ORIGINAL ARTICLES

Provider Recommendations for Colorectal Cancer Screening in Elderly Veterans

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BACKGROUND: Decisions regarding colorectal cancer (CRC) screening in the elderly depend on providers' assessment of likelihood of benefit partly based on patient comorbidity and past screening history. We aimed to describe providers' experiences and practice patterns regarding screening for CRC in elderly patients in the VA system.

METHODS AND PARTICIPANTS: A survey was sent to VA primary care providers who had previously participated in the CanCORS-sponsored *Share Thoughts on Care* study and at a VA medical center. The surveys consisted of clinical vignettes that varied by patient age (75, 80, or 85 years), comorbidity, and past CRC screening history.

MAIN RESULTS: Completed questionnaires were received from 183 of 351 providers (52%). Ninety-five percent of providers would recommend screening for a healthy 75 year old compared to 66% and 39% for a healthy 80 and 85 year old, respectively (p -values < 0.0001). Providers were more likely to recommend screening for a 75 year old with moderate CHF versus severe CHF [61% versus 15%, OR 9.0 (95% CI 5.8–14.0), p <0.0001] and more likely to recommend screening for an 80 year old with prior colonoscopy within the preceding 10 years, versus 5 years [42% versus 23%, OR 2.6 (95% CI 1.9–3.5), p <0.0001]. A substantial minority of respondents (range 15–21%) reported they would screen a 75 year old with an active malignancy, severe CHF, or severe COPD. Provider demographic characteristics were not significantly associated with the probability of a screening recommendation.

CONCLUSIONS: VA providers incorporate patient age, comorbidity, and past CRC screening history into CRC screening recommendations for elderly veterans; however, substantial proportions of these recommendations are inappropriate.

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Clinical practice guidelines recommend screening for colorectal cancer (CRC) beginning at age 50 in average-risk patients^{1–3}, and have generally not specified an upper age limit because trials have included relatively few patients aged 75 and older^{4–8}. The US Preventive Services Task Force (USPSTF) recently updated its CRC screening guidelines to recommend against routine screening for CRC in adults 76 to 85 years of age, and against CRC screening in adults older than age 85⁹. Screening for CRC does not decrease CRC-specific mortality until at least 5 years after screening has occurred^{4–6,10}, which significantly limits the benefit of screening in elderly patients with significant comorbidity and limited life expectancy. Recent studies have shown that despite the increased prevalence of colorectal neoplasia in the elderly, the protective effect of colonoscopy is offset by advancing age and comorbidity, and gains in life expectancy are modest compared to younger patients^{11,12}.

The decision to screen, or not to screen, is complex and requires taking into account several interrelated variables in addition to chronological age and estimated life expectancy, including past screening history, patient preference, system factors such as clinical reminders and quality of care measures, and individual physicians' experience and practice. An individualized approach has been advocated to target elders who might benefit the most from screening¹³; however, whether and to what extent these general guidelines are followed in clinical practice is unknown. Previous studies have shown that physician recommendations are influenced by patient age and comorbidity^{14,15}; however, CRC screening recommendations in the elderly are often inappropriate¹⁴, and physicians-in-training report substantial uncertainty about the potential of elderly patients to benefit from screening¹⁵. These considerations are of particular relevance to the Veterans Affairs (VA) system with its growing population of elderly patients, and where recent observational evidence shows that patients with poor health and reduced life expectancy are undergoing CRC screening at relatively high rates^{16,17}. To our knowledge, no study has directly questioned providers about CRC screening practices in elderly patients in

the VA system, nor has a study specifically assessed the impact of prior screening for CRC in this setting, especially in light of the updated USPSTF recommendations. We conducted a survey of practicing VA primary care health providers to (1) describe provider recommendations regarding CRC screening when faced with older patients with varying degrees of comorbidity and prior histories of CRC screening and (2) determine patient and provider characteristics associated with screening recommendations.

