(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

J.M. Gee¹, A.C.J. Polley¹, M. Watson², M. Rhodes², C.J.M. Speakman², W.S.L. Stebbings², I.T. Johnson¹. ¹Institute of Food Research, Norwich Research Park, Norwich NR4 7UA; ²Norfolk & Norwich Hospital, Brunswick Road, Norwich, NR1 3SR, UK

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)

S.C. Smith¹, C.V. Bouvier¹, D. Michaeli², R.E. Pounder¹, M.E. Caplin¹. ¹Dept of Gastroenterology, Royal Free and University College Medical School, London, UK; ²Aptin Corporation, California, USA

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

S.J. McAree¹, A.P. Catterall^{1,2}, S.M. Greenfield^{1,2}, P.B. McIntyre¹. ¹QE 2 Hospital, Welwyn Garden City; ²Lister Hospital, Stevenage, UK

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

D. Watts, N. Anderson, S. Campbell, G. Brydon, S. Ghosh. *Gastrointestinal Unit, University of Edinburgh, Western General Hospital, UK*

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

tract. It has been suggested that faecal calprotectin might be a useful screening tool in distinguishing organic from functional bowel disease, especially in children. We report, for the first time, elevated faecal calprotectin in patients with diarrhoea due to pancreatic insufficiency.

Method: A total of 115 patients (77 women: 38 men; age 19–85) with chronic non bloody diarrhoea were screened in this study. Both pancreatic elastase and calprotectin were assayed by ELISA in faecal samples (normal : calprotectin < 30 µg/g, elastase >150 µg/g.) Pancreatic imaging in those with low faecal elastase was carried out by a combination of CT scanning, endoscopic pancreatograms and endoscopic ultrasonography.

Results: Twenty six (21%) patients had low faecal elastase. Of these, 5 were confirmed radiologically to have chronic pancreatitis. All 5 patients were shown to have abnormally high faecal calprotectin levels (90–534 µg/g). 14 patients had suspected pancreatic insufficiency in the absence of other causative pathology. 13 (93%) of these patients had elevated faecal calprotectin (73–799 µg/g). 7 patients with low faecal elastase and 'watery' faecal samples were subsequently shown to have probably normal pancreatic function and an alternative explanation for symptoms (adenoma, Clostridial colitis, small bowel bacterial overgrowth, diverticular disease). Of these patients, 2 (29%) had abnormally high faecal calprotectin (176 µg/g=adenoma, 2670 µg/g=C.diff colitis) (table 1).

Abstract 223, Table 1

	Total patients	Low elastase	High calprotectin
Confirmed pancreatic disease	5	5 (100%)	5 (100%)
Possible pancreatic disease	14	14 (100%)	13 (93%)
No pancreatic disease	96	7 (7%)	42 (44%)

Conclusion: Pancreatic insufficiency may be associated with high faecal calprotectin in the absence of neoplastic or inflammatory intestinal disease. Low faecal elastase may also be associated with watery diarrhoea secondary to inflammatory intestinal disease, itself associated with an elevated faecal calprotectin concentration.

Symposium: Guts, Liver and Bones: 224–225

224 GUIDELINES FOR OSTEOPOROSIS PREVENTION: HOW FAR HAVE WE YET TO GO?

E. Seward, T. Quigley, M. Smith. *Dept of Gastroenterology, Havering Hospitals' NHS Trust, Romford, Essex RM7 0BE, UK*

Background: The British Society of Gastroenterology has published guidelines for the prevention and treatment of osteoporosis in patients with coeliac disease and inflammatory bowel disease (IBD) (*Gut* 2000;46(suppl 1):i1-i8). This has important implications for the planning of clinical services, especially with the limited availability of DEXA scanning. We have undertaken an assessment of the need for DEXA scans in our gastroenterology out-patient population.

Methods: In a district general hospital, population 460,000, we identified all patients with coeliac disease and IBD attending all gastroenterology out-patient clinics (3.5 consultant gastroenterologists, total 6 clinics per week) over a one month period. We assessed the number of these patients who required DEXA scanning and further investigation according to the BSG guidelines.

