

Physicians' Colorectal Cancer Screening Discussion and Recommendation Patterns

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Abstract

Background: Primary care physician (PCP) actions are pivotal to colorectal cancer (CRC) screening performance, and guidelines recommend discussion with patients about test options and potential benefits and harms. This article profiles patterns of discussion about and recommendations for screening and explores potential associations with multilevel factors (patient, clinician, practice, and environment).

Methods: In 2009, we analyzed data from 1,266 physicians responding to the 2006–2007 National Survey of Primary Care Physicians' Recommendations and Practices for Breast, Cervical, Colorectal, and Lung Cancer Screening (absolute response rate = 69.3%; cooperation rate = 75.0%). Descriptive statistics examined physicians' reports of discussion and recommendations. Multivariate analyses assessed the associations of these practices with multilevel factors.

Results: Although few respondents reported discussion of all options, 46% usually discuss more than one option; the vast majority of these respondents discuss fecal occult blood testing (FOBT) and colonoscopy (49%) or FOBT, sigmoidoscopy, and colonoscopy (32%). Of physicians who discuss more than one option, a majority reported usually recommending one or more test options, most commonly colonoscopy alone (43%) and FOBT and colonoscopy (43%). Several personal characteristics (specialty), perceived patient characteristics (prefer physician to decide), practice characteristics (geographic location), and community barriers (specialist availability) were independently associated with discussion and/or recommendation patterns.

Conclusions: PCPs do not discuss the full menu of test options, but many report selecting one or two options for discussion and recommendation. To ensure that patients' perspectives and concerns are elicited and considered, patient decision-making approaches should be considered.

Impact: Attention to informed decision making in CRC screening will be important for enhancing patient-centered quality care. *Cancer Epidemiol Biomarkers Prev*; 20(3); 509–21. ©2011 AACR.

Introduction and Background

Evidence concerning the efficacy of screening is clear for colorectal cancer (CRC), the third most common cancer in men and women in the United States and the second leading cause of cancer death (1). The natural history of CRC provides opportunity not only for early detection but also for prevention by removing adenomas. (2, 3) However, despite demonstrated mortality and morbidity benefits, CRC screening rates are modest (4),

particularly compared with other cancer screening and preventive services (5).

The pivotal role of the primary care physician (PCP) in increasing screening prevalence is well established (6). Guidelines from numerous organizations endorse several tests as efficacious for CRC screening, including home fecal occult blood testing (FOBT), flexible sigmoidoscopy, colonoscopy, and double-contrast barium enema (DCBE) (7). These guidelines state that the choice of test should be based on patient preferences and adherence, medical contraindication, and available resources. Adherence to guidelines would therefore require discussion between physicians and patients about a menu of screening options; discussion topics should include patients' preferences and potential benefits, harms, and limitations of test options (8). Both the likelihood of a discussion of multiple options taking place and the nature of physicians' recommendation may reflect characteristics of the physician and the patient, such as communication skills (9, 10), and factors at other levels including the presence of an enabling policy and practice environment (11, 12) and community resources.

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The purpose of this study was to assess the extent to which PCPs follow guidelines concerning communication about CRC screening test options. Our questions were as follows: (a) Do PCPs report that they discuss the recommended test options for screening, and, if so, which ones? and (b) Do PCPs report that they make specific recommendations, and, if so, which test(s) do they recommend? To better understand what factors are associated with these communication patterns, we also explored PCPs' personal characteristics, their perceptions of patient preferences and barriers, practice characteristics and barriers, and reported community influences. Klabunde and colleagues have reported on PCPs' test-specific recommendations (routine, starting age, periodicity, and stopping age) for screening using data from the 2006–2007 National Survey of PCPs' Recommendations and Practices for Cancer Screening (13, 14). We used additional data from this survey to investigate PCPs' CRC screening discussion and recommendation patterns with patients.

