COLORECTAL CANCER PREVENTION

S244

An Appraisal of the Referral, Uptake and Outcomes of Genetic Counseling and Testing in Patients With Young Onset Colorectal Cancer

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Introduction: The incidence of young-onset colorectal cancer (YOCRC) defined as CRC in individuals < 50 years of age is rapidly rising. Germline genetic testing is currently recommended for all patients with CRC< 50 years. Germline pathogenic variants (PV) are detected in 16-20% of patients with YOCRC and many are diagnosed with an actionable PV not typically associated with CRC, highlighting a need for genetic counseling and multi-panel gene testing (MGPT) in these patients. We aimed to determine the rate of referral to genetic counseling, and uptake and outcomes of germline testing in YOCRC patients seen at a tertiary referral center.
Methods: Patients diagnosed with YOCRC from 2010-2019 were included. Patients with appendiceal cancer, known family history of a hereditary cancer syndrome and inflammatory bowel disease were excluded. Demographic data including age, sex, race and family history of CRC were extracted from the electronic medical record (EMR).Genetic counseling referral was confirmed through an order in the EMR, clinical documentation in office visits with colorectal surgery, oncology or gastroenterology, or a completed visit with the genetic counselor. Data was analyzed using STATA, Chi-square and t-test and descriptive analyses were included.
Results: 793 YOCRC patients (457 male and 336 female) were included. 56% (445) were referred for genetic counseling and 88% of referred patients completed genetic testing. 20.5% had a PV detected; 83% were in CRC associated genes and 18% were in other actionable genes (Table). Referral to genetic counseling was higher in younger patients (mean age= 40 years in those referred vs. mean age= 43 years in those not referred, $p < 0.05$) and those with a family history of CRC (70% of patients with family history of CRC vs. 53% of patients without family history were referred, $p< 0.05$) There was no significant association between referral rate and sex or race.
Conclusion: Even in a large academic center, the rates of referrals for genetic counseling in patients with YOCRC were documented in only about half the patients. 1 in 5 YOCRC patients had a PV detected. If the 348 patients not referred to genetic counseling underwent testing, an additional 71 patients may be detected with a germline PV. Our findings highlight the need to raise awareness of the importance of genetic counseling and testing in YOCRC patients, and suggest that health systems should consider implementing care pathways to mitigate the potential impact of under-referral.

Table 1. Demographics, Referral to and Uptake of Genetic Counseling and Testing and Outcome of Genetic Testing

Number of patients with YOCRC Demographics	793 N (%)	Mean (SD)
Age		41.9 (6.8)
Sex		
Male	457 (57.6)	
Female	336 (42.4)	
Race		
White	684 (86.3)	
Black	72 (9.1)	
Other	37 (4.7)	
Family History of CRC		
Yes	280 (40.2)	
No	417 (59.8)	
Referral for Genetic Counseling	445 (56.1)	
Attended Genetic Counseling	390 (87.6)	
Underwent Genetic Testing	376 (96.4)	
• Pathogenic Variant Detected	77 (20.5)	
• Variant of Uncertain Significance Detected	88 (23.4)	
• No Variant Detected	211 (56.1)	

Genetic Testing Outcomes				
	Genetic Syndrome	Pathogenic Variant	Number of Patients	Total (%)
CRC and polyposis genes N=64 (83%)	Lynch syndrome N=37 (48%)	*MLH1*	11	37 (48)
		MSH2	13	
		MSH6	8	
		PMS2	5	
	FAP N= 15 (19.4%)	*APC*	15	15 (19.4)
	MYH- Associated polyposis N =10 (12.9%)	*MUTYH (Biallelic)*	6	10 (12.9)
		MUTYH (Monoallelic)	4	
	Juvenile polyposis syndrome N = 1 (1.2%)	*SMAD4*	1	1 (1.2)
		MSH3 (monoallelic)	1	1 (1.2)
Other genes N=13 (17%)		*ATM*	4	13 (17)
		BRCA1/2	4	
		BLM (monoallelic)	1	
		CHEK2	2	
		FLCN	1	
		CDKN2A	1	

S245 Outstanding Research Award in the Colorectal Cancer Prevention Category

Risk Factors for 5-Year Post-Colonoscopy Colorectal Cancers (PCCRCs)

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Introduction: 3-10% of CRCs are PCCRCs, which are CRCs identified after a colonoscopy (CY) that does not find CRC. Risk factors for PCCRCs have been little studied. The study aim was to identify risk factors for PCCRCs at 3 years (PCCRC-3y) based on polypectomy of ≥ 1 neoplastic polyps at index CY.
Methods: We assembled a cohort of 50 to 85 year-old Veterans with newly diagnosed CRC from 1/1/2003 to 12/31/2013, examining prior exposure to CY. Those whose CY occurred ≤ 6 months prior to CRC diagnosis with no other CY within the previous 36 months were categorized as having detected CRC (DCRC). Those whose CY occurred 6-36 months prior to CRC diagnosis were categorized as PCCRC-3y. We conducted 2 nested case-control studies (CCS) based on whether polypectomy of neoplastic polyps was performed during index CY, and compared demographics, clinical features, and CY-specific factors (e.g., prep quality, endoscopist training, VA- vs non-VA CY, and recommended surveillance interval) between PCCRC cases and DCRC controls who

were matched for age and facility in a 1:2 ratio. Univariable and multivariable logistic regression identified factors independently associated with PCCRC, reported as odds ratios (OR) and 95% CIs.

Results: There were 29,877 patients with CRC, with 1785 (6.0%) classified as PCCRC. From this dataset, we identified 402 cases and 804 matched controls w/o polypectomy and 404 cases and 808 controls with polypectomy, with cases and controls comparable demographically. Factors independently associated with PCCRC in the no polypectomy CCS were: Charlson score (OR=1.10; CI, 1.00-1.21); BMI ≥ 30 kg/M^2 (OR=1.66; CI, 1.16-2.39); and recommended surveillance interval either < 5 years (OR=4.67; CI, 3.30-6.66) or missing (OR=3.00; CI, 2.17-4.14), c-statistic = 0.70. When the two surveillance variables were removed from the model, good or excellent prep quality was protective (OR=0.64; CI, 0.46-0.78), c-statistic=0.61. In the polypectomy CCS, the factors were: non-VA CY (OR=2.97; CI, 1.11-8.21); non-GI endoscopist (OR=1.64; CI, 1.16-2.33); advanced adenoma (OR=2.02; CI, 1.54-2.65); ≥ 2 proximal polyps (OR=1.43; CI, 1.09-1.87) and recommended follow-up < 1 year (OR=3.38; CI, 2.40-4.80), c-statistic of 0.71.

Conclusion: Several factors are associated with PCCRC-3yr, some of which are modifiable, and the most important of which is recommended surveillance interval. These factors may be useful for tailoring surveillance and as targets for quality improvement.

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Differences in Lynch Syndrome Colonoscopy Surveillance by Pathogenic Variant

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Introduction: Lynch syndrome is caused by pathogenic variants in 4 mismatch repair genes: *MLH1, MSH2, MSH6,* & *PMS2.* There is limited data on differences in endoscopic surveillance by pathogenic variant, and surveillance for colorectal cancer (CRC) with colonoscopy every 1-2 years is recommended for all patients. It is not known if occurrence of colonic lesions differs by mutation status. We aimed to evaluate colonoscopy surveillance outcomes in patients with Lynch syndrome overall and compare findings between patients by variant.

Methods: We retrospectively reviewed colonoscopy results in patients with Lynch syndrome at our institution. Of 221 patients identified by participation in the Hereditary Gastrointestinal Cancer Registry (HGCR), 101 were included after excluding those without ≥1 colonoscopy available and 1 patient with a hereditary polyposis syndrome. Baseline variables and surveillance results from diagnosis to May 2020 were compared by variant (*MLH1, MSH2, MSH6, PMS2*). Primary outcomes included development and recurrence of adenoma, CRC, high grade dysplasia (HGD), advanced adenoma (AA), and sessile serrated lesions (SSL). Logistic regression analyses were completed to evaluate the relationship between pathogenic variant and development or recurrence of adenoma, SSL, and AA/HGD/CRC. A survival analysis evaluated the development of the primary outcomes in patients with ≥ 2 colonoscopies.

Results: 327 colonoscopies were reviewed. Baseline characteristics did not differ by variant, and patients with MLH1 had more colonoscopies completed (**Table**). PMS2 was associated with decreased odds of AA/HGD/CRC development compared to MLH1 (OR .102, 95% CI .013-.507) and adenoma development compared to MSH2 (OR .240, 95% CI .057-.902). Among those with ≥2 colonoscopies (n=71), there was no significant difference in adenoma or AA/HGD/CRC development, but MSH2 had a lower risk of SSL compared to MLH1 (HR .053, 95% CI .004-.762) and MSH6 (HR .067, 95% CI .005-.861). For recurrence, PMS2 had a lower risk of adenoma recurrence compared to MLH1 (OR=.021, 95% CI .021-.001) and MSH2 (OR .084, 95% CI .006-.726). Similarly, MSH6 (OR .068, CI .004-.652) had a lower risk of adenoma recurrence compared to MLH1.

Conclusion: Surveillance colonoscopy outcomes, including SSL risk, differed in patients with Lynch Syndrome based on the pathogenic variant present. These findings suggest the need to further evaluate appropriate surveillance intervals based on variant.

Table 1. Baseline Characteristics and Surveillance Colonoscopy Outcomes by Pathogenic Variant Key

	All n=101	MSH6 n=18	MSH2 n=32	PMS2 n-23	MLH1 n=28	p*
Baseline Variables						
Age	45 (24)	50 (20)	46 (25)	44 (20.5)	40.5 (22.5)	.509
BMI	27.3 (8.5)	29 (5.9)	26.2 (5.8)	25.9 (12.3)	26.8 (10.6)	.584
Female	61 (60.4)	11 (61.1)	24 (75)	13 (56.5)	13 (46.4)	.164
White	95 (97)	18 (100)	28 (93)	22 (96)	27 (100)	.911
History of Malignancy	53 (52.5)	12 (66.7)	19 (59.4)	8 (34.8)	14 (50)	.164
Colonoscopy Variables						
Total number	327	45	111	50	121	
Per Patient	2 (4)	1.5 (2.8)	3 (2.2)	2 (2)	4 (4)	.004
Surveillance (years)	3.6 (6)	0.3 (4.4)	3.9 (6.2)	1.1 (3.9)	4.5 (4.9)	.023
Surveillance Outcomes						
Adenoma	54 (53.5)	9 (50)	18 (56.2)	10 (43.5)	17 (60.7)	.650
SSL	17 (16.8)	5 (27.8)	5 (15.6)	3 (13)	4 (14.3)	.621
AA/HGD/CRC	29 (28.7)	5 (27.8)	10 (31.2)	2 (8.7)	12 (42.9)	.051

SSL: Sessile serrated lesion; AA: Advanced Adenoma; HGD: High grade dysplasia; CRC: Colorectal Cancer Values are n (%) or median (IQR); *Fisher's exact for categorical variables & Kruskal-Wallis for continuous.

S247

Differing Colonic Adenoma Presentation in Adults With Cystic Fibrosis Compared to the General Population With Screening and Surveillance Colonoscopy

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Introduction: People with CF (PwCF) experience increased rates of early colon polyp development and progression to colorectal cancer compared to the general population; a trend further magnified in patients with solid organ transplant. The exact mechanism for why CF patients develop more polyps and whether different polyp types occur at similar prevalence rates as the general population remains unclear. We developed a database of colonoscopy results in PwCF to better characterize the prevalence and location of varying polyp types.

Methods: In this retrospective chart review, PwCF were identified via the University of Washington (UW) CF Foundation Patient Registry and the UW CF Transplant Registry. Patients with a diagnosis of CF were included, however, those younger than 18 years old were excluded. Electronic medical records (EMR) were accessed using the UW's Epic EMR system including linked archival data systems. Colonoscopy reports were systematically reviewed with selected variables including patient age at time of procedure, date of colonoscopy, bowel preparation quality, and cecal intubation. Polyp quantity, size, type, location, and presence of cancer were also collected. Statistical analysis was performed to assess our data compared to the general population. This study was approved by the UW IRB.

Results: Of 782 patients were identified, 181 had available colonoscopy records (any indication). A total of 306 colonoscopies were reviewed (53.6% women, 46.4% men). Median age at time of colonoscopy was 42 years old. Cecal intubation rate was 92.5%. A total of 295 polyps were identified; 43.7% of patients had at least 1 polyp and 27.1% had at least 2 or more polyps. Conventional adenomas represented 98.7% (n = 225) of all pre-cancerous polyps resected. Sessile serrated lesions and hyperplastic polyps were significantly less prevalent than what has been previously described in the general population ($p < 0.05$). Polyp location within the colon was predominantly left-sided (Table).
Conclusion: PwCF had a significantly different polyp type distribution compared to what has been described in the general population. Conventional adenomas appear to be the near exclusive precancerous polyp type found in CF patients. SSLs appear to be rare in this population. This finding could have bearing on future study, particularly on impacts of highly-effective modulators on polyp formation and the efficacy of stool-based DNA testing for screening in this population.

Table 1. Prevalence and Distribution of Polyps in Patients with CF

	Variable	Prevalence
Cancer		
(n = 3)	Adenocarcinoma	1.66%
Polyp Type		
(n = 177)	Tubular Adenoma	30.39%
	Tubulovillous Adenoma	4.97%
	Sessile Serrated Lesion	1.10%
	Traditional Serrated Adenoma	0.55%
	Hyerplastic Polyp	9.39%
	Inflammatory Polyp	5.52%
	Other Benign	4.41%
	Unknown/Lost	3.87%
Location		
(n = 295)	Right Colon	43.1%
	Left Colon	53.9%
	Unknown	3.0%

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Disparities in Rates of Multitarget Stool DNA Test Completion for Colorectal Cancer Screening

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Introduction: Screening for colorectal cancer (CRC) reduces CRC mortality, but over 30% of adults aged 50-75 in the United States are not up to date with CRC screening per recent studies. Multitarget stool DNA (mt-sDNA) testing is a noninvasive option for CRC screening which could help bridge this gap, but completion of mt-sDNA testing requires active engagement from the patient. We aimed to assess the rate at which patients completed mt-sDNA screening and identify characteristics associated with mt-sDNA test completion.
Methods: We conducted a retrospective cohort study of all mt-sDNA tests ordered between April 2020 and July 2021 at our institution. For each patient we recorded age, sex, race, education, preferred language, insurance status, ordering clinician, whether CRC screening was previously completed, and whether the patient completed mt-sDNA testing. Multivariate logistic regression was used to determine which factors were associated with completion of mt-sDNA testing.
Results: A total of 797 patients were ordered mt-sDNA tests during the study period. Median age was 61 years, 272 (34%) were male, 318 (40%) were non-White, and 368 (46%) had previously completed CRC screening (Table). 627 tests (79%) were ordered by an attending primary care physician (PCP), 81 (10%) by a resident PCP, 48 (6%) as part of an outreach program to patients overdue for CRC screening, and 41 (5%) by a gastroenterologist. A total of 483 patients (61%) completed screening, with median time to completion being 25 days (IQR 17-43). On multivariate analysis, higher mt-sDNA completion was associated with Asian race (OR 2.84, 95% CI 1.44-5.62) and completion of prior CRC screening (OR 1.51, 95% CI 1.05-2.17), whereas Black race (OR 0.58, 95% CI 0.39-0.87), order from a resident PCP (OR 0.32, 95% CI 0.19-0.53), and order from the outreach program (OR 0.44, 95% CI 0.24-0.81) were associated with lower rates of mt-sDNA completion.
Conclusion: Nearly 40% percent of patients who were ordered a mt-sDNA test did not complete testing. Completion rates were lower in Black patients and patients with a resident PCP. While clinician experience may contribute to the difference, these findings may also reflect systems-level inequities such as socioeconomic disadvantages, decreased access to care, and lower trust in the healthcare system among certain patient populations. Our research identifies an opportunity to improve health equity in mt-sDNA screening.

Table 1. Baseline Patient Characteristics and Factors Associated with Completion of mt-sDNA Testing

	N (%)	Odds Ratio (95% CI)
Age		
60 and below	373 (47)	
61-75	362 (45)	1.17 (0.8-1.72)
76 and above	62 (8)	1.50 (0.74-3.02)
Male sex	272 (34)	1.07 (0.78-1.46)
Race		
White	479 (60)	-
Black	146 (18)	0.57 (0.38-0.86)
Hispanic	40 (5)	0.96 (0.47-1.96)
Asian	64 (8)	2.84 (1.44-5.62)
Other	68 (9)	1.03 (0.59-1.8)

Table 1. (*continued*)

	N (%)	Odds Ratio (95% CI)
College education or higher	373 (47)	1.19 (0.86-1.65)
Preferred language is not English	57 (7)	0.77 (0.41-1.45)
Insurance		
Commercial	393 (49)	-
Medicare	290 (36)	0.87 (0.59-1.29)
Medicaid or other	114 (14)	0.75 (0.47-1.19)
Status of last colorectal cancer screen		
None	390 (49)	-
Completed	368 (46)	1.47 (1.02-2.12)
Incomplete exam	39 (5)	1.39 (0.66-2.94)
Ordered by		
Primary care attending	627 (79)	-
Primary care resident	81 (10)	0.33 (0.2-0.55)
Outreach program	48 (6)	0.46 (0.24-0.85)
Gastroenterologist	41 (5)	1.09 (0.52-2.31)

S249 WITHDRAWN

S250 Presidential Poster Award

Colorectal Cancer Screening Rates at Federally Qualified Health Centers in California During the COVID-19 Pandemic: Insights From National Health Resources and Services Administration Data

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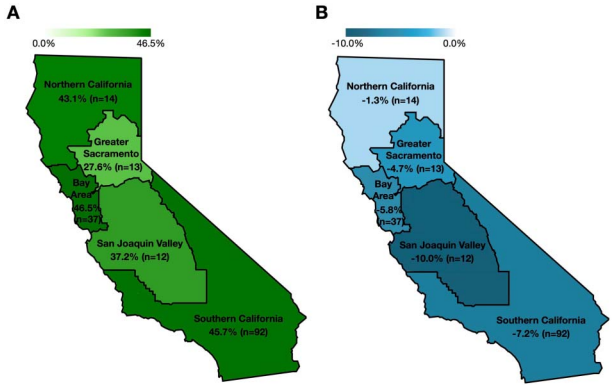
Introduction: Federally Qualified Health Centers (FQHCs) provide preventive health services such as colorectal cancer (CRC) screening to low-income and underinsured individuals. California has a racially, ethnically, and socioeconomically diverse population and includes more FQHCs than any other state. Our aim was to assess CRC screening rates and factors impacting the screening rate change (SRC) from 2019 to 2020 at California FQHCs during the COVID-19 pandemic.
Methods: Cross-sectional analyses were performed using the 2019 and 2020 Uniform Data System (UDS) for all FQHCs in California. The UDS provides annual data such as patient demographics and healthcare utilization for all Health Resources and Services Administration-funded health centers. We abstracted CRC screening rates at each FQHC for patients ages 50-74. We then calculated the SRC from 2019 to 2020 for each FQHC, and stratified FQHCs into quartiles by SRC. Wilcoxon rank-sum and chi-square tests were used to assess clinic-level differences between FQHCs in the quartile with the largest decrease in CRC screening rate (SRC Q1) and all other quartiles (SRC Q2-4). Mixed effects logistic regression was used to determine characteristics associated with the largest declines in SRC (being in SRC Q1).
Results: Across all FQHCs in California (n=168), 1,207,401 patients were eligible for CRC screening in 2020. The median CRC screening rate was 36.8% in 2020, down from 44.5% in 2019 (Table). FQHCs with the largest decline in screening (SRC Q1) had a lower percentage of male patients (p=0.010), White (non-Hispanic) patients (p=0.002), and Medicare/Medicaid dually eligible patients (p=0.002). SRC Q1 FQHCs were more likely to have a high percentage of Hispanic/Latinx patients (p=0.002) and patients with a preference for non-English language (p=0.009), and were also more likely to be in an urban setting (p=0.04) (Table). In an adjusted model, serving a higher percentage of Medicare/Medicaid dually eligible patients was associated with lower odds of having the largest SRC decline from 2019 to 2020 (aOR 0.46; 95% CI 0.27-0.81; p=0.007).
Conclusion: California FQHCs saw a notable decline in CRC screening rates from 2019 to 2020. Clinic-level factors associated with the greatest declines included the proportion of Medicare/Medicaid dually eligible patients served. This study highlights the need for tailored interventions to address low CRC screening rates in California FQHCs overall, and especially in FQHCs with a high proportion of underinsured individuals (Figure)



[0250] **Figure 1.** (A) Colorectal cancer screening rates in 2019 and (B) change in screening rates between 2019 and 2020 among adults ages 50 to 74 at Health Resources and Services Administration-funded FQHCs in California by state geographical region (n=number of FQHCs in region)

Table 1. Federally Qualified Health Center (FQHC) characteristics (2020 data) and the colorectal cancer (CRC) screening rate change (SRC) in California FQHCs from 2019 to 2020 by quartiles

Frequency or Percent	Overall (n=168)	SRC Q1 (n=42)	SRC Q2+Q3+Q4 (n=126)	P Value
Total Patients Eligible for CRC Screening (Age 50-74)[Y]	1,207,401	346,591	860,810	–
CRC Screening Rate in 2019 (median %)	44.5	53.7	41.6	< 0.0001
CRC Screening Rate in 2020 (median %)	36.8	31.2	37.7	0.030
Change in CRC Screening Uptake between 2020 and 2019				
Median Interquartile Range	-5.7 -13.1,-0.6	-18.6 -28.4,-15.1	-3.1 -7.5,1.0	< 0.0001
Sex Male (median %)	42.5	41.3	42.9	0.010
Race & Ethnicity (median %)				
White Non-Hispanic	17.5	11.5	18.9	0.002
Black Non-Hispanic	3.0	2.8	3.0	0.890
Hispanic/Latina/Latino/Latinx	55.8	68.2	51.1	0.002
Other Non-Hispanic	3.2	2.9	3.4	0.180
Preference for Non-English Language (median %)	33.1	38.7	30.6	0.009
Urban FQHCs, n (%)	133 (79.2%)	38 (90.5%)	95 (75.4%)	0.040
Experiencing Homelessness (median %)	3.2	3.3	3.2	0.890
Income Level >200% Federal Poverty Line (median %)	3.3	2.7	3.8	0.480
Uninsured (median %)	18.6	18.8	18.5	0.120
Medicaid (median %)	39.3	35.9	40.3	0.240
Medicare/Medicaid Dually Eligible (median %)	4.2	3.0	4.7	0.002
Private Insurance (median %)	8.6	10.2	8.3	0.610
Agricultural Workers (median %)	0.9	1.0	0.7	0.790

*SRC Q1 represents FQHCs with the largest decline in CRC screening rates from 2019 to 2020, and SRC Q2+Q3+Q4 represents all other FQHCs.
*p-values represent comparisons (Wilcoxon rank-sum and chi-square tests) between the first quartile and second through fourth quartiles combined for FQHCs' median percentage of White, Black, Hispanic/Latino, and other races, median percentage patient population with preference for non-English language, homelessness, income level above 200% of the Federal Poverty Line, uninsured status, and FQHC urbanicity.
[Y]These calculated values do not account for practice-changing 2021 United States Preventative Services Task Force guideline updates dictating that average-risk patients begin CRC screening at age 45.

S251 Presidential Poster Award

Serrated Polyps in Patients With Positive FIT or Mt-sDNA, or Colonoscopy Only: Data From the New Hampshire Colonoscopy Registry

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Introduction: Use of fecal immunochemical testing (FIT) or multi-target stool-based DNA tests (mt-sDNA) for initial colorectal cancer (CRC) screening increases polyp yield at colonoscopy. Polyps are resected during colonoscopy, preventing CRC. Serrated polyps, including sessile serrated polyps (SSPs), traditional serrated adenomas (TSAs) and hyperplastic polyps (HPs), progress to CRC through methylation, and may account for up to 30% of all CRC. FIT detects blood in the stool, and is more sensitive at detecting large (≥ 1 cm) adenomas than serrated polyps, which are less likely to bleed. In addition to detecting blood, mt-sDNA detects methylated DNA, and has been found more effective than FIT at detecting serrated polyps. We investigated the yield of serrated polyps in colonoscopies after FIT+ or mt-sDNA+ and in those with no preceding positive stool test in the population-based New Hampshire Colonoscopy Registry (NHCR).
Methods: Data from Exact Sciences Laboratories identified NHCR patients with a positive mt-sDNA test resulting from routine care (8/2015-12/2020). We compared NHCR patients with colonoscopy after an mt-sDNA+ or FIT+ test to those with colonoscopy only during the same period. Outcomes were clinically relevant serrated polyps (CRSPs: all SSPs and TSAs, and large (≥ 1 cm) HPs). A logistic regression model predicting CRSP adjusted for age, sex, BMI, presence of large (≥ 1 cm) adenomas and smoking.
Results: In our sample of 560 mt-sDNA+ patients, 414 FIT+ patients, and 59,438 with screening colonoscopy only, mt-sDNA+ was more likely to yield CRSPs than FIT+ or colonoscopy only ($p < 0.0001$). When stratifed by large adenomas, nearly 1 in 5 (18.0%) mt-sDNA+ patients had CRSPs with no large adenomas as compared to 1 in 10 (9.9%) FIT+ and 8% of colonoscopy only patients. A regression model showed that mt-sDNA+ patients were nearly 3 times as likely (OR 2.86, 95% CI 2.19 – 3.69) and FIT+ patients 1.5 times as likely (1.52, 1.05-2.14) to have CRSP as colonoscopy only patients. (Table)

Conclusion: At follow-up colonoscopy, mt-sDNA+ tests had a higher yield of CRSPs than FIT+ or colonoscopy only, both with and without synchronous large adenomas. Given the importance of the serrated pathway and the increased CRC risk associated with CRSPs, these data have significant implications for CRC screening.

Table 1. Clinically relevant serrated polyps (CRSPs: all SSPs & TSAs, HPs ≥1 cm) at colonoscopy in patients with mt-sDNA+, FIT+ and colonoscopy only, stratified by large (≥1 cm) adenomas

Colonoscopy Findings	mt-sDNA+ (N = 560)		FIT+ (N = 414)		Colonoscopy Only (N = 59,438)		P-Value	
	N	%	N	%	N	%	All groups	mt-sDNA+ vs FIT+
CRSP	118	21.1	47	11.4	5126	8.7	< 0.0001	< 0.0001
No CRSP	442	78.9	367	88.6	54,242	91.4		
CRSPS and Large Adenomas								
							< 0.0001	< 0.0001
Large adenoma & CRSP	17	3.0	6	1.5	385	0.7		
Large adenoma & no CRSP	86	15.4	56	13.5	2421	4.1		
CRSP & no large adenoma	101	18.0	41	9.9	4741	8.0		
No large adenoma or CRSP	356	63.6	311	75.1	51821	87.3		

S252 Presidential Poster Award

Screening With FIT-DNA: Impact on Colonoscopy Withdrawal Time, Adenoma Detection and Endoscopist's Recommendation for Follow-Up

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Introduction: Limited data exist on colonoscopy after abnormal fecal immunochemical test (FIT)-DNA (a.k.a. multitarget stool DNA test). We hypothesized that endoscopists perform a more careful exam (e.g., longer withdrawal time (WT)) and recommend early re-screening after FIT-DNA+/negative colonoscopy due to expectations about test performance. We aimed to A) determine adenoma detection rate (ADR) and other lesion detection rates and B) assess endoscopist behavior regarding WT and recommendations after negative colonoscopy for 3 indications: 1) FIT-DNA+, 2) average-risk screening (SCR) and 3) abnormal fecal occult blood test (FOBT+, guaiac or FIT).
Methods: Using GIQuIC data (2019-2022) from 727 endoscopy units, we identified patients aged 50-75 years undergoing colonoscopy for FIT-DNA+, SCR or FOBT+. We excluded colonoscopy with any other indications (e.g., family history), inadequate bowel preparation or incomplete exam. If pathology was obtained but results were not available, the record was excluded from pathology-related outcomes. Generalized estimating equations clustered by endoscopist were used to assess the association between indication and outcomes while adjusting for patient characteristics and endoscopist's screening ADR.
Results: >1.8 million colonoscopies were included; demographics varied by indication (Table). FIT-DNA+ was associated with higher ADR (59.6%) than SCR (39.3%, p< 0.0001) and FOBT+ (53.8%, p< .0001) and greater detection of advanced neoplasia and sessile serrated lesions (Table). Among those with no pathology obtained on colonoscopy, WT was longer for FIT-DNA+ than for SCR and FOBT+. Among patients aged 50-65 years with no pathology and ASA < IV, a 10-year colonoscopy was recommended in only 80.1% of FIT-DNA+ patients vs. 87.2% of SCR and 86.5% of FOBT+. In multivariable models, compared to FIT-DNA+, SCR and FOBT+ are associated with shorter WT (p< 0.0001 for both), and lower odds of adenoma detection (OR 0.48 (95% CI 0.47-0.50) and 0.71 (0.68-0.74), respectively) and recommendations for re-screening in < 10 years (OR 0.64 (0.57-0.72) and 0.84 (0.74-0.96), respectively).
Conclusion: FIT-DNA+ is associated with greater neoplasia detection than FOBT+ and SCR, but also with longer WT and more recommendations for early re-screening after a negative colonoscopy. Despite lower specificity of FIT-DNA vs. FOBT, endoscopists seem to have greater concern for missed pathology in FIT-DNA+/negative colonoscopies, leading to downstream impacts on healthcare utilization.

Table 1.

Colonoscopy for Abnormal FIT-DNA vs. Average Risk Screening vs. Abnormal FOBT: Patient Characteristics, Findings and Follow-Up Recommendations After a Negative Exam

	FIT-DNA+ (n=23,046)	Average Risk Screening (n=1,760,840)	FOBT+ (n=26,455)
Age, mean (sd)	64.2 (7.1)	58.7 (7.2)	63.8 (7.2)
Male (%)	9,939 (43.1)	816,630 (46.4)	12,698 (48.0)
Female (%)	13,107 (56.9)	944,210 (53.6)	13,757 (52.0)
White (%)	15,777 (68.5)	1,022,859 (58.1)	16,387 (61.9)
Black of African American (%)	1085 (4.7)	171,348 (9.7)	2112 (8.0)
Asian (%)	211 (0.9)	56,644 (3.2)	959 (3.6)
Other (%)	514 (2.2)	68,966 (3.9)	1224 (4.6)
Unknown/Declined (%)	5459 (23.7)	441,033 (25.1)	5773 (21.8)
Non-Hispanic (%)	14,234 (61.8)	1,018,724 (57.9)	16,691 (63.1)
Hispanic/Latino (%)	560 (2.4)	107,147 (6.1)	2407 (9.1)
Unknown/Decline	8252 (35.8)	634,969 (36.1)	7357 (27.8)
Total endoscopists contributing colonoscopies	2650	4845	3223
Endoscopist mean ADR‡(sd) with minimum 50 colonoscopies	39.1% (10.2) (Endoscopist n=2467)	39.2% (10.9) (Endoscopist n=3878)	39.5% (10.6) (Endoscopist n=3006)
Colonoscopy Findings			
Adenoma Detection Rate (ADR)	59.6% *,§	39.3% §	53.8%
ADR for Males	67.6% *,§	46.4% §	61.0%
ADR for Females	53.6% *,§	33.2% §	47.2%
Advanced Neoplasia Detection±	22.2% *,§	7.6% §	17.4%
Sessile Serrated Lesion Detection	16.2% *,§	8.2% †	8.8%
Adenocarcinoma Detection	1.5% *	0.3% §	1.4%
Analysis of Subgroup with No Polyps on Colonoscopy (i.e., No Pathology Obtained)			
Median Withdrawal Time, Minutes (interquartile range)	(n=4211) 8.5 (6.9-11.0) *,§	(n=673,519) 7.8 (6.4-9.9)	(n=7455) 7.8 (6.3-10.1)

Table 1. (*continued*)

Colonoscopy for Abnormal FIT-DNA vs. Average Risk Screening vs. Abnormal FOBT: Patient Characteristics, Findings and Follow-Up Recommendations After a Negative Exam

	FIT-DNA+ (n=23,046)	Average Risk Screening (n=1,760,840)	FOBT+ (n=26,455)
Next Recommended Colonoscopy (limited to age 50-65, ASA< IV, exclude other or none)	(n=2125)	(n=567,568)	(n=4301)
< 10 Years (%)	422 (19.9)	72,403 (12.8)	579 (13.5)
10 Years (%)	1703 (80.1)	495,165 (87.2)	3722 (86.5)
Next Recommended Colonoscopy (limited to age 50-65, ASA< IV, exclude other or none)	(n=2125)*,§	(n=567,568)§	(n=4301)
≤3 Years (%)	76 (3.6)	3840 (0.7)	65 (1.5)
4 or 5 Years (%)	333 (15.7)	65,289 (11.5)	478 (11.1)
6-9 Years (%)	13 (0.6)	3274 (0.6)	36 (0.8)
10 Years (%)	1703 (80.1)	495,165 (87.2)	3722 (86.5)
Excluded intervals n:			
Other	15	2335	29
None	18	974	19

‡ADR includes average risk screening only, ages 50-75, photodocumentation of the cecum, adequate bowel preparation.
*p<0.0001 compared with average risk screening.
§p<0.0001 compared with FOBT+.
†p=0.0002 compared with FOBT+. ± Includes either 1) adenoma≥10 mm, with high grade dysplasia, or with villous component; OR 2) sessile serrated polyp (SSP)≥10 mm, SSP with dysplasia, or traditional serrated adenoma; OR 3) adenocarcinoma.

S253 Presidential Poster Award

Colorectal Cancer Screening Rates at Federally Qualified Health Centers in 2019 and 2020 Varied Based on Urban-Rural Status and Predominant Racial/Ethnic Group

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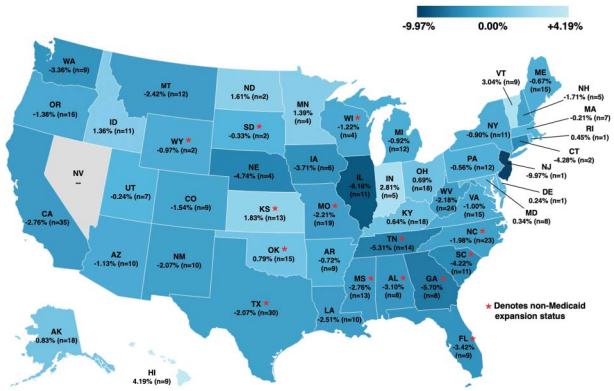
Introduction: Over 30 million low-income and underinsured individuals in the U.S. receive primary care services, including colorectal cancer (CRC) screening, at Federally Qualified Health Centers (FQHCs). Given known differences in healthcare access in rural settings, we aimed to quantify CRC screening rates and factors associated with a decline in screening between 2019 and 2020 at FQHCs based on urban-rural status.
Methods: We abstracted data from the Uniform Data System (UDS)—which compiles preventive health utilization data, including CRC screening rates among patients ages 50-74—for each FQHC. Our primary outcome was screening rate change (SRC), calculated as 2020 CRC screening rate minus 2019 CRC screening rate. We separated FQHCs based on urban-rural status and then created quartiles based on SRC. We used Wilcoxon Rank-Sum and x^2 testing to compare rural and urban FQHCs and performed backward stepwise multivariable logistic regression to determine FQHC-level characteristics (2020 data) associated the largest decline in screening participation between 2019 and 2020 (SRC Q1 status).
Results: In 2020, 734 urban and 527 rural FQHCs served 6,438,433 patients who were age-eligible for CRC screening. FQHC characteristics were significantly different between urban and rural FQHCs (Table). CRC screening rates were lower in rural FQHCs than urban FQHCs in 2019 (p=0.04) and 2020 (p< 0.0001), and SRC was lower in urban (-3.6%) than rural (-1.2%) FQHCs (p< 0.0001) (Table). Urban FQHCs were more likely to see a decline in CRC screening in 2020 if they served a majority non-Hispanic Black patients (aOR 2.05, 95%CI=1.19-3.52) or if they served a high proportion of uninsured patients (data not shown). Rural FQHCs were more likely to see a decline in CRC screening in 2020 if they served a majority Hispanic/Latinx patients (aOR 2.78, 95% CI=1.50-5.15) or if they were in a non-Medicaid expansion state (aOR 1.81, 95% CI 1.09-2.99) (data not shown). SRC was calculated by state for rural FQHCs and mapped in the Figure.
Conclusion: Urban FQHCs had a greater decline in CRC screening rates from 2019 to 2020 than rural FQHCs and experienced larger declines if the patient population was predominantly Black or uninsured. Rural FQHCs saw a steep decline if they served a majority Hispanic/Latinx population or were in a non-Medicaid expansion state. These findings suggest that efforts to increase CRC screening at US FQHCs may need to be tailored to their location, demographics, and insurance and Medicaid eligibility status.



[0253] **Figure 1.** Map of screening rate change (2020 CRC screening rate – 2019 CRC screening rate) by state for rural FQHCs and indication of Medicaid expansion status as of 2020

Table 1. **FQHC characteristics (2020 data), colorectal cancer (CRC) screening rates (2019 and 2020), and screening rate changes (SRC) for urban and rural FQHCs in the US overall and by SRC comparison groups**

Frequency or percent	All FQHCs (n=1261)	Urban FQHCs (n=734)			Rural FQHCs (n=527)			p-value*
		SRC Q1 (n=218)	SRC Q2+Q3+Q4 (n=516)	Total (n=734)	SRC Q1 (n=98)	SRC Q2+Q3+Q4 (n=429)	Total (n=527)	
Total patients eligible for CRC screening (age 50-74)	6,438,433	1,328,330	2,811,734	**4,140,064**	483,110	1,815,259	**2,298,369**	n/a
CRC screening rate in 2019 (median %)	42.9	48.0	38.3	**41.6**	48.5	43.7	**44.7**	0.04
CRC screening rate in 2020 (median %)	38.8	32.4	38.8	**36.9**	32.7	43.9	**42.4**	< 0.0001

Table 1. (*continued*)

Frequency or percent	All FQHCs (n=1261)	Urban FQHCs (n=734)			Rural FQHCs (n=527)			p-value*
		SRC Q1 (n=218)	SRC Q2+Q3+Q4 (n=516)	Total (n=734)	SRC Q1 (n=98)	SRC Q2+Q3+Q4 (n=429)	Total (n=527)	
Median 2019-2020 SRC	-2.7	-13.7	-1.2	**-3.6**	-12.6	0.1	**-1.2**	< 0.0001
Male patients (median %)	42.9	42.1	42.3	**42.2**	43.4	43.9	**43.8**	< 0.0001
Majority Race/Ethnicity served at FQHC (median %)								
Non-Hispanic White	36.4	16.0	25.2	**21.7**	66.9	70.4	**70.1**	< 0.0001
Non-Hispanic Black	8.2	12.7	19.1	**17.3**	2.6	1.6	**1.6**	< 0.0001
Hispanic/Latinx	15.8	33.4	24.7	**26.8**	7.7	5.5	**6.1**	< 0.0001
Other Non-Hispanic	4.6	5.2	5.9	**5.7**	2.5	3.4	**3.3**	< 0.0001
Patients with a preference for non-English Language (median %)	11.7	27.1	17.9	**19.2**	6.7	3.5	**3.8**	< 0.0001
Patients experiencing homelessness (median %)	1.8	3.2	2.6	**2.7**	1.1	1.0	**1.0**	< 0.0001
Patients with income Level >200% FPL (median %)	4.6	2.9	3.8	**3.5**	6.5	8.1	**7.8**	< 0.0001
Uninsured patients (median %)	19.6	23.9	21.5	**22.3**	19.7	16.2	**16.7**	< 0.0001
Medicaid Expansion (%)	71.6	76.6	73.6	**74.5**	59.2	69.5	**67.6**	0.007

*p-values represent Wilcoxon rank-sum or chisq tests comparing overall characteristics between urban and rural FQHCs.

S254 Presidential Poster Award

What Do "False-Positive" Stool Tests Really Mean? Data From the New Hampshire Colonoscopy Registry

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Introduction: Accurate understanding of the frequency of meaningful 'true positive' and 'false positive' mt-sDNA and FIT results is essential to optimizing the use of these important, common colorectal cancer (CRC) screening tests. We utilized the statewide, population-based New Hampshire Colonoscopy Registry (NHCR) to investigate colonoscopy outcomes using 3 distinct definitions of a 'positive' colonoscopy, and present the corresponding false discovery rate and positive predictive values (PPV).
Methods: Data from Exact Sciences Laboratories and the NHCR identified patients with mt-sDNA+ tests followed by colonoscopy resulting from routine care (8/15-12/20). We calculated false discovery rates (FDR) (# positive stool tests with negative colonoscopy divided by all positive stool tests) and the corresponding PPVs for both mt-sDNA+ and FIT+ cohorts using 3 definitions of positive colonoscopy: 1) Detection of colorectal advanced adenomatous Polyps and Cancer: DeeP-C Study (CRC, adenomas >1 cm or with 25%+ villous elements, high grade dysplasia or any serrated polyp [traditional serrated adenoma, sessile serrated polyp (SSP) or hyperplastic polyp (HP)] >1 cm) 2) Polyps requiring < 10 year follow up per USMSTF guidelines: includes DeeP-C findings (above) and 1 or more SSPs < 1 cm (with/without dysplasia) or 1 or more tubular adenomas < 1 cm. 3) Clinically Significant: Above DeeP-C and USMSTF findings and the remaining clinically significant serrated polyps: 5-9 mm proximal HPs.
Results: When using the strictest definition of positive colonoscopy, DeeP-C, the FDR was 71.9% for mt-sDNA+ and 81.7% for FIT+. Using the USMSTF definition, the FDR decreased to 33.2% for mt-sDNA+ and 47.6% for FIT+. Finally, adding 5-9 mm proximal HPs to the USMSTF < 10 year definition resulted in the lowest FDRs: 32.2% for mt-sDNA+ and 47.1% for FIT+ results. These decreasing FDRs correspond to increasing PPVs of 28.1% for mt-sDNA+ and 18.3% for FIT+ (DeeP-C) to 67.8% for mt-sDNA+ and 52.9% for FIT+ (DeeP-C + USMSTF + CSSP, Table).
Conclusion: Our analysis demonstrates a substantial decrease in FDRs (and corresponding increases in PPV) when using a definition of positive colonoscopy that includes additional significant precancerous findings such as adenomas or SSPs. These data present a more comprehensive and clinically relevant understanding of false positive outcomes at colonoscopies following positive stool tests, and to our knowledge this is the first such assessment of these outcomes.

Table 1. **False discovery rates and positive predictive value (PPV) according to different definitions of positive colonoscopy**

	False discovery rate ("negative" colonoscopy)			
	mt-sDNA N=549		FIT N=410	
	#	%	#	%
Deep-C*	395	71.9	335	81.7
DeeP-C* + USMSTF** < 10 yrs	182	33.2	195	47.6
DeeP-C*+ USMSTF** < 10 yrs + CSSP***	177	32.2	193	47.1
	Positive Predictive Value (PPV)			
	#	%	#	%
Deep-C*	154	28.1	75	18.3
DeeP-C* + USMSTF** < 10 yrs	367	66.8	215	52.4
DeeP-C*+ USMSTF** < 10 yrs + CSSP***	372	67.8	217	52.9

*DeeP-C: Detection of colorectal advanced adenomatous Polyps and Cancer3
**USMSTF: United States Multi-Society Task Force on Colorectal Cancer Screening8
***CSSP: all clinically significant serrated polyps, including all traditional serrated adenomas and sessile serrated polyps, all hyperplastic polyps >10 mm, and hyperplastic polyps 5-9 mm in the proximal colon

S255 Presidential Poster Award

Assessing the Impact of a Multi-Component Health System Intervention to Address Low Colorectal Cancer Screening Participation in Patients With a Family History of Colorectal Cancer

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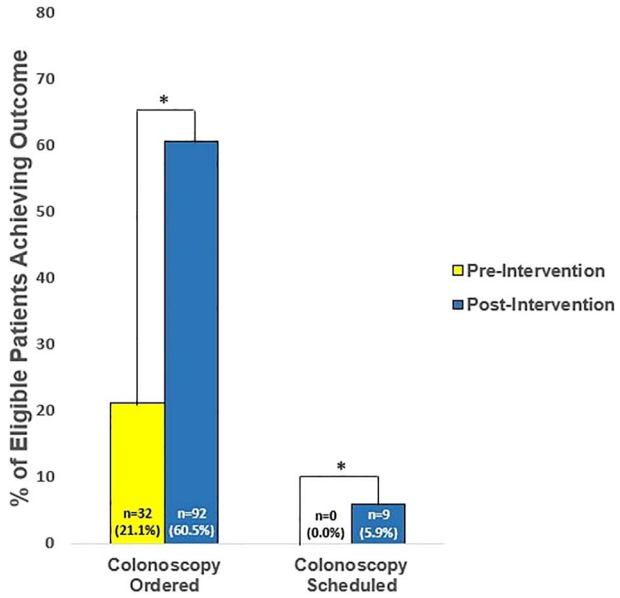
Introduction: In the United States, 3-10% of individuals have a family history of colorectal cancer (CRC). Population health strategies to increase CRC screening often exclude these individuals, and interventions to increase screening participation in this high-risk group are rare. We designed and implemented a multi-component health system intervention to increase CRC screening uptake among individuals with a family history of CRC that were excluded from mailed fecal immunochemical test (FIT) outreach in our health system.
Methods: The study was performed in a large academic medical center with biannual mailed FIT outreach for individuals at average-risk for CRC. We included patients who did not receive mailed FIT outreach in 2021 due to a family history of CRC. We excluded patients with a personal history of inflammatory bowel disease, colectomy, or CRC. The intervention included both primary care provider (PCP) and patient components. The PCP component was sent via the electronic health record (EHR) and included CRC screening guidelines for patients with a family history of CRC and a pended colonoscopy order for each patient overdue for screening. The patient component was delivered via the EHR patient portal and a mailed letter and included education about familial risk and colonoscopy, and a prompt to schedule a colonoscopy. Preliminary outcomes were measured 2-months post-intervention and were whether: (1) the PCP signed the pended colonoscopy order and (2) the patient scheduled colonoscopy. We used descriptive statistics to describe the study cohort and paired t-tests to compare the study outcomes pre- and post-intervention. The primary outcome of colonoscopy completion will be measured 6 months post-intervention.
Results: 152 patients received the intervention. The mean age was 61.3 years (s.d 7.0), 32.9% were male, and 42.1% were non-Hispanic White (Table). Colonoscopy orders increased from 32 (21.1%) to 92 (60.5%) from pre- to post-intervention ($p< 0.0001$) (Figure). Colonoscopies scheduled increased from 0 to 9 (5.9%) ($p=0.002$).
Conclusion: We designed and evaluated the preliminary results of a health system intervention that aims to increase screening participation among individuals with a family history of CRC. There was a significant increase in both colonoscopies ordered and colonoscopies scheduled. This study demonstrates a successful population health strategy to increase provider and patient intention to screen in this high-risk population.



[0255] **Figure 1.** Screening colonoscopies ordered and screening colonoscopies scheduled pre- intervention versus post- intervention, n= 152

Table 1. Intervention population characteristics, n= 152

Patient Characteristic	Study Population (n=152)
Age [years, mean (SD)]	61.3 (7.0)
Male Sex [n (%)]	50 (32.9)
White Race [n (%)]	72 (47.4)
Non-Hispanic Ethnicity [n (%)]	116 (76.3)
Private Insurance [n (%)]	149 (98.0)
Married [n (%)]	83 (54.6)
English Language Preference [n (%)]	147 (96.7)
Social Vulnerability Index [median (IQR)]	25.9 (11.8-47.8)
Current or Former Tobacco Use Disorder [n (%)]	38 (25.0)
Current or Former Alcohol Use Disorder [n (%)]	13 (8.6)
Body Mass Index ≥ 25 [n (%)]	100 (66.2)
Hemoglobin A1c ≥ 5.7 [n (%)]	75 (52.8)
Family Members with Documented CRC [median (IQR)]	1 (1-1)
1st Degree Family Members with Documented CRC [median (IQR)]	1 (1-1)
Years since Last PCP Visit [median (IQR)]	1.01 (0.75-1.62)
Years since Last GI Visit [median (IQR)]	2.3 (2.5-9.2)
Breast Cancer Screening Up-To-Date [n (%)]	47 (47)
Cervical Cancer Screening Up-To-Date [n (%)]	61 (83.6)

S256 Presidential Poster Award

Risk Factors of Colorectal Cancer in Africa: A Systematic Review and Meta-Analysis

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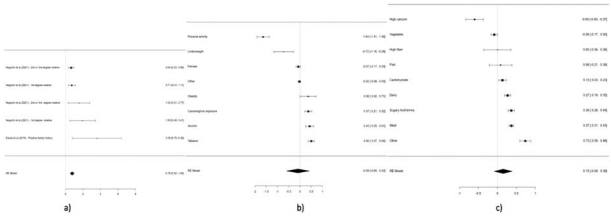
Introduction: Colorectal cancer (CRC) is the second leading cause of cancer-related death worldwide. A recent meta-analysis estimated a pooled CRC age-standardized incidence rate of 5.25 per 100,000, though suggested this to be an under-estimate of the true rate. Due to the heterogeneity of dietary and lifestyle practices throughout the continent, our work sought to define risk factors for the development of CRC in Africa.
Methods: We systematically searched PubMed, Embase, Global Health, CINAHL, Cochrane CENTRAL, and African Index Medicus for studies written in English, examining risk factors of CRC in Africa. Meta-analysis was performed to compare different risk factors in constituent studies. Jamovi software was used for statistical analysis utilizing a random-effects model. Analysis of CRC studies was supplemented by estimated relative risk (RR) comparing various risk factors.
Results: Of 2479 studies screened, 149 were included for the quantitative analysis (n=93707). Family history of CRC was associated with a RR of 2.14 and 95% RR CI [1.68-2.72], n=340. Individuals with diets based on high calcium, or vegetable consumption had 45% and 8% lower chances of having CRC, with respective RR of 0.55 [0.44-0.69] and 0.92 [0.84-0.99]. Diets based on carbohydrate, dairy, sugary food/drinks, or meat consumption indicated 14, 31, 43, or 45% higher chances of CRC, and 1.14 [1.03-1.26], 1.31 [1.21-1.42], 1.43 [1.32-1.57], 1.45 [1.36-1.54], n=5303. Physical activity was associated with lower RR of having CRC (81% less), 0.19 [0.15-.26]. Individuals that were obese, have been exposed to carcinogenic chemicals, have history of alcohol use, or tobacco use indicated 43, 45, 54, 65% higher chance of CRC, with 1.43 [1.02-2.03], 1.45 [1.23-1.68], 1.54 [1.28-1.84], 1.65 [1.45-1.9], n=8995. With the exception of family history, there was considerable heterogeneity among studies ($I^2 > 80\%$). (Figure)
Conclusion: There are both modifiable and non-modifiable risk factors that are distinct to Africa and vary across the continent. Our review revealed that obesity, carcinogen exposure, tobacco or alcohol use, and diets high in carbohydrates, dairy, and red meat increase CRC risk. On the contrary, high calcium or vegeTable-based diets, and physical activity are protective against the development of CRC. Further work is needed to characterize CRC risk factors by region and to understand the impact of risk factor mitigation efforts on the overall incidence of CRC.



[0256] **Figure 1.** Family history (panel a), type of diet (panel b), and type of lifestyle (panel c) risk factors of CRC in Africa, log relative-risk by case-control studies comparison

S257 Outstanding Research Award in the Colorectal Cancer Prevention Category (Trainee), Presidential Poster Award

Improving Adherence to Colorectal Cancer Screening Recommendations for First-Degree Relatives of Patients With Advanced Adenomas

Connie Wang, MD[1], Nghiem B. Ha, MD, MAS[1], Alec Faggen, MD[2], Tanya Khan, MD[1], Cary Kraft, MD[1], Yao-Wen Cheng, MD[1], Daniel Selvig, MD[1], Najwa El-Nachef, MD[1], Aparajita Singh, MD[1].
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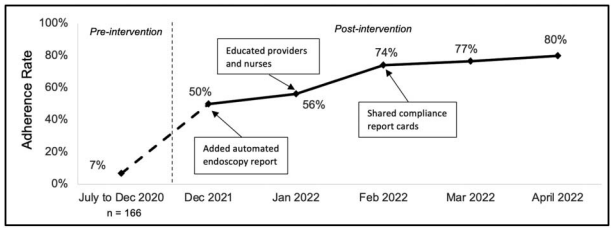
Introduction: Advanced adenoma (AA), defined as polyp size ≥1 cm or histologic features with villous or high-grade dysplasia, is common and confers an increased risk of colorectal cancer (CRC) to affected individuals and their first-degree relatives (FDR). Patients are unaware of this associated risk leading to inadequate screening of FDR. Also, practice variation regarding screening age/interval results in inconsistent recommendations. In this quality improvement study, we aimed to improve adherence to CRC screening recommendations for FDR of patients with a multifaceted intervention.
Methods: A pre-post study was conducted at a single academic center between 7/2020-5/2022 including adults undergoing outpatient screening/surveillance colonoscopy. Interventions included (1) surveying faculty/fellows on barriers to adhering to guidelines, (2) creating patient education materials in various languages on AA and importance of FDR screening, (3) standardizing screening recommendations with an automated prescriptive template in the endoscopy report, (4) educating providers and nurses, and (5) sharing quarterly compliance reports. The primary outcome was adherence to CRC screening recommendations for FDR of patients with AAs. Data were collected by chart review of the endoscopy report and post-procedure pathology follow up letters.
Results: Prior to the intervention, only 7% (11 of 166) with AA received appropriate CRC screening recommendations for their FDR. On the pre-intervention survey (n=38), suboptimal adherence was due to low familiarity with guidelines (47%), variability in delivery of screening recommendations (5% in endoscopy report; 18% spoke to patient; 13% communicated to primary provider; 47% no recommendation), and limited time available to communicate recommendations and provide patient education. Development of an automated template to standardize recommendations was implemented on 12/2021, followed by improved monthly rates of adherence to recommendations, from a baseline of 7% to 50%, 56%, 74%, 77% and 80%, respectively (Figure).
Conclusion: Earlier and more intensive screening of FDRs in those with AA is considered an untapped opportunity with the potential to substantially reduce the burden of CRC. This project utilizes stakeholder/patient education and automation of the process to improve compliance with the recommendations. Such novel workflows can play a key role in reducing the burden of CRC by targeting high-risk individuals for CRC screening.



[0257] **Figure 1.** Adherence rate of recommendations for colorectal cancer screening in first-degree relatives of patients with advanced adenomas

S258

Global Increase of Colorectal Cancer in Young Adults Over the Last 29 Years: An Analysis of the Global Burden of Disease Study 1990-2019

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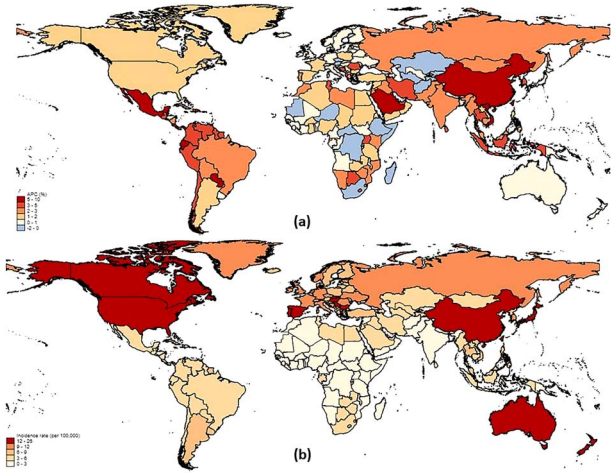
Introduction: The United States Preventive Services Taskforce lowered the recommended starting age for colorectal cancer (CRC) screening in average-risk adults from 50 to 45 years due to a rapid increase in young CRC incidence and overall favorable benefit-to-burden ratio in the US. This recommendation has not been widely adopted by other countries partially because the burden of young CRC in these countries is unclear compared to the United States.

