

performance. **Conclusions** A machine learning approach using cfDNA achieved high sensitivity and specificity in a large, predominantly early-stage, colorectal cancer cohort. The possibility of systematic technical and site-specific biases warrants similar confounder analyses in other retrospective, as well as prospective, studies. Prospective validation of the presented machine learning method and evaluation of a multi-analyte approach are underway.

Su1659

POSITIVE FAECAL OCCULT BLOOD TEST AFTER A PREVIOUS NEGATIVE COLONOSCOPY - TO SCOPE OR NOT?

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Introduction Colorectal carcinoma (CRC) is the second-most commonly diagnosed cancer and second-highest cause of cancer mortality in Australia. Currently, there is no consensus to inform clinicians of the optimal approach to manage patients presenting with positive faecal occult blood test (FOBT) but recent negative colonoscopy. This study aims to determine the likelihood of detecting significant colorectal pathology in these patients and the clinical, pathological and colonoscopic factors associated with advanced pathology. **Methods:** This study recruited patients who underwent colonoscopy following positive FOBT from March 2015 – April 2018 at a tertiary hospital in Sydney, Australia. Data collected included patient demographics and clinical characteristics, previous and current colonoscopy findings. The primary outcome was to identify the prevalence of CRC and advanced adenoma (size>10mm, high-grade dysplasia or villous architecture) in a patient with positive FOBT but previous negative colonoscopy (defined as no polyp or cancer). The secondary outcomes include the timeframe to detection and prevalence of advanced lesions on current colonoscopy in patients with or without prior colonoscopy. Statistical analysis using chi-square tests and binary logistic regression models assessed independent predictors of advanced neoplasia. **Results:** Colonoscopies were performed on 740 patients (male 52.8%; median age 64 years old). There were 27 (3.6%) patients with CRC, 362 (48.9%) with at least one adenoma and 188 (25.4%) with an advanced adenoma. There were 219 patients (29.6%) who had a previous colonoscopy. Of these, 111 had a previous negative index colonoscopy and in this cohort, there was 1 CRC detected, 16 with advanced adenomas and 45 (40.5%) with adenomas. Among patients with a negative index colonoscopy within 4 years, none had CRC and 7 had an advanced adenoma. Of the 452 patients with no prior colonoscopy, there were 22 CRCs (4.9%) and 129 patients (28.5%) with an advanced adenoma on their current colonoscopy. Multivariate analysis identified 3 significant independent predictors for the detection of advanced adenomas/CRC - male sex (OR 2.07; 95%CI 1.44-2.98; P<0.001), age (OR 1.04; 95%CI 1.02-1.07; P<0.001) and no previous colonoscopy (OR 2.39 95%CI 1.59-3.62; P<0.001). A personal history of polyps, family history of CRC, current abnormal symptoms and quality of bowel preparation of the previous colonoscopy were not significant predictors. **Conclusion** A previous negative colonoscopy done within 4 years conferred a 100% negative predictive value for detection of new CRC despite a positive FOBT. Any prior colonoscopy carried a better prognosis for detection of advanced pathology in a patient with current positive FOBT. These findings could potentially provide guidelines to managing patients with positive FOBT but previous negative colonoscopy.

Su1660

COLORECTAL CANCER SCREENING: COMPLIANCE WITH MULTI-TARGET STOOL DNA TESTING AMONG MEDICARE BENEFICIARIES

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Introduction The multi-target stool DNA (mt-sDNA) test is a non-invasive colorectal cancer (CRC) screening assay included in the United States Preventive Services Task Force, American Cancer Society, and Multi-Society Task Force guidelines for CRC screening of average-risk adults ages 50 years and older. Mt-sDNA testing is performed by a single national reference laboratory (Exact Sciences Laboratories [ESL], Madison, WI) and includes a nationwide 24/7 patient navigation system (compliance program) to support test completion through patient education and periodic reminders. The majority of active patient navigation activity occurs during the 60 days following each mt-sDNA test order. We focus on Medicare beneficiaries, as Medicare covers mt-sDNA screening with no out-of-pocket expenses, removing the potential impact of financial barriers on compliance. The impact of this systematic approach to CRC screening for Medicare beneficiaries is reported here. **Methods** Medicare beneficiaries ages 65-85 years with a valid mt-sDNA order between September 1, 2016 and August 31, 2017 were identified from the ESL database. Compliance was defined as completion of the mt-sDNA test (positive or negative result) within 365 days of the order date. To assess factors associated with early versus late compliance, compliance rates within 30, 60, 90, 180, and 365 days of the order date were calculated. Compliance by age, sex, and Medicare coverage type were examined. Descriptive statistics were used to identify and compare the data. **Results** Mt-sDNA test compliance was 71.1% among a population of 368,494 Medicare beneficiaries ages 65-85 years that was 64% female. Compliance was similar among 5-year age cohorts though individuals ages 75-85 years had slightly higher compliance. The median time to compliance decreased with age, from 28 days for individuals ages 65-69 years to 24 days for individuals ages 80-85 years. Compliance was similar for traditional Medicare versus Medicare Advantage coverage and by patient sex (Table 1). Among individuals complying within 365 days of their mt-sDNA order, 61.6% complied within 30 days and 90.7% complied within 60 days, which correlates with the time when the mt-sDNA test's patient compliance program is most active (Table 2). **Conclusions** Data from this observational study show that a high percentage (71%) of Medicare beneficiaries who had an mt-sDNA test order completed the test, with 91% completing the test within 60 days. These findings suggest that mt-sDNA test features (e.g. non-invasive, high sensitivity, molecularly-based, three-year screening interval) coupled with built-in patient navigation can enhance CRC screening compliance in the Medicare population. Patient, provider, CRC screening program, and healthcare delivery system characteristics should be studied to understand why some patients do not comply or remain unscreened.