Methods

Study participants

A nationally representative sample of PCPs was recruited to participate in a survey between September 2006 and May 2007. Eligible physicians included office-based family physicians, general internists, general practitioners, and obstetrician/gynecologists (OB/GYNs) aged 75 or younger. A sample of 2,576 PCPs was selected from the American Medical Association's Physician Masterfile, using the 4 specialty types as sampling strata. Prior to selection, the sampling frame database was sorted by age, gender, U.S. Census region, and urban–rural practice location within each of the strata. Survey instrumentation and detailed sampling strategy are discussed elsewhere (13).

Data collection

In September 2006, a total of 1,975 PCPs (family and general medicine, internal medicine, and OB/GYNs) were sent a questionnaire on CRC and lung cancer screening via express mail. As recommended by survey methodologists (15), multiple methods were used to encourage participation. These included letters of endorsement from national physician organizations, a \$50 honorarium check, postage-paid return envelopes, 2 additional survey mailings, up to 3 follow-up telephone reminders to nonrespondents to the repeated mailings, and the option to complete the survey by phone. Further methodologic details have been published elsewhere (14). All data in the current study were reported by the participating physicians.

Study measures

The dependent measures of interest concerned physicians' reports about *CRC screening test discussion and recommendations* with asymptomatic, average-risk patients

during the past 12 months. The 4 measures were as follows: (a) frequency of presenting more than one testing option (never, rarely, sometimes, and usually); (b) which test(s) was discussed (check *all* that apply—FOBT, sigmoidoscopy, colonoscopy, and others); (c) frequency of recommending any one particular test or combination of tests (never, rarely, sometimes, and usually); and (d) which test(s) was recommended (check *one*—FOBT, sigmoidoscopy, colonoscopy, FOBT and sigmoidoscopy, FOBT and colonoscopy, and other).

Numerous studies have illustrated that patient, provider, practice, and health system factors affect physician and patient behaviors associated with cancer screening (12, 16, 17). In view of this evidence, we assessed the relationship of selected multilevel factors with the communication-dependent measures. These measures included factors at the level of the individual physician, practice context and community, and physician reports of patients' preferences and barriers.

Individual physician characteristic measures included demographics of specialty, age, gender, race, board certification, international medical degree, and medical school affiliation. The survey inquired about *physicians' perceptions of patient preferences and barriers*. They were asked how frequently (never, rarely, sometimes, or usually) they encountered patient-related barriers to screening (resistance to discussion, difficulty understanding, and lack of adherence). They were also asked about the frequency with which their patients asked them to decide which test to have. Finally, PCPs reported on how influenced they were by patient preferences when making recommendations (very influenced, somewhat influenced, or not influenced).

Practice context measures included size, type (single or multispecialty), and geographic location (urban, large rural city/town, and small/isolated rural town). The survey asked about the practice's panel of patients, including the percentage of uninsured patients and the number seen in a typical week. Practice systems support measures included whether guidelines had been implemented; presence of a nurse practitioner and/or physician assistant in the practice; whether CRC screening reminders were provided to the physician and/or patients; and type of medical records (paper, in transition, or electronic). They also were asked about the frequency with which a practice barrier, time constraints, affected screening discussion (never, rarely, sometimes, or never).

Physicians reported on 2 *community level factors*: how frequently a shortage of trained providers in the geographic area for screening other than FOBT was a barrier; and how often a shortage of trained endoscopists in the geographic area was a barrier to follow-up of positive screening tests (never, rarely, sometimes, or usually).

Data analyses

We used descriptive statistics to examine the following: (a) the distribution of multilevel factors potentially

associated with physicians' communication about CRC screening with their asymptomatic, average-risk patients (Tables 1 and 2); and (b) physicians' communication patterns about CRC screening with asymptomatic, average-risk patients (Table 3).

Furthermore, we used χ^2 statistics to assess the bivariate associations of these variables with the dependent measures. Variables with an association at $P < 0.10$ were retained for inclusion in multivariate models. We estimated 2 models: The first was a bivariate logistic regression model to assess factors associated with physicians' frequency of presenting more than one test option. We were specifically interested in identifying factors that differentiated physicians who never or rarely discussed multiple screening options from those who sometimes or usually presented multiple options to their patients (Table 4). A second bivariate logistic regression model was estimated for the specific test or test combination recommended. The recommended test(s) was categorized into FOBT and colonoscopy/colonoscopy only, compared with other tests or test combinations (Table 5).

