

## Colorectal Cancer Screening Practices among Obstetrician/Gynecologists and Nurse Practitioners

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### Abstract

**Objective:** Obstetrician/gynecologists (Ob/Gyn) and nurse practitioners (NP) are essential providers of primary and preventive care for their female patients. Therefore, colorectal cancer (CRC) screening should be part of their routine preventive practices. The purpose of our study is to evaluate the CRC screening practices of these providers.

**Methods:** A self-administered survey was mailed to a national sample of 1130 Ob/Gyns and NPs to assess providers' demographics, current CRC screening practices, and familiarity with CRC guidelines.

**Results:** Three hundred thirty-six providers (29.7%) returned our survey (54% Ob/Gyns and 46% NPs). Three fourths of providers routinely performed screening for CRC, compared with 95% for breast and cervical cancer. Routine CRC screening was more common among Ob/Gyns (87.2%) than NPs (61.7%) ( $p < 0.001$ ). Slightly over half of providers correctly identified the recommended age to begin CRC screening for the average-risk patient, with no significant difference between provider types. Overall, Ob/Gyns scored higher than NPs on a series of questions assessing CRC screening ( $p < 0.03$ ). Several provider factors were found to be significantly associated with screening practices, including practicing  $>10$  years ( $p < 0.01$ ), practicing in a multispecialty group (2.62 times more likely), and having an older patient population ( $p < 0.001$ ).

**Conclusions:** Ob/Gyns and NPs underuse CRC screening compared with breast and cervical cancer screening and lack knowledge about appropriate use of CRC screening modalities. Opportunities to further educate Ob/Gyns and NPs should be sought to improve compliance with current CRC screening guidelines.

### Introduction

COLORRECTAL CANCER (CRC) is the third leading cause of cancer and cancer-related deaths in women.<sup>1</sup> In 2007, there will be an estimated 74,630 new diagnoses of colorectal cancer and 26,180 associated deaths in women.<sup>1</sup> The current recommended CRC screening tests for cancer prevention and cancer detection based on the most recent U.S. multisociety task force guidelines (American College of Gastroenterology, American College of Gastrointestinal Endoscopy, American College of Physicians/Society of Internal Medicine, and American Cancer Society) include colonoscopy every 10 years; flexible sigmoidoscopy, CT colonography, or barium enema every 5 years; yearly fecal occult blood test (FOBT) or fecal immunohistochemical test; and stool DNA, interval

unknown.<sup>2</sup> Despite these recommendations, CRC screening compliance among patients remains low. Data from the National Behavioral Risk Factor Surveillance System (BRFSS) in 2004 demonstrated only a 57% adherence rate for all CRC screening modalities.<sup>3</sup>

Women are less likely than men to be up-to-date with their CRC screening.<sup>4-11</sup> Therefore, it is critical to examine the CRC screening practices of physicians and nurse practitioners (NPs) who routinely provide primary care to women. Studies have shown that 38%–93% of gynecologists report providing primary care to their patients.<sup>12-14</sup> Since 1996, the Council on Resident Education in Obstetrics and Gynecology has recognized the importance of their discipline's role in women's primary healthcare and has required 6 months of primary care in their curriculum. In addition, NPs are used regularly in

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obstetrician/gynecologist (Ob/Gyn) practices and routinely perform health maintenance examinations. Thus, it is critical to ensure that CRC screening has been incorporated into both the Ob/Gyns' and NPs' preventive screening practices.

The objective of this study is to examine current CRC screening practices relative to nationally accepted guidelines and other preventive screening practices, such as mammography and cervical cancer screening, in a nationally representative sample of Ob/Gyns and NPs.

## Materials and Methods

### Sample population

After attaining IRB approval at the University of Michigan, we surveyed a nationally representative sample of Ob/Gyns and NPs in 2005–2006. The American Medical Association's Physician Masterfile was used as the sampling frame. The eligible population consisted of Ob/Gyns and NPs aged  $\leq 75$  years with an active license; 5526 individuals (1715 Ob/Gyns and 3811 NPs) met these eligibility criteria. A cross-section of the eligible population was selected using a systematic, stratified random sampling approach, which yielded 565 in each group of providers for a total of 1130 potential respondents. No information was collected on nonrespondents.