Methods: The incidence rates of early-onset CRC in young adults (defined as the onset of CRC in individuals aged between 20 to 49 years) from 1990 to 2019 were collected from the Global Health Data Exchange (GHDx) results tool (available at https://vizhub.healthdata.org/gbd-results). Data from 204 countries and geographic areas were available. The socio-demographic index (SDI) was used to categorize countries and geographic areas by development (low, low-middle, middle, high-middle, and high).

Results: The global incidence rate of young CRC increased from 4.2/100,000 to 6.7/100,000 from 1990 to 2019, with an annual percentage change (APC) of 1.6%. The increase in CRC incidence rate was faster in young adults than in individuals aged 50-74 years (APC 0.6%). In the high HDI region, the CRC incidence rate decreased in adults aged 50-74 years old while it increased in adults 20-49 years old from 1995 to 2019 (Table). The increase in young CRC incidence rate was consistently observed in all five SDI regions and 185 out of 204 countries and territories (Figure a). Middle (120.8%), high-middle (98.5%), and low-middle (63.7%) SDI regions experienced the most rapid increase in young CRC incidence rate, while the high SDI region had the highest incidence rate by 2019 (11.5 per 100,000). By 2019, nine countries and territories (Taiwan, Monaco, Portugal, Andorra, Japan, China, Bulgaria, Hungary, and Slovakia) had higher young CRC incidence rates than the United States (Figure b); CRC screening for average-risk adults aged 45-49 years should be studied in these countries. A concerning 142 countries had a higher annual percentage increase of young CRC than the United States, which warrants further attention and investigation. (Table) (Figure a/b)

Conclusion: The global incidence, mortality, and DALYs of young CRC increased from 1990 to 2019. The increase in young CRC incidence was prevalent in most countries worldwide. Several countries were found to have higher incidence rates or faster increase in young CRC, which warrants further attention.



[0258] **Figure 1.** Incidence and incidence rate change of colorectal cancer in adults aged 20-49 years in individual countries. (a) annual percentage change of incidence rate from 1990 to 2019; (b) incidence rate by 2019. Abbreviation: APC, annual percentage change

Table 1. The incidence rate of colorectal cancer (per 100,000) by age groups in high SDI countries

Year	25-49 years	40-44 years	45-49 years	50-74 years
1990	10.32 (10.50-10.14)	14.95 (15.35-14.52)	29.23 (29.90-28.60)	138.74 (140.71-136.16)
1991	10.54 (10.72-10.39)	15.35 (15.74-14.94)	29.83 (30.54-29.15)	141.39 (143.40-138.81)
1992	10.79 (10.98-10.63)	15.66 (16.04-15.27)	29.99 (30.72-29.30)	144.48 (146.51-141.82)
1993	11.19 (11.35-11.03)	16.09 (16.48-15.68)	30.56 (31.28-29.88)	149.43 (151.53-146.66)
1994	11.34 (11.51-11.18)	16.11 (16.48-15.71)	30.56 (31.28-29.85)	150.59 (152.74-147.77)
1995	11.64 (11.81-11.47)	16.22 (16.62-15.83)	30.99 (31.70-30.29)	152.43 (154.73-149.46)
1996	11.77 (11.95-11.61)	16.06 (16.44-15.67)	31.05 (31.79-30.35)	151.11 (153.26-148.11)
1997	11.89 (12.07-11.72)	16.16 (16.54-15.78)	31.20 (31.93-30.48)	148.85 (151.05-145.92)
1998	12.03 (12.21-11.86)	16.27 (16.64-15.88)	31.52 (32.26-30.86)	148.92 (151.13-145.92)
1999	12.20 (12.40-12.03)	16.39 (16.77-16.00)	31.82 (32.58-31.15)	149.03 (151.22-145.86)
2000	12.42 (12.61-12.25)	16.59 (17.00-16.20)	31.98 (32.74-31.31)	147.03 (149.39-143.93)
2001	12.69 (12.88-12.51)	16.78 (17.18-16.37)	32.29 (33.11-31.62)	145.39 (147.74-142.14)
2002	12.91 (13.10-12.72)	17.01 (17.41-16.60)	32.43 (33.27-31.78)	144.69 (147.04-141.35)
2003	13.17 (13.38-12.97)	17.23 (17.64-16.80)	32.66 (33.47-31.95)	144.57 (146.96-141.31)
2004	13.17 (13.36-12.98)	17.16 (17.56-16.76)	32.29 (33.05-31.58)	141.29 (143.78-138.17)
2005	13.32 (13.52-13.13)	17.33 (17.74-16.92)	32.39 (33.16-31.68)	140.09 (142.60-136.83)
2006	13.33 (13.52-13.13)	17.34 (17.77-16.92)	32.24 (33.00-31.51)	137.39 (139.96-134.19)
2007	13.42 (13.66-13.22)	17.44 (17.89-17.02)	32.40 (33.21-31.67)	137.23 (139.75-133.85)
2008	13.71 (13.95-13.50)	17.87 (18.35-17.43)	32.93 (33.79-32.18)	138.09 (140.73-134.53)
2009	13.92 (14.17-13.71)	18.21 (18.68-17.77)	33.36 (34.20-32.59)	138.41 (141.12-134.78)
2010	13.82 (14.06-13.60)	18.05 (18.54-17.59)	33.07 (33.91-32.27)	137.62 (140.35-134.00)
2011	13.75 (13.97-13.52)	18.05 (18.56-17.60)	32.94 (33.75-32.11)	137.41 (139.91-133.68)
2012	13.54 (13.77-13.29)	17.89 (18.43-17.42)	32.47 (33.31-31.62)	136.13 (138.88-132.39)
2013	13.46 (13.71-13.19)	17.92 (18.52-17.41)	32.28 (33.14-31.37)	135.93 (138.74-132.04)
2014	13.39 (13.65-13.12)	18.02 (18.64-17.49)	31.95 (32.89-31.02)	135.07 (137.93-131.12)
2015	13.41 (13.71-13.12)	18.15 (18.82-17.57)	31.85 (32.85-30.90)	135.57 (138.61-131.56)
2016	13.54 (13.86-13.22)	18.35 (19.03-17.72)	31.90 (32.94-30.94)	136.35 (139.34-132.16)
2017	13.44 (14.08-12.84)	18.35 (19.36-17.42)	31.51 (33.21-29.83)	136.33 (143.01-129.90)

Table 1. (*continued*)

Year	25-49 years	40-44 years	45-49 years	50-74 years
2018	13.39 (14.38-12.41)	18.34 (19.81-16.93)	31.61 (34.28-29.15)	137.80 (148.99-127.26)
2019	13.30 (14.50-12.22)	18.09 (19.84-16.48)	31.60 (34.91-28.60)	138.95 (151.53-127.17)

Abbreviation: SDI, Socio-Demographic Index.
Numbers present under age groups: incidence rate (95% uncertainty interval). Uncertainty intervals are a range of values that are likely to include the correct estimate of health loss for a given cause. Limited data create substantial uncertainty.

S259

Patients With Advanced Colorectal Polyps Have Poor Knowledge of Colorectal Cancer Risk and Screening Recommendations for Their First-Degree Relatives

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Introduction: First-degree relatives (FDRs) of patients with advanced colorectal polyps (ACPs) are at increased risk of colorectal cancer (CRC) and warrant earlier colonoscopy screening than the general population. Appropriate screening is dependent on patient (proband) knowledge and communication of risk and recommendations with FDRs. The aim of this study was to assess probands' knowledge of familial risk and need for increased screening in their FDRs, and to evaluate factors associated with accurate knowledge.
Methods: As part of an ongoing clinical trial, patients with ACPs (adenoma or serrated polyp ≥ 10 mm, villous features or high-grade dysplasia) diagnosed before the age of sixty were recruited from a statewide hospital system including eight hospital-based gastroenterology practices. Those who provided informed consent completed telephone surveys of demographic information, knowledge of familial risk and screening recommendations based on their polyp finding. Polyp characteristics were gathered from the medical record. Knowledge by baseline characteristics was compared using Chi Square Test.
Results: Of the 133 participants, median age at time of colonoscopy was 46, 53% were male, 89% White and 13% Latino/Hispanic. Most had an income > $45,000 (81%) and college/post-college education (68%). Most polyps were < 20 mm (67%), adenomatous (97%), without high-grade dysplasia (79%) and located in the left colon (52%) or rectum (24%). Only 47% (N=62) of participants were aware that FDRs are at increased risk of CRC based on their polyp, and 47% (N=63) were aware that FDRs are eligible for earlier colonoscopy screening. Women and non-Hispanic individuals had significantly better knowledge of family risk and screening recommendations (Table). Those with high-grade dysplasia were less likely to have accurate knowledge of familial risk. There was no significant difference in knowledge of risk or screening recommendations based on education, income, polyp size, location or presence of synchronous/metachronous advanced polyps.
Conclusion: Less than half of participants with ACPs are aware that their family members are at increased risk of CRC and should get earlier colonoscopy screening. There is a critical need for colonoscopists to communicate familial risk and recommendations to those with advanced polyps . Future studies to understand why males and those of Hispanic or Latino ethnicity have sub-optimal knowledge can inform targeted educational campaigns.

Table 1. **Characteristics of participants who are aware that their advanced polyp confers increased risk of CRC to their first-degree family members and first-degree family members should undergo colonoscopy earlier than the general population**

Total Cohort (N=133)	Risk higher N=62 (%)	P value	Should get colonoscopy earlier N=63 (%)	P value
Age				
20-29 (N=10)	3 (30.0)	0.057	5 (50.0)	0.702
30-39 (N=29)	18 (62.1)		18 (62.1)	
40-49 (N=49)	17 (34.7)		24 (49.0)	
50-59 (N=43)	23 (53.5)		16 (37.2)	
No response (N=2)	1 (50.0)		0 (0.0)	
Sex				
Male (N=71)	26 (36.6)	**0.013**	28 (39.4)	0.49
Female (N=62)	36 (58.1)		35 (56.5)	
Race				
White/Caucasian (N=118)	57 (48.3)	0.050	53 (44.9)	0.322
Black/African American (N=9)	3 (33.3)		6 (66.7)	
Other/No response (N=10)	1 (10.0)		6 (60.0)	
Ethnicity				
Hispanic/Latino Origin (N=17)	2 (11.8)	**0.002**	4 (23.5)	**0.032**
Not Hispanic/Latino Origin (N=115)	59 (51.3)		59 (51.3)	
Prefer not to answer (N=1)	1 (100.0)		0 (0.0)	
Household Income				
>70,000 (N=82)	45 (54.9)	0.064	45 (54.9)	0.056
45-69,999 (N=26)	12 (46.2)		14 (53.8)	
30-44,999 (N=13)	2 (15.4)		2 (15.4)	
15-29,999 (N=5)	2 (40.0)		1 (20.0)	
< 14,999 (N=3)	1 (33.3)		1 (33.3)	
Prefer not to answer (N=4)	0 (0.0)		0 (0.0)	
Highest Level of Education				
Post-college (N=8)	3 (37.5)	0.345	2 (25.0)	0.508
College graduate (N=83)	44 (53.0)		43 (51.8)	
Some college/technical school (N=29)	10 (34.5)		13 (44.8)	
High school/GED (N=11)	5 (45.5)		5 (45.5)	
Less than high school (N=2)	0 (0.0)		0 (0.0)	
Born in the United States				
Yes (N=120)	54 (45.0)	0.256	56 (46.7)	0.622
No (N=13)	8 (61.5)		7 (53.8)	
U.S. Birthplace Region				
Northeast (N=15)	6 (40.0)	0.433	8 (53.3)	0.050
Midwest (N=32)	18 (56.3)		21 (65.6)	
South (N=21)	10 (47.6)		7 (33.3)	
West (N=52)	20 (38.5)		20 (38.5)	

Table 1. (*continued*)

Total Cohort (N=133)	Risk higher N=62 (%)	P value	Should get colonoscopy earlier N=63 (%)	P value
Polyp Size				
< 10 mm (N=13)	9 (69.2)	0.387	7 (53.8)	0.892
10-20 mm (N=76)	34 (44.7)		37 (48.7)	
>20 mm (N=42)	18 (42.9)		18 (42.9)	
Unknown (N=2)	1 (50.0)		1 (50.0)	
High Grade Dysplasia Present				
Yes (N=28)	8 (28.6)	**0.031**	10 (35.7)	0.165
No (N=105)	54 (51.4)		53 (50.5)	
Polyp location				
Rectum (N=32)	14 (43.8)	0.193	15 (46.9)	0.999
Left Colon (N=69)	34 (49.3)		33 (47.8)	
Right Colon (N=28)	19 (67.9)		13 (46.4)	
Unknown (N=4)	3 (75.0)		2 (50.0)	
Synchronous Advanced Polyps				
Yes (N=33)	19 (57.6)	0.244	19 (57.6)	0.173
No (N=87)	36 (41.4)		38 (43.7)	
Unknown (N=13)	7 (53.8)		6 (46.2)	
Metachronous Advanced Polyps				
Yes (N=21)	8 (38.1)	0.139	6 (28.6)	0.103
No (N=87)	38 (43.7)		42 (48.3)	
Unknown (N=25)	16 (64.0)		15 (60.0)	

S260

AI Assisted Colonoscopy Does Not Affect Mental Workload in Gastroenterologists

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Introduction: Colonoscopy is operator-dependent and missed lesions contribute to interval colorectal cancer (CRC). Previous research shows at least 8.6% of CRC cases occur within the three years following a negative screening colonoscopy. With recent developments in the field of artificial intelligence (AI) with deep learning techniques, especially convolutional neural networks (CNN), AI assisted colonoscopy was invented with real time automated polyp detection. Many studies have shown improved polyp detection rate with AI assisted colonoscopy. As this is a novel technique used by endoscopists, the aim of our study was to assess the impact of AI assisted colonoscopy on the mental workload of endoscopists.
Methods: We conducted single center randomized controlled trial with gastroenterologists and fellows from Feb 2022-April 2022 with Medtronic GI genius system. Blocked randomization was performed depending on the number of procedures in a day. Gastroenterologists were randomized to perform procedure with AI assisted colonoscopy (AIC) or conventional colonoscopy (CC). The NASA task load index (TLX) score measures and conducts subjective mental workload (MWL) assessment while a subject is performing a certain task. This was completed by the endoscopist after each procedure. Primary outcome was MWL measured with NASA TLX, and secondary outcomes were total procedure time, withdrawal time, cecal intubation rate and polyp detection rate.
Results: A total of 290 procedures were included in our study with 146 in AIC and 144 in CC group. AIC group had 58.22% females with mean age 56.66 (54.32-59.00) and mean BMI 27.94 (26.88- 28.99). This was comparable to patients in CC group. Location of procedure (at hospital versus ambulatory endoscopy center), session time (AM versus PM), fellow participation, patients with history of diabetes, opioid use, tricyclic antidepressants, history of abdominal surgeries, history of constipation, bowel prep quality, type of sedation were similar between the two groups. Mean NASA TLX scores were 37.69 (33.99-41.38) in AIC and 35.56 (31.92-39.21) in CC groups, P=0.49. There is a trend towards increased withdrawal time in AIC compared to CC (mean 18.05 minutes vs 16.96 minutes; P=0.29). A trend towards increased polyp detection was noted in the AIC group (76.03% vs 66.67%; P=0.07). (Table)
Conclusion: Endoscopist mental workload during AI-assisted colonoscopy was comparable to conventional colonoscopy with a trend towards increased withdrawal time and polyp detection rate with AI.

TABLE 1			
	Conventional Colonoscopy(N=144)	AI assisted colonoscopy (N=146)	P value
Age (mean,95%CI)	55.96 (53.75-58.17)	56.66 (54.32-59.00)	0.66
Gender(n, %)			
1. Male	69 (47.92%)	61 (41.78%)	
2. Female	75 (52.08%)	85 (58.22%)	0.345
BMI (mean,95%CI)	28.66(27.73-29.59)	27.94(26.88-28.99)	0.31
Fellow participation			
1. Yes	12 (8.33%)	18 (12.33%)	
2. No	132 (91.67%)	128 (87.67%)	0.336
Location of procedure			
1. Ambulatory	71 (49.31%)	80 (54.79%)	
2. Hospital	73 (50.69%)	66 (45.21%)	0.411
Session time			
1. AM	101 (70.14%)	87 (59.59%)	
2. PM	43 (29.86%)	59 (40.41%)	0.066
Diabetes	21 (14.58%)	25 (17.12%)	0.63
Opioid Use	12 (8.33%)	7 (4.79%)	0.245
Tricyclic antidepressant use	32(22.22%)	23 (15.75%)	0.179
Indication for Colonoscopy			
1. Screening/surveillance	109(75.69%)	99 (67.81%)	
2. Lower GI Bleeding	12 (8.33%)	8 (5.48%)	
3. IBD	17 (11.81%)	17 (11.64%)	
4. Anemia	0	8 (5.48%)	
5. Diarrhea	3 (2.08%)	10 (6.85%)	
6. Weight Loss	0	0	
7. Abdominal pain	1 (0.69%)	2 (1.37%)	
8. Diverticulitis F/U	2 (1.39%)	2 (1.37%)	0.019
Endoscopy and colonoscopy in single session	26(18.06%)	30(20.55%)	0.656
History of abdominal surgery	56 (38.89%)	53 (36.30%)	0.716
History of constipation	9 (6.25%)	11 (7.53%)	0.817
Bowel Prep quality			
1. Poor	6 (4.17%)	4 (2.74%)	
2. Fair	8 (5.56%)	8 (5.48%)	
3. Good	78 (54.17%)	77 (52.74%)	
4. Excellent	52 (36.11)	57 (39.04%)	0.910
Bowel Prep Used			
1. MiraLAX	123 (85.42%)	123 (84.25%)	
2. MiraLAX + Colace	19 (13.19%)	16 (10.96%)	
3. MiraLAX + Mag Citrate	1 (0.69%)	4 (2.74%)	
4. Golytely	0	3 (2.05%)	0.199
5. Golytely + Mag Citrate	1 (0.69%)	0	
Schedule of Attending			
1. Full day	131 (90.97%)	132 (91.03%)	
2. Half day	13 (9.03%)	13 (8.97%)	1.00
Anesthesia type			
1. Conscious sedation	83 (57.64%)	76 (52.05%)	
2. MAC	61 (42.36%)	70 (47.95%)	0.348
Sessions with polyp removed			
1. Yes	96 (66.67%)	111 (76.03%)	
2. No	48 (33.33%)	35 (23.97%)	0.091

TABLE 2			
	Conventional Colonoscopy (N=144)	AI Assisted Colonoscopy (N=146)	
Primary outcomes			
1. Mean NASATLX score	35.56 (31.92-39.21)	37.69 (33.99-41.38)	0.419
Secondary outcome			
1. Total procedure time	25.99(23.81-28.17)	27.52 (25.72-29.33)	0.28
2. Cecal withdrawal time overall	16.96(15.37-18.55)	18.08 (16.69-19.47)	0.29
3. Cecal withdrawal time when polyp not removed	13.06 (11.64-14.48)	12.70 (10.87-14.53)	0.74
4. Cecal insertion time	9.16 (7.98-10.34)	9.64(8.56-10.71)	0.55
5. Cecal intubation rate	141 (98.60%)	143 (97.95%)	0.669
6. Polyp detection rate	96 (66.67%)	111 (76.03%)	0.07

[0260]

S261

Effect of a Patient Navigator on Colonoscopy Completion in FIT Positive Patients Refractory to Initial Scheduling Attempts

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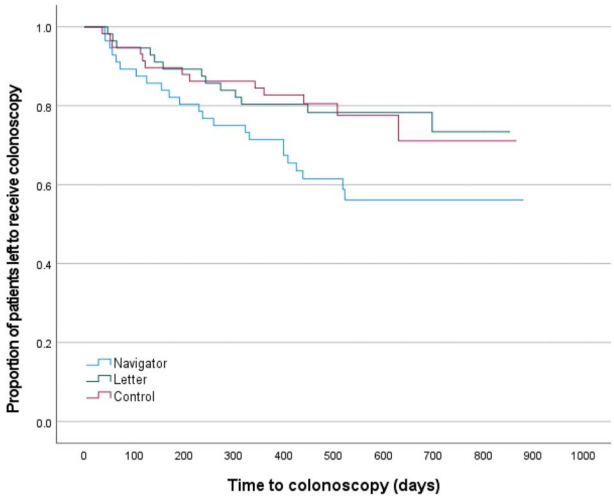
Introduction: Decreased time from positive fecal immunochemical test (FIT) to colonoscopy is associated with decreased morbidity and mortality from colorectal cancer. However, colonoscopy is often delayed or forgone for a variety of reasons. Prior studies have shown that patient navigation for FIT+ patients increases the likelihood of colonoscopy completion. The purpose of this study was to evaluate the impact of a patient navigator on improvement in colonoscopy completion in Veterans who had not completed timely colonoscopy after FIT+.
Methods: Patients in the Veterans Affairs Puget Sound Health Care System with FIT+ between 1/1/2020 and 6/30/2021 who had not yet completed colonoscopy were randomized in 11/2021 to: 1) navigation with a mailed letter and phone call from a trained, non-clinical staff member, 2) mailed letter only, or 3) control. The patient navigator provided basic education to the patient, elicited barriers to care, and facilitated seamless interaction with the primary care team. Demographic variables were recorded from the medical record. The Care Assessment Need (CAN) score was used to assess comorbid status. Outcomes were assessed as of 6/1/2022. Binary logistic regression and Kaplan Meier analyses were performed using SPSS.
Results: 170 FIT+ patients were identified and 56, 56, and 58 patients were assigned to the Navigator, Mailed Letter, and Control groups, respectively. Patient demographics were similar between cohorts (Table). Colonoscopy completion was significantly increased in the Navigator group ($p < 0.05$), while the letter alone had no significant impact (Table). Navigation was also associated with improved documentation of reasons for no colonoscopy ($p < 0.05$). Adjusting for measured covariates, compared to the Navigator group, the odds of colonoscopy completion was significantly lower for the Mailed Letter group (OR 0.31 (CI 0.14-0.67)) and the Control group (OR 0.37 (CI 0.17-0.78)). Kaplan Meier analysis (Figure) revealed statistically significant differences in time to colonoscopy between the three groups.
Conclusion: Patient navigation with a trained non-clinical staff member significantly improves colonoscopy completion following FIT+ in patients who are refractory to initial attempts at timely colonoscopy. Mailing a letter alone had no significant benefit. Further efforts are needed to ensure timely and complete diagnostic evaluation of patients with FIT+ screening. This study was sponsored by a grant from the American Cancer Society.



[0261] **Figure 1.** Kaplan Meier for Colonoscopy Completion Following FIT+ ($p = 0.05$)

Table 1. Demographic Information and Descriptive Results

	Overall (n = 170)	Navigator (n = 56)	Mailed Letter Only (n = 56)	Control (n = 58)
Mean Age (years)	67.3	65.8	68.6	67.5
Sex (% men)	90.1	89.3	91.1	91.4
Race (% white)	80.1	76.8	85.7	79.3
Hispanic Status (% Hispanic)	0.01	0.0	0.02	0.0
Mean CAN Score	60.0	62.2	57.7	60.0
Referral to GI Placed (%)	82.9	87.5	85.7	75.9
Colonoscopy Completed (%)	28.8	41.1	23.2	22.4
Colonoscopy Completed or Appropriate Reason for no Colonoscopy (%)	47.1	66.1	33.9	39.7
Median Days from FIT+ to Colonoscopy	211	230	235	196

S262

Impact of Younger Age Inclusion on Adenoma Detection Rate in an African American Predominant Screening Population

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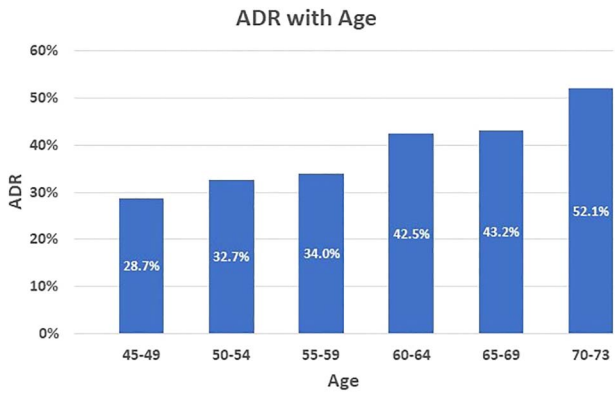
Introduction: Recent guidelines have lowered the age for initiation of colorectal cancer (CRC) screening to 45. The current benchmark for adenoma detection rate (ADR) for screening colonoscopy in men and women 50 years and older are 30% and 20%, respectively. It is unclear if the adenoma detection rate (ADR) will need to be lowered to accommodate for a younger patient population with a presumably lower adenoma burden. Our study's objective was to evaluate the ADR in a largely African American population comparing 45–49-year-old men and women to those 50 and older
Methods: We performed a retrospective review of our endoscopy database for all patients ages 45-73 who underwent average-risk screening colonoscopy at our institution. All average-risk screening colonoscopies for patients 50 years and older in the year 2017 and colonoscopies for patients younger than 50 from 2017 to 2021. We analyzed patients' race, age, pathologic findings, and bowel preparation. Colonoscopies were excluded if the cecum was not reached, or the bowel preparation was inadequate. Statistical analysis was performed utilizing Chi-square testing with significance set at a $P < 0.05$

Results: A total of 1267 average-risk colonoscopies were performed for patients between 45-73 years. After applying our exclusion criteria, 1152 colonoscopies were analyzed, Table. The overall ADR was 35.4%, with a statistically significant difference between patients ≥50 years and < 50 years (38.4% vs 28.7%, p=0.002). ADR correlated with age, Figure. ADR for males was higher than females (41.4% vs 30.4%, p< 0.001). There was no statistically significant difference in ADR between African Americans and non-African Americans (35.2% vs 35.6%, p=0.822)
Conclusion: In our predominantly African American patient population undergoing average-risk screening colonoscopy, we found an increase in ADR with age. Despite the inclusion of patients 45-49 years of age with a lower adenoma burden, ADR thresholds recommended by the GI societies were still attainable in this patient population. Endoscopists with a large young patient panel should expect a lower ADR but should not expect a drop in the ADR below the 25% benchmark



[0262] **Figure 1.** Adenoma Detection Rate Correlation with Age

Table 1. Patient characteristics in patients with or without adenomas. (N=1152)

Patient characteristic (N, %)	Adenoma: N (%)	No Adenoma: N (%)	P-value
Gender			< 0.001
Female (626, 54.3)	190 (30.4)	436 (69.6)	
Male (526, 45.7)	218 (41.4)	308 (58.6)	
Race			0.822
African American (952, 82.6%)	335 (35.2)	617 (64.8)	
Non-African American (160, 13.9)	57 (35.6)	103 (64.4)	
Unknown (40, 3.5)	16 (40.0)	24 (60.0)	
Age, Years			0.002
< 50 (349, 30.3)	100 (28.7)	249 (71.3)	
≥50 (803, 69.7)	308 (38.4)	495 (61.6)	

S263

Disparities in Survival and Stage at Diagnosis in Ethnic and Racial Minorities Diagnosed With Early Onset Colorectal Cancer

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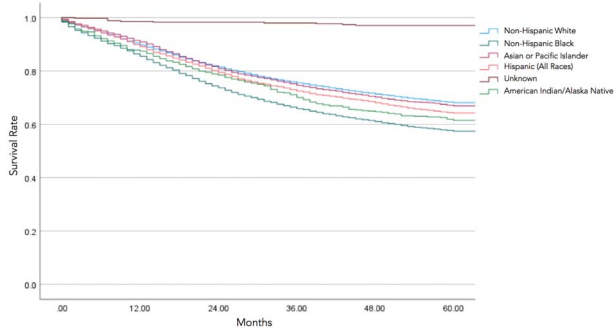
Introduction: Although the overall incidence of early onset Colorectal Cancer (eoCRC) is increasing, the incidence remains higher among Black and Hispanic patients than non-Hispanic whites. The aim of this study was to examine racial and ethnic disparities in the stage at diagnosis and survival of patients with eoCRC.
Methods: We conducted a retrospective cohort study using the National Cancer Institute's Surveillance, Epidemiology, and End Results 18 Registries (SEER 18) Program Research Plus database. We included all patients aged <50 years diagnosed with eoCRC from 2000-2017. Selected variables of interest included race/ethnicity, stage at diagnosis, and survival time. Survival analysis was limited to patients diagnosed between 2000-2012 to include minimum 5-year survival data. The study was certified exempt by the University of Washington IRB.
Results: 71,651 patients were identified of whom 58.5% were non-Hispanic White (NHW) patients and 41.5% were racial/ethnic minorities. 24,229 patients had localized (stage I-IIc), 26,947 patients had regional (stage IIIa-c), and 17,805 patients had distant (stage IVa/b) eoCRC at diagnosis. Patients from racial/ethnic minorities were significantly more likely to be diagnosed with distant eoCRC compared to NHW patients (Table) (p< 0.01). These differences were greatest for non-Hispanic Black (NHB) patients. Overall as well as stage-specific 1-year and 5-year survival was significantly shorter in racial/ethnic minorities (Figure) (p< 0.01). These differences were again greatest in NHB patients.
Conclusion: Significant differences in stage at diagnosis were seen between NHW and racial/ethnic minorities with eoCRC. Significant racial/ethnic differences were also seen in overall median survival and median survival at all stages of diagnosis. For both stage and survival, the greatest differences were seen in NHB patients followed by American Indian/Alaska Native patients. Further study is needed to understand the reason for these disparities.



[0263] **Figure 1.** Kaplan Meier curve depicting overall 5-year survival of patients with eoCRC stratified by race/ethnicity

Table 1. Stage at diagnosis, 1-year and 5 year survival rate of patients diagnosed with eoCRC stratified by race/ethnicity

Stage	Race/Ethnicity	Portion of Racial/Ethnic Cohort	1-year Survival Rate	5-year Survival Rate
		Overall		
(n = 48,987)	All Races/Ethnicities	100%	89.3%	66.6%
	Non-Hispanic White	100%	89.8%	68.4%
	Non-Hispanic Black	100%	85.6%	57.8%
	Hispanic (all races)	100%	89.3%	66.0%
	Asian of Pacific Islander	100%	91.0%	67.8%
	American Indian/Alaska Native	100%	87.4%	61.5%
	Unknown	100%	98.7%	97.4%
		Localized		
(n = 16,510)	All Races/Ethnicities	33.7%	98.2%	91.6%
	Non-Hispanic White	34.3%	98.4%	92.3%
	Non-Hispanic Black	32.5%	97.1%	87.8%
	Hispanic (all races)	31.9%	97.9%	90.6%
	Asian of Pacific Islander	32.4%	99.2%	93.5%
	American Indian/Alaska Native	31.5%	95.3%	85.8%
	Unknown	13.7%	99.6%	99.6%
		Regional		
(n = 18,706)	All Races/Ethnicities	38.2%	95.5%	74.9%
	Non-Hispanic White	38.8%	95.6%	76.7%
	Non-Hispanic Black	35.0%	93.8%	66.3%
	Hispanic (all races)	38.7%	95.7%	74.2%
	Asian or Pacific Islander	40.5%	96.4%	75.7%
	American Indian/Alaska Native	36.3%	94.0%	74.1%
	Unknown	13.7%	100%	96.2%
		Distant		
(n = 12,011)	All Races/Ethnicities	24.5%	67.6%	19.3%
	Non-Hispanic White	23.7%	68.1%	20.2%
	Non-Hispanic Black	28.2%	62.2%	12.2%
	Hispanic (all races)	25.5%	69.3%	23.1%
	Asian or Pacific Islander	23.8%	71.2%	19.8%
	American Indian/Alaska Native	26.9%	68.3%	15.1%
	Unknown	3.7%	85.5%	64.3%
		Unstaged		
(n = 1,760)	All Races/Ethnicities	3.6%	87.2%	67.0%
	Non-Hispanic White	3.2%	87.2%	67.9%
	Non-Hispanic Black	4.3%	84.7%	60.9%
	Hispanic (all races)	3.9%	87.4%	63.3%
	Asian or Pacific Islander	12.4%	86.3%	65.1%
	American Indian/Alaska Native	5.1%	97.5%	66.7%
	Unknown	20.3%	97.4%	97.4%

S264

A Prospective Study Evaluating Cologuard® Ordering in the Community Setting

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Introduction: Colonoscopy remains the gold standard screening test for colorectal cancer[1]. Cologuard® (CG), a non-invasive mtsDNA-FIT test, is indicated for use in asymptomatic patients without risk factors[2]. Our previous studies suggested inappropriate use of CG® in the community setting. This prospective follow-up study was conducted to evaluate the true rate of adherence to approved criteria for CG® testing.

Methods: This prospective study enrolled all referred patients with a positive CG® test from 5/2021 to 5/2022. All records were reviewed. Patients were asked if they had seen blood in their stool, were hemoccult positive, had a personal history of polyps or a family history of colon cancer. Data was collected from patients at the time of procedure. Colonoscopy results and patient demographics were analyzed. Follow-up discussions with referring primary care physicians (PCPs) were conducted after data collection.

Results: 123 patients (58M:65F) with a positive CG® test were enrolled. Mean age was 63.5y (97.6% patients >50y). 17% (21/123) were diabetic. 83.7% identified as White, 11.4% as Black, 1.6% as Hispanic, 0.8% as Asian and 2.4% with >2 races. Prior to CG® prescription, 23.6% (29/123) of patients reported visible bleeding. 15.4% (19/123) reported a positive hemoccult test. 26.0% (32/123) reported either visible bleeding or a positive hemoccult test or both. 18.7% (23/123) of patients reported a personal history of polyps and 13.0% (16/123) of patients indicated a family history of colon cancer. In total, 46.3% (57/123) of patients presented with at least one contraindication (bleeding or history) for CG® prescription. Of these patients, 44/123 (35.8%) had a negative colonoscopy or a non-adenomatous polyp. 36/123 (29.3%) had a non-advanced adenoma while 39/123 (31.7%) had an advanced adenoma. 4/123 (3.25%) had an invasive adenocarcinoma.

Conclusion: This prospective study reveals, in our large community practice, 46.3% of CG®-positive patients were tested incorrectly. Widespread erroneous testing leads to increased cost to the system and patient. Even though colonoscopy is readily accessible in our community, conversations with referring PCPs reveal that PCPs often order CG® when patients are resistant to bowel prepping for colonoscopy despite being aware of contraindications.

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1. Am J Gastroenterol. 2021 Mar 1;116(3):458-479.
2. N Engl J Med. 2014 Apr 3; 370(14):1287-97.

S265

Utilization of Patient-Centered Digital Tools to Improve Adherence Rates for Outpatient Screening Colonoscopies in a Metropolitan Hospital

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Introduction: Colorectal cancer (CRC) is the second leading cause of cancer-related deaths in the United States. Screening through stool testing or colonoscopy is the standard of care for all ages 50 to 75 years, but national rates of procedures remain sub-optimal. Digital applications i.e., frequent automated text-based reminders and assess through personal healthcare apps on smartphones, can be effective tools to overcome barriers to screening colonoscopy adherence thus improving the outcomes.
Methods: We performed a retrospective study on a prospectively maintained database on CRC screening adherence rates from July 2019 to March 2022 in outpatient settings of a metropolitan hospital. Only screening colonoscopies (SC) scheduled during the study time period were included. Demographics and health-care resources utilization were reviewed. Primary comparison was between SC performance rates, prior to and after implementation of: a digital navigation program (DNP) developed by a private company that consisted of generating automated messages containing bowel-prep instructions, appointment reminders, driving instructions, short informative procedure videos; and EPIC EMR generated personal health app called MyChart. All participants were offered access to DNP through a digital platform and MyChart app set up on their smartphones.
Results: Total of 3584 SC were scheduled during the study period. Overall age was 60±9.6 years and majority were males at 55%; Hispanics were 49% with Not Hispanics at 24%. Pre-intervention period (n=1057), 48% of SC performed and 52% cancelled; and in post-intervention period (n=2527), 85% SC performed with 15% cancelled ($p < .001$) with a percent change of 74% increase in procedures. In post-intervention group, DNP enrolled 930 patients of which 87% presented for procedure. Patients who did not present, received additional reminders. Bowel prep between groups showed no significant difference in quality (Table).
Conclusion: Our study highlights a significant increase in performance rates of scheduled screening colonoscopies with a 74% increase after implementation of a DNP and MyChart app utilization. Usefulness of digital applications in improving screening colonoscopy adherence and reducing no show rates, has been well studied in literature with promising results, but implementation on a larger scale is lacking. Especially after COVID-19 pandemic, use of technology to increase adherence to CRC screening and surveillance seems more warranted.

Table 1. Baseline characteristics of study population and comparison of scheduled screening colonoscopy performance rates among pre and post-intervention groups

	Pre-Intervention	Post-Intervention	P-value
N= 3584	1057	2527	
Baseline Characteristics			
Age	60.6+7.7	58.9+9.0	NS
Gender			NS
Male	460 (43.5%)	1068 (42.3%)	
Female	594 (56.2%)	1430 (56.6%)	
Scheduled Screening Colonoscopies (N=3584)			< 0.001
Performed	507(48%)	2146 (85%)	
Not Performed/Cancelled	550 (52%)	381(15%)	

S266

Lifetime Impact of the Change in Modality as a Result of Eliminating Cost-Sharing for Follow-Up Colonoscopy After a Positive Stool Test for Colorectal Cancer Screening

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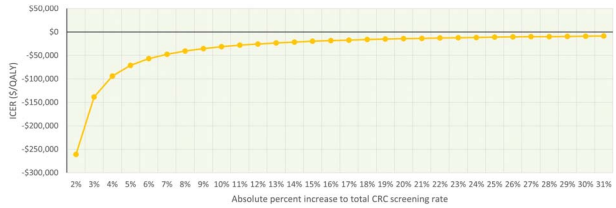
[1]University of Michigan, Ann Arbor, MI; [2]Exact Sciences Corporation, Madison, WI; [3]Mayo Clinic, Rochester, MN.

Introduction: Most commercial insurance plans in the US will be required to cover a follow-up colonoscopy after a positive stool test with no patient cost-sharing as of January 1, 2023. In Oregon, a policy that eliminated patient cost-sharing significantly increased the overall uptake of CRC screening and shifted screening modalities from colonoscopy to non-invasive methods. We estimated the clinical and economic effects of these outcomes that may stem from the policy on a cohort of US average-risk individuals newly eligible for CRC screening.
Methods: CRC-AIM, a validated microsimulation model for CRC, was used to simulate 2 million individuals undergoing CRC screening (colonoscopy every 10 years, annual fecal immunochemical test [FIT], triennial multi-target stool DNA [mt-sDNA]) from ages 45-75. Individuals who completed initial CRC screening were assumed to also complete follow-up colonoscopies. Outcomes were aggregated according to the current proportional distribution of different modalities. The baseline scenario represented the utilization of CRC screening prior to implementation of state-level policy (46% colonoscopy, 23% stool test, and 31% unscreened; derived from published literature). Scenarios 1-5 assumed 10% shift from colonoscopy to stool-test utilization with 1, 2, 5, 10, and 15% absolute increase in overall screening rate, respectively.
Results: When 10% shift from screening colonoscopy to stool-test utilization was modeled, an increase in overall screening as low as 1%, compared to the baseline led to lower total costs, and cost per patient screened and higher quality adjusted life years (QALYs) (Table). LYG increased by at least 5% while ≥1,200 cases and ≥900 deaths were averted per 1 million individuals with a modest (5%) uptake in total screening. Total colonoscopies were 1.7% lower than the baseline at 15% increase to total screening. All scenarios that included the alternate screening modality distributions were less costly and more effective compared to the baseline, regardless of percent changes to total screening uptake (Figure).
Conclusion: Based on this modeling analysis, policies that remove cost barriers to completing CRC screening can lead to shifts in test utilization patterns, increase overall participation rates, and improve both economic and clinical outcomes.



[0266] **Figure 1.** Incremental cost-effectiveness ratio by absolute percent increase in total CRC screening rate. Screening rates were assumed to increase as a consequence of waiving patient cost-sharing leading to a shift from screening colonoscopy to non-invasive methods. Negative ICER indicates that the scenario is less costly and more effective than the baseline. (CRC: colorectal cancer; ICER: incremental cost-effectiveness ratio; QALY: quality-adjusted life year)

Table 1. Estimated Outcomes in Baseline Scenario and Scenarios 1-5 Assuming 10% Absolute Reduction in Colonoscopy Utilization and Increased Overall Screening Rate. LYG, CRC cases, CRC deaths, total colonoscopies, and stool tests were calculated per 1000 individuals. Total costs and total QALYS were calculated per person

Scenario	% COLs	% Stool Tests	% Screened	LYG	CRC Cases	CRC Deaths	Total COLs	Stool Tests	Total Costs	Total QALYs	ICER
Baseline	46	23	69	246.4	36.9	15.6	2298.0	3442.1	$6,901	16.8482	NA
(1) 10% shift from COL to stool-test and 1% increase in screening	36	34	70	245.2	37.8	15.8	2051.6	5080.8	$6,628	16.8483	Less costly and more effective
(2) 10% shift from COL to stool-test and 2% increase in screening	36	35	71	248.5	37.3	15.5	2066.4	5229.8	$6,629	16.8492	Less costly and more effective
(3) 10% shift from COL to stool-test and 5% increase in screening	36	38	74	258.3	35.7	14.7	2110.8	5676.7	$6,632	16.8520	Less costly and more effective
(4) 10% shift from COL to stool-test and 10% increase in screening	36	43	79	274.7	33.0	13.3	2184.8	6421.6	$6,638	16.8565	Less costly and more effective
(5) 10% shift from COL to stool-test and 15% increase in screening	36	48	84	291.1	30.3	12.0	2258.8	7166.5	$6,644	16.8611	Less costly and more effective

COL: colonoscopy; CRC: colorectal cancer; ICER: incremental cost-effectiveness ratio; LYG: life-years gained; NA: not applicable; QALY: quality-adjusted life year.

S267

Analysis of Colorectal Cancer Survival in Middle Eastern Patients Using the California Cancer Registry

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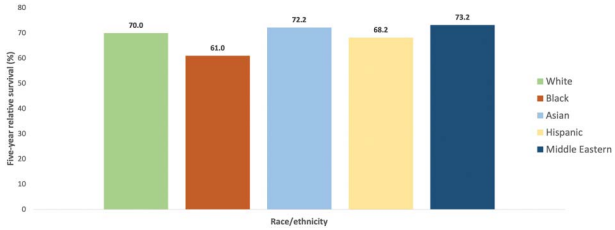
Introduction: Colorectal cancer (CRC) is a leading cause of morbidity and mortality in the U.S. Literature on cancer outcomes in Middle Eastern and North African (MENA) individuals is limited, largely in part because the U.S. Census has not yet recognized this group as a distinct ethnicity from White individuals. To address this gap, we estimated five-year colorectal cancer-specific survival by race and ethnicity, including patients of MENA ethnicity, in a diverse, population-based sample.
Methods: We identified patients diagnosed with CRC (ages 18-79 years) from 2004 – 2017 using the California Cancer Registry (CCR), including patients who were White, Black, Asian, Hispanic, and MENA. Specifically, MENA patients were identified using a validated list of Middle Eastern surnames linked to the CCR. For each racial/ethnic group, we calculated five-year colorectal cancer-specific survival using Kaplan-Meier estimates and performed Cox proportional hazards regression models to examine the association of race/ethnicity and survival, adjusting for age at diagnosis, sex, insurance, SES, marital status, tumor site, stage at diagnosis, and tumor grade/differentiation.
Results: We identified 110,192 patients with CRC, of whom 58,375 (53.0%) were White, 8,383 (7.6%) Black, 15,448 (14.0%) Asian, 23,539 (21.4%) Hispanic, and 2,656 (2.4%) MENA. Survival was lowest in Black (61.0% ± 0.6%) and highest in MENA (73.2% ± 1.0%) patients (Figure). Asian (72.2% ± 0.4%) patients had higher survival compared to White (70.0% ± 0.2%) and Hispanic (68.2% ± 0.4%) patients. In adjusted analysis, MENA (aHR 0.83, 95% CI 0.77, 0.91), Asian (aHR 0.88, 95% CI 0.85, 0.91), and Hispanic (aHR 0.94, 95% CI 0.91, 0.97) race/ethnicity were associated with higher survival compared to White race/ethnicity, and Black (aHR 1.16, 95% CI 1.11, 1.21) race/ethnicity was associated with lower survival compared to White race/ethnicity (Table).
Conclusion: To our knowledge, this study is the first of its kind to report CRC survival in MENA patients in the U.S. We observed higher rates of survival in MENA patients compared to other racial/ethnic groups, even after adjusting for clinical and sociodemographic factors. While higher adherence to the Mediterranean diet, the "healthy immigrant effect", and increased social support in MENA patients may, in part, explain survival differences, future studies are needed to establish protective factors and ascertain diagnostic and treatment differences in this unique population.



[0267] **Figure 1.** Five-year colorectal cancer-specific survival (age 18-79 years) using Kaplan-Meier estimates, by race/ethnicity, California Cancer Registry, 2004 – 2017

Table 1. Adjusted hazard ratios demonstrating association of race/ethnicity and survival (overall and colorectal-specific), California Cancer Registry, 2004 – 2017

	Overall Survival				Colorectal Cancer-specific Survival			
	Adjusted HR and 95% CI			p-value	Adjusted HR and 95% CI			p-value
Age at diagnosis	1.03	1.03	1.03	< .0001	1.02	1.02	1.02	< .0001
Year of diagnosis	1.02	1.01	1.02	< .0001	1.00	0.99	1.00	0.022
Female	0.84	0.82	0.86	< .0001	0.90	0.88	0.92	< .0001
Race/ethnicity								
Middle Eastern/North African	0.80	0.75	0.86	< .0001	0.83	0.77	0.91	< .0001
Non-Hispanic White	Ref				Ref			
Non-Hispanic Black	1.13	1.09	1.17	< .0001	1.16	1.11	1.21	< .0001
Hispanic	0.92	0.90	0.95	< .0001	0.94	0.91	0.97	0.0004
Non-Hispanic Asian or Pacific Islander	0.84	0.81	0.86	< .0001	0.88	0.85	0.91	< .0001
Insurance								
Managed care	Ref				Ref			
Medicare	1.12	1.09	1.14	< .0001	1.05	1.02	1.08	0.0026
Medicaid	1.34	1.30	1.39	< .0001	1.29	1.24	1.34	< .0001
Other	0.91	0.88	0.94	< .0001	0.93	0.89	0.97	0.0005
Not insured or unknown	1.24	1.18	1.30	< .0001	1.30	1.23	1.38	< .0001

Table 1. (*continued*)

	Overall Survival				Colorectal Cancer-specific Survival			
	Adjusted HR and 95% CI			p-value	Adjusted HR and 95% CI			p-value
Socioeconomic Status (SES)								
Lowest SES	1.40	1.36	1.45	< .0001	1.33	1.27	1.38	< .0001
Lower-middle SES	1.33	1.29	1.37	< .0001	1.28	1.23	1.33	< .0001
Middle SES	1.22	1.18	1.26	< .0001	1.20	1.16	1.25	< .0001
Higher-middle SES	1.14	1.11	1.18	< .0001	1.10	1.06	1.14	< .0001
Highest SES		Ref				Ref		
Marital status								
Single or other	Ref	Ref						
Married	0.77	0.76	0.79	< .0001	0.81	0.79	0.83	< .0001
Tumor site								
Colon		Ref				Ref		
Rectum	1.05	1.03	1.08	< .0001	1.09	1.06	1.12	< .0001
Tumor stage								
I		Ref				Ref		
II	1.58	1.53	1.64	< .0001	2.70	2.53	2.87	< .0001
III	2.33	2.25	2.41	< .0001	5.41	5.10	5.74	< .0001
IV	11.87	11.48	12.27	< .0001	31.80	30.02	33.68	< .0001
Tumor grade or differentiation								
Grade I or well differentiated		Ref				Ref		
Grade II or moderately differentiated	1.17	1.12	1.22	< .0001	1.32	1.24	1.39	< .0001
Grade III or poorly differentiated	1.68	1.61	1.76	< .0001	2.06	1.94	2.18	< .0001
Grade IV or undifferentiated/anaplastic	1.84	1.70	1.99	< .0001	2.22	2.02	2.45	< .0001
Grade/differentiation unknown	1.94	1.86	2.04	< .0001	2.20	2.07	2.34	< .0001

S268

Rectal Retroflexion for Screening Colonoscopy: A Systematic Review and Meta-Analysis

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Introduction: The primary goal of screening colonoscopy is to detect and resect premalignant colon lesions. However, the miss rate of these lesions remains significant in quality adjusted colonoscopies. A previous meta-analysis showed that right-sided retroflexion significantly increases the detection of adenomas in the right colon. However, evidence regarding the value of rectal retroflexion remains unclear. In this meta-analysis, we attempt to determine the effect of rectal retroflexion on the polyp detection rate compared to straight view examination and to determine the overall success rate of this maneuver.
Methods: A systematic review of all the major databases was performed (MEDLINE, Embase, CINHAL, Google Scholar). Abstracts of all major gastrointestinal scientific meetings were also searched. Two reviewers extracted the data from selected studies. Data on patient demographics, study design, country of publication, polyp histology, detection rate of polyps with retroflexion were extracted. Pooled proportions were calculated using the arcsine square root transformed portion. Pooled estimates were obtained using a random effects model. Heterogeneity and publication bias were assessed.
Results: Six studies were included in this analysis (N=5482). Studies were reported from the USA, United Kingdom and Mexico. All the studies were prospective studies. The mean age of the patients ranged from 53-60 years with 48.8% females. Retroflexion lead to higher polyp detection rates in the rectum (pooled event rate 1.2%; 95% CI: 0.6%-2.3%, p< 0.0001). A subgroup analysis for the detection rate of tubular adenoma or tubulovillous adenoma revealed a statistically significant higher detection in the retroflexion group compared to the forward view (pooled event rate 0.4%, 95% CI: 0.1%-0.9%, p=0.009). The overall rate of success of rectal retroflexion was 97.3%. Only 2 studies reported the rate of adverse events of this technique. The adverse events reported were pain and erosions with minor bleeding.
Conclusion: Rectal retroflexion significantly increased the detection of adenomatous polyps compared to forward view with a high maneuver success rate. Further studies with a randomized design and with reporting of adverse events are needed to guide recommendations regarding the efficacy of rectal retroflexion for screening colonoscopy.

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Utilizing a Decentralized Clinical Study Approach for Expedited and Diverse Recruitment for Clinical Validation of a Novel Non-invasive Multitargeted Stool-based RNA Test

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Introduction: Traditional clinical trials that utilize fixed sites often fail to recruit participants that are representative of the intended use population. Participants, particularly those from minority groups, cite geographical constraints, mistrust, miscommunication, and discrimination as barriers to successful recruitment. A decentralized clinical trial enrollment strategy offers reduced cost, reduced time requirements, and circumvents barriers associated with the recent pandemic outbreak.
Methods: After the mt-sRNA test system entered design-lock, a decentralized clinical trial (CRC-PREVENT) was launched through a digital campaign (https://www.colonscreeningstudy.com/; NCT04739722). Online advertisements were published on multiple social media sites, and engagement with materials directed patients to an online screener. Participants who completed the screener were eligible for enrollment if they met CRC-PREVENT inclusion and exclusion criteria and were willing to complete all clinical trial components, including providing a stool sample before an optical colonoscopy.
Results: After 12 months of active enrollment, 276,400 individuals engaged with digital advertisements and completed pre-screener surveys to determine eligibility for the clinical trial. In total, 14,264 individuals consented to participate in the CRC-PREVENT clinical trial. Of these individuals, 58% were female (42% were male), and 65% were over 50. Regarding race and ethnicity, eligible individuals directly represented the intended use population: 16% were Black or African American, 0.2% were Native Hawaiian, Pacific Islander, American Indian, or Alaskan Native, and 7% were Hispanic or Latinx. Regarding socioeconomic status, the decentralized approach permitted access to individuals with healthcare inequities: 25% of participants had income under $29,999, 5% of participants were from rural areas (defined as a city center < 10,000 people), and 36.7% of participants were on public insurance. Individuals were derived from 7,644 unique zip codes across all 48 continental United States. (Table)
Conclusion: A decentralized recruitment strategy permits highly successful enrollment in the face of screening burdens heightened by COVID-19 pandemic. This approach also offered a significantly more diverse population and could mitigate selection bias and attrition bias associated with the cohorts observed in traditional clinical studies.

Table 1. Enrollment distribution per demographics, insurance type and income

Age	N	%
< 44	8	0.1%
45-50	4886	34.3%
51-60	5491	38.5%
61-70	3220	22.6%
>70	595	4.2%
Total	14200	
Gender	**N**	**%**
Female	8259	57.9%
Male	5939	41.6%
Other	27	0.2%
Prefer not to answer	39	0.3%
Total	14264	
Race	**N**	**%**
American Indian or Alaskan Native	122	0.1%
Asian	458	3.2%
Black or African American	2243	15.8%
Native Hawaiian or Other Pacific Islander	33	0.2%
Other	514	3.6%
Prefer not to answer	96	0.7%
White	10731	75.6%
Total	14197	
Ethnicity	**N**	**%**
Hispanic or Latino	976	6.9%
Not Hispanic or Latino	12713	89.5%
Prefer not to answer	508	3.6%
Total	14197	
Insurance type	**N**	**%**
No insurance	162	1.1%
Private insurance	8516	60.0%
Public insurance (Medicaid)	1880	13.2%
Public insurance (Medicare Advantage)	1199	8.4%
Public insurance (Medicare)	2135	15.0%
Self-insured	305	2.1%
Total	14197	
Income	**N**	**%**
$100,000-$149,999	1958	13.8%
$150,000-$199,999	966	6.8%
$200,000 or more	996	7.0%
$30,000-$49,999	1833	12.9%
$50,000-$74,999	1855	13.1%
$75,000-$99,999	1634	11.5%
Prefer not to answer	1354	9.5%
Under $29,999	3605	25.4%
Total	14201	

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Is Hepatic Steatosis an Individual Risk Factor for Colorectal Adenomas?

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Introduction: Most colorectal cancers (CRC) originate from adenomatous lesions. Data suggests that obesity, insulin resistance, and metabolic syndrome are risk factors for CRC. Non-alcoholic fatty liver disease (NAFLD) is one of the manifestations of metabolic syndrome. Many studies have correlated metabolic syndrome with a risk of CRC but there is a paucity of evidence on NAFLD and its association with CRC. We aim to study the association between moderate to severe hepatic steatosis detected on vibration-controlled transient elastography (VCTE) and colorectal adenomas.
Methods: Inclusion criteria of patients with VCTE and colonoscopy. Exclusion criteria included autoimmune hepatitis, alcohol use disorder, viral hepatitis, and primary biliary cirrhosis. Steatosis was categorized as S0 - S1 (no/mild) and S2 - S3 (moderate/severe) based on the controlled attenuation parameter (CAP) grade on VCTE. Colonoscopy findings were stratified based on the biopsy results i.e., hyperplastic, adenoma, CRC, inflammatory or normal mucosa. Continuous variables were assessed using the Mann-Whitney U test and categorical variables using chi-square with $p < 0.05$ considered statistically significant. A multinomial logistic regression analysis (MLRA) was done between colorectal adenoma and significant covariates.

