a complete internal sphincter defect in all CLSSEC patients but in only 4 of 10 in the CLSS group. The fall in resting pressure was greater after CLSSEC; 98.4 ± 31.2 to 63.1 ± 19.4 ; $p=0.02$ than after CLSS; 94.9 ± 27.3 to 76.5 ± 20.1 ; NS. These data indicate that CLSSEC is a more precise method of sphincterotomy but does not eliminate the risk of transient or even permanent impaired continence.

196 INCIDENCE AND SIGNIFICANCE OF A PREVIOUS HYSTERECTOMY IN WOMEN ATTENDING FOR ENDOSCOPIC INVESTIGATION OF LOWER GI SYMPTOMS

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Background: The incidence of hysterectomy (HY) in women with lower GI symptoms attending for flexible sigmoidoscopy (FS) and its effect on the success rate of the procedure has not been formally studied.

Aims: To prospectively estimate HY incidence in women attending an endoscopy clinic with lower GI symptoms. Secondly determine if HY affected FS success rate or caused detectable differences in pelvic loop size/configuration as a result of pelvic adhesions.

Methods/Results: Over a 12 month period a single experienced endoscopist carried out 2 "fast track" surgical endoscopy lists per week. Non-sedated FS was carried out in 200 women using either a full-length adult or 130 cm paediatric colonoscope. The FS failure rate (defined as inability to reach the sigmoid/descending colon junction or beyond) was significantly higher ($p=0.0112$) in HY patients (16/54 or 30%) compared with 19/146 (13%) in the women with no HY history. Using magnetic endoscope imaging (MEI) combined with a painometer (*Gut* 2000;46(suppl II A30) we showed that HY patients tended to form smaller/ tighter (and hence more painful) pelvic loops than other women. Furthermore when using an adult colonoscope (but not a floppy paediatric instrument) to perform FS, the median insertion depth before pain was first felt was significantly less ($p=0.0002$) in the HY patients.

Conclusion: Over 25% of female patients attending for lower GI investigations will have had a previous hysterectomy. A thinner/less stiff paediatric colonoscope is recommended for such patients.

197 A PROSPECTIVE STUDY TO ASSESS THE IMPLEMENTATION OF A FAST-TRACK SYSTEM TO MEET THE TWO-WEEK TARGET FOR COLORECTAL CANCER

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Aims: This prospective study assesses the introduction of a fast-track referral system for patients with suspected colorectal cancer.

Methods: The referral system was initiated in Yeovil District Hospital and Taunton and Somerset Hospital using six screening criteria to select high-risk patients. Data on all high-risk patients from 1 November 1999 to 30 April 2000 was recorded prospectively. Patients with proven colorectal cancer diagnosed between 1 November 1998 and 30 April 1999 have been identified for comparison.

Results: 433 fast-track referrals were received in the six month period, with 303 patients (70%) seen within two weeks. There were 158 new cases of colorectal cancer in total (111 elective, 47

emergency). 59 patients were diagnosed from fast-track referrals (53% of total elective cases). Median time to diagnosis in the fast-track group was 11 days versus 32.5 days for non-fast-track elective cases ($p<0.001$). Median time to diagnosis for all elective cases was 17 days versus 38.5 days for patients presenting one year earlier ($p<0.001$). 75% of fast-track patients were diagnosed within two weeks, compared with 17% of non-fast-track elective patients ($p<0.001$). 48% of all elective patients were seen within two weeks versus 17% of patients presenting one year earlier ($p<0.001$). The proportion of emergency admissions was reduced from 40% to 30% ($p=0.07$) following the introduction of this system.

Conclusions: A fast-track system for suspected colorectal cancer has led to a significant reduction in the time to diagnosis, with the majority of cases diagnosed within two weeks.

198 IMPACT OF THE "2 WEEK RULE" ON THE TREATMENT OF COLORECTAL CANCER

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The government has pledged that all patients with suspected colorectal cancer will be seen within 2 weeks and they have published guidelines to identify high risk patients. This study analysed patients with colorectal cancer admitted to a single surgeon with no referral guidelines. The number who would have met the guidelines and the potential effect on overall time to treatment was determined by assuming the time to first out-patient appointment for this group would have been a maximum of 14 days and adjusting time to diagnosis and treatment accordingly. The case notes of 78 patients (32 (40%) female, mean age 68 years (range 24-96)) were studied. 81% of 32 patients with rectal cancer and 67% of 46 with colon cancer met the guidelines. Adherence to the guidelines in patients with rectal cancer would have had a small but significant effect on the time to first appointment (median 8 days, interquartile range 3-35 days, reduced to 8 (3-14) days. Wilcoxon matched pairs $p=0.016$). Time to diagnosis would also be reduced (26 (6-61) vs 17 (6-40), $p=0.016$) but there would have been no effect on time to surgery (117 (86-149) vs 96 (62-145), $p=0.06$) because of prolonged waiting times for staging and pre-operative radiotherapy. Time to first appointment with colon cancer would have fallen (28 (9-49) days vs 14 (9-14), $p<0.0001$). Time to diagnosis (62 (22-104) vs 21 (14-67), $p<0.0001$) and treatment (120 (56-143) vs 56 (40-117), $p<0.0001$) would also have been significantly reduced. Implementation of government guidelines and the 2 week rule would have had significant benefits in terms of treatment times for patients with colonic but not rectal cancer. Their introduction needs to be combined with increased resources for staging and radiotherapy due to achieve significant improvements for patients with rectal cancer.

199 AN AUDIT OF FAECAL OCCULT BLOOD TESTS IN A DISTRICT GENERAL HOSPITAL

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Introduction: Faecal occult blood tests (FOBs) have been validated in colorectal cancer screening. Their value in other indications is less clear. Despite this use of FOBs remains commonplace.

Aims: (1) To audit FOB use with reference to their source, indications and results. (2) To determine if FOBs altered in-patient management.

Methods: Computerised records of FOB requests received by the biochemistry department in 1997 were retrospectively reviewed. For in-patient requests hospital notes were reviewed to determine outcome and what influence the FOBs had on management.

