Barriers of and Facilitators to Physician Recommendation of Colorectal Cancer Screening

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BACKGROUND: Colorectal cancer screening (CRCS) has been demonstrated to be effective and is consistently recommended by clinical practice guidelines. However, only slightly over half of all Americans have ever been screened. Patients cite physician recommendation as the most important motivator of screening. This study explored the barriers of and facilitators to physician recommendation of CRCS.

METHODS: A 3-component qualitative study to explore the barriers of and facilitators to physician recommendation of CRCS: in-depth, semistructured interviews with 29 purposively sampled, community- and academic-based primary care physicians; chart-stimulated recall, a technique that utilizes patient charts to probe physician recall and provide context about the barriers of and facilitators to physician recommendation of CRCS during actual clinic encounters; and focus groups with 18 academic primary care physicians. Grounded theory techniques of analysis were used.

RESULTS: All the participating physicians were aware of and recommended CRCS. The overwhelmingly preferred test was colonoscopy. Barriers of physician recommendation of CRCS included patient comorbidities, prior patient refusal of screening, physician forgetfulness, acute care visits, lack of time, and lack of reminder systems and test tracking systems. Facilitators to physician recommendation of CRCS included patient request, patient age 50–59, physician positive attitudes about CRCS, physician prioritization of screening, visits devoted to preventive health, reminders, and incentives.

CONCLUSION: There are multiple physician, patient, and system barriers to recommending CRCS. Thus, interven-

tions may need to target barriers at multiple levels to successfully increase physician recommendation of CRCS.

KEY WORDS: physician practice patterns; colorectal cancer screening; mass screening; physician-patient relation; communication barriers.

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BACKGROUND

Colorectal cancer is the second leading cause of cancer deaths in the U.S.¹ Although, colorectal cancer screening (CRCS) has been demonstrated to be effective and is consistently recommended by clinical practice guidelines,^{2–5} only 57.3% of adults over 50 years have had a fecal occult blood test (FOBT) within 1 year and/or a lower endoscopy within the preceding 10 years.⁶

Studies show that patients cite physician recommendation as the most important motivator of CRCS.^{7–14} Approximately 75–90% of patients who have not had CRCS report that a doctor's recommendation would motivate them to undergo screening.^{10,12,15} However, physicians do not consistently recommend CRCS to each eligible patient.^{10,16–18}

Although multiple studies have investigated barriers and facilitators of CRCS, the majority have focused on the patient perspective.^{19,20} Fewer have focused on the physician's perspective.^{17,19} Understanding the perspective of the physician is an essential step in designing interventions to increase physician recommendation of CRCS. Studies have repeatedly shown that interventions which target physician recommendation of colorectal and breast cancer screening are significantly more effective than those that only target the patient.^{21–24} Accordingly, the primary objective of this study was to explore physicians' barriers of and facilitators to recommendation of CRCS. In contrast to previous studies of physician recommendation of screening, which have relied either on physician self-report which overestimates true rates,^{25,26} or chart abstraction, which is limited by recording bias,²⁷ this study used a triangulation of qualitative methods that included in-depth interviews, chart-stimulated recall, and focus groups.

METHODS

This study was approved by the Institutional Review Board at the University of Pennsylvania. The methods are outlined in

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the [Appendix](#). Briefly, subjects were recruited from the University of Pennsylvania Health System (UPHS) Network of primary care physicians. The UPHS network consists of 212 primary care physicians practicing in 17 counties across southeastern Pennsylvania, southern New Jersey, and Delaware and includes 5 academic internal medicine and 2 family medicine practices at the University of Pennsylvania. Among the 212 physicians, 30% practice at university practices and the remainder at community-based affiliated practices, 78% practice internal medicine and 22% are in family practice.

