Original Research Article

Colorectal Cancer Screening: Insights From a National Survey of Patients and Healthcare Providers

Abstract

Offering screening for colorectal cancer (CRC) to all age-appropriate and medically suitable patients is the standard of medical care in the United States. Provider advice is important for patients to accept screening for CRC. Previous research suggests that physicians' self-directed screening practices might influence the screening choices they recommend for their patients. The way physicians discuss CRC screening also might influence what method patients select. This 2-part, web-based survey evaluated (a) whether screening options recommended to the patients of primary care physicians (PCPs), obstetricians, and gynecologists aligned with screening choices they selected for themselves, and (b) provider-patient communication factors that predict patient selection of colonoscopy for CRC screening. Results suggest that PCPs' recommendations to their patients for CRC screening is not correlated with what PCPs select for themselves. PCPs elect to discuss screening options and let the patient choose. The second part of the study showed that from the patient perspective, when multiple CRC screening options are presented, patients are less likely to select colonoscopy even though patients place high value on detection of precancerous polyps for which colonoscopy is the gold standard. Education to address these findings will require a better understanding of patients' decision-making processes. Furthermore, strategies to better align physician-recommended patient CRC screening with what they select as "best practice" for themselves may be needed. However, education could be offered to better inform patients of the benefits and limitations of different CRC screening methods and help clinicians understand their implicit biases that may present in discussions with patients about options for CRC screening.

Introduction

Colorectal cancer (CRC) is the second-most common cause of cancer-related death in the United States.[1] In the most recent data, the annual age-standardized CRC incidence rate was 38.7 per 100,000 persons, whereas the mortality rate was 13.9 per 100,000 persons.[2] The percentage of adults aged 50 to 75 years who were current with CRC screening increased by 1.4% from 2016

to 2018, which means that 4.2 million more adults aged 50 to 75 years were screened for CRC. However, 21.7 million adults aged 50 to 75 years have never been screened for CRC, 81% of whom are 50 to 64 years of age.[3] Screening guidelines offer an array of test options, although the strongest evidence is for colonoscopy or fecal immunohistochemical testing (FIT).[4-9] Unfortunately, CRC screening rates in the United States and Canada range from 50% to 65%, far below the screening rates achieved with other recommendations, such as cervical cancer screening.[10]

Increasing CRC screening to 80% could prevent an estimated 200,000 cancer deaths within 20 years.[11] In addition to preventing cancer deaths, CRC screening is directed at prevention of CRC. Screening colonoscopy allows both detection and removal of precancerous colorectal lesions and therefore is the best strategy for *prevention* of CRC.

Patient preferences are not well incorporated into screening discussions and test decisions, which could contribute to low screening uptake.[12] Although patients and physicians have reported a desire to engage in shared decision-making about CRC prevention, it is unclear whether such shared decision-making actually occurs during clinical visits.[13] A study of 717 primary care physicians (PCPs) and their 147,834 rostered patients due for CRC screening found that while most physicians used strategies to enhance screening participation such as reminders, audit and feedback reports, or designating staff responsible for screening, no single strategy was strongly associated with screening.[14]

Recent research has shown that physicians' preferences for their own CRC screening are associated with greater uptake by their patients.[10] Additionally, physicians are more likely themselves to undergo colonoscopy than other types of tests, such as fecal occult blood testing.[10] Based on this research, one might predict that physicians who undergo colonoscopy are more likely to have their patients undergo CRC screening by colonoscopy, as well.

Although primary care for adults is typically characterized by use of a provider for family medicine or general internal medicine, many women see only their obstetrician-gynecologist (OB-GYN).[15] It is reported that these specialists function as PCPs for nearly half of their patients.[16] The objective of this study was to determine whether the recommendations of PCPs and OB-GYNs for CRC screening aligned with the CRC screening method they selected for

themselves and whether elements of the patient experience with providers around CRC screening were predictive of patients having a colonoscopy performed for CRC screening.

Methods

Research questions included the following: (a) What types of CRC screening are providers recommending to patients? (b) Are providers' recommendations to patients associated with their own CRC screening choices? (c) What types of CRC screening do patients actually receive? (d) What patient and provider-patient communication factors predict patients having a colonoscopy?