Results: 1497 FOBs from 630 patients (516 from primary care). 58.5% of hospital patients (HP) v 28.8% of primary care patients (PC) were positive ($p<0.001$). Median age 63 (1 month to 100 years). Complete collections of 3 faecal samples were greater in PC than in HP (61.8% v 36.0%; $p<0.001$). Indications from PC were anaemia 32.8%; frank GI bleeding 9.9%; altered bowel habit 20.7%; abdominal pain 13.8%; others 10.3%. An indication was not supplied in 12.4%. 15 of 121 GPs were responsible for 37% of primary care requests. Indications for HP were anaemia 43.9%; frank GI bleeding 18.4%; altered bowel habit 12.0%; abdominal pain 7.0%; others 14.9%. Elderly care wards 42 (36.8%); general surgery 25 (21.9%); nephrology 16 (14%); others 31 (27.2%). Decisions to

send FOBs were made by nurses in 18 cases. Case notes of 86 in-patients were reviewed (remaining 28 unavailable). Further management was determined on the basis of FOBs in 14 of 53 positive and 20 of 33 negative cases (GI imaging, specialist referral, repeat FOBs, no investigation). 23 positive and 4 negative FOBs did not appear to have been reviewed by clinicians. GI diagnoses were made in 23 positive cases (3 colorectal cancers). GI diagnoses were also made in 12 cases in spite of negative FOBs (1 small bowel lymphoma). In these 35 cases pathology was found throughout the GIT.

Conclusions: FOBs are used for a wide range of non-validated indications. A few GPs & hospital sub-specialities are responsible for a disproportionate number of requests. In the majority of hospital patients FOBs add little to overall management.

200 IMPACT OF THE NURSE LED RECTAL BLEEDING CLINIC

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Background/Aims: Rectal bleeding is a common symptom referral often necessitating multiple hospital visits for initial assessment, investigation and subsequent management. Recently there has been a heightened awareness of colorectal cancer leading to an increased service demand. To meet this demand a nurse led open access rectal bleeding clinic was set up to provide a fast-track service to examine, treat and discharge patients with benign anorectal conditions and screen for neoplastic disease in a single session.

Methods: A rectal bleeding clinic was established in August 1999. Patients over the age of 45 with symptoms of bright red rectal bleeding only were referred directly by their GP to the Endoscopy unit. Referral letters were screened by a Consultant surgeon (ACW) and appointments arranged within a 4 week period. A full history and physical examination was performed with flexible sigmoidoscopy and video proctoscopy in all patients. Those with benign ano-rectal disease were treated and discharged on the same day. Patients with normal findings were referred for barium enema and in those with adenomatous polyps colonoscopy was performed. Patients were followed up at 1 and 5 year intervals.

Results: 220 patients were referred (118 male, 102 female, mean age 55.9yr (sd=14.8). Indications: rectal bleeding (90%), 9% of referrals included bleeding/anal pain and bleeding/change in bowel habit (1%). Findings: benign ano-rectal disease (45%) (injection of haemorrhoids in 10%), diverticular disease/IBD (17%), polyps (adenomas>1cm) (10%) (median age 54yr (45-68); mean no. of polyps 1), cancer (2%) (median age 75.5yr (70-88)), and normal examination (26%). Of the cancers/polyps (4%) were within reach of a rigid sigmoidoscope (at 20cm). The remaining (96%) cancers/polyps were found in the distal/proximal sigmoid and descending colon. 45% of these patients also had co-existent haemorrhoids. 20 patients have been followed up at their one-year interval; only two have been re-referred for treatment of their haemorrhoids and discharged. Routine outpatient waiting times have been reduced from 16 to 8 weeks.

Conclusion: All patients with symptoms of rectal bleeding require at least a flexible sigmoidoscopy to exclude neoplastic disease. A nurse led clinic provides an effective 'one-session' service reducing outpatient clinic waiting times.

201 THE CLEAR CAMPAIGN: PUBLIC ACCESS PR BLEEDING CLINICS-AN INITIAL REPORT

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Background: Colorectal cancer (CRC) is the second commonest cause of UK cancer deaths. Our District General Hospital (West Yorkshire, UK urban/rural mix, population served 195,00-95,000 male) has developed a novel CRC campaign after being approached by a local charity group (Skipton Rotary Club). The CLEAR (CoLorectal Education And Research) campaign aims are to increase public awareness of symptoms of CRC and support a new rapid access per rectum bleeding clinic. We describe the CLEAR clinic development and initial analysis comparing it with open-access flexible sigmoidoscopy clinics (OAFS).

Method: A pilot study of established OAFS was done from Dec '98 to Mar '99 inclusive. 158 patients (n=158) were scoped. 18 tumours and polyps (neoplasia) were found, as were 3 cases of

inflammatory bowel disease (IBD). The most sensitive symptom was per rectum bleeding which identified 14 of the neoplasia and 2 of the IBD. This symptom is easily understandable to the public, and was made the criterion for access to the CLEAR clinic. Access is made by a telephone call directly from a member of the public to a CLEAR number, and the patient is seen at the next clinic (either fortnightly or monthly depending on demand). Initial rollout was to GPs who informed their patients of the clinic and how to access it if symptomatic, followed by a letterbox drop to households within the relevant postcode areas, also allowing patients to bypass GPs altogether (patient initiated). Clinics are between 5pm and 7pm for patient convenience.

Results: From Oct '99 to Oct '00 CLEAR (n=179) and OAFS (n=648) clinics have been directly compared. "PR bleeders" seen in OAFS are 45% cf. 56% in the pilot study - not significant (NS) - implying that this group has not simply been diverted to CLEAR clinics. There are significant differences in numbers of males presenting via OAFS and CLEAR (43% vs. 54% p=0.035). This points towards an under representation of males at OAFS (p=0.029 vs. population) which disappears at CLEAR (p=NS vs. population). Average ages were similar (56.4 at OAFS, 53.3 at CLEAR). At CLEAR clinics, 25 neoplasia and 5 IBD cases were identified cf. 91 neoplasia and 21 IBD at OAFS (p=NS).

Conclusions: Our population accepts public access clinics for per rectum bleeding. The pickup rate of significant pathology at these clinics is directly comparable to an established service. That more men attend these clinics may reflect both the change in clinic timing and the simplified access. There is no evidence of inappropriate testing with patient initiated direct access and our approach appears on initial analysis to increase service uptake by men.

202 TOPICAL L-ARGININE LOWERS RESTING ANAL PRESSURE

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Introduction: Chronic anal fissure is associated with raised resting anal pressure (RAP). The discovery of nitric oxide as a neurotransmitter mediating relaxation of the internal anal sphincter, led to investigation of exogenous nitric oxide donors, such as glyceryl tri-nitrate (GTN) as possible treatments for anal fissure. Endogenous nitric oxide (NO) is produced from cellular metabolism of L-arginine by NO synthase. This study investigated whether topical L-arginine may lead to increased NO production and reduced pressures in healthy volunteers.

