Introduction Current BSG guidelines advise routine endoscopic surveillance for patients with Barrett's oesophagus to enable early detection of oesophageal adenocarcinoma. However, evidence for improved outcomes from surveillance is weak and remains the subject of debate. To address these concerns, BOSS aims to compare the benefits of 2-yearly surveillance endoscopy against endoscopy on an 'at need' basis only. As a large, multicentre trial with 10 year follow-up, this ambitious project faced a number of challenges to recruitment, particularly the acceptability of randomising to a control arm with no routine endoscopy, especially in sites where surveillance had been established.

Methods Multi-centre randomised controlled trial (ISRCTN54190466). Inclusion criteria: patients over 18 with endoscopic and histologically proven Barrett's oesophagus >1 cm. Exclusion criteria: patients unable to consent, unfit for endoscopy, high-grade dysplasia or cancer, or participation in AsPECT trial. Target sample size: 3400. Recruitment: patients identified at local centres with new diagnosis, or existing diagnosis of Barrett's and endoscopy within last 2 years. Follow-up will be for 10 years. Intervention arm will receive 2-yearly surveillance endoscopy, control arm will receive endoscopy on an 'at need' basis if symptomatic. Primary outcome: all cause mortality. **Results** Recruitment began March 2009, target of 3400 was reached ahead of schedule in October 2011. 3469 consented to be randomised (58.4% of eligible screened patients): 1739 in 2-yearly surveillance, 1730 in 'at need' arm. 127 hospitals were open to recruitment, though 3 withdrew from the study, recruitment was closed in one centre by the trial team, and 11 did not recruit any patients. 3780 screened patients did not enter: 1309 ineligible, 2471 declined. Most common reasons for patients to decline were: preference for surveillance, preference not to have endoscopies and a family history of cancer. As of January 2014, 111 patients were no longer in their originally randomised treatment groups: 55 due to patient/clinician decision, 56 for other reasons. For 107 of those 111 patients, data continues to be collected.

Conclusion The successful recruitment to BOSS strongly supports the acceptability of randomisation to the control arm, and patients' willingness to participate in a long follow-up RCT. The large number of centres and enthusiastic principal investigators have shown continued success, and great promise for BOSS to answer key questions on Barrett's surveillance.

REFERENCE

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Disclosure of Interest None Declared.

PTU-168 BARRETT'S OESOPHAGUS SCREENING: INFRARED SPECTROSCOPY FOR CYTOLOGICAL ASSESSMENT

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10.1136/gutjnl-2014-307263.242

Introduction Screening for Barrett's oesophagus could allow early detection, enabling timely diagnosis and intervention for oesophageal adenocarcinoma. Recent studies have shown the acceptability of a swallowed cytology brush ('Cytosponge') for cell collection. If introduced, cytological assessment would pose several challenges. Firstly, oesophageal cytology is performed infrequently, and expertise in this field is correspondingly

Abstract PTU-168 Table 1

	Normal squamous	Barrett's oesoph.	Dysplasia
Sensitivity	100% 1%	96% 2%	94% 3%
Specificity	99% 1%	99% 1%	98% 1%

limited. Secondly, assessment of individual cells is challenging even for experienced cytopathologists, with a degree of interobserver variability. Thirdly, screening would require a great deal of cytopathology resources. Infrared spectroscopy (IR) gives reproducible spectra based on cell biochemistry; applying multivariate statistical analysis and computer modelling can provide robust and rapid discrimination between pathological cell subtypes. We aimed to demonstrate the potential application of IR in analysis of oesophageal cytology.

Methods Endoscopic cytology brushes were used to collect oesophageal cells from patients undergoing endoscopy for Barrett's oesophagus. Cells were fixed in formalin, centrifuged and slides prepared. IR spectra were measured across the entire sample area. Pre-processing steps allowed spectra from individual cells to be reconstituted. Further pre-processing removed confounding effects and enhanced signal-to-noise ratios. Conventional cytology analysis was undertaken to provide a reference for developing a predictive model using IR data. Chemometric analysis was then undertaken using Partial Least Squares Discriminant Analysis (PLS1DA) and cross-validation performed.