Human Subjects

This study was exempt from institutional review board approval because it is not considered human subjects research under 45 *Code of Federal Regulations* Part 46. It does not obtain, use, study, analyze, or generate identifiable private information.[17]

Measures

The authors drafted separate physician and patient survey questionnaires to assess beliefs, approaches, previous care experience, and both understanding and use of CRC screening tests.

Physician Survey

The questionnaire consisted of 10 questions: 5 demographic and 5 CRC screening-focused questions. The first set of CRC screening-focused questions asked that physicians reflect on patient encounters within appointments and report information about discussions, recommendations, and tests ordered. Participants then selected a CRC screening choice for themselves and rated their confidence in the preferred testing method. The survey took respondents approximately 10 minutes to complete. Potential participants were excluded if they were not in the specialties of interest, were not practicing in the United States, or indicated that they do not routinely recommend CRC screening to patients at average risk of CRC.

Patient Survey

The authors developed the patient survey to assess whether physicians' perceptions of interactions with patients—such as recollections about recommendations—were validated by patient reports about CRC screening and to understand factors that may influence which CRC screening method is ultimately selected. There were 20 items in this survey's questionnaire: 8 demographic and 12 CRC screening experience questions. Patients recalled the last doctor's

appointment that included CRC screening discussions. Patients reported information about physician characteristics, conversations about screening, and decision-making. Estimated completion time for this survey was approximately 10 minutes. Potential participants were excluded if they were not at least 50 years of age, not living in the United States, or never had CRC screening recommended.

Procedures

Medscape LLC (New York, New York) collected all physician data between December 2 and December 5, 2019, by targeting a randomized sample of its physician members in primary care and obstetrics-gynecology. Cross-matching between Medscape's membership list and the American Medical Association database ensured that only practicing US physicians qualified for recruitment in the study. This list was then randomized for recruitment. The goal was to include 150 participants, which took 2 campaigns of 1500 emails each. Physicians each received $25 for participating in this study. The survey was closed after reaching the target sample size of 150 or more participants.

The patient survey was conducted by WebMD, May 14-26, 2020, via pop-up from the WebMD page. US residency and a 50-years-of-age minimum were required to qualify. In addition, patients must have had a CRC screening recommended to them previously to participate. Participation was voluntary and not compensated. The goal was to have 200 participants complete the survey, which required 149,607 pop-ups to achieve.

Analytic Plan

Physician Data

To compare differences between physicians' recommendations for patients and self-choices of colonoscopy, 2 variables were created from survey questions. Physician recommendation for patients was assessed from the question, "What do you typically recommend for CRC screening for patients at average risk?" Physician self-choice was assessed from the question, "Which CRC screening you would choose for yourself?" Chi-squared tests [χ^2 = (observed – expected)^2/expected] determined whether differences existed between the proportion of physicians who recommended colonoscopy to patients and the proportion of physicians who would select colonoscopies for themselves. We excluded physicians who selected "discuss

multiple options" as their first choice for approach to patient CRC screening method from this analysis. To support findings of self-choice, a thematic analysis on responses from 1 open-ended question asking physicians to describe why they selected colonoscopies was included.

Patient Data

A multivariate analysis was conducted. The dependent variable in this analysis was defined from the following question: "After discussing with your health care provider, what test did you have done?" A dummy variable from responses to this question was created, and patients who reported receiving a colonoscopy were assigned a "1" (0 = no or all other tests). Independent variables fell within 2 categories: personal behaviors and appointment dynamics. The amount of time since last visit indicated individuals' personal behavior choices related to CRC screening, which was treated as continuous. Appointment dynamic variables consisted of the specialty of physician seen, whether multiple tests were discussed in the appointment, and whether the physician's recommendation was the reason for each patient's last CRC screening method of choice. Responses to questions were recoded into dummy variables.

All models were adjusted for age, gender, ethnicity, insurance status, and family history.[1] First, cross-tabs and correlations explored the data. Then, logistic regression was conducted to predict the odds that a patient received a colonoscopy during their last screening visit. The odds ratios were translated into likelihood estimates for colonoscopy given different appointment dynamics. The authors used SAS 9.4 to perform all data analyses on the patient data.

Results

Sample

The physician sample consisted of 159 physicians; 106 PCPs and 53 OB-GYNs (5% survey response rate) completed the survey. The average age of physicians was 48.13 years (SD, 12.91 [range, 28-82 years]). Physicians averaged 15.93 years of practice (range, 0-49 years), with most physicians (62%) practicing in a group setting.