Using purposive sampling, a nonprobability sampling technique whereby the subjects are selected because of a specific characteristic, such as gender or specialty, 63 practicing primary care physicians (excluding trainees) were invited by letter to participate in a study about preventive health. The letter did not disclose the intent to study CRCS exclusively. If they agreed to participate, physicians had to pull the charts of the 10 most recent patient visits seen within the previous week before the interview. It was not until the day of the interview that physicians were informed they would be specifically asked to discuss their CRCS patterns. Interviews lasted 30–45 minutes and were conducted by one of the investigators (CEG) or a trained medical student (JSB) between November 2003 and October 2004. Interviews started with global questions about CRCS and proceeded to the chart-stimulated recall interview, which is described below. Interview participants received \$50.

The interview instrument was designed using the Walsh and McPhee Systems Model of Clinical Preventive Care as a conceptual framework.²⁸ This framework proposes that a primary care physician's approach to performing a preventive activity or test is determined by patient, physician, and system factors; preventive activity factors; and situational cues to action. The framework was adapted to reflect our interest in the physician discussion of CRCS rather than patient screening behavior to explore the patient, physician, and health system factors that affect whether a physician discusses CRCS ([Appendix](#)). Unstructured probes were utilized to obtain further depth and completeness of responses to questions.

To validate the information obtained during interview, we used chart-stimulated recall to elicit barriers of and facilitators to physician recommendation of CRCS during actual patient-physician encounters. In chart-stimulated recall, a physician uses their own documentation of actual patient encounters to stimulate recall of his or her decision-making processes, whereas an evaluator probes the reasoning behind their medical decision-making.²⁹ Three to six chart-stimulated recalls are sufficient to provide reliable and valid assessment of physician performance.^{30–32}

For chart-stimulated recall, 3 to 5 charts from the 10 charts pulled by the physicians were discussed in reverse chronological, sequential order to maximize physician recall of the encounter. If the physician had no recall of the encounter, that chart was excluded. Neither the investigators nor the interviewer had direct access to the medical records or patient-identifying information. Physicians were instructed to include encounters of patients 51 years or older and exclude encounters of patients with a personal or family history of colorectal cancer or polyps and symptoms or signs of colorectal cancer. We requested a 1- to 2-line summary of each encounter that included patient age, reason for visit, and comorbidities to frame the context in which discussion of CRCS did or did not occur. As shown in the [Appendix](#), physicians were then asked

whether screening was recommended (CSR1), the facilitators to (CSR1a) or barriers of (CSR1b) their behavior, and outcomes (CSR2a and 2b). The interview and chart-stimulated recall procedures were pilot tested with the Internal Medicine faculty and trainees of the University of Pennsylvania.

Finally, two 1-hour focus groups were conducted by one of the lead investigators (JAS or CEG) to help summarize and interpret the results from the interviews. Six primary care physicians from the UPHS network met in April 2005 and 12 primary care physicians from Drexel College of Medicine met in May 2005. The groups were asked to rank the importance and prevalence of the barriers and facilitators uncovered by the in-depth interviews and chart-stimulated recall sessions. Focus group participants received \$100. Physicians could not participate in both the interviews and focus groups.

ANALYSIS

All interviews and the 2 focus groups were transcribed verbatim. Transcribed interviews were imported into NVivo 2.0 (QSR International). Interviews were read and coded independently by 2 investigators (CEG and JSB) and then coded jointly using consensus conferences. Interviews were analyzed using grounded theory techniques of analysis.³³ All barriers and facilitators offered in the interviews, chart-stimulated recall, and focus groups were coded.

RESULTS

Chart-stimulated Recall

Of the 63 UPHS primary care physicians who were offered participation in the in-depth interviews, 32 were interviewed, 6 refused, and 27 did not respond. Three of the interviews could not be transcribed because of recording problems. The results described below are based on 29 interviews.

