to have more or less of an impact based on the phrase being searched for.

**PTU-144** BREATHE TESTING FOR GI CANCERS- SCALING UP FOR CLINICAL PRACTICE

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10.1136/gutjnl-2018-BSGAbstracts.524

Introduction Gastrointestinal (GI) cancers are a major cause of morbidity and mortality, yet symptoms are common and non-specific. A non-invasive breath test may be a useful tool for triaging for endoscopy/CT those without red-flag symptoms, or possibly for screening. Prior studies have shown promising results of a breath test for oesophagogastric (80% sensitivity/81% specificity) and colorectal (96% sensitivity/76% specificity) cancers.

The Breath MAGIC (Models for Assessment of GI Cancer) study investigates feasibility and acceptability of breath testing in Primary Care. We also developed a quality control (QC) system for breath sampling.

Methods This is an prospective cohort study of patients attending their GP for current/recent GI symptoms, from November 2016-May 2017, recruitment target 500. Exhaled breath (250mls) was collected by GP practice/NIHR research nurses using the ReCIVA breath sampling device, onto thermal desorption tubes. Breath volatile organic compounds (VOCs) were measured using Gas Chromatography (GC) and Proton Transfer Reaction (PTR) Mass Spectrometry, at St Mary’s Hospital VOC Laboratory. This platform allows analysis of 100 samples per day of continuous, unattended operation. Patients were recruited from 16 London GP practices on the day or were prebooked via phone/text. Feasibility and acceptability were measured using field notes, a telephone conference then focus group of research nurses (thematically analysed), and GP questionnaires. To develop a QC system, 76 ‘good quality’ samples taken by one experienced operator were used as a standard.

Results Plan-Do-Study-Act cycles from field notes identified barriers and drove regular improvements e.g. phone/text recruitment, a GP poster, grouping of nearby practices, and training healthcare assistants to breath-test. In total 636 patients were enrolled, suggesting breath testing is feasible in Primary Care. Sampling was feasible, with some equipment-related but few patient-related limiting factors reported. Analysis was also feasible, with 34% and 53% of samples analysed within <48 and 72 hours respectively. Two abundant breath compounds, almost universally present, were accurate predictors of adequate sample quality, using acetone >50 ppb (H3O+ ionisation, PTR) and isoprene >2.5 ppb (NO+ ionisation, PTR). This was validated on 284 separate patients’ samples. A process was also developed to interrogate ReCIVA software sampling data.

Conclusions Breath testing is feasible in Primary Care, from a human factors and process perspective. This finding, and the development of a QC process, opens up the possibility of large-scale breath testing, pending results of diagnostic accuracy studies. A revised recruitment target of 1000 with new patient acceptability questionnaires will likely provide further evidence for this.