Methylation of the *SFRP4* promoter was significantly (p=0.001) greater in biopsies from those at higher CRC risk. In addition, increasing age (a strong modulator of CRC risk) was significantly (p<0.001) associated with increased *SFRP4* methylation.

Conclusion This study showed that *SFRP4* methylation is significantly greater in macroscopically normal rectal biopsies from those at higher CRC risk. This aberrant epigenetic mark may be causal for CRC risk and further studies are needed to investigate whether methylation of *SFRP4* is reversible by dietary and other interventions.

Competing interests None declared.

PWE-085 AGE-RELATED CHANGES IN DIVERTICULAR DISEASE ADMISSIONS IN SCOTTISH HOSPITALS 2000–2010

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Introduction Recent studies suggest that acute admissions for diverticular disease (DD) are increasing in younger age groups. Verification of this trend in Scotland and examination of treatment patterns by age will help in the understanding of DD and may establish better hospital treatment pathways for DD patients.

Methods The Scottish Morbidity Record (SMR01) Linked Database was utilised to extract data on hospital admissions with a primary diagnosis of DD (ICD-10 code K572-K579) from 2000 to 2010. These were categorised into three treatment groups: diagnostic (investigational), medical (ie, receiving medical therapy only) and surgical (ie, having an operation). For each group, the incidence of admissions was determined by year of admission and then stratified by age (<45, 45–54, 55–64, 65–74, 75–84 and 85+ years). Proportions of admissions by age group were determined.

Results Admissions for DD increased from 6591 in 2000 to 10 228 in 2010 (55%). The largest numerical increase (2957, 57.1%) was seen in diagnostic admissions, while the greatest percentage change was seen in medical admissions (688, 73.1%). Surgical interventions remained stable (Abstract PWE-085 table 1). There was little difference in the age-related incidence of diagnostic admissions between 2000 and 2010. In patients <55 years, medical admissions increased between 2000 and 2010 (17.6% [166/941] vs 25.7% [418/1629]). The proportion of surgical admissions in patients 55–64 years also increased (19.2% to 28.5%) but decreased in the 65–74 year group (29.1% to 22.9%). There was little change in admission types among other age groups between 2000 and 2010.

Abstract PWE-085 Table 1 DD admission type and age-band—incidence and % of annual admissions 2000 and 2010

Type	Diagnostic		Medical		Surgical	
Year	2000	2010	2000	2010	2000	2010
N (% change)	5175	81321 (+57.1%)	941	1629 (+73.1%)	475	467 (−1.6%)
<45	193 (3.7%)	275 (3.4%)	34 (3.6%)	158 (9.7%)	41 (8.6%)	41 (8.8%)
45–54	523 (10.1%)	965 (11.9%)	132 (14.0%)	260 (16.0%)	88 (18.5%)	81 (17.3%)
55–64	1057 (20.4%)	1921 (23.6%)	144 (15.3%)	325 (20.0%)	91 (19.2%)	133 (28.5%)
65–74	1682 (32.5%)	2476 (30.4%)	257 (27.3%)	373 (22.9%)	138 (29.1%)	107 (22.9%)
75–84	1337 (25.8%)	2045 (25.1%)	242 (25.7%)	350 (21.5%)	94 (19.8%)	89 (19.1%)
85+	383 (7.4%)	450 (5.5%)	132 (14.0%)	163 (10.0%)	23 (4.8%)	16 (3.4%)

Conclusion DD admissions are increasing in Scotland due to rises in diagnostic and medical admissions. There was no age-related change in the proportion of diagnostic admissions between 2000 and 2010, but there was an increase in DD patients <55 years managed medically. There appeared to be a shift away from surgery in patients 65–74 years towards those in the age band 55–64 years.

Competing interests H Paterson Grant/Research Support from: Shire Pharmaceuticals Inc, I Arnott Grant/Research Support from: Shire Pharmaceuticals Inc.