The median age of all participants ($n=47$) was 41 years (range 33–74) and 24 were female. Five physicians were African American and 5 were Asian. Most physicians ($n=32$) practiced internal medicine and the rest were in family practice ($n=5$). All participants were board certified and five reported that they were trained in flexible sigmoidoscopy. The majority ($n=33$) of physicians practiced in urban settings and the rest in suburban settings. Approximately a third ($n=17$) used electronic medical records and the rest used paper records.

Using chart-stimulated recall, 155 encounters of patients aged 51 years or older were reviewed with physicians. Of these, 31 (20%) met the exclusion criteria. No charts had to be excluded because of lack of physician recall. Of the remaining 124 chart-stimulated recalls, 46 (37%) had had CRCS within the interval recommended by clinical practice guidelines. A recommendation for CRCS was due in the remaining 78 encounters. In these 78 encounters where screening was due, physicians recommended CRCS in 22 (28%) of the encounters and did not discuss screening in 56 (72%) of the encounters.

Overall Awareness of CRCS and CRCS Practice Patterns

All physicians stated they were aware of and reported that they recommended CRCS to their patients. The overwhelm-

ingly preferred test was colonoscopy stating it was “a comprehensive screening test”, “cost-effective”, and “the definitive” study. Many physicians stopped recommending and performing flexible sigmoidoscopy because it does not visualize the entire colon and thus was perceived as an inferior test. With flexible sigmoidoscopy, missing cancer was felt to be an inevitable outcome and a few physicians had already experienced this.

Physicians cited several relative contraindications to CRCS. Advanced age (defined as 80–90 years old), poor functional status, severe (such as a terminal illness) or life-threatening comorbidity (e.g., insulin-induced hypoglycemia), or if the colonoscopy prep was contraindicated by the comorbidity (e.g., uncompensated heart failure, electrolyte imbalances).

Barriers of Physician Recommendation of CRCS

Table 1 shows the barriers and facilitators of CRCS cited by physicians in the interview. Parenthetically, we note the number of times the barrier or facilitator was cited during the chart-stimulated recall. Barriers and facilitators without an adjacent parenthesis indicate that the physician cited them during the interview, but not during the chart-stimulated recall session. Consistent with our conceptual framework, barriers were related to patient, physician, and system variables.

Patient Barriers

Comorbidity. Addressing patient comorbidities, even if these are stable, in a limited period of time causes the physician to consciously defer or sometimes miss the discussion of CRCS. Several comorbidities are particularly time intensive and include diabetes, psychiatric disease (including depression and anxiety), and cognitive impairment.

You know just sort of fitting into the 15 minute visit for your complicated patient that has ten problems, and you know seven of them are active and need to be addressed that day. You sort of know, okay, I should address this with them but you've now spent 25, 30 minutes with them already on all their active issues, I'll get to it next visit.

Patients Who Previously Refused or Did Not Comply with Screening.

Physicians reported that if patients previously refused or did not comply with screening recommendations, they often do not bring up CRCS again. Conversely, 1 physician did recount an instance of a patient who, after several discussions, finally agreed to undergo screening.

Language Barriers. Even with the assistance of translators, physicians caring for non-English speaking patients had a particularly difficult time recommending CRCS because translation of the recommendation takes up much of the time allotted for the visit.

Distrust. Distrusting patients were described as those who do not like to go to doctors' offices and are “antimedicine” or “suspicious”. In these patients, although physicians may