METHODS

Sample

The survey sample consisted of VA providers who had previously participated in the *Share Thoughts on Care* study as part of the Cancer Care Outcomes Research and Surveillance (CanCORS) consortium¹⁸, and VA primary care providers (physicians, nurse practitioners, and physician assistants) based at the Richard L. Roudebush VA Medical Center (Indianapolis, Indiana). The details of the *Share Thoughts on Care* study aims, design, and methods have been previously described¹⁸. In brief, CanCORS was organized in 2001 and is composed of six research groups funded by the National Cancer Institute (NCI) and one funded by the Department of Veterans Affairs and NCI. The sample for the present study was drawn from primary care providers at 14 VA medical centers that are part of VA CanCORS (Atlanta, GA; Baltimore, MD; Biloxi, MS; Chicago-Hines and Chicago-Lakeside, IL; Durham, NC; Houston, TX; Indianapolis, IN; Minneapolis, MN; Nashville, TN; New York, NY; Seattle, WA; Temple, TX; Tucson, AZ). Primary care providers at the Roudebush VA Medical Center in Indianapolis were invited to participate regardless of whether they had previously participated in CanCORS. The study was approved by the Indiana University Institutional Review Board, the Roudebush VA Medical Center Research and Development Committee, the CanCORS Ancillary Study Committee, and the CanCORS Publications Committee.

Measures

All providers were mailed a questionnaire that took approximately 10 min to complete (Online Appendix). A reminder was mailed if no response was received within 4 weeks. The first survey was mailed in June 2007 and the last received in April 2008. The survey instrument questions were developed after discussions with primary care providers and geriatricians based at the Roudebush VAMC. An initial pilot version was administered to five primary care providers at the Roudebush VAMC, and a final version was drafted based on their feedback regarding question relevance and ease of administration. In the final version, providers were presented with three clinical scenarios representing hypothetical veterans aged 75, 80, and 85. Scenarios included no comorbidity, moderate congestive heart failure (CHF), severe CHF, moderate chronic obstructive pulmonary disease (COPD), severe COPD, active malignancy at a site other than the colon, sigmoidoscopy within the previous 5 years or 10 years, colonoscopy within the previous 5 years or 10 years, life expectancy <5 years or <10 years (Appendix). Providers were asked how likely they were to recommend CRC

screening in each situation with choices of “very unlikely,” “somewhat unlikely,” “somewhat likely,” and “very likely.” These categories were subsequently collapsed into two headings for the analysis: likely (including “somewhat likely” and “very likely”) and unlikely (including “very unlikely,” “somewhat unlikely”).

Analysis

Data distributions were analyzed using descriptive statistics. Analyses of Likert scale (ordinal) data were performed using the non-parametric Wilcoxon test and Kruskal-Wallis test. T-tests and ANOVA were used to compare continuous variables between groups. Spearman's and Pearson's correlation coefficients were used for non-parametric and parametric data based on distributions. Generalized estimating equations (GEE) were used to analyze the providers' responses with factors for age of patient, comorbidity, and interaction between patient age and comorbidity. This method, which is an extension of traditional linear models, accounts for the correlation between repeated responses by each physician to the questions for comorbidities at patient ages 75, 80, and 85. Due to multiple comparisons, the Sidak method was used to control experiment-wise error rate with significance based on the adjusted p values¹⁹. Differences between all possible comparisons were analyzed. Interactions between physician demographic factors (particularly physician age) and patient age for each question were explored using a multiple linear regression model, with the answer as the dependent variable and patient and physician ages as independent variables. All analyses were conducted using SAS version 9 (Cary, NC).

RESULTS

Completed questionnaires were received from 183 of 351 providers (52%). Twenty-two of 183 (12%) were primary care providers at the Roudebush VA Medical Center. Respondent demographic and clinical practice characteristics are summarized in Table 1. There were no significant differences between respondents and non-respondents regarding age, gender, race, year of graduation, medical school location, and board certification status.

Responses to individual clinical scenarios are shown in Table 2. Ninety-five percent of respondents would screen a 75 year old with no comorbidity, versus 39% for a healthy 85 year old. The proportion of elders for whom screening was recommended decreased as scenarios included progressively worse comorbidity. Interestingly, 21% would screen a 75 year old with an active malignancy outside the colon; the corresponding rates for a 75 year old were 15% for severe CHF and 17% for severe COPD, respectively. When presented with life expectancy estimates (without mention of specific comorbid conditions), most providers were unlikely to screen a patient with a life expectancy of less than 5 years, regardless of age; however, 43% stated they were likely screen a 75 year old with a life expectancy of less than 10 years. A history of prior endoscopic screening for CRC also impacted providers' recommendations: Most would recommend screening for a 75 year old even if the patient had previously undergone sigmoidoscopy or colonoscopy within the preceding 5 or 10 years; notably, 53% stated they were likely to screen a 75 year old who had

Table 1. Respondent Demographic and Clinical Practice Characteristics (N=183)