We used the statistical program SUDAAN (version 9.1) to account for the complex survey design and to incorporate survey weights in order to obtain national estimates. The analyses were conducted in 2009.

Results

This analysis included responses from 1,266 PCPs, representing an absolute response rate of 69.3%. The cooperation rate (excluding physicians lacking valid contact information) was 75.0%. As reported in Table 1, a majority of participants were board certified U.S. graduates without a medical school affiliation.

As also shown in Table 1, 26% and 53% of physicians reported that patient preferences were very or somewhat influential in their CRC screening recommendations; 51% reported that their patients usually wanted them to decide which test to have. With respect to patient-centered barriers, physicians reported as usually or sometimes a barrier: patient unwillingness to discuss CRC screening (39%), patients' difficulty in understanding CRC information (24%), and lack of patient follow-through to complete screening (81%).

With respect to characteristics of respondents' primary practice sites, the majority sites were located in urban areas and in solo or small-group, single specialty practices (Table 2). A small proportion (6%) reported that more than 25% of their patients were uninsured. With respect to practice supports, 62% reported that CRC screening guidelines were implemented, 30% reported practice-based physician reminders for CRC screening, and 15% reported patient reminders. With respect to type of medical records, 56% reported paper records, 18% reported full electronic records, and 26% reported that records were partially electronic or in transition to full electronic records. Forty percent reported that lack of

time for discussion of CRC screening was usually or sometimes a problem.

Concerning community factors, although a majority reported never or rarely having a problem with availability of specialists in their geographic area, a meaningful proportion (up to 25%) reported that they sometimes or usually had problems.

Physician reports of CRC screening discussion and recommendation

The national guidelines in place at the time of the survey specified 4 different tests as acceptable screening options (FOBT, sigmoidoscopy, colonoscopy, and DCBE) (18–20). Communication behavior measures associated with physicians' discussion and recommendation of the CRC screening options are reported in Table 3. With respect to frequency of discussing more than one CRC testing option, 46% reported they usually did so, 28% reported sometimes, 17% rarely, and 9% reported they never discussed more than one option. Virtually none discussed all options. Of those who did discuss more than one option, 49% reported discussing FOBT and colonoscopy; 32% reported discussing FOBT, sigmoidoscopy, and colonoscopy. With respect to recommendation, a large majority of those who discussed more than one option (74%) reported that they usually recommended one or more test or combination of tests over other tests; 43% recommended colonoscopy over others and 43% recommended FOBT and colonoscopy over others, but few recommended all options.

Factors associated with physicians' CRC screening discussion and recommendation

As reported in Table 4, several physician-level factors were associated with the likelihood of usually or sometimes discussing more than one option. Family medicine physicians were more likely to usually/sometimes discuss more than one test option than general internists. PCPs who graduated from U.S. medical schools were less likely than international medical school graduates to usually or sometimes discuss multiple test options. On the other hand, PCPs who said that patient preferences were very or somewhat influential in their CRC screening recommendations and those who reported that they were sometimes asked by their patients to decide which tests to have were more likely to usually or sometimes discuss multiple test options. PCPs who reported that their patients rarely, sometimes, or usually had difficulty understanding CRC information were more likely to report that they usually/sometimes discussed more than one option than those who reported that their patients never had difficulty. PCPs practicing in small rural towns compared to PCPs in urban areas, and PCPs who reported CRC guidelines being implemented in their practices, were more likely to usually/sometimes discuss more than one test option. PCPs who reported that a shortage of trained specialists in the practice's geographic area for screening was usually/sometimes a barrier were

Table 1. Physician characteristics and perceptions of patient preferences and barriers ($n = 1,266$)