Table 1. Barriers of and Facilitators to Physician Recommendation of CRCS

Category	Barriers identified by interview (number of encounters barrier identified by chart-stimulated recall) in the 56 charts where CRCS was due and was not discussed by the physician*	Facilitator identified by interview (number of encounters facilitator identified by chart-stimulated recall in the 22 charts where CRCS was due and recommended by the physician*
Patient	Comorbidity (11) Patient previously refused or did not comply with screening (7) Language barriers Distrust Patient has not had other forms of cancer screening	Patient or colleague request (4) Patient age over 50 (1) Healthy or medically stable patients (1) Family history of colorectal cancer or polyps Gender History of cancer Anxious patients Routine screeners (3) Positive attitude about CRCS (3) Chart review/ preparation before or during the encounter (2) Personal experience with a family member or patient with colorectal cancer Annual physical (9) Reminders (7) Public education campaigns Having FOBT kits in the exam room Incentives from Insurers Teaching residents Opportunistic screening
Physician	Forgetfulness (12) Concurrent care provided by a gastroenterologist (1) Physician is aware that the patient scheduled another visit for physical/ fatigue (2)	
System	Acute care visits (28) Lack of time (2) Lack of reminders (1) Inability to track down date of prior screening (1) Lack of insurance coverage Long delay in colonoscopy scheduling/lack of direct access colonoscopy	

*In some encounters, physicians cited more than 1 barrier or more than 1 facilitator.

recommend CRCS, they admitted they might not try hard to persuade them to have CRCS.

Patient Has Not Had Other Forms of Cancer Screening. When faced with a patient who is not up to date with other cancer screening, a physician may choose to recommend other cancer screening tests that are seen as more acceptable to patients (such as mammography and prostate screening test) before recommending CRCS.

Physician Barriers

Forgetfulness. Physicians admitted that, at times, they simply forget to recommend CRCS, at least sometimes because of the many other competing issues during a visit.

Concurrent Care Provided by a Gastroenterologist. Some physicians did not discuss CRCS with patients who are already under the care of a gastroenterologist because they assumed that the gastroenterologist would address screening.

Other Physician Factors. Sometimes, even if a physician was aware that a patient was not up to date with screening, physicians deferred the discussion for other reasons such as the patient was already scheduled for a full physical examination at a future visit or physician fatigue at the end of the day.

System Barriers

Acute Care Visits. Physicians reported it is very challenging to recommend CRCS during acute care visits because, at these visits, the physician is most concerned about stabilizing the urgent medical problem. Often, these patients are “added-on” into an already tight schedule. At best, some physicians suggest the patient return for a health maintenance visit.

Lack of Time. Lack of time occurs if there are too many active issues or patient concerns to address in a brief period of time. As such, it is closely linked with comorbidity. Furthermore, in general, discussion of colonoscopy is lengthier than discussion of other cancer screening tests because you need time to explain the choices, the procedure, the referral process, the prep, and transportation needs. Physicians report that when there is limited time, screening is often deferred, given lower priority or just not addressed at all.

I'd say that probably time...because it's so far down in the agenda while you're in that room with the patient.

Lack of Reminders. Physicians were frustrated at the few reminder systems in place in health care system.

There's no tickler in our system. I mean the problem is the car dealer tells me when my car needs a checkup, but the system can't [remind me to screen a patient].

Inability to Track Down Dates of Prior Screening. During 1 chart-stimulated recall encounter, a physician informed us that although CRCS did cross her mind, she was unsure if and when the patient had had screening and thus had to request outside medical records before making a recommendation.

Lack of Insurance Coverage. Physicians reported that if they are aware that a patient does not have health insurance, then they do not recommend CRCS.

Long Delay in Colonoscopy Scheduling/Lack of Direct Access Colonoscopy. The long delay involved between scheduling and completing colonoscopy and lack of direct or open access colonoscopy does not deter physicians from recommending CRCS, but does influence their choice of tests, sometimes choosing barium enema if there is a long delay for colonoscopy.

FACILITATORS TO PHYSICIAN RECOMMENDATION OF CRCS

Patient Facilitators

Patient or Colleague Request. Physicians reported that patient request is a strong facilitator, albeit not a routine one. Other times, a consultant, such as a gynecologist, requests screening. Requests from either source serve as a cue to action for the physician to offer CRCS. Notably, some physicians reported that it is the highly informed and educated patients that are most likely to request screening.

