



## Influence of provider discussion and specific recommendation on colorectal cancer screening uptake among U.S. adults <sup>☆☆☆</sup>



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### ABSTRACT

**Objectives.** It is unclear if provider recommendations regarding colorectal cancer (CRC) screening modalities affect patient compliance. We evaluated provider–patient communications about CRC screening with and without a specific screening modality recommendation on patient compliance with screening guidelines.

**Methods.** We used the 2007 Health Information National Trends Survey (HINTS) and identified 4283 respondents who were at least 50 years of age and answered questions about their communication with their care providers and CRC screening uptake. We defined being compliant with CRC screening as the use of fecal occult blood testing (FOBT) within 1 year, sigmoidoscopy within 5 years, or colonoscopy within 10 years. We used survey weights in all analyses.

**Results.** CRC screening discussions occurred with 3320 (76.2%) respondents. Approximately 95% of these discussions were with physicians. Overall, 2793 (62.6%) respondents were current with CRC screening regardless of the screening modality. Discussion about screening (odds ratio (OR) = 8.83; 95% confidence interval (CI): 7.20–10.84) and providers making a specific recommendation about screening modality rather than leaving it to the patient to decide (OR = 2.04; 95% CI: 1.54–2.68) were associated with patient compliance with CRC screening guidelines.

**Conclusion.** Compliance with CRC screening guidelines is improved when providers discuss options and make specific screening test recommendations.

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### Introduction

Although there are multiple acceptable modalities for colorectal cancer (CRC) screening in the United States such as fecal occult blood

testing (FOBT) and fecal DNA testing, double contrast barium enema, CT colonography, flexible sigmoidoscopy, and colonoscopy (Levin et al., 2008), the uptake of CRC screening is suboptimal in the general population (Carcaise-Edinboro and Bradley, 2008; Palmer et al., 2011; Seeff et al., 2004; Shapiro et al., 2001, 2008). Previous studies have shown that a lack of patient awareness is a commonly reported barrier to undergoing screening, while having seen a physician within the past year, spending adequate time discussing screening, and lower perceived barriers to CRC testing are strongly associated with increased uptake of CRC screening (Bazargan et al., 2009; Carcaise-Edinboro and Bradley, 2008; Seeff et al., 2004). This underscores the importance of doctor–patient communication in promoting CRC screening uptake. However, it is unclear what strategies to adopt in encouraging CRC screening in the primary care setting. Should providers discuss the full menu of CRC screening options with patients and let the patients decide what screening option they prefer, or should the provider recommend a

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specific screening modality to the patient after discussing the various available options?

Furthermore, it is unknown how the presence or absence of provider recommendations regarding the choice of CRC screening modality affects a patient's status of being compliant with CRC screening guidelines. In the present study, we evaluated whether subjects were more likely to be compliant with CRC screening guidelines when their care providers discuss CRC screening options and make specific recommendations regarding the choice of screening modality.

## Methods

### Study population

The detail of the National Cancer Institute's 2007 Health Information National Trends Survey (HINTS) has been published (Cantor et al., 2009). In brief, HINTS was a survey containing questions about health-related information and behavior. The 2007 iteration was conducted between January 2008 and May 2008. Two modes of data collection were used: 1) by mail: in which surveys were mailed to random addresses on a list obtained from the United States Postal Service; and 2) random digit dial by telephone: in which participants completed a thirty-minute phone survey. The overall response rate was 24.2% for the telephone sample and 31% for the mail sample. A total of 3582 subjects responded to the mail survey while 4092 respondents completed the telephone survey for a total of 7674 participants in the study. In the survey, participants were asked to "think about the last time a doctor, nurse or other health professional told you that you should get a test to check for colon cancer. When did that discussion take place?" The response options were: 1) a year ago or less, 2) more than 1 but not more than 2 years ago, 3) more than 2 but not more than 5 years ago, 4) over 5 years ago, 5) I do not remember, and 6) no health professional has told me I should get this test." They were further asked about who discussed CRC screening with them and the tests discussed (FOBT, sigmoidoscopy or colonoscopy). They were also asked "the last time you were told you should be tested for colon cancer, did the doctor, nurse or other health professional recommend to you any particular test?" and "Which test to check for colon cancer did the doctor, nurse or other health professional recommend to you?" They were further asked if they have had FOBT, sigmoidoscopy or colonoscopy and when they had the tests (please see <http://hints.cancer.gov/instrument.aspx> for more detail about the survey instrument).

For the present analysis, we excluded 2938 respondents who were younger than 50 years of age, 79 respondents whose ages were unknown, 76 people with a previous history of CRC, 239 people who did not provide information to determine their CRC screening status and 59 respondents who did not answer questions regarding CRC screening discussion. Thus, our analytical cohort consisted of 4283 (1845 mail and 2438 telephone) respondents. The Institutional Review Board of Howard University, Washington, DC approved the current study.