PWE-086 POLYP SIZE MEASUREMENTS IN THE BOWEL CANCER SCREENING PROGRAMME

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Introduction Polyp size is a principal factor used to determine surveillance intervals both nationally and internationally, and is an independent risk factor for the malignant potential of colorectal lesions. There is uncertainty regarding the most accurate method of measurement of colonic polyps, between the in situ and post-formalin fixation measurements. This study aims to determine the preferred polyp measurement for use in determining surveillance intervals and compare post-fixation polyp measurements using three different devices.

Methods 107 consecutive colorectal polyps were measured in situ, pre-fixation and post-fixation to the nearest millimetre. Post-fixation measurements were recorded using a metal ruler, callipers and a graduated magnifying lens. One sample t-tests and the Kruskall–Wallis test were used for data analysis.

Results Pre-fixation ruler measurements were significantly higher than both in situ and post-fixation ruler measurements (p<0.05). However no significant difference was observed between in situ and post-fixation measurements (p=0.36). In situ measurements were associated with a higher rate of surveillance group variation than post-fixation measurements (9.3% vs 5.6%). No significant difference was seen between measurements obtained by the three different devices post-fixation (p=0.89).

Conclusion Post-fixation polyp size measurements are associated with lower rates of surveillance variation and may be considered the preferred measurement. On average colonoscopists underestimated polyp size. In the absence of a clinically significant difference between measurement devices, we advise the ruler be used for post-fixation measurements due to its widespread availability.

Competing interests None declared.

PWE-087 COLONOSCOPY DEMAND AND ADHERANCE TO POLYP SURVEILLANCE GUIDELINES

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Introduction Demand for colonoscopy is projected to increase by 5–10% per annum. Many units are struggling to match the demand to existing capacity. A significant proportion of endoscopy unit workload is related to follow-up colonoscopy in patients with a previous history of colorectal adenomas. Non-adherence to the BSG polyp surveillance guidelines could result in either excess demand for colonoscopy or inappropriate delays in diagnosing advanced colorectal neoplasia.

Methods We retrospectively searched the Trust's endoscopy database (catchment population 520 000) to assess our compliance to the

BSG Polyp Surveillance guidelines (originally published in 2002). We chose different time periods to study including 2002, 2005–2006, 2009 (50 patients each) and 2011 (100 patients). We had previously conducted an audit in 2010 (unpublished) and following this embarked on a programme of endoscopist education to improve compliance data.

Results Compliance with the BSG Polyp Surveillance guidelines was 33% in 2002, 65% in 2005/2006, 57% in 2009 and 98% in 2011. Based on our unit's activity 3832 colonoscopies were performed in 2011 with an overall polyp detection rate of 34.6% (1325.9 colonoscopies). 98% compliance with BSG guidelines would have resulted in inappropriate advice being given in 26.5 of those colonoscopies. For every 10% reduction in compliance against the BSG standard (and for our unit based on 2011 figures) an additional 123.5 polyp positive colonoscopies would receice inappropriate guidance on polyp follow-up. In our experience (unpublished), inappropriate advice results in an increase in frequency of follow-up colonoscopies as endoscopists overestimate the patient's future risk of advanced colorectal neoplasia. This potentially has huge resource and organisation implications.

Conclusion We demonstrate a big improvement in compliance with the BSG polyp surveillance guidelines at our unit following a period of endoscopist education in 2010. With demand for colonoscopy projected to rise 5%–10% year on year and with limited ability to increase capacity under current financial constraints, appropriate patient selection for colonoscopy is essential. Failure to comply with the BSG guidelines has significant financial, organisational and patient implications. We recommend all units validate waiting lists for patients on a polyp surveillance programme.

Competing interests None declared.

PWE-088 NEGATIVE LOWER GI INVESTIGATIONS: MISS RATES IN COLORECTAL CANCER

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Introduction Retrospective studies have confirmed that colonic investigations may miss a diagnosis of colorectal cancer (CRC) with a wide variation in reported miss rates.[1 2] Colorectal cancer miss rates of up to 12%, 22% and 50% have been reported for colonoscopy, barium enema and sigmoidoscopy, respectively.