[1] Race, gender, and family history were dummy coded (0, 1), where White = 1 (non-White = 0), female = 1 (male = 0), privately insured = 1 (public insurance = 0), and family history = 1 (if participants answered yes to the question, "Do you have any family history of colon cancer, with a parent, brother, or sister who was < 60 years of age?").

The patient sample consisted of 238 responders, of whom 233 with complete data were used in analyses. The mean (SD) age of respondents was 68.61 (8.92) years, and the majority of race and gender was White and female (79% and 63%, respectively) (Table 1). [Table 1 near here]

Physicians

Descriptive results indicated that physicians consider the ability to prevent cancer, convenience to patients, and patient requests as the most important factors for determining CRC screening test recommendations for their patients (Table 2). [Table 2 near here] Seventy-nine percent of PCPs chose colonoscopy for themselves, whereas only 48% recommended it to their patients. The difference in the proportion of PCPs who recommend colonoscopy as a first choice for CRC screening compared with what they would select for themselves was statistically significant (χ^2 = 21.975(1); $P < .001$). Most physicians (55%) recommend colonoscopy, with OB-GYNs (68%) more inclined to recommend this type of screening over their PCP counterparts (48%) (Table 3). [Table 3 near here] In the qualitative portion of the survey, many physicians justified choosing colonoscopy because it is viewed as the "gold standard" of CRC testing. Finally, one-third of PCPs report discussing multiple options with patients, an indication of shared decision-making (Table 3). Results from χ^2 tests indicate that PCPs but not OB-GYNs were less likely to recommend colonoscopies for patients than they were to select colonoscopies for themselves (Table 4). [Table 4 near here]

Patients

Participants reported that the average (SD) time since last screening for CRC was 2.56 (1.53) years. On their last visit during which screening was discussed, the majority (75%) saw a PCP, and about a fifth (18%) reported seeing a gastroenterologist. Fifteen percent of patients discussed multiple options with healthcare providers, whereas 85% reported discussing only one CRC screening method with physicians. Moreover, 60% of respondents indicated that the physician's recommendation during this appointment was the reason for the CRC screening method they selected (Table 1).

Results from logistic regression (Table 5) [Table 5 near here] indicated that time from last screening (odds ratio [OR], 1.55; 95% CI, 1.21, 2.10) and provider recommendations (OR, 4.07; 95% CI, 2.17, 8.02) were increased odds that a patient had a colonoscopy as their most recent CRC screening method. Individuals with longer times since their last screening had greater odds

of receiving a colonoscopy as their most recent CRC screening method than patients who reported shorter times since the last screening. More than 50% of participants had CRC screening within the last 2 years (Table 1). Participants whose providers discussed multiple tests with them had significantly lower odds of getting a colonoscopy (OR, 0.12; 95% CI, 0.16, 0.46; Table 5) than patients who only discussed one option with their provider. Moreover, patients who reported that their providers' recommendations were the reason why they selected colonoscopy had higher odds (OR, 4.07; 95% CI, 2.17, 8.02; Table 5) of a colonoscopy than patients who discussed multiple options.

Discussion

Physician-directed recommendation has been one of the best predictors of compliance with specific recommendations for cancer screening.[10] The increased focus on CRC screening during office visits correlated with greater testing in the patients. Also, more patients were likely to undergo the same type of test as their physicians.[10] If patients tend to be more likely to get CRC screening when their physicians have been tested, this may be an opportunity for physicians to increase their participation in CRC screening and possibly motivate their patients to do the same.[14] For example, in one study, uptake of CRC screening by physicians and nonphysicians was 67.9% and 66.6%, respectively.[10] Among patients who never had a screening colonoscopy, 78% reported that they would be willing to undergo the procedure if strongly recommended by their physicians.[18]

The results of the current study showed that physicians universally agreed that effectiveness for prevention of CRC was important for what they would recommend to patients (95% in agreement). In comparison, other factors—lower costs to patients (34%), convenience (52%), patient compliance (69%), request (65%), and longer intervals (62%)—were viewed as less important. This finding seems paradoxical, however, with the physician first choice recommendations. Only 55% of physicians chose colonoscopy, which is clearly the best test for identifying and removing precancerous polyps. Clearly, this finding most appropriately recognizes that the ultimate "goal" of screening is not best directed at CRC detection but rather *prevention*. It is unclear why the OB-GYNs (primary care for many women) more commonly chose colonoscopy as the first recommendation (68% vs 48%). Conceivably, the OB-GYNs have more experience in optimal testing for other screening programs (eg, cervical cancer or breast

cancer screening) and may use more "invasive" screening than x-rays, blood, or stool testing. It is also notable that this disparity between PCPs and OB-GYNs disappeared when they chose colonoscopy as the preferred test for themselves (79% vs 76%). Respectively, there was a significant discrepancy between what PCPs selected for their patients (48% vs 79%; $P < .001$) and a numerical difference for OB-GYNs (68% vs 76%; $P = .36$).