Method: Local ethics committee approval was obtained. Anal manometry was performed using a solid state catheter for 2 hours following application of 400 mg of L-arginine ointment to the anal verge in 15 volunteers. After a washout period of 2-4 weeks, 11 of the 15 volunteers repeated the study using a placebo gel (Aquagel) for a period of one hour.

Results: The pressure drop from the initial RAP is shown in the table below. Topical L-arginine caused a greater maximum fall in mean RAP than placebo (p=0.002, Mann-Whitney U, table 1).

Abstract 202, Table 1

Time (mins)	Mean fall from initial resting anal pressure (cm H ₂ O)			
	Arginine	P value	Placebo	P value
15	20.7±2.8	0.001	7±2.8	0.06
30	20.3±3.4	0.001	4.6±1.7	0.03
45	15.3±4.8	0.011	6.9±3.1	0.12
60	14.5±5.0	0.015	4.1±3.8	0.37
120	17.7±5.0	0.006	-	-
Greatest fall in RAP	30.8±3.6	0.001	16.1±1.5	0.003

Results are expressed as mean ± S.E.M. The 'P' value for the fall in RAP at each time point was calculated using Wilcoxon Rank Sign test.

Conclusion: Arginine effectively lowers RAP; its onset of action is rapid and duration at least 2 hours. Arginine shows promise as a possible alternative treatment for chronic anal fissure.

203 ILEAL POLYPS IN FAMILIAL ADENOMATOUS POLYPOSIS

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Background: Restorative proctocolectomy with ileal pouch-anal anastomosis has become more common as a prophylactic procedure in familial adenomatous polyposis (FAP) because of the advantage of removal of all cancer-prone mucosa. The recent finding (*Gastroenterology* 2000;118(suppl 2):A427), however, of adenomatous polyps of ileal origin arising in up to 66% of FAP pouches has prompted a closer inspection of FAP ileal mucosa which is not incorporated into a pouch.

Aim: To demonstrate ileal adenoma at the time of colectomy for FAP.

Subjects and Methods: 12 patients with FAP were examined intra-operatively by passing a video-colonoscopy into the ileum immediately after colectomy and before the anastomosis was made. The surgeon then manually fed the tip of the endoscope 60cm proximally. The site, number and size of ileal polyps were recorded. Four biopsies were taken from normal looking ileum and four from polyp or other suspicious mucosa, thereby following the same protocol for pouchoscopy. In addition, the resected ileal cuff adjacent to the caecum was examined histologically for adenoma.

Results: The median age at colectomy was 25.5 yrs (14 to 56) and number of macroscopically visible colonic polyps in the histological specimen 648 (143-1180). Six of the 12 patients had visible ileal polyps up to 1cm in size but in all cases the lesions consisted of lymphoid hyperplasia, not adenoma. One of the biopsies from normal looking mucosa in one patient, and one of the resected ileal cuff specimens in another contained single-crypt and oligocryptal adenomas respectively.

Conclusion: The terminal ileum in these confirmed cases of FAP does not contain adenomatous polyps and has detectable microscopic adenoma only. This is in contrast to FAP pouch ileal mucosa in which visible and histologically confirmed adenomatous polyps are seen in two thirds of cases. Environmental changes (faecal stasis) associated with pouch formation may lead to growth of ileal adenomas. Incidence and nature of pouch adenomas in patients with familial adenomatous polyposis.

204 OUTCOME OF ANAL FISTULA SURGERY IN CROHN'S DISEASE

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We have prospectively studied the results of operations for symptomatic anorectal fistulas (AF) in Crohn's disease (CD). Thirty patients with 37 AF and CD were studied clinically and using a continence score and anorectal physiological studies before and three months after operation; 18 women, mean age 37.8 (range 25-53 years). Three of 37 AF were superficial, 13 of 37 were intersphincteric, 20 of 37 were trans-sphincteric and 1 of 37 supersphincteric. Thirteen AF were laid open and 24 were treated by a loose seton. Follow up was 2.1 years (range 0.8-2.6). In patients managed by lay-open, continence status deteriorated significantly; Cleveland Incontinence Score (CIS) deteriorated from 5.3 to 10.4 ($p=0.0004$); resting and squeeze anal pressures fell from 58.2 to 36.3 and from 78.3 to 59.6 respectively ($p=0.006$ and $p=0.01$). The volume of first leakage also fell from 529.6 ml to 312.7 ml. After loose seton, the CIS deteriorated only slightly from 4.2 to 7.1 ($p=0.03$); resting and squeeze pressures also fell from 50.2 to 43.2 and from 76.8 to 68.0 respectively ($p=0.02$ and $p=0.02$). The volume of first leakage fell from 512.1 ml to 398.2 ml. During the study period 22 of 30 AF healed in a mean time of 4.7 months (3.2 to 7.1). Laying open and AF in CD compromises continence more than the use of a loose seton. Furthermore, surgical treatment achieves healing in only three quarters of all patients.

205 SERUM B12 FALLS AFTER POUCH SURGERY BUT BACTERIAL OVERGROWTH IS NOT THE CAUSE

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The long-term effect of totally stapled restorative proctocolectomy (TSRP) on vitamin B12 levels is unknown. We routinely measure

vitamin B12 levels in our 164 patients, at follow-up after TSRP. Since bacterial overgrowth is suspected as a cause of B12 deficiency in these patients, hydrogen breath tests were performed on those with low serum B12. Three patients were B12 deficient prior to pouch formation. At follow-up thirty nine (23.8%) had low B12 ($<188\text{pg/ml}$), at a median of 2.4 years (0-7) of pouch function. In addition forty seven (73.4%) patients with multiple B12 measurements showed steadily decreasing levels. 34/35 (97.1%) patients with B12 deficiency who subsequently had a hydrogen breath test were negative for bacterial overgrowth (table 1).

Abstract 205, Table 1

Elapsed Time After TSRP	Patients With B12 Deficiency
0	10.0%
<1 year	17.0%
<3 years	21.2%
<5 years	22.9%
>7 years	23.4%

These data show that almost one in four patients after TSRP will have low serum B12 within 7 years. We recommend lifelong follow-up of vitamin B12 levels. In this study, bacterial overgrowth does not appear to be the cause of this B12 deficiency.