Table 1. mt-sDNA Orders, Completed Tests, Compliance, and Time to Compliance for the Study Population

Category Subgroup	Number of mt-sDNA Test Orders	Number of Tests Completed Within 365 Days of Order	Compliance Rate (% Tests Completed Within 365 Days of Order) [1]	Median Time to Compliance (Days)	IQR Time to Compliance (Days)
Overall Medicare population	368,494	262,084	71.1%	27	20, 37
Age					
65-69 years	141,191	99,764	70.7%	28	21, 39
70-74 years	121,566	86,220	70.9%	27	20, 37
75-79 years	70,502	50,998	72.3%	25	20, 35
80-85 years	35,235	25,102	71.2%	24	19, 34
Sex [2]					
Male	132,806	95,433	71.9%	26	20, 35
Female	235,617	166,601	70.7%	28	21, 38
Coverage type					
Traditional Medicare	250,800	178,922	71.3%	27	20, 37
Medicare Advantage Plan	117,694	83,162	70.7%	27	20, 37
1. Percentage of individuals with a valid mt-sDNA order who were successfully screened (positive or negative mt-sDNA result) within 365 days of their order date					
2. Patient sex is available for orders only when included on the test order form					
IQR = interquartile range; mt-sDNA = multi-target stool DNA test.					

Mt-sDNA Orders, Completed Tests, Compliance, and Time to Compliance for the Study Population

Table 2. Cumulative Compliance with mt-sDNA Testing over 365 Days Following Order Date

Category	Within 30 Days	Within 60 Days	Within 90 Days	Within 180 Days	Within 365 Days
Compliance rate [1]	61.6%	90.7%	94.4%	97.8%	100.0%
Completed tests	161,449	237,603	247,495	256,432	262,084
1. Percentage of individuals with a valid mt-sDNA order who were successfully screened (positive or negative mt-sDNA test result) within 30, 60, 90, 180, or 365 days of their order date					
Mt-sDNA = multi-target stool DNA test.					

Cumulative Compliance with mt-sDNA Testing over 365 Days Following Order Date

Su1661

A FAVORABLE SURVIVAL OF THE SCREENING-DETECTED COLORECTAL CANCER IN YOUNG ADULTS (<50): IMPLICATIONS FOR COLORECTAL CANCER SCREENING FOR YOUNG ADULTS

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Backgrounds and Aims: Recent increasing incidence and mortality of colorectal cancer (CRC) among young adults (<50 years) in the Western countries has been paid attentions. Screening for young adults is being considered but controversy due to limited evidence of its effectiveness. Most countries begin CRC screening at age of 50, whereas Japan begins at age of 40 mainly using fecal immunochemical test. Here, we aimed to clarify characteristics of CRC of young adults (<50) and the long-term outcomes of screening-detected CRC of young adults by comparisons with detection age and the detection mode using an institutional cancer registry database. **Methods:** This is a retrospective cohort study using a CRC registry of a Japanese tertiary cancer center. All consecutive patients who were diagnosed as CRC between January 2007 and December 2016 were included. CRCs were staged based on the 8th edition of the Union for International Control Criteria. When multiple CRCs were identified, a CRC at the most advanced stage only was considered. Patients were categorized into 3 groups according to age: Age <50 group, Age 50-75 group, Age >75 group. CRCs were categorized into screening-detected CRC (SD-CRC) and non-screening-detected CRC (non-SD-CRC). We calculated overall survival (OS) using the Kaplan-Meier method and adjusted hazard ratio (HR) using Cox regression models. **Results:** During median follow-up period of 4.6 year, 4345 patients with 4345 CRCs were identified. Age <50 group had 361 patients (8.3%). Age <50 group showed a significantly lower rate of SD-CRC (29.4 vs. 35.8% in Age 50-75 group). Higher rate of rectal cancer (50.4 vs. 43.3% in Age 50-75 group), increased proportion of family history of CRC (22.2 vs. 16.8% in Age 50-75 group), and decreased proportion of Stage I CRCs (15.2 vs. 30.3%) were noted. SD-CRC group of Age <50 showed increased proportion of Stage I CRCs (29.2 vs. 9.4% in non-SD-CRC group of Age <50) (Table.1). Adjusted HR for Age <50 group was 1.12 (95% CI, 0.90-1.41) (Figure 1A). SD-CRC group demonstrated a significantly better prognosis than non-SD-CRC group (HR, 0.51; 95% CI: 0.42-0.61) (Figure.1B). Notably, SD-CRC group in Age <50 group also demonstrated significantly more favorable OS than the non-SD-CRC group (HR, 0.50; 95% CI: 0.26-0.95), similar to in the Age 50-75 group (HR, 0.46; 95% CI: 0.36-0.95) and in the Age >75 group (HR, 0.59; 95% CI: 0.42-0.82). **Conclusion:** We found that young adult patients (<50) were more likely to present with advanced stage and had a lower rate of SD-CRC. Nevertheless, patients with SD-CRC at age <50 showed a significantly more favorable overall survival than non-SD-CRC patients. This implicates a potential benefit of screening for young adults (<50).