Colorectal cancer screening: Physicians’ knowledge of risk assessment and guidelines, practice, and description of barriers and facilitators

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BACKGROUND: Physician nonadherence to colorectal cancer (CRC) screening recommendations contributes to underuse of screening.

OBJECTIVE: To assess physicians’ knowledge of CRC screening guidelines for average-risk individuals, perceived barriers to screening and practice behaviours.

METHODS: Between October 2004 and March 2005, staff physicians working in three university-affiliated hospitals in Montreal, Quebec, were surveyed. Self-administered questionnaires assessed knowledge of risk classification and current guidelines for average-risk individuals, as well as perceptions of barriers to screening and practice behaviours.

RESULTS: All 65 invited physicians participated in the survey, including 46 (70.8%) family medicine physicians and 19 (29.2%) general internists. Most physicians knew that screening should begin at 50 years of age, all knew to screen men and women and 92% said they screened average-risk patients. Fifty-seven (87.7%) physicians correctly identified three common characteristics associated with high risk for developing CRC. Physicians who screened average-risk patients preferred fecal occult blood testing (88.3%) and colonoscopy (88.3%) to flexible sigmoidoscopy (10.0%) and double-contrast barium enema (30.0%). Most physicians knew the correct screening periodicity for fecal occult blood testing (87.6%), but only 40% or fewer could identify correct screening periodicities for the other modalities. Barriers and facilitators focused on health care delivery system improvements, best evidence on which to base recommendations and changes to the health care delivery system.

CONCLUSIONS: Physicians lacked knowledge of the recommended screening modalities and periodicities to appropriately screen average-risk individuals. Because CRC screening can reduce mortality, efforts to improve physician delivery should focus on physician knowledge and changes to the health care delivery system.

Key Words: Colorectal cancer; Guidelines; Primary care; Screening

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Received for publication September 16, 2005. Accepted March 2, 2006

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Colorectal cancer (CRC) is the third most commonly diagnosed cancer in men and women and a leading cause of cancer deaths in industrialized countries (1-5). Screening for CRC reduces its incidence through removal of premalignant polyps, and CRC morbidity and mortality through early detection and treatment (6-9). Current Canadian guidelines recommend fecal occult blood testing (FOBT) every other year as a primary screening for CRC in average-risk individuals (50 years of age and older who are without risk factors for the development of CRC and do not have any personal or family history of colon polyps or CRC) (10-12). American guidelines make different recommendations for the same group of patients. They suggest annual FOBT, flexible sigmoidoscopy (FS) every five years, double-contrast barium enema (DCBE) every five years or colonoscopy every 10 years (13-15). The Quebec Association of Gastroenterology recommends DCBE every five to 10 years or colonoscopy every 10 years, further confusing the issue. Despite the proliferation of CRC screening guidelines or perhaps because of the lack of consensus, only an estimated 10% to 50% of the eligible population have been screened (16-20). Given that primary care practices are major sites for providing health promotion and screening services, some of the underutilization may be attributable to physician nonadherence to CRC screening guidelines.

In the absence of a mass screening program, individuals rely on their physicians to provide CRC screening. Studies consistently find associations between increased CRC screening and receipt of a physician’s recommendation to patients for CRC screening, as well as having health care coverage or a regular physician (21-29). Yet, although physicians’ self-report to offering CRC screening to 36% to 90% of their eligible patients (4,30,31) when patient medical chart data are examined, the proportion of screen-eligible patients who actually received documented screening is overestimated (4,30). For example, 74% primary care physicians in Alberta recommended that asymptomatic patients undergo screening but only 36% actually offered screening to at least 75% of their average-risk patients (30). Physician underuse of CRC screening may be a result of the perception that the evidence to support screening is inconclusive (32), lack of familiarity with CRC screening guidelines (4,31,33,34), failure to routinely assess CRC risk (33), inappropriate use of CRC screening (33) or of procedures such as digital rectal examinations that are not recommended (36), or absence of a screening policy (32,37). Moreover, the physician’s decision to screen, as well as choice of screening modality is influenced by perceptions of barriers (31,38) such as scheduling difficulties for large bowel procedures (30,36), lack of consultation time (30,36), uncertainty about which modality to offer (30) and patient comorbidity (36,39).