Results: Out of the 415 patients analyzed, 206 patients met inclusion criteria. 124 had moderate/severe steatosis and 82 had no/mild steatosis. Descriptive analysis showed that BMI (p = 0.001), aspirin (p = 0.011), smoking (p = 0.004), and adenoma (p = 0.02) were significantly different between both groups. In the MLRA model; aspirin had an odds ratio (OR) = 0.39 [0.25 - 0.84] (p = 0.01), moderate/severe steatosis OR = 3.5 [2.39 - 10.45](p = 0.03) and obesity OR = 2.9 [1.07 - 6.78](p = 0.02) in association with colorectal adenoma (Figure).
Conclusion: Our study indicated that moderate/severe hepatic steatosis is associated with an increased risk of colorectal adenoma detection on colonoscopy. Several patients were excluded due to the non-availability of colonoscopy reports, many of whom were less than 45 years of age. Current guidelines do not recommend earlier screening for CRC after detection of hepatic steatosis for patients. We recommend prospective studies to understand this positive association better. Further studies would be needed to determine if the increase in adenoma detection lowers the risk for the detection of CRC.

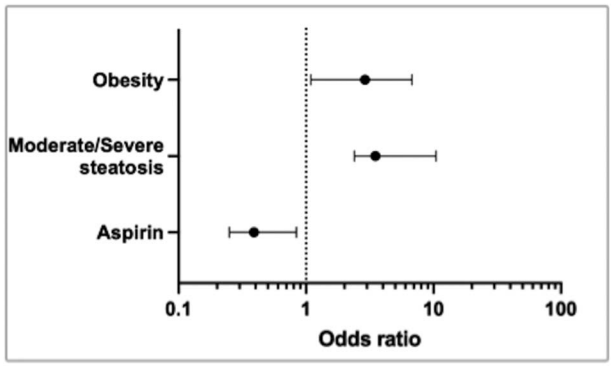

Figure. 1

[0270] **Figure 1.** Forest plot showing the relationship between colorectal adenoma detection and significant covariates.

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Representation of Racial Minorities in the United States Colonoscopy Surveillance Interval Guidelines

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Introduction: Clinical guidelines should ideally be formulated from data representative of the population they are applicable to. However, historically many studies have had disproportionately high rates of white patient enrollment, which could lead to inequities in care for racial minorities. In this study, we examined the degree to which racial minorities were represented in the US colonoscopy surveillance guidelines.
Methods: We reviewed US guidelines between 1997 and 2020 and identified all studies cited by recommendations for surveillance after a baseline colonoscopy with no polyps, adenomas, sessile serrated polyps (SSPs), and hyperplastic polyps (HPs). Each study within a meta-analysis was analyzed separately. We compared the proportion of studies reporting race to the proportion which reported sex and family history of colorectal cancer (CRC). Among studies reporting race, we calculated both the median percentage of minorities and the aggregate racial distribution of patients. Statistical testing was performed via Fisher's exact test, and Bonferroni correction was applied for multiple comparisons.
Results: We reviewed a total of 77 studies, of which 35 were from the US (Table). 18 studies (23%) reported race, compared to 73 studies (95%) which reported sex and 34 (44%) which reported family history of CRC ($p < 0.001$ and $p = 0.006$ respectively). All studies which reported race were US-based studies, thus 51% of US-based studies reported race. Among studies that reported race, the median number of minorities was 15% of the study population, ranging from a low of 12% for studies on adenomas and HPs to 30% for studies on SSPs. In aggregate, non-white patients comprised 43% of the study population for normal colonoscopies but only 9% for adenomas, 22% of for SSPs, and 15% for HPs ($p < 0.001$ for all pairwise comparisons).
Conclusion: Most studies on colonoscopy surveillance intervals, including approximately half of US-based studies, do not report the race of study participants. Among the studies that report racial data, minority patients are underrepresented in studies of adenoma, SSP, and HP surveillance intervals compared to the US population. Underrepresentation may lead to differences in outcomes being missed, thus future research should strive to include more data from these underrepresented groups.

Table 1. Reporting of Race and Racial Distribution of Patients among Studies of Colonoscopy Surveillance Intervals Abbreviations: CRC, colorectal cancer

	All studies (N=77)	Normal colonoscopy (N=18)	Adenomas (N=54)	Sessile serrated polyps (N=7)	Hyperplastic polyps (N=5)
Number of studies which reported:					
Sex, n (%)	73 (95)	16 (89)	51 (94)	7 (100)	5 (100)
Family history of CRC, n (%)	34 (44)	8 (44)	24 (44)	3 (43)	3 (60)
Race, n (%)	18 (23)	3 (17)	12 (22)	2 (29)	2 (40)
Percentage of minority patients, median (range)*	15 (4-43)	24 (15-43)	12 (4-36)	30 (16-43)	12 (10-15)
Number of patients:*					
White, n (%)	752,876 (58)	710,149 (57)	26,672 (91)	3,053 (78)	13,341 (85)
Black, n (%)	80,528 (6)	77,510 (6)	1,020 (4)	561 (14)	1,437 (9)
Asian, n (%)	155,966 (12)	155,079 (12)	295 (1)	217 (6)	375 (2)
Hispanic, n (%)	144,783 (11)	144,093 (12)	309 (1)	59 (2)	322 (2)
Other, n (%)	167,082 (13)	165,955 (13)	954 (3)	19 (1)	154 (1)

*Among studies which reported race.

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Colonoscopy in Diverticulitis for Patients With Recent Screening Colonoscopy

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Introduction: Acute diverticulitis is inflammation due to micro-perforation of a diverticulum. Professional societies such as the American Society of Colon and Rectal Surgeons and the American College of Gastroenterology recommend that patients undergo colonoscopy to exclude colon cancer after an episode of acute diverticulitis. The aim of our study is to determine if there is an increased detection rate of malignancy and adenomas in colonoscopy performed after diverticulitis, if the patient had received a screening colonoscopy within five years prior of diverticulitis diagnosis.
Methods: IRB approved retrospective chart review from within the last 10 years spanning 12/2009 to 12/2020 at a single center study (Promedica Toledo Hospital) with appropriate ICD 10 codes were analyzed. A total of 946 patients were evaluated and out of these patients, 124 fit our inclusion criteria. Figure shows our patient selection process.
Results: 5.64% of patients were found to have Advanced Colonic Neoplasia (ACN). 0% were found to have Colorectal Cancer (CRC) on follow up. As a result, Advanced Adenoma (AA) was also found to be 5.64% in our single center study. Table lists our follow up colonoscopy findings. categorical data, Chi Square test was used to investigate differences in proportions, except where Fisher's Exact test was appropriate.
Conclusion: Recent data for routine colonoscopy after acute uncomplicated diverticulitis showed a pooled prevalence of 5% for ACN, 1.5% for CRC, and 3.8% for AA. For patients at average risk for screening of colorectal cancer, a prevalence rate for CRC was found to be .20% and ACN was found to be 10.3%. Our study found 5.64% AA and 0% were found to have CRC on follow up. Patients who met our criteria did not have CRC detected upon follow up and had a lower detection rate of ACN compared to average risk population for normal screening of CRC. Though there was no detected CRC in our patient population, there was still notable detection of high risk polyps. This fact may be reason enough to continue colonoscopy after diverticulitis even in patients with screening colonoscopy within 5 years of their diverticulitis episode.

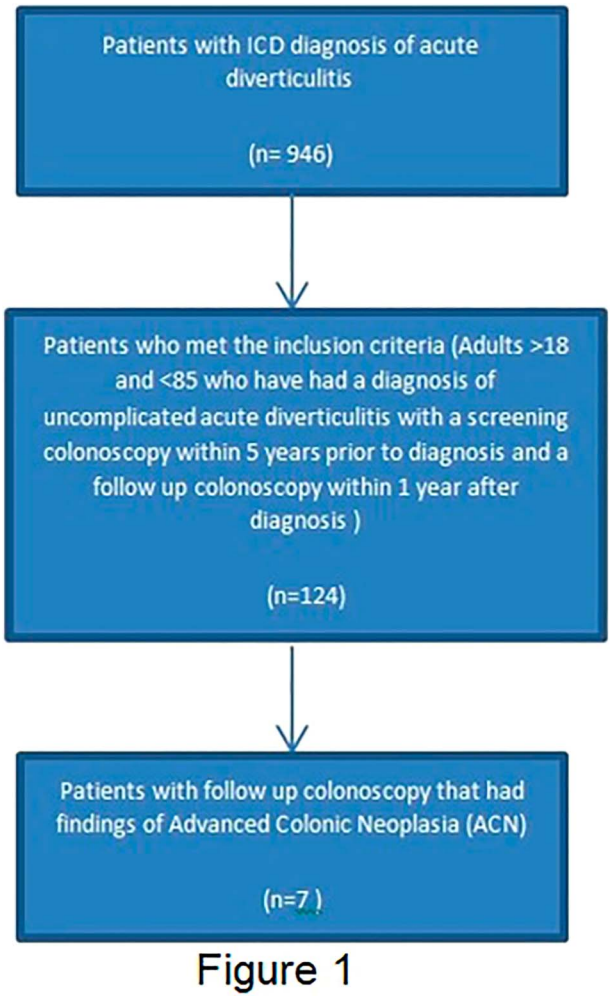

Figure 1

[0272] **Figure 1.** Patient Selection

Table 1. Follow Up Colonoscopy Findings

Variables	Value
Normal	61 (49.2%)
≥20 Hyperplastic Polyps	0 (0%)
Hyperplastic Polyp > 10 mm	11 (8.87%)
Tubular Adenoma or Sessile Serrated Polyps < 10 mm	34 (27.4%)
Tubular Adenoma or Sessile Serrated Polyps > 10 mm	9 (7.26%)
Tubulovillous or Villous Adenoma and/or High Grade Dysplasia	1 (.81%)
Serrated Adenoma	0 (0%)
Sessile Serrated with Dysplasia	0 (0%)

Table 1. (*continued*)

Variables	Value
>10 Adenomas	0 (0%)
Colorectal Cancer	0 (0%)
Other	22 (17.74%)

Total # of Patients (n= 124). Other: Includes Diverticulosis, Benign Polyps, Hyperplastic Polyps < 10 mm, Collagenous Colitis

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Risk Factors Impacting Advanced Adenoma Detection Rate Following Negative Multitarget Stool DNA Testing

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Introduction: Colonoscopy remains the gold standard for colorectal cancer (CRC) screening, but less invasive screening modalities have been employed more recently, including the multitarget Stool DNA (MT-sDNA or Cologuard) test, which combines detection of blood products with genetic markers in the stool. Data regarding the false-negative rate of the MT-sDNA test in real-world clinical practice is limited. Our primary aim was to determine the rate of false-negative MT-sDNA testing and evaluate for factors associated with higher false-negative rates within our health system.

Methods: Adults (≥18 years old) with a negative MT-sDNA test between 2017 and 2022 and subsequent colonoscopy within three years of the MT-sDNA test, regardless of colonoscopy indication were included. Our primary outcome of interest was advanced adenoma (AA) detection rate, defined as adenoma with villous features, size ≥ 1.0 cm, high-grade dysplasia, or early invasive cancer. Demographic and procedural variables including age, sex, race, BMI, colonoscopy indication, polyp size, and polyp location were manually extracted from patient charts and compared between the two groups (AA vs. no AA) using chi-squared analysis.

Results: A total of 370 patients met the inclusion criteria, of which 31 (8.4%) were found to have AA and 3 (0.81%) were found to have CRC on colonoscopy within 3 years of negative MT-sDNA test. There were no demographic differences between the two groups. AA detection rate was significantly higher in patients who underwent colonoscopy for GI bleeding (32.3% vs 14.2%, p=0.008) as opposed to other indications. Among patients who had polyps (N=148), AA detection was associated with more numerous polyps (2 [IQR 1-4] vs 1 [IQR 1-2], p < 0.001), and larger polyp size (14 [SD 5.1] vs 5.1 [SD 2.2], p < 0.001). AAs were also significantly more frequently found in the hepatic flexure (6.5% vs 0.3%, p=0.050) and transverse colon (41.9% vs 5.6%, p=0.002) compared to other locations (Table).

Conclusion: The results of this study validate the 8% quoted false-negative rate for MT-sDNA testing shown in prior literature. Large polyps in the transverse colon and hepatic flexure are more likely to result in a false negative MT-sDNA test and therefore these locations should be examined in more detail during endoscope withdrawal. Finally, a negative MT-sDNA test result should be interpreted with caution and gastroenterologists should have a low threshold to perform a colonoscopy if otherwise clinically indicated.

Table 1. **Baseline demographics and procedural variables in patients with negative MT-sDNA testing and advanced adenoma on colonoscopy (n=31) as compared to patients without advanced adenoma (n=339)**

		Advanced Adenoma n=31		Non-Advanced Adenoma n=339		p value
Male Sex, n(%)	n(%)	16	51.6%	126	37.2%	0.114
Age – years	Median (IQR)	67	59-74	66	59-71	0.157
Race	n(%)					0.168
White		28	90.3%	272	80.2%	
Black		3	9.7%	59	17.4%	
Other		0	0.0%	8	2.4%	
BMI – kg/m^2	Median (IQR)	30.7	25.6-35.2	30.1	26-34	0.807
Personal History of Colon Cancer	n(%)	0	0.0%	3	0.9%	0.600
Family History of Colon Cancer	n(%)	0	0.0%	32	9.4%	0.074
Personal History of IBD	n(%)	0	0.0%	3	0.9%	0.600
Indication for Colonoscopy	n(%)					
GI Bleeding		10	32.3%	48	14.2%	**0.008**
Iron deficiency anemia		4	12.9%	28	8.3%	0.380
Diarrhea		1	3.2%	34	10.0%	0.216
Constipation		0	0.0%	6	1.8%	0.457
Weight loss		0	0.0%	5	1.5%	0.497
Abnormal Imaging		2	6.5%	11	3.2%	0.355
IBD		0	0.0%	0	0.0%	
Screening		14	45.2%	193	56.9%	0.207
Other		0	0.0%	14	4.1%	0.250
Prep Quality	n(%)					
Poor		2	6.5%	24	7.1%	0.896
Inadequate		0	0.0%	2	0.6%	0.669
Fair		10	32.3%	79	23.3%	0.265
Adequate		2	6.5%	35	10.3%	0.493
Good		17	54.8%	187	55.2%	0.972
Excellent		0	0.0%	12	3.5%	0.288

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Evaluation of Gender, Racial, and Socio-Economic Factors Underlying Disparities in Colorectal Cancer Screening

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Introduction: Screening colonoscopy is the best available means of preventing mortality and/ or morbidity from colorectal cancer (CRC). The present recommendations for CRC screening in average-risk asymptomatic individuals start at the age of 45 years. This has tremendously increased the population size eligible for screening colonoscopy. However, there are numerous unaccounted disparities in healthcare access and delivery that are not well understood. We conducted a cross-sectional analysis of non-institutionalized US adults to evaluate the impact of social, economic and literacy-based factors on the utilization of colonoscopy for CRC screening.
Methods: Individual-level data from the Center for Disease Control and Prevention's Behavioral Risk Factors Surveillance System (BRFSS) from 2016 and 2018 was accessed to identify respondents that underwent colonoscopy. BRFSS is a telephone-based survey which provides prevalence data on behavioral risk factors related to common health conditions and preventive services from all US states and three US territories. Patient ethnicity, gender, literacy, annual income, and employment status associated with and without the use of colonoscopy for average-risk CRC screening was accessed. A logistic regression analysis of these factors was conducted utilizing the BRFSS web enabled analysis tool and reported as Odds Ratios (ORs) with corresponding 95% confidence intervals (CIs).
Results: A total of 923,739 patients were surveyed, of which 461,433 (50%) patients had undergone a colonoscopy or sigmoidoscopy at least once in their lifetime. Most patients were above 55 years of age (86.5%), female (57.9%), non-Hispanic Caucasians (82.4%), and had health care coverage (95.7%). The factors associated with decreased odds of getting a screening colonoscopy were: Hispanic race (OR 0.79, 95% CI 0.75-0.85), lack of healthcare coverage (OR 0.43 95% CI 0.40-0.46), physical inactivity (OR 0.88, 95% CI 0.86-0.92), and financial concerns affecting doctor visits (OR 0.88, 95% CI 0.83-0.92). Female gender, patients with higher education, higher annual household income, and retired status had increased odds of getting a screening colonoscopy (Table).
Conclusion: Survey of BRFSS demonstrates multiple factors that significantly impact the utilization of average-risk screening colonoscopy. This study helps shed light on racial and socioeconomic determinants of health that should be addressed to improve patient accessibility to screening colonoscopy.

Table 1.

Characteristic	Odds Ratio	95% CI	p-value
Demographics			
Females	1.18	(1.15 - 1.22)	< 0.01
Caucasian race	1	(1.00 - 1.00)	.
African Americans	1.08	(1.03 - 1.15)	0.002
Hispanics	0.79	(0.75 - 0.85)	< 0.01
Annual household income			
< $10,000	1	(1.00 - 1.00)	.
$10,000 < = < $15,000	1.20	(1.10 - 1.32)	< 0.01
$15,000 < = < $20,000	1.23	(1.13 - 1.34)	< 0.01
$20,000 < = < $25,000	1.39	(1.28 - 1.52)	< 0.01
$25,000 < = < $35,000	1.60	(1.47 - 1.75)	< 0.01
$35,000 < = < $50,000	1.87	(1.72 - 2.04)	< 0.01
$50,000 < = < $75,000	2.44	(2.24 - 2.66)	< 0.01
>= $75,000	2.91	(2.68 - 3.17)	< 0.01
Education			
Did not graduate high school	1	(1.00 - 1.00)	.
High school graduate	1.24	(1.17 - 1.32)	< 0.01
Attended college or technical school	1.46	(1.38 - 1.56)	< 0.01
College or technical school graduate	1.74	(1.63 - 1.86)	< 0.01
Employment Status			
Employed for wages	1	(1.00 - 1.00)	.
Self-employed	0.85	(0.81 - 0.90)	< 0.01
A homemaker	1.05	(0.97 - 1.14)	0.22
Retired	1.62	(1.55 - 1.70)	< 0.01
Unable to work	1.72	(1.62 - 1.84)	< 0.001
No exercise in the last one month	0.88	(0.85 - 0.92)	< 0.01
Could not see a doctor due to financial concerns	0.88	(0.84-0.93)	< 0.01
No healthcare coverage	0.43	(0.40 - 0.46)	< 0.01

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Age-Specific Trends in Colorectal Cancer Mortality Rates Over a 27-Year Period

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Introduction: Incidence rates of colorectal cancer (CRC) are increasing among younger adults (age < 50 years) in the U.S., and more recently, rates have increased in persons age 50-54 years. To better understand the corresponding changes in mortality, we examined trends in CRC mortality rates by age over a 27-year time period.
Methods: We used population-based data from the National Cancer Institute's Surveillance, Epidemiology, and End Results program of cancer registries to estimate age-specific (30-84 years, by 5-year age group) mortality rates per 100,000 persons during the period 1992–2019. We used joinpoint regression analysis to quantify changes in the direction and magnitude of mortality rates; the slope of the best-fit line between joinpoints corresponds to the annual percent change (APC) in mortality, with $p < 0.05$ indicating a statistically significant difference from a slope of zero.
Results: Between 1992 and 2019, CRC mortality rates steadily increased by about 1% per year for ages 30-34 and 35-39 years. For ages 40-44 and 45-49 years, rates decreased by < 1% per year from 1992 until the mid 2000s and subsequently increased from 2004 to 2019 (APC 1.1, $p < 0.05$) and 2006 to 2019 (APC 1.3, $p < 0.05$), respectively (Table). For age groups 50-54 to 60-64 years, mortality rates decreased by about 2% per year from 1992 until the mid 2000s; however, after 2006, rates increased for age 50-54 years (APC 0.5, $p < 0.05$) and decreased more slowly for ages 55-59 (APC -0.4, $p < 0.05$) and 60-64 (APC -1.5, $p < 0.05$) years. Mortality rates also decreased at a lower rate for age 65-69 years, beginning in 2011 (APC for 2011-2019: -1.7, $p < 0.05$ vs. APC for 2001-2010: -3.9, $p < 0.05$). For age groups 70-74 to 80-84 years, mortality rates steadily decreased by about 3% per year from 2000 to 2019.
Conclusion: Age-specific CRC mortality rates mirror the well-described trends in CRC incidence rates, with increasing rates in every age group up to 50-54 years and slowing rates at age 55-59 years. Our findings suggest that CRC diagnoses and deaths are increasingly common in middle-aged adults, despite the availability of screening and improved treatment options. Future efforts should identify factors contributing to increasing CRC mortality rates, as well as implement strategies to improve screening participation in these age groups.

Table 1. Trends in age-specific (30-84 years, by 5-year age group) mortality rates of colorectal cancer, SEER 13, 1992–2019 NOTE: Each trend corresponds to the slope of the best-fit line between joinpoints. Annual percent changes (APCs) statistically significant from zero (p<0.05) are marked with an asterisk

	Trend 1		Trend 2		Trend 3	
Age	Years	APC	Years	APC	Years	APC
30-34	1992-2019	0.93*				
35-39	1992-2019	1.04*				
40-44	1992-2003	-0.35	2004-2019	1.13*		
45-49	1992-2005	-0.59*	2006-2019	1.28*		
50-54	1992-2004	-1.53*	2005-2019	0.47*		
55-59	1992-2005	-2.54*	2006-2019	-0.42*		
60-64	1992-2001	-2.05*	2002-2004	-5.61*	2005-2019	-1.53*
65-69	1992-2000	-2.00*	2001-2010	-3.86*	2011-2019	-1.65*
70-74	1992-1999	-1.89*	2000-2019	-3.56*		
75-79	1992-2000	-1.95*	2001-2019	-3.39*		
80-84	1992-2001	-2.22*	2002-2019	-3.18*		

S276

Does Hepatitis C Independently Increase the Risk of Colorectal Adenoma?

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Introduction: Hepatitis C virus (HCV) infection has been associated with extrahepatic malignancies, one such is colorectal carcinoma (CRC). The majority of CRC arise from adenomatous polyps, it is not known if HCV infection influences the growth of these precancerous lesions. This study evaluates the prevalence of colorectal adenomas in HCV patients compared to the general population and if HCV is an independent risk factor for the detection of colorectal adenomas.
Methods: This case-control study included patients who underwent screening colonoscopy at our hospital. Patients were divided into cases (HCV) and controls (non-HCV). Patients with no biopsy reports, hepatitis B, and inflammatory bowel disease were excluded. Colonoscopy findings were stratified on the biopsy results i.e., hyperplastic, adenomatous, CRC or normal mucosa. Continuous variables were analyzed using Mann Whitney U test and categorical variables using Chi-square and Fisher's exact test with $p< 0.05$ considered statistically significant. After 1:1 propensity score matching (PSM), a matched cohort of cases and controls was generated. A multivariate regression analysis to compute an odds ratio for colorectal adenoma detection rate was done.
Results: 415 patients were screened, of which 109 HCV patients and 97 controls were included. Descriptive analysis showed that age ($p = 0.03$), BMI ($p = 0.001$), aspirin ($p = 0.01$), smoking ($p = 0.004$), alcohol use ($p = 0.01$) and adenoma detection ($p = 0.006$) were significantly different between both groups. After propensity matching, multivariate regression analysis showed patients with HCV had odds ratio (OR) = 2.06 ($p = 0.03$), and aspirin use had OR = 0.38 ($p = 0.01$) in having colorectal adenoma. (Table)
Conclusion: Our study shows a significantly higher rate of adenomas in chronic HCV patients. On multivariate analysis with and without propensity score matching, HCV infection was found to be an independent risk factor for colorectal adenoma. Current guidelines do not recommend earlier screening for CRC for such patients. Prospective studies would be required to assess if treatment of HCV leads to lower adenoma detection rates.

Table 1. Multivariate logistic regression for colorectal adenoma detection

Variables	p value	Odds ratio	Lower Limit of 95% CI	Upper Limit of 95% CI
Age (>60, median)	0.0295*	1.043	1.034	2.125
Hepatitis C	0.0314*	2.152	1.125	3.810
Family history of CRC	0.220	1.984	0.665	5.922
Aspirin use	0.0116*	0.387	0.253	0.89
Smoking	0.499	1.229	0.677	2.231
Alcohol use	0.293	1.527	0.694	3.359
Female Gender	0.869	1.050	0.586	1.882
Diabetes Mellitus	0.529	1.244	0.630	2.459
HIV	0.895	1.148	0.150	8.806

S277

Anal Cancer Screening Practices in Liver Transplant Centers Across the United States: A Nationwide Practice Study

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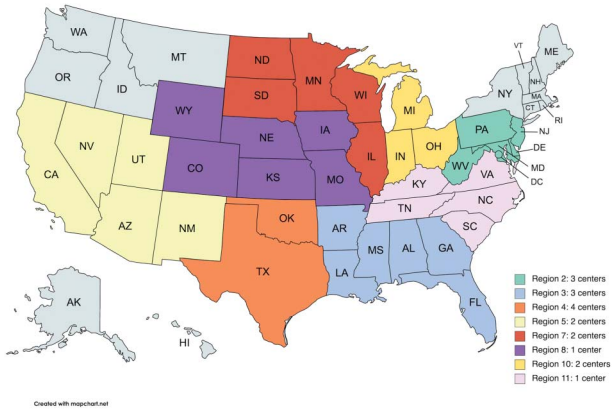
Introduction: Transplant recipients are at an increased risk of developing anogenital Human Papillomavirus (HPV)-related disease, including anal high-grade squamous intraepithelial lesions (HSIL) and cancer compared with the general population, largely due to impaired cell-mediated immunity. There are currently no well-established guidelines for anal cancer screening in this population, and timely primary and secondary prevention practices remain scarce. The aim of this study is to understand the knowledge, attitudes, and practices of anal cancer screening in adult liver transplant candidates and recipients at transplant centers across the United States (U.S.).
Methods: An online questionnaire was created that consists of four sections, with questions on the transplant center's practices regarding anal cancer screening, barriers, facilitators and needs with regard to anal cancer screening, and HPV vaccination. The survey was sent to medical directors with publicly available emails from liver transplant centers across the U.S (n=113).
Results: We received a total of 20 responses (18% response rate), from liver transplant centers across the U.S. of which 2 were incomplete and were not included in the analysis (Figure). Half of the responses (n=9) were from large transplant centers performing more than 100 transplants per year. Out of all responses, only 2 centers have formal guidelines for anal cancer screening, 7 centers perform screening without formal guidelines, 6 centers do not screen and 3 centers responded "not sure" of the current practices. All respondents believe that data on the impact of screening on anal cancer incidence would support decisions on screening, and access to specialists for screening/high-resolution anoscopy (HRA) would be helpful or very helpful on a 5-point Likert Scale. Regarding screening practices, 3 centers perform anal cytology followed by HRA for abnormal results, and 3 centers perform HRA for all screened patients. Only 5 centers assess HPV vaccination history regularly.
Conclusion: Results from a cohort of liver transplant centers from around the country reveal non-standardized anal cancer screening practices among transplant centers. These results underscore the urgent need for better data on anal cancer screening in transplant populations as well as for access to specialist care. The results may help catalyze a more standardized screening approach to anal cancer screening in transplant patients.



[0277] **Figure 1.** Map of the United States with number of centers participating in the survey by UNOS region

Table 1.

Neighborhood Index	Geographic granularity	# of studies utilizing index	Index domains					Study		
			Income	Education	Housing	Employment	Other	Author/year	Liver-related outcome	Findings
Area deprivation index	Census block group	2	• Families below poverty level, % • Income disparity • Median family income, $ • Population < 150% poverty threshold, %	• Population aged ≥25y with at least a high school education, % • Population aged ≥25y with < 9y of education, %	• Median home value, $ • Median gross rent, $ • Median monthly mortgage, $ • Owner occupied housing units, % • Households with 1+ person per room, %	• Civilian labor force unemployed (aged ≥16y), % • Employed persons aged ≥16y in white-collar occupations, %	• Single parent households with dependents < 18y, % • Households without a motor vehicle, % • Households without a telephone, % • Occupied housing units without complete plumbing, %	Nichols 2022 Goldstein 2021	Liver transplant waitlist removal due to nonadherence HCV prevlence	No association High ADI associated with increased HCV prevalence
Community health score	County	1	• Median household income, $	—	—	—	• Years of potential life lost • Children with low birth weight, % • Adults with poor or fair reported health, % • Adults' poor reported physical health days • Adults' poor reported mental health days • Individuals reporting tobacco use, % • Adult obesity prevalence • Physical inactivity prevalence • Rate of preventable hospital stays	Akateh 2020	Survival after liver transplant	No association
Custom index		1	• People below poverty level, %	• Educational attainment in population ≥25y, % • High-school graduate or higher, %	• Families that are married householders, % • Families with different residence 1y ago	—	• Civilian noninstitutionalized population with a disability, % • Single-female head of household, % • Single-male head of household, % • County-level Gini index of income inequality • Grandparents responsible for grandchildren, % • Married women, except separated, % • Married men, except separated, %	DuPre 2020	Risk of Hepatitis A	More disadvantaged profiles associated with increased risk of Hepatitis A

Table 1. (*continued*)

Neighborhood Index	Geographic granularity	# of studies utilizing index	Index domains					Study		
			Income	Education	Housing	Employment	Other	Author/year	Liver-related outcome	Findings
Facility income quartiles	Zip code	1	• Median income of each patient's zip code area of residence, divided into quartiles	—	—	—		Uppal 2020	Rate of treatment for liver metastases from colon cancer	High FIQ (ie high nSES) associated with higher rates of treatment
Multiethnic Study of atherosclerosis (MESA index)	Individuals	1	• Median household income, $ • Households receiving interest, % • Dividend or net rental income, $	• Adults ≥25y who completed high school, % • Adults ≥25y who completed college, %	• Median value of owner-occupied housing units, $	• Employed persons ≥16y in executive managerial or professional occupations, %	—	Ortiz 2020	Risk of liver cancer	High MESA quartile (ie low nSES) associated with higher risk of liver cancer
Neighborhood deprivation index	Census tract	3	• Households below poverty status, % • Households with < $30,000 income per year, % • Households on public assistance income, %	• Population aged ≥25y who did not graduate high school, %	• Housing units with ≥1 occupant per room, %	• Unemployment, % • Males in management positions, %	• Female headed households with dependent children, %	Ortiz 2020 Major 2014 Marcus 2018	Risk of liver cancer • Risk of HCC • Chronic liver disease (CLD) mortality Likelihood of receiving treatment for Hepatitis C	High NDI quartile (ie low nSES) associated with increased risk of liver cancer • Low NDI not associated with increased risk of HCC • Low NDI associated with increased CLD mortality High NDI associated with decreased likelihood of receiving treatment for Hepatitis C
Roux index	Census block group	1	• Median household income, $ • Households receiving interest, dividend, or net rental income, %	• Adults aged ≥25 who had completed high school, % • Adults aged ≥25 who had completed college, %	• Median home value, $	• Employed people ≥16 in management, business, science, or arts occupations, %	—	Akateh 2020	Survival after liver transplant	No association
Social deprivation index	Variable	1	• Families living in poverty, %	• Individuals with less than 12 years of education, %	• Families living in rented housing, %, • Overcrowded housing, %	• Unemployed adults ≤65y, %	• Single-parent households, % • Households without a car, %	Giammarino 2020	Risk of nonalcoholic steatohepatitis (NASH)	High SDI associated with increased risk of NASH
Socioeconomic position index	Variable	1	• Median household income, $ • Families below the US poverty line, %	• Population aged ≥25y who did not graduate high school, %	• Expensive homes, %	• Working class, % • Unemployment, %	—	Ortiz 2020	Risk of liver cancer	High SEP quartile (ie low SES) associated with increased risk of liver cancer
Townsend index	Variable	1	—	—	• Crowding, % • Renter, %	• Unemployment amongst ≥16y, %	• No car ownership, %	Ortiz 2020	Risk of liver cancer	High Townsend quartile (ie low SES) associated with increased risk of liver cancer
Yost index	Census block group	2	• Median household income, $ • Families below 200% of the poverty line, %	• Liu education index (% aged ≥25 years with college, high school and less than high school)	• Median house value, $ • Median rent, $	• Individuals with blue collar jobs, % • Unemployment amongst ≥16y, %		Ortiz 2020 Sangaramoorthy 2022	Risk of liver cancer Risk of HCC	High Yost quartile (ie low SES) associated with increased risk of liver cancer High Yost quartile (ie low SES) associated with increased incidence of HCC

S278

Assessing Adherence to Recommending 10-Year Intervals After Normal Screening Colonoscopy in Average-Risk Individuals Based on Specialty and Practice Status

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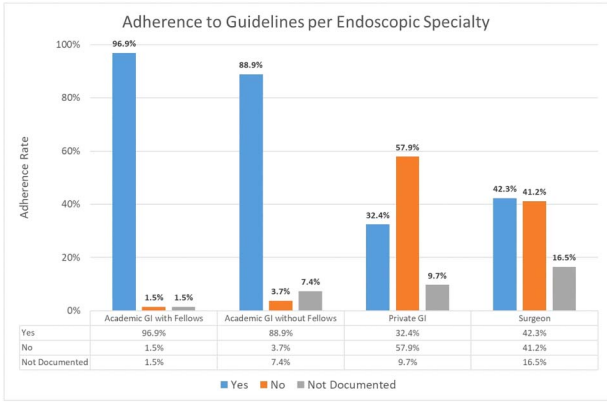
Introduction: After a normal average-risk CRC screening colonoscopy, endoscopists should recommend repeat screening in 10 years. Target is 90% adherence per guidelines, and this has been a priority quality indicator for CMS Medical Incentive Payment System and the ACPs Choosing Wisely Program. Our 2017 quality improvement (QI) project showed poor adherence (less than 40%) among private gastroenterologists and academic surgeons. Prior to commencing a new QI initiative, this project assessed frequency of adherence in 2021 at a single site.
Methods: *Inclusion criteria*: To minimize confounders, patients were limited to: (a) average-risk, 50-82 year old; (b) colonoscopy performed in 2021; (c) sole indication of CRC screening; (d) no biopsy, polypectomy, or reference to abnormal findings on procedure report. *Study Setting*: Hospital-based "open" endoscopy suite (i.e., utilized by academic/private gastroenterologists and academic surgeons) at an academic tertiary care center. *Primary Outcome*: Adherence to guideline intervals defined as repeat colonoscopy in 10 years, discontinuation of CRC screening due to patient's age when bowel preparation is adequate or repeat colonoscopy within 1 year if bowel preparation is poor/inadequate. Adherence rates stratified by specialty and type of practice: academic gastroenterologist (n = 7), academic surgeon (n = 3), or private gastroenterologist (n = 6). Differences in adherence between groups assessed using chi-square analysis.
Results: Among 465 eligible patients, mean age was 60.1 +/- 8.2 years, 38.5% male, and 76.8% African American. Adherence surpassed target of 90% adherence for academic gastroenterologists (total=96.0%) with (96.9%) or without GI fellows (88.9%) and was superior to adherence by private gastroenterologists or academic general surgeons ($p < 0.001$). The latter two groups were adherent in 32.4% and 42.3%, respectively (Figure). Adherence was significantly better with good/excellent bowel preps (71.8%) compared to other bowel prep categories ($p< 0.001$), and patients with poor, fair, or no documentation of prep were adherent in 42.1% (Table).
Conclusion: In this project, adherence among academic gastroenterologist met guideline-specified target of 90% when a gastroenterology fellow participated in the procedure. In all other groups, adherence did not meet the recommended threshold. These data are similar to our 2017 QI project and identify an excellent opportunity for a quality intervention educational and monitoring project to improve performance.



[0278] **Figure 1.** Adherence to Guidelines per Endoscopic Specialty

Table 1. Adherence to Recommended Intervals stratified by Bowel Preparation

Bowel Preparation	Adherence to Recommended Intervals*	P-value
No Documentation	42.9% (9/21)	< 0.001
Poor/Inadequate	62.2% (28/45)	
Fair	19.5% (8/41)	
Good/Excellent	71.8% (257/358)	

*Adherence to recommended intervals by guidelines defined as a 10-year repeat colonoscopy recommendation if colonoscopy was normal in an average-risk individual, < 1 year was recommended if the bowel preparation was inadequate, or repeat colonoscopy not recommended if patient was ≥66 years at time of normal colonoscopy.

S279

Racial and Ethnic Disparities in Treatment for Early Onset Colorectal Cancer

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Introduction: Incidence of early onset Colorectal Cancer (eoCRC), defined as colorectal cancer diagnosed before the age of 50, is on the rise, with known racial and ethnic disparities in risk. The aim of this study was to examine racial and ethnic disparities in the treatment of eoCRC.
Methods: We conducted a retrospective cohort study using the National Cancer Institute's Surveillance, Epidemiology, and End Results 18 Registries (SEER 18) Program Research Plus database. We included all patients younger than 50 years old diagnosed with eoCRC from 2000-2017. Selected variables of interest included race/ethnicity, stage at diagnosis, and treatment (chemotherapy, radiation therapy, and surgery) received. Statistical analysis was performed using International Business Machines (IBM) SPSS Statistics software. Limitations of the SEER Research Plus database include the capture of only first course treatment as well as the possibility of not capturing chemotherapy or radiation events in some patients. This limitation is not present for surgical treatment events. The study was certified exempt by the University of Washington IRB.
Results: 71,651 patients were identified, of whom 24,229 patients had localized (stage I-IIc) eoCRC. 26,947 patients had regional (stage IIIa-c) eoCRC. 17,805 patients had distant (stage IVa/b) eoCRC (Table). Patients from racial/ethnic minorities with localized disease received surgery significantly less frequently than non-Hispanic Whites ($p< 0.01$), with the greatest differences seen for non-Hispanic Black patients and Hispanic patients. Patients from minority backgrounds with distant disease received chemotherapy significantly less frequently than non-Hispanic Whites ($p< 0.01$). These differences were greatest for non-Hispanic Black patients and American Indian/Alaska Native patients. There was no significant difference in radiation therapy frequency among patients with rectal cancer.
Conclusion: Significant differences in treatment received were seen between non-Hispanic Whites and racial/ethnic minorities with eoCRC. Non-Hispanic Black, Hispanic, and American Indian/Alaska native patients were at greatest risk of not receiving surgery for treatment of localized eoCRC or chemotherapy for distant disease. Further study is needed to understand the reason for these disparities.

Table 1. Portion of patients receiving specified treatment modalities stratified by stage of eoCRC and race

Stage	Race/Ethnicity	Surgery (n = 71,651)	Chemotherapy (n= 71,651)	Radiation - Rectal Cancers Only (n = 27,948)
Localized				
	Non-Hispanic White	95.30%	20.33%	29.31%
	Hispanic	92.68%	19.42%	24.48%

Table 1. (*continued*)

Stage	Race/Ethnicity	Surgery (n = 71,651)	Chemotherapy (n= 71,651)	Radiation - Rectal Cancers Only (n = 27,948)
	American Indian/Alaska Native	94.09%	25.32%	37.07%
	Asian/Pacific Islander	95.59%	19.54%	23.59%
	Non-Hispanic Black	93.01%	16.80%	19.21%
	Unknown	81.51%	3.39%	3.37%
Regional				
	Non-Hispanic White	96.73%	76.04%	74.10%
	Hispanic	94.84%	73.57%	74.15%
	American Indian/Alaska Native	93.95%	78.63%	82.47%
	Asian/Pacific Islander	96.35%	77.44%	74.53%
	Non-Hispanic Black	96.03%	70.06%	71.92%
	Unknown	94.68%	54.26%	67.74%
Distant				
	Non-Hispanic White	66.29%	80.81%	40.70%
	Hispanic	59.93%	78.02%	39.83%
	American Indian/Alaska Native	59.24%	77.72%	43.84%
	Asian/Pacific Islander	65.43%	81.88%	42.93%
	Non-Hispanic Black	61.13%	74.38%	38.53%
	Unknown	75.00%	67.86%	45.45%

S280

Appropriateness of Scheduled 5-Year Colorectal Cancer Surveillance Colonoscopies at an Academic Medical Center

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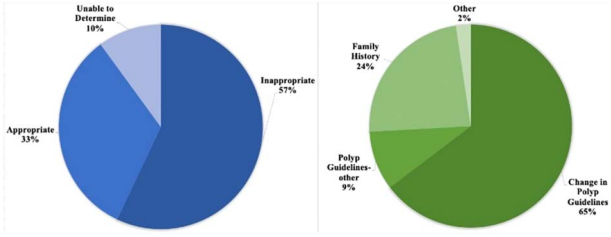
Introduction: Prudent adenoma detection and family history assessment results in increased surveillance colonoscopies for colorectal cancer screening (CRC), where recommended intervals for follow-up colonoscopies are based on prior colonoscopy findings (i.e., polyp number, size, pathology) as well as family history. Previous studies based on retrospective electronic health data determined that surveillance colonoscopies are often performed earlier than recommended intervals based on guidelines. These procedures expose patients to procedural risks, inconvenience with scheduling and unnecessary preps, and add to healthcare costs, as well as increase caseload for endoscopy centers that often have limited capacity. In the context of updated surveillance guidelines that lengthen follow-up intervals for some adenomas, we sought to assess the proportion of 5-year surveillance colonoscopies scheduled without appropriate indication.
Methods: We conducted a retrospective cohort study of all outpatient endoscopic procedures scheduled in a tertiary, academic medical center over a 4-week period (4/25/22-5/20/22). We screened for cases that had an active Electronic Health Record (EHR) flag for 5-year screening colonoscopy and were classified by the ordering provider as having a screening, non-diagnostic indication, and then confirmed the EHR flag and indication with chart review. Two physicians conducted chart review of last colonoscopy and ordering provider documentation to evaluate indication and appropriateness for 5-year screening based on US Multi-Society Task Force February 2020 guidelines.
Results: The 4-week period included 2,222 total procedures scheduled, of which 149 were colonoscopies scheduled for 5-year surveillance. Of these, 57% (85/149) were inappropriate based on current guidelines, which accounts for 4% (85/2,222) of total cases. 74% (63/85) of inappropriate cases were due to not meeting polyp-based guidelines, where 65% (55/85) was due to the 2020 change in guidelines. 24% (20/85) were based on inappropriately applied family history. (Figure)
Conclusion: A majority of cases scheduled for 5-year surveillance were not indicated, where most were inappropriate based on updated polyp-based guidelines. Interventions targeting these cases and assessing overall appropriateness of cases may reduce patient harm and increase the capacity for necessary procedures.



[0280] **Figure 1.** (a) Appropriateness of Scheduled 5-Year Surveillance Colonoscopies (b) Reasons for Inappropriate Colonoscopy Scheduling

S281

Adenoma Positivity Rate in a Young Urban Patient Population Undergoing Colonoscopy

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Introduction: There is a rise in colorectal cancer (CRC) in younger patients less than 45 years of age. However, there is limited data on the prevalence of colorectal neoplasia in patients younger than 45 years. Our study's objective was to evaluate the adenoma positivity rate (APR) for patients 40-49 years undergoing colonoscopy regardless of indication
Methods: We retrospectively reviewed our endoscopy database for all patients ages 40-49 who underwent colonoscopy at our institution between January 2018 and December 2021. We analyzed patients' demographics, BMI, indication, findings, and bowel preparation. Colonoscopies were excluded if the bowel preparation was inadequate (n=48), or the pathology revealed colonic adenocarcinoma (n=2). Statistical analysis was performed utilizing Chi-square testing with significance set at a $P < 0.05$

Results: A total of 621 colonoscopies were performed for patients between 40-49 years. After applying our exclusion criteria, 571 colonoscopies were analyzed. The overall APR was 31.2%, with no statistically significant difference between patients ages 40-44 and 45-49 years (34.9% and 30.3%, p=0.358). There was no statistically significant difference in the demographics between patients with adenomas and those without adenomas detected on colonoscopy, Table. Most of our patients identified their race as African American (73.6%), with an overall mean BMI of 33.2, and a slightly higher percentage were females (56.2). The indication for colonoscopy showed numeric differences that were not statistically significant, with the highest APR found in patients undergoing surveillance colonoscopy for a history of colon polyps compared to average-risk screening (42.6% vs 28.2%, p=0.167)

Conclusion: Our analysis of a relatively young patient population undergoing colonoscopy in an open-access colonoscopy suite, serving an urban community revealed an APR that is above 30% with no difference among patients 40-44 and 45-49 years old. Albeit our results are skewed due to a quarter of our patients undergoing high-risk screening or surveillance colonoscopy. Further research will help identify whether this similar adenoma burden translates to higher CRC rates for this younger population and its impact on CRC screening in the future

Table 1. Presence or absence of adenomas among patients ages 40-49 undergoing colonoscopy along with patient characteristics. (N=571)

Patient Characteristic (N, %)	Adenoma: N (%)	No Adenoma: N (%)	P-Value
Age			0.358
40-44 (106, 18.6)	37 (34.9)	69 (65.1)	
45-49 (465, 81.4)	141 (30.3)	261 (69.7)	
Gender			0.067
Female (321, 56.2)	90 (28.0)	231 (72.0)	
Male (250, 43.8)	88 (35.2)	162 (64.8)	
Race			0.891
African American (420, 73.6)	132 (31.4)	288 (68.6)	
Caucasian (44, 7.7)	14 (31.8)	30 (68.2)	
Other (39, 6.8)	10 (25.6)	29 (74.4)	
Unknown (68, 11.9)	22 (32.4)	46 (67.6)	
BMI			0.313
15-19 (8, 1.4)	1 (12.5)	7 (87.5)	
20-24 (86, 15.1)	32 (37.2)	54 (62.8)	
25-29 (144, 25.2)	44 (30.6)	100 (69.4)	
30-34 (135, 23.6)	41 (30.4)	94 (69.6)	
35-39 (87, 15.2)	32 (36.8)	55 (63.2)	
≥40 (111, 19.4)	28 (25.2)	83 (74.8)	
Indication			0.167
Average-risk Screening (354, 62.0)	100 (28.2)	254 (71.8)	
High-risk Screening (94, 16.5)	31 (33.0)	63 (67.0)	
Diagnostic (76, 13.3)	27 (35.5)	49 (64.5)	
Surveillance (47, 8.2)	20 (42.6)	27 (57.4)	

S282

Patient Navigator Pilot to Improve Completion of FIT Testing in Primary Care

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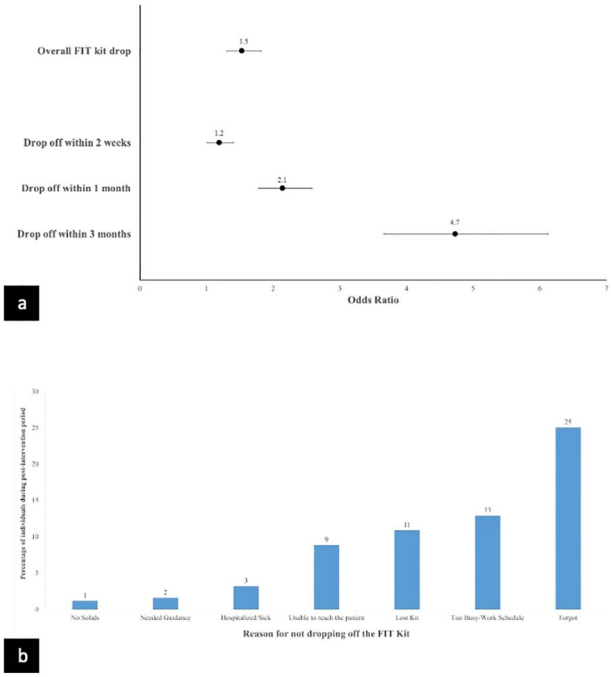
Introduction: Colorectal cancer (CRC) screening is a critical preventative service and part of routine patient care. CRC is the second leading cause of cancer death in the US, and yet a third of the eligible population does not undergo routine screening. Endoscopy centers have been stretched thin by both COVID-19 and the recent drop in screening initiation age to 45. Fecal immunochemical testing (FIT), a sensitive and specific CRC screening modality, may be used to reach and risk-stratify more patients to increase the yield for detecting advanced neoplasia and cancer, reducing pressure on colonoscopy centers. Unfortunately, FIT is often suboptimal as patients inconsistently complete and return the test for analysis.

Methods: We performed a retrospective analysis of 5211 individuals at a single internal medicine clinic who had FIT ordered as part of USPSTF recommended care from 01/2017 through 12/2021. Starting in 01/2021 we instituted a dedicated patient navigator to support patients in completing FIT. Chi-square, Fisher exact test, and Student's t-tests were performed for descriptive analyses. Multivariable logistic regression was used to compare FIT kit drop off rates pre- and post-intervention, with the model adjusted by age, gender, race, ethnicity, language, and insurance status. Analysis was performed in SAS version 9.4. (Table)

Results: The post-intervention period included 1181 (22.7%) patients. The predominant reasons cited for failure to complete testing were "forgot" (25%), "too busy" (13%), and "lost kit" (11%). Our intervention improved drop off rates from 46.4% to 51.3% at 2 weeks (OR 1.19, 95%CI 1.01-1.41), 56.7% to 73.7% at 1 month (2.14 [1.78-2.58]), 64.7% to 89.7% at 3 months (4.73 [3.66-6.12]), and 78.9% to 98.2% at 1 year (14.39 [8.25-25.12]). Overall, our intervention improved FIT kit drop off rates by 53.4% (1.53 [1.30-1.81]). FIT was positive in 4.9% (p=0.0529). (Figure)

Conclusion: FIT can increase CRC screening rates, particularly in resource-limited settings, and may decrease the burden on endoscopy centers nationwide by improving the efficiency of colonoscopy in the average risk screening population. The addition of a dedicated patient navigator is a simple intervention that, by providing culturally competent care and personalized attention, improves completion rates and return time, allowing FIT to be a reliable method of screening. The ability to increase screening rates and prioritize patients for diagnostic colonoscopies will ultimately lead to earlier detection and treatment of CRC.



[0282] **Figure 1.** (a) FIT kit drop off rates compared during pre- and post-intervention periods. (b) Reasons cited for not dropping off FIT kits during the intervention period

Table 1. Baseline characteristics of patients who underwent FIT testing, comparing pre- and post-intervention periods, from 2017 to 2021

Variable N (%)	Pre-Intervention	Post-Intervention	P-Value	Total
	N=4030 (77.3%)	N=1181 (22.7%)		N=5211 (100%)
Gender = female	1880 (46.7)	562 (48.3)	0.3139	2442 (47.0)
Age, mean (SD)	59.5 (+/- 6.8)	58.8 (+/- 8.4)	**0.0076**	59.3 (+/- 7.2)
45-50	265 (6.6)	210 (17.8)	< **0.0001**	475 (9.1)
51-64	2759 (68.5)	671 (56.8)	< **0.0001**	3430 (65.8)
65-75	1006 (25.0)	300 (25.4)	0.7593	1306 (25.1)
Hispanic/Latino	1740 (43.5)	529 (47.4)	**0.0200**	2269 (44.3)
Race				
White/Caucasian	1380 (34.6)	321 (27.4)	< **0.0001**	1705 (33.0)
Black or African American	910 (22.8)	279 (23.8)	0.4524	1189 (23.0)
Asian	115 (2.9)	25 (2.3)	0.1685	140 (2.7)
Other	1585 (39.7)	546 (46.6)	< **0.0001**	2131 (41.3)
Insurance				
Neighborhood	1426 (36.5)	435 (38.7)	0.3609	1861 (37.0)
Medicare	774 (19.8)	167 (14.9)	< **0.0001**	941 (18.7)
Medicaid	185 (4.7)	37 (3.3)	**0.0292**	222 (4.4)
Commercial	1519 (38.9)	481 (43.0)	0.0592	2000 (39.8)
Language				
English	2207 (54.8)	578 (48.9)	**0.0004**	2785 (53.4)
Spanish	1460 (36.2)	453 (39.0)	0.0899	1913 (36.8)
Portuguese	80 (2.0)	18 (1.6)	0.3342	98 (1.9)
Other	278 (6.9)	96 (8.3)	0.1133	374 (7.2)

S283

Increasing Time Interval Between Oral Sulfate Tablets for Bowel Preparation Reduces Incidence and Severity of Erosive Gastritis

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Introduction: Oral Tablet bowel preparation containing sodium sulfate, magnesium sulfate and potassium chloride (OST) was developed to improve patient compliance. We previously suggested a relationship between OST and erosive gastritis. Based on our prior findings we hypothesized that the potassium chloride component in OST is responsible for erosive changes and reducing contact time with gastric mucosa will decrease incidence of erosive gastritis. To achieve that we changed OST preparation instructions from dosing over 15-20 minutes as per package insert (OST-P) to one hour allowing 4-5 minutes delay and more water intake between Tablets (OST-D).

Methods: We conducted a retrospective review of patients undergoing upper esophagogastroduodenoscopy (EGD) at the time of colonoscopy by a single operator from December 12, 2021, to May 3, 2022. We compared the incidence of erosive gastritis in patients receiving OST-D versus oral sulfate solution (OSS) and PEG. We revised EGD images and classified erosive gastritis into mild (focal superficial erosions), moderate (diffuse superficial erosions), and severe (deep, cratered erosions, with scab). We reviewed EGD images from our prior OST study (OST-P) and classified lesions in the same manner. Exclusion criteria included NSAID use and H. pylori infection.
Results: 135 patients underwent EGD at the time of colonoscopy. 11 excluded due to NSAID use or H. pylori infection and 1 due to unavailable prep data. Of the remaining 123 patients, 41 received OST-D, 82 OSS and PEG. Among 41 OST-D patients reviewed, 24 (58%) had inflammatory changes characterized by erosions and adherent blood compared to 27/33 (82%) with OST-P (p=0.04). Severity in this study was lower with OST-D; severe erosive gastritis was seen in 1/41 (2.4%) moderate in 11/41 (27%) and mild in 12/41 (29%) compared to 4/33 (12%), 14/33 (42%) and 9/33 (27%) respectively with OST-P. Erosive changes were also found in 24/82 (30%) of patients who received OSS and PEG, which is significantly lower than OST- D group 24/41(58%, p < .01).
Conclusion: While these findings are consistent with our prior study which suggested an increased incidence of erosive gastritis with OST prep, this study suggests that increasing time interval between Tablets leads to a decrease in incidence and severity of erosive gastritis suggesting that erosive changes are related to retention of OST Tablets. Endoscopists need to be made aware of these findings to decrease incidence and severity of erosive gastritis in patients using OST.