Physician:	163 (89%)
Mid-level practitioner:	20 (11%)
Age (mean ± SD):	48±11 years
White race:	131 (74%)
Male:	110 (61%)
US or Canadian medical school:	133 (78%)
Board certification:	153 (90%)
Years in practice (mean ± SD):	20±11
Patients screened for CRC/year (mean ± SD):	329±420
Patients aged ≥75 screened for CRC/year (mean ± SD):	111±232
Preferred CRC screening strategy	
Colonoscopy every 10 years:	98 (54%)
Annual fecal occult blood test (FOBT):	56 (31%)
Annual FOBT and flexible sigmoidoscopy every 5 years:	27 (15%)
Age recommended to start CRC screening:	
50 years	173 (95%)
Age recommended to stop CRC screening:	
75 years	17 (9%)
80 years	65 (36%)
85 years	18 (10%)
Not based on chronological age alone	75 (41%)

undergone clearing colonoscopy within the preceding 5 years, and 23% would screen an 80 year old with a similar history.

The interactions between patient age and clinical variables, and their impact on provider likelihood of recommending screening are presented in Table 2: The percentage of providers who recommended screening decreased as patient age increased for a given scenario.

Selected within-age group changes in screening recommendations based on comorbidity and prior CRC screening are presented in Table 3. For a 75 year old patient, providers were significantly more likely to recommend screening in the presence of milder comorbidity, longer life expectancy, and longer time since most recent screening. These trends were maintained for 80 and 85 year old patients, except for prior screening history, which was no longer a significant factor for 85 year old patients (Table 3).

In the GEE analysis with terms for patient age, comorbidity, and patient age-comorbidity interaction, provider characteristics were not significantly associated with the probability of a screening recommendation with one exception. This was the scenario where the patient had a clearing colonoscopy within the previous 10 years: there was a significant interaction between provider age and patient age ($p=0.04$), with older providers less likely to recommend screening for an 85 year old patient who had a clearing colonoscopy within the previous 10 years. There were no main effects for provider graduation location ($p=0.62$), provider board certification status ($p=0.28$), and gender ($p=0.26$). There were no significant interactions between provider age and patient age groups, indicating that providers were less likely to recommend screening for older patients regardless of their own age.

DISCUSSION

In this survey of VA practitioners, we described provider recommendations for vignettes on CRC screening in the elderly

when faced with patients of different ages, degrees of comorbidity, and prior history of CRC screening, and we explored patient and provider characteristics associated with screening recommendations. We found that VA providers reported being less likely to recommend screening for CRC as patient age increased; this trend was maintained regardless of patient health status as measured by a specific disease state and severity, or life expectancy. Most providers reported they would not screen an elderly patient with a life expectancy of less than 5 years, which is the cutoff below which there is no clear disease-specific survival benefit from CRC screening^{4-6,10}. This trend was maintained whether the patient had specific advanced disease states (severe CHF or severe COPD) or whether the patient's life expectancy was less than 5 years irrespective of the degree of comorbidity. However, a substantial minority of respondents (15–21%) reported they would screen a 75 year old with an active extracolonic malignancy, severe CHF, or severe COPD, indicating that age is an important factor in making screening decisions in the elderly, even in the presence of severe comorbidity.

Based on responses to these vignettes, providers appear to assign a cutoff age of 80 depending on the patient's underlying comorbidity: this was the case for patients with an active extracolonic malignancy or with severe COPD. Conversely, for

Table 2. Proportion of Providers Reporting They Are Likely to Recommend CRC Screening by Patient Age, Comorbidity, and Previous Screening (N = 183)

Patient factor	75 year old patient	80 year old patient	85 year old patient	Age comparison (P-value)	
				75–80	80–85
No other medical problems	95%	66%	39%	<0.0001	<0.0001
Moderate CHF	61%	27%	17%	<0.0001	0.003
Severe CHF	15%	9%	4%	1.00	0.56
Moderate COPD	63%	27%	16%	<0.0001	0.003
Severe COPD	17%	7%	4%	0.02	1.00
Active malignancy outside the colon	21%	10%	7%	0.07	1.00
Life expectancy <5 years	9%	7%	4%	1.00	1.00
Life expectancy <10 years	43%	26%	15%	<0.0001	0.003
Sigmoidoscopy within preceding 5 years	74%	34%	19%	<0.0001	<0.0001
Sigmoidoscopy within preceding 10 years	87%	46%	23%	<0.0001	<0.0001
Colonoscopy within preceding 5 years	53%	23%	13%	<0.0001	0.20
Colonoscopy within preceding 10 years	77%	42%	20%	<0.0001	<0.0001