Methods A retrospective study was conducted to determine the diagnostic miss rate of colorectal cancer at our institution. All patients diagnosed with colonic or rectal adenocarcinoma between 2006 and 2010 were identified from the Royal Liverpool and Broadgreen University Hospital Trust histopathology database. Data were collected using the computerised systems and case notes. A miss was defined as a patient investigated with barium enema (BE), CT abdo-colon enhanced (CTACE), CT colonoscopy (CTC), flexible sigmoidoscopy and/or colonoscopy, and discharged without being followed-up or diagnosed with CRC in the 5 years preceding the subsequent CRC diagnosis.

Results During the study period, 579 patients were diagnosed with colorectal cancer. The notes were irretrievable or had insufficient documentation in 5 cases. Twenty-two (3.8%) cases were considered misses: 5 (0.8%) were administrative misses, where patients were lost to follow-up, or they cancelled or failed to attend an appointment; in one case (0.2%), there was a clinician-associated miss, where an inappropriate choice of investigation was performed (a flexible sigmoidoscopy missed a proximal CRC); and 16 (2.8%) were technical misses, where CRC was missed with an appropriate choice of investigation. Of the technical misses, 10 (1.7%) were radiological (0.7%, 0.7% and 0.3% for BE, CTACE and CTC respectively) and 8 (1.4%) were endoscopic (0.5% and 0.9% for flexible sigmoidoscopy and colonoscopy). 45% of missed cancers were left-sided and below the splenic flexure.

Conclusion This study has shown a lower miss rate in our institution than previously reported,[3] and when compared with other studies.

Competing interests None declared.

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PWE-089 THE ROLES OF CYP2C40 AND CYP2C55 IN PREVENTING COLON CANCER

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Introduction Certain Cytochrome P450 (CYP)-dependent arachidonic acid (AA) metabolites are thought to induce therapeutic effects in the colon via activation of peroxisome proliferator activated receptors (PPARs), specifically the PPAR α subtype. The activation of PPAR α leads to changes in the expression and activity of target genes and other transcription factors such as COX-2, NF-KB and AP-1, resulting in anti-inflammatory and anti-tumorigenic effects. CYP2C40 and CYP2C55 are two recently discovered CYPs, isolated from the murine intestinal tract. Their metabolites include 16-HETE, 8,9-EET and 14,15-EET which have been shown to have anti-inflammatory effects both in vitro and in vivo. Evidence suggests that CYP2C40 and CYP2C55 may have a potential therapeutic role to play in colon tumorigenesis. This study aims to determine whether PPAR activation leads to an up-regulation in the expression of CYP2C40 and CYP2C55.

Methods CYP2C40 and CYP2C55 promoter regions were isolated from murine DNA via PCR and inserted into a luciferase plasmid (pGL4.10). Plasmid DNA was cloned following transfection into highly competent cells and purified via Midi-Prep recovery. Purified plasmids were transfected into COS-7 and HCA-7 cells and the cells were treated with PPAR α, β and γ ligands Wy14643, GW0742 and Rosiglitazone (COS-7 cells had PPAR α/β/γ over-expressed). Cells were harvested after 24 h incubation and luciferase activity (equivalent to gene expression) was measured in relative light units (RLU) using a reporter assay system.

Results In COS-7 cells PPAR α, β and γ ligands led to a significant increase in CYP2C40 RLU from a baseline measurement of (mean (±SD)) 235 (20) to 726 (45), 458 (61) and 466 (42) for PPAR α, β and γ respectively. CYP2C55 showed a significant increase from 154 (6) to 263 (10) and 354 (21) for PPAR α and β respectively (p=0.001). HCA-7 cells were shown to only express endogenous PPAR α and following incubation with PPAR α, β and γ ligands a significant RLU increase was observed in CYP2C40 from 55 (13) to 126 (17) and in CYP2C55 from 62 (11) to 111 (4) for PPAR α (p=0.001).

Conclusion The results suggest that a functional peroxisome proliferator response element (PPRE) exists within the promoter regions of CYP2C40 and CYP2C55 and that activation of PPAR α within the HCA-7 cell line leads to a significant increase in CYP2C40 and CYP2C55 expression. Given the beneficial properties of PPAR α and CYP derived AA metabolites it seems that CYP2C40 and CYP2C55 may become important future therapeutic targets in colon cancer.

Competing interests None declared.