Results: Over a four week period 124 of a total 204 patients with either coeliac disease or IBD were found to require a DEXA scan according to the guidelines. The mean age of those requiring a scan was greater than those who did not (54.1 (18.6)y vs 38.6 (12.3)y (age (sd)). All 21 patients with coeliac disease required a scan. Of those with Crohn's disease 43/72 required a scan as did 60/111 patients with ulcerative colitis. Reasons for scans in patients with IBD are given in the table. DEXA scans had already been requested in 12 patients and 5 patients were on treatment (table 1).

Conclusions: Currently we are achieving BSG guidelines in less than 10% of our patient population. Introducing guidelines will mean that almost 2/3 of patients with Crohn's disease and more than half our ulcerative colitis patients will require a DEXA scan. Subsequently scanning will be required for patients with a new diagnosis of IBD,

Abstract 224, Table 1

	On steroids	Post-menopausal or male >55y	Both steroids and age criteria
Crohn's disease	21	21	1
Ulcerative colitis	14	32	14

those requiring long courses of steroids and those reaching the age thresholds, as well as those on bone protection treatment. Patients with coeliac disease who require a scan at diagnosis place less pressure on resources.

225 PREVALENCE OF FRAGILITY FRACTURE IN COELIAC DISEASE AND INFLAMMATORY BOWEL DISEASE

W.E. Fickling, A. Holdoway, D.A. Robertson, A.K. Bhalla¹. *Royal United Hospital; ¹Royal National Hospital for Rheumatic Diseases, Bath, UK*

Background: Osteoporosis is a common complication of both inflammatory bowel disease and coeliac disease, but there is little information on the prevalence of fragility fracture in these patients.

Methods: Ambulant patients with coeliac disease (102), Crohn's disease (88) and ulcerative colitis (130) completed a questionnaire detailing their fracture history. Fractures involving major trauma e.g. Road Traffic Accidents, falls from greater than three feet and sports injuries were excluded from analysis.

Results: 42% of patients with coeliac disease had experienced a previous fracture. Commonest fractures involved the distal radius (32%) and ankle (16%). Prevalence was higher in females than males (46% vs 33%). Females were younger than males (52.3yrs vs 59.1yrs) and were diagnosed at an earlier age (45.9yrs vs 52.3 yrs). In neither sex was age at diagnosis related to history of fracture. 99 patients were diagnosed after the age of 25, when peak bone mass is achieved. 130 patients with ulcerative colitis (47 male, 83 female, mean age 45.7yrs) and 88 patients with Crohn's disease (31 male, 57 female, mean age 38.7yrs) completed the questionnaire. 29% of patients with ulcerative colitis and 30% of patients with Crohn's disease had suffered a fracture. Patients incurring fractures after diagnosis of ulcerative colitis had earlier onset of disease (mean 28.6yrs vs 37.9yrs) and longer duration (14.0yrs vs 7.7yrs) than patients without fractures. Fracture risk was unrelated to disease extent, use of systemic corticosteroids, smoking and family history of fragility fracture.

Conclusions: Fractures are very common in patients with coeliac disease and inflammatory bowel disease. Efforts to prevent, detect and treat low bone mineral density may reduce this prevalence.

Cell Biology/Neoplasia/Coeliac Free Papers: 226–239

226 IMMUNE RESPONSES IN BARRETT'S METAPLASIA

J.A. Eksteen¹, J.L. Smith², C. Tselepis¹, I. Perry¹, R.F. Harrison³. *Depts of ¹Medicine and ²Pathology, University of Birmingham; Dept of ³Immunology, Southampton General Hospital, UK*

Introduction: Barrett's metaplasia (BM) is a chronic inflammatory disorder of the oesophagus in response to persistent gastro-oesophageal reflux and is associated with two distinct complications: benign oesophageal strictures and a 125-fold increased risk of developing an oesophageal adenocarcinoma. Benign strictures usually form in proximal areas of BM whereas adenocarcinomas arise distally. The characteristics of the inflammation and its role in the development of these complications have however been unclear.

Hypothesis: We propose that different immune responses are involved in the pathogenesis of these complications and that inflammation in BM is not a homogenous condition.

Methods: Endoscopic biopsies were obtained from normal oesophageal mucosa (n=10), oesophagitis (n=10) and paired biopsies from proximal and distal BM (n=20). The samples were assessed using immunohistochemistry, immunofluorescence, western blotting, and PCR amplification of DNA isolates from paraffin-embedded biopsies with consensus primers TCRB, TCRG and IgH.