Table 3. Selected Within-Age Group Screening Recommendation Comparisons

Age	Patient factor	Patient factor	OR (95% CI)	P-value
75	Moderate COPD	Severe COPD	7.5 (5.0–11.3)	<0.0001
75	Moderate CHF	Severe CHF	9.0 (5.8–14.0)	<0.0001
75	Life expectancy <10 years	Life expectancy <5 years	6.9 (4.4–11.0)	<0.0001
75	Sigmoidoscopy within preceding 10 years	Sigmoidoscopy within preceding 5 years	2.5 (1.6–3.8)	0.011
75	Colonoscopy within preceding 10 years	Colonoscopy within preceding 5 years	3.2 (2.3–4.5)	<0.0001
80	Moderate COPD	Severe COPD	4.7 (2.8–7.8)	<0.0001
80	Moderate CHF	Severe CHF	3.6 (2.3–5.5)	<0.0001
80	Life expectancy <10 years	Life expectancy <5 years	4.8 (2.9–8.0)	<0.0001
80	Sigmoidoscopy within preceding 10 years	Sigmoidoscopy within preceding 5 years	1.7 (1.4–2.2)	0.001
80	Colonoscopy within preceding 10 years	Colonoscopy within preceding 5 years	2.6 (1.9–3.5)	<0.0001
85	Moderate COPD	Severe COPD	4.3 (2.3–8.0)	0.001
85	Moderate CHF	Severe CHF	3.9 (2.2–7.0)	0.0009
85	Life expectancy <10 years	Life expectancy <5 years	3.4 (1.9–6.1)	0.006
85	Sigmoidoscopy within preceding 10 years	Sigmoidoscopy within preceding 5 years	1.3 (1.1–1.7)	0.87
85	Colonoscopy within preceding 10 years	Colonoscopy within preceding 5 years	1.6 (1.2–2.2)	0.63

patients with severe CHF or life expectancy <5 years, most providers reported they were unlikely to recommend CRC screening regardless of patient age. Similar trends were observed when past CRC screening was assessed: younger patients were more likely to be re-screened, and providers appeared to assign a cutoff age of 80 in specific situations, e.g., patients who had a colonoscopy within the previous 5 years. We also found that provider demographic characteristics were not significantly associated with the probability of a screening recommendation. Specifically, there was no association between provider characteristics and the likelihood of “inappropriate screening”: in individuals with short life expectancy (including presence of another active cancer, severe CHF or COPD, and life expectancy stated less than 5 years), and in those who had undergone screening colonoscopy within the preceding 5 years.

To our knowledge, this survey is the first to question providers regarding their practice patterns for screening for CRC in elderly patients in the VA system and to specifically assess the impact of prior screening for CRC in this setting. In a recent study, Lewis et al. surveyed a group of resident physicians at a university internal medicine program, and reported their life expectancy estimates and screening recommendations for hypothetical 75 and 85 year old women patients with good, fair, or poor health states¹⁵. The resident physicians' life expectancy estimates showed moderate agreement with life table estimates, and their recommendations for CRC screening varied appropriately according to patient life expectancy and health state¹⁵. Cooper et al. surveyed 884 primary care physicians to determine their recommendations for CRC screening using fecal occult blood testing (FOBT) and sigmoidoscopy in four pairs of clinical vignettes that varied by

patient age (65 or 75 years) and comorbidity (none, mild, moderate, and severe)¹⁴. Physicians were more likely to recommend screening with FOBT rather than sigmoidoscopy, regardless of patient age and comorbidity. Interestingly, many providers recommended screening with FOBT in inappropriate circumstances, such as a patient with a terminal malignancy¹⁴. Our study complements the aforementioned surveys and advances the field in at least two important ways: First, we surveyed primarily practicing primary care providers (physicians and nurse practitioners) as opposed to physicians-in-training, and this is likely to be more reflective of current screening practices within the VA system. Second, we included past endoscopic screening history in the clinical vignettes, an important factor in screening decision-making that has not been previously assessed and that is especially relevant in a geriatric population. The main strength of this study is its setting: the VA population tends to be older and with higher degrees of comorbidity, and VA providers likely face challenging screening decisions for their elderly patients on a frequent basis. Thus, our findings may be more reflective of actual practice patterns in cancer screening in geriatric age groups than surveys of physicians or residents who do not routinely oversee the care of geriatric patients.