S284

Family Matters: Impact of a Dot Phrase on Complete Family History Documentation During Initial Colorectal Cancer Screening Visits

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Introduction: Obtaining a complete family history (FH) informs gastrointestinal (GI) cancer screening and referrals for genetic testing, but this is inconsistently done during colorectal cancer (CRC) screening visits. Previously, we improved the rate of complete FHs obtained to 28.4% from 5.2% after implementing education and a FH screening form in clinic. In this study, we assessed the impact of sharing a FH dot phrase on the rate of complete FHs obtained and genetics referrals made during outpatient CRC screening visits.
Methods: We shared a dot phrase that prompts obtaining a complete FH to our gastroenterology division on February 9, 2022. A complete FH was defined as addressing history of cancer in first- and second-degree relatives, colon polyps in first-degree relatives, and GI disease. We reviewed outpatient GI CRC screening visits from February 10, 2022 to March 9, 2022, and compared them to a one-month period of pre-intervention visits. Patient characteristics, rates of complete FH and genetic referrals were extracted. Patients with prior colonoscopies or indications for diagnostic colonoscopy were excluded. Rates of complete FH and genetic referrals were compared between the pre- and post-intervention groups with unpaired T-tests.
Results: A total of 188 patient visits were included; 93 post-intervention and 81 pre-intervention. The pre-and post-intervention groups were overall similar, but there were more white patients in the post-intervention group (Table). Complete FHs were obtained in 46/93 (49.5%) of post-intervention visits compared to 23/81 (28.4%) of visits in the pre-intervention group (p = 0.004). Genetic referrals were placed in 1/93 (1.1%) of post-intervention visits compared to 3/81 (3.7%) of pre-intervention visits (p=0.270).
Conclusion: In our study, the rate of complete FHs obtained increased significantly to 49.5% from 28.4% after introduction of a FH dot phrase . The rate of genetic referrals was unchanged, though a larger sample size may be required to detect any potential difference. Given there were more white patients in the post-intervention group, further observation of complete FH rates in patients based on race is warranted. When upper GI problems were addressed along with CRC screening, FHs were often incomplete, suggesting a target for further intervention. Overall, further efforts are warranted to increase the rate of complete FHs obtained during CRC screening visits.

Table 1. Baseline characteristics and statistical analyses

Patient Characteristics	Whole Cohort N=174	Pre-intervention N= 81	Post-intervention N= 93	p value
Average age at screening, standard deviation [years]	51	51	50	
Gender, n (%)				
Male	75 (43%)	33 (41%)	42 (45%)	0.1416
Female	99 (57%)	48 (59%)	51 (55%)	0.6672
Race/Ethnicity, n (%)				
AA	85 (49%)	44 (54%)	41 (44%)	0.6455
Asian	9 (5%)	3 (3.7%)	6 (6.5%)	0.1585*
Hawaiian or Pacific Islander	0 (0%)	0 (0.0%)	0 (0%)	-
Hispanic	12 (6.9%)	5 (6.2%)	7 (7.5%)	0.4122
Other	8 (4.6%)	5 (6.2%)	3 (3.2%)	0.3173*
Unknown	11 (6.3%)	7 (8.6%)	4 (4.3%)	0.2005*
White	49 (28%)	17 (21%)	32 (34%)	**0.0024**
Complete family history	69 (40%)	23 (28.4%)	46 (49.5%)	**0.004**
Genetic referral	3 (1.7%)	3 (3.7%)	1 (1.1%)	0.2695

*High estimated error, category with value less than 5.

S285

Validation of a Deep Machine Learning Tool to Determine Intra-Procedural Screening Colonoscopy Quality Indicators in an Academic Health System

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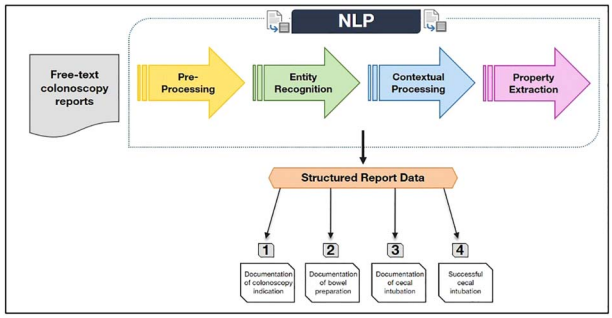
Introduction: High quality screening colonoscopy is the hallmark of effective colorectal cancer (CRC) prevention. However, continuously monitoring colonoscopy quality indicators for providers and health systems remains a challenge. We developed and validated a natural language processing (NLP) tool to automatically measure 4 intraprocedural colonoscopy quality improvement (QI) metrics and characterized its performance.
Methods: We implemented this quality initiative in a large academic healthcare system that performs >15,100 screening colonoscopies yearly in 6 endoscopy centers. We trained and developed an NLP algorithm that extracts and analyzes data from free-text colonoscopy reports to measure colonoscopy indication (IND), bowel preparation (BP), cecal intubation (CI), and successful cecal intubation (SCI) (Figure). We then randomly selected 600 screening colonoscopies performed between 6/2020-2/2021 to validate the NLP's performance. We compared the NLP-derived quality metrics to manual chart review (gold standard). We calculated the sensitivity, specificity, positive predictive value, negative predictive value, F-score, and accuracy for each metric. When NLP and manual review were discordant, another physician repeated manual review to resolve the discrepancy.
Results: Our validation cohort (n=600) was 49.2% female with mean age 61.5 (sd=8.9, Table). Overall, the NLP had excellent performance across all four evaluated quality metrics when compared to manual chart review. For all metrics, sensitivity ranged from 99.3 to 100.0% and specificity ranged from 94.3 to 100.0% (Table). Within our cohort, the NLP misclassified only 2 cases for the documentation of IND. For documentation of BP, the NLP misclassified 1 case. Both misclassifications (IND and BP) were due to conflicting documentation by the endoscopist in the same colonoscopy report. The NLP had perfect performance for the documentation of CI. Finally, for SCI, NLP misclassified 12 cases, mainly due to the endoscopist not mentioning the word "cecum" or documenting "terminal ileum" instead.
Conclusion: We developed an automated NLP algorithm that is highly accurate and sensitive in determining four priority intraprocedural colonoscopy quality indicators. Metrics from this tool can inform where to invest resources to further improve QI measures. In the future, we hope to optimize the NLP performance, measure additional colonoscopy quality metrics, and disseminate the NLP algorithm to other health systems to improve CRC outcomes.



[0285] **Figure 1.** Schematic of the natural language processing pipeline. This diagram depicts a model of how the NLP algorithm process data. All new colonoscopy reports are automatically imported daily into our neural network. Relevant information is then identified and labeled appropriately converting free text into a structured format. The data extracted by the NLP enables downstream analyses and interpretation of the quality indicators

Table 1. Performance of the NLP for 4 quality metrics: (1) colonoscopy indication, (2) bowel preparation, (3) cecal intubation, and (4) successful cecal intubation; N=600

Documentation of colonoscopy indication (IND)			
Manual review	**Natural Language Processor (NLP)**		
	"Screening" detected	**"Screening" not detected**	**Total**
"Screening" detected	314	0	314
"Screening" not detected	2	284	286
Total	316	284	600
Test characteristics	Sensitivity	99.3%	
	Specificity	100%	
	Positive Predictive Value (PPV)	100%	
	Negative Predictive Value (NPV)	99.4%	
	F1-score*	0.996	
	Accuracy	99.7%	
Documentation of bowel preparation (BP)			
Manual review	NLP		Total
	BP documented	BP not documented	
BP documented	599	0	599
BP not documented	1	9	1
Total	600	0	600
Test characteristics	Sensitivity	100%	
	Specificity	97.5%	
	PPV	99.8%	
	NPV	N/A	
	F1-score*	0.999	
	Accuracy	99.8%	
Documentation of cecal intubation (CI)			
Manual review	NLP		Total
	CI documented	CI not documented	
CI documented	599	0	599
CI not documented	0	1	1
Total	599	1	600
Test characteristics	Sensitivity	100%	
	Specificity	100%	
	PPV	100%	
	NPV	100%	
	F1-score*	1	
	Accuracy	100%	
Documentation of successful cecal intubation (SCI)			
Manual review	NLP		Total
	SCI documented	SCI not documented	
SCI documented	437	3	440
SCI not documented	9	150	159
Total	446	153	599
Test characteristics	Sensitivity	99.3%	
	Specificity	94.3%	
	PPV	98.0%	
	NPV	98.0%	
	F1-score*	0.987	
	Accuracy	98.0%	

Abbreviations: NLP: natural language processor; IND: colonoscopy indication; BP: documentation of bowel preparation; CI: cecal intubation; SCI: successful cecal intubation; PPV: positive predictive value; NPV: negative predictive value.
*The F1-score combines the precision and recall of a classifier into a single metric by taking their harmonic mean.

S286

Is There a Lower Adenoma Detection Rate in Patients Age 45-49 Who Undergo a Screening Colonoscopy?

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Introduction: Colorectal cancer (CRC) is the #2 cancer killer in the US. Recently, the USPSTF guidelines reduced the CRC screening age to 45 yo for normal-risk individuals. The adenoma detection rate (ADR) of 25% (20% F, 30% M) is an accepted benchmark of a quality colonoscopy in 50-75 yo. Since prevalence of adenomas increases with age, it has been suggested that a 1-3% reduction in ADR can be anticipated in 45-49 yo patients undergoing a screening colonoscopy. No studies have evaluated the ADR among 45-49 yo screened in 2021, since the integration of the new guidelines. **Aim: To compare the ADR in screening colonoscopies for patients ages 45-49 yo vs. older cohorts in 2021.**
Methods: A retrospective analysis of records was performed on 6386 asymptomatic 45-75 yo patients who underwent a screening colonoscopy. Exclusion criteria included: (1) prior screening test, (2) incomplete colonoscopy, (3) inadequate bowel preparation, or (4) hereditary CRC syndrome/CRC family history. ADR is defined as the percentage of colonoscopies with ≥1 tubular adenoma (TA), tubulovillous adenoma (TVA), or sessile serrated adenoma (SSA). An advanced lesion was defined as a TA/SSA >10 mm, villous or high grade dysplasia, traditional serrated adenoma, or >5 adenomas or SSA in any combination, or cancer.
Results: 5985 colonoscopies (2857 M,3128 F) were performed with an average withdrawal time ~11 minutes. Table shows ADR results. The 45-49 yo cohort represented 10.9% of the screened population. The ADR in the 45-49 age range was 32.1% vs 38.7% (P< 0.0097) for the 50-75 age cohort.
Conclusion: In our study, 10.9% of the screened population was between 45-49 years old. The ADR was significantly lower in the 45-49 yo cohort as compared to the 50-75 yo cohort; however, the 32% ADR remains well above the accepted benchmark of 25%. The APC is lower in 45-49 yo patients, and a larger sample size may show reduction in ADR when compared to 50-54 yo. Gastroenterologists can expect only a slightly lower ADR in the newest screening cohort (age 45-49), but it remains critical that physicians emphasize the importance of average-risk CRC in the younger demographic.

Table 1. Adenoma Detection Rates in Screening Colonoscopies

	45-49 y n = 654	50-54 y n = 2563	P value (compared with 45-49)	50-75 y n = 5331	P value (compared with 45-49)
Overall ADR (%)	32.1	36.2	0.1158	38.7	0.0097
ADR (%) in men n=2857	37.2	41.6	0.2951	44.2	0.0885
ADR (%) in women n=3128	28.2	30.6	0.4586	33.6	0.0888
APC	0.56	0.69	0.0005	0.77	< 0.0001
CRC detected	1	2	0.5757	10	0.8452

ADR: adenoma detection rate; APC: adenoma per colonoscopy; CRC: colorectal cancer.

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S287

Comparison of Cost-Effectiveness Outcomes Between a Novel Multitargeted Stool-Based RNA Test and Alternative Non-Invasive Stool and Blood Tests for Colorectal Cancer Screening

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Introduction: Colorectal cancer (CRC) mortality has been significantly mitigated by increased CRC screening via colonoscopy. Colonoscopy has low compliance rates due to invasiveness, procedure-associated risks, bowel preparation, and time requirements. Existing non-invasive screening methods are limited by relatively low sensitivity for precancerous lesions, especially advanced adenomas (AAs). Using a Markov model, cost-effectiveness outcomes were compared between a novel multitargeted stool RNA (mt-sRNA) test, existing stool-based screening tests (fecal immunochemical test [FIT], and multitarget stool DNA [mt-sDNA]), no screening, and a recently introduced triennial blood-based screening test.
Methods: The Markov model compared morbidity, mortality, and cost using 1,000 average-risk patients 45-75 years of age over a 30-year time horizon. The model input included test-specific sensitivity and specificity with a fixed incidence and prevalence of CRCs/AAs to assess lesion detection rates across each screening method. Reimbursement rates were assumed equal for blood, mt-sDNA, and mt-sRNA tests ($508). Data on distribution across disease stages and five-year survival rates predicted long-term outcomes for patients with CRC. The model accounts for the cost of screening, complications associated with colonoscopy, surveillance/follow-up requirements, and the cost of CRC treatment. For the primary analysis, adherence was assumed to be 100%. For secondary research, adherence was set at 40%, 60%, and 80%.
Results: At 100% adherence, the mt-sRNA test resulted in an additional reduction in CRC cases by 68.1% (blood test), 42.5% (mt-sDNA test), 30.8% (FIT test), and 82.1% (no screening). The mt-sRNA screening strategy also resulted in the reduction of deaths by 64.7% (blood test), 39.8% (mt-sDNA test), 29.8% (FIT test), and 78.3% (no screening). When adherence is set at 40%, 60%, or 80%, use of the mt-sRNA test results in an increased number of pre-cancerous adenomas detected relative to all other screening strategies. Incremental costs associated with the mt-sRNA test were intermediary with higher costs associated with follow-on colonoscopy/surveillance, and lower costs associated with CRC treatment.
Conclusion: This model suggests that CRC screening tests that target advanced adenomas detection have superior cost-effectiveness due to better cancer prevention. The mt-sRNA test is a more cost-effective alternative for colorectal cancer screening in the average-risk population than other non-invasive strategies (Table).

Table 1. Cost-effectiveness of mt-sRNA against other screening modalities at variable adherence rates, per 1000 patients over a 30-year time horizon

Adherence rate	mt-sRNA test vs.	Incremental CRC cases prevented	CRC cases reduction (%)	CRC deaths reduction (%)	Incremental costs per CRC case prevented	Incremental costs per CRC case prevented
40% for all tests	Blood test	14	39.5%	35.1%	-$175,379	-$311,289
	mt-sDNA	6	22.7%	19.9%	-$168,747	-$302,667
	FIT	6	21.2%	19.0%	$8,666	$14,681
	No screening	20	48.1%	42.8%	$67,232	$122,252
60% for all tests	Blood test	16	51.5%	47.0%	-$182,381	-$309,202
	mt-sDNA	7	30.8%	27.7%	-$178,940	-$293,907
	FIT	5	23.0%	21.2%	$188,435	$296,188
	No screening	27	63.6%	58.3%	$29,789	$52,683
80% for all tests	Blood test	17	60.3%	56.2%	-$188,028	-$306,278
	mt-sDNA	7	37.2%	34.2%	-$182,141	-$284,899
	FIT	4	26.1%	24.6%	$409,606	$607,669
	No screening	31	73.9%	69.2%	$19,817	$34,312
100% for all tests	Blood test	16	68.1%	64.7%	-$3,104,328	-$103,478

Table 1. (*continued*)

Adherence rate	mt-sRNA test vs.	Incremental CRC cases prevented	CRC cases reduction (%)	CRC deaths reduction (%)	Incremental costs per CRC case prevented	Incremental costs per CRC case prevented
	mt-sDNA	6	42.5%	39.8%	-$1,073,985	-$35,799
	FIT	3	30.8%	29.8%	$2,289,314	$76,310
	No screening	35	82.1%	78.3%	$612,243	$20,408

S288

Long-Term Follow-Up of Colonoscopy Quality Monitoring

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Introduction: High-quality colonoscopy is paramount to effective prevention of colorectal cancer. A variety of interventions have been proposed to monitor and improve colonoscopy quality at operator and institutional levels. Since 2009, endoscopists at our university-affiliated, Veterans Affairs Medical Center (VAMC) have received a quarterly report card summarizing individual colonoscopy quality indicators. This intervention was associated with short-term improvement in adenoma detection rate (ADR). However, long-term effects of this monitoring on colonoscopy quality metrics, and appropriate monitoring frequency, are unclear.
Methods: We conducted a retrospective study of prospectively administered quarterly colonoscopy quality report cards at a VAMC from April 1, 2012 to August 31, 2019. Anonymized reports included individual endoscopists' ADR, cecal intubation rates, and withdrawal time. We included endoscopists who had contributed at least 50 colonoscopies per year, and at least 4 consecutive quarters during the study time frame. Linear regression models were used to determine and test slopes over time for each quality metric by physician, and to determine if slopes differed for data above vs below the median for each metric. Analyses were performed for quarterly and yearly data to assess whether there are significant differences based on monitoring frequency.
Results: Data from the report cards of 17 endoscopists who had performed 24,361 colonoscopies were included. The mean quarterly ADR (±SD) was 51.7% (±11.7%), while the mean yearly ADR was 47.2% (±13.8%). Over the study time frame, there was a small increase in overall ADR based on both quarterly and yearly measurements (slope + 0.6%, p=0.02; and slope +2.7%, p < 0.001, respectively). However, most endoscopists had no significant change in their ADRs (Table). Overall cecal intubation rates and withdrawal times did not change significantly. Analysis of standard deviation of ADRs (to represent outcome variability over time within a physician) showed no significant difference between yearly and quarterly measurements (p=0.064). Individual endoscopists' ADR standard deviation differences between yearly and quarterly measurement ranged from -4.7% to +6.8%.
Conclusion: Long-term colonoscopy quality monitoring was paralleled with modest improvement in overall ADR, likely due to temporal trends. For endoscopists with baseline high ADR, intensive monitoring and reporting of colonoscopy quality metrics is not necessary and could be performed annually.

Table 1. Mean ADR and slopes of ADR for yearly and quarterly measurement

	Quarterly				Yearly			
Physician	Mean (± SD)	Slope	SE	p-value	Mean (± SD)	Slope	SE	p-value
All	51.7% (+ 11.7%)	0.6%	0.2%	0.021	47.2% (+ 13.8%)	2.7%	0.4%	< .001
Physician A	48.5% (+ 7.8%)	1.1%	2.6%	0.689	49.3% (+ 5.7%)	-3.0%	2.3%	0.314
Physician B	39.4% (+ 5.4%)	0.2%	0.5%	0.628	36.8% (+ 9.4%)	1.6%	1.4%	0.306
Physician C	66.3% (+ 6.0%)	1.6%	0.7%	0.022	64.1% (+ 7.6%)	2.3%	1.2%	0.113
Physician D	53.4% (+ 9.2%)	1.2%	0.8%	0.155	47.9% (+ 13.3%)	3.5%	1.7%	0.084
Physician E	33.8% (+ 11.5%)	4.7%	10.8%	0.692	21.0% (+ 15.0%)	13.6%	6.3%	0.275
Physician F	46.4% (+ 6.3%)	0.6%	2.0%	0.761	48.2% (+ 4.8%)	1.8%	2.3%	0.531
Physician G	48.0% (+ 11.5%)	0.1%	1.1%	0.948	39.6% (+ 9.1%)	1.9%	1.3%	0.201
Physician H	60.3% (+ 8.6%)	1.2%	0.8%	0.118	54.0% (+ 13.3%)	3.6%	1.6%	0.070
Physician I	55.1% (+ 6.2%)	-1.3%	0.9%	0.167	53.2% (+ 9.1%)	1.4%	2.3%	0.589
Physician J	51.8% (+ 7.5%)	0.4%	1.5%	0.802	48.9% (+ 12.2%)	3.6%	3.9%	0.431
Physician K	38.5% (+ 11.0%)	-1.4%	1.3%	0.290	35.5% (+ 12.2%)	1.6%	2.4%	0.533
Physician L	50.1% (+ 8.1%)	14.2%	3.4%	0.052	35.9% (+ 14.9%)	-21.0%		
Physician M	48.2% (+ 11.3%)	11.8%	3.8%	0.026	38.6% (+ 15.3%)	7.1%	13.6%	0.692
Physician N	60.0% (+ 7.5%)	2.0%	2.9%	0.506	59.7% (+ 2.8%)	0.8%	2.7%	0.819
Physician O	52.9% (+ 6.4%)	1.3%	1.2%	0.277	52.1% (+ 5.2%)	1.9%	1.6%	0.302
Physician P	59.1% (+ 10.4%)	6.0%	2.5%	0.043	59.2% (+ 8.6%)	5.6%	2.6%	0.160
Physician Q	55.2% (+ 10.7%)	0.4%	1.1%	0.747	48.5% (+ 13.6%)	3.0%	1.9%	0.169

S289

Artificial Intelligence-Assisted Colon Polyp Detection: Initial Experience by Gastroenterology Fellows

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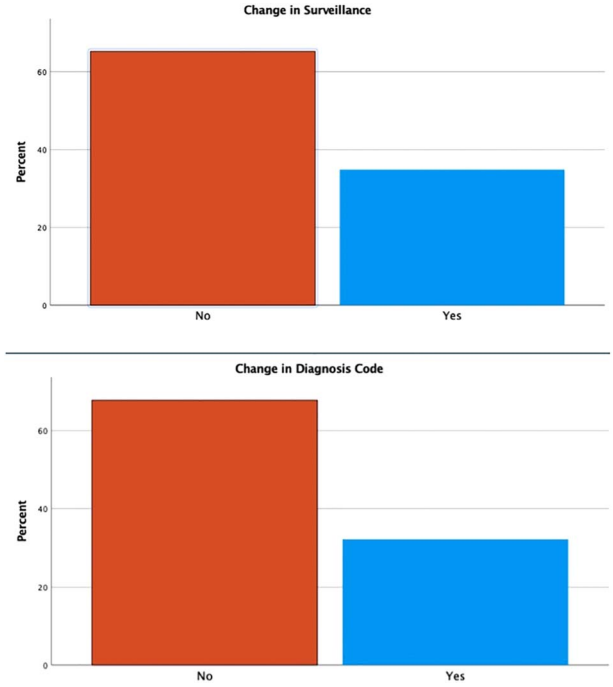
Introduction: One-fourth of colorectal neoplasia are missed on screening colonoscopies. Polyp detection rate is an important quality indicator for colonoscopy performance. It varies widely among providers in both community and academic settings. Currently, professional societies recommend an adenoma detection rate of at least 20% for women and 30% for men. The aim of our study is to evaluate the use of artificial intelligence (AI) during colonoscopies performed by gastroenterology fellows to assist their detection of colon polyps.
Methods: Patients undergoing outpatient colonoscopy in two specific rooms equipped with GI Genius (Medtronic, Minneapolis, MN) from February to May 2022 were eligible for investigation. Inclusion criteria were patient procedures done by 2nd and 3rd year fellows supervised by one of 4 faculty members. Demographic data, colonoscopy quality measures and number of polyps were recorded. An inquiry by the faculty was performed with a binary response of yes or no for each detected polyp during the procedure to assess if AI assisted in fellow polyp detection. The polyp detection rate by AI was calculated as -

(number of procedures AI assisted in detecting polyps / total number of procedures) x 100. In addition, data on if a change in endoscopic billing code occurred or surveillance interval was obtained as a result of AI. Descriptive statistics were used to analyze results.

Results: A total of 115 patients met inclusion criteria and comprise the study group. Average age of the participants was 56.9 yrs. Females were 57% and males were 43%. African Americans enrolled in accounted for 45.2%, Caucasians 50.4%, Hispanic/Latino 2.6% and 1.8% Asians. The mean Boston Bowel Prep Score was 7.5. Mean withdrawal time was 14.4 minutes. The AI assisted polyp detection rate was 46%. Reduced surveillance interval in 34.8% and increased procedure revenue in 32.2% occurred in patients with fellow performed AI assisted colonoscopy. (Figure)

Conclusion: The current investigation revealed that AI assisted colonoscopy resulted in an acceptable polyp detection rate, reduced post procedure surveillance intervals in those with AI detected lesions and increased overall revenue from trainee-performed procedures. AI improved quality of fellow colonoscopy exams by reducing missed lesions, allowing for correct patient stratification and maximal polyp/cancer reduction from the procedure. These preliminary results should be confirmed using larger cohorts of fellow procedures using AI during colonoscopy. (Table)



[0289] **Figure 1.** Graph on the top shows percent change in surveillance interval and the graph at the bottom shows percent change in diagnosis code

Table 1. Demographics and Results

Variable		
Age	Mean	Std. Deviation
	56.9	11.9
Gender	N	%
Male	49	43
Female	65	57
Race	N	%
African American	52	45.2
Caucasian	58	50.4
Hispanic or Latino	3	2.6
Asian	2	1.7
BBPS Right Score	N	%
1	7	6.1
2	51	44.3
3	57	49.6
BBPS Transverse Score	N	%
1	2	1.7
2	48	41.7
3	65	56.5
BBPS Left Score	N	%
1	2	1.7
2	50	43.5
3	63	54.8
Total BBPS	Mean	Std. Deviation
	7.5	1.56

Table 1. (*continued*)

Variable		
Withdrawal Time (minutes)	Mean	Std. Deviation
	14.4	10.19
Polyps Removed	Mean	Std. Deviation
Cecum		
Total	0.21	0.58
AI Assisted	0.12	0.33
Ascending Colon		
Total	0.44	0.9
AI Assisted	0.14	0.35
Transverse Colon		
Total	0.53	0.99
AI Assisted	0.21	0.54
Descending Colon		
Total	0.35	0.86
AI Assisted	0.1	0.33
Sigmoid Colon		
Total	0.45	0.88
AI Assisted	0.12	0.37
Rectum		
Total	0.19	1.02
AI Assisted	0	0
Entire Colon		
Total	2.2	3
AI Assisted	0.7	0.9
Did this reduce surveillance interval	N	%
No	75	65.2
Yes	40	34.8
Did it change procedure code	N	%
No	78	67.8
Yes	37	32.2

S290

Is Fecal Immunochemical Test (FIT) the Answer to Increasing Colorectal Cancer Screening (CRC) Uptake in the Filipino Community? Results From a Conjoint Analysis Survey

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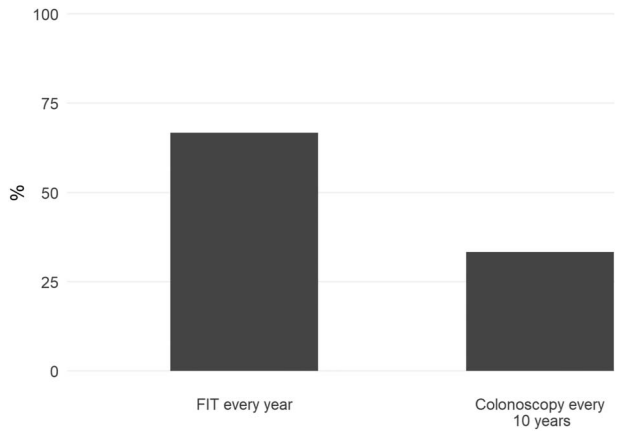
Introduction: Asian Americans are the fastest growing major racial/ethnic group in the US, with Filipinos comprising the 3rd largest group. While >80% of Filipinos are proficient in English, and have insurance rates, education levels, and incomes that exceed the general US population, they have lower CRC screening rates and worse CRC outcomes vs. non-Hispanic Whites. To begin to address this disparity, we used conjoint analysis to understand Filipinos' preferences for the different CRC screening test options.
Methods: To quantify Filipinos' preferences for CRC screening tests, we conducted a choice-based conjoint analysis survey for individuals ≥40yo at average risk for CRC who had not undergone prior screening. From 4/29-11/7/21, we recruited Filipinos at an academic medical center and through a national survey research firm (Cint). Using the conjoint data, we performed simulations to determine each individual's preferred screening test; for this analysis, we focused on the proportion of people who preferred annual FIT or colonoscopy every 10 years as both are tier 1 tests according to the US Multi-Society Task Force (MSTF) on CRC. We then performed logistic regression to explore whether demographics predicted decision making on FIT vs colonoscopy; variables with $p < .20$ from bivariate analyses were included as covariates in the regression model.
Results: Overall, 105 participants completed the survey; most respondents were female (74.3%) and aged 40-49y (84.8%). Moreover, 64.8% of participants stated they planned to get screened for CRC and they reported high self-perceived benefits of CRC screening (median 4.4, IQR 3.8-4.8; 1-5 scale, higher=more beneficial). When performing simulations using the conjoint data for the US MSTF tier 1 tests, we found that 66.7% of respondents preferred an annual FIT while 33.3% preferred a colonoscopy every 10 years (Figure). In a regression analysis that accounted for sex, marital status, household income, employment status, and geographic region, no variables were significantly associated with individual's preference for FIT over colonoscopy (Table).
Conclusion: We found that 2 in 3 Filipinos prefer annual FIT over colonoscopy for their CRC screening and that demographics poorly predict individual decision making. To improve CRC screening uptake in the Filipino community, our data suggest that community-based interventions should either focus primarily on FIT or employ a choice-based approach (ie, FIT or colonoscopy).



[0290] **Figure 1.** Data from simulations using conjoint analysis data assessing the proportion of respondents who would prefer each MSTF tier 1-recommended test (N=105)

Table 1. Regression analysis on preferring FIT every year over colonoscopy every 10 years for CRC screening; screening test preferences were determined through simulations from conjoint analysis-derived data (N=105)

Variable	Prefers FIT every year for CRC screening	
	n (% of row)	aOR [95% CI]
Sex:		
Male	21 (77.8%)	Reference
Female	49 (62.8%)	0.61 (0.20, 1.86)
Marital status:		
Married or living with a partner	53 (62.4%)	Reference
Not married	17 (85.0%)	2.65 (0.61, 11.44)
Total household income:		
≤$100,000	34 (79.1%)	reference
>$100,000	31 (62.0%)	0.72 (0.24, 2.20)
Prefer not to say	5 (41.7%)	0.23 (0.05, 1.12)
Employment status:		
Unemployed, on disability, on leave of absence from work, retired, or a homemaker	19 (82.6%)	reference
Employed or student	51 (62.2%)	0.36 (0.10, 1.31)
US region:		
Northeast/South/ Midwest	15 (83.3%)	reference
West	55 (63.2%)	0.70 (0.15, 3.21)
Has non-first degree relative or friend diagnosed with CRC	11 (44.0%)	0.42 (0.15, 1.16)

S291

Demographic and Socio-Economic Trends in Colon Cancer Screening Rates Among Older Adults in the United States

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Introduction: Colorectal cancer (CRC) screening decreases incidence and improves survival. Screening rates can be influenced by disparities in demographic, social and economic factors. Using a large US database, We aimed to study the demographic and socio-economic factors affecting colon cancer screening rates among older adults.
Methods: We used the Behavior Risk Factor Surveillance System, a nationally representative health-related telephone survey in 2020, to compare reported colorectal cancer screening rates. We included all respondents over the age of 50 eligible for colon cancer screening. We performed binary logistic regression modeling to obtain adjusted odds ratios (aORs) adjusting for race, level of education, health care access limited by insurance coverage and cost. Weighted percentages were calculated as appropriate. Statistical analysis was performed using IBM SPSS version 25, IBM corp.
Results: Of the 401,959 patients surveyed, 132,128 (72.39%) eligible patients had reported undergoing at least one of recommended CRC tests in the appropriate time interval, 43,570 (27.61%) had reported not undergoing any form of screening. Individuals with no cost issues related to access to a doctor in the past year, graduated high school, college attendance and Caucasian had a lower reported risk of lack of CRC screening (aOR 0.729, 0.699, 0.761 p< 0.001; aOR 0.829, 0.788, 0.872 p< 0.001; aOR 0.684, 0.651, 0.720, p< 0.001, aOR 0.731, 0.698, 0.765 p< 0.001 respectively). Individuals without insurance, minority races and females had a higher reported risk of lack of CRC screening (aOR 3.230, 3.082, 3.384 p< 0.001; aOR 1.459, 1.350, 1.576 p< 0.001; aOR 1.084, 1.059, 1.110 p< 0.001 respectively). (Table)
Conclusion: In this large national survey, we found a modest increase in reported risk of lack of appropriate CRC screening in individuals without insurance, minority groups and females. Individuals with Caucasian race, no cost issues, high school or college education were associated with higher rates of appropriate CRC screening. Further studies on the influence of social determinants of health are required to study its effect on CRC screening rates.

Table 1. Logistic regression Modeling to obtain adjusted odds ratios (aORs) adjusting for race, level of education, health care access limited by insurance coverage and cost

	P value	Adjusted Odds Ratio (aOR)	95% C.I.	
			Lower	Upper
No cost issues	< .001	.729	.699	.761

Table 1. (*continued*)

	P value	Adjusted Odds Ratio (aOR)	95% C.I.	
			Lower	Upper
No insurance	.000	3.230	3.082	3.384
Female	< .001	1.084	1.059	1.110
Age 55 to 59	.000	.441	.426	.457
Age 60 to 64	.000	.370	.358	.384
Age 65 to 64	.000	.284	.273	.294
Age 65 to 69	.000	.234	.225	.244
Age 60 to 74	< .001	.260	.241	.281
Graduated high school	< .001	.829	.788	.872
Attended College	< .001	.684	.651	.720
Graduated College	< .001	.535	.509	.563
Caucasian	< .001	.731	.698	.765
African American	< .001	1.459	1.350	1.576
American Indian	< .001	1.295	1.190	1.409
Asian only	.006	1.253	1.068	1.470
Other Race	< .001	1.138	1.056	1.225

S292

Socioeconomic Status: An Important Determinant for Follow-Up for Surveillance Colonoscopy After Endoscopic Mucosal Resection

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University of Alabama Birmingham, Birmingham, AL.

Introduction: Alabama had significantly higher incidence of colorectal cancer (CRC)at 43.5 compared to the US rate 39.5, and African Americans have higher rate of CRC compared to Caucasian individuals. There is compelling evidence that surveillance colonoscopy after high-risk adenoma polypectomy can reduce the risk of developing CRC.Our objective was to identify risk factors associated with poor follow up after undergoing colonoscopy with endoscopic mucosal resection (EMR).
Methods: We performed retrospective chart review of patients who had EMR at our facility between June 2016-March 2022.Patient demographics, referral, procedural and census data were collected. Census data obtained was used to evaluate income, median household income, and educational attainment. Patients were divided into two groups; poor and good follow up. Poor follow up was defined as those who failed to follow up and/or presented for surveillance colonoscopy >1 month after the recommended timeframe.
Results: Initial chart review included 520 eligible patients;73 were excluded due to lack of referral data, and 59 with recent EMR whose recommended surveillance colonoscopy has not passed. Of the included 388 patients, 293 (75.5%) had poor follow up and 95 (24.5%) had good follow up. Descriptive statistics of the various characteristics and comparisons of the of two groups is presented in Table. Compared to individuals with good follow up, there was a significant association of poor follow up with patients whose index colonoscopy was performed at an outside hospital (p=0.003) and if the index colonoscopy was their first colonoscopy (p=0.04). Additionally, census data revealed lower median home values were associated with poor follow up ($168,382) when compared to good follow up ($185,034). There was a trend to poor follow up in patients with obesity (80.5%), former alcohol use (88.9%), patients insured by Medicaid (88.9%), and minority populations including African American, and Hispanic/other ethnicities (77.1%,90.9%, respectively).
Conclusion: Our study illustrates that social economic status has significant impact on surveillance colonoscopy after EMR, and outside hospital referral are more likely to have poor follow up compared to in house referrals. Given the potential impact this data has for reducing risk of developing CRC in lower social economic individuals, further studies are needed to validate this finding and stratify predictors of poor follow up.

Table 1. **Descriptive characteristics and comparison of poora vs goodb follow up in patients who underwent EMR at UAB between June 2016-March 2022**

	Overall	Follow-up		p value
	N=388	Poor n=293 (75.5%)	Good n=95 (24.5%)	
Age (years), mean (SD)	63 (10.4)	64 (10.4)	62 (10.4)	0.23[c]
Sex				
Male	52.1%	75.3%	24.8%	0.89[d]
Female	47.9%	75.8%	24.2%	
Race/Ethnicity				
Caucasian	67.8%	73.8%	26.2%	0.38[d]
African American	28.1%	77.1%	22.9%	
Other	2.8%	90.9%	9.1%	
Type of insurance				
Private	45.9%	74.7%	25.3%	0.39[d]
Medicare	47.4%	75.0%	25.0%	
Medicaid	4.6%	88.9%	11.1%	
Uninsured	2.1%	75.0%	25.0%	
BMI				
less than 24.9 – Underweight/ Normal	24.8%	72.8%	27.2%	0.11[d]
between 25.0 and 29.9 – Overweight	32.4%	70.0%	30.0%	
more than 30.0 – Obese	42.9%	80.5%	19.5%	
ASA classification				
1	0.8%	66.7%	33.3%	0.84[d]
2	60.2%	75.5%	24.5%	
3	38.5%	75.8%	24.2%	
4	0.5%	50.0%	50.0%	
Smoking				

Table 1. (*continued*)

	Overall	Follow-up		p value
	N=388	Poor n=293 (75.5%)	Good n=95 (24.5%)	
Current	25.0%	76.3%	23.7%	0.79[d]
Former	26.8%	73.1%	26.9%	
Never	47.7%	76.2%	23.8%	
Alcohol				
Current	46.1%	72.6%	27.4%	0.25[d]
Former	6.9%	88.9%	11.1%	
Never	46.4%	76.1%	23.9%	
Drugs				
Current	3.4%	84.6%	15.4%	0.85[d]
Former	4.4%	70.6%	29.4%	
Never	87.9%	75.4%	24.6%	
Employment				
Employed	29.9%	74.1%	25.9%	0.99[d]
Unemployed	6.9%	74.1%	25.9%	
Retired	28.4%	75.5%	24.6%	
Disabled	10.1%	76.9%	23.1%	
First colonoscopy				
Yes	17.0%	75.8%	24.2%	0.04[d]*
No	44.6%	69.9%	30.1%	
Outside Hospital Referral				
Yes	31.7%	86.2%	13.8%	0.003[d]*
No	67.8%	70.7%	29.3%	
Time of procedure				
Morning	57.9%	72.9%	27.1%	0.16[d]
Afternoon	42.0%	79.1%	20.9%	

ASA=American Society of Anesthesiologists; BMI=body mass index; EMR= endoscopic mucosal resection; SD=standard deviation; UAB=University of Alabama at Birmingham.
*Statistically significant at 0.05 level (two-tailed test).
[a]Poor follow up included patients that did not receive surveillance colonoscopy within recommended timeframe or patients who were lost to follow up.
[b]Good follow up is defined as undergoing surveillance colonoscopy within the recommended timeframe.
[c]Unpaired t-test.
[d]Chi-square test.

S293

Validation of an Automated Adenoma Detection Rate

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Introduction: Adenoma detection rate (ADR) is an internationally recognized benchmark in the performance of colonoscopy, representing an important endoscopist quality metric. While ADR is a simple and widely accepted measure, the process of determining ADR is labor intensive. With the advent of endoscopy software within electronic health record (EHR) systems, ADR can be calculated automatically. However, the method of ADR calculation is inaccurate and therefore we aimed to compare automated ADR based on coding parameters from Lumens software within EPIC with manually calculated ADR.
Methods: We performed an IRB approved analysis of colonoscopy data from 2/1/22-5/10/22 at our institution. All outpatient colonoscopies were evaluated for indication, endoscopic findings, and histology. Manual ADR calculation was performed as per the CMS 2019 definition. We also extracted ADR data and the previously validated cecal withdrawal times available within the EHR. Automated ADR was performed within the EHR by extracting exams performed for the z12.11 and z12.12 indications. Data from individual endoscopists was made anonymous then normalized and compared with a single sample T-test; aggregate ADR rates were compared using Chi-squared analysis.
Results: Over this 98-day period, there were 1,737 colonoscopies performed. After identifying screening exams as per CMS guidelines and exclusion of seven endoscopists with less than 30 colonoscopies performed over this period, the manual calculation of ADR included 688 colonoscopies performed in patients ≥45 and 505 colonoscopies in patients ≥50. The automated ADR calculations in the EHR included a total of 503 exams in individuals ≥50. An adequate prep was seen in 92.2% of cases with an average BBPS of 7.3. Average cecal withdrawal time in screening exams was 9 minutes, 37 seconds and was not correlated with ADR. While ADR is reported in individuals ≥50 years as per CMS, the overall ADR between those ≥50 was 4.0% higher when compared to ≥45 (35.8% vs 31.8%, respectively), though this did not meet statistical significance (95%CI -1.4% to 9.4%). Comparison of manual ADR and automated ADR by endoscopist showed no significant differences. A comparison of manual ADR (35.8%) showed no significant difference from the automated ADR calculation (34.9%), p=0.79. (Table)
Conclusion: An automated ADR will not strictly adhere to CMS definitions of ADR, but this index appears to be an adequate surrogate marker of ADR, simplifying an otherwise time-intensive process.

Table 1. **Comparison of the absolute values of manually calculated ADR ("True ADR") with the EHR-derived "Automated ADR"**

Endoscopist	True ADR	Automated ADR
1	41.5%	27.0%
2	34.3%	25.0%
3	40.0%	42.4%
4	37.5%	45.5%
5	31.7%	43.2%
6	37.5%	44.8%
7	28.9%	21.7%
8	30.0%	18.8%
9	42.9%	54.2%
10	30.4%	44.1%
11	47.6%	29.4%

Table 1. (*continued*)

Endoscopist	True ADR	Automated ADR
12	25.6%	26.4%
Combined	**35.8%**	**34.9%**

While individual differences are present, these differences were statistically insignificant. Furthermore, when all data was combined, the two values were within one percentage point. T-statistic =0.846 (p = 20.8).

S294

Decline in Colorectal Cancer Screening Rates in Federally Qualified Health Centers in Los Angeles County From 2019 to 2020

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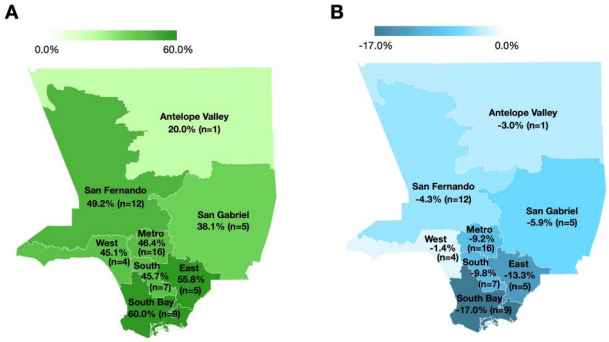
[1]David Geffen School of Medicine at UCLA, Los Angeles, CA; [2]University of California, Los Angeles, Los Angeles, CA.

Introduction: Federally Qualified Health Centers (FQHCs) are funded by the Health Resources and Services Administration (HRSA) to provide primary care services to low-income and underinsured individuals. Los Angeles County (LAC) is a large, diverse county with greater than 10.2 million residents and 8 distinct Service Planning Areas (SPAs) that represent specific geographic regions with variable resources. We aimed to describe colorectal cancer (CRC) screening rates (CRCSR) and the screening rate change (SRCs) in LAC overall and for each SPA between 2019 and 2020 to determine where resources are most needed for CRCSR recovery following the COVID-19 pandemic.
Methods: Our data source was the Uniform Data System (UDS), which includes quality data for the FQHCs funded by HRSA. We determined 2019 and 2020 CRCSR for LAC FQHCs overall and for each FQHC, including average-risk patients age 50-74. We then separated FQHCs into quartiles based on SRC and performed mixed-effects logistic regression to determine FQHC-level characteristics associated with the largest decline in CRCSR from 2019 to 2020 (i.e., predictors of category SRC Q1). Lastly, we determined SRC for each SPA in LAC.
Results: In 2019, there were 58 FQHCs in LAC with 326,473 patients eligible for CRC screening. In 2020, there were 59 FQHCs with 350,405 eligible patients. The median 2020 CRCSR in LAC FQHCs was 37.3%, down from 48.0% in 2019 (2020 median SRC= -9.6%) (Table). In the regression model among all LAC FQHCs, those with higher proportions of patients preferring a non-English language had significantly higher odds of having the largest decline in CRCSR from 2019 to 2020 (SRC Q1) (aOR=3.25, 95% CI=1.22-8.65; data not shown). CRCSR decreased from 2019 to 2020 in all SPAs with SRC ranging from -17.0% (South Bay) to -1.4% (West LA) (Figure).
Conclusion: In Los Angeles County FQHCs, CRC screening rates were higher than the national FQHC average in 2019 however declined considerably between 2019 and 2020. The decline in CRC screening rates was highest in FQHCs serving a higher proportion of patients with a preference for a non-English language and varied by county region. Our findings highlight the need for targeted measures, including language-appropriate resources, to improve CRC screening uptake in FQHCs that provide care to some of the most historically marginalized individuals.



[0294] **Figure 1.** A) Median CRC screening rate among adults age 50 to 74 at FQHCs in Los Angeles County in 2019, by Service Planning Area (SPA). B) Percent change in CRC screening rate (screening rate change, SRC) for adults age 50 to 74 at FQHCs in LA County between 2019 and 2020, by SPA; n=58 FQHCs

Table 1. FQHC characteristics (2020 data) and CRC screening rates (2019 and 2020) for HRSA-funded FQHCs in LA County overall and by 2020 CRC screening rate change quartiles

Frequency or percent	Overall (n=59)	SRC Q1 (n=15)	SRC Q2+Q3+Q4 (n=44)	p-value
Total patients eligible for CRC screening (age 50-74)	350,405	79,218	271,187	n/a
CRC screening rate in 2019 (median %)	48.0	61.4	44.7	0.0001
CRC screening rate in 2020 (median %)	37.3	37.3	37.3	0.97
Change in CRC Screening Uptake between 2020 and 2019				
Median Interquartile Range	-9.58 -15.2, -2.2	-24.49 -31.4, -17.2	-5.52 -10.0, -1.3	< 0.0001
Sex Male (median %)	41.5	42.2	41.4	0.83
Race & Ethnicity (median %)				
White Non-Hispanic	8.7	6.2	10.2	0.12
Black Non-Hispanic	6.4	4.6	6.7	0.40
Hispanic/Latine	63.5	54.9	63.7	0.94
Other Non-Hispanic	2.6	1.8	2.6	0.16
Preference for non-English Language (median %)	34.1	43.4	33.3	0.01
Urban FQHCs, n (%)	59 (100%)	15 (100%)	44 (100%)	n/a
Experiencing homelessness (median %)	2.3	2.4	2.2	0.57
Income Level >200% FPL (median %)	2.1	1.8	2.2	0.60
Uninsured (median %)	22.6	22.7	22.6	0.72
Medicaid (median %)	41.8	40.0	42.0	0.52
Medicare/Medicaid Dually Eligible (median %)	3.0	2.8	3.0	0.64

Table 1. (*continued*)

Frequency or percent	Overall (n=59)	SRC Q1 (n=15)	SRC Q2+Q3+Q4 (n=44)	p-value
Private Ins (median %)	7.1	10.2	6.5	0.19
Agricultural Workers (median %)	0.26	0.30	0.26	0.74

S295

Preliminary Observations of FIT Testing for Colorectal Cancer (CRC) Prevention in Two Public Hospitals in New York City

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Introduction: Expanding colorectal cancer screening (CRC) on a population level is essential in decreasing CRC mortality. Fecal immunochemical test (FIT) has an important role in improving screening rates. Currently, CRC guidelines recommend annual fecal immunochemical test (FIT) with follow up colonoscopy for all positive tests. We reviewed our experience with FIT testing for CRC screening at our institutions between July 2019 and December 2021.
Methods: Eligible primary care clinic patients were given FIT kits with information on how to perform and submit the samples either during face-to-face visits or by mail. Eligible patients were identified as those aged 50-75 due for CRC screening, defined as those without a colonoscopy in the prior 10 years or FIT kit in the prior one year. Among patients who received FIT kits by mail, no standard education was provided about CRC, its screening, or the role of colonoscopy in prevention. A de-identified database was constructed containing demographic variables, process measures, colonoscopy quality measures and outcome measures in FIT+ patients.
Results: One hundred seventy-six patients had positive FIT with a positivity rate of 7.2%. Mean age was 60+/-12 years and 52% were female. Follow up colonoscopies were ordered in 73% and performed in 52% of those ordered, representing only 38% of all positive FIT requiring a follow up colonoscopy. Mean and median intervals between +FIT and colonoscopy was 4 months. Of colonoscopies not performed, the patient refused in 54% while system issues were responsible in 21%. Quality metrics, including cecal intubation rates, withdrawal times, and adenoma detection rates (ADR) all met or exceeded benchmarks. The ADR was 58%, almost twice the benchmark, and the detection rate for advanced adenomas was 21%. Eight patients had cancers (11.9%) of which 6 had signs or symptoms and 4 were advanced. There were no interval cancers detected and no complications occurred.
Conclusion: Among primary care clinic patients with positive FITs, we found that a low percentage completed their follow up colonoscopies. Among those who did complete colonoscopy, there were high detection rates for both adenomas and advanced adenomas. This highlights the importance of colonoscopy and demonstrates that enhanced pre-FIT educational efforts may be needed to increase adherence to colonoscopy follow up in patients with positive FIT results.

S296

Appropriateness and Completion of Multitarget Stool DNA Testing in Primary and Subspecialty Care

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Introduction: Colorectal cancer (CRC) is the third most prevalent cancer in the United States, with a 4% lifetime incidence. While more clinicians have begun ordering multitarget stool DNA (mt-sDNA) testing due to the COVID-19 pandemic, adherence to guidelines on mt-sDNA and rates of subsequent follow-up testing has not been well studied. We assessed the appropriateness of mt-sDNA orders and rate of high-quality colonoscopy completion following a positive result in a large academic medical center.
Methods: We identified patients ordered for mt-sDNA in primary care and gastroenterology clinics at our institution between April 2020 and July 2021. For each case, we reviewed the appropriateness of mt-sDNA testing, documentation of shared decision making, result of testing, and subsequent follow-up. Appropriateness was defined in accordance to the most recent American College of Gastroenterology guidelines on mt-sDNA use for CRC screening.
Results: Of the 797 patients in our study, 685 (86%) met all appropriateness criteria for mt-sDNA testing (Table). Shared decision making was documented in 488 (62%) cases, and the most common reason for ordering mt-SDNA was hesitancy for colonoscopy. 483 patients (61%) completed mt-sDNA testing, of which 74 cases (15%) were positive. Rates of positivity were higher in cases of "inappropriate" (28%) rather than "appropriate" (13.7%) orders ($p = 0.01$). Colonoscopy was ordered in 73 cases (99%) and completed by 59 patients (80%). Of the 56 patients who underwent colonoscopy at our institution, most had documentation of a high-quality colonoscopy, defined as adequate prep (84%), cecal intubation (93%), visualization of the appendiceal orifice and ileocecal valve (94%), and right colon retroflexion (83%). Sixteen patients (29%) were found with advanced adenomas and 19 (34%) had other adenomas or sessile polyps. Among the 409 patients with negative tests, a 3-year follow-up recommendation was documented for 369 patients (90%).
Conclusion: Most clinicians at our institution identified appropriate patients for mt-sDNA testing and provided appropriate follow-up, and the majority of patients who underwent colonoscopy had documentation of a high-quality colonoscopy. In contrast, there were suboptimal rates of mt-sDNA completion and documentation of shared decision making. Further studies are needed to identify barriers to documentation of shared-decision making and to completion of high-quality colonoscopies in patients being screened with mt-sDNA.

Table 1. **Appropriateness, shared decision making, and screening results in patients undergoing mt-sDNA testing**

Appropriateness of Order	
Order was appropriate (%)	685 (86)
Inappropriate due to patient age < 45 (%)	2 (0)
Inappropriate due to patient age > 85 (%)	10 (1)
Inappropriate because CRC screening was repeated too quickly (%)	29 (4)
Inappropriate as patient is at higher than normal risk for CRC (%)	79 (12)
Other condition (eg. abnormal surgical anatomy) (%)	7 (1)
Shared Decision Making	
Documentation of shared decision making (%)	488 (62)
mt-sDNA was ordered because patient declined colonoscopy (%)	302 (62)
Screening Results	
Completed mt-sDNA screening (%)	483 (61)
Median time to mt-sDNA completion, days (IQR)	25 (17-43)
Positive (%)	74 (15)
Diagnostic colonoscopy was ordered (%)	73 (99)
Completed colonoscopy (%)	59 (80)
Completed colonoscopy at our institution	56 (76)

Table 1. (*continued*)

Appropriateness of Order	
Median time to colonoscopy, days (IQR)	53 (27-95)
Adequate bowel preparation (%)	47 (84)
Documentation of cecal intubation (%)	55 (98)
Documentation of appendiceal orifice and IC valve visualization (%)	48 (94)
Documentation of right colon retroflexion (%)	44 (83)
Advanced adenoma found on colonoscopy (%)	16 (29)
Other adenoma or sessile polyp found on colonoscopy (%)	19 (34)
Negative (%)	409 (85)
Documentation of a 3-year follow-up screening recommendation (%)	369 (80)

S297

Missed Opportunities in Colorectal Cancer Screening Education: An Analysis of NCI-Designated Cancer Center Website Content

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Introduction: The NCI-Designated Cancer Centers (NCC) are the authority on cancer education for both health care professionals and patients. These centers serve as the primary source of information and guidance for patients on current age-appropriate cancer screening guidelines. Due to a higher incidence of colorectal cancer (CRC) in younger adults, the American Cancer Society (ACS) has decreased the age at which to begin screening to 45 years-old in average risk adults. We aimed to analyze the websites of 71 NCC to determine whether or not these websites provide information on all possible screening modalities as well as if one screening modality is more emphasized than another.
Methods: We reviewed the websites of 71 NCC and performed a content analysis. In particular, we recorded if each NCC website mentioned the following as options for CRC screening: high sensitivity FOBT, FIT, sDNA-FIT, colonoscopy, flexible sigmoidoscopy, flexible sigmoidoscopy with FIT, and computed tomography (CT) colonography. Special notation was made of NCC websites that discussed all possible screening modalities as well as risks and benefits of CRC screening.
Results: In totality, of the 71 NCC websites, only 8.4% (6/71) mentioned all seven possible screening modalities. All 71 websites, however, specifically cited the role of colonoscopy in screening for CRC. In terms of non-invasive testing, 42.3% of NCC websites (30/71) discussed high sensitivity FOBT, 30.9% (22/71) discussed FIT, 28.2% (20/71) discussed sDNA-FIT, and 35.2% (25/71) discussed CT colonography. In terms of invasive testing aside from colonoscopy, 36.6% (26/71) cited flexible sigmoidoscopy as an option for CRC screening and 14.0% (10/71) cited flexible sigmoidoscopy with FIT.
Conclusion: Overall, less than 10% of NCI-Designated Cancer Centers actually mention to all of the possible options for CRC screening on their websites, which represents a missed educational opportunity for both patients and health care professionals. As hypothesized, these websites primarily emphasize the role of colonoscopy in detecting CRC. Less than half of the NCC websites even referenced non-invasive testing options for CRC screening, which may be an important consideration for patients who are either high-risk for or unwilling to undergo a colonoscopy. We believe that educating patients about all of the various options for CRC screening may help increase screening adherence for CRC in the long-term.