There is evidence that presenting multiple options to patients for CRC screening will improve acceptance. When patients were offered colonoscopy or fecal testing, more patients were willing to comply with CRC screening.[19] However, the data from this study's second survey suggest that of multiple (> 2) options discussed, patients are *less likely* to choose colonoscopy, even though 95% believe that detection of precancerous polyps is an important component of CRC screening. Current best practice recommended is a sequential approach, beginning with colonoscopy, and if that is not accepted, to progressively offer tier-directed options.[7] Notably, how discussions were framed and the specifics for presentation are key variables; these were not standardized and remain key discriminants. It was clear that only 15% of patients discussed multiple CRC screening options with their physician, and only 29% of physicians reported discussing multiple options with patients, letting them decide on the screening option. Recognizably, in the primary care setting, there may be limited time for expanded discussions beyond the primary reason for the visit. Furthermore, there may be multiple competing factors that account for perceived or real-time constraints for the patient visit.[20] There also are increasing demands for medical record documentation, compliance with quality metrics, time constraints, and innumerable other factors that may further limit physician and patient opportunities for other discussions. Therefore, detailed discussions about multiple choices for CRC screening may not be practical. Evidence shows that offering 5 options for CRC did not increase compliance compared with offering only 2 tests.[21]

Although 88% of physicians also prioritized length of screening intervals as moderately, mostly, or very important, the overall first choices for screening seem to be paradoxical, as only 55% recommended colonoscopy. Clearly, the guidelines have recommended colonoscopy and FIT as the primary modalities for CRC screening, reserving the other available tests for patients unwilling or unable to undergo these tests.[8,7] The importance of a high-quality exam and high-quality examiner to justify these extended intervals has been evident.[22] In comparison with stool-based testing, which is recommended annually, or every 3 years if testing for methylated DNA,

the 10-year interval for colonoscopy would more appropriately reflect the reported importance ratings.

Results of this study are most notable for identifying the disparity in what PCPs choose for themselves compared with what they offer their patients. Additionally, findings suggest that patients who have the experience of discussing multiple options for CRC screening is associated with a lower likelihood of patients selecting colonoscopy, even though 95% of patients would like their screening to include detection of precancerous polyps, which is best done via a colonoscopy. These findings suggest education for the following areas: 1) PCP education on best practice in communication with patients about invasive cancer screening procedures; 2) patient education on differences between CRC screening methods and what they detect vs what they do not.

Limitations of this study include the use of a convenience sample in the patient survey; therefore, data represent those who use the internet to find health information at WebMD.com. Furthermore, the data are from physicians and do not include ancillary care providers who make CRC recommendations. These data are not representative of people from all races and ethnicities who are older than 50 years of age.

Strengths of this study are, to our knowledge, that it is the largest report of patients' and PCPs' determinants for CRC screening tests. Clearly, a better understanding of PCP and patient perspectives for choosing colonoscopy is important for best efforts to prevent CRC. More granular perspectives for CRC screening may identify areas for patient and PCP education to enhance effective CRC screening discussions, navigation strategies, and compliance, and, ultimately, prevention of CRC.

Significant disparity was evident between which CRC screening modality PCPs chose for themselves and which screening modality they recommended for patients. This difference was not shown for OB-GYNs. Instead of recommending colonoscopy for patients like they would choose for themselves, PCPs tend to opt for discussing multiple options and letting patients choose for themselves. This strategy, based on patient self-report, is associated with being less likely to get a colonoscopy for CRC screening. Future research should seek to provide greater understanding of how discussing multiple options for CRC screening is associated with patients being less likely to choose colonoscopy despite patient desire for screening to prevent cancer. Are patients who are more likely to ask for this discussion less likely to get colonoscopies, or is

it the PCP who first presents multiple options that leads to the patient being less likely to get a colonoscopy? This understanding will provide insight into how to improve provider-patient communication so that it is clear to the patient that colonoscopy is the best way to detect precancerous polyps.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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Table 1. Patient Characteristics From Patient Survey Respondents