Results 23 cytology brush samples were collected from 11 patients. 4 samples contained low cell counts and were excluded from analysis. 5536 cells (2339 normal squamous, 2511 Barrett's oesophagus and 686 dysplastic) were used to create and validate a predictive model. The predictive capability of the model is shown in the table below:

Conclusion The high accuracy demonstrated by our predictive model suggests IR is a promising candidate for cytological analysis of oesophageal cells. As an objective, automated system, this technique could prove invaluable for Barrett's screening in future.

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Disclosure of Interest None Declared.

PTU-169 LONG-LASTING OESOPHAGEAL MUCOSAL PROTECTION WITH ALGINATES: A POTENTIAL FOR TOPICAL MUCOSAL THERAPY IN GASTRO-OESOPHAGEAL REFLUX

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10.1136/gutjnl-2014-307263.243

Introduction Patients with non-erosive reflux disease (NERD) exhibit impaired oesophageal mucosal barrier integrity in the form of dilated intercellular spaces and low transepithelial electrical resistance (TER). Such refluxate-induced changes to the mucosal integrity may underlie increased sensitivity to perception of reflux events, even on PPI, and could potentially be modified by application of topical solutions.

Sodium alginate solutions are used in treatment of GORD, with proposed mechanisms of action including acid buffering, displacement of the gastric acid pocket, and reduction of reflux events. We have recently described that *in vitro* topical

application of a sodium alginate solution is able to protect mucosal biopsies against impairment of oesophageal mucosal integrity when exposed to acidic solutions shortly after application. The durability of this protection is unclear.

We aimed to assess the protective effect and physical location of a topically applied sodium alginate solution 1 h after application.

Methods 3 mucosal biopsies were taken from the distal oesophagus (3 cm above the z-line) in 10 patients attending the Royal London Hospital for gastroscopy. Biopsies were transferred immediately to Krebs buffer pH 7.4. The luminal surfaces of 2 biopsies were coated with 200 µl of either a sodium alginate solution (Gaviscon Advance, Reckitt Benckiser, Hull, UK) or a viscous control solution (of same viscosity, but without alginate). The biopsies were mechanically washed with 5 ml Krebs, then each placed in an Using chambers and bathed in pH 7.4 solution for 1 h. The luminal aspect of the biopsy was then exposed for 30 min to an acidic solution pH 2 + 1 mg/ml pepsin + 1 mM taurodeoxycholate. Percentage changes in TER from baseline at the end of exposure were recorded. For the 3rd biopsy sodium alginate solution containing fluorescein-labelled alginate was used, and after 1 h bathing in pH 7.4 solution the biopsy was fixed for immunohistological detection of the alginate.

Results Our previous experiments have demonstrated that exposure of *unprotected* biopsies to the acidic solution results in a $-14.4 \pm 2.9\%$ change in TER from baseline. 1 h after protection with alginate solution the same exposure caused a $-8.2 \pm 4.2\%$ change in TER compared to $-15.9 \pm 3.0\%$ change after protection with the viscous control ($p < 0.05$).

Labelled alginate could be seen coating the luminal surface after 1 h in all cases.

Conclusion *In vitro*, alginate solutions can adhere to the oesophageal mucosa for up to 1 h and exert a topical protectant effect against refluxate-like solutions. This suggests that durable topical protectants can be further explored and developed as first-line/add-on therapies for GORD.

Disclosure of Interest P. Woodland: None Declared, C. Lee: None Declared, P. Dettmar Employee of: Technostics Limited, S. Preston: None Declared, D. Sifrim Grant/research support from: Reckitt-Benckiser, Sandhill Scientific, Consultant for: Sandhill Scientific.