S298

The Impact of Social Determinants of Health on Colorectal Cancer Screening in Transgender People

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Introduction: Colon cancer screening (CRC) rates are lower in transgender (TGD) people compared to cis-gender people. Studies have identified several barriers to screening. TGD people experience discrimination such as unemployment, lack of education, access to health care, housing insecurity. The aim of our study is to identify the impact of barriers related to Social Determinants of Health (SDH), as identified by the United States Department of Health and Human Services (US DHHS), on CRC screening rates in TGD people.
Methods: A retrospective chart analysis using the electronic medical record was performed, including TGD people > 45 years of age between January 2017 to January 2022 at a large academic medical center in New York City with expertise in transgender medicine. Patients who had a concern for SDH during a healthcare visit were included in the analysis. Demographic data was collected. Patients' CRC screening rates were noted. Specific barriers related to SDH were studied by categorising them into 5 main domains as described by the US DHHS: 1. Economic stability; 2. Access to quality education; 3. Access to quality health care; 4. Housing and neighbourhoods; 5. Social and community related concerns. A descriptive and co-variate analysis was performed. (Figure)
Results: We identified 1046 TGD people > 45 years of age seen between January 2017 to January 2022, with complete data and colon cancer screening offered to 143 people. Of those offered screening,104/143 (72.7%) completed screening. Two or more barriers were identified in 78 people. Social and community related concerns (including food insecurity, mental health, disabilities, substance, domestic and child abuse) was the most common barrier (182 people, 59.3%), followed by economic instability (105 people, 32.4%). Fifty six people (18.2%) had a lack of access to healthcare. 43 people (14%) had housing insecurities while deficiency in access to quality education was perceived in 22 people (7.1%). The presence of at least one barrier to SDH negatively impacted CRC screening completion ($p < 0.01$). (Table)
Conclusion: Thirty percent of people within our study were found to have at least one barrier related to SDH which was negatively associated with CRC screening. These barriers identified reaffirm the need to develop comprehensive initiatives aimed at mitigating obstacles to CRC screening, and raise awareness of CRC in TGD people. Future studies should focus on implementing assessment tools for early identification of these barriers.

	N (%)
CRC Screening Offered	143 (46.6%)
CRC Screening Completed when Offered	104 (72.7%)
Barriers related to SDH	
Economic Stability	105 (32.4%)
Education Access and Quality	22 (7.1%)
Healthcare Access and Quality	56 (18.2%)
Neighbourhood and Built environments	43 (14.0%)
Social and Community context	182 (59.3%)

*CRC- Colorectal cancer, SDH- Social determinants of Health

[0298] **Figure 1.** Descriptive analyses identifying barriers related to SDH

Table 1. Demographics of patient population

	Mean or N (%)
Age (mean)	55.2 years
Sex recorded on birth certificate	
Male	268 (87.3%)
Female	39 (12.7%)
Ethnicity	
Hispanic	83 (27.0%)
Non-Hispanic	136 (44.3%)
Unknown	88 (28.7%)
Gender identity	
Male	35 (11.4%)
Female	264 (86.0%)
Nonbinary	4 (1.3%)
Gender nonconforming	2 (0.7%)
Unknown	2 (0.7%)
Sexual Orientation	
Straight	123 (40.1%)
Lesbian/Gay	36 (11.7%)
Bisexual	27 (8.8%)
Queer	7 (2.3%)
Don't know	17 (5.5%)
Unknown	97 (31.6%)

S299

How Often Do We Provide Recommendations to Patients With Colorectal Cancer or Advanced Colonic Adenomas on When Their First-Degree Relatives Should Begin Colorectal Cancer Screening?

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Introduction: First-degree relatives of patients found to have colorectal cancer (CRC) or advanced adenomas (AA) are advised to undergo colonoscopy starting at age 40, 10 years prior to time of CRC diagnosis in their first-degree relative, or at age of onset of AA in their first-degree relative; whichever comes first. Current guidelines recommend written communication to patients with CRC or AAs advising screening in first-degree relatives, which is particularly important in light of increased rates of early-onset CRC. We aimed to analyze the rate at which we provided guidance to patients found to have CRC or AAs on advising their first-degree relatives on timing of colonoscopy.
Methods: We analyzed patients at our institution who underwent outpatient colonoscopies from November 29, 2021 to April 30, 2022. AAs were defined as adenomas ≥ 1 centimeter (cm) in size with tubulovillous, villous, high-grade dysplasia or traditional serrated features on histology, or sessile serrated lesions (SSLs) either ≥ 1 cm or with dysplasia. Patients with prior history of CRC or AA were excluded. We assessed how often appropriate screening recommendations were provided to patients with CRC or AAs for first-degree relatives based on documentation within 3 months of colonoscopy.
Results: A total of 1332 colonoscopies were reviewed, with 47 patients meeting criteria for a new diagnosis of CRC or AA. Of these patients, 53.2% were African American and 57.4% were females (Table). The mean patient age was 56.9 years (± 10.6 years). Of these 47 patients, 3 patients (6.4%) were provided with specific written screening recommendations for first-degree relatives within 3 months of colonoscopy.

Conclusion: In this retrospective analysis of patients found to have CRC or AAs on colonoscopy, only 6.4% were provided written guidance to advise first-degree relatives on appropriate timing for colonoscopy within three months after procedure. While verbal recommendations to patients may occur, patients may not recall specifics post-procedure or via telephone. Furthermore, guidelines call for recommendations for family members to be included in endoscopy reports, or through a letter meant to be shared with first-degree relatives. Considering these findings, we aim to provide an education intervention and templates for post-colonoscopy pathology letters and/or clinic visits to facilitate communication to patients with CRC or AAs on appropriately advising CRC screening in family members.

Table 1. Demographic information of patients found to have newly diagnosed colorectal cancer (CRC) or advanced adenoma (AA) on colonoscopy

	Number of patients (%)
Known Family History of CRC or AA	6 (12.8%)
Gender	
Male	20 (42.5%)
Female	27 (57.4%)
Ethnicity	
White	14 (29.8%)
African American	25 (53.2%)
Asian	3 (6.4%)
Hispanic	2 (4.3%)
Other	3 (6.4%)
Age (mean)	56.9 years (± 10.6)

S300

Prevalence of Gastrointestinal Cancers Rapidly Increasing Among Middle-Aged Patients in Statewide Database of Over Five Million Patients

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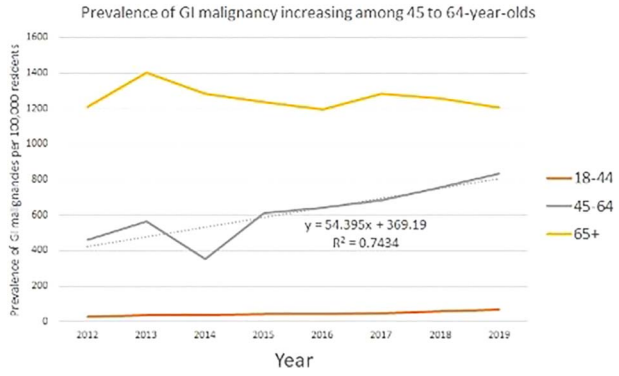
Introduction: Colorectal, gastric, esophageal and pancreatic cancers account for the 2nd, 3rd, 6th and 7th leading causes of cancer-related death worldwide, respectively. Gastrointestinal cancers have historically affected primarily older patients but may have become more common among younger patients in recent years. We assessed the prevalence of gastrointestinal cancers in Florida using a large database of over five million patients.
Methods: We extracted de-identified data from the *OneFlorida* Clinical Data Research Network, an electronic data repository that encompasses more than 40% of Floridians. We queried the database for ICD-9 and ICD-10 codes for esophageal, gastric, pancreatic, and colorectal cancers and collected demographic data on the patients. The primary outcome was the prevalence of GI cancers over time. For each year, the prevalence was calculated as the total number of patients who carry the diagnosis divided by the total number of patients in the population. The number was adjusted for each 100,000 patients. We used linear regression models to assess trends over time.
Results: Between 2012 and 2019, 4.2 million to 5.4 million patients were identified each year. The 2019 cohort was comprised of 57% female, 40% White race, and 808,493 patients between ages 45 and 64 (here defined as middle age). The prevalence per 100,000 residents for this patient group rose from 49 to 94 for esophageal, 58 to 91 for gastric, 72 to 159 for pancreatic, and 285 to 490 for colorectal cancers (Figure). According to the linear regression model, the combined prevalence of all four gastrointestinal malignancies among 45 to 64-year-olds increased by an average of 54 per 100,000 per year. Colorectal increased by 34.5 per 100,000, pancreatic by 11.1, gastric by 3.4, and esophageal by 5.4. All cancers were significantly more common in men than in women in all years, most recently 406 vs 269 ($p < 0.0001$) in 2019. They were also more prevalent among white and Asian American patients than among African Americans or Native Americans (378 and 363 vs. 222 and 190, respectively, $P < 0.0001$).
Conclusion: The prevalence of esophageal, gastric, pancreatic, and colorectal cancers is increasing among middle-aged adults. Diagnosis remains more common in men, as well as in Asian American and White populations. These trends may be due to social or environmental factors increasing the incidence of GI cancers or to improved diagnostic techniques facilitating earlier diagnosis of existing malignancy.



[0300] **Figure 1.** Prevalence of esophageal, gastric, pancreatic, and colorectal cancers by age in a statewide database. The prevalence among 45 to 64-year-olds increased by 54 per 100,000 per year

S301

Patients Prefer Blood Based Screening Tests Compared With Current Options for Colorectal Cancer Screening in a Community-Based Confidential Survey

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Introduction: Colorectal Cancer (CRC) is the 2nd most common cause of cancer deaths in the US. Screening improves survival but screening rates remain low. Colonoscopy (COL), Multi target stool DNA test (Mt-sDNA), and Fecal Immunochemical Test (FIT) are the most commonly used screening tests. Studies are underway to evaluate the efficacy of blood-based screening tests (BBST). Patient attitudes and preferences towards BBST are unknown.
Methods: This was a prospective, cross-sectional, IRB approved study done in NE Florida. 3 cohorts were studied: GI patients, PCP patients and community based GI physicians. They were invited to participate in a confidential online survey. After informed consent, they were given clear and concise written information about current tests. A BBST was presumed to be as effective as today's Mt-sDNA. The survey had 19 questions and a Likert scale was used.
Results: 186 GI and 62 PCP patients completed the survey (Mean age 59, M=41%, F=59%. White=73%, Black=28% Asian=12% Hispanic=12%). There were no significant differences in the responses of patients from GI and PCP offices, males and females and education levels. Patients in both GI and PCP cohorts believed in CRC screening (76% strongly positive). Patients rated "effectiveness" and "safety" as the

most important criteria. Patients ranked COL (69%), Mt-sDNA, and FIT as their preferred tests, in that order. After the introduction of a BBST, both cohorts ranked BBST as their top choice (58%). GI patients ranked COL and Mt-sDNA 2nd and 3rd while PCP patients ranked Colonoscopy and Mt-sDNA equally. "Effectiveness", "absence of risk" and "absence of embarrassment" were the main factors that made BBST their top choice. Increasing the frequency of BBST from 5 to 3 to 1 year did not change its favorability. GI physicians (Mean age 51, M=77%, F=33%), ranked COL, Mt-sDNA, FIT in that order. After a BBST was introduced, COL remained their top choice followed by BBST, Mt-sDNA, and FIT. 91% of GI physicians had a COL and 14% had a Mt-sDNA test. 100% of GI physicians discussed COL with their patients, but only 59% discussed Mt-sDNA. (Table)

Conclusion: Our study highlights the appeal of a BBST over current CRC screening tests, amongst both GI and PCP patients. Increasing the frequency from 5 to 3 to 1 year did not change its appeal. There was clear divergence between patients and GI physicians, with GI physicians choosing COL above BBST. Shared decision making may help narrow this gap. BBST have the potential to improve currently low screening rates.

Table 1. Patient Demographics And Preferences

Patient Location	
Borland Groover	186 (75%)
Primary Care Physician practice	62 (25%)
Race/Ethnicity	
American Indian/Alaskan native	1 (0.5%)
Asian	24 (10%)
Afrrican American	28 (11%)
Hispanic	12 (5%)
White	182 (73%)
Other	4 (1.5%)
Highest Education Level	
Trade/Technical/Vocational	25 (10%)
High School	35 (15%)
Bachelors	85 (34%)
Masters	56 (23%)
Professional	26 (11%)
Other	21 (8%)
Previous Screening for CRC	
Yes	195 (79%)
No	53 (21%)
CRC Screening Benefit Perception	
Strongly Positive	179 (72%)
Moderately Positive	50 (20%)
Neutral	17 (7%)
Moderately Negative	2 (1%)
Strongly Negative	0 (0%)
Gender Preference for GI Physician	
Male	32 (13%)
Female	33 (12%)
No Preference	186 (75%)

S302

A Single Centered Retrospective Review of Colonoscopy Results in Patients With Positive Cologuard

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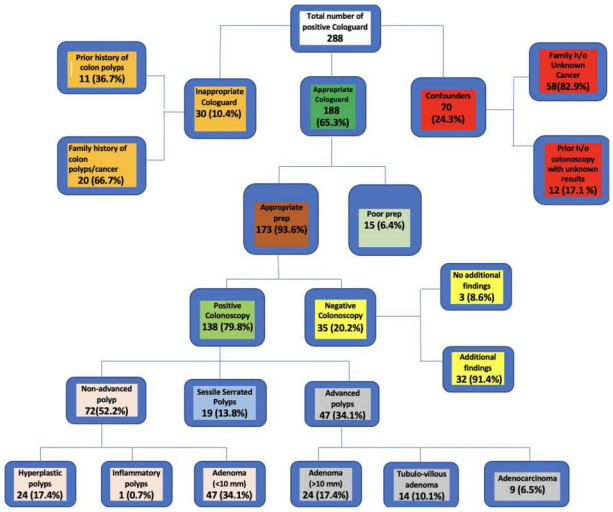
Introduction: Colorectal cancer (CRC) is the most common form of gastrointestinal cancer and is the third leading cause of cancer deaths in the US. At this time, effective screening tools used for colon adenomas and cancer detection are fecal occult blood test (FOBT), fecal immunochemical tests (FIT), stool DNA test (Cologuard), and optical colonoscopy. A limitation of FOBT and FIT tests is that they carry low positive predictive values. Cologuard is indicated in colorectal cancer screening in "average risk" adults performed in three-year intervals. Currently, Cologuard is considered 92 % sensitive and 87% specific in colon cancer detection in the average-risk population. In our retrospective study, we will be comparing the results of positive Cologuard with subsequent colonoscopy findings. (Figure)

Methods: a. 288 patients with positive Cologuard test were reviewed and compared with results of follow-up colonoscopies. b. The relevant information was transcribed into an excel file. Information including, but not limited to, MRN, Age, Height, Weight, BMI, Medication, Family History, results and date of positive Cologuard, results, and follow-up colonoscopies, was assessed. c. Patients were identified by utilizing their medical record numbers through the ProVation software. Prior to analysis, de-identification of patient's data was performed.

Results: - Out of 288 patients who tested positive on Cologuard screening, a. 10.4% of patients (30/288) were excluded as they were noted to have undergone an inappropriate Cologuard test. b. 24.3% of patients (70/288) were excluded because of a family history of unknown cancer (58/70, 82.9%) and prior history of colonoscopy with unknown results (12/70, 17.1%). c. 6.4% (15/188) were excluded because of poor preparation. - 93.6% of patients (173/188) had appropriate preparation. Of these, a. 20.2% (35/176) of patients had negative colonoscopies for polyps/CRC. b. 79.8% (138/176) had positive colonoscopies. Of these patients, 52.2% (72/138) had non-advanced polyps, 13.8% (19/138) had sessile serrated polyps and 34.1% (47/138) had advanced polyps.

Conclusion: - In our patient population, 10.7% (30/288) patients underwent inappropriate Cologuard testing. - 65.3% (188/288) patients underwent appropriate Cologuard testing with: a. 6.4% (12/188) of patients were removed because of poor prep. b. 20.2% (35/176) of patients had a normal colonoscopy. c. 79.8% (138/176) patients resulted in an abnormal colonoscopy with 6.5% (9/138) patients diagnosed with colorectal cancer.



[0302] **Figure 1.** Flowsheet

S303 WITHDRAWN

S304

Use of Screening versus All Exams to Calculate Mean Adenomas per Colonoscopy: Data From the New Hampshire Colonoscopy Registry

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Introduction: Adenomas per colonoscopy (APC) may be a better quality measure than adenoma detection rate since it reflects the ability of an endoscopist to optimize colorectal cancer prevention by clearing the colon of all precursors. A major limitation of all detection rates is that some endoscopists have a lower volume of exams. A proposed solution is to use all exams as opposed to current calculation using only screening colonoscopies. We used data from the New Hampshire Colonoscopy Registry (NHCR) to compare APC calculated with data from screening versus all exams.
Methods: Our sample consisted of patients enrolled in the NHCR with at least one follow up event 3 months of later than index exam. Follow up were events were a colonoscopy or CRC diagnosis in the New Hampshire State Cancer Registry which collects data from NH and other states (VT, MA, ME). The exposure variable was APC which was calculated as the total number of adenomas for colonoscopies divided by number of colonoscopies for each endoscopist. Screening APC (APC-S) used data from screening exams and APC-A used all exams, regardless of indication. APC was examined as continuous variables as well by categories, 0.2, 0.4, 0.6 and 0.8. We examined risk for PCCRC defined as any CRC diagnosed 3 months after an index exam. Exclusion criteria were any CRC diagnosed at index or within 3 months, incomplete exams, IBD, and genetic syndromes. Cox regression was used to model the Hazard of PCCRC on APC controlling for age, sex, index exam year, index findings, bowel prep quality, having more than 1 surveillance exam and family history of CRC.
Results: Our sample included 27,688 exams performed by 152 endoscopists with 153 CRCs diagnosed after the index exam. APC-A and APC-S had a high correlation (Spearman's rho=0.90; p< 0.001) but the mean APC-A was higher (0.69) than APC-S (0.43) Both APCs were associated with a reduction of PCCRC as a continuous variable as well as stratified as above (Table). The median percentage of screening exams across endoscopists was 50% (IQR=16). Median difference between APCs was 0.21 (IQR=0.12)
Conclusion: Our novel data support the use of APC as calculated for all exams as a quality measure by demonstrating a reduction in PCCRC risk in exams performed by endoscopists with higher APC-As, similar to that for APC-S. In addition, the 2 rates correlated closely. However, varying proportions of screening exams may make it difficult to develop benchmarks without adjusting for endoscopist case mix.

Table 1. Post colonoscopy CRC and APC calculated with screening (APC-S) and all exams (APC-A)

		APC-S < 0.2 (REF)	APC-S 0.2-< 0.4	APC-S 0.4-< 0.6	APC-S 0.6-< 0.8	APC-S 0.8+	P value	Continuous APC	p value
APC-S	HR	1.0	0.20	0.17	0.15	0.08	0.001	0.10	0.001
	95 % CI	REF	0.12-0.34	0.10-0.29	0.07-0.32	0.03-0.25		0.03-0.32	
	Absolute Risk	2.6%	0.7%	0.5%	0.3%	0.2%	0.001	—	—
	N	688	10175	10424	4042	2359	—	—	—
		APC-A < 0.2 (REF)	APC-A 0.2-< 0.4	APC-A 0.4-< 0.6	APC-A 0.6-< 0.8	APC-A 0.8+	P value	Continuous APC	p value
APC-A	HR	1.0	0.22	0.21	0.18	0.11	0.001	0.21	0.001
	95% CI	REF	0.11-0.44	0.12-0.40	0.10-0.34	0.06-0.23		0.10-0.45	
	Absolute Risk	2.5%	0.7%	0.7%	0.5%	0.2%	0.001	—	—
	N	522	3540	7889	7686	8051	—	—	—

Cox regression was used to model the Hazard of PCCRC on APC controlling for age, sex, index exam year, index findings, bowel prep quality, having more than 1 surveillance exam and family history of CRC.

S305

Changes in Colorectal Cancer Incidence Associated With Medicaid Expansion: An Analysis of the National Cancer Database

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Introduction: The Affordable Care Act (ACA), enacted in 2010, increased insurance coverage for states that expanded Medicaid, but its impact across the United States on Colorectal Cancer (CRC) detection remains unclear. The National Cancer Database (NCDB) is a hospital-based cancer registry that captures approximately 75% of diagnosed cancers in the U.S. and Puerto Rico. This study used the NCDB to investigate the changes in the frequency of colon cancer incidence before and after Medicaid expansion.
Methods: We compared all adult cases of CRC in the NCDB using ICD-codes from pre-Medicaid expansion in 2006-2009 to the period after full state participation in 2015-2018. Information on patient demographics (age, sex, race, insurance status, educational attainment, residential location, Charlson-Deyo Comorbidity Score (CDCS), staging at diagnosis) were queried. United States census data from 2010 and 2020 were used to standardize CRC incidence. Chi-square and t-test analysis were performed using SPSS v.28.
Results: With the ACA, the proportion of those without insurance dropped from only 3.3% to 3.0% in the NCDB database. The total incidence of CRC was 569,659 patients for the two study periods. There were 86.4 cases per 100,000 diagnosed pre-Medicaid expansion and 92.5 cases per 100,000 post-Medicaid expansion. Patients diagnosed after expansion were younger 65.6±12.4 y vs 67.1±12.7 y. In the post-Medicaid expansion period, there was an increase in the incidence of CRC in males (52.7% vs 50.5%), Non-Hispanic Black (12.4% vs 11.5%) and Hispanic patients (6.9% vs 4.8%), patients with lower educational attainment (22.6% vs 21.6%), and patients with greater comorbidities via CDCS (5.0% vs 2.9%). Though there were statistically significant differences in income and residential location, these findings were not clinically significant. There was a slight shift in the incidence of CRC diagnosed at a later stage post-expansion. Results are summarized in Table.
Conclusion: Medicaid expansion was associated with an increase in the incidence of CRC diagnosis despite a very modest drop in the proportion uninsured. The age of diagnosis decreased post-Medicaid expansion. There was also an increase in the proportion of males, minorities, patients with lower educational attainment, and those with a greater number of comorbid conditions. CRC was not found at an earlier stage of diagnosis despite an increase in the access to medical care. These findings highlight the impact of expanding health insurance coverage for all.

Table 1. Comparison of Patient Characteristics between Pre-Medicaid Expansion (2006-2009) and Post-Medicaid Expansion (2015-2018)

Factors		Pre-Expansion (2006-2009) n=266,109	Post-Expansion (2015-2018) n=303,550	p-value
Age (SD) y	-	67.13 (12.7)	65.55 (12.4)	p< 0.001
Sex	Male	134,445 (50.5)	159,973 (52.7)	p< 0.001
	Female	131,664 (49.5)	143,577 (47.3)	
Race	NWH	211,311 (79.4)	226,924 (74.8)	p< 0.001
	NHB	30,526 (11.5)	37,611 (12.4)	
	Hispanic	12,799 (4.8)	21,018 (6.9)	
	Other	11,473 (4.3)	17,997 (5.9)	
Income	Less than $40,227	49,766 (19.6)	49,676 (19.1)	p< 0.001
	$40,227 - $50,353	57,193 (22.5)	57,874 (22.3)	
	$50,354 - $63,332	59,329 (23.5)	60,291 (23.2)	
	$63,333 or more	87,568 (34.5)	92,041 (35.4)	
Percent Without High School Degree	17.6% or more	54,980 (21.6)	58,975 (22.6)	p< 0.001
	10.9% - 17.5%	67,951 (26.7)	69,392 (26.6)	
	6.3% - 10.8%	71,875 (28.3)	71,563 (27.5)	
	Less than 6.3%	59,561 (23.4)	60,463 (23.2)	
Insurance	Private	103,997 (39.1)	119,317 (39.3)	p< 0.001
	Medicaid	11,495 (4.3)	24,050 (8.0)	
	Medicare	141,713 (53.3)	150,794 (49.7)	
	Non-Insured	8,904 (3.3)	9,389 (3.0)	
Residence Location	Metropolitan	218,379 (84.6)	251,012 (84.6)	p< 0.001
	Urban	34,764 (13.5)	40,309 (13.6)	
	Rural	5,062 (2.0)	5,248 (1.8)	
Treatment Facility	Community Cancer Program	25,022 (9.4)	26,467 (8.7)	p< 0.001
	Comprehensive Community Cancer Program	114,751 (43.1)	123,506 (40.7)	
	Academic Program	69,335 (26.1)	91,285 (30.1)	
	Integrated Network Cancer Program	57,001 (21.4)	62,292 (20.5)	
Charlson-Deyo Score	0	186,579 (70.1)	217,758 (71.7)	p< 0.001
	1	56,325 (21.2)	52,888 (17.4)	
	2	16,160 (6.1)	17,727 (5.8)	
	>3	7,045 (2.6)	15,177 (5.0)	
Stage at Diagnosis	0	18,376 (6.9)	14,210 (4.7)	p< 0.001
	I	60,846 (22.9)	64,322 (22.2)	
	II	66,828 (25.1)	72,303 (23.8)	
	III	68,524 (25.8)	83,346 (27.5)	
	IV	51,535 (19.4)	69,369 (21.9)	

S306

Findings of Colonoscopy in Patients With Liver Cirrhosis: A Different Population?

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Introduction: Few data are available on the prevalence of preneoplastic and neoplastic colonic lesions in patients with liver cirrhosis. In addition, intestinal dysmotility related to cirrhosis might impair bowel preparation more than those without chronic liver disease. The aim of this study was to analyze the adenoma detection rate and to assess the quality of colonoscopy bowel cleansing in patients with liver cirrhosis.
Methods: We conducted a retrospective monocentric study in a cohort of cirrhotic patients who underwent colonoscopy between January 2012 and May 2022. The prevalence of colonic lesions, the adequacy of bowel preparation and the patient´s characteristics were assessed.
Results: A total of 125 patients were included, most of them male (80.8%), with a median age of 61 years old (IQR 55-68). The main etiologies of cirrhosis were alcoholic (60.8%), hepatitis C virus infection (12.8%) and metabolic associated fatty liver disease (8.8%). Seventy-one (56.8%) patients were Child-Pugh class A. A total of 173 colonoscopies were performed. The main reasons for performing the procedure were colorectal cancer screening (48.0%), anemia (26.0%) and gastrointestinal bleeding (11.6%). The cecal intubation rate was 87.9%. Approximately half of the incomplete endoscopies were interrupted because of poor bowel preparation. Indeed, poor bowel preparation was documented in 37% of procedures. Only 26 (15%) patients had a good colon cleansing level. Adenomatous polyps were discovered in 26.6% of procedures (low-grade dysplasia 25.4%, high-grade dysplasia 1.2%). Three individuals had a well-differentiated adenocarcinoma. Rectal varices were found in 26 (15.0%) patients, colonic telangiectasia in 30 (17.3%) and diverticula in 21 (12.1%). No abnormalities were detected in 54 (31.2%) individuals. Neither Child-Pugh grade (p=9.622), gender (p=0.169) or advanced age (p=0.292) affected adenoma detection rates. No significant differences were observed in the findings of adenomas between different chronic liver diseases.
Conclusion: Cirrhotic patients have worse bowel preparation scores and cecal intubation rates compared to the general population. Although we did not find a significant difference in polyp detection rates, this result may have been impacted by impaired bowel preparation. Given the importance of colorectal detection, alternative bowel cleansing protocols are needed for cirrhotic patients.

S307

Artificial Intelligence Identifies High Risk Patients Lost to Colon Cancer Screening Follow-Up During COVID-19 Pandemic

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Introduction: The COVID-19 pandemic resulted in the complete stoppage of many colon cancer screening programs. During this time, many patients were at risk of being lost to follow up for their colorectal cancer (CRC) screening and surveillance. Here, we describe use of an artificial intelligence driven recall system to surface high risk patients potentially overdue for repeat colonoscopy and interrogate the reasons for missed recall.
Methods: We conducted a retrospective study at a tertiary care academic medical center in continuous patients who underwent an initial colonoscopy between August to October 2019 and had a follow-up recommendation for a repeat colonoscopy within 2 years of the index procedure. A natural language understanding workflow was developed by Halo Solutions LLC in which: 1) procedure reports from gGastro (Modernizing Medicine, Florida) were converted to text files using OCR, and 2) these reports were evaluated alongside linked electronic healthcare record (EHR) data to determine the timing and indication of the recall procedure. Data was then manually reviewed to assess the reasons for missing the surveillance colonoscopy. Cases were randomly checked for accuracy, reaching an accuracy rate of 96%.
Results: 4663 colonoscopies were performed, of which 14% (n=677) had a recall recommendation for surveillance colonoscopy within 2 years of the index colonoscopy. Of those cases, 24% (n=162/677) were flagged as potentially overdue. Of the 162 cases, 48 were found to have missing colonoscopy orders, 31 were not contacted by scheduling, and 32 were lost to follow up despite at least 1 attempted outreach. The remaining 51 were also lost to follow up but upon further review, deemed not overdue following manual review of the full record (e.g., outside records documented colonoscopy, patient expired, etc.).
Conclusion: Missed CRC surveillance for patients with higher risk findings or disease processes increases the risk of patient harm from missed polyps and cancers. Nearly one in six patients who were advised to have a colonoscopy within two years of their index procedure were lost to follow up. In most EHR systems, once these patients are lost to follow up, there is no safety net to identify who these patients are. Integrating artificial intelligence into the EHR and clinical practice enables rapid identification of patients at risk of loss to follow up and allows for optimizing patient care and safety.

S308

Test Characteristics of Fecal Immunochemical Tests for Colorectal Cancer and Advanced Adenomas Based on Location: A Systematic Review

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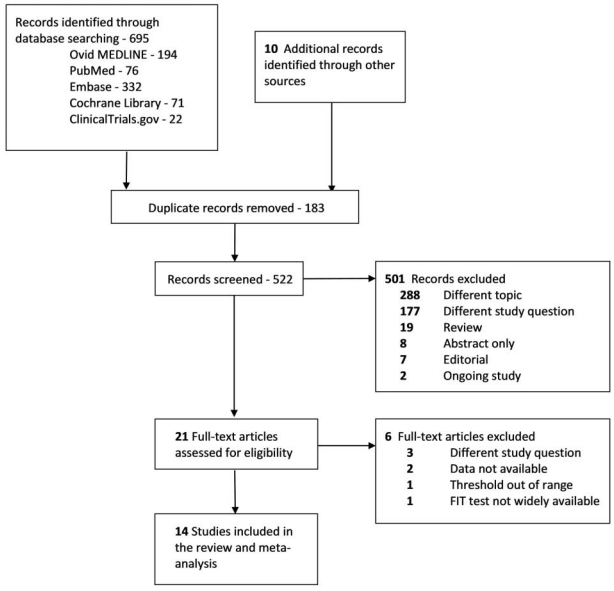
Introduction: Test characteristics of fecal immunochemical tests (FITs) vary based on threshold, and may vary based on location within the colon; however, published studies are inconsistent. We conducted a systematic review to determine the effect of location on test characteristics for colorectal cancer (CRC) and advanced adenomas (AA).
Methods: We searched Ovid MEDLINE, PubMed, EMBASE, and Cochrane Library for studies on FIT where colonoscopy was the reference standard and contained FIT test characteristics based on location within the colon (μg/g). Two authors independently reviewed all citations to identify relevant studies, abstracted study characteristics and numerical data, and assessed study quality (QUADAS). For summary-level estimates, we used a univariate generalized linear mixed model to simultaneously estimate pooled sensitivity and specificity separately for CRC and advanced adenomas. We compared proximal and distal sensitivity for CRC and AA in pre-specified groups based on specific FIT or threshold using random effects logistic regression with a test for differences between subgroups.
Results: From 705 titles, we reviewed 522 unique citations and abstracts when available, from which we reviewed 21 full-text articles, selecting 14 articles meeting inclusion criteria (Figure). The 14 studies included 30 FIT analyses and examined 10 different FITs, 5 of which were tested at >1 threshold. Mean patient age (11 studies) was 59.4 years; 64.3% (13 studies) were women. All studies were of high quality. Among 34,790 individuals, there were 259 (94 proximal, 165 distal) CRCs (0.7%) and 2450 (1097 proximal, 1371 distal AAs (7.0%). Test characteristics for proximal and distal CRC and AA by threshold are in the Table. For both CRC and AA, test characteristics varied by threshold, but not location. For CRC, the <10 μg/g threshold had the greatest numerical difference in sensitivity: 0.86 proximal vs 0.76 distal, but was not statistically significant (P=0.76). For AA, the ≥ 20 μg threshold had the largest numerical difference: 0.14 proximal vs. 0.24 distal) but did not reach statistical significance ($P = 0.0518$). All other comparisons were not statistically significant ($P > 0.85$ for CRC and $P > 0.21$ for AA).
Conclusion: In this systematic review of FIT test characteristics for CRC and AA, we found that test characteristics varied by threshold. For the most used test thresholds, sensitivity for AA was numerically greater for the distal colon, but none of the differences was statistically significant.

Table 1. Quantitative and Comparative Results

Threshold (μg/g)	N of Subjects	N of CRCs Proximal	N of CRCs Distal	Univariate Summary Results for Colorectal Cancer (CRC)						P-value[1]
				Proximal			Distal			
				N of Studies	Sensitivity [95% CI]	Specificity [95% CI]	N of Studies	Sensitivity [95% CI]	Specificity [95%CI]	Proximal vs distal (sensitivity only)
< 10 (all studies)	4074	7	21	3	0.86 [0.42; 0.98]	0.90 [0.82; 0.94]	2	0.76 [0.54; 0.90]	0.91 [0.81; 0.96]	——
< 10 (excluding Graser 2009)	3789	6	21	2	0.83 [0.37; 0.98]	0.91 [0.81; 0.96]	2	0.76 [0.54; 0.90]	0.91 [0.81; 0.96]	0.71
10 (all studies)	13476	34	85	6	0.74 [0.56; 0.86]	0.93 [0.88; 0.96]	5	0.74 [0.57; 0.86]	0.91 [0.87; 0.94]	——
10 (excluding Levy 2014)	13259	33	85	5	0.76 [0.58; 0.87]	0.91 [0.87; 0.94]	5	0.74 [0.57; 0.86]	0.91 [0.87; 0.94]	0.86
11-19	14882	43	104	6	0.81 [0.52; 0.94]	0.93 [0.88; 0.95]	6	0.81 [0.68; 0.90]	0.93 [0.88; 0.95]	0.99
>=20	18675	81	142	10	0.75 [0.65; 0.83]	0.95 [0.93; 0.97]	10	0.76 [0.68; 0.82]	0.95 [0.93; 0.97]	0.90
				Univariate Summary Results for Advanced Adenoma (AA)						
				Proximal			Distal			
Threshold μg/g	N of Subjects	N of AA Proximal	N of AA Distal	N of Studies	Sensitivity [95% CI]	Specificity [95% CI]	N of Studies	Sensitivity [95% CI]	Specificity [95% CI]	
< 10	4074	112	239	3	0.25 [0.14; 0.40]	0.90 [0.82; 0.94]	3	0.32 [0.26; 0.38]	0.90 [0.82; 0.94]	0.38
10	13805	370	552	7	0.2090 [0.12; 0.35]	0.94 [0.90; 0.96]	7	0.31 [0.23; 0.40]	0.94 [0.89; 0.96]	0.21
11-19	14882	449	664	6	0.26 [0.17; 0.39]	0.93 [0.88; 0.95]	6	0.32 [0.23; 0.42]	0.93 [0.88; 0.95]	0.51
>=20	19750	942	1172	14	0.14 [0.08; 0.22]	0.95 [0.93; 0.96]	14	0.24 [0.18; 0.32]	0.95 [0.93; 0.96]	0.0518

Note: Univariate summary estimates are shown for both sensitivity and specificity with 95% confidence intervals in brackets. Estimates were obtained using a random effects logistic regression model.
1P-value for difference between proximal and distal sensitivity from random effects logistic regression model.

Figure 1. PRISMA Flow Diagram



[0308] **Figure 1.** PRISMA Flow Diagram

S309

The Effect of Music on Colonoscopy (MUSICOL): A Randomized Controlled Trial

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Introduction: Widespread adoption of colorectal cancer (CRC) screening has resulted in earlier detection and reduced mortality. Despite the proven success of CRC screening, gaps in adherence remain with only 64% participation rate in the United States over the past 10 years. Patients commonly experience feelings of anxiety and anticipated discomfort prior to and during colonoscopies which may deter them from undergoing the procedure. Music is an inexpensive and safe therapy that could potentially improve the experience and consequently adherence to screening programs. Our study aims to assess if playing music before and during colonoscopies improves the patient experience, willingness to repeat the procedure in the future, and endoscopist performance.
Methods: We performed a single-center randomized trial including patients aged ≥18 years undergoing screening colonoscopy. The music group, no music (control) group, and endoscopist were not informed of the aim of the study. Patients in the music group were asked to select a preferred genre from music to be played during before and during the colonoscopy. Baseline anxiety was assessed with the PROMIS Anxiety 7a questionnaire. Overall patient experience and willingness to undergo another procedure in the future were assessed by Likert scale. Endoscopist performance was assessed by adenoma detection rate and time to reach cecum. Statistical analysis was performed using the chi-squared test and Wilcoxon two-sample test via SAS.
Results: 79 patients were eligible and recruited. Demographic characteristics, anxiety score, pre-procedure pain score, and post-procedure pain score of the two groups are shown in Table. There was no statistically significant difference in other study outcomes such as patient future willingness, patient overall satisfaction, adenoma detection rate, time to reach cecum, procedure time, midazolam dosage, and fentanyl dosage between the music group and control group in Table.
Conclusion: While the preliminary data does not show any significant differences in future willingness and overall experience rating, additional recruitment is necessary to reach adequate power to assess whether music during colonoscopies could improve the patient experience, adherence to screening programs, and endoscopist performance.

Table 1. Demographic, anxiety and pain scores

	Music group (n=40)	Control group (n=39)	P-value
Age	55.6	57.8	0.22
Male (n, %)	18 (45.0%)	16 (41.0%)	0.72
Ethnicity (White&Caucasian/Hispanic&Latino/Black&AA/Asian)	6/9/23/2	5/6/26/2	0.83
Hx of prior c-scope (n, %)	20 (50.0%)	19 (48.7%)	0.90
Hx of abdominal Sx (n, %)	12 (30.0%)	8 (20.5%)	0.33
Anxiety medication use (n, %)	1 (2.5%)	1 (2.6%)	0.99
pre procedural pain ($\bar{x}$)	0.13	0.28	0.39
post procedural pain ($\bar{x}$)	0.28	0.23	0.64
Post-procedure anxiety level ($\bar{x}$)	10.7	12	0.25
Endoscopists' performance measurements, sedation use, and primary outcomes			
Time to cecum ($\bar{x}$ minutes)	11.9	10.1	0.43
Procedure time ($\bar{x}$ minutes)	33.0	31.1	0.38
Adenoma Detection(n, %)	15 (37.5%)	14 (35.9%)	0.88
Midazolam dose ($\bar{x}$ mg)	3.94	4.03	0.80
Fentanyl ($\bar{x}$ μg)	79.4	85.3	0.43
Future Willingness ($\bar{x}$)	4.77	4.73	0.95
Overall experience rating ($\bar{x}$)	4.84	4.67	0.34

Table shows demographics, anxiety score, pain scores, endoscopists' performance measurements, sedation use, and primary outcomes.

S310

Enhancing Resident Education on Colorectal Cancer Screening and Surveillance: A Pilot Project

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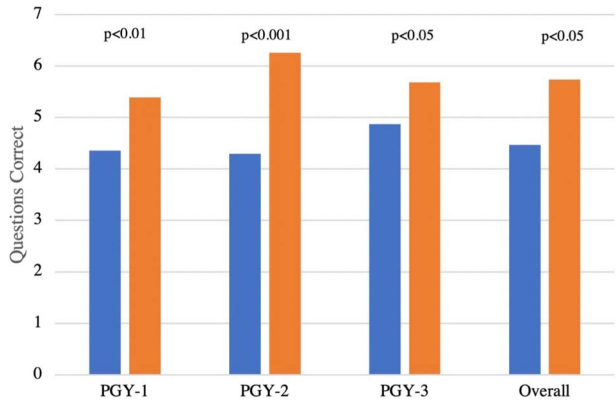
Introduction: The U.S. Preventive Services Task Force issued new guidelines for colorectal cancer (CRC) screening in 2021. Adoption of these new recommendations by Internal Medicine (IM) residents has not been well studied. Clinical practice paradigms are updated frequently but practices are ingrained in physicians during residency. We investigated the knowledge of current CRC screening guidelines of IM residents at a large, metropolitan training hospital.
Methods: A 13-question survey was designed to record demographics (5 questions) and test knowledge of CRC screening guidelines (8 questions) among IM residents. The survey tested both understanding of CRC screening initiation for average-risk and high-risk patients and identifying an appropriate screening test with its respective associated intervals. An educational pamphlet detailing these CRC screening guidelines was created and distributed to all IM residents. No other intervention was performed. Two months after distribution, a post-intervention survey was used to assess changes in resident knowledge and practice. IM residents were stratified into post-graduate year (PGY) level for analysis.
Results: IM residents (n=120) completed the pre-intervention survey, and 112 residents completed the post-intervention survey after distribution of the CRC guideline pamphlet. The average questions correct across PGY levels were significantly improved after educational intervention (8 is perfect score, mean 4.46 pre-survey vs mean 5.74 post-survey, $p < 0.05$) (Figure). Residents overall showed improvement in identifying CRC screening initiation age across all PGY levels, however this was not uniform with every PGY level after educational intervention. Residents overall showed improvement in identifying CRC screening tests with its respective intervals among all tests, however there were differences between PGY level after educational intervention (Table).
Conclusion: Overall, residents across all PGY levels showed improvement in knowledge after a very simple educational intervention. Growth in knowledge was not uniform between every training year. While residents in training are knowledgeable regarding CRC screening with colonoscopy in average-risk patients, there are deficiencies in areas of high-risk patients. Targeted educational interventions specific to training level may optimize resident understanding of management for high-risk patients, alternative screening modalities, and dynamic CRC screening guidelines.

Table 1. Pre- and Post-Educational Intervention Results for Resident Knowledge across PGY-level (FIT: Fecal Immunochemical Test; FOBT: Fecal Occult Blood Test)

		PGY-1			PGY-2			PGY-3			Overall		
		Pre-Intervention (% Correct) (n=56)	Post-Intervention (% Correct) (n=49)	Relative % Change	Pre-Intervention (% Correct) (n=34)	Post-Intervention (% Correct) (n=35)	Relative % Change	Pre-Intervention (% Correct) (n=30)	Post-Intervention (% Correct) (n=28)mu	Relative % Change	Pre-Intervention (% Correct) (n=120)	Post-Intervention (% Correct) (n=112)	Relative % Change
Assessment of Appropriate CRC Screening Initiation	For the average risk American, CRC Screening should begin at what age?	57.1	87.8	54%	47.1	94.3	100%	46.7	78.6	68%	55.3	87.5	58%
	For the average risk African American, routine CRC screening should begin at what age?	46.4	73.5	58%	64.7	80	24%	70.6	76.6	8%	59.1	77.6	31%
	For patients with first degree relative diagnosed with CRC at 55 yo, routine screening should begin earliest at what age?	39.3	18.4	-53%	5.9	45.7	675%	26.7	25	-6%	26.6	28.6	7.5%
Assessment of Methods of CRC Detection and Their Associated Intervals	Colonoscopy *(q 10 years)*	92.9	100	8%	100	100	0%	100	100	0%	96.7	100	3.4%
	FIT *(q 1 years)*	46.4	65.3	41%	47.1	94.3	100%	46.7	60.7	30%	46.7	73.2	57%
	Flexible Sigmoidoscopy *(q 5 years)*	42.9	81.6	90%	76.5	91.4	19%	63.3	60.7	-4%	57.5	79.4	38%
	FOBT *(q 1 years)*	42.9	55.1	28%	41.2	37.1	-10%	53.3	78.6	47%	45	51.7	15%
	Cologuard *(q 3 years)*	25	57.1	128%	47.1	82.9	76%	73.3	82.1	12%	43.3	66.7	54%



[0310] **Figure 1.** Pre- (Blue) and Post-Educational (Orange) Intervention Mean Scores across PGY-level

S311

Following Through on Positive Fecal Immunochemical Testing via FIT Navigation and a Direct-to-Colonoscopy Pathway: Preparing for the Next Wave

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Introduction: Colorectal cancer screening was disrupted during the COVID-19 pandemic, resulting in some systems utilizing mail-out fecal immunochemical testing (FIT) in average-risk patients. Our facility initiated this in late March 2020; adding a FIT navigator position in August. FIT navigation (FITNav) has shown success in clinical trials; however, formal guidance on its implementation is scarce. After noting no improvement in an administrative metric measuring colonoscopy < 180 days after +FIT, we initiated a multi-stage QI project which began with stakeholder meetings and retrospective chart review.
Methods: After process mapping, we queried all index +FIT from Mar. 1, 2019 - Sept. 3, 2021. Manual chart review abstracted order notes, gastroenterology consults, and records of patient/navigator notification. +FIT were divided into three periods: Mar. 1 - Sept. 3 2019, 2020, 2021: pre-pandemic, early pandemic, and late pandemic. FITNav was fully implemented in the latter. Dementia & >65 y/o, diagnostic FIT, inpatient FIT, or comorbidities judged by a GI clinician to increase anesthesia risk were exclusion criteria. The unadjusted and adjusted association between late & early pandemic proportion receiving colonoscopy < 180 days was assessed using binary logistic regression, summarized as odds ratio (OR) and 95% confidence intervals (CI).
Results: 121, 103, and 253 index +FIT met criteria over the pre, early, and late pandemic. While no significant differences in demographics were present, days to patient notification rose from mean (SD) of 7.8 (6.1) to 10.4 (17.3) in early pandemic, returning to 7.2 (8.2) in late pandemic (p=0.01). Proportion receiving colonoscopy < 180 days was 53.7%, 60.2%, and 58.5% (Unadjusted OR 1.08; 95% CI .60-1.94 p=0.796). Adjusted OR was similar (0.94; 95% CI 0.58-1.52, p=0.787). 20.2% of late pandemic +FIT were not sent to FITNav (Table).
Conclusion: This analysis suggests that in the early pandemic, colonoscopy < 180 days was maintained. This data also suggests that FITNav implementation without further system design was insufficient to increase colonoscopy < 180 days. These findings prompted creation of a direct-to-colonoscopy pathway and a centralized Microsoft Access database which went live May 27, 2022. This intervention gives the FITNav access to all +FIT on the day of results, semi-automated alerts, and prospective data collection for future improvement cycles. Systems considering FITNav should understand that implementation may require such efforts to achieve success.

Table 1. Cohort Characteristics and Clinician Workflow Between Periods Demographic comparison between cohorts demonstrates no statistically significant differences

		Pre-pandemic (N=121)	Early Pandemic (N=103)	Late Pandemic (N=253)	Total	P-value
Colonoscopy < 180 Days	Yes	65 (53.7%)	62 (60.2%)	148 (58.5%)	275 (57.7%)	*0.573*
	No	56 (46.3%)	41 (39.8%)	105 (41.5%)	202 (42.3%)	
Age at FIT Result (Years)	Mean (SD)	66.8 (8.2)	65.8 (8.6)	65.7 (8.9)	66.0 (8.6)	0.513
Race/Ethnicity	Caucasion Non-Hispanic	94 (77.7%)	74 (71.8%)	191 (75.5%)	359 (75.3%)	0.08
	Black Non-Hispanic	11 (9.1%)	17 (16.5%)	22 (8.7%)	50 (10.5%)	
	Hispanic	6 (5.0%)	9 (8.7%)	14 (5.5%)	29 (6.1%)	
	Others/Multiple	6 (5.0%)	1 (1.0%)	8 (3.2%)	15 (3.1%)	
	Unknown/Declined to Answer	4 (3.3%)	2 (1.9%)	18 (7.1%)	24 (5.0%)	
Sex	Female	12 (9.9%)	11 (10.7%)	19 (7.5%)	42 (8.8%)	0.558
	Male	109 (90.1%)	92 (89.3%)	234 (92.5%)	435 (91.2%)	
Area Deprivation Index (National Percentile)	Mean (SD)	64.2 (21.5)	63.2 (23.7)	64.9 (22.5)	64.4 (22.5)	0.824
Time to Patient Notification (days)[1]	Mean (SD)	7.8 (6.1)	10.4 (17.3)	7.2 (8.2)	8.1 (10.5)	**0.041**
Patient Notification Method[1]	Letter Only	22 (18.6)	31 (30.7%)	44 (17.8%)	97 (20.8%)	**0.002**
	Phone Call Only	51 (43.2%)	39 (38.6%)	113 (45.7%)	203 (43.6%)	
	Call + Letter (Letter First)	31 (26.3)	9 (8.9%)	37 (15.0%)	77 (16.5%)	
	Call + Letter (Call First)	12 (10.2)	12 (11.9%)	38 (15.4%)	62 (13.3%)	
	Secure Messaging Only	0 (0.0%)	4 (4.0%)	2 (0.8%)	6 (1.3%)	
	Secure Messaging + Phone/Letter	2 (1.7%)	4 (4.0%)	6 (2.4%)	12 (2.6%)	
Gastroenterology (GI) Consult Placed[2]	Yes	105 (86.8%)	96 (93.2%)	224 (88.5%)	425 (89.1%)	0.281
	No	16 (13.2%)	7 (6.8%)	29 (11.5%)	52 (10.9%)	
Time to GI Consult (days)	Mean (SD)	16.8 (25.8)	9.3 (16.4)	9.8 (18.6)	11.5 (20.5)	**0.009**
GI Consult Timing[2]	Placed Before +FIT Result Known	4 (3.8%)	12 (12.5%)	12 (5.4)	28 (6.6%)	**0.026**
	Placed After +FIT Result Known	101 (96.2%)	84 (87.5%)	212 (94.6%)	397 (93.4%)	
FIT Navigator Notified by RN	Yes	0	21 (20.4%)[3]	202 (79.8%)	–	–
	No	0	82 (79.6%)	51 (20.2%)	–	
Colonoscopy Location[4]	JAHVH Colonoscopy	66 (80.5%)	56 (77.8%)	122 (78.2%)	244 (78.7%)	0.467
	Community Colonoscopy	16 (19.5%)	13 (18.1%)	31 (19.9%)	60 (19.4%)	
	Other VA	0 (0%)	3 (4.2%)	3 (1.9%)	6 (1.9%)	

Changes in clinician workflow/process were evident with regards to patient notification (increased in the early pandemic), time to GI consults (decreased in the early pandemic), and the timing of GI consults. No changes in colonoscopy location were evident.
[1]Patient Notification Method was determined based on attempts rather than responses as the latter proved to be unobtainable due to >40% missing data.
[2]This data pertains to the 1st GI consult. Often patients required multiple consults, especially if community/other VA procedures were needed.
[3]While the FIT navigator began receiving notifications in August 2020, we estimated 1-month before workflow was present based on manual chart review.
[4]Colonoscopy location was based on manual chart review which included searching all scanned imaging files (to capture community colonoscopies) as well as Joint Legacy Viewer (JLV) which gives information on Other VA procedures (patients can sometimes receive care at other VA facilities).

S312

Comparing the Adenoma Detection Rate of Endocuff-Assisted Colonoscopy (EAC) Against Combined Artificial Intelligence and Endocuff-Assisted Colonoscopy (AEAC)

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Introduction: Colorectal cancer (CRC) is the second leading cause of cancer-related mortality in the world. While effective at preventing CRC, standard colonoscopy can miss precancerous polyps placing patients at risk for interval CRC. Endoscopic mechanical attachments and artificial intelligence (AI) are technologies that have independently shown improvement in adenoma detection rate (ADR). We sought to compare the performance of Endocuff-assisted colonoscopy (EAC) to combined AI and EAC (AEAC) in relation to ADR.
Methods: This was a single-center study involving patients who underwent either AEAC or EAC between December 2021 and May 2022. Demographic (age, sex) and clinical (indication, Boston Bowel preparation scale (BBPS), withdrawal time, polyp location, histology and size) data on patients was obtained from the electronic health record. The primary outcome was ADR. Secondary outcomes were polyp detection rate (PDR), adenomas per colonoscopy (APC), polyps per colonoscopy (PPC), sessile serrated lesion rate (SSR) and sessile serrated lesions per colonoscopy (SSPC). Categorical variables were analyzed using a two-sided chi square test. Continuous variables were assessed using the student's t-test or Mann-Whitney U-test. Odds ratios (OR) and 95% confidence intervals (CI) were calculated using logistic regression.
Results: 148 patients (50.7% men, mean age 60.9 years; 74 AEAC vs 74 EAC) were included. The AEAC group did not differ by age, sex, indication or BBPS from the EAC group (Table). ADR in the AEAC group was higher (71.6% vs 60.8%; OR 1.63; 95% CI 0.82-3.24; $P = 0.17$). SSR was 14.9% in the EAC group versus 24.3% in the AEAC group ($P > 0.05$) (Table). For adenomas >5-10mm in size, the AEAC group had a significantly higher ADR (28.4% vs 14.9%; OR 2.27; 95% CI 1.00-5.13; $P = 0.05$). Withdrawal time was longer in the AEAC group (8.0min vs 7.3min; $P = 0.03$). Subgroup analysis by indication revealed that ADR trended towards significance for patients in the AEAC group undergoing colonoscopy for CRC screening (70.3% vs 52.3%; OR 2.17; 95% CI 0.94-4.98; $P = 0.068$).
Conclusion: Combining AI with Endocuff-assisted colonoscopy increased ADR, PDR, APC, PPC, SSR and SSPC when compared to EAC. ADR trended towards significance for patients in the AEAC group undergoing CRC screening. This study highlights the potential benefits of maximizing surface area exposure (mechanical enhancement) combined with enhanced mucosal inspection (AI). Future larger studies will be needed to further validate this combination.

Table 1. Patient Demographics and Per-Patient Lesion Analysis Caption

Variable	EAC (n=74)	AEAC (n=74)	*P*
Mean age (SD), y	60.8 (9.7)	61.0 (9.9)	0.91
Sex, n (%)			0.87
Male	38 (51.4)	37 (50)	
Female	36 (48.6)	37 (50)	
Indication for colonoscopy, n (%)			0.08
Screening	44 (59.5)	54 (73)	
Surveillance	30 (40.5)	20 (27)	
Mean BBPS (SD)	8.6 (0.8)	8.5 (0.9)	0.55
Median withdrawal time (IQR), min*	7.3 (6.6-8.2)	8.0 (7.3-8.7)	0.03
Patients with >1 adenoma (ADR), n (%)	45 (60.8)	53 (71.6)	0.17
Adenomas per colonoscopy (APC), (range)	1.43 (0-12)	1.45 (0-5)	0.96
Patients with >1 polyp (PDR), n (%)	66 (89.2)	70 (94.6)	0.23
Polyps per colonoscopy (PPC), (range)	2.55 (0-13)	2.62 (0-16)	0.85
Patients with >1 sessile serrated lesion (SSR), n (%)	11 (14.9)	18 (24.3)	0.15
Sessile serrated lesions per colonoscopy (SSPC), (range)	0.23 (0-4)	0.27 (0-2)	0.67
Adenoma location, n (%)**			
Right colon	31 (41.9)	33 (44.6)	0.74
Transverse colon	16 (21.6)	17 (23)	0.84
Left colon	22 (29.7)	26 (35.1)	0.48
Adenoma size, n (%)**			
1-5mm	40 (54.1)	39 (52.7)	0.87
>5-10mm	11 (14.9)	21 (28.4)	0.05
>10mm	8 (10.8)	11 (14.9)	0.46
Polyp location, n (%)**			
Right colon	34 (45.9)	42 (56.8)	0.19
Transverse colon	22 (29.7)	22 (29.7)	1.00
Left colon	49 (66.2)	51 (68.9)	0.73
Polyp size, n (%)**			
1-5mm	62 (83.8)	55 (74.3)	0.16
>5-10mm	15 (20.3)	24 (32.4)	0.09
>10mm	8 (10.8)	12 (16.2)	0.34
Sessile serrated lesion location, n (%)**			
Right colon	3 (4.1)	10 (13.5)	0.08
Transverse colon	7 (9.5)	3 (4.1)	0.33
Left colon	5 (6.8)	6 (8.1)	1.00
Sessile serrated lesions size, n (%)**			
1-5mm	5 (6.8)	5 (6.8)	1.00
>5-10mm	3 (4.1)	8 (10.8)	0.21
>10mm	4 (5.4)	6 (8.1)	0.75

EAC, Endocuff-assisted colonoscopy; AEAC, artificial intelligence and EAC; SD, standard deviation; BBPS, Boston Bowel Preparation scale; IQR, interquartile range; PDR, polyp detection rate; PPC, polyps per colonoscopy; ADR, adenoma detection rate; APC, adenomas per colonoscopy; SSR, sessile serrated lesion rate; SSPC, sessile serrated lesions per colonoscopy.
*There was 1 case missing data in the EAC cohort.
**Number of patients with >1 adenoma/polyp/sessile serrated lesion.