206 PATIENT VERSUS PHYSICIAN DELAY IN COLORECTAL CANCER; CAN WE DO BETTER?

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Background: Altered bowel habit and rectal bleeding are considered ominous symptoms. Negligence may cause considerable delay in diagnosis of colorectal cancers. We have prospectively analysed presenting symptoms, patient's delay, and physician's delay in colorectal cancer patients who were admitted to our unit.

Method: Questionnaire survey of time interval between onset of symptoms and first visit to physician and time interval from first visit to diagnosis of colorectal cancer.

Results: 63 patients (24 male; median age 60 years, range 23 to 78 years) were evaluated, 34 (53.9%) had rectal cancer, 12 (19%) had right colonic cancer, 11 (17.4%) had left colonic cancer and 06 (9.5%) transverse colonic cancer. Presenting symptoms in rectal cancer were (n=34): bleeding (n=27; 79.4%), altered bowel habit (n=23; 67.6%), and abdominal pain (n=09; 26.4%). Some patients had more than one symptom. Presenting symptoms in colonic cancer (n=29) were: altered bowel habit (n=24; 82.7%), and abdominal pain (n=16; 55.1%). Some patients had multiple symptoms. Patient's delay (median) in seeing a physician was 08 weeks (range 1-32 weeks) for rectal cancer versus (median) 06 weeks (range 01-364 weeks) for colonic cancers. Time to definitive diagnosis following the first visit to a physician was: rectal cancer (median) 18 weeks (range 01-192 weeks) versus colonic cancer (median) 12 weeks (range 01-32 weeks).

Conclusion: There was an unacceptable delay in time to diagnosis of colorectal cancers from the time of patient first visit to the physician.

207 COMPUTED TOMOGRAPHIC COLOGRAPHY (CTC) FOR COLON CANCER AND POLYP DETECTION

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CTC is a new technique allowing minimally invasive imaging of the colon. We are conducting a clinical trial, which has been funded by the North West R&D NHS scheme to determine the accuracy of CTC compared to fiberoptic colonoscopy (FC) in detecting colonic polyps and cancer.

Methods: Patients undergo CTC prior to/on the same day as FC. CTC / FC is performed after standard bowel cleansing/preparation. Two CT acquisitions are performed with the patient supine and then prone using a single spiral CT following administration of intravenous Buscopan and colonic air insufflation. The findings of CTC are correlated with the findings of FC in each patient.

Results: To date 112 patients have been recruited. The FC patient diagnoses were as shown in the table.

Abstract 207, Table 1

Normal/Incomplete	= 57 patients
Diverticular Disease	= 15 patients
Colitis (UC + Crohn's)	= 3 patients
Polyps <1cm	= 14 patients
Polyps >1cm	= 11 patients
Polyps (Mixed size)	= 3 patients
Cancers	= 7 patients
Cancer + polyps	= 2 patients

FC was completed to the caecum in only 79% of patients whereas CTC was completed in all. A total of 65 polyps were detected by FC. CTC detected 20 of 22 polyps greater than 1 cm but only 22 of the 43 polyps less than 1 cm in diameter. In addition 5 false positives on CT were identified. 9 cancers seen at FC were all detected by CTC. Additionally CTC detected two further cancers in the right side of the colon not reached at FC and a renal cell carcinoma in a patient presenting with pain and change in bowel habit.

Discussion: Initial results show that CTC is a sensitive method of detecting colonic cancers and the majority of polyps > 1 cm. All cancers and 91% of 1cm polyps have been identified by CTC. Up to date figures from this study will be presented.

208 DISTRIBUTION OF COLORECTAL ADENOMAS: CAN FLEXIBLE SIGMOIDOSCOPY BE EFFECTIVE FOR SCREENING?

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Screening flexible sigmoidoscopy has the potential to reduce colorectal mortality by detecting polyps followed by colonoscopy and polypectomy. However the effectiveness of flexible sigmoidoscopy depends on the frequency of proximal polyps in the left colon within reach of the flexible sigmoidoscope. We have therefore determined this frequency in our population.

Methods: Consecutive patients were included if at least one colonic polyp was detected during index colonoscopy. These patients were searched from endoscopy databases and hospital diagnostic codes.

Results: 234 patients had at least one polyp at index colonoscopy. Colonoscopy was performed for investigations of lower gastrointestinal symptoms and anaemia. The caecum was intubated in 209 (89%). The mean age was 62 years (range 33–89 years).

199 patients (85%) had at least one adenoma (the rest had hyperplastic polyps or carcinoma). 119 (60%) were male and 80 (40%) were female. 21 (11%) subjects had more than two adenomas. There were a total of 269 adenomas of which 195 (72%) were in the rectosigmoid colon. There were 199 "high risk adenomas" (adenomas larger than 10 mm in diameter, adenomas containing villous components, or adenomas with severe dysplasia). 146 (73%) of these were in the rectosigmoid colon. 32 (16%) subjects had adenomas only proximal to the sigmoid colon, including 18 (9%) subjects with "high risk adenomas".

Conclusion: 72% of adenomas were within the rectosigmoid colon and could have been detected by flexible sigmoidoscopy. 16% of patients with proximal polyps would have been missed by flexible sigmoidoscopy. These figures support the recommendation of flexible sigmoidoscopy for colorectal cancer screening.

209 RETROPERITONEAL MARGIN TUMOUR INVOLVEMENT IN CAECAI CARCINOMA

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Background: Mesorectal plane tumour involvement is a well established predictor of local recurrence in rectal carcinoma. However, the relationship between retroperitoneal surgical margin (RSM) tumour involvement (TI) and local recurrence in caecal carcinoma is poorly characterised.

Aim: To assess the rate of RSM TI in caecal carcinoma and to compare this with the previously published rate of local tumour recurrence.

Methods: 37 right hemicolectomy specimens were studied. During routine specimen dissection, at least one additional tissue block was taken to include the tumour and the RSM. The distance of the tumour from the RSM was measured using a microscope and vernier scale. The Dukes' stage, TNM stage and presence or absence of anterior peritoneal surface (APS) TI was also recorded in each case. RSM and APS TI were defined as the presence of tumour (or an involved lymph node) within 1mm of the RSM and APS respectively.