### Survey methods

A survey was mailed to all 1130 potential respondents. To enhance participation, nonresponders were sent a reminder postcard 1 month after the initial survey mailing. An additional mailing to nonresponders was conducted 12 weeks after the initial survey mailing. The survey instrument was composed of 31 questions and was based on constructs from previously used surveys.<sup>15,16</sup> Data regarding personal and practice demographics were ascertained, including sex, race/ethnicity, practice type, community size, years in practice, percentage of primary care practice, percentage of patients aged  $\geq 50$ , and weekly patient volume. To assess baseline general preventive patient practices, we inquired about use of mammography, Papanicolaou (Pap) smear, and bone densitometry testing.

CRC screening methods were evaluated by determining the most frequent methods used; use of in-office vs. in-home FOBT; FOBT testing restrictions, such as avoiding meat, anticoagulants, and nonsteroidal anti-inflammatory drugs (NSAIDs); and age to initiate CRC screening in patients of various risk (i.e., with or without a family history of CRC or adenomatous polyps). Finally, we asked participants to assess CRC screening candidacy in three clinical scenarios that were representative of varying patient risk levels for CRC: patients with a history of ulcerative colitis, positive FOBT, or adenomatous polyp.

### Statistical analysis

The primary outcome measure was the reported routine use of CRC screening. A secondary outcome was the reported routine use of a recommended method of CRC screening. We compared the routine use of CRC screening with routine breast and cervical cancer screening and bone densitometry testing. We then examined demographic predictors of routine use of CRC screening, including age, race/ethnicity, practice type, number of years in practice, proportion of visits

classified as primary care, and the proportion of patients  $\geq 50$  years.

Knowledge about CRC screening was measured by creating a summary score from answers to six individual items. These items addressed the age to start screening for an average-risk patient, age to start screening in a patient with a first-degree relative diagnosed with CRC or adenomatous polyp  $< 60$  and  $> 60$  years old, and three hypothetical clinical scenarios. The three clinical scenarios presented included a patient with a positive FOBT, a patient with a history of ulcerative colitis that affected the entire colon, and a patient with a personal history of an adenomatous polyp. Each correct answer was worth 1 point, and all other answers were worth 0 points. The total score was calculated by summing the points generated by each individual answer.

Each potential predictor variable was first examined in relation to routine use of CRC screening; bivariate analyses were performed using chi-square tests for categorical variables and Student's *t* tests for continuous variables. Multivariable logistic regression analysis was subsequently performed to determine the adjusted odds ratios (OR) of variables that achieved bivariate statistical significance. *p* values of  $< 0.05$  were considered statistically significant. All statistical analyses were done using SPSS version 13.0 (SPSS, Chicago, IL).

TABLE 1. CHARACTERISTICS OF STUDY POPULATION  
(*N* = 336)<sup>a</sup>

Characteristic	Ob/Gyn ( <i>n</i> = 182)	Nurse practitioner ( <i>n</i> = 154)
Sex		
Female*	81 (44.5%)	150 (97.4%)
Age, years,* mean (SD)	55.5 (8.3)	50.9 (8.4)
Race		
Caucasian	150 (83.7%)	135 (88.8%)
Other	29 (16.2%)	17 (11.2%)
Practice type*		
Private	147 (80.1%)	66 (42.9%)
Multispecialty	18 (9.9%)	11 (6.0%)
Academic	7 (3.8%)	20 (12.6%)
HMO	1 (0.5%)	8 (5.2%)
Community size*		
$< 50,000$	34 (18.9)	34 (22.3)
51,000–100,000	37 (20.1)	48 (31.6)
$> 100,000$	109 (60.6)	70 (46.1)
Years practicing*		
$< 5$	8 (4.4)	13 (8.4)
5–10	4 (2.2)	34 (22.1)
$> 10$	169 (92.9)	107 (69.5)
% of visits classified as primary care, mean (SD)*	38.6% (33.7)	29.0% (32.4)
No. who provide primary care	157 (86.3)	126 (81.8%)
Patients seen per week, mean number (SD)*	70.0 (31.8)	60.7 (34.4)
% of patients $\geq 50$ years, mean (SD)*	42.5% (23.5)	20.7% (23.5)

\**p*  $< 0.05$ .

<sup>a</sup>Numbers may not equal 100% because of multiple or missing answers by respondents.