S313

Targeting Low Referral Rates for Colorectal Adenocarcinoma to Cancer Genetics

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Introduction: Colorectal cancer (CRC) incidence is rising in those 20-49 years old. Approximately 10.5% of new CRC diagnoses occur in those under 50 years old. Individuals with early-onset CRC should be referred for cancer genetic testing to evaluate for an inherited colorectal syndrome. Historically, the rate of genetics referral for this target population has been low. We identified a cohort of patients eligible for cancer genetic risks assessment based on young onset of CRC at our institution.
Methods: This is a retrospective chart review of individuals age ≤50 in the cancer registry database with colon or rectal adenocarcinoma from 2016 to 2020. Data was collected on demographics, age at diagnosis, tumor histology, germline testing, and referral to genetic services. The primary intervention was to contact via telephone those who had not been previously referred for cancer genetic testing and to invite them to undergo risks assessment and testing.
Results: Initially, 86 individuals were identified and 34 (39.5%) were previously referred to cancer genetics. Of the remaining patients, 36 (69.2%) were alive at the time of the study. The average age at cancer diagnosis was 43.5 years-old. A majority of the panel was Caucasian (52.7%). Ten patients (20.4%) were contacted and referred for an appointment, representing a 29.4% increase in referrals (P=0.787). The remaining 79.6% of patients either declined screening, were unable to be contacted, or were deemed inappropriate for referral. There was not a statistically significant increase in referral rates among all races. Non-white Hispanics had the largest increase at 75% (P=0.682) followed by Caucasians at 26.1% (P=0.178). All individuals who were successfully contacted and agreeable to referral have pending appointments with cancer genetics.
Conclusion: While the reasons for the rise in CRC in younger individuals are not yet well understood, a subset of these cancers may be detected earlier by identifying those with CRC associated mutations. The approach to genetic testing hinges on a detailed family history that can be easily missed. In order to increase inclusivity, utilizing navigation based on age criteria and tumor subtype to identify patients may

increase referral rates to genetics counselors. In this study we did not achieve statistical significance, likely due to small sample size. Still, racial disparities in genetics referrals exist and improving navigation can increase referrals across all races.

S314

Increasing Colon Cancer Screening Compliance in a Residency Clinic by Means of Personalized Patient Phone Calls

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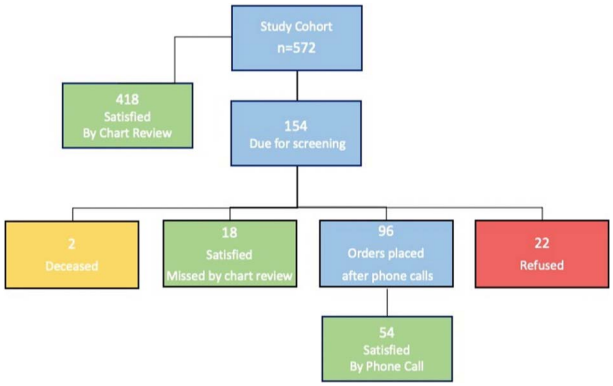
Introduction: Colorectal cancer (CRC) ranks second as a cause of cancer mortality and is the third most prevalent cancer in both men and women in the US. CRC screening efforts are directed towards the detection and removal of adenomas and sessile serrated lesions (SSLs), which reduces CRC incidence and CRC mortality significantly. In our Internal Medicine clinic at a tertiary care hospital, a deficient colorectal cancer screening compliance rate was identified in 2019. We performed individual patient calls to increase the screening rates and evaluated the efficacy of these interventions.
Methods: We screened patients aged 50-75 in our clinic. Patient due for CRC screening was defined as having had their screening colonoscopy more than 10 years ago or stool-DNA test more than 3 years ago with normal results. Patients with a history of colon cancer or familial cancer syndromes were excluded. For the next year, patients due for screening were called by resident physicians to provide counseling regarding different screening options and the risks and benefits of each test. If the patient agreed, a stool test or a referral to a gastroenterologist was ordered. We hypothesized that if patients underwent a screening test within 1 year after the phone calls, it was because of the interventions.
Results: A total of 572 patients were eligible for the study. 418 patients were satisfied with screening at the start. 154 patients due for CRC screening were called, 18 patients responded to have received screening on time from other facilities; hence satisfied and 2 patients were deceased at the time of intervention. Out of 134 patients eligible for screening, 96 agreed to undergo a screening colonoscopy after the discussion, 22 patients refused screening and 16 patients were unable to be contacted via phone. Among 96 patients who agreed to screen, 54 received screening for CRC within a year of the intervention. Phone call intervention revealed a 45.7% (54/134-16) response rate. The baseline CRC screening compliance before interventions was 76.2% (418+18/572), and post-intervention compliance rate was 85.6% (418+18+54/572). (Figure)
Conclusion: A phone call intervention increased colorectal cancer screening compliance by 9.4% in our cohort. We concluded that internal medicine clinics can play an active part in CRC prevention by counseling patients during regular wellness visits, sending reminder letters and/or phone calls to eligible patients.



[0314] **Figure 1.** Process Flowchart

S315

Does Having a Fellow Improve the Quality of Screening Colonoscopy?

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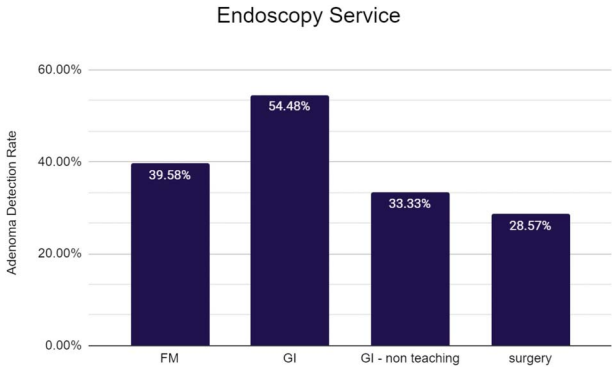
Introduction: Adenoma detection rate (ADR) is used as a quality metric for physicians performing screening colonoscopies. Many studies use the ADR to assess if different variables affect the quality of colonoscopy. At times, some patients request that a physician in training, a gastroenterology fellow, not be involved in their procedure. This study aims to assess the differences in ADR during screening colonoscopy with and without involvement of the gastroenterology fellow.
Methods: A retrospective review of 243 consecutive screening colonoscopies performed at LSU Health Shreveport over a 3-month period starting in December 2020. The colonoscopies were performed by 10 different attending physicians and 13 different fellows/residents. Procedural sedation was performed by an endoscopy nurse, and a physician. Procedures that were done under minimal anesthesia care, sedation was administered by a certified nurse anesthetist, that included Midazolam, Ketamine, Fentanyl and Propofol. The inclusion criteria for the study were patients presenting for a screening colonoscopy with no prior colonoscopy, etc..in the last 10 years. Poor prep, incomplete colonoscopy for any reason were excluded from the study. After chart review, various variables were recorded. The data was then used to show the ADR with the different variables. (Figure)
Results: 243 colonoscopies were reviewed. 144 with a gastroenterology fellow, 7 with a surgery resident, and 92 with an attending physician. The fellow's ADR were included vs with an attending alone was 54.3% vs 32.6% (p-value 0.0009). Of colonoscopies done, 59 had MAC sedation, 94 with an endoscopist giving propofol sedation, 89 with versed sedation resulting in ADR of 57.6% vs 53.2% vs 30.3%. When comparing ADR of MAC (57.6%) vs non-MAC (42.1%) was statistically significant with a p-value of 0.04. When comparing ADR to the attending service, endoscopist was part of: GI teaching service 54.5%, GI non-teaching 33.3%, Family medicine 39.6%, and surgery 28.6%.
Conclusion: Many people understand the importance of screening colonoscopy and the aim of this study was to find out what variables improve the quality of colonoscopies. It showed that a colonoscopy that involves a fellow, attending teaching service, with MAC anesthesia has the highest rate of detection of precancerous adenomas. Limitations of the study include a low sample size. Other limitations include the different services have varying practice habits such as withdrawal time.



[0315] **Figure 1.** ADR by service

A Cross-Sectional Quality Improvement Study: Assessing the General Public Knowledge of Colorectal Cancer (CRC) by Comparing Races During CRC Awareness Month in March 2022 at a Safety Net Hospital

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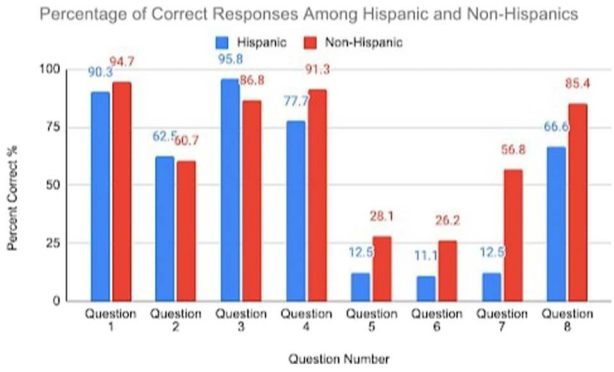
Introduction: Colorectal cancer (CRC) is the second leading cause of cancer death and the third most common cause of cancer amongst men and women in the US. Despite being a preventable malignancy, about 7 in 10 US adults are up-to-date with CRC screening. It is predicted that by 2035 there will be a 27.8% increase in mortality secondary to colorectal cancer. In recent years, only approximately half of the Hispanic population in the US has reported obtaining CRC screening, yet by 2050 30% of the US, people will be Hispanic.
Methods: A short survey about CRC awareness, provided by the Centers for Disease Control and Prevention (CDC), was randomly handed out to patients, employees, and visitors at Nassau University Medical Center, a 530-bed safety-net hospital in Long Island, NY. The surveys were randomly distributed during *National Colorectal Cancer Awareness Month* (NCCAM). Statistical analysis was conducted to ascertain the overall percentage of accurate responses and compare Hispanic (H) and non-Hispanic (n-H) responses.
Results: 278 individuals (72 H, 206 n-H) completed the CRC awareness survey during NCCAM. Our findings reflect an overall good understanding regarding symptomatology (80.6% [66.6% H; 85.4% n-H]), gender disease (93.5% [90.3% H; 94.7 n-H]), preventive screening (89.2% [95.8% H; 86.9% n-H]), and symptom-related CRC (87.8% [77.7% H; 91.3% n-H]) (Table). We also saw a significant shortfall regarding screening alternatives (45.3% [12.5% H; 56,8% n-H]) and age-starting (24.1% [12.5% H; 28.1% n-H]) and age-ending screenings (22.3% [11.1% H; 26.2% n-H]) (Figure).
Conclusion: Since the mid-1980s, the overall CRC incidence has declined steadily due to increased general awareness, uptake of screening, and modifying risk factors. However, the high incidence and mortality rates in the US could be due to a lack of CRC knowledge. Our study provides evidence of CRC awareness deficiency. This disparity among races was highly noticeable, with only 12% of Hispanics compared to 56% of non- Hispanics aware of other screening modalities. Poor socioeconomic status, low education levels, and language barriers could be contributing factors. Interestingly, both groups showed a decreased awareness of the appropriate age to begin colorectal cancer screening. In light of our findings, and with the rapid rise in the Hispanic population throughout the US, further action is warranted to increase awareness of CRC, particularly amongst this vulnerable population, ultimately saving lives.



[0316] **Figure 1.** The percentage of accurate responses to the CRC Awareness Survey among Hispanics and Non-Hispanics patients, employees, and visitors of a large New York safety-net hospital during National Colorectal Cancer Awareness Month

Table 1. CRC Awareness Survey provided by the CDC given on random dates to Hispanics and non-Hispanics patients, employees, and visitors of a large New York safety-net hospital during National Colorectal Cancer Awareness Month

Legend: Q: Question A: Correct answer	Total Answers (n=278)	%	Correct Answers Hispanics (n=72)	%	Correct Answers Non-Hispanics (n=206)	%
Q1: Who gets colorectal cancer? Men only. Women only. A: Both men and women.	13/278 5/278 260/278	4.7 1.8 93.5	65/72	90.3	195/206	94.7
Q2: Colorectal cancer is the second leading cancer killer in the U.S. A: True. : False.	170/278 107/278	61.2 38.5	45/72	62.5	125/206	60.7
Q3: Getting screened for colorectal cancer can help you prevent the disease. A: True. : False.	248/278 22/278	89.2 7.9	69/72	95.8	179/206	86.9

Table 1. (*continued*)

Legend: Q: Question A: Correct answer	Total Answers (n=278)	%	Correct Answers Hispanics (n=72)	%	Correct Answers Non-Hispanics (n=206)	%
Q4: If you don't have any symptoms, it means you don't have colorectal cancer. : True. A: False.	36/278 244/278	12.9 87.8	56/72	77.7	188/206	91.3
Q5: Screening is recommended to begin at what age? : 40. A: 45. : 50. : 60.	122/278 67/278 84/278 6/278	43.9 24.1 30.2 2.2	9/72	12.5	58/206	28.1
Q6: At what age can you stop getting screened for colorectal cancer? : 60. : 65. : 70. A: 75. : 80.	15/278 10/278 29/278 62/278 160/278	5.4 3.6 10.4 22.3 57.6	8/72	11.1	54/206	26.2
Q7: The only screening test for colorectal cancer is colonoscopy. : True. A: False.	152/278 126/278	54.7 45.3	9/72	12.5	117/206	56.8
Q8: Which of these are symptoms of colorectal cancer? : Blood in or on your stool (bowel movement). : Stomach pain, aches, or cramps that don't go away. : Losing weight and you don't know why. A: All of these. : None of these.	34/278 10/278 4/278 224/278 11/278	12.2 3.6 1.4 80.6 4.0	48/72	66.6	176/206	85.4

*For an estimated population of 1,000 on any given day in a large safety-net hospital, 278 participants account for a 95% confidence level ($p<0.05$).

S317

Demographic Disparities in Colorectal Carcinoma Screening in a Large Urban Federally Qualified Health Center Network

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Introduction: Epidemiologic studies continue to show disparities in CRC screening. Demographic factors including age, gender, race/ethnicity, level of education, and primary language affect the chance of having age-appropriate CRC screening. The endpoint of this study was to investigate potential differences in CRC screening by gender, race/ethnicity, and primary language in one of the largest Federally Qualified Health Center (FQHC) networks in the U.S.
Methods: In this retrospective, observational study, data was obtained from the electronic medical records (EMR) of 12,663 patients aged 50-75 years old seen at Family Health Centers at NYU Langone during the period between August 2019 and July 2020.
Results: CRC screening was done in n=4034 (56.6%) females, but only n=2531 (45.7%) males. In terms of race/ethnicity, CRC screening was done in n=4002 (58.9%) in Hispanics, n=723 (63.7%) Non-Hispanic Asians, n= 1341 (40.5%) Non-Hispanic African/Americans and n= 468 (34.4%) Non-Hispanic-Whites. In terms of language, CRC screening was done in n= 2842 (42.4%) English-speaking patients, n= 3071 (62%) Spanish-speaking patients and n= 575 (66.8%) Chinese-speaking patients.
Conclusion: Age-appropriate CRC screening rates differed by gender, race/ethnicity, and primary language. The lower age-appropriate CRC screening rate in males is consistent with what we know about CRC screening trends in the U.S. Surprisingly, the age-appropriate CRC screening rate was higher in Non-Hispanic Asians and Hispanics, and in those who speak a language other than English. Additionally, the age-appropriate CRC screening rate was higher in non-Hispanic African Americans than in Non-Hispanic-Whites. (Table). Improvement in CRC screening in Hispanics, Non-Hispanic Asians, and non-Hispanic African Americans has likely been due to EMR best practice and care gap flags which prompt providers to screen patients. Within the immigrant population, both literacy and culture have been shown to have a strong impact on health care utilization. Diminishing disparities in screening further may require increasing patient education that is culturally sensitive and accessible for patients with low health literacy.

Table 1. **Characteristics of patients, stratified by CRC screening status**

Variable	Overall (n=12,663), n (%)	Patients with one or more screenings for colorectal cancer Yes (n= 6565), n (%)	 No (n= 6098), n (%)	*P*
Sex at birth				
Male	5537 (43.7)	2531 (45.7)	3006 (54.3)	< 0.01
Female	7126 (56.3)	4034 (56.6)	3092 (43.4)	
Race/Ethnicity				
Non-Hispanic - White	1359 (10.7)	468 (34.4)	891(65.5)	< 0.01
Hispanic (All races)	6793 (53.6)	4002 (58.9)	2791 (41.1)	
Non-Hispanic African/American	3310 (26.1)	1341 (40.5)	1969 (59.5)	
Non-Hispanic Asian	1135 (9)	723 (63.7)	412 (36.3)	
Other	66 (0.52)	31(47)	35 (53)	
Primary Language				
English	6700 (52.9)	2842 (42.4)	3858 (57.6)	< 0.05
Spanish	4950 (39.1)	3071 (62)	1879 (38)	
Chinese	861 (6.8)	575 (66.8)	286 (33.2)	
Other/Unreported	152 (1.2)	1 (0.6)	151. 151.(99.4)	

S318

African Americans Have Higher Inpatient Mortality at a Younger Age: A Nationwide Inpatient Sample Database Analysis

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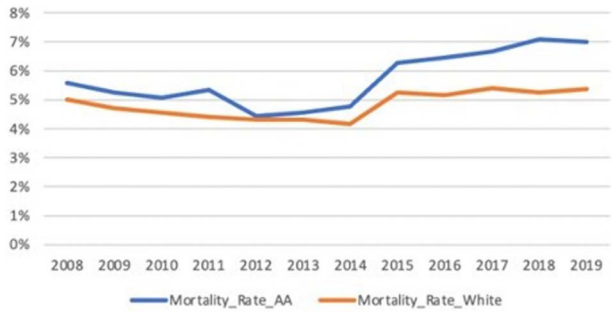
Introduction: Colorectal cancer (CRC) is the 3rd most common cause of cancer-related death in women and 2nd in men in the US. CRC incidence and mortality have been trending down with better screening strategies. Significant disparities are still reported to remain among certain races/ethnicities and age groups. In this study, we assessed CRC-related outcomes in African Americans (AA) as compared to Caucasians to understand racial and age disparities.

Methods: We used the Nationwide Inpatient Sample (NIS) database from 2008 and 2019. Previously validated ICD-10-CM codes identified CRC. CRC patients were divided into two groups Caucasians and AA. Univariate logistic regression for categorical variables and linear regression for continuous variables was carried out to identify independent associations at $p < 0.05$. Statistical Analysis was performed using R studio. Age of hospitalization and racial distribution was studied along with the other comorbidities.

Results: A total of 2,569,516 inpatient admissions were included. 410,139 were AA and 2,159,377 were Caucasians (Table a). AA's have a younger age at admission with a mean age of 63 years compared to 68 years in Caucasians ($p< 0.001$). AA's have a higher percentage of inpatient admissions in the younger population between the ages of 28 to 67. Caucasians have a higher percentage of inpatient admission due to CRC after 68 years of age. Despite their relatively younger age, AA's have significantly higher inpatient mortality (5.9%) compared to Caucasians (4.9%) ($p< 0.001$). More AA's (51%) had low median household income of $1-24999 in contrast to Caucasians (23%). AA's have a higher percentage of use of Medicaid (18% vs. 6.7%) and Caucasians have a higher percentage of Medicare (59% vs 49%). The disparity in mortality remained significantly higher in the AA population compared to Caucasians even after controlling household income and type of insurance. (Table b)

Conclusion: Despite advances in CRC screening and treatment, racial disparities in outcomes continue to exist. This study found that AA's with colorectal cancer have consistently higher inpatient mortality rates compared to Caucasians with a widening gap from 2015 to 2019 (Figure). AA's with colorectal cancer are also being hospitalized at younger ages compared to their Caucasian counterparts. These disparities are most likely due to a number of social determinants of health. Future screening and treatment guidelines need to recognize these factors in order to improve equity in colorectal cancer outcomes.



[0318] **Figure 1.** Trends of Inpatient mortality due to CRC comparing AA(African Americans) and white(Caucasians) between the years 2008-2019

Table 1. (a) Demographics of Colorectal cancer hospitalizations in Caucasians and African Americans (b) Outcome of Colorectal cancer hospitalizations in Caucasians and African Americans

	Caucasians, N = 2,159,377	African American, N = 410,139	p-value
Age in years at admission	68 (58, 78)	63 (54, 72)	< 0.001
Sex			< 0.001
Male	1,071,773 (50%)	191,960 (47%)	
Female	1,086,925 (50%)	218,014 (53%)	
PAY			< 0.001
Medicare	1,262,570 (59%)	199,569 (49%)	
Medicaid	144,929 (6.7%)	72,952 (18%)	
Private	654,826 (30%)	106,884 (26%)	
Self Pay	43,274 (2.0%)	16,563 (4.0%)	
No charge	4,346 (0.2%)	1,772 (0.4%)	
Other	46,231 (2.1%)	11,644 (2.8%)	
Median household income			< 0.001
$1- 24999	487,393 (23%)	202,340 (51%)	
$25000-34999	565,496 (27%)	84,672 (21%)	
$35000-44999	542,108 (26%)	66,013 (17%)	
$45000+	527,105 (25%)	46,966 (12%)	
Age_Group			< 0.001
18-27	8,081 (0.4%)	2,417 (0.6%)	
28-37	37,429 (1.7%)	11,177 (2.7%)	
38-47	125,799 (5.8%)	33,865 (8.3%)	
48-57	350,485 (16%)	91,595 (22%)	
58-67	528,264 (24%)	119,722 (29%)	
68-77	561,376 (26%)	90,141 (22%)	
78-87	418,539 (19%)	48,858 (12%)	
88 and above	129,404 (6.0%)	12,364 (3.0%)	
Obesity	206,028 (9.5%)	41,133 (10%)	< 0.001
Smoking	124,563 (5.8%)	24,672 (6.0%)	0.005
DM	384,959 (18%)	92,562 (23%)	< 0.001
HLD	624,296 (29%)	93,668 (23%)	< 0.001
HTN	756,288 (35%)	175,882 (43%)	< 0.001
Alcohol	23,310 (1.1%)	3,195 (0.8%)	< 0.001

Table 1. (*continued*)

	Caucasians, N = 2,159,377	African American, N = 410,139	p-value
UC (Ulcerative colitis)	16,423 (0.8%)	1,876 (0.5%)	< 0.001
CD (Crohn's disease)	12,967 (0.6%)	1,408 (0.3%)	< 0.001
OUTCOMES (UNIVARIATE ANALYSIS)			
Inpatient Mortality	104,918 (4.9%)	24,042 (5.9%)	
Length of stay (cleaned) (days)	5.0 (3.0, 8.0)	5.0 (3.0, 9.0)	< 0.001
Total charges (cleaned) ($)	$42,842 (23,051, 77,615)	$42,248 (21,937, 80,273)	0.2

S319

Improving Colorectal Cancer Screening to Implement New Guidelines

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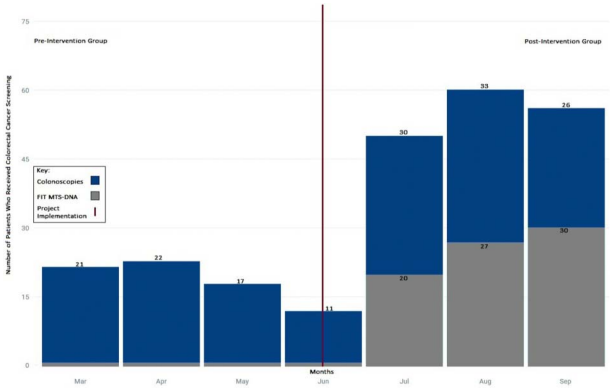
Introduction: Colorectal cancer (CRC) is the 2nd leading cause of cancer-related deaths in the U.S. The American College of Gastroenterology recently updated their CRC screening guidelines in March 2021 to screen ages 45-75. The U.S. Preventive Services Task Force also added Grade B recommendations to screen individuals aged 45-49 as of May 2021. With these updates in mind, a quality improvement project was initiated to increase CRC screening in patients aged 45-49 years.
Methods: Our primary objective was to improve rates of CRC screening in ages 45-49. Only average risk patients aged 45-49 with no prior CRC screening were included. Patients with a personal or family history of CRC, adenomatous polyps, Lynch syndrome, familial adenomatous polyposis, & recent gastrointestinal bleed were excluded. In June 2021, our institution's healthcare gaps were modified to include CRC screening for ages 45-49. Patients 3 months pre-intervention were compared to those 3 months post-intervention. Baseline demographics were also assessed. The type of screening, adenoma detection rates, colonic lesion rates, & malignant neoplasm rates were evaluated as secondary outcomes. (Figure)
Results: Overall demographics were similar between the two groups. Both had similar age, BMI, sex, race, & ethnicity. The amount of open healthcare gaps, use of alcohol, & tobacco use were also very similar. We found a statistically significant improvement in CRC screening rates after the intervention. A total of 59 patients (0.0445%) completed CRC screening pre-intervention. While 131 patients (0.0989%) received CRC screening post-intervention. Our primary objective was met with a $P < 0.0001$. A comprehensive increase of 71 patients received CRC screening post-intervention. Secondary outcomes however revealed no significant difference between the pre & post-intervention groups. (Table)
Conclusion: Our implementation did not assess other CRC screening modalities other than colonoscopy & FIT MTS-DNA stool testing as our institution predominantly uses these two methods for screening. Despite this limitation, our project successfully achieved its goal. A total of 71 additional patients completed CRC screening. This translates to an improvement of CRC screening by over 200%. Though there was no significant difference in detecting malignant adenomatous neoplasms, this increase still theoretically translates to detection of 2 additional patients diagnosed with CRC per epidemiological studies. Overall further work needs to be done to improve our CRC screening rates.



[0319] **Figure 1.** Number of Patients Who Received Colorectal Cancer Screening by Month

Table 1.

Demographics & Outcomes	Pre-Intervention	Post-Intervention	P-value
Median Age	48	47	
Median BMI	30.5	29.6	
Male Sex Percentage	54.2%	46.9%	P = 0.53 [95% CI: -0.147 to 0.285]
Median Care Gap Score¶	3	3	
Max Care Gap Score♠	7	7	
Average Alcohol Use Per Week	3 / week	4 / week	
Smoking Percentage♥	8%	20%	P = 0.073 [95% CI: -0.238 to 0.010]
Caucasian Race	86.4%	91.3%	P = 0.736 [95% CI: -0.343 to 0.240]
African American Race	4.7%	4.31%	
Hispanic Ethnicity	0.53%	0.63%	
Asian Americans and Pacific Islanders Race	0.79%	0.80%	
Total Patients Eligible for CRC♣ Screening	132452	132432	
Total CRC Screened Number of Patients	59	131	
Total CRC Screened Percentage	0.0445%	0.0989%	**P < 0.0001 [95% CI: -0.000748 to -0.000340]**

Table 1. (*continued*)

Demographics & Outcomes	Pre-Intervention	Post-Intervention	P-value
CRC Screened through Colonoscopy	59	80	
CRC Screened through FIT MTS-DNA	0	51	
Adenoma Detection Rate on Colonoscopy°	44.1%	38.8%	P = 0.63 [95% CI: -0.162 to 0.269]
Colonic Lesion Detection Rate on Colonoscopy[a]	42.4%	40%	P = 0.83 [95% CI: -0.192 to 0.240]
Malignant Adenomatous Neoplasms Detection Rate on Colonoscopy	0%	0%	

¶Median number of healthcare gaps that were unresolved in patients after CRC screening took place
♠. Maximum number of healthcare gaps that were unresolved in patients after CRC screening took place
♥. Percentage of patients with any prior history of smoking as documented by Social History.
♣. Colorectal Cancer.
°Percentage of patients who were found to have 1 or more precancerous polyps detected on colonoscopy.
[a]. Percentage of patient who were found to have colonic lesions of any kind aside for polyps on colonoscopy.

S320 WITHDRAWN

S321

Effective Messaging Strategies for Colorectal Cancer Screening: The Development of the 2022 NCCRT Messaging Guidebook for Black and African American People

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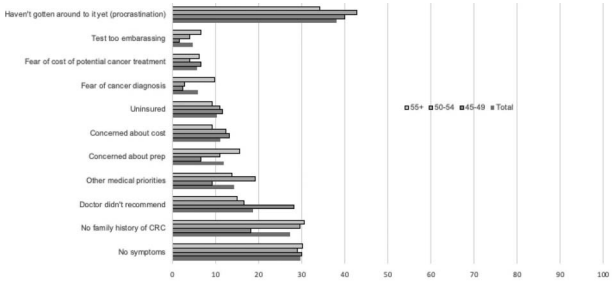
Introduction: Colorectal cancer (CRC) is the second leading cause of cancer-related deaths in the United States (US) and disproportionately impacts Black individuals. The US Preventive Services Taskforce began recommending CRC screening for individuals aged 45-49 in 2021, however effective strategies to increase screening participation in Black individuals in this age group are unknown. Thus, the National Colorectal RoundTable (NCCRT) used a mixed methods approach to identify barriers and facilitators to CRC screening in Black individuals, with specific focus on those age 45-49. Results informed the development of the *2022 NCCRT Messaging Guidebook for Black & African American People.*
Methods: We conducted a mixed-methods study in a large, nationally representative sample of unscreened Black individuals. We first conducted semi-structured qualitative interviews with Black individuals over age 45, recruited from the Schlesinger Group qualitative research platform. Findings informed content for a subsequent survey to understand barriers and facilitators, administered broadly via the Prodege online research platform. Messages to encourage screening participation were developed based on learnings from prior ACS and NCCRT work. Message were tested using MaxDiff analytic methods and reviewed by a multidisciplinary advisory committee for inclusion in the Guidebook.
Results: There were 10 qualitative interview and 490 survey participants. The average age of participants was 52.7 (s.d.=6.1) for interviews and 55.3 (s.d.=7.3) for surveys. 40.0% were female and 38.2% lived in the Southeast US (Table). The most frequently reported barrier to screening was procrastination (40.0% in age 45-49; 42.8% in age 50-65; 34.2% in age >55). Procrastination was often attributed to financial concerns (20.8% in age 45-49) and COVID-19 (27.0% in age 50-54; 21.8% in age >55) (Figure). Of those age 45-49, the majority preferred to receive screening information from a health care provider (57.5%), however only 31.7% reported that a provider had initiated a screening conversation. Several messages rated as highly effective in encouraging screening were included in the NCCRT Guidebook.
Conclusion: We identified several age-specific barriers to CRC screening and developed unique messaging to motivate screening among unscreened Black individuals age 45 and over. Messages that tested positively are publicly available as a resource for organizations and institutions that aim to increase screening rates.



[0321] **Figure 1.** Reasons for procrastination of CRC screening among survey participants x - axis label: percentage

Table 1. Characteristics of qualitative interview and survey study populations

Characteristics Mean (s.d.) or N, %	Qualitative Interview participants Mean or N (%)	Survey participants Mean or N (%)	Total Participants N (%)
Age – Mean	52.7	55.3	
45-49	3 (30.0%)	120 (24.5%)	123 (24.6%)
50-54	2 (20.0%)	145 (29.6%)	147 (29.4%)
55+	5 (50.0%)	225 (45.9%)	230 (46.0%)
Race			
Black	10 (100.0%)	490 (100%)	500 (100.0%)
Gender			
Female	4 (40.0%)	262 (53.5%)	266 (53.2%)
Male	6 (60.0%)	226 (46.1%)	232 (46.4%)
Other	0 (0%)	2 (0.4%)	
Health insurance type			
Private	6 (60.0%)	153 (37.1%)	159 (31.8%)
Medicare	0 (0.0%)	111 (26.9%)	111 (22.2%)
State Insurance Program**	1 (10.0%)	119 (28.8%)	120 (24.0%)
VA/military	0 (0.0%)	15 (3.6%)	15 (3.0%)
Other	1 (10.0%)	38, (9.2%)	39 (7.8%)
Uninsured	2 (20.0%)	77, (15.7%)	79 (15.8%)
Location Type			
Urban	5 (50.0%)	215 (43.9%)	220 (44.0%)
Suburban	4 (40.0%)	211 (43.1%)	215 (43.0%)
Rural	1 (10.0%)	62 (12.7%)	63 (12.6%)
Not sure	0 (0.0%)	2 (0.4%)	2 (0.4%)
Household Income			
Less than 12,000	1 (10.0%)	63 (12.9%)	64 (12.8%)
12,000 to 39,999	2 (20.0%)	187 (38.2%)	189 (37.8%)
40,000 to 59,999	2 (20.0%)	98 (20.0%)	100 (20.0%)
60,000 to 79,000	1 (10.0%)	53 (10.8%)	54 (10.8)
80,000 to 99,999	1 (10.0%)	22 (4.5%)	23 (4.6%)
100,000 or more	3 (30.0%)	49 (10.0%)	52 10.4)
Prefer not to say	0 (0.0%)	18 (3.7%)	18 (3.6%)
Family history of CRC			
Yes	2 (20.0%)	43 (8.8%)	45 (9.0%)
No	8 (80.0%)	447 (91.2%)	455 (91.0%)
US Region			
Northeast	2 (20.0%)	100 (20.4%)	102 (20.4%)
Southeast	4 (40.0%)	187 (38.2%)	191 (38.2%)
Southwest	0 (0.0%)	69 (14.1%)	69 (13.8%)
Midwest	3 (30.0%)	90 (18.4%)	93 (18.6%)
West	1 (10.0%)	44 (9.0%)	45 (9.0%)
Marital status	Not Asked		
Single/never married		195 (39.8%)	
Married/living partner		174 (35.5%)	
Separated/Divorced/Widowed		118 (24.1%)	
Prefer not to say		3 (0.6%)	
Education	Not Asked		
High school or less Some college		144 (29.4%)	
Trade or vocational training		136 (27.8%)	
Associates or Bachelors' Degree		21 (4.3%)	
Graduate degree		137 (27.9%)	
Postgraduate Degree		41 (8.4%)	
		11 (2.2%)	
Employment	Not Asked		
Employed full time		183 (37.3%)	
Employed part time		42 (8.6%)	
Retired		77 (15.7%)	
Unemployed or disabled		142 (29.0%)	
Self-employed		40 (8.2%)	
Student		6 (1.2%)	

S322

Colonoscopy Findings in Patients With a Germline Pathogenic Variant in CDH1

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Introduction: Germline pathogenic variants (PV) in CDH1 predispose to hereditary diffuse gastric cancer and lobular breast cancer. There is no data on the risk of colorectal neoplasia in carriers of CDH1 pathogenic variants. Our aim is to investigate the colonoscopy findings in patients with a pathogenic variant in CDH1 undergoing colorectal cancer screening with colonoscopy.

Methods: This IRB-approved study identified patients with germline PV in CDH1 throughout the Cologene™ database in the David G. Jagelman Inherited Colorectal Cancer Registries. The electronic medical record was used to obtain information, including demographic characteristics, personal and family history of cancer, and colonoscopy findings, including adenomas, advanced adenomas (≥3 adenomas, or an adenoma ≥ 10 mm, or with villous features or high-grade dysplasia), and invasive colorectal cancer (CRC).

Results: This IRB-approved study identified patients with germline PV in CDH1 throughout the Cologene™ database in the David G. Jagelman Inherited Colorectal Cancer Registries. The electronic medical record was used to obtain information, including demographic characteristics, personal and family history of cancer, and colonoscopy findings, including adenomas, advanced adenomas (≥3 adenomas, or an adenoma ≥ 10 mm, or with villous features or high-grade dysplasia), and invasive colorectal cancer (CRC). (Table)

Conclusion: In our small cohort of mostly female carriers of pathogenic variants in CDH1 undergoing screening colonoscopy, we found an early onset colon cancer and a high incidence of early-onset adenomas and advanced adenomas. We suggest colonoscopy be considered for patients with CDH1 PV at the age of 40 years or 10 years younger than the earliest age of CRC in an FDR if under the age of 60 at diagnosis.

Table 1. Data is presented as median and quartiles [25th, 75th percentiles] or frequency (percent)

Factors	Number of Carriers=34
Age (years)	52.6 [48.7;60.7]
Gender: Female/Male	24 (70.6%)/ 10 (29.4%)
Personal History of Gastric Cancer/Breast Cancer	16 (47.1%)/13 (38.2%)
Family History of Colorectal Cancer or Advanced Adenoma	11 (32.4%)
Age at 1st colonoscopy (years)	50.1 [46.7;57.8]
Number of colonoscopies per patient	
# 1	24 (71%)
# 2	7 (21%)
# 3 or more	3 (9%)
Patients with Polyps	18 (53%)
Age at First Polyp (years)	51.6 [49.4;61.8]
Cumulative Number of Polyps	1.00 [0.00;1.00]
Patients with Hyperplastic Polyps	4 (12%)
Patients with Tubular Adenomas < 10 mm	12 (35%)
Patients with Advanced Adenomas # Tubulovillous/Villous adenoma # High-Grade Dysplasia	4 (12%) 3 (9%) 1 (3%)
Patients with CRC	1 (3%)
Age at first Tubular Adenoma (years)	54.6 [47.4;63.3]
Age at first Advanced Adenoma (years)	54.1 [50.4;58.0]
Age at CRC (years)	49.2

S323

Colorectal Cancer Screening Rate Comparison in an Underserved Population With National Average and Interventions to Improve the Quality Care in a Resident-Led Clinic

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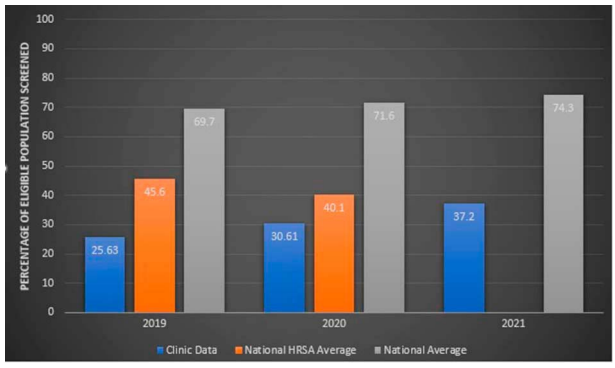
[1]Raritan Bay Medical Center, Perth Amboy, NJ; [2]Jewish Renaissance Medical Center, Perth Amboy, NJ; [3]Allied Digestive Health, Freehold, NJ.

Introduction: Late diagnosis of colorectal cancer is linked to higher mortality. Early diagnosis can be achieved through proper screening of the eligible population. Patients served at Federally Qualified Health Centers (FQHC) have CRC screening rates disproportionately lower than the national average. According to the HRSA in 2020, 40.1% of eligible adults were up to date with CRC screening compared to CDC data which shows in 2018, 68.8% of qualified individuals were current with CRC screening. This project highlights a three-year quality improvement initiative to increase screening rates in an underserved FQHC resident-led clinic.
Methods: A retrospective single-center quality improvement study was done to determine rates of CRC screening between 2019 to 2021. As illustrated in the Figure below, changes were implemented at different intervals, such as identifying the barriers to care, proper utilization of EMR, provider education, and Fecal Immunochemical Test (FIT) kit availability in the provider room.
Results: Serial interventions were done to improve the screening rates of the population receiving CRC screening. From 2019 to 2020, this project focused on proper utilization within the EMR, and screening rates increased from 25.63% to 30.61%, a 4.98% increase in screening percentage. From 2020 to 2021, this project focused on provider EMR utilization, availability of FIT kits in every exam room, and education geared towards patient compliance, which resulted in a 6.59% increased screening rate with a total rate of 37.20% Overall, there was 17% improvement in CRC screening rates.
Conclusion: CRC screening rates are widely different depending on the area, insurance coverage, and education level of the patients. In underserved areas, there is a lower screening prevalence compared to the national average. In our study, we compared the screening prevalence in an underserved area in Perth Amboy with the national average. Our study showed that the screening rate of the eligible population for CRC screening was 25.63% in 2019, compared with the national average of 69.7% in the same year. We took steps forward to enhance CRC screening in our population by educating the clinicians and increasing FIT kit availability in exam rooms. Data showed an increase in the prevalence from 25.63% in 2019 to 37.20% in 2021 after applying these interventions. The purpose of this study is to increase the screening rates to match the national average, which will decrease mortality from CRC and will improve quality care.



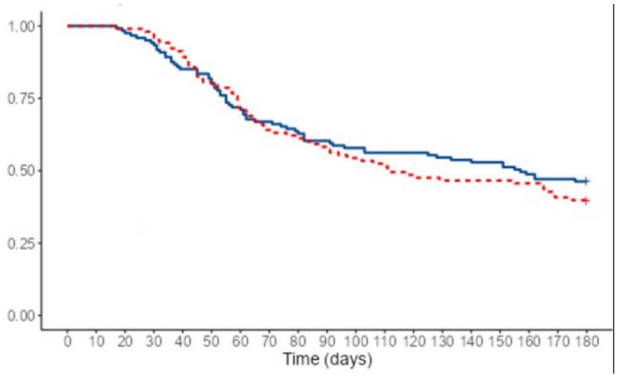
[0323] **Figure 1.** CRC Screening Rates Comparison

S324

Positive Fecal Immunochemical Testing (+FIT) in the COVID-19 Pandemic: Resilient Systems in Troubled Times

Wesley Wright, MD[1], Molly Orlick[2], Judah Kreinbrook, BS[2], Ambuj Kumar, MD, MPH[1], Brijesh Patel, MD[3].
[1]University of South Florida Morsani College of Medicine, Tampa, FL; [2]Tampa VA Clinical Research and Education Center, Tampa, FL; [3]James A. Haley VA Hospital, Tampa, FL.

Introduction: Colorectal cancer screening via colonoscopy decreased significantly due to the COVID-19 pandemic, with mail-out fecal immunochemical testing (FIT) initiated to maintain screening. Due to concerns surrounding +FIT follow-up we added FIT navigation (FITNav) via a nurse practitioner who followed +FIT to colonoscopy in August 2020. After implementation we noted little improvement in colonoscopy < 180 days compliance. This prompted a quality improvement (QI) project which resulted in a centralized database. Here we report a subgroup analysis to answer the question: were there racial disparities in +FIT follow-up prior to FITNav implementation?
Methods: We queried +FIT from patients 45-85 y/o from 3/1/2019/20-9/3/2019/20, defined as the pre-pandemic and pandemic cohorts respectively. Patients with dementia & >65 y/o, diagnostic/inpatient FIT, or provider-initiated cancellation of colonoscopy due to comorbidities were excluded. Chart review retrieved FIT indications, patient/navigator notification time, GI consult placement time, and colonoscopy. We added Area deprivation index (ADI) to evaluate neighborhood-level disparities. An adjusted and unadjusted cox regression model was used to evaluate colonoscopy < 180 days between pandemic/pre-pandemic, summarizing via hazard ratios (HR) and 95% confidence intervals (CI). (Figure)
Results: There were 121 & 103 +FIT meeting criteria in the pandemic & pre-pandemic respectively. Demographics (age, marital status, race, ADI, and sex) between periods showed no statistically significant differences. Proportion receiving colonoscopy < 180 days in the pre-pandemic and pandemic periods was 53.7% and 60.2% (unadjusted HR 1.08, 95% CI 0.76-1.54, p=0.676). This remained insignificant when adjusted for race/ethnicity, marital status, priority group, ADI, time to notification, and age (adjusted HR 1.03, 95% CI 0.71-1.50, p=0.872). While Black, non-Hispanic individuals had a univariate HR of 2.09 (95% CI 1.33-3.29 p=0.001), multivariate HR was 1.59 (95% CI 0.92-2.74, p=0.093). ADI did not show a statistically significant difference upon univariate or multivariate analysis. (Table)
Conclusion: No findings were present which suggested new or exacerbated racial disparities. Additionally, neighborhood-level disparities did not modify these findings; however, this evaluation is limited by sample size.



[0324] **Figure 1.** Kaplan-Meier Plot Colonoscopy in <180 days Pre-pandemic vs. Pandemic y-axis= Probability Blue= Pre-pandemic Red= Pandemic

Table 1. Hazard Ratios Obtained on Cox Regression for Pre-pandemic/Pandemic Cohorts

		Total	HR (univariable)*	HR (multivariable)*
Cohort	Pre-pandemic	114 (53%)		
	Pandemic	101 (47%)	1.08 (0.76-1.54, p=0.676)	1.03 (0.71-1.50, p=0.872)
Race/Ethnicity	Caucasian/ Non-Hispanic	162 (75%)		
	Black/ Non-Hispanic	26 (12%)	2.09 (1.33-3.29, p=0.001)	1.59 (0.92-2.74, p=0.093)
	Hispanic	15 (7%)	0.80 (0.37-1.73, p=0.573)	0.74 (0.33-1.64, p=0.454)
	Others	6 (4%)	0.74 (0.33-1.64, p=0.454)	0.82 (0.25-2.67, p=0.741)
	Declined/Unknown	6 (4%)	0.55 (0.13-2.22, p=0.398)	0.47 (0.11-1.98, p=0.304)
Marital Status	Married	113 (52.6%)		
	Not Married	102 (47.4%)	0.68 (0.47-0.97, p=0.033)	0.74 (0.51-1.10, p=0.136)
ADI National Rank	Mean (SD)	64.1 (22.7)	0.99 (0.99-1.00, p=0.127)	1.00 (0.99-1.01, p=0.441)
Days to FIT Notification	Mean (SD)	9.0 (12.7)	0.98 (0.96-1.01, p=0.141)	0.98 (0.95-1.01, p=0.131)
Age	Mean (SD)	66.4 (8.4)	0.98 (0.96-1.00, p=0.035)	0.98 (0.96-1.01, p=0.133)

*Blank Cells represent reference groups.

S325

Comparative Yields of Polyps and Cancers in FIT+ Patients With and Without Indications for Diagnostic Colonoscopy in Two Public Hospitals in New York City

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Introduction: Testing for occult blood in feces has a long history in clinical medicine. Current guidelines emphasize its use as a tool for colorectal cancer (CRC) screening. During pilot studies, we learned that some FIT kits had been distributed to patients with objective signs or symptoms of gastrointestinal disease. We compared the procedural outcomes of patients who had a positive FIT when ordered for CRC screening versus those who had subjective or objective evidence of gastrointestinal disease at Jacobi Medical Center and North Central Bronx Hospital.
Methods: FIT kits were mailed or distributed in the primary care medical clinic to patients between 7/31/2019 and 12/31/2021. In 176 patients with positive FIT results, chart review including demographic variables, process measures such as follow up colonoscopy, quality metrics, and procedural outcomes. The overall group was subdivided into screening and diagnostic groups, based upon the presence or absence of anemia, weight loss or gastrointestinal symptoms at the time of FIT testing, based on chart review.
Results: FIT was performed by screening criteria alone in 55% while 45% had diagnostic indications. There were no significant differences in age, sex, or race in the two subgroups. Colonoscopy was ordered in 70% vs 76% in the diagnostic versus screening group, respectively. Of the exams ordered, a significantly higher percentage of diagnostic than screening cases underwent colonoscopy (65% vs 42%, p< 0.05). Of 8 cancers found, 6 were in the diagnostic group (p >0.05), as were all 4 advanced cancers by clinical staging. Time intervals from positive FIT result and colonoscopy were the same in both subgroups (median 4 months). Adenoma and advanced adenoma detection rates were not significantly different in the screening and diagnostic groups, respectively (65% vs 53% and 32 vs 11%, p >0.05 for both).
Conclusion: A positive FIT indicates an elevated likelihood of harboring a colonic neoplasm, including advanced adenomas, irrespective of signs and symptoms. It is uncertain if signs and symptoms were recognized as significant by the provider or patient and led to higher adherence to colonoscopy. In the presence or absence of clinical signs and/or symptoms, a positive FIT result can accelerate the diagnosis of an advanced adenoma or cancer.

S326

Characteristics of Patients With Colorectal Cancer on Screening Colonoscopy: A Case Control Study in a Predominantly Hispanic Community

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Introduction: Colorectal cancer (CRC) is the second most common cause of cancer-related death in men and women. The incidence of CRC has declined, primarily due to screening programs and lifestyle modifications. A disparity in colon cancer screening rates has been recognized between Hispanics and non-Hispanic whites. The aim of this study was to identify factors associated with the incidence of CRC found during screening colonoscopy in asymptomatic individuals in a predominantly Hispanic community on the US-Mexico border.
Methods: We conducted a case-control study in which subjects diagnosed with CRC during their first screening colonoscopy were identified as cases, and randomly selected subjects with normal colonoscopies were matched as a control group (1:1 match). Demographic, clinical, pathological, and endoscopic data of the case and control groups, collected from medical records at our tertiary county hospital from January 2010 to March 2021, were compared between the two groups. Continuous data was described using mean and standard deviation (SD); categorical data as frequency and proportion (%). Chi-square and t-tests were used for statistical comparison as appropriate.
Results: A total of 116 subjects (51% male, 89% Hispanic) diagnosed with CRC on their first screening colonoscopy were identified as cases. The majority of the cancers were left-sided (66%) and were either stage 1 or 2 disease (65%). A randomly selected 116 subjects (51% male; 93% Hispanic) with normal colonoscopy were matched as the control group. The mean age was found to be higher in subjects with CRC (case group) compared to the control group (60.2 vs 58.2, $p=0.03$). Hyperlipidemia was found to be less frequent in subjects with CRC compared with those with normal colonoscopy (41% vs 59%, $p=0.01$). Otherwise, there were no statistically significant differences in the variables examined between the CRC and control group (Table).
Conclusion: In our predominantly Hispanic population, higher age was associated with CRC on screening colonoscopy compared with a control group of patients. Hyperlipidemia was less prevalent in subjects with CRC than those with normal colonoscopies. Whether lifestyle habits or the use of medications, such as statins, contribute to this finding needs further investigation.

Table 1. Characteristics of asymptomatic individuals found to have colorectal cancer on screening colonoscopy compared with subjects with a normal exam (no polyps) on screening colonoscopy

	NORMAL	CRC	
Screening colonoscopies	n = 116	n = 116	
Gender (%)			
Male	59 (51)	59 (51)	
Female	57 (49)	57 (49)	
Mean age at the time of procedure (SD)	58.2 (5.3)	60.2 (8.2)	$p = 0.03$
Ethnicity (%)			
Hispanic	108 (93)	103 (89)	$p = 0.25$
Non-Hispanic	8 (7)	13 (11)	
Mean BMI (SD)	30.6 (6.7)	29.9 (5.5)	$p = 0.39$
Diabetes (%)	42 (36)	35 (30)	$p = 0.33$
Hyperlipidemia (%)	68 (59)	47 (41)	$p = 0.01$
Hypertension (%)	58 (50)	61 (53)	$p = 0.69$
Tobacco use (current and former) (%)	27 (23)	36 (31)	$p = 0.18$
Alcohol use (current and former) (%)	41 (35)	44 (38)	$p = 0.68$

CRC: colorectal cancer, BMI: body mass index, SD: standard deviation.

S327

Assessment of Mortality Among Patients Having Colorectal Cancer and Atrial Fibrillation

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Introduction: Atrial Fibrillation (AFib) is the most common persistent cardiac arrhythmia, occurring in about 1% of the general population and Colorectal cancer (CRC) is the fourth most diagnosed cancer in the world. Although, there is well-established literature assessing the relationship of patients with cancer and AFib, very few studies have depicted the relationship between CRC and AFib. Our study aims to assess the effect of AFib on the mortality among CRC patients.
Methods: In this retrospective analysis, National Inpatient Sample (NIS) data from 10/2015 to 12/2017 was used which include 245,305 patients in this study. Demographic characteristics and clinical outcomes were compared among patients diagnosed with CRC with and without AFib. Bivariate analyses were performed using the chi-squared test or Fisher exact test (2-tailed) for categorical variables as appropriate, to assess the differences in the two groups.
Results: Patients who had CRC and AFib had 1.71 (95% CI: 1.45-2.02) higher odds of mortality compared with those without AFib. After propensity match of demographics and clinical factors, there was still 1.44 (95%CI: 1.18-1.75) times higher probability of mortality in AFib patient. Additionally, CRC with AFib had significantly prolonged hospitalization and cost. Secondary outcome analysis showed that AFib associate with high odds of sepsis (OR: 1.45, 95%CI: 1.30-1.62), AKI (OR: 1.45, 95%CI: 1.30-1.62), lower GI bleeding (OR: 1.31, 95%CI: 1.21-1.43) and respiratory failure (OR: 1.39, 95%CI: 1.15-1.67)) after the propensity match (Table). Interestingly, females had 25% lower odds of predictive mortality compared with males who were diagnosed with colorectal cancer and AFib (95%CI: 0.58-0.97) In addition, subjects who had CCI of 2 had 65% lower odds of mortality (95%CI: 0.22-0.55) comparing with CCI of 3 or more (Table).
Conclusion: Several studies have demonstrated that AFib is more common among CRC patient. With growing cancer burden and the high incident of AFib, it becomes important to study the effect of AFib on CRC mortality. As we found here, that AFib associate with 1.4 time higher odds of mortality in CRC patients after propensity match. Interestingly, higher odds of other complications such as sepsis, AKI, Respiratory failture and GI bleeding was also found in CRC patients with AFib, which could be the cause of higher mortality rate in AFib patient. Therefore, AFib could become a good indicator for the mortality in CRC patient.

Table 1. (upper) Propensity matched analysis showing effect of AFib on mortality in CRC patient. (Lower) Predictors of mortality in CRC with AFib

Variable	OR of primary and secondary outcome in CRC without vs with AFib after Propensity matched	
	OR (95% CI)	*p* Value
Mortality	1.44 (1.18-1.75)	< 0.001
Sepsis	1.45(1.30-1.62)	< 0.001
Mechanical Ventilation	1.38(1.11-1.72)	0.004
AKI	1.45(1.30-1.62)	< 0.001
Respiratory Failure	1.39(1.15-1.67)	< 0.001
Blood transfusion	1.61(1.05-1.29)	0.005
Lower GI bleeding	1.31(1.21-1.43)	< 0.001

Table 1. (*continued*)

Variable	OR of primary and secondary outcome in CRC without vs with AFib after Propensity matched	
	OR (95% CI)	*p* Value
Pressure support	1.96(1.18-3.26)	0.01
Predictors	Predictors of mortality in CRC with AFib	
	OR (95% CI)	*p* Value
Female	0.75(0.58-0.97)	0.028
Race (Black)	1.04(0.63-1.73)	0.868
Race (Hispanic)	1.37(0.80-2.35)	0.245
Race (Asian)	0.66(0.20-2.18)	0.501
CCI of 2	0.35(0.22-0.55)	0.001

OR, Odds ratio; CRC, Colorectal cancer; AKI, Acute kidney injury; CCI, Charlson comorbidity index.