Characteristic	Unweighted <i>n</i>	Weighted %
Physician specialty		
Family medicine/general practice	547	45.2
General internal medicine	415	36.9
OB/GYN	304	17.9
Age		
<40	251	20.1
40–49	385	30.7
50–59	398	31.9
≥60	232	17.4
Gender		
Female	400	31.2
Male	866	68.8
Race		
Non-Hispanic white	925	72.1
Non-Hispanic black	46	3.9
Hispanic	66	5.5
Asian	184	14.7
Other ^a	45	3.8
Board certified		
Yes	999	80.2
No	267	19.8
International medical school graduate		
Yes	265	21.7
No	1,001	78.3
Affiliation with medical school		
Yes	441	35.1
No	818	64.3
Missing	7	0.5
Influence of patient preferences on recommendations		
Very	323	26.3
Somewhat	659	52.5
None	264	19.8
NA/missing	20	1.4
Frequency patients request to have MD decide which test they should have?		
Never	50	3.7
Rarely	142	10.5
Sometimes	430	34.2
Usually	636	51.0
Missing	8	0.6
Frequency patients do not want to discuss screening		
Never	180	13.4
Rarely	585	47.2
Sometimes	445	35.2
Usually	47	3.5
Missing	9	0.7
Frequency patients have difficulty understanding CRC information		
Never	185	14.4
Rarely	764	60.4
Sometimes	290	23.1
Usually	14	1.2
Missing	13	0.9
Frequency that patients' lack of adherence to complete CRC screening tests is a barrier		
Never	8	0.6
Rarely	214	17.8
Sometimes	953	74.8
Usually	79	6.0
Missing	12	0.8

^aAmerican Indian/Alaska Native, Native Hawaiian/other Pacific Islander, multiple races, other race, and unknown.

Table 2. Physicians' practice and community-level factors

Characteristic	Unweighted <i>n</i>	Weighted %
Geographic location		
Urban ^a	1,032	81.8
Large rural city/town ^b	133	10.2
Small/isolated rural town ^c	101	8.0
Practice size		
Solo	328	26.0
2–5	511	40.7
6–15	274	21.4
≥16	145	11.2
Missing	8	0.7
Practice type		
Single specialty	916	72.1
Multispecialty	300	24.1
Other/missing	50	3.8
Primary practice arrangement		
Full/part owner of practice	702	54.8
Employee, physician-owned practice	125	9.7
Employee, large medical group, HMO, or health care system	197	16.5
Employee, university hospital/clinic	76	5.6
Employee, other hospital/clinic	130	10.5
Other/missing	36	2.9
Patients seen in typical week ^d		
≤50	217	17.0
51–75	224	17.3
76–100	404	31.9
101–125	245	20.0
≥126	154	12.2
Missing	22	1.6
Percentage of patients uninsured ^d		
0%–5%	759	60.3
6%–25%	366	28.8
>26%	82	6.4
Don't know/missing	59	4.5
Guidelines implemented in practice		
Yes	763	61.5
≥1 NP or PA in practice ^d		
Yes	669	52.1
Reminders to physician ^d		
Yes	363	30.0
Reminders to patients ^d		
Yes	186	15.1
Type of medical record ^d		
Paper	709	55.7
Partial/in transition to electronic	329	25.8
Full electronic	218	17.7
Missing	10	0.8
Frequency of lack of time to discuss CRC screening is a barrier		
Never	311	24.4
Rarely	445	34.8

(Continued on the following page)

Table 2. Physicians' practice and community-level factors (Cont'd)

Characteristic	Unweighted <i>n</i>	Weighted %
Sometimes	440	34.8
Usually	60	5.16
Missing	10	0.8
Frequency that shortage of trained providers in geographic area for screening other than FOBT is a barrier		
Never	828	65.8
Rarely	290	22.4
Sometimes	106	8.7
Usually	28	2.1
Missing	14	1.0
Frequency that shortage of trained providers in geographic area for follow-up of positive screening tests with invasive endoscopic procedures is a barrier		
Never	541	42.5
Rarely	395	30.9
Sometimes	171	14.2
Usually	138	11.0
Missing	21	1.4

Abbreviations: HMO, health maintenance organization; NP, nurse practitioner; PA, physician assistant.

^aRural Urban Commuting Area (RUCA) 2 codes 1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 7.1.

^bRUCA2 codes 4.0, 4.2, 5.0, 5.2, 6.0.

^cRUCA2 codes 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 9.0, 9.1, 10.0, 10.2, 10.4, 10.5, 10.6.