Patient Age 50–59. Physicians report that noticing that the patient age is 50–59 is often an automatic reminder for them to initiate a discussion about CRCS. Age prompted what 1 physician called an “automatic algorithm” for review of age-appropriate screening tests.

Healthy or Medically Stable Patients. Physicians are more likely to recommend screening if their patient is healthy or medically stable because this allows more time during the visit to address health maintenance issues.

Gender. A few physicians remarked that discussing CRCS was sometimes easier to do with women because women have a longer history of undergoing cancer screening tests (i.e., mammograms and Pap smears) compared to men.

History of Cancer. In patients with a history of cancer, physicians reported a “heightened awareness” for other malignancies and this prompted their recommendation of colorectal and other cancer screening tests.

Anxious Patients. Patients characterized as anxious or the “worrying type” are more likely to be offered CRCS because “they already got you sensitized to think of anything and everything that you can possibly do to them”.

Physician Facilitators

Routine Screeners. Some physicians appeared to be programmed to ask all their patients over 50 about CRCS because CRCS was part of their “algorithm” or “mental checklist” for screening.

I mean it is just a matter of being obsessive or paranoid or being a good doctor or whatever you want to call it. It is sweating the details. It's checking the oil. You know that is what makes me do what I do is the desire to do the right thing.

Positive Attitude about CRCS. Despite the lack of randomized controlled trials about colonoscopy, physicians had positive attitudes about colonoscopy and this was a facilitator to recommending CRCS.

I feel very strong that colonoscopies are going to pan out, even though we don't have the great prospective study, and believe enough in it that I feel very good about recommending this to my patients.

Chart Review/Preparation Before or During the Encounter. Several physicians annotate CRCS status in the chart, either on a flow sheet, in the problems list, or in a health maintenance section of their notes. For these physicians, review of the chart, either before going into the room or during the encounter, serves as a facilitator to recommending CRCS.

Personal Experience with a Family Member or Patient with Colorectal Cancer. A few physicians reported that having a family member or patient with CRC leads them to offer screening to all their patients.

System Facilitators

Annual Physicals. Physicians reported that an annual physical not only affords the physician more time during the visit, but they also approach the visit with a different "mindset", which places preventive health on the agenda.

Reminders. Physicians reported that reminders, such as electronic reminders, flow sheets, and surveys completed by the patient while in the waiting room are a facilitator for recommending CRCS.

Public Education Campaigns. Physicians believed that general awareness about CRCS is increasing in part because of public education campaigns such as that led by Katie Couric and American Cancer Society public service announcements (e.g., "Mr. Polyp" ads), and this led more patients to ask their doctors about CRCS.

Having FOBT Kits in the Exam Room. Having FOBT kits available in the room was mentioned as a facilitator for recommending CRCS.

Incentives from Insurers. One physician reported that a patient requested CRCS because her insurer provided an incentive of \$50 for completing her age-appropriate cancer screening tests.

Teaching Residents. Physicians reported that teaching trainees was a facilitator for recommending screening because it was their responsibility to teach comprehensive screening.

Opportunistic Screening. If patients are being scheduled for an upper endoscopy, then this presented physicians with an opportunity for addressing CRCS.

FOCUS GROUPS

Of the 44 primary care physicians who were offered participation in the focus groups sessions, 18 agreed to participate, and the remainder did not respond. Discussions among focus group participants did not reveal any new barriers or facilitators that were not previously identified by chart-stimulated recall. After being asked to list all the barriers of and facilitators to CRCS, the 18 participants were asked to rank which category of barriers (patient, physician, and system) they viewed as the most important barriers. The most commonly ranked category of barriers was patient barriers (8 votes), followed by system barriers (7 votes), and finally by physician barriers (3 votes). In addition, the focus group participants were asked to identify the barrier they thought was most important in preventing them from recommending CRCS to their patients. The barriers ranked most important were lack of time (6 votes), followed by patient reluctance (5 votes). Other barriers reported to be most important, but only receiving 1 vote each were: comorbidity, not scheduling of physicals, physician forgetfulness, patient refusal of other screening, invasiveness of the test, cultural differences, and lack of availability of gastrointestinal consultants.