PTU-170 MISSED UPPER GASTROINTESTINAL (UGI) CANCERS AT ENDOSCOPY: A DISTRICT GENERAL HOSPITAL EXPERIENCE

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10.1136/gutjnl-2014-307263.244

Introduction Despite advances in the staging and treatment, the prognosis of upper gastrointestinal tract (UGIT) cancer in the UK remains poor, often presenting insidiously at a late stage. However, in contrast to our understanding of missed colorectal cancer rates following colonoscopy, relatively few studies have been published addressing the frequency of missed UGIT malignancies. Depending on the population studied this ranges from 6.7 to 25.8%. The aim of this study was to identify how frequently oesophagogastrroduodenoscopy (OGD) may have failed to detect cancer at Prince Charles Hospital, a District General Hospital in South Wales, with a stable population of 150000, in the 36 months preceding a confirmed histological diagnosis.

Methods All patients between 1st January 2010 and 31st December 2012 who underwent an OGD and were subsequently diagnosed with cancer were identified using endoscopic records and the cancer service database. Patients who had undergone a prior endoscopy within 3 years of diagnosis were then identified and their records reviewed to analyse the previous endoscopic and histological findings.

Results 5454 endoscopies were performed during this time period, and a total of 134 patients (2.4%) with UGI cancer were identified. 77 (57%) were oesophageal, 49 (37%) gastric and 8 (6%) duodenal. The mean age was 69 years (range 24–91), with a higher proportion of males to females (3:1). Of these, 9 patients (6.7%) had undergone at least one previous endoscopy in the 36 months leading up to a confirmed UGIT cancer diagnosis, with 44% of these being within the preceding 12 months. The mean interval was 15 months. The majority (55%) of patients had only one prior endoscopy (range 1–5). 8 patients (89%) were found to have pathology at a preceding endoscopy at the site of a subsequently detected cancer. 6 patients were felt to have insufficient biopsy sampling (<4 or none) and 3 had inadequate surveillance or follow up of identified pathology (of which two had both inadequate sampling and surveillance).

Conclusion These findings, whilst similar to those previously reported in the literature have highlighted the importance of careful and thorough examination of the UGI tract, in particular with regard to adequate tissue sampling and surveillance. Consideration should be given to dedicated lists for surveillance of Barrett's and the use of additional techniques such as narrow band imaging and chromoendoscopy in order to enhance diagnostic accuracy.

Disclosure of Interest None Declared.

PTU-171 RECURRENCE AFTER SUCCESSFUL RADIOFREQUENCY ABLATION FOR BARRETT'S RELATED NEOPLASIA IS MORE LIKELY IN MALES: DATA FROM THE UNITED KINGDOM PATIENT REGISTRY

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10.1136/gutjnl-2014-307263.245

Introduction Barrett's oesophagus (BE) can lead to oesophageal adenocarcinoma (OAC). BE is more prevalent in males. Endoscopic mucosal resection (EMR) for visible lesions followed by Radiofrequency ablation (RFA) have become first line treatment for patients with BE related neoplasia. Recurrence after treatment can occur in up to 25% of patients. Risk factors for recurrence are unclear.

Methods We examine prospective data from United Kingdom (UK) registry of patients undergoing RFA/EMR over past 5 years. We examine if recurrence after treatment is influenced by gender, baseline histology, BE length and prior EMR. Before RFA, visible lesions were removed by EMR. Thereafter patients underwent RFA 3 monthly. Biopsies were taken at 12 months and outcomes for clearance of dysplasia (CR-D) and BE (CR-IM) were assessed. After successful treatment patients were followed up 3 monthly for the first year, 6 monthly for second year and annually thereafter. Biopsies were taken from 1cm below neo z-line and previously treated BE segment.

Results A total of 412 males and 95 females have been treated with no statistical difference in baseline BE length, histology or