^dIn main practice location.

more likely to report usually or sometimes discussing more than one test option.

Table 5 reports findings of the models investigating measures associated with various patterns of test recommendation. Several PCP characteristics were associated with which test(s) was recommended. PCPs of race other than non-Hispanic white and Asian were less likely to report recommending FOBT + colonoscopy/colonoscopy only than those recommending other test or test combinations, as were those PCPs not affiliated with medical schools. Those not affiliated with medical schools were less likely to report FOBT and colonoscopy or colonoscopy only than those reporting all other recommendations.

PCPs who reported that patients usually/sometimes had difficulty understanding CRC information were less likely to recommend FOBT + colonoscopy or colonoscopy only than those recommending other tests or test combinations. PCPs who reported that their patients usually want them to decide on the test were significantly more likely to report recommending FOBT + colonoscopy or colonoscopy alone than those recommending other tests or test combinations.

PCPs from multispecialty practices were less likely to recommend FOBT + colonoscopy/colonoscopy only over other tests than those from single specialty practices. PCPs reporting that a shortage of trained providers for screening other than FOBT or for follow-up of positive screening tests was sometimes/usually a barrier were

less likely to report recommendation of FOBT + colonoscopy/colonoscopy only than those recommending other tests or test combinations.

Discussion and Implications

Findings from this nationally representative survey of PCPs suggest that the discussions most U.S. PCPs have with their average-risk patients about CRC screening test options are limited. Self-reported discussion of options does not, of course, equate with informed decision making, as recommended by guidelines. However, discussing alternatives is a necessary component of that process (21). Regardless of whether these discussions rise to the level of informed decision making, the recommendations reported by survey participants provide additional evidence of the dramatic increase in recommendations for and use of colonoscopy (22–24).

Findings also indicate that individual factors as well as practice and community factors are associated with PCPs' discussion and recommendation patterns, as has been identified, albeit inconsistently, in previous studies and reviews (17, 25–27). The findings suggest that socialization of specialties and organizational norms may be associated with CRC recommendations. In addition, characteristics of the practice setting may enable or hinder physician behaviors (16), as does access to specialists in the community (27).

Table 3. Physician reports of CRC screening discussion and recommendations with asymptomatic, average-risk patients

	Unweighted <i>n</i>	Weighted %
How often do you present >1 testing option? (<i>n</i> = 1,266)		
Never	117	8.9
Rarely	214	16.7
Sometimes	348	27.5
Usually	578	46.3
Missing	9	0.7
Which test(s) did you discuss? (<i>n</i> = 1,149) ^a		
FOBT only	12	1.1
Sigmoidoscopy only	3	0.3
Colonoscopy only	81	7.3
FOBT and colonoscopy	567	48.7
FOBT, sigmoidoscopy, and colonoscopy	366	32.2
Sigmoidoscopy and colonoscopy	44	3.5
Other combinations ^b	61	5.7
None of the tests or missing	15	1.3
How often did you recommend one test or combination of tests over others? (<i>n</i> = 1,149) ^a		
Never or rarely	88	7.2
Sometimes	222	18.7
Usually	834	73.7
Missing	5	0.4
Which test(s) did you recommend over others? (<i>n</i> = 1,126) ^c		
Colonoscopy	484	43.3
FOBT and colonoscopy	483	42.7
Other combinations ^d	143	12.7
Missing	16	1.2

^aA total of 117 respondents who "never" present >1 testing option in measure here are excluded from the rest of the table.

^bOther combinations: FOBT and sigmoidoscopy (*n* = 22); FOBT, sigmoidoscopy, colonoscopy, and other (*n* = 16); FOBT, colonoscopy, and other (*n* = 18); sigmoidoscopy, colonoscopy, and other (*n* = 1); colonoscopy and other (*n* = 2); other only (*n* = 2).

^cExcluded 23 respondents who "never" recommend one test over others. Categories used in regression models in Table 5. Missings excluded in the models.

^dOther combinations: FOBT/sigmoidoscopy, FOBT only, sigmoidoscopy only, and other specified in text.

