EEN treatment.[1] We explored dietary triggers of CD relapse by performing dietary assessment and measuring faecal food biomarkers in children with CD during early food reintroduction.

**Methods** Combination of clinical remission post EEN (weighted Paediatric Crohn's Disease Activity Index <12.5) and a significant drop in FC (>500 mg/kg/>35%), was used to define the patient group. All patients provided 3-day estimated weight food diaries and a faecal sample. Patients were divided equally for statistical analysis purposes in two groups; above (Group 1) and below (Group 2) the median FC concentration at food reintroduction [900 mg/kg (341, 1,243)]. Nutrient and food group analysis was performed with WinDiets 10. Faecal short chain fatty acids, gluten immunogenic peptide and starch were measured as proxy of fibre, gluten and malabsorbed/resistant starch.

**Results** 14 children provided a FC sample within 21 (15, 51) days post EEN. Classification of patients in the two groups resulted in significantly different FC values: Group 1: 1181 mg/kg (1024, 1781) vs Group 2: 411 mg/kg (130, 651) ($p<0.01$). Total energy intake did not differ between the two groups ($p=0.37$). Patients in Group 1 consumed more fibre, protein and phosphorus than Group 2 ($p=0.04$, $p=0.02$, $p=0.04$). Butyrate and valerate levels were higher in Group 1 than Group 2 ($p=0.02$, $p<0.01$), whereas no differences were observed in GIP and faecal starch levels. Patients in Group 1 reported higher red & processed meat consumption ($p=0.02$).

**Conclusions** This analysis highlights dietary components potentially associated with recurrence of colonic inflammation in children with CD during early food reintroduction. These findings should be confirmed in larger studies.

### REFERENCE

1. Logan, M. *et al*. 2019 *AP&T* **50**:664–674.

## 050 LONGITUDINAL ANALYSIS OF THE METABOLOME IN EARLY LIFE IN PRETERM BABIES

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**Background** Information on the metabolome in early life is still limited. Here, we describe the evolution of the metabolome in preterm babies during their first weeks of life.

**Methods** Multiple stool samples from 69 preterm babies were collected across 7 hospitals in the UK. Volatile organic compounds (VOCs) were analysed by running an aliquot of stool (mean=80.6 mg, SD=12.3 mg) gas chromatography/mass spectrometry. Data were interpreted using AMDIS with NIST reference library. Statistical analysis to identify factors that influenced the metabolome included clustering, PERMANOVA and linear mixed-effects modeling were carried out in R.

**Results** Several factors influenced the metabolomic results; the most relevant, was as expected, the individual, followed by the hospital, the babies age in days, and the gestational age. As samples were run in two different batches, a batch effect was observed. The age of the baby influenced both the number of VOCs and the VOC profile. Number of VOCs increased over time; a sharp rise was observed after day 5 and it was stablised after day 10. In terms of VOCs observed, a shift was observed after day 5, with the observation of VOCs produced during, or by-products of carbohydrate, fermentation (i.e. butane-2,3-dione, propyl acetate, propan-1-ol and propyl propanoate). Meanwhile, branched short chain fatty acid (BSCFA), produced by bacteria in the colon during branched amino acids fermentation, were observed before 5 days of life. This was also the case for butanoic acid.

**Conclusion** This study shows for the first time how the metabolome changes in early life in preterm babies. A shift in the metabolome was observed after 5 days of life when the babies started to be fed and interestingly this becomes stable relatively soon (during the second week). This is likely to be related to the shift from meconium to stool. The observation of BSCFA during the first week suggests these come from the degradation of protein-rich amniotic fluid, meanwhile of acids, alcohols and esters only appears after babies were fed with milk.

# Colon and anorectum

## 051 CAN FIT RULE OUT COLORECTAL CANCER IN SYMPTOMATIC PATIENTS? RESULTS FROM THE NICE FIT STUDY

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**Introduction** The faecal immunochemical test (FIT) is a non-invasive quantitative test which measures occult blood in faeces (faecal haemoglobin, FHb). FIT was introduced by NICE in 2017 to triage referral of patients with low risk symptoms (DG30). We report on the largest prospective and ethically approved diagnostic accuracy study to date of FIT in patients with high and low risk symptoms for colorectal cancer (CRC), meeting NICE NG12 and DG30 criteria.

**Methods** This multicenter study was powered to establish the diagnostic accuracy of FIT for CRC. Patients were eligible for recruitment if they experienced bowel symptoms meeting NICE two-week (TW) referral criteria and had been triaged to investigation with colonoscopy. All eligible patients referred for colonoscopy on TW pathway were asked to complete a FIT test kit (HM-JACK) prior to their colonoscopy. Patients were excluded from analysis if they did not provide a valid FIT or did not undergo complete colonoscopy. Patients were classified as high or low risk as per NICE NG12 or DG30 criteria respectively. Colonoscopy results were compared to FIT measurements of FHb and the conduct of the tests was double-blinded. Quality assurance of endoscopy and clinical data was performed by senior clinicians and external statisticians analysed anonymised data. This trial is registered on isrctn.com, ISRCTN49676259.