Results: RSM and APS TI was present in 4 cases (11%) and 26 cases (70%) respectively. Direct (ie non-nodal) RSM TI (2 cases) only occurred in posterior or circumferential tumours.

Conclusion: RSM TI, although less common than APS TI, occurs within a significant number of caecal carcinomas. The rate of RSM TI identified in this study compares favourably with a previously published local recurrence rate of 10% in caecal carcinoma (*Ann Surg* 2000;232:181–6), suggesting that RSM TI is an important predictor of recurrence in caecal carcinoma. It is possible that patients with RSM TI may benefit from postoperative radiotherapy.

210 LOW INCIDENCE OF COLORECTAL CANCER IN SOUTH ASIANS RESIDENT IN THE UK

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Background and aims: Colorectal cancer is relatively uncommon in India. Data from the 1970's showed reduced mortality from colorectal cancer in South Asians in the UK (*BMJ* 1984;289:1185–7). There have, however, been no large studies of racial differences in colorectal cancer incidence in the UK. Many South Asians have been resident in the West Midlands for several decades. We aimed to determine whether there was a reduced incidence of colorectal cancer in South Asians in Wolverhampton, and whether there were trends in incidence over the past decade.

Methods: Cases of colonic and rectal cancer from 1990–99 were identified from the Histopathology Dept database. South Asian patients were identified by surname/forename analysis, and African and Oriental subjects excluded. Age-sex standardised incidences were calculated using Census data.

Results: From 1990–99 the median age-sex standardised incidence of colonic cancer was 14.69/100,000/year in South Asians compared to 37.20/100,000/year in non-Asians (96% white, 4% black Caribbean) ($p=0.0002$). For rectal cancer the median age-sex standardised incidence in South Asians was 4.26/100,000/year compared to 22.57/100,000/year in non-Asians ($p=0.002$). There was a trend towards increasing incidence of colonic cancer from 1990–99 in non-Asians ($p=0.03$), but no significant trend in Asians. Rectal cancer incidence is increasing in Asians ($p=0.049$), but not in non-Asians. Standardised Morbidity Ratios for cancer in South Asians is shown in the table.

Abstract 210, Table 1

Year	90	91	92	93	94	95	96	97	98	99
Colon	0	0.30	0.52	0	0.52	0.62	0.42	0.27	0	0.61
Rectal	0	0	0.38	0	0	0.32	0.52	0.51	0	1.35

Conclusions: There is a markedly reduced incidence of colonic and rectal cancers in South Asian immigrants compared to whites and black Caribbeans. The rates of colonic cancer in South Asians have not increased over the last 10 years as might be expected with prolonged exposure possible western environmental factors predisposing to colorectal neoplasia. Rectal cancer is increasing in this group, however.

211 SIGNIFICANCE OF PROXIMAL COLONIC TUMORS IN PATIENTS WITH DISTAL COLONIC POLYPS

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Colonic polyps are mainly distal in distribution and proximal polyps are infrequent and associated with low recurrence rate. This audit was designed to assess the distribution of colonic polyps discovered at colonoscopy in symptomatic patients with emphasis on the characteristics of proximal lesions (Proximal to the Splenic flexure) in patients

with distal polyps. Two hundred and four polyps were resected endoscopically from 99 patients who presented with altered bowel habits and/or rectal bleeding. There were 58 males and 41 females with a mean age of 65 ± 14 (SEM). They had been symptomatic for a mean of 6 ± 17 months before undergoing colonoscopy. One hundred and fifty (74%) polyps were resected at the index colonoscopy of which only 13 (9%) polyps were proximal and 137 (91%) were distal. 54 other polyps were resected at subsequent surveillance colonoscopy of which only 9 (17%) were proximal and 45 distal. 83 polyps (41%) showed evidence of high grade dysplasia, 22 (11%) showed low grade dysplasia, in the remaining 99 polyps there was no dysplastic changes. The 22 proximal polyps, 12 (55%) showed high grade dysplasia and 2 (10%) low grade dysplasia as compared to 39% and 11% respectively for distal polyps. There were four colonic cancers diagnosed either at the index colonoscopy (2) or at surveillance colonoscopy (12 and 60 months). All four cancers were Duke A/B and successfully resected.

Conclusions: The majority of advanced colonic tumours are located distally. Proximal lesions constituted less than 10% of all tumours resected but a significant proportion of proximal polyps had high grade dysplasia. This contrasts with distal lesion when high grade dysplasia was evident in just over a third of all specimens.

212 NEO-ADJUVANT THERAPY (NAT) IN RECTAL CANCER: TUMOUR REGRESSION AND IMPACT ON LYMPH NODE HARVEST

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Background: Neo-adjuvant therapy is known to cause tumour down staging in rectal cancer. This study evaluated the impact of NAT on tumour regression and lymph node harvest.

Patients and Methods: Twelve patients (6 males; median age-58 years, range 26-72) with rectal cancer were subjected to high dose neo-adjuvant therapy (4500cGy in 25 fractions). Tumour regression (TRG) was graded 1-5. TRG1- no residual tumour cells; TRG2- rare residual tumour cells with marked fibrosis; TRG3-marked fibrosis with scattered tumour cells or groups; TRG4- abundant cancer cells with little fibrosis; TRG5- no tumour regression. Lymph nodes were harvested by dissecting along blood vessels. Data was compared with 10 randomly selected non irradiated controls. (3males, median age 54 years, range 22-65years)

Results: Tumour regression was seen in all patients; 3(25%) had grade 1 regression, 2(17%) had grade 2 regression, 2(17%) had grade 3 and 5(42%) grade 4 regression. Median nodal harvest was 3 (range 0-11) after NAT compared with 9 (range 1-19) in those without NAT ($p < 0.01$, t-test). Median size of the harvested nodes after NAT was 5mm (range 2-10) versus 9mm (range 4-12) without NAT ($p < 0.01$). Tumour deposits were identified in 6 of 44 nodes (14%) after NAT compared with 16 of 93 (17%) nodes without NAT ($p > 0.05$).

Conclusion: Although NAT down stages rectal cancer, it results in a significantly lower lymph node yield which are also significantly smaller in size compared with non irradiated controls. Histopathologists must be aware of this to ensure adequate sampling, and hence accurate reporting of lymph node status in irradiated rectal cancer.