The associations of perceptions of less access to specialty care and increased discussion are difficult to interpret cross-sectionally. Patients should benefit to the extent that reduced access would increase discussion. More discussion should increase consideration of patients' preferences and presumably increase adherence. However, to the extent that less access reduces follow-up of abnormal tests and reduces patients' range of available test options—limiting preference-based testing—both adherence and quality of care may be negatively affected (28).

Interestingly, a large proportion of physicians reported that patient preferences were influential in their CRC screening discussion but not with the type of test recommended. Likewise, PCPs' reports of patients wanting the physician to decide which test to have were associated with discussion of multiple tests but not with the type of test recommended. This may reflect a growing norm in

the medical profession that views colonoscopy as the test of choice. Given the cross-sectional nature of the study, however, the directionality of the association cannot be clear. That is, a physician could outline several testing options, leading the patient to ask the physician for his or her recommendation, resulting in the physician recommending fewer options.

Indeed, a growing literature supports discussion and the related goal of shared and informed decision making in general. As noted, detailed investigation of elements of a decision-making process was not undertaken in this study. For example, a PCP's report of having discussed multiple modalities does not equate with elements of decision-making processes and does not mean that patients were even offered a choice. Recent qualitative work by McQueen and colleagues (29) showed that physicians' communication processes generally precluded discussion of patients' test preferences and did

Table 4. Multiple logistic regression model and associated measures with frequency of presenting more than one test option

	Usually/sometimes vs. rarely/never, OR (95% CI)	P
Specialty		
General internal medicine	1.0 (1.0–1.0)	0.0016
Family medicine/general practice	1.5 (1.1–2.1)	
OB/GYN	0.8 (0.6–1.1)	
International medical school graduate		
Yes	1.0 (1.0–1.0)	0.0002
No	0.5 (0.4–0.7)	
Influence of patient preferences on recommendation		
Not influenced	1.0 (1.0–1.0)	<0.0001
Somewhat	2.2 (1.6–2.9)	
Very	3.3 (2.2–4.8)	
How often patients want physician to decide test		
Never/rarely	1.0 (1.0–1.0)	<0.0001
Sometimes	3.0 (2.0–4.6)	
Usually	1.2 (0.8–1.7)	
Patients' difficulty understanding CRC information is a barrier		
Never	1.0 (1.0–1.0)	0.0018
Rarely	1.5 (1.1–2.2)	
Sometimes/usually	2.3 (1.5–3.5)	
Geographic location of practice		
Urban	1.0 (1.0–1.0)	0.0043
Large rural city/town	1.7 (1.0–3.0)	
Small isolated rural town	2.3 (1.3–3.9)	
Guidelines implemented in practice		
No	1.0 (1.0–1.0)	0.0108
Yes	1.4 (1.1–1.9)	
Frequency of not having time to discuss screening is a barrier		
Never	1.0 (1.0–1.0)	0.1417
Rarely	1.1 (0.8–1.6)	
Sometimes/usually	1.4 (1.0–2.0)	
Medical records		
Paper	1.0 (1.0–1.0)	0.2848
Partial/in transition to electronic	0.8 (0.6–1.1)	
Full electronic	0.9 (0.6–1.3)	
Shortage of trained providers in geographic area for screening other than FOBT is a barrier		
Never	1.0 (1.0–1.0)	0.0428
Rarely	1.0 (0.7–1.4)	
Sometimes/usually	1.9 (1.2–3.3)	

not facilitate shared decision making. These investigators further observed that physicians consistently recommended CRC screening but focused on colonoscopy. Another issue is that shared decision making can be viewed inconsistently by patients and their physicians (30). Ideally, physicians will become more adept at promoting discussion, including presenting options, so that patients are aware that choices can be made. A more supportive system of health care is needed to bolster efforts by physicians to increase interaction with patients (31).

