Introduction Adenoma detection rate (ADR) is the most important measure of mucosal visualisation at lower gastrointestinal endoscopy. Higher ADRs are associated with lower post-colonoscopy colorectal cancer (PCCRC) rates with a 3% reduction in PCCRCs with every 1% increase in ADR. In the English flexible sigmoidoscopy screening programme (Bowel scope) there is also significant variation in ADRs across screening centres. Large studies have demonstrated improved detection rates during screening procedures utilising Endocuff Vision™ (EV). The aim of this study is to determine the effect of Endocuff Vision on ADR in a flexible sigmoidoscopy bowel cancer screening population.

Methods B-ADENOMA was a multicentre, randomised controlled trial involving 16 English Bowel scope screening centres, performed between February 2017 and April 2018. Patients attending for Bowel scope screening were randomised to Endocuff™-assisted Bowel scope (EAB) or Standard Bowel scope (SB). Adenoma Detection Rate (ADR) was compared between trial arms on an intention-to-treat basis. Secondary analyses compared Mean number of Adenomas per Procedure (MAP), Polyp Detection Rate (PDR), characteristics and location of polyps, procedural characteristics between arms and made comparisons with national Bowel scope data. Patient experience, procedure extent and complication rates were assessed for non-inferiority.

Results 3222 patients were randomised (53% male) to receive EAB (n=1610) or SB (n=1612). Baseline demographics were comparable between the two arms. ADR in the EAB arm was 13.3% and in the SB arm was 12.2% (p=0.353). Also, no statistically significant differences between arms were found in MAP, PDR, polyp morphology or location. Patient experience and complication rates were similar in both arms. The cuff exchange rate in the EAB arm was 4.2%, ADR in the SB arm was 3.1% higher than the national ADR (9.1%).

Conclusions EV did not improve Bowel scope ADR when compared with standard Bowel scope. ADR in both arms was higher than the national ADR. This suggests that, where detection rates are already high, use of EV does not improve detection further. Reasons for the high ADR in the SB arm require further exploration but may include selection effects at centre level and contamination effects at endoscopist level.
are limited. A perforation rate of 0.03% and attributable morbidity and mortality from pancreatic EUS fine needle aspiration (FNA) of 2.02% respectively are reported. We have examined PB EUS & FNA use in England, how it relates to pancreatic cancer (PC) therapy and associated mortality and adverse events.

**Methods** Adults undergoing PB EUS from 2007–17 were identified in Hospital Episode Statistics. A PC diagnosis within 6 months of EUS was required for PC cohort inclusion. EUS and FNA numbers per year, associated 7-day adverse events and 30-day mortality were examined. A logistic regression model examined the impact of variables on mortality and surgical resection.

**Results** 79,490 PB EUS in 69,120 subjects were identified. The number per year increased from 2,915 (29% FNA) to 12,764 (35% FNA) over the study period. 8,859 subjects were diagnosed with PC. Bleeding was coded in 0.4% of PB EUS. Perforation was coded in 0.03% and in 0.05% of the PC cohort. 1.6% of PB EUS subjects and 2.8% in the PC cohort died within 30 days of their final EUS. The following factors were associated with increased mortality: increasing age (odds ratio 1.04 (95%CI 1.03–1.04), p<0.001); males (1.38 (1.22–1.56), p<0.001); increasing co-morbidity score (1.49 (1.28–1.75), p<0.001); FNA (2.20 (1.93–2.51), p<0.001); pancreatic cancer (1.37 (1.17–1.60), p<0.001); and low provider total PB EUS volume (baseline >782 EUS) 8–111 (3.99 (2.95–5.38), p<0.001), 112–782 (1.33 (1.13–1.57), p=0.001). Less deprivation was associated with reduced mortality: quintile 5 (0.76 (0.62–0.92), p=0.006).

32.9% of PC subjects had a surgical resection, 43.1% received chemotherapy alone and 33.1% had no active therapy. Increasing age (0.97 (95%CI 0.96–0.97), p<0.001), increasing co-morbidity score (0.77 (0.60–0.98), p=0.034) and multiple EUS procedures prior to PC diagnosis (0.80 (0.66–0.98), p=0.033) were all associated with a lower resection rate. The two least deprived quintiles were associated with an increased resection rate (quintile 4 1.33 (1.11–1.59), p=0.002), quintile 5 1.33 (1.11–1.59), p=0.002).

**Conclusions** The number of PB-EUS undertaken in England has increased six-fold over the last decade, with an increased proportion of FNA. Deprivation and low provider volume were associated with 30 day mortality. A third of subjects undergoing PB EUS for PC did not receive surgery or chemotherapy. The results of this study support a reappraisal of the provision of and indications for PB EUS.

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**Abstract OTU-04**

**ARTIFICIAL INTELLIGENCE FOR REAL-TIME POLYP LOCALISATION IN COLONOSCOPY WITHDRAWAL VIDEOS**

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**Introduction** Artificial intelligence (AI) can potentially improve adenoma detection rates. Previous work focussed on still images and selected video sequences which may be subject to bias and lack clinical utility. This study assesses whether a convolutional neural network (CNN) developed using still images and short video sequences from a multicentre dataset using different processors generalises effectively to locate polyps in a new video dataset consisting of complete colonoscopy withdrawals (caecum to rectum).

**Methods** Our group previously developed a CNN using 4664 polyp test frames from the MICCAI 2015 polyp dataset. Here, we created a new dataset using 17 complete colonoscopy withdrawal videos, previously unseen by the CNN, containing 83 polyps consisting of 83,716 frames (14,634 polyp & 69,082 non-polyp) using Olympus EVIS LUCERA CV290 (SL) processors and colonoscopes. White light frames were annotated by drawing bounding boxes around polyps. Size, morphology, histopathology and location was recorded for each polyp (table 1). Low quality frames (e.g. blurred) were excluded. Half the procedures were randomly selected to create a testing set. A true positive was scored if the CNN prediction overlapped with the bounding box. A false positive indicated a non-overlapping location.

**Results** The CNN operated at real-time video-rate achieving a sensitivity of 91.6% and positive predictive value 75.3% in the MICCAI test set. When the MICCAI trained CNN was tested on our previously unseen colonoscopy procedures, it achieved a sensitivity of 76.6% and specificity of 78.9%. This CNN was fine-tuned by using polyp positive frames from our training dataset. This improved sensitivity to 84.5% and specificity to 92.5%.

**Conclusion** Whilst the CNN achieved excellent results on the public still image dataset, it is more challenging to generalise results to complete colonoscopy withdrawals. Fine-tuning using our dataset improved performance. Furthermore, our procedures were performed by experts, including a significant proportion of right sided flat elevated and subtle sessile serrated lesions which were not evaluated in recent publications. AI