**Results** 9822 patients from 50 sites across England participated in the study between October 2017 to March 2019, 329 cancers were detected (3.3% prevalence). Preliminary results for combined DG30 and NG12 groups show the sensitivity of FIT at FHb thresholds of 2, 10 and 150 µg/g was 97.0%, 90.9% and 70.8% respectively. The positive predictive value (PPV) of FIT in combined groups for CRC at thresholds of 2, 10 and 150 µg/g was 8.7%, 16.1% and 31.1% respectively and the negative predictive value (NPV) of FIT at these thresholds was 99.8%, 99.6% and 98.9% respectively. 6900

patients (71.3%) had high risk symptoms (NG12). The sensitivity of FIT in this group at thresholds of 2 and 10 µg/g was 98.4% and 92.8%, respectively. The PPV was 9.1% and 16.3%, respectively. In contrast the sensitivity of FIT was significantly lower for low risk symptoms (DG30) at 91.5% and 84.5% at cut-offs of 2 or 10 µg/g respectively ($p<0.01$). The PPV for low risk symptoms at these thresholds was 7.7% and 16.0% respectively.

**Conclusions** This is the first study to report that at the lowest threshold of detectable blood (2 µg/g), FIT sensitivity is equivalent to the current gold standard investigation of colonoscopy. The results of this study support the use of FIT as an objective diagnostic tool to triage patients with both high and low risk CRC symptoms, reducing the number of unnecessary investigations.

## O52 INCREASING INCIDENCE OF YOUNG-ONSET COLORECTAL CANCERS IN THE UK AND RISING MORTALITY IN RECTAL CANCERS

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**Introduction** The incidence of young- onset (<50 years old) colorectal cancer (CRC) is reported to be increasing in the western world. Studies on assessing trend in both the incidence and mortality are limited. Furthermore, there are no studies specific to United Kingdom (UK).

**Design** We performed a UK specific population- based study on young colon and rectal cancer incidence and mortality. Data on young- onset colon and rectal cancer incidence and mortality between 1996 and 2016 were obtained from the Cancer Research UK. Trends were analysed by Joinpoint Regression Program expressed as average annual percentage change (AAPC).

**Results** Incidence of young- onset colon and rectal cancer increased significantly in both male (colon cancer: 3.9 per 100,000 to 5.9 per 100,000; rectal cancer: 3.1 per 100,000 to 3.9 per 100,000) and female (colon cancer: 3.6 per 100,000 to 6.2 per 100,000; rectal cancer: 2.3 per 100,000 to 3.1 per 100,000). Mortality of young- onset colon cancer decreased significantly for male (1.7 per 100,000 to 1.1 per 100,000) but an insignificant decrease in female (1.4 per 100,000 to 1.1 per 100,000). However, the rectal cancer mortality increased significantly in both male (0.8 per 100,000 to 1.2 per 100,000) and female (0.6 per 100,000 to 1.0 per 100,000). (Figure 1)

**Conclusion** This is the first UK specific population- based study demonstrating the rising incidence of young- onset colon and rectal cancer and rising mortality from rectal cancer. There is a need for an increased awareness amongst clinicians in the UK and potential change to the current UK national bowel cancer screening guidelines.

## O53 THE EVOLUTION OF SPORADIC COLORECTAL ADENOMAS: COPY NUMBER ALTERATIONS (CNA) IN POLYP PROGRESSORS VS NON-PROGRESSORS

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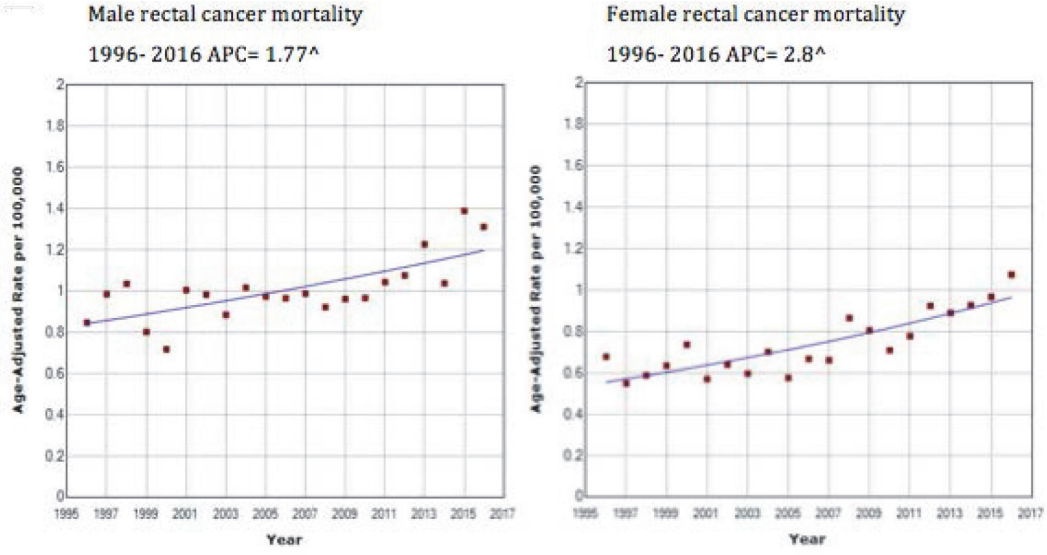
**Introduction** 1 in 10 people in the UK have a detectable adenoma in the bowel wall. Most adenomas are asymptomatic and detected incidentally during national screening and surveillance programmes. People who have adenomas detected and removed are considered at an increased risk of colorectal cancer (CRC), with risk calculations based on adenoma size and multiplicity. Our current risk stratification model is unspecific and results in many patients having unnecessary surveillance procedures.

We hypothesise that prognostic biomarkers can be found through molecular analysis of adenomas removed at index colonoscopy, and there is a key role for copy number




**Abstract O52 Figure 1** Annual percentage change (APC) of mortality for male and female young- onset (<50) rectal cancer. ^Indicates that the APC is significantly different from zero at the alpha= 0.05 level