The nuances, dynamics, and influences involved in patient–physician communication and personalized screening are indeed complex (32–35). Because recent work (36–38) has shown that taking patient preferences into account when recommending CRC screening may have a substantial, positive effect on adherence, the processes of patient-centered decision making are worthy of more investigation. Data from several sources suggest that varying the content of the discussions, frequently guided by the use of tools such as decision aids, can affect both screening rates and patients' satisfaction with the

Table 5. Multiple logistic regression models and associated measures with test or test combination recommendation over others

	FOBT + colonoscopy/colonoscopy only compared with other	P
Specialty		
General internal medicine	1.0 (1.0–1.0)	0.5418
Family medicine/general practice	0.8 (0.6–1.2)	
OB/GYN	0.8 (0.5–1.3)	
Race		
Non-Hispanic white	1.0 (1.0–1.0)	0.0267
Asian	0.7 (0.5–1.4)	
Other	0.5 (0.3–0.9)	
Board certified		
Yes	1.0 (1.0–1.0)	0.2030
No	0.7 (0.5–1.2)	
International graduate		
Yes	1.0 (1.0–1.0)	0.4895
No	0.9 (0.6–1.3)	
Affiliated with medical school		
Yes	1.0 (1.0–1.0)	0.0118
No	0.6 (0.4–0.9)	
How often patients want physician to decide test		
Never/rarely	1.0 (1.0–1.0)	0.0057
Sometimes	1.2 (0.7–1.9)	
Usually	1.9 (1.2–3.1)	
Patients' difficulty understanding CRC information is a barrier		
Never	1.0 (1.0–1.0)	<0.0001
Rarely	0.5 (0.3–1.1)	
Sometimes/usually	0.2 (0.1–0.4)	
Practice size		
Solo	1.0 (1.0–1.0)	0.0188
2–5 MDs	1.5 (0.9–2.5)	
6–15 MDs	0.8 (0.5–1.3)	
≥16 MDs	0.6 (0.3–1.1)	
Practice type		
Single	1.0 (1.0–1.0)	0.0157
Multispecialty	0.6 (0.4–0.9)	
Primary practice arrangement		
Full/part owner	1.0 (1.0–1.0)	0.0528
Other	0.7 (0.5–1.0)	
≥1 NP or PA in practice		
No	1.0 (1.0–1.0)	0.1609
Yes	0.8 (0.5–1.1)	
Reminders to physician		
No	1.0 (1.0–1.0)	0.0990
Yes	0.8 (0.6–1.1)	
Lack of time to discuss screening is a barrier		
Never	1.0 (1.0–1.0)	0.0164
Rarely	1.2 (0.7–1.9)	
Sometimes/usually	0.6 (0.4–1.0)	
Shortage of trained providers in geographic area for screening tests other than FOBT is a barrier		
Never	1.0 (1.0–1.0)	<0.0001
Rarely	0.7 (0.5–1.1)	

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Table 5. Multiple logistic regression models and associated measures with test or test combination recommendation over others (Cont'd)

	FOBT + colonoscopy/colonoscopy only compared with other	P
Sometimes/usually	0.3 (0.2–0.5)	
Shortage of trained providers in geographic area for follow-up of positive screening tests with invasive endoscopic procedures is a barrier		
Never	1.0 (1.0–1.0)	<0.0001
Rarely	0.9 (0.5–1.5)	
Sometimes	0.4 (0.3–0.7)	
Usually	0.3 (0.2–0.5)	
Medical records		
Paper	1.0 (1.0–1.0)	0.7920
Partial/in transition to electronic	0.9 (0.6–1.4)	
Full electronic	0.9 (0.5–1.4)	

Abbreviations: NP, nurse practitioner; PA, physician assistant.

^aOther combinations as the reference group. "Other" includes FOBT and sigmoidoscopy, FOBT only, sigmoidoscopy only, and "other-specified."

decision process. For example, discussing out-of-pocket costs of CRC screening options may reduce uptake of colonoscopy (39). A decision aid that included explicit reference to the option of not screening (40) was found to be less clear to patients and received a lower overall satisfaction rating, but it did not affect interest in screening.