**Results**

*Characteristics of study population*

Of the 1130 potential respondents, 336 (29.7%) returned the mailed survey. The study population comprised 182 (54%) Ob/Gyns and 154 (46%) NPs. Characteristics of the study population are described in Table 1. Overall, most respondents were Caucasian (84.8%), worked in private practice settings (63.4%), and had been in practice for >10 years (82.1%). Compared with NPs, a greater proportion of the Ob/Gyns were male, older, worked in private practice settings, worked in larger communities, had been in practice for >10 years, and cared for an older patient population.

*Preventive screening practices*

Routine screening practices of Ob/Gyns and NPs are shown in Table 2. A significantly larger proportion of Ob/Gyns (87.2%) reported ordering or performing CRC screening compared with only 61.7% of NPs ( $p < 0.01$ ). However, CRC screening was ordered less than mammography and cervical cancer screening among both provider groups, but more frequently than cholesterol and bone mineral density (BMD) screening. Routine CRC screening was significantly associated with routine use of other preventive screening practices ( $p < 0.001$ ).

*Practitioner personal preferences*

Respondents were asked to indicate their preferences for their own personal CRC screening; 67% preferred colonoscopy. Sixty-three percent of Ob/Gyns and 24% of NPs had themselves already undergone a colonoscopy or FOBT by the time of the survey.

*CRC screening method used and follow-up of positive screening tests*

Overall, the most common CRC screening methods used for patients were FOBT and colonoscopy (76.2% and 28.3%, respectively). A significantly larger proportion of Ob/Gyns (37.0%) reported ordering colonoscopy compared with only 19.8% of NPs ( $p < 0.005$ ). Sixty-eight percent of providers performed FOBT using in-office digital rectal examination; 30% reported using in-office digital rectal examination exclusively as their CRC screening modality. Of the remaining respondents, 15% of providers used in-home FOBT exclusively

and 36% used both in-home and in-office FOBT. If a patient's FOBT was positive, 61% of providers indicated they would refer for colonoscopy, yet 21% would repeat the FOBT. Although most providers reported screening routinely for CRC, many were not correctly using the five recommended screening methods and did not respond to positive testing in accordance to current recommendations.

*CRC screening knowledge*

Table 3 shows providers' performance on survey items measuring knowledge. Overall, 55.4% of providers identified the correct age (50 years) to initiate CRC screening in patients of average risk; one third (33.2%) of respondents thought CRC screening should be initiated at 40 years of age, and 8.2% thought that it should be initiated at 45 years of age. Generally, Ob/Gyns performed better than NPs on most items. Most providers in either group were unable to identify the correct age to begin screening in patients with a first-degree relative with CRC/polyps at age >60. Fifty-five percent of providers thought that it was never appropriate to discontinue

TABLE 3. CRC SCREENING KNOWLEDGE AMONG OBSTETRICIAN/GYNECOLOGISTS AND NURSE PRACTITIONERS

Knowledge item (correct answer)	% Correct answers	
	Ob/Gyn (%)	Nurse practitioner (%)
Age to begin screening for average risk patient (age 50)	104 (57.1)	82 (53.2)
Age to begin screening in patient with two or more 1st-degree relatives of any age or 1st-degree relative <60 with CRC or polyps (age 40)	137 (75.3)	117 (76.0)
Evaluation of average risk patient with positive FOBT* (colonoscopy)	173 (95.1)	126 (81.8)
Screening frequency in patient with ulcerative pancolitis >10 years* (every 1-2 years with colonoscopy)	173 (95.1)	134 (87.0)
Evaluation of patient with adenomatous polyp diagnosed >10 years ago* (colonoscopy)	176 (96.7)	137 (88.9)
Age to begin screening in patient with 1st-degree relative with CRC/polyps at age ≥60 (age 40)	76 (41.6)	65 (42.2)
Knowledge score,* mean, SD	4.36 (1.11)	4.09 (1.32)*

TABLE 2. SCREENING METHODS REPORTED BY OBSTETRICIAN/GYNECOLOGISTS (OB/GYN) AND NURSE PRACTITIONERS (NP)

Routine screening practices	Ob/Gyn (n = 182)	NP (n = 154)
Order CRC screening*	157 (87.2%)	95 (61.7%)
Mammography*	178 (98.9%)	140 (90.9%)
Cervical cancer screening*	176 (97.8%)	145 (94.8%)
Cholesterol	95 (52.8%)	64 (42.1%)
Order bone mineral densitometry (DEXA)*	129 (71.7%)	72 (47.1%)
Correct screening method	109 (59.9%)	92 (59.7%)

\* $p < 0.01$ .