Because CRC is one of the few cancers that can be cured when detected early (40), increased physician delivery of screening would lead to reductions in CRC incidence, morbidity and mortality. Therefore, the aim of the present study was to identify physicians’ knowledge of CRC risk classification and screening guidelines, their self-reported screening practice and the barriers and facilitators to implementing screening. The first step toward improving delivery of CRC screening is to document physicians’ knowledge of screening guidelines, practice behaviours, and perceived barriers and potential facilitators to screening.

**METHODS**

**Recruitment**

A purposeful sample of physicians working in three primary care outpatient clinics affiliated with McGill University (Montreal, Quebec) were approached to participate in the survey. Data collection occurred between October 2004 and March 2005 using a self-administered questionnaire. Most physicians completed the survey during staff meetings before an information session on CRC screening. Physicians not in attendance were approached by the study coordinator at a later date. Staff physicians affiliated with each study site were eligible for inclusion. Residents and physician assistants were excluded because they often see patients in consultation with staff physicians.

**Survey instrument**

The physician questionnaire was designed to provide information on knowledge of current CRC screening guidelines, perceived barriers to CRC screening and practice regarding CRC screening. The survey was pilot-tested on five medical residents and pretested on five physicians.

**Risk stratification:** To successfully implement screening guidelines in average-risk patients, physicians needed to understand risk classification to discern average- from high risk. One question on the questionnaire asked physicians to select from a list of characteristics that would put individuals at high risk for CRC. Response choices included inflammatory bowel disease, irritable bowel syndrome, personal family history of CRC and familial polyposis.

**Knowledge of guidelines:** Seven questions assessed clinicians’ knowledge of guidelines for average-risk individuals. These included, age when screening should begin (30, 35, 40, 45, 50, 55 or 60 years), who should be screened (men, women) and frequency of screening for digital rectal examination, FOBT, FS, DCBE and colonoscopy (every one, two, three, five or 10 years, or not appropriate).

**Usual practice:** Physicians were asked whether they would recommend that average-risk patients undergo screening for CRC, and to indicate the screening modalities usually recommended (digital rectal examination, FOBT, FS, DCBE, colonoscopy or preference depending on patient status).

**Barriers to screening:** For each of the four screening modalities currently recommended, physicians were asked to indicate the barriers that would prevent them from recommending the procedure. Potential barriers included uncertainty about the efficacy of screening, lack of training or experience, poor patient compliance, unavailability of equipment, scheduling difficulty, lack of consultation time, absence of practice nurses and patients with comorbid conditions.

**Facilitators to screening:** One open-ended question asked physicians for three things that would make it easier for them to provide CRC screening to their patients.

**RESULTS**

**Description of physicians**

All 65 primary care physicians who were approached completed the survey. The sample included 46 (70.8%) family medicine (FM) physicians and 19 (29.2%) general internists (GIs) (Table 1). Thirty-seven (56.9%) were men and 28 (43.1%) were women; there was no difference in sex by specialty (P=0.2249). The mean number of years since graduation from medical school was 21.5 (SD=8.6) and ranged from three to 35 years.
Risk status
Of the 65 physicians, most indicated that inflammatory bowel disease (92.3%), family history (96.9%) and familial polyposis (98.5%) influenced CRC risk classification. No one selected irritable bowel syndrome. Fifty-seven (87.7%) physicians correctly identified the three common risk factors for developing CRC, inflammatory bowel disease, family history and familial polyposis. Knowledge of risk factors did not differ by physician specialty (all P>0.2621).

Guidelines
Most (90.6%) physicians correctly selected 50 years as the age at which to begin screening for CRC in average-risk individuals. All (100%) physicians were aware that both men and women should be screened. As seen in Figure 1, the majority (87.6%) of physicians correctly identified the three common risk factors for developing CRC, inflammatory bowel disease, family history and familial polyposis. Knowledge of risk factors did not differ by physician specialty (all P>0.2621).