What to discuss is both a practical and an ethical question. The guidelines recommend describing the full menu for ethical reasons, perhaps both to stress their equivalence for preventing and detecting colon cancer and to give patients the chance to match their preferences and values to the test options. However, in previous studies, physicians frequently limited discussion for practical reasons such as time. Also, some patients might not prefer extensive discussion. Lafata and colleagues (41) found the likelihood of CRC screening was lower among those patients whose physicians offered a choice among options. How best to reduce the complexity of these discussions is an open empirical question; any reduction has implications for patients' decision making and screening uptake. More work is needed to guide physicians in assessing and responding to these preferences in everyday clinical practice. Because screening prevalence is lower in minority and lower educated groups (42), attention to discussion and recommendation among these groups should be a particular priority.

CRC screening test options are clearly more complex than the test options for other cancers, and guidelines are frequently modified (43). For example, since the conduct of this survey, new American Cancer Society (ACS) guidelines have expanded the menu of CRC screening options (3, 44) to include computed tomographic colonography and fecal DNA testing whereas the U.S. Preventive Services Task Force (USPSTF) has dropped DCBE

from its most recent recommendations (7). The current ACS guideline also opines that the primary goal of screening should be prevention (3), that is, removal of polyps. An interpretation of this guideline may be that colonoscopy is the "gold standard" in CRC screening. If so, the call for discussion of all test options is likely to be debated. However, recent results from a U.K. trial may reenergize the debate about flexible sigmoidoscopy (45). To our knowledge, there is no trial of the efficacy of presenting all options in increasing adherence, nor of the extent to which such a full presentation would affect patient satisfaction with decision making. The call for discussion of multiple options also presents a dilemma for physicians who must confront the constraints of patients' insurance coverage or substantial out-of-pocket costs when considering an expensive test such as colonoscopy. It should be noted, however, that under health policy reform, insurers will be required to cover the cost of USPSTF-recommended CRC screening tests, with no patient copays imposed (46). At minimum, options apparently need to be discussed to the extent that selection among them should be influenced by patients' opinions about safety, convenience, efficacy, and cost (6).

The authors acknowledge several limitations of the study. The design is cross-sectional, which must be considered when interpreting results. Although the response rate was high, relatively few respondents were from rural areas. Geographic variation in PCPs' recommendations may exist because of issues such as endoscopic availability or community socioeconomic status (47). In addition, study data are based on self-report and were not validated (48). Some items, such as reporting respect for patient preferences, may be prone to social desirability bias. Records and claims data, however, are also subject to validity and reliability limitations (49). As

introduced earlier, the authors further acknowledge that we asked only a global measure of what options PCPs discuss with their patients and did not assess the depth/ extensiveness/clarity of the discussion, including whether the harms and benefits of each test were discussed and whether patients had a clear understanding of the discussion. However, given that a discussion of available options is an important initial step in an informed decision-making process, our study provides important population-based insights that suggest that the quality of current decision-making-related CRC screening is likely to be suboptimal for many patients. Finally, for PCPs who recommend more than one test option, the precise patterns of use of the modalities (e.g., FOBT or colonoscopy vs. FOBT and colonoscopy) are unknown. They could be discussing both as options but ultimately only recommend one for their patients.

The high response rate and national representativeness, however, make these findings important and present opportunities and challenges for public health and health services research and practice. Complicated guidelines heighten the need for implementing evidence-based medicine and shared decision making in practice (50, 51). Involving the health care team and using information technology supports may be important strategies for improving communication (52, 53). Other patient-directed strategies have been reported (54–56), and the changing population profile in the United States, with increasing racial and ethnic minority populations (57) and the growing proportion of elders (58), will require enhanced patient-directed strategies. These strategies may include targeted health communication messages

and innovative, individualized approaches to screening. In addition, because multilevel factors have been found to be associated with screening discussion and recommendation, such interventions should be a priority for evaluation (59). Indeed, growing interest in policy initiatives such as patient-centered medical homes (60, 61), development of accountable care organizations (62) and meaningful use criteria (63), and the promotion of electronic medical records reinforce the need to test strategies aimed at multiple levels. Increasing CRC screening prevalence will require testing and disseminating multiple strategies (59, 64, 65) to improve quality of care and outcomes (12, 65).

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed. The findings and conclusions in this report are those of the authors and do not necessarily represent the views or official position of the National Cancer Institute, the Agency for Healthcare Research and Quality, or the Centers for Disease Control and Prevention.

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