In addition, the discussions revealed that counseling about CRCS can take 5 minutes in someone who has heard of and is ready to accept the test, but 10–20 minutes if they are unaware, less willing to have the test, or need to make special arrangements to prepare for the procedure. Focus group discussions also revealed that physicians are more paternalistic than collaborative when counseling patients about CRCS when compared to discussing PSA screening. One participant reported he just tells his patients "I think you need this" because it "makes it easier". Finally, participants expressed much frustration about working in systems that made it challenging to provide preventive care, especially to the vulnerable.

I actually think we [have] two different jobs. We take care of the well and we take care of the sick. And they're very different skill sets. I think I do this well with the well.

Made me sad about the fate of general medicine. What a wonderful group of doctors, trying to do the right thing, identifying system problems, and all frustrated, under-appreciated, etc.

CONCLUSIONS

Despite the established effectiveness and cost effectiveness of CRCS and its widespread promulgation by clinical practice guidelines, CRCS rates remain suboptimal. However, studies show that most patients report they would undergo CRCS if their physician recommended it.^{10,12} This study identifies many specific barriers to and facilitators of physician recommendation of CRCS.

Consistent with our conceptual framework, barriers of and facilitators to physician recommendation were identified at the patient, physician, and system levels. Thus, addressing 1 barrier may not be sufficient to raise physician rates of CRCS recommendation. Multifaceted interventions are likely to be required to effectively raise CRCS rates.^{34–38}

This study identifies several modifiable barriers and facilitators that inform the design interventions to raise the rates of physician recommendation of CRCS. On the patient level, continued patient education of CRCS is not only a means of raising awareness and acceptance among patients, but can also be a cue to action for physicians to offer CRCS. This study shows that physicians are responsive to an active request or inquiry on the part of the patient.

On the physician level, awareness and attitudes about CRCS were very favorable. Although physicians reported that they recommend CRCS, review of their medical records revealed that their rates of recommendation of CRCS were suboptimal. Of the 124 encounters that met the criteria for chart-stimulated recall, 46 had evidence that a CRCS test had been completed and another 22 received a recommendation from their physician at the index visit examined by chart-stimulated recall. Thus, only 55% of the encounters had evidence of a recommendation for screening within the interval recommended by clinical practice guidelines. One potential intervention to raise physician CRCS recommendation rates would be to provide physicians with awareness of their own rates of CRCS to overcome the misperception that all their patients have received a recommendation for CRCS. Anecdotally, several participating physicians reported that this study had been an intervention by making them aware of the cases where screening should have been recommended and was not.

Another physician barrier is their response to a patient who had previously refused CRCS. Physicians may not offer screening again to patients that have previously refused screening. However, behavioral theory suggests behavioral changes occur in stages. The transtheoretical model supports that stage of readiness to change occurs in small steps along a continuum that ultimately leads in a behavioral change.³⁹ One study of stage of adoption of CRCS found that 56% of low-income and African-American women are in the precontemplation stage of adoption where they knew very little and have not yet actively thought about CRCS.⁴⁰ Our findings support the need for further physician education of stage-based communication theory.

The most frequently cited physician barrier is forgetfulness. Clearly, systems that build physician reminders, either electronic or paper,^{41,42} and checklists^{43,44} related to preventive care and counseling are needed to assist physicians in systematically recommending CRCS to all their eligible patients.