Variable	Mean or percentage
Demographics and personal characteristics	
Age	68.61 years
Race[a]	
White	79%
Black	9%
Other	2%
Sex (female = 1)	63%
Insurance type[b]	
Private	37%
Medicare/Medicaid	56%
No coverage	2%
Personal history of colorectal cancer	1%
Family history of colorectal cancer	22%
Personal behaviors	
Years since last screening	
Less than 12 months ago	27%
1 to 2 years ago	35%
3 to 4 years ago	16%
5 to 6 years ago	11%
7 to 8 years ago	6%
9 to 10 years ago	5%
More than 10 years ago	2%
Appointment dynamics	
Physician seen	
Primary care physician	75%
Gastroenterologist	18%
Discussed multiple options with providers	15%
Provider recommended selected test	60%
Perceived importance of test[c]	
Detection of colon cancer	5%
Detection of precancerous polyps	12%
Detection of both	83%
CRC screening	
Colonoscopy	69%
Cologuard	9%
Virtual colonography	2%
Other test	8%
No Test	12%

[a] In analytical model, White is compared with all others (non-White) because of low variation.

[b] In analytical model, private insurance is compared with both Medicare and those who have no insurance coverage.

[c] In model, detection of both will be compared with other options.

Table 2. Importance of Factors for Physicians' Recommendations for CRC Screening Tests

All physicians (N = 159) Factor	Not important	Slightly important	Moderately important	Mostly important	Very important
Effectiveness in prevention		1%	4%	7%	88%
Lower costs	6%	15%	45%	17%	17%
Convenience to patients	3%	8%	38%	28%	24%
Health system/insurance	9%	9%	27%	26%	28%
Patient compliance	1%	8%	23%	31%	38%
Patient requests	1%	9%	26%	30%	35%
Longer intervals	4%	8%	25%	26%	36%

Table 3. Physicians' First Choice CRC Screening Recommendations

Screening decision	All (N = 159)	PCPs (n = 106)	OB-GYNs (n = 53)
Colonoscopy	55%	48%	68%
CT colonography (virtual colonoscopy)	1%	1%	0%
FIT	9%	11%	2%
FIT-fecal DNA test (Cologuard)	6%	7%	4%
Flexible sigmoidoscopy	0%	0%	0%
Guaiac-based FOBT (eg, Hemoccult)	3%	0%	8%
Discuss pros and cons of tests and let patient decide	28%	33%	17%

Abbreviations: CT, computed tomography; FIT, fecal immunochemical test; FOBT, fecal occult blood test; OB-GYN, obstetrician-gynecologist; PCP, primary care physician

Table 4. Chi-Square Results Comparing Physician Recommendation With Self-Choice Among PCPs and OB-GYNs Who Selected a First-Choice Recommendation for Patients

	PCPs (n = 106)			OB-GYNs (n = 53)		
Screening decision	Patient choice	X^2 *P* value	Self-choice	Patient choice	X^2 *P* value	Self-choice
Colonoscopy	48%	21.975 *P* < .001 df = 1	79%	68%	.841 *P* = .359 df = 1	76%

Abbreviations: df, degrees of freedom; FOBT, fecal occult blood test; OB-GYN, obstetrician-gynecologist; PCP, primary care physician

Table 5. Logistic Regression Results for Colonoscopy as Last CRC Screening Method for Patients

	Odds ratio (CI)	
	Model 1	Model 2
Personal behaviors		
Time since last screen (years)	1.45** (1.15, 1.84)	1.55** (1.21, 2.10)
Appointment dynamics		
Specialists: PCPs		1.94 (.61, 6.37)
Specialists: Gastroenterologists		2.62 (.66, 10.48)
Multiple tests discussed		.12*** (.16,.46)
Provider recommended colonoscopy		4.07*** (2.17, 8.02)
Patient desire for detection of precancerous polyps[a]		1.09 (.49, 2.98)

Note. All models have been adjusted for race (White), sex (female = 1), age, insurance status, and family history. Across both models, odds ratios were not significant for each of these covariates.

Abbreviations: CI, confidence interval; PCP, primary care physician

[a]Chose detection of precancerous polyps or detection of polyps and cancer

** < .01.

*** < .001.