\* $p < 0.05$ .

CRC screening regardless of age. There was a significant correlation between knowledge and routine CRC screening (correlation coefficient = 0.289,  $p < 0.01$ ) but not between knowledge and screening using a recommended method. Even after adjusting for provider type, years in practice, and practice type, this relationship remained statistically significant ( $p < 0.001$ ).

#### *Provider factors associated with CRC screening*

Several provider and practice factors were significantly associated with routine CRC screening in bivariate analyses, including provider type, provider sex, multispecialty practice type, greater number of years in practice, greater proportion of patient  $\geq 50$ , higher mean number of visits per week, and high proportion of visits characterized as primary care ( $p < 0.02$  for each variable). After adjusting for factors achieving bivariate significance, providers in multispecialty groups were 2.62 times more likely to report routine CRC screening compared with those in single specialty private practices (95% confidence interval [CI] 1.21-5.68). The adjusted OR of routine screening for a 1 percentage point increase in the proportion of patients  $> 50$  years old was 0.981 (95% CI 0.967-0.996), which corresponds to an approximately 17% decrease in the likelihood of routine screening for every 10 percentage point increase in the proportion of patients  $> 50$  years old. Those in practice between 5 and 10 years were 2.56 times more likely to report routine screening than those in practice  $> 10$  years (95% CI 1.1-5.97). Provider gender was not associated with routine screening, but males were less likely than females to report using a recommended screening method (OR 0.41,  $p < 0.005$ ). Finally, there was no difference in reported rates of routine screening between NPs and Ob/Gyns, although NPs were less likely to report using a recommended screening method than Ob/Gyns ( $p < 0.001$ ).

#### **Discussion**

Improving CRC screening practices is an initiative promoted by several professional societies, including the American College of Obstetricians and Gynecologists (ACOG). This study is the first to describe current CRC screening practices and knowledge among Ob/Gyns and NPs in light of the most recent practice guidelines.<sup>2</sup> Our findings suggest that both provider knowledge and screening practices need improvement, particularly with regard to FOBT use.

Our findings are similar to those of studies of other physicians. In two national surveys of primary care physicians, 85.1%–98% of participants recommended CRC screening.<sup>16,17</sup> In contrast, screening rates among gastroenterologists are reported to be as high as 98%.<sup>15</sup> However, NPs in our study reported lower screening rates than in previous studies. In 2000, Shaheen et al.<sup>18</sup> conducted a survey of NPs and physician assistants. They reported 69% of primary care NPs reported recommending flexible sigmoidoscopy and 92% reported performing FOBT.

Current recommendations regarding FOBT testing include two samples from three consecutive stools that are not rehydrated using either a guaiac-based test with dietary restriction (avoiding red meat) or an immunochemical test without dietary restriction.<sup>19</sup> For both Ob/Gyns and NPs in our sample, FOBT (66%) was the diagnostic modality most often used for

screening, but it appears that many are not using it as recommended. Almost one third of participants reported relying on a single stool sample obtained by in-office digital rectal examination as their screening modality. Similarly, Maminski<sup>20</sup> reported in a retrospective study of gynecology patients that 43% of CRC screening consisted of a single digital FOBT. Single-sample digital rectal examination appears to be a common practice of other primary care providers as well.<sup>21</sup> The sensitivity of single digital FOBT is markedly lower (4.9%) than that of home FOBT kits (23.9%), which assess two samples from three consecutive stools.<sup>21</sup> Further, 66% of practitioners in our study rehydrated stool samples, which is not recommended in the current guidelines because it decreases the performance of the assay.<sup>19</sup> Finally, 43% of those surveyed failed to include dietary restrictions when using guaiac-based FOBT, and a similar proportion reported withholding NSAIDs, although there are no recommendations to do so.<sup>19</sup>

The effectiveness of FOBT as a CRC screening tool is determined in part by additional testing, specifically, ordering a colonoscopy when a positive test occurs. One fifth of our study participants would repeat the FOBT after a positive result, which is similar to respondents elsewhere.<sup>21</sup> Because important lesions may bleed only intermittently, confirmatory FOBT could miss clinically important lesions.<sup>22</sup> Therefore, follow-up of all positive tests with colonoscopy is indicated.<sup>19,22</sup>