S328

Detection of Mutated Tumor DNA From Colorectal Cancer Using Real Time-PCR

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Introduction: Colorectal cancer (CRC) is the third leading cause of cancer related death in the United States. Screening for CRC has long been identified as an effective approach to prevent and manage advanced disease which decreases cancer mortality. However, despite screening guidelines currently in place, many Americans are not screened for the disease. Current technologies to analyze DNA mutations, one hallmark of cancer, in patient samples are labor intensive and have a high cost as they require special machinery and downstream data analysis. The objective of our study was to determine if mutated DNA can be detected in colon tissues and serum from CRC patients using a standard molecular biology technique, polymerase chain reaction (PCR).
Methods: We used a real-time PCR method to detect common point mutations in DNA in colorectal cancer (for example, TP53 818 G >A). Briefly, we used primers complementary to the mutated DNA with the sequence ending at the point mutation in the 3' terminal in both directions (mutated primer). To inhibit amplification of wild type DNA, we used modified replication deficient primers that were complementary to the wild type sequence (WT blocking primer). This method was tested with genomic DNA isolated from human cancer cell lines with known mutations and those without the mutation.
Results: Using the PCR based approach with the cancer cell lines, we were able to obtain a cycle amplification (Cq) difference of up to 20, which correlates to a 10,000 fold amplification separation between the WT and mutated DNA.
Conclusion: We tested a PCR based approach to detect the presence of mutated DNA which is relatively inexpensive compared to DNA sequencing. Primers used in this assay can be modified to detect any point mutations of interest in colorectal cancer. Further studies will determine and affirm the utility of detecting DNA mutations in the early diagnosis of colorectal cancer.

S329

Comparison of the Effect of a Positive Stool DNA Test on Mucosal Inspection Time to Average Risk Screening Colonoscopy

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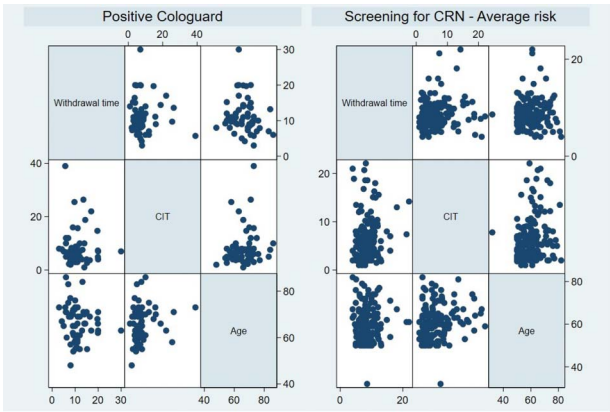
Introduction: Studies have shown that longer withdrawal times correlated with increased rates of adenoma detection (ADR). Quality metrics are often focused on patients with polyps. Withdrawal time for procedures in which no polyps were detected represents the mucosal inspection time and can be a marker for high-quality colonoscopy. We aimed to evaluate mucosal inspection time in patients with positive MT-sDNA testing in comparison to average-risk screening colonoscopy in a tertiary care center.
Methods: We performed a retrospective chart review of patients who underwent colonoscopy for indication of positive MT-sDNA stool test-based screening or screening based on average risk performed at a tertiary care center. We included patients without identification of polyp during colonoscopy and a completed study. Patients with poor preparation were excluded. Data collection included demographics, bowel preparation quality, time of day, day of the week, ASA grade, cecal intubation time, withdrawal time, complexity, and fellow involvement. Multivariable models were built to assess the relationship between withdrawal time and the indication for which the colonoscopy was performed. (Table)
Results: A total of 225 colonoscopies were identified wherein no polyps were removed, of which 58 were performed for positive stool MT-sDNA (Stool DNA+ group) and 167 for screening for average-risk (screening group). Patients in the "Stool DNA+ group" were older (66 vs. 59; p< 0.04), had a longer cecal intubation time (7 vs. 5 minutes; p< 0.04) and had tortuous colon. The "Stool DNA+ group" had a longer withdrawal time than those in the screening group (11 vs. 9, P< 0.04). In a multivariable analysis, after adjusting for age, ASA grade, procedure time (AM or PM), and time to the cecum, the withdrawal time in "Stool DNA+ group" was 2.6 (95% CI 1.5 – 3.7, p< 0.04) minutes longer than screening for average-risk individuals. After a median follow-up of 2.7 person-years, no post-colonoscopy cancers were reported. (Figure)
Conclusion: In our pilot study, the withdrawal time or mucosal inspection time was higher in patients with positive stool MT-sDNA testing compared to average-risk screening colonoscopy. This may serve as a benchmark for high-quality colonoscopy and should be translated into a quality metric for all screening colonoscopies irrespective of risk.



[0329] **Figure 1.** Scatterplot of Withdrawal Time by Indication

Table 1. Baseline Characteristics and Unadjusted Outcomes

Baseline	Stool DNA+ Group	Screening - Average Risk Group	p-value
Age (Median, IQR)	66 (55 – 77)	59 (50 – 78)	< 0.04
Female (n, %)	36 (62)	93 (56)	0.39
Race (n, %)			< 0.04
- Caucasians	43 (74)	113 (68)	
- Hispanic Ethnicity	6 (10)	36 (22)	
- Black	2 (3)	3(2)	
- Other	7 (13)	15 (8)	
Day of the Week (n, %)			0.88
- Monday	14 (24)	33 (20)	
- Tuesday	9 (15)	22 (13)	
- Wednesday	10 (17)	33 (20)	
- Thursday	14 (24)	39 (23)	
- Friday	11 (19)	40 (24)	
Advanced to (n, %)			0.65
- Cecum	40 (69)	109 (66)	
- Terminal Ileum	18 (31)	57 (34)	
Time of Day (n, %)			0.07
- AM	40 (69)	134 (80)	
- PM	18 (31)	33 (20)	
ASA Grade (n, %)		50 (30)	0.04
- 1	8 (14)	90 (54)	
- 2	36 (62)	27 (16)	
- 3	14 (24)		
Bowel Preparation Quality (n, %)			0.25
- Good	56 (97)	154 (92)	
- Fair	2 (3)	13 (8)	
Complexity (n, %)			
- Tortuous	5 (9)	3 (2)	< 0.04
- Redundant	2 (3)	3 (2)	0.46
- Moderate or severe diverticulosis	5 (9)	14 (8)	0.95
Fellow Involved (n, %)	6 (10)	20 (12)	0.74
BMI (Mean± SD)	28 (± 5.3)	28 (± *6.4*)	0.70
First Colonoscopy (n, %)	17 (29)	64 (38)	0.21
Cecal Intubation Time (Median, IQR)	7 (2.7 – 22)	5.2 (1.5 – 18.9)	< 0.04
Withdrawal Time (Mean ± 95% CI) (Unadjusted)	11 (10 – 12)	9 (8 – 9)	< 0.04

S330

Individualized Audit and Feedback Improves Colonoscopy Quality Indicators

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Introduction: In the US, colorectal cancer(CRC) ranks second to lung cancer as a cause of cancer mortality. Colonoscopy is the only form of colon cancer screening that allows early detection and prevention of colon cancer. Colonoscopy is very dependent on the skill and competence of the colonoscopist. Adenoma detection rate(ADR) and colonoscopy withdrawal time(CWT) are important quality indicators of colonoscopy. Here, we aimed to determine if CWT influenced ADR, polyp detection rates(PDR) or serrated adenoma detection rates(SADR). Secondarily, we assessed gender differences in the detection rates. Lastly, we evaluated the effect of audit and feedback on CWT and detection rates among colonoscopists.
Methods: A retrospective analysis of screening Colonoscopies performed between 03/2019 and 03/2020 at Sanford Medical Center in Fargo, ND was carried out. Data on sex, CWT, ADR, PDR and SADR was obtained. Additionally, an interventional quasi-experimental study was conducted. Starting from 1/1/2020, ADR was announced for every GI provider at monthly GI meetings. The surgical group was used as a control group as the feedback and disclosure system was not implemented for this group.
Results: Of 4,213 patients, 267 did not have any CWT documented and were excluded in the analysis. Three logistic regression models were used for ADR, PDR and SADR using independent predictor variables CWT and female gender. Increased ADR, PDR and SADR were significantly more likely to occur as CWT increased with odds ratio(OR) of 1.24 (1.22,1.27), 1.36 (1.32,1.39) and 1.11 (1.09,1.13) respectively. ADR and PDR were significantly less likely to occur in female patients with OR of 0.65 (0.57, 0.75) and 0.59 (0.51,0.68) respectively but not SADR (Table A). Among GI providers, audit and feedback resulted in a significant mean increase of CWT in minutes from 11.02+5.52 to 12.05+6.29 (p< .001). ADR increased from 43% to 50.4% (p< .002) and PDR increased from 56.9% to 65.7% (p< .001) while SADR increased from 6.1% to 7.0% but not significantly (p=0.43)(Table B). Surgeons who did not receive the feedback and audit did not have any significant changes in CWT, ADR and PDR but had a significant decrease in SADR from 9.0% to 4.7% (p=.02)(Table B).
Conclusion: Our results support extensive evidence that increasing CWT improves ADR, PDR and SADR and that female gender is associated with decreased ADR. Audit and feedback improves CWT, ADR and PDR that can potentially help reduce risk in CRC development.

Table 1. Detection rate (A) predictors and (B) outcomes

A. Adenoma Detection[a]

Predictors	Odds Ratios	95% CI	*P*-value
(Intercept)	0.12	(0.09, 0.16)	< 0.001
Withdrawal Time (minutes)	1.24	(1.22, 1.27)	< 0.001
Gender [female]	0.65	(0.57, 0.75)	< 0.001
Polyp Detection[b]			
Predictors	Odds Ratios	95% CI	*P*-value

Table 1. (*continued*)

A. Adenoma Detection[a]				
Predictors	**Odds Ratios**	**95% CI**	***P*-value**	
(Intercept)	0.1	(0.08, 0.14)	< 0.001	
Withdrawal Time (minutes)	1.36	(1.32, 1.39)	< 0.001	
Gender [female]	0.59	(0.51, 0.68)	< 0.001	
Serrated Adenoma Detection[c]				
Predictors	**Odds Ratios**	**95% CI**		***P*-value**
(Intercept)	0.02	(0.02, 0.03)		< 0.001
Withdrawal Time (minutes)	1.11	(1.09, 1.13)		< 0.001
Gender [female]	1.07	(0.82, 1.39)		0.624
B. GI group				
Outcome	**Level**	**< = Dec 2019 (n = 2498)**	**>= Jan 2020 (n = 554)**	***P*-value**
Withdrawal Time in minutes (mean (SD))		11.02 (5.52)	12.05 (6.29)	0.0005
Adenoma detected (%)	Yes	1073 (43.0)	279 (50.4)	0.0018
	No	1425 (57.0)	275 (49.6)	
Polyp detected (%)	Yes	1421 (56.9)	364 (65.7)	0.0001
	No	1077 (43.1)	190 (34.3)	
Serrated Adenoma detected (%)	Yes	137 (6.1)	39 (7.0)	0.4336
	No	2116 (93.9)	515 (93.0)	
Surgical group				
Outcome	Level	< = Dec 2019 (n = 882)	>= Jan 2020 (n = 279)	*P*-value
Withdrawal Time in minutes (mean (SD))		11.37 (4.36)	11.37 (5.59)	0.9992
Adenoma detected (%)	Yes	467 (52.9)	136 (48.7)	0.2426
	No	415 (47.1)	143 (51.3)	
Polyp detected (%)	Yes	591 (67.0)	177 (63.4)	0.2770
	No	291 (33.0)	102 (36.6)	
Serrated Adenoma detected (%)	Yes	79 (9.0)	13 (4.7)	0.0216
	No	803 (91.0)	266 (95.3)	

[a]Adenoma detection was more likely to occur as withdrawal time increased. Adenoma detection was less likely to occur in female patients.
[b]Polyp detection was more likely to occur as withdrawal time (min) increased. Polyp detection was less likely to occur in female patients.
[c]Serrated adenoma detection was more likely to occur as withdrawal time (min) increased. Gender was not a significant predictor of serrated adenoma detection.

S331

The Impact of PCP Counseling for Colorectal Cancer Screening: A Primary Care Quality Improvement Project

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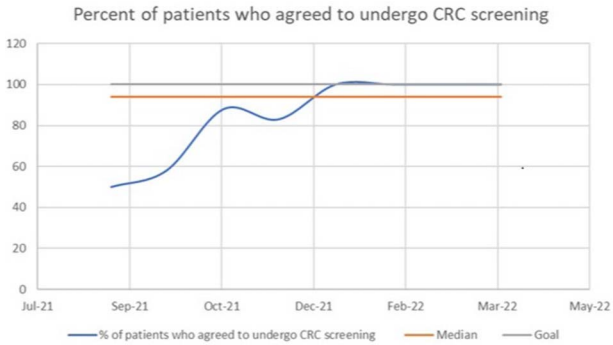
Introduction: Effective primary care physician (PCP) counseling plays a key role in patient adherence to primary prevention cancer screening programs. The impact of PCP counseling on the patients' adherence to colorectal cancer (CRC) screening programs is believed to be underestimated. Therefore, we conducted a 24-week prospective quality improvement initiative investigating the effects of PCP counseling for CRC screening on patient participation rates.
Methods: We identified patients who met the criteria for CRC screening during their routine primary care appointments at the resident-run internal medicine ambulatory clinic at Cleveland Clinic (CCF) from October 2021 to March 2022. A fishbone diagram was used for root-cause analysis which revealed key causes of inadequate CRC screening: lack of patient education and awareness about the importance of CRC screening. Our PDSA cycle included patient education by PCPs about the importance of CRC screening in asymptomatic patients and the benefits of early treatment of the disease. The PCPs explained various screening modalities. The chosen modality was ordered for interested patients. The primary outcomes were the percentage of patients who agreed to undergo CRC screening and the percentage of patients who scheduled or completed the screening test.
Results: A total of 52 subjects both met the criteria for CRC screening and attended their routine primary care appointments at CCF where they underwent PCP counseling. Only 4 (8%) patients had undergone a prior CRC screening test. The median age was 55 years, and females compromised 52% of the subjects. A total of 44 subjects (85%) agreed to undergo CRC screening after being counseled by their PCPs. Of those 44 individuals, 42 (95%) chose colonoscopy, and two (5%) chose FOBT. By the end of the study period, eighteen patients (41%) had either scheduled or completed their tests (Figure, Table).
Conclusion: Our study demonstrates that PCP counseling is associated with high patient engagement to undergo CRC screening. However, it is still unclear whether PCP counseling in the context of a primary care clinic visit alone is sufficient to ensure the completion of CRC screening. Thus, we plan to examine CRC screening completion rates within a year of the original test being ordered and explore barriers that limit the completion of CRC screening by surveying patients in subsequent clinic visits. We will propose other interventions (email reminders or phone calls) to address these barriers and improve CRC screening completion rates.



[0331] **Figure 1.** Time course of patients who agreed to undergo CRC screening.

Table 1. Summary of the data

Age median (range)	55 (45-83) yrs
Female vs. Male	52.0% vs 48.0%
Percentage of patients were up to date with CRC screening	8.0%
Percentage of patients who agreed to undergo CRC screening	85.0%
Percentage of patients who scheduled their CRC screening test by the time of data curation	41.0%

Inappropriate Utilization of Fecal Immunochemical Test (FIT) in Inpatient and Emergency Setting and Its Impact on Patient Outcomes: A Quality Improvement Project

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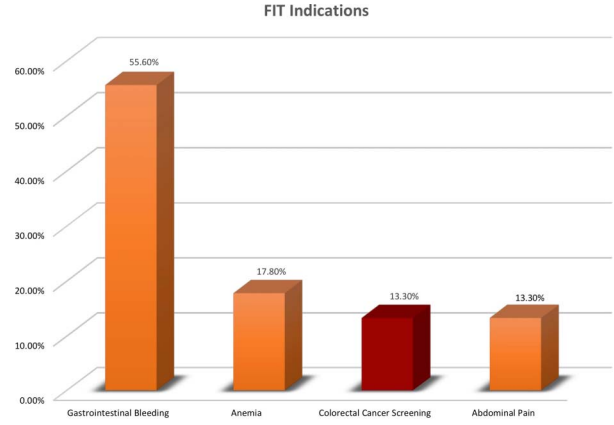
Introduction: Fecal immunochemical test (FIT) uses antibodies to detect blood in stool and is indicated for colorectal cancer (CRC) screening. Positive FIT followed by colonoscopy significantly reduces mortality and morbidity associated with CRC. However, inappropriate utilization of FIT testing can lead to unnecessary endoscopic evaluation. We evaluated its utilization in inpatient and emergency settings to determine the outcomes and impact on patient care.
Methods: A retrospective observational study was conducted and electronic medical records of patients with a positive FIT between November 2020 to March 2021 at a large community-based hospital were reviewed. The primary outcome was proportion of FIT tests ordered for non-screening related indications. Secondary outcomes were gastroenterology (GI) referral, follow-up endoscopic evaluation, time to colonoscopy, and colonoscopy findings. Data was analyzed using descriptive statistics.
Results: During the 5 month period, 45 patients had a positive FIT in the hospital setting. Among these patients 41 (91.1%) were male, and the median age was 58 years (Table). The majority of tests were ordered by the emergency department (75.5%, n=34) followed by the general medical floor (20%, n=9) and intensive care unit (4.44%, n=2). The most common indication for ordering the test was gastrointestinal bleed (55.6%, n=25) and only 6 (13.3%) were ordered for CRC screening (Figure). Among patients with a positive FIT, 31 (68.9%) were referred to GI, 11 (24.4%) had an esophagogastroduodenoscopy (EGD), 21 (46.7%) had a colonoscopy and 10 (22.2%) had both (EGD and colonoscopy) within 12 months. Among those who underwent a colonoscopy the median time to colonoscopy was 9 days. Colonoscopy showed normal findings in most patients (52.4%, n=11), followed by adenoma detection in 5 patients (23.8%). No CRC was diagnosed in this cohort.
Conclusion: Our study showed FIT was routinely ordered in the hospital setting for indications other than CRC screening and less than half of the patients received follow-up colonoscopy after a positive FIT. This can be attributed to a poor understanding of the test's purpose. Inappropriate FIT testing leads to unnecessary endoscopic evaluation and adds significant strain on healthcare resource utilization. We plan to implement measures to reduce this practice in these settings and improve colonoscopy completion rates after a positive FIT.



[0332] **Figure 1.** Indications for FIT testing in the inpatient and emergency setting

Table 1. Baseline characteristics of patients (n=45)

Gender, n (%)	
Male	41 (91.1)
Female	4 (8.9)
Age, n (%)	
<45 years	17 (37.8)
45-75 years	17 (37.8)
>75 years	11 (24.4)
BMI, n (%)	
< 18.5	2 (4.4)
18.5-24.9	15 (33.3)
25-29.9	13 (28.9)
30-39.9	15 (33.3)
Race, n (%)	
White	33 (73.3)
Black	11 (24.4)
American Indian	1 (2.2)
Time to Colonoscopy, n (%)	
< 1 month	12 (57.1)
1-6 months	8 (38.1)
> 6 months	1 (4.7)
Colonoscopy Findings, n (%)	
Normal	11 (52.4)
Benign polyp	3 (14.3)
Adenoma	5 (23.8)
Colorectal cancer	0 (0)
Other	2 (9.5)

S333

How Reliable Is Circulating Tumor DNA in Detecting Disease Progression or Regression of Non-Colorectal Gastrointestinal Cancers

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Introduction: Circulating tumor DNA are short DNA sequences of tumor cells shed into the systemic circulation. Post-operative ctDNA positivity has been studied as a potential marker for disease recurrence, however, dynamic changes in its level and immediate correlation with imaging have not been well described.
Methods: We conducted a retrospective study including adult patients with non-colorectal gastrointestinal (GI) cancer. We evaluated the correlation of ctDNA with imaging studies to detect disease progression or regression. Eighteen patients, with 33 ctDNA samples were included.
Results: Out of the 18 patients, five had pancreatic, three each had hepatocellular and cholangiocarcinoma, two each had anal cancer and neuroendocrine tumor, and one each had gastric, small bowel, and GI malignancy of unknown primary. Among the patients, 50% were male, and the median age at diagnosis was 64 years. 72.2% of the patients had advanced disease (stage III/IV), and only 22.2% had a predisposing condition leading to malignancy. Our primary endpoint, the correlation of single positive ctDNA results with imaging showing either progression or residual disease, showed a sensitivity of 60% and specificity of 100%. Secondarily, serial ctDNA was analyzed in ten patients with at least two ctDNA test results. This revealed a sensitivity of 80% and specificity of 100% for up-trending ctDNA values to detect progression, down-trending to detect regression, and persistent negative results to detect the absence of disease. This calculated sensitivity was lower than our separate analysis of colorectal cancer, where the sensitivity of single and serial ctDNA was 84.8% and 92.9%, respectively. The specificity, however, was 100% in both cancer groups. The positive ctDNA results detected disease progression with a median lead-time of 44 days compared to imaging.
Conclusion: Colorectal cancer is the most studied malignancy in regards to the use of circulating tumor DNA as a marker of tumor recurrence. Similar studies in non-colorectal GI cancers are lacking. However, limited studies have shown some promising results for the use of post-operative ctDNA. The test's sensitivity in our study was inferior compared to colorectal cancer, but given high specificity and improvement in sensitivity with serial analysis, ctDNA can be a valid way to monitor disease progression or regression in non-colorectal GI cancers. Further clinical studies are required to prove its utility in the reliable detection of immediate changes in disease status.

S334

Geographic Diversity of Data Behind Surveillance Colonoscopy Guidelines in the United States

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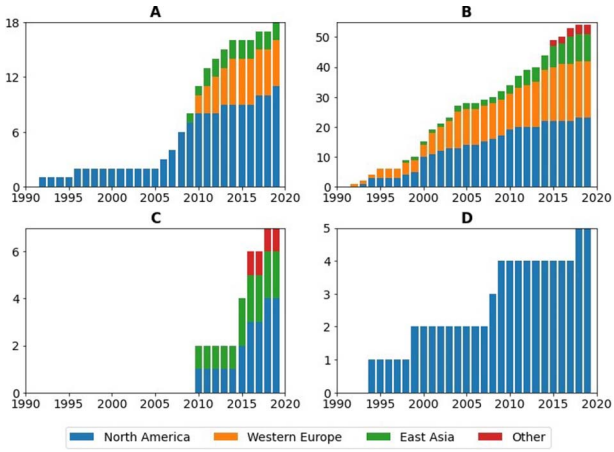
Introduction: The selection of an appropriate surveillance interval after colonoscopy for colorectal cancer screening can minimize unnecessary procedures while preventing the development of interval neoplasia. Both the 2020 US Multi-Society Task Force guidelines and earlier iterations incorporate international data, but not all areas of the world may be represented equally. We examined the studies cited in the US surveillance colonoscopy guidelines to determine the representation of different geographic regions.
Methods: We examined studies which were incorporated into the US surveillance colonoscopy guidelines between 1997 and 2020 for the following categories: normal exam, exam with adenomas, exam with sessile serrated polyps (SSPs), and exam with hyperplastic polyps (HPs). For each category, we calculated the number of studies and total number of patients that came from each region of the world. We also examined trends in the number of studies from different region over time for each of the four categories.
Results: There were 18 studies totaling 9,052,886 patients pertaining to surveillance after a normal exam, 54 studies totaling 226,730 patients for adenomas, 7 studies totaling 20,993 patients for SSPs, and 5 studies totaling 22,645 patients for HPs. Thirty-eight studies (49%) were from North America, 24 (31%) from Western Europe, 11 (14%) from East Asia, and 4 (5%) were from other regions (2 from Israel, 1 from Australia, and 1 from Argentina). The greatest number of studies in all categories came from North America, though studies from other regions increased over time (Figure). North America contributed the largest number of patients to studies on normal exams (50%) and HPs (100%), whereas Western Europe contributed the greatest number (61%) for adenomas and East Asia contributed the greatest number (51%) for SSPs.

Conclusion: The number of patients included in studies on surveillance after adenomas, SSPs, and HPs were an order of magnitude less than that of a normal exam which could limit the strength of recommendations for these polyp types. Furthermore, nearly all data were drawn from patients in North America, Western Europe, or East Asia with little representation from populations in other regions. Given the multicultural nature of the US population, incorporating research from other regions of the world could improve the generalizability of current surveillance colonoscopy guidelines.



[0334] **Figure 1.** Distribution of studies by region on surveillance interval after colonoscopy with (A) no polyps, (B) adenomas, (C) sessile serrated polyps, and (D) hyperplastic polyps

S335

Increasing FIT Return Rates Through Public Outreach vs Clinic Distribution

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Introduction: The incidence of colorectal cancer (CRC) in the United States is increasing, and it remains the second leading cause of cancer death in the United States for men and women combined. The American Cancer Society recommends adults aged 45 years and older with an average risk of CRC undergo regular screening with either a high sensitivity stool-based test or structural (visual) examination, depending on patient preference and test availability. The primary objective of our study was to analyze the impact of clinic vs public outreach distribution of kits in return rates of fecal immunochemical tests (FIT) for colorectal cancer screening.
Methods: At public outreach events and daily clinics in the West Texas Panhandle area, participants in the GET FIT program were provided with FIT kits after completing the education on colorectal cancer. Participants who fit the inclusion criteria and had received a FIT kit from the program were included. They were instructed on how to perform the test and mail it back. Participants that did not return the completed kits within two weeks were reminded either by 1) through a reminder letter or 2) by telephone every 2 weeks (+/- 3 days) for 60 days or 5 attempts to contact. We de-identified and analyzed the FIT kit return data from April 2019-March 2020 and calculated the return rates for these kits.
Results: There were 968 patients who were given kits between April 2019-March 2020. 648 kits (66.9%) were returned. Most participants were female (64.3%) and Hispanic (49.6%). Most of the kits were returned without any reminder needed (48.0%) There were 639 kits and 329 kits distributed at clinics and public outreach events, of which 479 (75.0%) and 169 kits (51.4%) were returned, respectively. The average time to return FIT kits was 18.13 days overall and was lower in public events distributed kits (15.84 days) compared to clinic (20.11 days). (Table)
Conclusion: Fecal immunohistochemical test (FIT) remains one of the primary options for colorectal cancer screening. Due to its lower cost and noninvasiveness, FIT was offered to patients at average risk. Although kits distributed at clinics had a higher return rate compared to those at public outreach events, there was a long average time to return these kits in clinic patients. Future study into methods improving return rates after kit distribution at clinics and public outreach events should be studied.

Table 1. Characteristics of the study population between April 2019-March 2020

Total Number of Patients	969
Gender	
Male	346 (35.7%)
Female	623 (64.3%)
Total Kits Distributed	
Clinics	639 (65.9%)
Public Outreach	329 (34.1%)
FIT Returned in Clinic vs Public Outreach	
Clinic- Yes	479 (75.0%)
Clinic-No	160 (25.0%)
Public Outreach-Yes	169 (51.4%)
Public Outreach-No	160 (48.6%)
Average Time to Return FIT KIT (days)	
Overall	18.13
Public	15.84
Clinic	20.11

S336

Computer-Aided Detection (CADe) and Its Effect on Adenoma Detection Rate (ADR) in a Single Tertiary Center

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Introduction: Artificial intelligence (AI) with deep learning is revolutionizing patient care across medicine. In Gastroenterology, AI systems are helping endoscopists identify polyps in real-time. Several randomized control trials have tested the efficacy of Computer-Aided Detection (CADe) system in adenoma and polyp detection. We aimed to assess the impact of CADe on adenoma detection rates (ADR) at our institution.
Methods: This is a cross-sectional study that took place at a University Hospital between November 2021 and March 2022. We constructed a de-identified database with patients over the age of 45 that underwent screening and surveillance colonoscopies. Incomplete studies secondary to poor bowel preparation were excluded. We compared ADR, Polyp Detection Rate (PDR), total procedure time, withdrawal time, adenoma detected per colonoscopy (APC), and polyp detected per colonoscopy (PPC) between colonoscopies performed with and without CADe.
Results: A total of 64 colonoscopies were evaluated, 32 of them were done with CADe, and 32 without it. ADR was 53% with CADe and 43% without (odds ratio 1.45, 95% CI 0.5442–3.9013; p=0.4537). Polyp detection rate was 78% with CADe, 62% without CADe (odds ratio 2.1429, 95% CI 0.7118–6.4512; p=0.1753). Average total procedure time was 25 minutes 24 seconds (SD ± 7 minutes) with CADe, and 23 minutes 41 seconds without (SD ± 9 minutes) (p=0.42), average withdrawal time was 16 minutes 43 seconds (SD ± 6 minutes) for CADe and 14 minutes 49 seconds (SD ± 8 minutes) without CADe (p=0.32). APC were 1.48 (SD ± 1.15) with CADe and 0.90 (SD ± 1.3) without CADe (p=0.48). PPC were 2 (SD ± 2.38) and 1.90 (SD ± 2.69) respectively (p=0.49).
Conclusion: Several randomized control trials have proven that the use of CADe increases ADR without increasing withdrawal time. In our study, ADR with CADe was found to be higher compared to an already good ADR without CADe, and procedure, as well as withdrawal time were mildly increased with the use of CADe. However, the results were not significant, likely due to a low sample size. A larger study would be needed in order to show significant differences within the two groups.

S337

Colonoscopy Quality Metrics After a Multi-Target Stool DNA or Fecal Immunochemical Test: A Systematic Review and Meta-Analysis

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Introduction: Colorectal cancer (CRC) accounts for approximately 50,000 deaths or 14 deaths per 100,000 people yearly in the United States. Multi-target stool DNA (mt-sDNA) and fecal immunochemical test (FIT) are validated CRC screening strategies in average-risk asymptomatic individuals. This study aims to evaluate the colonoscopy quality metrics following a positive mt-sDNA test, FIT.
Methods: We performed a comprehensive search in the databases of PubMed/MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials from inception through May 2022. Meta-analysis was performed by standard methodology using the random-effects model and heterogeneity was assessed using the I2% statistics. Outcomes of interest were adenoma detection rate (ADR), colorectal cancer detection rate (CRCDR), withdrawal time (WT), and cecal intubation rate (CIR).
Results: 27 high-quality studies (97825 patients) were included in the analysis. 94161 had a positive FIT test in 23 studies and 3664 had positive mt-sDNA in 4 studies. The pooled WT after positive mt-sDNA was 16.1 minutes (95% CI 9.4-22.8, I2=99%), whereas after positive FIT was 11.6 minutes (10.9-12.3, 99%). The corresponding WT in the negative tests was 13.2 minutes (12.7-13.7) for mt-sDNA and 10.2 minutes (9.3-11.2) for FIT. The pooled ADR was 73% (69.9-75.8) and CRCDR was 1.9% (0.9-4.2) in mt-sDNA positive. The pooled ADR was 54.2% (49.8-58.4) and pooled CRCDR was 4% (3.2-4.9) in FIT positive. Pooled CIR were excellent: 99% (98.6-99.3) in mt-sDNA positive, and 96.8% (95.8-97.6) in FIT positive. Pooled rates are summarized in Table.
Conclusion: Our meta-analysis demonstrated that positive mt-sDNA or FIT patients had a higher WT and CIR when compared to negative or unknown tests. ADR and CRCDR were high, however, it is not known if it is secondary to positive stool test or to longer WT. Future studies are needed to validate our findings and determine the cost-effectiveness of these screening tests.

Table 1. Colonoscopy quality metrics including withdrawal time, cecal intubation rate, adenoma detection rate and colorectal cancer detection rate after positive and negative multi-target stool DNA and fecal immunochemical test testing

Outcomes	Multi-target stool DNA (mt-sDNA)	Fecal Immunochemical Test (FIT)
Withdrawal time (WT), mean (95%CI)	Positive: 16.1 (9.4-22.8) (SE: 3.4); 4 studies Negative: 13.2 (12.7-13.7) (SE: 0.2) 1 study	Positive: 11.6 (10.9-12.3) (SE: 0.3); 22 studies Negative: 10.2 (9.3-11.2) (SE: 0.5) 6 studies
Cecal intubation Rate (CIR), pooled rate (95%CI)	Positive: 99% (98.6-99.3) 2 studies	Positive: 96.8% (95.8-97.6, 94%) 12 studies
Adenoma Detection Rate (ADR), pooled rate (95%CI)	Positive: 73% (69.9-75.8) 1 study Negative: NR	Positive: 54.2% (49.8-58.4, 97%) 20 studies Negative: 35.1% (30.5-39.9, 95%) 6 studies
Colorectal Cancer Detection Rate (CRCDR), pooled rate (95%CI)	Positive: 1.9% (0.9-4.2, 81%) 3 studies Negative: 7.9% (2.6-21.8) 1 study	Positive: 4% (3.2-4.9, 88%) 17 studies Negative: 0.5% (0.2-1.6, 85%) 5 studies

Abbreviations: NR: not reported, SE: standard error, CI: confidence interval.

S338

The Impact of Smartphone Applications on Bowel Preparation, Compliance With Appointments, Cost-Effectiveness and Patients' Quality of Life for the Colonoscopy Process: A Scoping Review

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Introduction: Among cancers diagnosed in both males and females, colorectal cancer (CRC) is the second most common cancer and the third leading cause of cancer-related death in the United States. CRC also has the second highest cost of any cancer in the United States.Colonoscopy, as the gold standard for CRC screening, is the most sensitive test and can be both diagnostic and therapeutic. Recent trials have shown that mobile apps have improved patient adherence to bowel preparation and colonoscopy appointments. We conducted a scoping review to evaluate the impact of smartphone application (SPA) technology in patients undergoing elective colonoscopy to measure compliance with appointments, cost-effectiveness, bowel preparation, and quality of life.
Methods: This scoping review was performed according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews. Ovid Medline, Web of Science, ScienceDirect, Scopus, Cochrane Library, and PubMed were screened up to Oct 14, 2020, and bibliographies of the retrieved articles were included. Based on prespecified inclusion and exclusion criteria, 8 primary studies were included in the final analysis from a total of 3,979 nonduplicate articles.
Results: Seven studies included bowel preparation efficacy in their main objectives.The majority of studies used Boston Bowel Preparation Scales (BPPS) to assess bowel preparation. Adherence to colonoscopy screening was assessed by one study.Adherence to diet and laxatives was assessed by three studies.Quality of life and patient satisfaction during the peri-procedural period of colonoscopy were assessed by five studies. Cost-effectiveness was not assessed by any studies are included.
Conclusion: In six studies; patients in the smartphone group had a successful bowel preparation when compared with the control arm; on the other hand, one study did not find any differences between groups. Adherence to colonoscopy screening was assessed by one study. Patients in the digital intervention arm were significantly more likely to complete a screening test. Patient satisfaction during the periprocedural period of colonoscopy was assessed by five studies which reported significantly higher patient satisfaction in the intervention arm compared to the control arm. None of the studies measured cost-effectiveness. Study characteristics and detailed results are provided in Table. Future trials investigating SPAs should include cost-effectiveness and adherence to appointments as an endpoint.

Table 1. Study and patient characteristic charting form

Study	Intervention	Study design	Population	Age	Outcomes	Results
Sharara et al., 2017	Mobile App	RCT, Colonoscopist blinded	160	>18	**Primary outcome:** Adherence with instructions	No statistical difference in overall adherence (p=0.40) or bowel cleanliness (p=0.68).
Walter et al., 2020	Mobile App	RCT, Colonoscopist blinded	500	>18	**Primary outcome:** Quality of preparation (BPPS) **Secondary outcome:** Compliance with diet and laxatives. Discomfort from the prep.	App compare to standard instruction; BPPS (7.6 ± 0.1) vs (6.7 ± 0.1) (p< 0.0001), Insufficient bowel prep 8% vs 17% (P = .0023), Adenoma detection rate 35% vs 27% in controls (P = .0324), Adherence and decreasing level of discomfort (p< 0.0001).
Denizard-Thompson et al. 2020	Mobile App	RCT	408	>18	**Primary outcome:** Chart-verified completion of a CRC screening test within 24 weeks **Secondary outcome:** Benefits, barriers to screening, self-efficacy, ability to state a screening decision, intent to screen within 30 days and patient/provider discussion	mPATH-CRC arm vs control arm; completing of CRC screening 30% vs. 15%, Ordering the test 69% vs. 32%, Overall, patients in both the mPATH and Control arms were equally likely to complete colorectal cancer tests once they were ordered (43% and 46% respectively, *P* = 0.70)
Lorenzo-Zuniga et al. 2015	Mobile App	RCT, Colonoscopist blinded	260	>18	**Primary outcome:** Bowel prep quality **Secondary outcome:** Patient satisfaction with a specific questionnaire	Mobile App vs Control arm Number of Optimum bowel prep (100% vs 96.1%,P=0.037 respectively. Also, patient-reported tolerability and overall experience with the prescribed bowel preparation was significantly higher for mobile app group
Cho et al. 2017	Mobile App	RCT, Colonoscopist blinded	142	>18	**Primary outcome:** The quality of bowel cleansing using the BBPS. **Secondary outcome:**Patient satisfaction with a specific questionnaire	Mobile App vs control arm BBPS (7.70±1.1 vs. 7.24±0.8, respectively, p=0.007). The mean score of the satisfaction questionnaire was significantly higher in the App group than that of the control group (app group: 7.62±2.2 vs. control group: 5.97±2.2, p< 0.001).
Walter et al. 2017	Mobile App	RCT, Colonoscopist blinded	50	>18	**Primary outcome:** Stable function of the developed mobile app during colonoscopy preparation time. **Secondary outcome:** The quality of bowel cleansing using the BBPS.	The smartphone app prototype was sufficiently working with stable function during the time of colonoscopy preparation in smartphone app group patients. For Bowel cleanness assessment; mean BBPS score was 8.1 (SD 0.25) versus 7.1 (SD 0.41) (P=.02 for difference) (control group).
Guo et al. 2019	Mobile App	RCT, Colonoscopist blinded	293	>18	**Primary outcome:** Rate of adequate bowel preparation according to BBPS Scale **Secondary outcome:** Compliance with instructions,side effects and rates of adenoma detection	Rate of adequate bowel prep Mobile App vs Control (77.2% vs. 56.8%, p < .001), The adenoma detection rate (ADR) (21.4% vs. 12.8%, p = .029), The rates of incomplete compliance with instructions: (15.17% vs 33.11%, p < .001), The overall adverse events SPA vs Control (23.45% and 37.84%, p = .008)
Brief et al.2020	Mobile App	RCT, Colonoscopist blinded	46	< 1 8	**Primary outcome:** Bowel preparation quality BBPS score **Secondary outcome:** Patient arrival time to endoscopy suite, calls to gastroenterology service, Subjects with improved knowledge after receiving materials	Mobile App vs control group Bowel prep quality BBPS 7.2 (range 3-9) versus a mean score of 5.9 (range 3-9) (P=.02), Arrival time average 46 mins vs 44 mins (p=.56), Calls to gastroenterology service 6 vs 2 (p=.27), Subjects with improved knowledge after receiving materials %; 50 vs 36 (p=.37)

S339

Effect of Healthcare Disparities and Socioeconomic Factors on Adenoma Detection Rates During COVID-19 Pandemic

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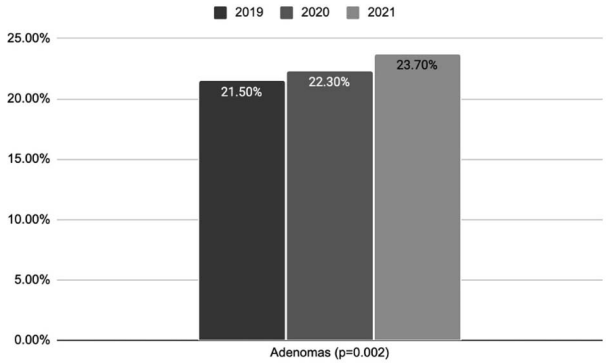
Introduction: Health care disparities, which existed prior to the pandemic appear to have worsened with the onset of the pandemic. These are especially pronounced for health maintenance measures such as screening colonoscopy which is the cornerstone of colorectal cancer (CRC) prevention. In this study, we aimed to evaluate the impact of COVID-19 on healthcare disparities and the demographic and socio-economic factors associated with adenoma detection rates (ADR).
Methods: We identified all patients who underwent colonoscopy at all Ohio facilities of the Cleveland Clinic health system in 2019, 2020, and 2021 from July 1st to December 31st in each year. The timeline of July 1st to December 31st was selected based on lockdown which lasted till the end of June 2020 in Ohio. The patients were divided into two groups: patients with an adenoma or other precancerous polyps (cases) and patients without an adenoma (controls) detected on colonoscopy. We collected and compared various demographic and socioeconomic factors between both groups.
Results: A total of 23,316 screening colonoscopies were performed in Cleveland Clinic, Ohio during the study period. Among these 23,316 procedures, adenomas were detected on 5,259 (22.6%) procedures. The ADR significantly increased from 2019 (21.5%) to 2021 (23.7%) (p< 0.001) (Figure). As compared to controls, there was significantly higher number of elderly patients, males, and Caucasians among the cases. Patients with private insurance (58.3% vs. 62.6%) had significantly decreased ADR whereas patients with Medicare (27% vs. 22.3%) and Medicaid (6.8% vs 6.2%) had higher rates of ADR as compared to controls. There was a significantly higher proportion of patients in the lower quartile of education and median household income among cases than in controls (p< 0.05 for both). Patients with tobacco use also had significantly higher ADR whereas alcohol use, Illicit drug use, and preferred language was not significantly associated with higher ADR (p >0.05 for all). On multivariate analysis, age >65, male gender, Caucasian race, tobacco use, private insurance, and obesity were positive predictors of adenomas (p< 0.05 for all) (Table).
Conclusion: There has been significant increase in ADR immediately after Covid lockdown which continue to persist in 2021. Male patients, Caucasians, obese patients, smokers, and elderly have higher ADR. These results will help design targeted CRC screening in this high-risk population.



[0339] **Figure 1.** showing increasing trends of adenoma detection on screening colonoscopy from 2019 to 2021

Table 1. Demographic, socioeconomic factors associated with adenoma detection on screening colonoscopy

	No Adenoma (N=18057)	Adenoma (N=5259)	p-value	Adjusted OR (95% CI)	p-value
Age (mean ± sd)	59.1 ± 8.9	60.6 ± 9.0	< 0.001	NA	
Age >=65	4877 (27%)	1741 (33.1%)	< 0.001	1.7 (1.6 - 1.7)	< **0.001**
Sex					
Male =1	7873 (43.6%)	2896 (55.1%)	< 0.001	REF	
Female	10184 (56.4%)	2363 (44.9%)		0.65 (0.62 - 0.67)	< **0.001**
Race			0.003		
Caucasians	13621 (75.4%)	4054 (77.1%)		REF	
African Americans	3145 (17.4%)	810 (15.4%)		0.9 (0.85 - 0.96)	**0.001**
Others	1291 (7.1%)	395 (7.5%)		0.97 (0.89 - 1.05)	0.54
Insurance type			< 0.001		
Medicare	4033 (22.3%)	1419 (27%)		1.04 (0.98 - 1.09)	0.15
Medicaid and other public	1111 (6.2%)	356 (6.8%)		0.87 (0.8 - 0.94)	**0.001**
Private	11297 (62.6%)	3067 (58.3%)		REF	
No insurance	1616 (8.9%)	417 (7.9%)		0.76 (0.71 - 0.82)	< **0.001**
Education level (% high school grads in zip code)			0.008		
Q1< 88	3887 (22.6%)	1143 (22.7%)		REF	
Q2 >=88 to < 92.5	3973 (23.1%)	1268 (25.1%)		1.01.(0.94 - 1.08)	0.79
Q3 >= 92.5 to < 94	3962 (23%)	1153 (22.9%)		0.99 (0.91 - 1.08)	0.82
Q4 >= 94	5380 (31.3%)	1478 (29.3%)		0.99 (0.9 - 1.09)	0.87
Median household income (Quartiles based on Zip code)			0.005		
Q1 < 43449	3759 (21.9%)	1147 (22.7%)		REF	
Q2 >=43449 to < 55969	4113 (23.9%)	1220 (24.2%)		0.96 (0.0.90-1.03)	0.37
Q3 >= 55969 to < 67917	4288 (24.9%)	1324 (26.3%)		1.08 (0.98 - 1.18)	0.09
Q4 >= 67917	5042 (29.3%)	1351 (26.8%)		1.0 (0.9 - 1.1)	0.99
Tobacco Use	1549 (8.6%)	613 (11.7%)	< 0.001	1.41 (1.32 - 1.51)	< **0.001**
Alcohol use	11686 (64.7%)	3404 (64.7%)	0.99	NA	
Illicit drug use	622 (3.4%)	208 (4%)	0.079	NA	
Preferred language			0.3	NA	
English	17690 (98%)	5144 (97.8%)			
Spanish	176 (1%)	48 (0.9%)			
Others	191 (1.1%)	67 (1.3%)			
BMI	29.5 ± 6.5	30.3 ± 6.5	< 0.001		
Obesity	7200 (40.3%)	2333 (44.8%)	< 0.001	1.28 (1.23-1.33)	< **0.001**

Impact of COVID-19 on Trends and Healthcare Disparities on Utilization of Screening Colonoscopy

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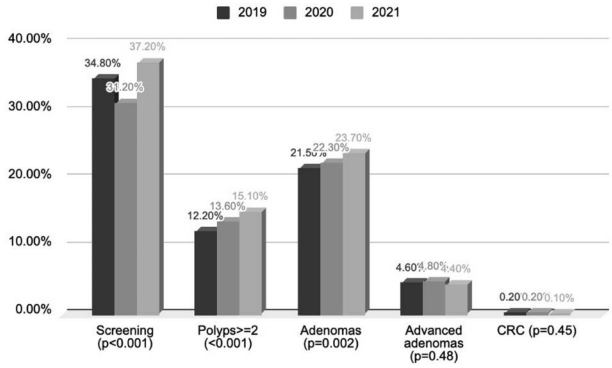
Introduction: Screening colonoscopy is the cornerstone of colorectal cancer (CRC) prevention. In March 2020, all elective outpatient procedures were halted by Ohio public health authorities. In this study, we aimed to study the impact of COVID-19 on trends and disparities in screening colonoscopy utilization.

Methods: We identified all patients who underwent colonoscopy at Cleveland Clinic Ohio facilities in 2019 to 2021 from July 1st to December 31st respective year. The timeline of July 1st to December 31st was selected based on lockdown which lasted till the end of June 2020 in Ohio and to compare the factors before, immediately after, and a year after COVID lockdown to understand its long-term impact. We then calculated rates of screening colonoscopy and factors associated with colonoscopy utilization during the study periods of each year.

Results: Among the total of 68206 colonoscopies, 23316 (34.2%) were screening colonoscopies. The rate of screening colonoscopy significantly declined in 2020 (31.2%) and then increased to 37.2% in 2021 as compared to 34.8% in 2020 ($p< 0.001$) (Figure). The mean age of patients significantly went down after the COVID pandemic ($p< 0.001$), but proportion of seniors (age >65) and the male: female ratio remained the same. In Caucasians, the rate of colonoscopy initially declined in 2020 (74.2%) then increased over 2019 (46%) levels in 2021 (76.9%) whereas utilization of colonoscopy in African Americans initially increased in 2020 (18.9%) and then decreased to even less than 2019 (16.5%) in 2021 (15.9%) ($p< 0.001$) (Table). Patients with private insurance, the highest quartile of median household income, and education had increasing rates of colonoscopy ($p< 0.001$) in 2020 and 2021. Patients who had ≥2 polyps (12.2%, 13.6% and 15.1%) and adenomas (21.5%, 22.3% and 23.7%) on screening colonoscopy significantly increased from 2019 to 2021 ($p< 0.05$) (Figure). Fortunately, there was no significant increase noted in rates of advanced adenomas ($p=0.48$) and colorectal cancer ($p=0.45$) (Figure).

Conclusion: The pandemic exacerbated preexisting healthcare disparities in colonoscopy utilization which have continued to persist in 2021. The number of polyps and adenomas detected on screening colonoscopy has significantly increased in the post-pandemic lockdown period but that did not translate into excess advanced adenoma detection or CRC rates. This data will assist current and future efforts to increase the uptake of CRC screening, especially in marginalized populations.



[0340] **Figure 1.** Trends of screening colonoscopy, polyps >=2, adenomas, advanced adenomas, and new diagnosis of CRC in 2019, 2020 and 2021 study period

Table 1. Demographics, socioeconomic and clinical factors in each year's study period

Factor	2019 (N=7905)	2020 (N=6737)	2021 (N=8674)	p-value
Age (mean ± sd)	59.8 ± 8.6	59.6 ± 8.9	58.9 ± 9.3	< **0.001**
Age >=65	2275 (28.8%)	1871 (27.8%)	2472 (28.5%)	0.38
Sex				0.97
Male	3648 (46.1%)	3107 (46.1%)	4014 (46.3%)	
Female	4257 (53.9%)	3630 (53.9%)	4660 (53.7%)	
Race				< **0.001**
Caucasians	6004 (76%)	4999 (74.2%)	6672 (76.9%)	
African Americans	1303 (16.5%)	1271 (18.9%)	1381 (15.9%)	
Others	598 (7.6%)	467 (6.9%)	621 (7.2%)	
Insurance type				< **0.001**
Medicare	1965 (24.9%)	1619 (24%)	1868 (21.5%)	
Medicaid and other public	435 (5.5%)	491 (7.3%)	541 (6.2%)	
Private	4662 (59%)	4061 (60.3%)	5641 (65%)	
No insurance	843 (10.7%)	566 (8.4%)	624 (7.2%)	
Education level (% high school grads in zip code)				< **0.001**
Q1< 88	1905 (22.8%)	1557 (24.1%)	1768 (21.3%)	
Q2 >=88 to < 92.5	1815 (24.3%)	1503 (23.3%)	1923 (23.1%)	
Q3 >= 92.5 to < 94	1714 (22.9%)	1549 (22.6%)	1942 (23.3%)	
Q4 >= 94	2237 (29.9%)	1935 (30%)	2686 (32.3%)	
Median household income				< **0.001**
Q1 < 43449	1647 (22%)	1544 (23.9%)	1715 (20.6%)	
Q2 >=43449 to < 55969	1837 (24.6%)	1532 (23.7%)	1964 (23.6%)	
Q3 >= 55969 to < 67917	1889 (25.3%)	1569 (24.3%)	2154 (25.9%)	
Q4 >= 67917	2098 (28.1%)	1809 (28%)	2486 (29.9%)	
Tobacco Use	699 (8.8%)	636 (9.4%)	827 (9.5%)	0.13
Alcohol use	5033 (63.7%)	4310 (64%)	5747 (66.3%)	**0.001**
Illicit drug use	259 (3.3%)	245 (3.6%)	326 (3.8%)	0.22
Preferred language				0.5
English	7732 (97.8%)	6613 (98.2%)	8489 (97.9%)	
Spanish	83(1%)	60 (0.9%)	81 (0.9%)	
Others	90 (1.1%)	64 (0.9%)	104 (1.2%)	
BMI	29.6 ± 6.4	29.8 ± 6.5	29.7 ± 6.5	0.52

Table 1. (*continued*)

Factor	2019 (N=7905)	2020 (N=6737)	2021 (N=8674)	p-value
Number of polyps				< 0.001
0	4483 (56.7%)	3770 (56%)	4643 (53.5%)	
1	2456 (31.1%)	2049 (30.4%)	2721 (31.4%)	
>=2	966 (12.2%)	918 (13.6%)	1310 (15.1%)	
Adenoma	1697 (21.5%)	1503 (22.3%)	2059 (23.7%)	**0.002**
Advanced Adenoma	361 (4.6%)	324 (4.8%)	382 (4.4%)	0.48
Cancer	12 (0.2%)	12 (0.2%)	9 (0.1%)	0.45

S341

FITs and Starts: Electronic Messaging Outreach to Improve Colorectal Cancer Screening Rates in the Patient-Centered Medical Home

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Introduction: In 2021, the United States Preventive Services Task Force recommended colorectal cancer (CRC) screening begin at age 45 instead of age 50 in all adults of average CRC risk. Top tier screening tools include annual fecal immunochemical test (FIT) or colonoscopy every ten years. We implemented a quality improvement project to assess the effectiveness of electronic messaging outreach on CRC screening by offering a pre-ordered FIT to eligible patients.
Methods: All patients ages 45-49 in the Walter Reed Internal Medicine Patient Centered Medical Home due for CRC screening were identified using CarePoint, a Department of Defense healthcare database. Patients with a history of IBD, CRC, colectomy, or without an active Tricare Online (TOL) account were excluded. A FIT was ordered and a standardized message was sent explaining the expanded screening age and screening options. Reminder messages were sent approximately 30 days and 90 days after the initial message. The outcome measured was the number of patients who underwent colorectal cancer screening in the six month period.
Results: Six hundred seventy-three patients ages 45-49 were identified as needing CRC screening and have active TOL accounts. Thirty-four (5%) patients had previous screening not registered by CarePoint. 96 (15%) of the remaining patients returned their FIT tests. Negative FITs returned for 90 people and 6 FITs were positive. Of the positive FITs, high risk adenomas were identified on two colonoscopies, one patient had ulcerative proctitis, one was normal, and two colonoscopies are pending.
Conclusion: Recent changes to CRC screening guidelines starting at an earlier age have dramatically increased the eligible patient pool. FIT is an easily performed, low cost, screening tool available in the primary care setting. This initiative alone will conservatively save $76,047 over 10 years compared to colonoscopy and improves access to care for high risk populations requiring GI appointments and endoscopies. Additionally, this project identifies that improving CRC screening can be achieved without utilizing clinician time, optimizing time in patient care. The identification of patients due for screening with TOL, placement of FIT orders, and sending outreach messaging can be completed by any trained team member which is consistent with goals of the medical home model. This protocol could be employed within MHS to streamline care, decrease healthcare expenditures, and most importantly improve the rates of colorectal cancer screening.

S342

A Quality Improvement Project on Colorectal Cancer Screening and Follow-Up Through Utilization of Healthcare Maintenance Forms Among Average Risk Active Patients in Resident Run Primary Care Clinics

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Introduction: Among adults ages 50 and older, colorectal cancer (CRC) screening in accordance with guidelines increased from 38% in 2000 to 66% in 2018; 61% reported having a colonoscopy in the past 10 years and approximately 11% reported a recent stool test. At Maimonides Medical Center, from January to March 2020, it was noted that the patients between ages 50-75 had a 34% compliance rate for CRC screening including colonoscopy, guaiac-based fecal occult blood test (gFOBT), fecal immunochemical test (FIT), and multitargeted stool DNA (MT-sDNA). We initiated a quality improvement project to learn more about how CRC screening is performed in resident-run primary care clinics and create methods to improve screening.
Methods: In the winter of 2020, our intervention centered on resident-run lectures to promote the utilization of healthcare maintenance forms to ensure appropriate documentation and to assist with more accurate quality improvement metrics when treating patients in the primary care clinics; CRC screening was the primary focus. The forms indicated when a patient was due for a screening test and whether a patient refused a particular test. Individual patient panels for house staff with periodic review with an attending were also utilized to improve education and address deficits in patient care. Data for analysis was collected from NextGen Healthcare, an electronic medical record system.
Results: From January to March 2021, 534 unique patients presented to the three resident-run primary care clinics at Maimonides. Among these patients, 173 patients were between ages of 50-75 with 136 patients frequenting the clinic at least three times in the past five years. 62 patients among the 136 (45.6%) were compliant with CRC screening; 58 patients underwent colonoscopies, and 4 patients were compliant with FIT, all with appropriate follow-up. 31 patients (22.8%) were offered only colonoscopies with a gastrointestinal (GI) referral; among this cohort, 8 patients stated refusal, and none were offered fecal stool tests. Of note, MT-sDNA was not utilized.
Conclusion: Our approach with utilizing, analyzing, and continuously updating healthcare maintenance forms at each visit yielded increased CRC screening rates in our patient population. Utilization of gFOBT, FIT, and MT-sDNA for patients who refuse colonoscopies remains a barrier.