### Statistical analyses

Per HINTS guidelines regarding the use of this dataset, we evaluated the effect of the sampling method (mail versus telephone survey) in association with the discussion of the CRC screening variable. There was a slightly higher CRC discussion among mail survey respondents (77.8% versus 74.3%,  $P = 0.048$ ). Therefore, we analyzed the mail and telephone surveys separately and also in combination. Since the results were similar, we present the combined data as our main analysis.

We compared the characteristics of respondents who had discussions with their care providers regarding CRC screening with those who did not have such discussions. Our outcome of interest was patient status of being compliant with CRC screening guidelines, which we defined as the use of FOBT within 1 year, sigmoidoscopy within 5 years, or colonoscopy within 10 years. We used logistic regression analysis to compare the association of a CRC screening discussion and whether or not the care provider recommended a specific CRC screening test with patient compliance with CRC screening. We used survey weights in all analyses and variance estimations were performed using Taylor series linearization to account for the complex survey design. Our full model included age, sex, race, highest education achieved, marital status, smoking status, household income, health insurance status and having a regular healthcare provider. We calculated odds ratios (ORs) and 95% confidence intervals (CIs). We

used Stata® statistical software version 11.2 (College Station, TX) for all analyses and reported only weighted percentages.

## Results

In this analysis, there were 4283 survey respondents (weighted population size = 81,471,893). The mean age was 63.6 years (95% CI: 63.5–63.8 years) and 2575 (53.5%) were female. Table 1 shows the characteristics of respondents by whether they had discussions with a healthcare provider regarding CRC screening or not. A total of 3320 (76.2%) respondents had CRC screening discussions with their healthcare providers and these discussions took place with a physician among 94.7% of respondents. CRC discussions were more likely to occur with non-Hispanic whites and those with college education, higher household income, and health insurance. Having a regular care provider was an independent predictor of having CRC screening discussion (79.7% versus 57.5%, OR = 2.21; 95% CI: 1.66–2.97).

Overall, 2793 (62.6%) were compliant with CRC screening guidelines. Respondents who had CRC screening discussions were more likely to be compliant with CRC screening guidelines (OR = 8.83; 95% CI: 7.20–10.84) (Table 2). Compared with those who did not discuss CRC screening with their healthcare providers, the presence of a screening discussion without any specific recommendation on the choice of screening modality was associated with a 6-fold increased odds of being compliant with CRC screening (OR = 6.05; 95% CI: 4.79–7.64), whereas when a specific recommendation was made about screening modality, we observed a 13-fold increased odds of being compliant with CRC screening (OR = 12.11; 95% CI: 9.41–15.60). In a direct comparison among respondents who had CRC screening discussions with

**Table 1**  
Characteristics of respondents by CRC discussion.

Characteristics	CRC screening discussion		P value
	No N = 963 (23.8%)	Yes N = 3320 (76.2%)	
Mean age, years (95% CI)	63.2 (62.5–64.0)	63.8 (63.5–64.0)	
Sex, n (%)			0.01
Male	337 (21.4)	1371 (78.6)	
Female	626 (25.9)	1949 (74.1)	
Race, n (%)			<0.001
White	706 (21.6)	2685 (78.4)	
Black	87 (23.9)	267 (76.1)	
Hispanic	78 (37.0)	152 (63.1)	
Other	55 (41.6)	132 (58.4)	
Education status, n (%)			<0.001
Less than high school	143 (31.2)	286 (68.8)	
High school	316 (27.6)	832 (72.4)	
Some college/vocation	265 (22.7)	971 (77.3)	
College graduate	220 (15.7)	1205 (84.3)	
Marital status, n (%)			0.002
Unmarried	458 (27.5)	1263 (72.5)	
Married	485 (21.6)	2029 (78.4)	
Insurance status, n (%)			<0.001
Uninsured	131 (43.6)	177 (56.4)	
Insured	820 (22.1)	3094 (77.9)	
Income, n (%)			<0.001
<\$20,000	207 (31.0)	452 (69.0)	
\$20,000–\$35,000	192 (29.4)	476 (70.6)	
\$35,000–\$50,000	96 (21.0)	406 (79.0)	
\$50,000–\$75,000	143 (21.3)	545 (78.7)	
More than \$75,000	146 (16.5)	879 (83.5)	
Smoking status, n (%)			<0.001
Never	436 (23.7)	1564 (76.3)	
Former	318 (20.9)	1298 (79.1)	
Current	199 (32.2)	410 (67.8)	
Has regular healthcare provider, n (%)			<0.001
No	238 (42.5)	335 (57.5)	
Yes	714 (20.3)	2951 (79.7)	

Missing race = 121, education = 45, marital status = 48, insurance = 61, income = 741, smoking = 58, regular healthcare provider = 45. Population size = 81,471,893.

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