System barriers of visit type and time are closely linked and associated with physician recommendation of CRCS. This is consistent with 3 previous studies that demonstrate that health maintenance visits are a significant predictor of cancer screening.^{45–47} Thus, a modifiable system intervention is to reimburse providers for the time spent on preventive health counseling similar to the Medicare Part B “Welcome to Medicare” physical, which reimburses providers for a visit devoted to education and counseling about the preventive services.⁴⁸ In addition, financial incentives provided by insurers to patients for completion of age-appropriate screening, as discussed by one of the participating physicians above, have been shown to be an effective intervention for increasing

patient request of CRCS.⁴⁹ The inability to track down dates of prior screening can be addressed with software programs that create electronic patient registries such as the Comorbid Disease Management Database (COMMAND) developed by the Mississippi Quality Improvement Organization.⁵⁰ Hemocult card kits can be placed in all the patient rooms to serve as a cue to action for physicians. Finally, paramedical personnel can be trained to discuss the risk and benefits of and conduct cancer-screening tests to address the barrier of lack of physician time.^{51–53}

The limitations of this study include that slightly over half of the physicians invited to participate refused or did not respond, introducing the possibility of bias. For example, participating physicians may have been more interested in preventive health, which may have prevented us from uncovering all the barriers to the recommendation of CRCS. In addition, the relatively small number of participating physicians and setting of the study in 2 large health systems in 1 city may also limit the generalizability of our findings. Finally, although physicians were required to pull a retrospective sequential sample of their charts for chart-stimulated recall before the interview and they did not learn that this study was about CRCS until after they had pulled their charts, it is possible that there was selection bias when choosing charts for discussion. Despite these limitations, the results provide new knowledge of circumstances that prevent or facilitate physician recommendation of CRCS. An additional strength is that the methods used in this study address the potential shortcomings of physician recall bias about their own counseling behavior. Finally, chart-stimulated recall was a feasible method to validate interview data and helped address the well-described discrepancy between physicians' perceived and actual behavior related to recommending cancer screening tests,^{26,54,55} as well as recording bias inherent in methods based on chart abstraction.^{56–58} Overall, the finding that there are multiple modifiable barriers to and facilitators of physician recommendation of CRCS should guide investigators in designing patient- and physician-targeted educational and system interventions that increase physician recommendation of CRCS.

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APPENDIX

Table 2. In-depth Interview and Chart-stimulated Recall Protocol

Interview and CSR

Interview

- I 1. Do you recommend CRCS to your asymptomatic patients over 50 yr of age?
- I 1a. If so, what tests do you recommend?
- I 1b. How often do you recommend these tests?
- I 2. What are the barriers to your recommending CRCS?
- I 3. What are the facilitators to your recommending CRCS?
- I 4. What are the barriers to your recommending CRCS specifically related to the health care system you practice in?
- I 5. What are the facilitators to your recommending CRCS specifically related to the health care system you practice in?
- I 6. What are the barriers to your recommending CRCS specifically relating to your patient population?
- I 7. What are facilitators to your recommending CRCS relating to your specific patient population?

Chart-stimulated recall (CSR) protocol

1. Two days before the interview, physician reminded to gather 10 charts from patients seen in the previous 1–2 wk (electronic records obviated the need for gathering charts).
2. Physician rates recall of the encounter on scale 0 (no recall) to 10 (perfect recall). Interviewer excludes charts with recall rated 0 and documents reason for exclusion.
3. Review inclusion criteria for chart-stimulated recall (all patients over 51 seen by physician in the previous 1–2 wk, and follow-up care is provided by physician).
4. Review exclusion criteria (signs or symptoms of colorectal cancer including weight loss, melena, hematochezia, anemia, abdominal pain, change in bowel habits; family history of colorectal cancer; history of colorectal cancer; history of polyps).
5. Physician provides 1–2 line summary of patient encounter that includes patient age, reason for visit, major comorbidities.

Investigator questions

- CSR 1. At this recent visit, did you offer or recommend CRCS to the patient?
- CSR 1a. If yes: What factors facilitated a recommendation of screening?
- CSR 1b. If no: What factors prevented a recommendation for screening?
- CSR 2a and 2b. Has the patient (ever) been screened? If so, when.

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