213 5-HYDROXYTRYPTAMINE (5-HT) LEVELS IN COLONIC MUCOSA IN THE IRRITABLE BOWEL SYNDROME (IBS): ASSESSMENT BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

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Introduction: We have shown previously by immunohistochemistry an increase in 5-HT staining enterochromaffin cells (EC) in the colonic mucosa of IBS patients.

Aims: To assess any differences between IBS patient and control total colonic mucosal 5-HT levels as quantified by HPLC.

Methods: Eight patients with IBS and 4 control patients with normal colonoscopy for polyps or rectal bleeding had biopsies each taken from the ascending, transverse and sigmoid colon. Immunostaining was performed using the avidin biotin method (Vectastain elite kit) with anti-serotonin (5-HT) mouse monoclonal antibody. Stained cell

numbers in five crypts per specimen were assessed using semi-automated image analysis with a KS400 (Zeiss Ltd) system and expressed as mean number of stained cells per unit crypt length (μm) + standard error. Samples for HPLC were prepared by homogenising biopsies in 0.5% perchloric acid with 2mM EDTA. Data are expressed as a mean in nmol/mg dry weight(dw) $\pm$ standard error. Results were examined by Mann-Whitney analysis. (Significance level at $p < 0.05$).

Results: Immunostaining studies of colonic mucosa showed 1.43 (± 0.16) stained cells per unit crypt length in IBS v 0.89 (± 0.15) in controls ($p = 0.042$). However, total mucosal 5-HT by HPLC was higher in controls than IBS (3.05 ± 0.48 vs 2.21 ± 0.53 nmol/mg dw ($p = .03$)).

Conclusion: These studies show a lower total colonic mucosal 5-HT level in IBS than controls. In contrast higher numbers of 5-HT staining EC cells are seen in IBS than controls. This apparent discordance might be explained by the increased release and consequent depletion of 5-HT from the colonic mucosa in IBS with a compensatory chronic increase in the number of EC cells which would appear not to reflect the total 5-HT concentration since the immunostaining does not quantitate intracellular levels of 5-HT.

214 EFFECTS OF LACTOBACILLUS PLANTARUM 299V ON SYMPTOMS AND COLONIC FERMENTATION IN IRRITABLE BOWEL SYNDROME (IBS)

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Introduction: 50% of IBS sufferers may have food intolerances, an abnormal colonic flora and malfermentation. The probiotic Lactobacillus plantarum 299V (Probi AB, Lund, Sweden) has been shown to promote colonic fermentation in healthy volunteers and to improve symptoms in a group of IBS subjects.

Methods: Twelve patients with IBS fulfilling the Rome criteria took part in a double-blind, cross-over 4 week trial of 125mls Lactobacillus plantarum 299V (5×10^7 cfu/ml) daily against a placebo drink of similar colour and taste. Unbeknown to patients and investigators all received placebo first to avoid any cross-over effect of the active preparation. A validated composite symptom score was completed daily. After each treatment fermentation was assessed by 24hrs continuous measurement of gaseous exchange in a 1.4³m canopy followed by breath hydrogen determination for 3 hrs after 20mls of lactulose. Hydrogen was measured by electro-chemical cell (GMI, Renfrew, UK)

Results: No changes were seen in symptoms or calorimetry results (table).

Abstract 214, Table 1

	Placebo	Active
Median symptom score	8.5 (6.25-11.25 IQR)	8 (6.75-13.5 IQR)
Median maximum rate of gas production (ml/min)	0.55 (0.4-1.1 IQR)	0.42 (0.45-1.5 IQR)
Median hydrogen/24hrs (mls)	189.7 (118.3-291.1 IQR)	208.2 (146.2-350.9 IQR)

Breath hydrogen excretion after lactulose was reduced by the probiotic (median at 120mins 6ppm; placebo, 17ppm $p = 0.019$).

Conclusion: L. plantarum 299V had a beneficial effect on colonic fermentation reflected in reduced breath hydrogen after lactulose, but not sufficient to reduce total hydrogen production, or to affect patients' symptoms.

215 LACTULOSE HYDROGEN BREATH TEST IN THE DIAGNOSIS OF IRRITABLE BOWEL SYNDROME (IBS) CAUSED BY FOOD INTOLERANCE

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Introduction: IBS may be associated with food intolerance, and malfermentation of food residues in the colon leading to excess hydrogen production (*Lancet* 1998;352:1187-9). Malfermentation might provide the basis for a diagnostic test to identify IBS patients suitable for dietary treatment.

Methods: Colonic fermentation, measured by continuous measurement of gaseous exchange over 24hrs in a 1.4m³ tent calorimeter, was compared in 18 unselected subjects fulfilling the Rome criteria for IBS, 10 normal volunteers and 12 patients with IBS who had previously failed to respond to an exclusion diet. Immediately after calorimetry, each subject, fasting, received 20gms of lactulose and end expiratory breath samples were collected every 30 minutes for three hours. Hydrogen concentrations in tent gases and breath samples were determined by an electrochemical cell (GMI, Renfrew, UK).

Results: Total 24hr excretion of hydrogen, as in earlier studies, was significantly greater in the IBS group (median 333.7ml/24hrs, IQR 234.7-445.67) compared to the normal volunteers [median 203.1ml/24hrs, IQR 131.4-256, $p=0.002$] or the failed-diet group [median 204.5ml/24hrs, IQR 111.35-289.13, $p=0.015$]. However, no difference was detected in breath excretion of hydrogen following lactulose in any group. Small bowel transit was similar in IBS subjects and controls.

Conclusion: This confirms, in a larger number of patients, our earlier report that total hydrogen production over 24hrs is increased in IBS associated with food intolerance. The lactulose hydrogen breath test, however, does not reflect total 24hr hydrogen production and has no diagnostic value in identifying this subgroup of IBS.

216 COMPARISON OF THE CAECAL AND FAECAL MICROFLORA OF HEALTHY SUBJECTS AND PATIENTS WITH IRRITABLE BOWEL SYNDROME (IBS)

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Introduction: Colonic malfermentation has been suggested to be a factor producing IBS and IBS patients have been shown to have lower numbers of lactic acid bacteria in their stools with increased aerobic counts. The caecum is the most important colonic region for bacterial fermentation, but it is not known if the faecal flora is representative of that of the caecum.