Practice
A total of 61 (93.8%) physicians reported screening average-risk patients. As seen in Figure 2, FOBT (88.3%) and colonoscopy (88.3%) were preferred to FS (10.0%) and DCBE (30.0%). Digital rectal examination was used by 32 (52.5%) physicians. Of the 61 physicians who screened average-risk patients, proportionately more GIs compared with FM physicians used FS (21.1% versus 4.8%, respectively, P=0.0694, Fisher’s exact test); although this difference did not reach statistical significance.

Barriers
Physicians reported a mean of 5.9 (SD=3.7) barriers to providing or recommending the four currently accepted screening modalities. Table 2 shows the physicians’ responses to barriers to screening according to modality. Uncertainty about the efficacy of the modality was salient for FOBT, FS and DCBE. Lacking experience was relevant mainly for FS. Scheduling difficulties and comorbidity were major concerns for colonoscopy. Having sufficient consultation time was most important for colonoscopy. Concern about patient compliance was of similar importance for all modalities. Barriers were similar across physician specialty. Lack of equipment was of
most concern for FS and colonoscopy; lack of practice nurse
to managed.

Facilitators
When asked what would facilitate screening, physicians said
they would like easier access to gastroenterologists (61.5%),
having educational information to give to patients (23.1%),
simpler screening modalities (21.5%), clearer guidelines (13.9%),
time to counsel patients about the various modalities (13.9%),
reminder systems (10.8%), specialized screening clinics (10.8%) and
different scientific evidence to support screening recommendations (7.7%). A larger propor-
tion of FM physicians wanted clearer guidelines (19.6% versus
0%, P=0.0491) compared with GIs.

DISCUSSION
The present study of academic FM physicians and GIs assessed
knowledge of risk classification and screening recommenda-
tions for individuals at average risk for developing CRC,
screening practice, and perceived barriers and facilitators to
screening. Nearly all of the physicians were familiar with the
common risk factors for developing CRC, suggesting that
recommended screening could be offered to the majority of
average-risk patients seeking health care. Physicians were
knowledgeable about who should receive CRC screening and
what age to begin; most said they screened average-risk
patients. Digital rectal examination was used to screen for CRC despite the lack of endorsement as a screening
strategy, an approach also used in other studies. Of the
recommended strategies, FOBT and colonoscopy were
preferred to FS and DCBE. Most physicians knew the correct
screening periodicity for FOBT. However, 9% indicated that
it was not an appropriate screening method despite the evi-
dence to support its efficacy at reducing mortality from CRC
(7,8). Correct periodicities for FS and DCBE were reported by
fewer than 40% of physicians, with the majority indicating
these procedures were not appropriate screening methods.
Of note, only 40% of physicians correctly indicated the appropri-
ate periodicity for colonoscopy; 46.2% said it should be per-
formed more frequently and nine (13.8%) said it was not an
appropriate screening modality for average-risk individuals.
Given that many physicians endorsed more frequent
colonoscopic screening than is currently recommended, if
translated into practice, this could unnecessarily expose
average-risk patients to increased risk for severe consequences
from colonoscopy (eg, bowel perforation, hemorrhage and
death) and could also increase health care costs.

Perceived barriers that prevented physicians from
providing or recommending CRC screening varied by modal-
ity. Some barriers suggested gaps in physician knowledge. For
example, uncertainty about efficacy was important for FOBT
and FS but not for colonoscopy. These findings are inconsis-
tent with the scientific evidence in support of screening
FOBT (7,8) and FS (42,43) in reducing mortality from CRC,
and the lack of evidence for colonoscopy. Nonetheless, use of
FS has declined while colonoscopy use has increased (44),
owing to recent studies (45,46) and media coverage (47) doc-
umenting the advantages of colonoscopy, as well as the back-
ing of organizations that develop the guidelines (48). Other
barriers either were not or should not have been associated
with reported practice behaviors. Physicians reported more
barriers to colonoscopy than to other screening modalities
even though colonoscopy was one of the two most commonly
recommended screening modalities. In addition, lack of
experience was an important barrier to providing FS but
should not have prevented physicians from recommending it
as a screening strategy because this examination is widely
performed by gastroenterologists. Finally, approximately
one-quarter of physicians reported that concern about patient
compliance to all screening modalities prevented them from
offering CRC screening, despite the inconsistent evidence
that patient compliance is a barrier to CRC screening
(8,45,49-51). These findings point to a need to educate physi-
cians of the benefits of appropriate screening, that CRC is one
of the few cancers that is detectable in the precancerous state
and that early detection and treatment can reduce the inci-
dence of morbidity and mortality from CRC.