Despite the fact that FOBT was the most commonly used modality, providers preferred colonoscopy for themselves. This discordance could be explained by a number of factors, including convenience of FOBT, cost, availability or risks of colonoscopy, and patient compliance. Klabunde et al.<sup>23</sup> demonstrated from the 2000 National Health Interview Survey that 46% of primary care providers cited cost and lack of insurance as one of the major barriers to CRC screening. In a recent survey of primary care providers in Wisconsin, 68.5% cited cost as the major reason for not recommending colonoscopy, and 33.2% and 26.1% reported a lack of availability or risk of perforation, respectively, as barriers to colonoscopy.<sup>24</sup> Providers' expectation of low patient compliance might also explain the relatively low use of colonoscopy. However, providers are not particularly good at determining which features of a diagnostic test are important to patients and affect their compliance.<sup>25</sup>

Clearly, opportunities for improving knowledge about CRC screening exist. For instance, only slightly more than half (54.6%) of our respondents were able to identify the correct age to initiate screening in average-risk patients. Performance in our study was only slightly better than in a 1997 study of primary care providers (48.5%) but worse than a 1999 survey of gastroenterologists (71%).<sup>15,16</sup> Our findings are disheartening, as CRC screening guidelines for average-risk populations have been available since 1997. As demonstrated by our and others' findings, further education is needed to improve screening for patients at increased risk for CRC.<sup>24,26</sup>

We found three provider factors that appeared to be positively associated with CRC screening. After controlling for other influencing factors, practitioners in multispecialty groups were 2.62 times more likely to report routine CRC screening compared with those in single specialty private practices. This may be due to enforcement of practice standards as a result of managed care or group economics. We also found that providers in practice between 5 and 10 years

were more likely to report screening than other groups, which is consistent with other studies suggesting recent graduates are more likely to screen for CRC than those in practice >10 years.<sup>27,28</sup> In previous work, provider gender has also been shown to affect patient CRC screening adherence. Menees et al.<sup>29</sup> demonstrated that having a female physician was associated with increased prevalence of CRC screening at the time of upper endoscopy (EGD) and increased CRC screening completion in the following 6 months. Other studies have suggested that patients of female physicians were more likely to undergo breast and cervical cancer screening than those with male physicians.<sup>30,31</sup> Although female providers in our study were not more likely to report screening than males, they were more likely to report using a recommended method. This result supports previous findings, where women physicians have been found to be more focused on prevention than their male counterparts and have more favorable views and beliefs on prevention.<sup>32–34</sup>

This study sampled practicing Ob/Gyns and NPs from the American Medical Association's membership list. However, this group may not represent the larger group of practicing Ob/Gyns or NPs in this country. A more representative sample of Ob/Gyns would probably be obtained by sampling members of the ACOG, but their membership lists were not available. When compared with studies of ACOG members, our sample tended to be slightly older but had a similar proportion of female physicians. Further, respondents in our study and in other studies of ACOG members tend to be in practice for  $\geq 10$  years.<sup>35,36</sup>

We also acknowledge several other study limitations. First, the low response rate (29%) limits the generalizability of our findings, but it is reassuring that our responses were fairly consistent with studies of other provider types, some of which might be expected to be more knowledgeable about CRC screening than Ob/Gyns. Additionally, as those who respond to surveys are typically thought to have a particular interest or knowledge in the study topic, we would expect that our sample would perform better than nonresponders. Therefore, our results probably do not underestimate screening practices or knowledge about CRC screening. Additionally, reporting bias may be present in these data because we are relying on self-reported data. Again, we would expect that influence to result in an overestimate of CRC screening practices. Other studies have shown that clinicians overestimate their cancer screening practices.<sup>37–39</sup>

## Conclusions

Our results demonstrate important CRC screening patterns among Ob/Gyns and NPs. Routine screening for CRC among Ob/Gyns and NPs is less frequent than screening for other cancers, such as breast cancer or cervical cancer. Even though up to 80% of surveyed providers reported performing routine CRC screening, only 59% routinely screen following recommended guidelines, and 53% were able to identify the correct age to initiate screening. The incorrect use of FOBT is prevalent especially among Ob/Gyns, as is inadequate follow-up of positive FOBT results. As many women seek primary care from Ob/Gyns and NPs, further education of both healthcare providers and patients may improve compliance with current CRC screening guidelines.

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## Disclaimer Statement

The authors have no conflicts of interest to report.

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