Methods: 7 subjects referred for investigation of rectal bleeding whose bowel function and colonoscopy were normal, were considered healthy controls. These and 8 IBS patients were prepared for colonoscopy by a single 100ml enema to empty the sigmoid, leaving the proximal colon undisturbed. The colonoscope was then passed to the caecum using CO₂ for insufflation to maintain anaerobic conditions. Caecal fluid was aspirated and mucosal biopsies taken. Patients also provided faecal specimens. Samples were cultured using standard aerobic and anaerobic microbiological techniques. Dry weights of the specimens were obtained by freeze-drying to standardise results.

Results: There were significantly higher numbers of anaerobes in the faeces of healthy subjects compared with IBS patients ($P=0.021$). There were no significant differences between numbers of aerobes or lactic acid bacteria (LAB) in the faeces of the two groups. Lower numbers of organisms were detected in lumen samples. There were no significant differences between numbers of anaerobes, aerobes or LAB in the caecal lumens of healthy and IBS subjects. In IBS patients, lactobacilli were present in the caecal mucosae and caecal lumen but were not detectable in the faeces. Aerobes were detected in the caecal mucosae of 5 IBS patients compared with 2 of the healthy subjects ($P=0.072$).

Conclusion: Differences in the caecal and faecal flora of may be a factor contributing to colonic malfermentation and the development of IBS.

217 IRRITABLE RECTUM: THE MOST COMMON CAUSE OF FAECAL INCONTINENCE IN A SPECIALIST COLORECTAL PRACTICE

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Faecal incontinence (FI) is a common symptom in patients referred to coloproctology and may be due to many causes. We investigate all patients referred with FI. A profile of a consecutive series of these patients is presented. 100 consecutive patients with FI were investigated by ano-rectal physiology, endosonography (USG) and where indicated video proctography. The median age of the patients was 55 years (22-84); 79 were female of whom 44 had an adverse event during childbirth. On investigation the basal anal canal pressure

was <60mmHg in 82 patients and <30mmHg in 36. The corresponding maximum squeeze pressure was <100mmHg in 83 patients and <50mmHg in 26. The pudendal terminal latency was prolonged in only 20 patients. Rectal sensitivity was assessed using an intra-rectal balloon: 56 patients were unable to tolerate inflation beyond 50 ml. Sphincter defects were identified on USG in 10 patients (3 of IAS, 1 EAS and 7 both internal and external sphincters). On the basis of both clinical history and investigation the aetiology of the FI was considered to be multi-factorial in 47 patients. The predominant diagnoses were: diffuse pelvic floor weakness 16 patients, sphincter deficit 48, and irritable / hypersensitive rectum 53 patients. 29 patients had no demonstrable abnormality of the pelvic floor or sphincters. These data suggest that the cause of FI is often multi-factorial. In this series hypersensitivity of the rectum was an important and previously unrecognised cause of faecal incontinence. This has important implications for treatment especially if surgery is considered.

218 SMOKING AND ANASTOMOTIC LEAK FOLLOWING ANTERIOR RESECTION OF THE RECTUM

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Introduction: Anastomotic leak is a major cause of morbidity and mortality following colonic resection and occurs in 2% to 17% of cases. The level of anastomosis, integrity of blood supply and obesity have previously been considered risk factors for leak.

Methods: Clinical details of all patients undergoing anterior resection of the rectum over a two year period were reviewed.

Results: Two hundred and eight patients (116 male) underwent anterior resection of the rectum. There were 25 combined clinical and radiological leaks (12%). Anastomotic breakdown was significantly associated with a history of smoking ($\chi^2=5.85$, 1 d.f., $p=0.016$) or drinking more than 28 units of alcohol per week (Fisher's Exact test $p=0.03$). Smoking, but not alcohol, was found to be independently associated with leak (relative risk 3.1 vs. non-smokers, 95% c.i. 1.2-8.2). The risk of leak was increased for both current smokers and ex-smokers. Male patients and patients undergoing low anterior resection showed a trend towards higher rates of leak whilst the age of the patient, grade of surgeon and type of post-operative analgesia did not significantly affect the risk of leak. Overall 30 day mortality was 12% for patients with an anastomotic leak compared with 5.5% for those without.

Conclusions: Smokers are 3 times as likely to suffer an anastomotic leak following anterior resection of the rectum than non-smokers. Smoking was the strongest independent risk factor studied in this series. The increased risk of leak from smoking is not reduced in patients who have given up for greater than ten years prior to surgery. A history of smoking, past or present, should influence the decision to perform a concurrent defunctioning stoma in patients undergoing an anterior resection of the rectum.

219 EPIDURAL INCREASES INFECTION RATE FOLLOWING LEFT-SIDED COLONIC RESECTION

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Background: There is an increasing use of epidural anaesthesia during left-sided colonic resections, it is however unknown if the anaesthetic technique and post operative provision of analgesia influences morbidity. POSSUM (Physiological and Operative Severity Score for the enUmeration of Mortality and morbidity) and Portsmouth correction (P-Poosum) are accepted as physiological audit tools to predict morbidity and mortality in GI surgery, allowing cross group analysis. In comparing observed to expected morbidity, observed complications are equally weighted between mild and severe.

Methods: A retrospective analysis of 148 patients' consecutive left-sided resections over a 25 month period was undertaken. Analysis of observed complication rate was compared to POSSUM expected morbidity and expected mortality; Portsmouth corrected morbidity and correlation between type of anaesthesia/analgesia was also assessed.

Results: Observed:Expected mortality was 0.359 (P-Poosum 1.062), O:E morbidity 1.74. Of these 148 patients, only 15 received PCA. 46.3% of observed morbidity were infective, 82.8% were mild

(pyrexia of unknown origin, urinary, chest or line), and 17.2% severe (deep infection or septicemia). Expected Mortality and Morbidity of patients receiving PCA and Epidural were similar ($p=0.343$ and $p=0.348$). A greater infection rate is seen with Epidural (45.1%, 18.4% severe) compared to 20% patients receiving PCA, of which none were severe (χ^2 : $p=0.02$). 12.5% patients receiving Epidurals experienced hypotension (systolic <90 mmHg for >2 hrs), and of these 58.9% had septic episodes ($p=0.053$).

Conclusions: In patients undergoing left-sided colonic resection, patients receiving epidural analgesia were more than twice as likely to experience an infective adverse event as those receiving PCA. This may in part be due to hypotensive episodes associated with epidural.