Reported facilitators to screening provide insight to
tential interventions that may increase physician
adherence to screening recommendations. The main area
targeted for improvement was the health care delivery system,
with many physicians indicating that having better access to
availability of specialists, more consultation time to explain
CRC screening, educational material for patients, reminder
systems and specialized screening clinics would improve their
ability to offer CRC screening. Some of these improvements
would require additional resources to create new innovations
(eg, reminder systems and screening clinics), while others
would benefit from increased efficiency (eg, having nonmedical personnel to explain screening and available
educational material). The second and third targets for
improvement were the screening guidelines and modalities
themselves, which need to be easier to follow for both
physicians and their patients. Physicians expressed concern
that guidelines need to be clear and consistent across
organizations. In addition, they confirmed what is already
known about screening in general – that the success of
delivering screening rests on the characteristics of the exami-
nation, such as its availability, ease of administration and
accurate test results (52). Given that none of the current
screening modalities meets these criteria, the search for an
optimal screening strategy is ongoing (53-55). In the mean-
time, changes targeted at office systems have shown to be
effective at increasing rates of CRC screening (56).

The increasing awareness of the importance of CRC
screening and the movement to establish mass screening
programs may help to explain why greater proportions of
physicians in the present study said they screened average-risk
patients, knew the recommended age at which to begin
screening, and knew the recommended periodicities for
colonoscopy and DCBE compared with results from the previ-
ous surveys (30,37,41,57). Yet, CRC screening guidelines are
only one of countless guidelines that primary care physicians
need to know about and implement with their patients. For
example, the National Guideline Clearinghouse web site (58)
currently contains 1718 individual summaries. Primary care
physicians may indeed feel overwhelmed by the amount of
literature they need to integrate into practice. Clear and
consistent CRC screening guidelines across organizations
would instill greater confidence in the recommendations, as
well as reduce the amount of information that physicians need
to manage.

The present survey was part of a larger research project
aimed at evaluating the determinants of CRC screening in
primary care. One study strength is the 100% response rate that could be attributed in part to the fact that at least one influential physician at each study site was a coinvestigator on the project. These physicians not only contributed to the conceptualization and design of the study but also generated enthusiasm for participation among staff physicians. Study limitations worth mentioning were that all data were obtained by self-report and no attempts were made to compare physician responses with actual practice. In addition, generalizability of our findings may be limited because all participants were affiliated with one large, metropolitan university and may have been more knowledgeable of current CRC screening guidelines compared with physicians in rural and nonteaching hospitals.

CONCLUSION

Academic FM physicians and GI specialists demonstrated awareness of CRC guidelines but lacked specific knowledge about the recommended modalities and periodicities to correctly implement screening guidelines in average-risk patients. Of particular concern were physicians’ perceptions that FOBT and F5 were not effective screening methods and the shorter-than-recommended periodicity for colonoscopy. Barriers and facilitators to providing CRC screening focused on health care delivery system improvements, better evidence upon which to base recommendations and development of practical screening modalities. Having guidelines that are consistent across organizations may promote physician uptake. In as much as CRC screening can reduce mortality, efforts to increase physician offers of screening should be aimed at physician knowledge and changes to the health care delivery system.

ACKNOWLEDGEMENTS: The present research was supported by a grant from the Fonds de la Recherche en Santé du Québec (FRSQ). Maida J Sewitch is supported as a Research Scientist of the Canadian Cancer Society through an award from the National Cancer Institute of Canada. A particular tribute is paid to the study coordinator, Ms Caroline Fournier, who recruited the physicians for the study.

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