S343

The Effects of the COVID-19 Pandemic on Average-Risk Colorectal Cancer Screening: A Quality Assurance Evaluation to Assess Policy Success at the Facility Level

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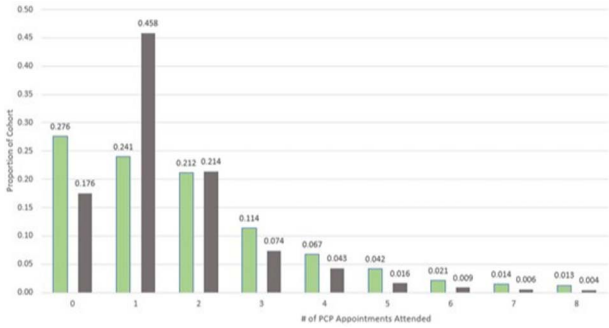
Introduction: While the Veterans' Health Administration (VHA) leads the U.S. in colorectal cancer (CRC) screening, the COVID-19 pandemic required suspension of screening colonoscopies. In March 2020, national policy directed the triage of colonoscopies, suggesting average-risk patients undergo fecal immunochemical testing (FIT). Our facility began a mail-out FIT program due to this guidance. This project arose to assess the pandemic effects on screening while also assessing disparities across race/ethnicity.
Methods: Screening eligibility (lacking colonoscopy ≤10 years, FIT ≤ 12 months, +FIT ≤ 5 yrs.) on March 1, 2019, and 2020 formed pre-pandemic and pandemic cohorts, respectively. 45-75 y/o Black/African American & 50-75 y/o in all other races with a prior PCP visit ≤ 1 yr. were identified. ICD codes and VHA health factors prior to each eligibility date excluded those with family/personal history of CRC, irritable bowel disease, polyps, dementia, or previous palliative care. Area Deprivation Index (ADI) was obtained to characterize neighborhood-level disparities. Demographics, ICD/CPT codes, and PCP appointment records were queried from an administrative data warehouse. The unadjusted and adjusted association between pandemic/pre-pandemic CRC screening rates was assessed using binary logistic regression and summarized as odds ratio (OR) along with 95% confidence intervals (CI). (Figure) (Table)
Results: The pandemic cohort attended significantly less PCP appts. (mean 1.56 vs. 2.56; p< 0.001) and was more likely to be younger (mean 61.9 vs. 62.9; p< 0.001), female (12.5% vs. 9.5%; p=0.002), married (54.9% vs. 50.6%; p=0.003) or ≥50% service-connected disability (81.5% vs. 71.3%; p< 0.001). In both, those screened were younger, female, in higher priority groups, attending more PCP appts., and lower in ADI. Pre-pandemic screening incidence was 50.3%, decreasing significantly to 15.1% in the pandemic (OR 0.17; 95% CI 0.15-0.20; p< 0.001), remaining statistically significant when adjusted for age, race, marital status, PCP Appts., and ADI (OR 0.16; 95% CI 0.15-0.19; P< 0.001)

Conclusion: CRC screening uptake decreased significantly in the pandemic across race/ethnicity, suggesting no exacerbation of racial disparities. Nevertheless, the large decrease suggests that transition to mail-out FIT was insufficient to overcome pandemic effects in our opportunistic screening system. Additionally, lower ADI was correlated with lower screening uptake, demonstrating the need to incorporate ADI into health disparities assessments.



[0343] **Figure 1.** Frequency of Attended PCP Appointments in Pre-pandemic/Pandemic Cohorts Grey=Pandemic Green=Pre-pandemic Notice the decrease in "no-shows" (those with 0 attended PCP appts.) in the pandemic period, showing that the lack of screening uptake was not solely due to patient non-compliance with PCP visits. The increase in those with only 1 PCP appt. should also be noted

Table 1. Screening Type/Location and FIT results between Cohorts Note the transition from a significant proportion receiving colonoscopy at our facility (i.e., internal) to FIT

		Pre-pandemic	Pandemic	p-value
Screening Test Type	FIT	689 (64.2)	362 (86.2)	p< 0.001
	Internal Colonoscopy	320 (29.8)	32 (7.6)	
	Community Colonoscopy	65 (6.1)	26 (6.2)	
FIT Result	Negative	640 (92.6)	341 (94.2)	0.403
	Positive	51 (7.4)	21 (5.8)	

S344

Prevalence of Colorectal Adenomas in Young Hispanic Population

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Introduction: Colorectal cancer (CRC) is the second most common cancer in men and women in Puerto Rico. According to the Central Cancer Registry of Puerto Rico, colorectal cancer was the leading cause of death from cancer in Puerto Rican men and women between 2006 and 2010. CRC screening efforts are directed toward removal of adenomas and detection of early-stage CRC. The most common precancerous colon polyp is the adenoma, which is believed to be the precursor for about 80% of CRC. This study aims to estimate the prevalence of colorectal adenomas in Hispanic young adults in Puerto Rico.
Methods: This population-based retrospective cross-sectional study reviewed the reports of colonoscopies for persons from 21 to 49 years of age performed during 2012 to 2019 in three academic settings. Variables examined included age, gender, presence, and location of adenomas. Descriptive statistics compared categorical variables as bivariate schema using Chi-square. The protocol was approved by the MSC IRB.
Results: A total of 635 colonoscopies were performed. Subjects had a mean age of 38 years old of which 42.05% were female and 57.95% were males (Table). Overall adenoma prevalence was 33.395%. The adenoma prevalence was higher among males compared with females (17.32% vs 16.06%). Adenoma prevalence increased with advancing age from 0.79% among 21-26 years to 17.95% among ages 45-49 years. Location of adenoma was highest in the rectum (10.87%) and sigmoid colon (8.98%) and lowest in the cecum (0.63%).
Conclusion: Our study demonstrates a progressive increase in prevalence of adenomas in Hispanic population after 32 years of age that reaches nearly 1 in 5 at ages 45 to 49. Adenoma prevalence increases among increasing age. Males have a higher prevalence when compared to females. Distal adenomas are far more frequent. Effectiveness of screening colonoscopies has markedly reduced the prevalence of CRC in patients above 50 years. However, some studies have shown an increase in prevalence of CRC among Hispanics below the age of 50. Our findings corroborate the presence of colorectal neoplasia below age 50 and support earlier screening colonoscopies in Hispanics.

Table 1. Age at Colonoscopy Stratified

Age	21 - 26	27 - 32	33 - 38	39 – 44	45 - 49	Total
Adenoma Detection						
No	45 (7.09%)	45 (7.09%)	69 (10.87%)	109 (17.17%)	155 (24.41%)	423 (66.61%)
Yes	5 (0.79%)	6 (0.94%)	37 (5.83%)	50 (7.87%)	114 (17.95%)	212 (33.39%)
Total	50 (7.87%)	51 (8.03%)	106 (16.69%)	159 (25.04%)	269 (42.36%)	635 (100.00%)

Prevalence of Adenoma 21- 26: 0.79%, Prevalence of Adenoma 27 -32: 0.94%, Prevalence of Adenoma 33 - 38: 5.83%, Prevalence of Adenoma 39 - 44: 7.87%, Prevalence of Adenoma 45 - 49: 17.95%. Note. Due to rounding error, percentages may not sum to 100%.

S345

Gender Differences and Disparities in Non-Malignant Colorectal Polyp Surgery in United States

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Introduction: Cancer related death due to colorectal cancer is the third leading cause in both men and women. Annually, more than 1.1 million cases of colon cancer are diagnosed globally. The incidence rates of colorectal cancer are higher in men than in women. Most of the colon cancer are sporadic and arise from benign adenomas. Despite advancement in endoscopic management of large colorectal polyps, colectomies are still performed in United States. In addition, there is inadequate evidence of gender differences in surgery for nonmalignant colorectal polyps and prognosis. This study aims to examine the disparities/gender differences in surgery for non-malignant polyps from the National inpatient database.

Methods: This is a retrospective cohort study involving hospitalizations between January 1, 2012, and December 31, 2019, from the National Inpatient Sample (NIS). Our study sample included discharged adult patients (≥18 years old) hospitalized for non-malignant colonic or anorectal polyp as principal diagnosis and who underwent colectomy or proctectomy as a primary procedure. The principal or primary diagnosis is the unique diagnosis during the hospitalization for which the patient was primarily admitted or treated (NIS first diagnosis variable "I10_DX1"). The primary outcome of our study is to evaluate the disparities in surgical resection of nonmalignant colorectal polyp admissions over the above period. We used descriptive statistics to present patient demographics and hospital characteristics. Rates of in-hospital mortality is expressed as per 100,000 hospitalizations with surgery for principal nonmalignant colorectal polyp.

Results: There were 99330 primary admissions for surgical resection of non-malignant polyp resection in the United States from year 2012 to 2019. Fifty one percent were female (n=50191) and 66 % cases (n=59407) from academic hospitals. Majority were White Americans. Males had higher range of income threshold compared to females (p=*0.001*). However, females had significantly lesser in-hospital mortality, lower length of hospital stay, and less severe medical comorbidities (*p=0.001*). (Figure)

Conclusion: There was a significant decrease in-hospital mortality and lower length of hospital stay in females after surgery for non-malignant colorectal polyps over study periods. It is very important to understand the sociocultural differences and gender specific strategies for treatment. (Table)

Table 1. Baseline characteristics of the weighted sample from the NIS 2012–2019 for adults with non-malignant polyps who underwent surgery for a total weighted N=99,330

Variables	Male n=49,139	Female n=50,191	P-value
Age (years), Standard deviation (SD)	65.5 SD=10.4	65.2 SD=10.7	< 0.064
Academic	66.12%	66.95%	0.236
Non-academic	33.88%	33.05%	0.236
Race: White Americans Black Americans Hispanic Other Race	79.28% 10.78% 5.69% 4.25%	75.49% 14.51% 6.04% 3.96%	< 0.001
Charlson comorbidity index (CCI)-0 1 2 3 or higher	52.71% 26.1% 10.86% 10.34%	57.66% 26.34% 9.19% 6.81%	< 0.001
Annual Income: 1-45,999 46,000–58,999 59,000–78,999 79,000 or more	178 (19.98) 226 (25.36) 262 (29.41) 225 (25.25)	186 (23.88) 223 (28.63) 210 (26.96) 160 (20.54)	0.024
Length of stay (days) (95% CI)	5.3 (5.2–5.4)	4.8 (4.7–4.8)	< 0.001
In-hospital mortality (%)	0.65%	0.3%	< 0.001
AMI	5.79%	2.56%	< 0.001
CHF	4.93%	3.68%	< 0.001
PVD	4.21%	1.99%	< 0.001
CEVD	1.73%	1.53%	0.287
Dementia	0.37%	0.43%	0.501
COPD	14.96%	18.16%	< 0.001
Rheumatoid Disease	1.10%	2.33%	< 0.001
Hemiplegia	0.19%	0.07%	0.018
Kidney disease	8.07%	5.17%	< 0.001
Cancer	1.97%	1.32%	< 0.001
Peptic ulcer	0.54%	0.40%	0.176
Mild liver disease	1.47%	1.11%	0.027
Moderate/severe liver disease	0.52%	0.25%	0.003
Metastatic cancer	0.28%	0.24%	0.580
AIDS	0.04%	0.02%	0.448
Diabetes mellitus	21.97%	18.57%	< 0.001
Complication of DM	3.79%	2.34%	< 0.001

Table 2. Unadjusted and adjusted in-hospital mortality among adult patients with surgery for non-malignant polyp (weighted n=82,995)

In-hospital mortality	Unadjusted Odds ratio	LL, UL 95% CI	P value	Adjusted Odds ratio	LL, UL 95% CI	P value
Academic (reference: Non-Academic	0.73	0.46, 1.15	0.174	0.80	0.50, 1.29	0.368
Sex (Reference: male) Female	0.46	0.30, 0.71	< 0.001	0.67	0.40, 1.08	0.101
Race (Reference: White Americans) Black Americans Hispanic	0.96 0.93	0.50, 1.79 0.37, 2.30	0.863 0.872	0.96 0.99	0.47, 1.95 0.36, 2.73	0.914 0.984
Charlson Comorbidity Index (Reference: 0) 1 2 3 or higher	2.53 6.12 9.17	1.40, 4.60 3.33, 11.23 5.16, 16.31	0.002 < 0.001 < 0.001	1.99 5.56 6.12	0.97, 4.08 2.73, 11.35 3.0, 12.4	0.060 < 0.001 < 0.001

COLORECTAL CANCER PREVENTION

S2241 Presidential Poster Award

Solitary Penile Lesion: A Peculiar Presentation of Colorectal Cancer Recurrence and Metastasis

Raj Jessica Thomas, DO[1], Serina Williams, BS[2], Patrick S. Rush, DO[3].
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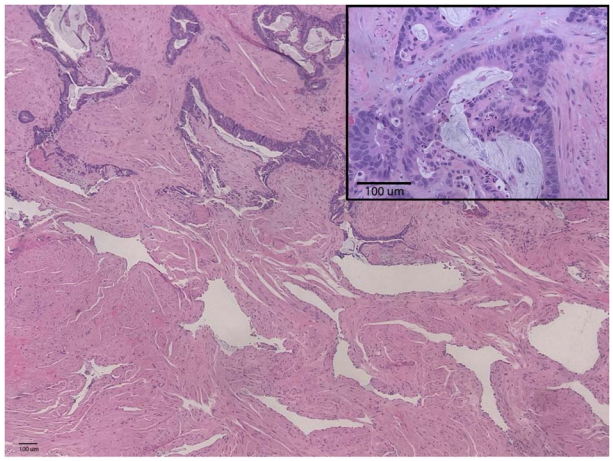
Introduction: Colorectal cancer (CRC) is the third leading cause of cancer-related deaths in the United States and 50% of CRC patients will develop metastases in the course of disease. Presented is a case of a 60-year-old male with a past medical history significant for psoriasis and colorectal cancer (Stage C T4bN1M0) treated by chemoradiation with complete response. A year later, the patient presented with painful red lesion on the penis clinically initially thought to be fungal balanitis, treated with various interventions ranging from antibiotics and antifungals without improvement. Biopsy of the lesion demonstrated metastatic colorectal adenocarcinoma filling the corpora. The patient went under partial penectomy and was advised to follow with chemoradiation. This case showcases an atypical presentation of metastatic colorectal cancer, and stands as a reminder to the possibility of metastasis to highly vascular areas, which are not restricted only the liver, but which also include the skin, particularly the scalp, and in this unusual presentation, the penis.
Case Description/Methods: A 60-year-old male with past medical history of psoriasis and rectal cancer successfully responsive to chemoradiation presented to with a painful red lesion on the glans penis. He denied any bleeding, discharge, dysuria or difficulty urinating. He admitted to throbbing pain at the area. He had no new sexual partners. Initially thought to be fungal balanitis. He was treated with various interventions ranging from antibiotics and antifungals without improvement. Given the progression of the penile lesion, he was referred to urology. On clinical exam, lesion showed advancement from initial presentation. A 6cm erythematous, raised mass in prepuce involving glans penis with a 2cm indurated base was found. Biopsy of the lesion demonstrated metastatic colorectal adenocarcinoma filling the corpora. The patient went under partial penectomy and was advised to follow with chemoradiation **(Figure)**.
Discussion: Although there is a high propensity of colorectal cancer to metastasize to the liver, it is essential to keep in mind other vascular entities that may also be affected. This may include skin with a higher tendency to the scalp or as in this atypical presentation to the penis. However, given the past medical history of rectal carcinoma in this patient, it is reasonable to conclude that the lesion can be cancerous in nature and it should not deter one from making the diagnosis of metastatic rectal cancer in other highly vascular regions.



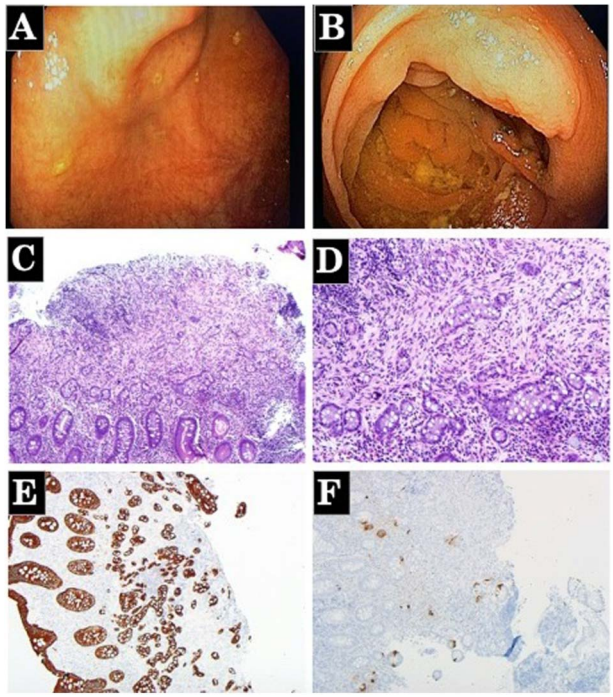
[2241] **Figure 1.** Low-power magnification of H&E sections of the penile sample shows the vascular corporal regions of the penis which are expanded by atypical glandular structures. Higher power (Top right inset) shows these glandular regions to be malignant with hyperchromasia, and cribriform growth with typical "dirty necrosis" of colorectal adenocarcinoma.

S2242 Presidential Poster Award

Taking Caution at Road's End: Incidental Finding of Appendiceal Goblet Cell Tumor on Colonoscopy

Kyler Kozacek, DO, Ruth Reese, MD, Jeffrey Laczek, MD, Patrick Voorhees, MD.
Walter Reed National Military Medical Center, Bethesda, MD.

Introduction: Appendiceal cancer is uncommon and rarely diagnosed on colonoscopy. We present a case of incidentally discovered goblet cell adenocarcinoma of the appendix and its subsequent management.
Case Description/Methods: 81-year-old male presented to GI clinic for persistent epigastric pain and reflux. Symptoms had been worsening for several years and were refractory to medical therapy. He denied unintentional weight loss, nausea, melena, or a family history of colorectal cancer. He had 9 colonoscopies between 1999 and 2016 for rectal bleeding due to hemorrhoids and diverticulosis, with a single 2mm TA removed in 2016 and 5-year follow-up advised. Repeat EGD and colonoscopy were scheduled, during which the appendiceal orifice (AO) had a "heaped-up" appearance and was biopsied with cold forceps. Histology revealed goblet cell adenocarcinoma (GCA.) CT of the abdomen and pelvis showed a mildly enlarged appendix, no LAD, and no evidence of metastasis. The patient underwent a laparoscopic right hemicolectomy. Pathology clarified that carcinoma extended from appendix to mesoappendix and cecum with extensive lymphovascular and perineural invasion. Resected margins and 19 resected lymph nodes were negative for malignancy and ultimately staged pT4aN0 (IIB). Colonoscopy 1 year later revealed healthy ileocolonic anastomosis without signs of polyps or other masses (Figure).
Discussion: Appendiceal cancer is categorized into 2 types: epithelial and neuroendocrine. GCA histologically has features of both. Incidence is rare, reportedly 0.05/100,000/year. It is usually an incidental finding following appendectomy for acute appendicitis and uncommonly found via colonoscopy. The AO is a key endoscopic landmark that should be identified on all colonoscopies to ensure completeness. Endoscopists should have a low threshold to biopsy abnormal-appearing tissue surrounding the AO. While no established risk factors for GCA, cases report an association with schistosomiasis and caucasian proclivity. Clinical diagnosis is difficult as presentations range from abdominal pain to appendicitis. Swift work-up and therapy are essential as appendiceal GCA can aggressively spread nodally or intraperitoneally. While evidence-based guidelines are not available, current management is similar to that of colon cancer with hemicolectomy for localized disease, adjuvant chemotherapy based on the surgical pathology, and post-treatment surveillance. We hope this case highlights the rarity of appendiceal GCA and the need for evidence-based guidelines.



[2242] **Figure 1.** A) Appendiceal orifice with "heaped-up" appearance B) Healthy ileocolonic anastamosis C) Clusters of goblet-like mucinous cells with invasion into and through the lamina propria (10X) D) High power view (20X) of cohesive groups of goblet-like mucinous cells. Nuclear atypia is mild and mitotic figures are inconspicuous E) Cytokeratin AE1/AE3 highlights the colonic mucosa and the infiltrative goblet-cell tumor (10X) F) Chromogranin highlights scattered endocrine cells (10X).

S2243

An Exceedingly Rare Occurrence: Late Recurrent Colon Adenocarcinoma Metastasizing to Jejunum and Duodenum

Pearl Aggarwal, MD[1], Francisco Somoza-Cano, MD[1], Kanchi Patell, MD[1], Abdul Rahman Al Armashi, MD[2], Mohammed K. Mazumder, MD[1].
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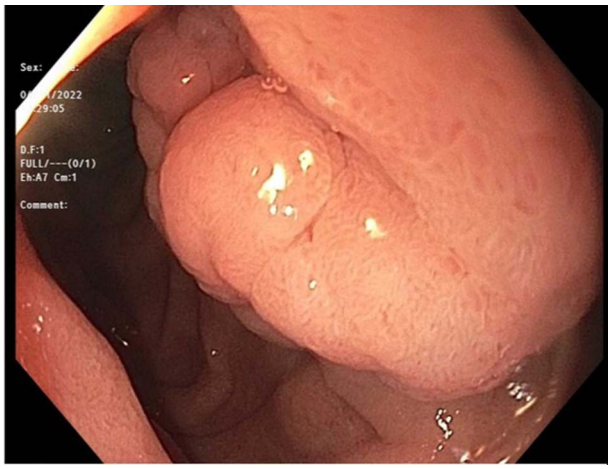
Introduction: Colorectal cancer (CRC) is one of the most common cancer malignancies globally. However, the late recurrent disease after early diagnosis and treatment is rare. We present a case of small bowel obstructions secondary to recurrent CRC treated over 16 years ago.
Case Description/Methods: A 64-year-old African-American male with a past medical history of Stage IIA colon adenocarcinoma status post rectosigmoid resection who received chemoradiation (capecitabine) presented after worsening nausea and vomiting. An abdominal CT scan revealed a partial small bowel obstruction at the jejunum with abdominal lymphadenopathy. The patient was taken to an exploratory laparotomy with adhesiolysis and resection of the aforementioned mass. Pathology reported a metastatic adenocarcinoma with the colon as the primary malignancy. In his immediate post-op, the patient presented with worsening vomiting. Upper endoscopy revealed a pedunculated tumor of approximately 3 cm in size in the duodenum, partially obstructing the small bowel. The tumor was resected and had identical pathological characteristics to the jejunal mass. Immunohistochemistry (IMR) for mismatch repair proteins was negative without loss of MMR nuclear expression. The patient was remitted to palliative care (Figure).
Discussion: Late recurrent CRC to small bowel is exceedingly rare and seldom reported in the literature. The recurrence patterns are dependent on several factors: interval until recurrence, site of first recurrence, stage of primary cancer, adjacent organ involvement, and influence of adjuvant therapies. Current literature suggests that the disease-free interval is significantly longer in those who received both adjuvant therapies than in those who received either radiotherapy or chemotherapy or neither of them. In our case, the interval between curative resection and recurrence of adenocarcinoma was over 10 yrs. Our patient underwent standard surveillance with colonoscopy. Locoregional recurrences have been studied involving the anastomotic site, tumor bed, mesentery, surgical site scar, draining lymphatics, or the port site. Based on these recurrence patterns, it is debatable if the current surveillance guidelines are sufficient and prompt the query if additional strategies are required to supplement the current guidelines and increase patient compliance.



[2243] **Figure 1.** Upper GI endoscopy with a mass at the second portion of the duodenum.

REFERENCE
1. Turk PS, Wanebo HJ. Results of surgical treatment of nonhepatic recurrence of colorectal carcinoma. Cancer. 1993 Jun 15;71(12 Suppl):4267-77.

S2244

Brain Metastases With Headache and Memory Loss as a Primary Manifestation From Undiagnosed Rectal Cancer

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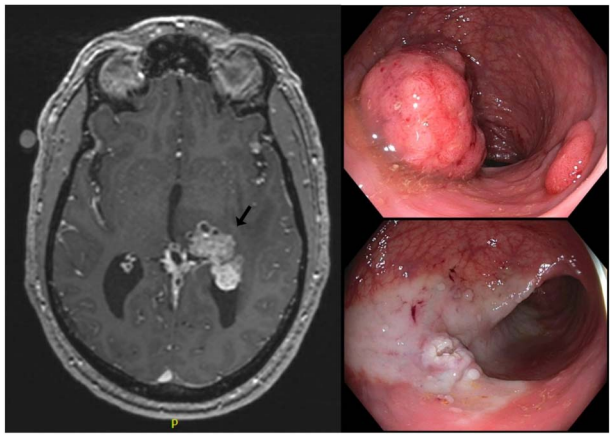
Introduction: Colorectal cancer typically metastasizes to the liver and lungs. Intracranial metastasis of colorectal cancer is rare. We report a rare case of rectal cancer with brain metastases who initially presented with headaches and memory difficulties without any other systemic manifestations.
Case Description/Methods: A 50-year-old White male presented at the neurology clinic for chronic headaches and memory difficulties for over one year. There were no gastrointestinal complaints except occasional bright red blood per rectum after passing hard stools, which was thought to be due to anal pathology. His last colonoscopy was unsuccessful because of poor preparation. He then developed new onset of dizziness, right-sided facial weakness, and seizures. MRI of the brain (Figure) showed a left thalamic enhancing mass with extensive edema extending to the midbrain with leptomeningeal metastatic deposits. He underwent left parietal mini craniotomy with partial resection of intraventricular tumor. Histopathology of the tumor showed an adenocarcinoma with immunochemistry stains positive for AE1/AE3, CK7, and CDX2 and negative for SATB2, CK20, PAX 8, and S100. Ki-67 proliferative index was 75.0%. All these were clued to the pancreaticobiliary or gastrointestinal origin of the metastasis. Abdomen/pelvis and chest CT were unremarkable for any evidence of malignancy. A repeat colonoscopy showed a 7 cm x 5 cm pedunculated polypoid non-obstructing lesion (Figure) in the rectum which was removed with hot snare. The histology revealed an invasive moderately differentiated adenocarcinoma arising from the Tubulovillous adenoma with high-grade dysplasia without any lympho-vascular invasion (Figure).
Discussion: Metachronous metastasis of colorectal cancer to the brain is rare and devastating. The brain metastases of colorectal cancer dictate the prognosis as chemotherapy does not penetrate CNS. Our case highlights an interesting illustration of an undiagnosed rectal cancer with isolated brain metastases presenting with neurological manifestations. Careful investigation is often warranted in such cases without any GI manifestations. Radiation therapy, anti-EGFR antibody therapies and monoclonal antibodies in addition to chemotherapy are the cornerstones of treatment in patients with colorectal cancer with brain metastases.



[2244] **Figure 1.** Brain MRI demonstrating metastasis to the left thalamus (black arrow). On right Colonoscopy images showing a fungating mass in the rectum and post hot-snare polypectomy.

S2245

Endoscopic Ultrasound in the Diagnosis of Rectal Adenocarcinoma in a Recurrent Polyp

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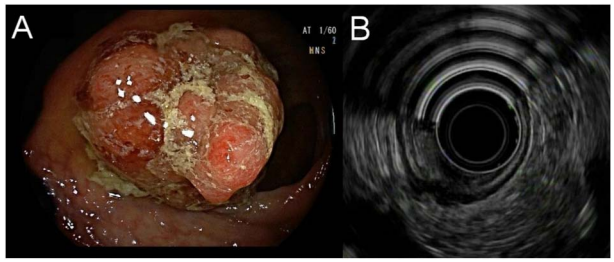
Introduction: Colonoscopy remains an effective modality for treatment of large polyps. Post-polypectomy surveillance is critical in evaluating for recurrence. The role of rectal endoscopic ultrasound (EUS) in post-polypectomy care remains unclear. In this case, we present a clinical scenario where rectal EUS was impactful.

Case Description/Methods: A 50-year-old woman without a family history of colorectal cancer presented with a positive multitarget stool DNA test. Three months later, colonoscopy revealed a benign appearing 40mm rectosigmoid sessile polyp (**Figure A**). Piecemeal polypectomy using hot snare over saline pillow was performed and the site was tattooed. Pathology showed a tubulovillous adenoma. She was then referred for a surveillance sigmoidoscopy. Three months later, a recurrent 35mm sessile polyp was encountered at the previous tattoo site. The polyp was resected in a piecemeal fashion using saline injection lift with hot snare and hot biopsy avulsion. The polyp was difficult to remove due to the infiltrating tattoo and scarring from prior polypectomy. Pathology showed a villous adenoma. Four months later, surveillance sigmoidoscopy revealed another recurrent 20mm polyp. Rectal EUS during the same session showed a 19mm x 10mm heterogeneous lesion with focal invasion into the muscularis propria (Figure B). It was removed using saline injection lift, piecemeal resection with hot snare and cold forceps, and then ablated with argon plasma coagulation. Pathology again showed villous adenoma. Given the EUS findings, she was referred to surgical oncology. CT chest/abdomen/pelvis was negative for a mass and metastatic disease. CEA was only 0.99ng/mL. She then underwent lower anterior resection. Final pathology revealed well differentiated adenocarcinoma pT2 pN0 without lymph node metastasis. Surveillance colonoscopy less than a year later did not reveal any recurrent disease.
Discussion: Recurrence following piecemeal resection of sessile polyps is seen in up to 50% of patients in some studies. However, multiple recurrences are uncommon and warrant further investigation. Rectal EUS has been studied once previously for post resection of high-risk polyps and found to have only a slight incremental yield over white light endoscopy in the detection of cancer. In our case, rectal EUS did suggest underlying malignancy, which was confirmed on final surgical pathology. EUS in recurrent polyps is not well studied in the literature but may be a useful tool for the detection of underlying masses in these scenarios.



[2245] **Figure 1.** A. Rectosigmoid polyp. B. Heterogenous lesion with focal invasion into the muscularis propria.

S2246

FIT or Unfit: Advanced Colon Cancer Screening

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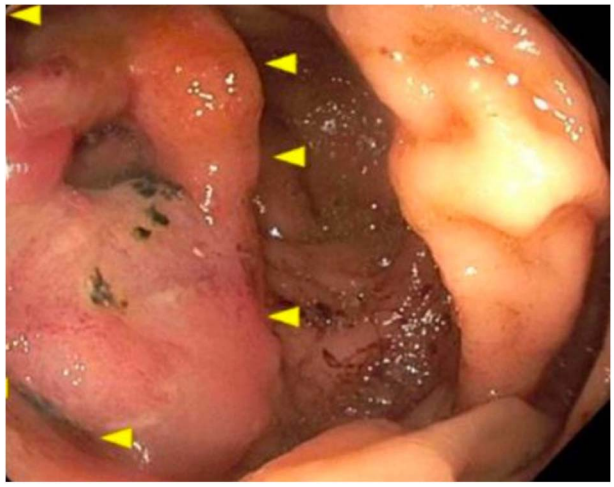
Introduction: Colorectal cancer (CRC) is the third leading cause of cancer related mortality worldwide. The U.S. Preventative Services Task Force guidelines recommend screening for average risk patients at age 45, and modalities include stool-based or direct visualization tests. We report a presentation of Stage IV colorectal adenocarcinoma in the setting of 3 annual negative fecal immunochemical testing (FIT) tests.
Case Description/Methods: A 67-year-old woman presented with shortness of breath, unintentional weight loss, and abdominal pain. She denied hematochezia or melena. Physical exam was notable for pallor and right upper quadrant pain. Initial laboratory data showed normocytic anemia with a hemoglobin 10.1 g/dL, alkaline phosphatase 610 U/L, aspartate aminotransaminase 116 U/L, alanine aminotransaminase 67 U/L. Computed tomography of the chest, abdomen, and pelvis revealed a normal colon and extensive metastatic disease in the liver and lungs with bilateral subsegmental pulmonary emboli. Chart review was notable for negative FIT tests in 2017, 2018, and 2020, performed within a year of this presentation. Further workup was significant for elevated carcinogenic embryonic antigen 1470 ng/mL, and normal alpha-fetoprotein and cancer antigen 19-9 levels. Colonoscopy revealed an infiltrating, ulcerated, semi-circumferential mass at the ileo-cecal valve and ascending colon (Figure). Pathology demonstrated moderately differentiated invasive colonic adenocarcinoma with malignant glands infiltrating a desmoplastic stroma. Immunohistochemistry did not show any microsatellite instability changes.
Discussion: One study showed FIT testing was 73.8% sensitive for detecting Stage I-III CRC, however, sensitivities dropped with advanced precancerous lesions and sessile serrated polyps to 23.8% and 5.1% respectively. Another retrospective cohort looking at 6 consecutive rounds of FIT testing demonstrated lower accuracy of detecting proximal colon cancers compared to distal cancers (0.45 vs 0.73; $P < 0.001$). Lower cut off values of qualitative FIT correlated with better sensitivities, however, specificity declined. Although FIT testing is able to detect the majority of colorectal cancers, it has decreased accuracy and sensitivity in advanced precancerous lesions, sessile serrated polyps, and proximal (right) colon lesions. Colonoscopy is considered gold standard and further guidelines should recommend a standardized cut off value to help improve screening efficacy.



[2246] **Figure 1.** Large fungating mass in the ascending colon and ileo-cecal valve.

S2247

Gastric Irritation Noted in Patients Using New Tablet-Based Colonoscopy Preparation

Natalie Savini, BS, MD[1], Emily Singh, MD[2].
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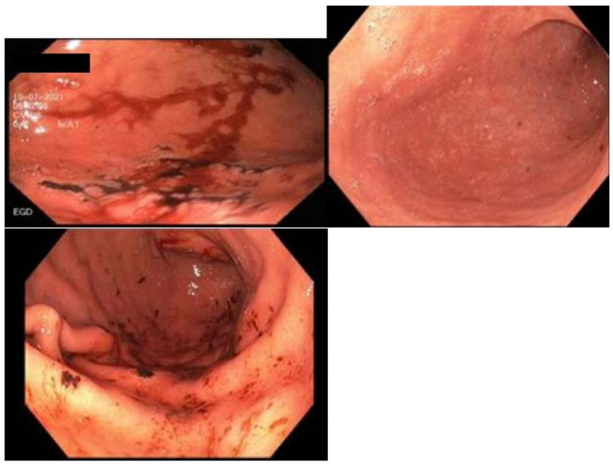
Introduction: In November 2020, the FDA approved a novel colonoscopy preparation, a tablet-based bowel prep containing poorly absorbed sulfate salts. This case series includes 3 patients undergoing upper and lower endoscopy who were found to have gastric irritation thought to be caused by this bowel preparation.
Case Description/Methods: A 35-year-old male with gastroesophageal reflux presented with 5-day history of hematochezia and abdominal pain. He underwent colonoscopy which showed internal hemorrhoids and esophagastroduodenoscopy (EGD) showed ulceration of the stomach body (Figure, top left). Biopsies showed focal active gastritis and superficial erosion without *H. pylori* organisms. The patient started daily PPI and 3 months later repeat EGD showed normal mucosa both visually and pathologically. A 59-year-old female endorsed abdominal bloating and heartburn after completing treatment for *H. pylori* 1-month prior. She underwent EGD with colonoscopy (for screening). EGD showed multiple diminutive round erythematous spots in the stomach antrum with pinpoint foci of dark heme suggestive of hemorrhagic gastritis (Figure, top right). Biopsies showed moderate inactive chronic inflammation without *H. pylori* organisms. A 70-year-old female requested endoscopy as she had a personal history of remote H. pylori infection and her father had gastric cancer. On EGD, there were superficial erosions in the lesser curve of the stomach (Figure, bottom 3). Biopsies were obtained and showed gastric mucosa with reactive epithelial changes without evidence of *H. pylori* infection.
Discussion: The preparation consists of 24 tablets total, each taken with 16 ounces of water. The ingredients include magnesium sulfate, potassium chloride, and sodium sulfate. The sulfate salts are responsible for the osmotic and therefore laxative effects of the medication. Potassium chloride is included to avoid diarrhea induced hypokalemia. Potassium chloride is a mucosal irritant that has been reported to cause upper gastrointestinal ulcers and erosions. In each case, gastric irritation was an unexpected finding in a patient without significant risk factors for developing gastric ulcers. The common factor among them all is the same tablet-based preparation used for colonoscopy. Noted was a similar pattern of ulceration in the gastric antrum and body noted in these patients, which was in a pattern of the tablets resting on the greater curve of the stomach. While gastric ulceration may be asymptomatic, it may lead to diagnostic confusion and further unnecessary workup.



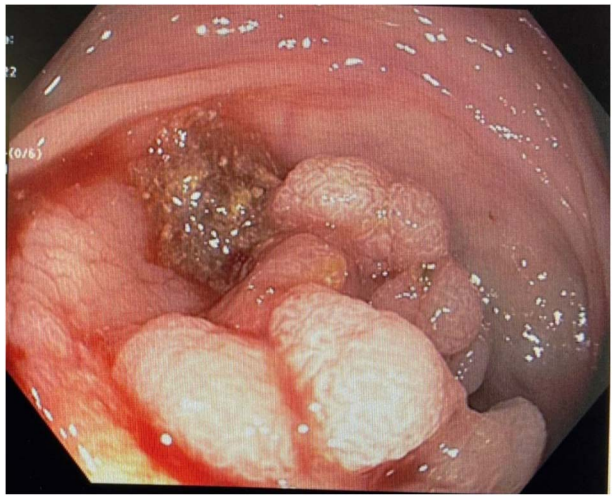
[2247] **Figure 1.** Colonoscopy images.

S2248

Multiple Synchronous Lesions of Colon Cancer Presenting as Severe Anemia

Saraswathi Lakkasani, MD[1], Mehul Shah, MD[1], Navjot Kaur Grewal, MD[1], Jay Stylman, MD[1], Sanjana Reddy Mandapati, MD[2], Mahidhar Reddy, MD[1], Jaydeep Mahasamudram, MD[3].
[1]Saint Michael's Medical Center, New York Medical College, Newark, NJ; [2]Rowan University, Newark, NJ; [3]Bronx Lebanon Hospital, New York, NY.

Introduction: Synchronous colorectal cancer (CRC) is described as the presence of more than one primary cancerous lesion at initial presentation or within 6 months of diagnosis. It is a rare and distinct type of CRC compared to a solitary lesion. The prevalence rates range from 1.1 to 8.1%. Synchronous CRC is more often observed in males with a male to female ratio of 1.8. We report a case of an elderly female patient with quadruple synchronous CRC presenting as severe anemia.
Case Description/Methods: An 81-year-old female with no significant past medical or family history presented for generalized weakness. The physical examination was normal. Labs showed hemoglobin of 4.9 and CEA value of 90.6 ng/ml. Anemia workup revealed Iron deficiency. The patient received 3 units of packed red blood cells and started on iron replacement. Colonoscopy findings revealed one 30mm polyp at rectosigmoid colon and few 5-20mm polyps in sigmoid, descending, and ascending colon with 4 partially obstructing mass lesions in proximal descending colon, hepatic flexure, cecum and ileocecal valve. Pathology diagnosed all the lesions as invasive adenocarcinoma with signet cell and mucin presence associated with tubulo-villous adenoma. Computed tomography of chest, abdomen and pelvis did not reveal any evidence of metastatic disease. Surgery and Oncology consulted for further management (Figure).
Discussion: Inflammatory bowel disease, familial adenomatous polyposis and hereditary non polyposis colorectal cancer has been shown to be significant predisposing risk factors for synchronous CRC. However, they contribute to only 10% of all cases of synchronous CRC, which indicates that most of the risk factors are still unknown for synchronous CRC. Studies reported that most synchronous lesions occur in different regions of colon and only a few develop at the same segment, therefore it is important to have a thorough pre-operative examination of the colon. Despite the growing incidence of synchronous CRC, little is known about the risk factors, molecular characteristics, and prognosis. We aim to add to the growing literature for detailed review of the profiles of such patients to aid in identification of at-risk patients to design more effective and targeted therapies to improve outcomes.



[2248] **Figure 1.** Partially obstructing mass in proximal descending colon.

S2249

A Case of Tinnitus in a Patient With Ulcerative Colitis on Rectal Mesalamine

Omar Khalil[1], Lara Miranda[1], Daniel Kim[1], Suzanne Elshafey, MD[2], David Wan, MD[3].
[1]Weill Cornell Medical College, Manhattan, NY; [2]New York Presbyterian-Weill Cornell Medical Center, Manhattan, NY; [3]New York-Presbyterian Hospital/Weill Cornell Medicine, New York, NY.

Introduction: Ulcerative colitis (UC) is the most common form of inflammatory bowel disease (IBD), with a prevalence of 156 to 291 cases per 100,000 per year. It is characterized by continuous inflammation, friability, mucosal and submucosal erosions involving any segment of the colon. Mesalamine (5-ASA) is a first-line treatment that can be given orally or rectally. Mesalamine is also a salicylate, which have a strongly documented association with tinnitus. To our knowledge, however, there are no case reports of IBD patients treated with oral or rectal 5-ASA having otic side effects. Thus, it is important to recognize this potential side effect of mesalamines, even if only used rectally.
Case Description/Methods: A 76-year-old man with hypertension, coronary artery disease (CAD), prostate cancer status post radiation, sigmoid diverticulitis with pelvic abscess requiring sigmoidectomy and ileostomy status post reversal who presented with worsening bowel incontinence 4 months after ileostomy reversal. Family history was notable for 2 children with IBD. Infectious stool studies were negative. CT scan of the abdomen showed proctitis. Flexible sigmoidoscopy was performed, and pathology was suggestive of ulcerative proctosigmoiditis. The patient was started on mesalamine enemas with subsequent improvement in bowel incontinence. However, within 3 months, he developed tinnitus. Rectal mesalamine was discontinued with full resolution of the tinnitus less than 2 weeks later. To control his proctosigmoiditis, budesonide foam was used with a complete clinical response.
Discussion: Rectal mesalamine is variably absorbed in the gut and is mainly cleared by the kidneys after N-acetylation in the liver. Possible reasons for toxicity include liver or renal impairment or coadministration of other salicylates like aspirin. Although this patient had normal liver function, his eGFR was reduced and he was on aspirin therapy for CAD, which may have increased his risk of developing tinnitus. It is important to recognize this potential complication of mesalamine, and assess these factors prior to prescribing mesalamine, counsel patients, and maintain close follow-up of patients with risk factors, as tinnitus is often easily reversible with mesalamine discontinuation. Further studies are needed to better understand the pharmacokinetics of rectal mesalamine and its role in systemic toxicity.

S2250

***Clostridium sordellii* Pelvic Abscess as the First Sign of an Underlying Gastrointestinal Malignancy**

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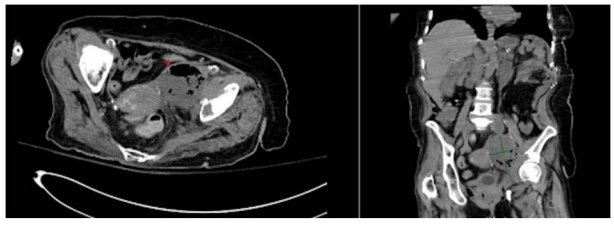
TTUHSC, Odessa, TX.

Introduction: *Clostridium sordellii* is a rare gram-positive anaerobe associated to cause lethal infections after childbirth, penetrating injuries, and routine gynecological procedures. Very few cases of *C. sordellii* infection in patients with underlying malignancy have been reported. Here we present a case of septic shock with *C. sordellii* as the first sign of an underlying advanced rectal carcinoma.
Case Description/Methods: A 68-year-old female with a history of well-controlled diabetes came to the hospital with nonradiated left hip pain associated with fevers, and generalized weakness for 4 days. She denied history of recent falls, rheumatological diseases, steroid use, and weight loss. On arrival, the patient was hypotensive and tachycardic. Physical examination was significant for non-distended abdomen with approximately 5x5cm irregular tender suprapubic mass with erythema on the overlying skin, and externally rotated and abducted left hip with severe tenderness over the left hip joint. Laboratories evidenced leukocytosis. CT Abdomen showed 7.6x5.7x5.5 cm poorly marginated gas containing soft tissue mass in the left pelvis suspicious of an abscess with an irregular osteolytic lesion of the left acetabulum and superior pubic ramus (Figure). MRI revealed osseous lesions involving numerous bones and a large lesion in the L3 vertebral body, indicating malignancy. The clinical picture was consistent with septic shock, and the pelvic abscess was the likely source in the setting of underlying malignancy. Sepsis protocol was initiated, cultures were sent, and the patient was started on antibiotics. Pelvic abscess fluid grew *C. sordellii* in the anaerobic bottle. Pathology report of the pelvic bone confirmed Squamous cell carcinoma with basaloid features, likely rectal carcinoma with no histopathological evidence of osteomyelitis.
Discussion: Historically, Clostridium species like *C. septicum* have been linked with GI malignancies. The reason for this connection is thought to be due to damage to the normal mucosa barrier from ulceration seen in GI malignancies, which can lead to hematogenous invasion. *C. sordellii* infections are also increasingly being associated with GI and GU malignancies, posing the question of whether we need to be more aggressive in screening these patients for underlying cancers. This could further help in early screening and diagnosis of underlying malignancies which can improve the mortality outcomes.



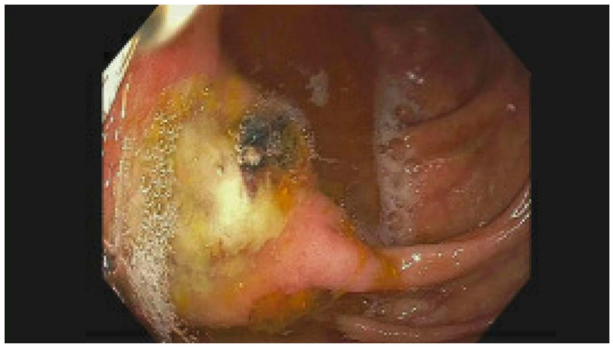
[2250] **Figure 1.** CT Abdomen and Pelvis without contrast, different views showed 7.6 x 5.7 x 5.5 cm poorly marginated gas containing soft tissue mass in the left pelvis suspicious for an abscess.

S2251

A Case of Invasive Colonic Adenocarcinoma in a Patient With *E. faecalis* Bacteremia

Omar Khalil[1], Lara Miranda[1], Daniel Kim[1], Suzanne Elshafey, MD[2], David Wan, MD[3].
[1]Weill Cornell Medical College, Manhattan, NY; [2]New York Presbyterian-Weill Cornell Medical Center, Manhattan, NY; [3]New York-Presbyterian Hospital/Weill Cornell Medicine, New York, NY.

Introduction: Studies have shown that there are increasing incidents of gram-positive bacteremia in cancer patients. The main causal organisms are staphylococci, streptococci, and enterococci. There are multiple factors that contribute to the increasing gram-positive bacteremia and there should be more research in this area to decrease infection burdens on cancer patients.
Case Description/Methods: An 86-year-old man with a history of total aortic valve replacement, septic arthritis and recurrent enterococcus bacteremia presented with fever, chills and right knee pain. He was febrile on presentation with bilateral knee tenderness and swelling on exam. His labs were notable for leukocytosis and normocytic anemia. Blood cultures were drawn and he was empirically started on cefepime and vancomycin. He underwent bilateral knee aspiration and preliminary cultures grew enterococcus faecalis. To workup the source of his infection, a transesophageal echocardiogram was done that noted a mobile mass on the mitral valve. He also underwent a colonoscopy that found a large fungating sessile ulcerated mass in the ascending colon. The mass was biopsied with cold forceps for histology that was positive for invasive adenocarcinoma. The patient was admitted to manage his colon cancer and ultimately underwent a right hemicolectomy (Figure).
Discussion: There is a well-established association between *S. bovis* bacteremia and colon cancer. Appropriately, these patients often undergo a screening colonoscopy as part of their management. On the other hand, patients with *E. faecalis* bacteremia do not undergo this important screening as often because the association with colon cancer is not as well-documented for these patients. This is unfortunate given the increasing incidence of colon cancer associated with gram-positive bacteremia and increasing data blaming E. faecalis for the mutagenesis of colonic cells and progression to colon cancer. Therefore, it is vital to improve the study and documentation of *E. faecalis*-associated colon cancer and update the guidelines so that more patients with *E. faecalis* bacteremia benefit from potentially life-saving colon cancer screening.



[2251] **Figure 1.** Mass observed on colonoscopy.

S2252

A Rare Case of Duodenal Adenocarcinoma Discovered by Cologuard

Shane Quo, DO[1], Mary Parianos, MD[1], Howard Koch, MD[2].
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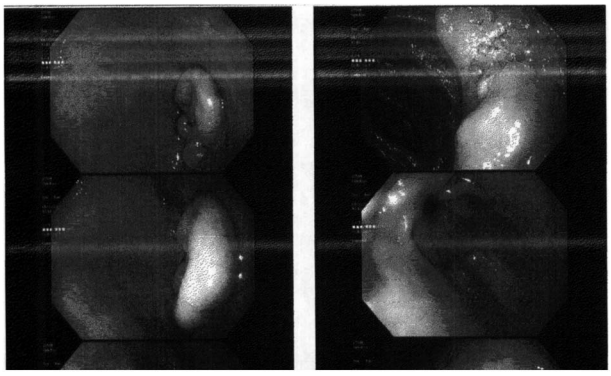
Introduction: Non-invasive colon cancer screening is continuing to become more and more prominent in preventative medicine. According to the American Cancer Society, colorectal cancer is the third leading cause of cancer-related deaths in men and in women, although the death rate continues to decrease due to the increased rate of colon cancer screening. Cologuard has become another tool for decreasing the death rate of colon cancer. However, this statement proves true in a rare case of duodenal adenocarcinoma in a 74-year-old female, which was diagnosed due to a positive Cologuard test.
Case Description/Methods: A 74-year-old woman with past medical history of invasive ductal carcinoma of the right breast and smoking history presents for an annual visitation. Due to her age and previous benign colon cancer screenings, her primary care physician opted for Cologuard for colorectal cancer screening, which returned positive. At this time, the patient complained of mild reflux symptoms, otherwise denied any other symptoms. Due to these symptoms and positive Cologuard, the patient was sent to see a gastroenterologist for evaluation. A colonoscopy and endoscopy due to the patient's symptoms and Cologuard results. Colonoscopy was unremarkable. Endoscopy demonstrated a near circumferential adenomatous lesion in the first portion of the duodenum. Due to the size and extent of the lesion, endoscopic resection was not an option. A biopsy was performed and the pathology evaluation revealed that the duodenal mass was 1.8 cm well differentiated duodenal adenocarcinoma with invasion into the submucosa. The results prompted further imaging and referral to a general surgery for evaluation. General surgery performed a surgical resection of the duodenum with pancreaticoduodenectomy (Figure).
Discussion: There are minimal publications regarding small bowel carcinoma diagnosed due to a positive Cologuard. Our case report hopes to raise awareness of this possibility and inspire further research on the topic. Cologuard is an approved form of colon cancer screening that tests for blood and atypical DNA within stool. Following any abnormal results with this initial screening, it is recommended that the patient undergo a colonoscopy. However, at this time, there is limited published data referencing any benefit with Cologuard towards the finding of duodenal adenocarcinoma. This fact is precisely why this case is unique and raises the possibility for future study of Cologuard's ability to be expanded to detection of carcinoma of the small bowel.



[2252] **Figure 1.** Duodenal Adenocarcinoma on Endoscopy.

S2253

Aggressive Metastatic Adenocarcinoma of Colon in Young Hispanic Female Masquerading as Skull Base Osteomyelitis

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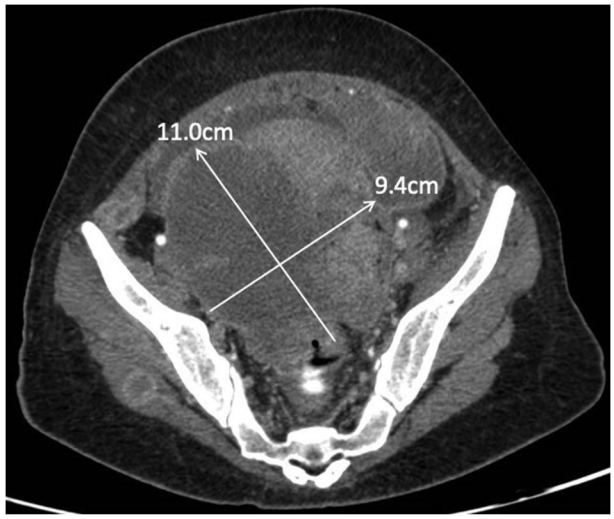
Introduction: Colorectal cancer (CRC) is the third most common cancer in men and women in the United States. Studies suggest that 20% of patients present with metastasis, most commonly to liver and lungs. Few cases have been reported with metastasis to the skull. Statistical data suggest a steady increase in CRC in patients under fifty years of age. We present an atypical presentation of metastatic adenocarcinoma of colon to the base of the skull in a young female patient.
Case Description/Methods: Case of a 36-year-old female patient without medical history who presented with one month history of posterior neck pain radiating to her right ear with associated recurrent otitis refractory to oral antibiotics. There was no family history of CRC and no history of toxic habits. Physical exam with benign abdomen. Digital rectal exam with no abnormalities. Laboratories remarkable for leukocytosis with neutrophilia, thrombocytosis, hypochromic microcytic anemia; elevated alkaline phosphatase, hypoalbuminemia and normal liver function tests. Negative HIV and hepatitis profile. Head and Neck CT scan with asymmetrical nodular fullness in the posterior nasopharynx with extension and invasion of clivus consistent with osteomyelitis of skull base for which patient was started on broad spectrum IV antibiotic therapy. However, patient deteriorated with aphasia, right cranial nerve abducens paresis. Head and neck CT angiography with right cavernous sinus thrombosis requiring full dose anticoagulation. After developing acute right upper quadrant abdominal pain with decreased levels of hemoglobin without any visible bleeding source, abdominopelvic CT was performed and showed a large distal sigmoid peri colonic mass measuring 11cm x 9.4cm (Figure) with disseminated metastatic disease. Brain MRI confirmed clivus metastatic lesion. Liver biopsy confirmed adenocarcinoma of colon. Serologic markers with elevated carcinoembryonic antigen; negative cancer antigen (CA) 19-9 and CA 125. Hospitalization was complicated due to rapidly progressive multiorgan failure for which neither colonoscopy nor chemotherapy were feasible. Supportive comfort care and hospice management were provided.
Discussion: United States statistical data reports an incidence of 12% of CRC among people under 50 years old. In younger population, CRC presents in a clinically advanced and biologically more aggressive disease. Therefore, close attention to alarming and atypical symptoms in this population should warrant low threshold for early colonoscopy screening.



[2253] **Figure 1.** Necrotic heterogenous pericolonic mass in the distal sigmoid measuring 11.0 cm x 9.4 cm.