Our study also suggests that inappropriate screening for CRC could occur in the VA system, as evidenced by the substantial minority of providers who would screen patients with an active malignancy, or with severe life-limiting comorbidity. This is also illustrated by the relatively high proportion of providers who would screen patients who had undergone a screening colonoscopy within the preceding 5 years, despite guidelines that recommend a 10-year interval in this setting²⁰. Recent data show that CRC screening in the VA system is not well targeted to patient comorbidity, with only 47% of patients with no comorbidity and 41% of patients with life expectancies less than 5 years having undergone screening¹⁷. Relatively high rates of screening have also been observed in the case of prostate-specific antigen (PSA) screening in elderly veterans²¹. The reasons for “inappropriate” cancer screening in the VA system are unclear, but may be partly driven by performance measures that measure adherence rates to practice guidelines to assess quality of care. As shown by Walter and colleagues²², these performance measures place pressure on local VAs to score well and thus increase screening rates, but do not properly take into account illness severity, patient preference, or physician judgment. The updated USPSTF guidelines, which recommend against routine screening for CRC in adults 76 to 85 years of age and against CRC screening in adults older than age 85, may ultimately lead to a decrease in CRC screening rates in elderly veterans. However, the impact of these new guidelines on clinical practice is not yet known, and our data collection preceded the publication of the updated guidelines.

Our study has several limitations. First, many of the providers who were surveyed had previously participated in a large survey-based study (CanCORS), and their responses and practice patterns may differ from those of VA practitioners who did not participate. However, there were no significant differences in the demographic and professional characteristics of respondents compared to non-respondents, limiting the impact of selection bias. Second, the sample size was relatively small, despite efforts to ensure a high response rate, and this could have limited our ability to detect meaningful associa-

tions between provider characteristics and screening recommendations. Third, response to hypothetical clinical vignettes may not reflect actual clinical practice. On one hand, clinician surveys tend to be hypothetical clinical “snapshots,” which may poorly reflect actual clinical practice, because the vignettes include too few variables to realistically mirror real-life complex medical situations. On the other hand, including too many variables to allow inclusion of all possible clinical scenario permutations would have led to a very large and impractical survey, and generated a large amount of difficult-to-interpret data. Additionally, one of our main aims was to examine the impact of the interaction between patient age and comorbidity on provider screening decisions, and this would have been obscured by the inclusion of additional variables in each vignette. Our work was intended to provide an initial framework for future studies assessing in greater detail variables affecting CRC screening decisions in elderly veterans. Thus, we believe our decision to include two variables in each vignette was a pragmatic, albeit imperfect, compromise. Fourth, we did not assess patient preference as a factor in CRC screening decision-making; in the study by Lewis et al., a significant association was found between physician uncertainty and the recommendation to let the patient make the decision about screening¹⁵. Finally, we did not specify screening modalities when surveying providers about their screening recommendations. In the study by Cooper and colleagues, providers recommended screening with FOBT much more frequently than sigmoidoscopy¹⁴, possibly because FOBT is non-invasive and providers caring for older patients with poor health consider it more appropriate for screening. Indeed, FOBT remains the dominant modality for CRC screening in the VA system²³. However, the effectiveness of screening for CRC depends on proper follow-up of patients with positive FOBT or sigmoidoscopy, and these patients should ideally undergo colonoscopy. This line of reasoning, which considers colonoscopy as the “final common pathway” for all CRC screening, is appropriate when patients are expected to derive a substantial survival benefit from screening that outweighs the risks of colonoscopy, but may not apply to older patients with limited life expectancy.

In conclusion, we found that VA providers incorporate patient age, comorbidity, life expectancy, and past CRC screening history in making decisions when considering CRC screening for elderly veterans, albeit in inconsistent ways with considerable variability. This is consistent with the evidence that clinicians rely on biases and heuristics in decision-making, and these factors (“intuitive” decision making²⁴) play a larger role as uncertainty increases²⁵. The impact of the new USPSTF guidelines on CRC screening practices in the VA system is yet to be determined, and it would be interesting to compare our findings with data collected after the publication of the guidelines. Further research with larger sample sizes is needed to address these gaps in evidence, to confirm our findings, and to identify provider characteristics associated with specific screening recommendations.

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