220 USE OF WHOLE CRYPT MOUNTS TO QUANTIFY APOPTOSIS IN HUMAN COLONIC CRYPTS EXPOSED TO IONISING RADIATION OR DIETARY INTERVENTION WITH FISH OIL

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In healthy colonic mucosa a balance is maintained between cell production and loss via apoptosis or exfoliation. Crypt cell apoptosis is a relatively rare event, but is essential for deletion of DNA-damaged cells from the crypts. Having previously shown that dietary intervention with fish oil can increase crypt cell apoptosis in rat intestine (*Carcinogenesis* 20:645-50), we have quantified apoptosis in the distal colons of cancer patients who received either a placebo or fish oil immediately before surgery, and compared the results with the effects of preoperative radiotherapy.

Methods: Samples of colonic mucosa (5, 10, 15, 20 and 25 cm from the tumour) were taken from the resected tissue of patients ($n=7$) diagnosed with left-sided colon carcinoma, who had received X-ray therapy (25Gy in 5 fractions over 5 days) before surgery. Patients with a similar diagnosis, not requiring pre-operative radiotherapy, were randomly assigned to receive fish oil capsules ($n=25$; 2.4g n-3 fatty acids/day) or a placebo ($n=24$) for 7-21 days pre-operatively. All tissue samples were immediately transferred to fixative for storage. Following rehydration and staining with Feulgen's reagent, whole crypt mounts were prepared to assess mitosis and apoptosis, using morphological criteria.

Results: In the irradiated intestine, crypt structure was extremely delicate within a 10 cm radius of the tumour and cells were severely damaged with massive DNA fragmentation. Further from the tumour site crypts retained their normal morphology but those from irradiated mucosa had a significantly lower mitotic rate and a higher frequency of apoptosis than the controls. The frequency of apoptosis was inversely proportional to distance from the site of the tumour. There was no effect of fish oil on apoptosis in patients not receiving radiotherapy.

Conclusions: The whole crypt mount technique can be used to visualise and quantify apoptosis in human intestinal mucosa, and to assess the effects of dietary or other interventions.

Pancreas Posters: 221-223

221 ASSESSMENT OF IMMUNE RESPONSE IN PATIENTS WITH PANCREATIC CANCER VACCINATED WITH GASTRIN-DIPHTEHRIA TOXOID (G17DT)

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G17DT is a conjugate of an epitope derived from gastrin 17 linked to Diphtheria toxoid (DT). Gastrin is an autocrine growth factor in pancreatic and other GI tract cancers. In a phase II study of G17DT for advanced pancreatic cancer only 6/13 (45%) formed antibody to 100mcg of G17DT however 15/18 (83%) formed antibody to the higher dose of 250mcg. The median survival of the whole group was

7 months. Side effects were limited to mild local pain and erythema with 3 patients forming an abscess. Patients with pancreatic cancer are thought to have a suppressed immune response compared to other GI cancers.

Aim: To assess anti-DT antibody level pre and post vaccination to determine its correlation with Gastrin antibodies and relationship with immunogen side effects.

Methods: 26 of the 31 vaccinated patients had serum available. 18 had developed antibody to gastrin (G+) and 8 had not (G-). Anti-DT antibody level was determined by in-vitro tissue culture neutralisation of purified DT.

Results: 16 (88%) of the G+ group had non-protective levels of anti-DT antibody before vaccination compared with 7 (87%) of the G- group. In cases given 100mcg of G17DT and remaining G-, 3/6 (33%) produced protective levels of antibody to DT; the median rise in DT antibody was 1 fold. Both of the 2 cases given 250mcg and remaining G- failed to become DT protected. In those who became G+ after 100mcg of G17DT, 16/18 (89%) were DT immune. The rise in the DT titre was 64 fold in the 100mcg group and 256 fold in the 250 mcg group. In the 3 who formed an abscess, all achieved high anti-gastrin antibody levels and had non-protective anti-DT baseline titre, with a median increase of 256 fold in anti-DT antibody.

Conclusion: 250mcg of G17DT produces higher titres of anti-DT as well as a higher proportion of G+ patients. Response to G17DT is not dependent on pre-vaccine DT antibody. An anti-DT response was seen in some G- patients therefore suggesting that this group is not uniformly immunosuppressed.

222 ONE-YEAR AUDIT OF THE MANAGEMENT OF PANCREATIC CANCER AT A DISTRICT GENERAL HOSPITAL

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Introduction: The treatment of Pancreatic cancer remains a challenge to a good endoscopic service. Three Gastroenterologists provide the ERCP service for the 500 000 population of East and North Hertfordshire NHS Trusts. Over 300 ERCP's are performed annually. In common with other units, we are finding that an increasing number of ERCP's are therapeutic. We wished to review the efficacy of our diagnosis and endoscopic treatment of pancreatic cancer.

Methods: Patients were identified between 31.03.1999 and 31.03.2000 from the endoscopic database and from diagnostic coding. 51 patients were identified, all with complete ERCP data. 10 patients notes were incomplete with regard to non ERCP data and have been excluded.

Results: 92% presented with recent onset jaundice and a background of weight loss. 72% presented as medical emergencies to the on call medical team. Of the technically feasible procedures ERCP alone provided palliation of jaundice in 77% of patients within a mean of 10 days. Of the remainder of non-palliated cases PTC provided relief in 91%. ERCP alone provided a tissue diagnosis in 29% of patients. 100% of bile duct brushings and small bowel biopsies were adequate. 67% of Pancreatic fluid samples were adequate. PTC provided a tissue diagnosis in one patient with 66% adequate samples. In 12 ERCP's and 2 at PTC's there was no attempt at tissue diagnosis. 25% of stents needed to be replaced with a mean survival of 89 days.

Conclusion: Pancreatic cancer tends to present as a medical emergency with icterus. The success of palliation with ERCP and PTC is comparable with other studies (*J R Coll Surg Engl* 1992;74:338-42.). The adequacy of samples taken at ERCP and PTC is also comparable as was stent survival (*Gut* 1997;40:671-8). Our referrals to the surgeons seemed appropriate, however only 6 were referred to an oncologist. After discussion it was felt that we should: a) Endeavour to collect brushings and small bowel biopsies at ERCP, to improve our tissue diagnosis rate. b) That we were under referring patients to our oncology service.

223 FAECAL CALPROTECTIN IS ELEVATED IN PANCREATIC INSUFFICIENCY

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Background: Calprotectin is a stable 36kDa neutrophil derived bactericidal protein. Elevated faecal calprotectin has been reported by us and others, in inflammatory and neoplastic diseases of the intestinal