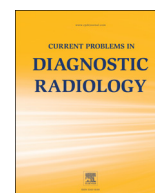




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Patient Preferences Regarding Colorectal Cancer Screening: Test Features and Cost Willing to Pay Out of Pocket

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The purpose of this investigation was to evaluate whether test features would make an individual more or less likely to undergo colorectal cancer screening and how much an individual would be willing to pay out of pocket for a screening test. The methods include an administration of a survey to consecutive adult patients of a general medicine clinic. The survey consisted of Likert-scale questions assessing the patients' likelihood of choosing a screening test based on various test characteristics. Additional questions measured the patients' age, race, gender, and maximum out-of-pocket cost they would be willing to pay. Chi-square tests were used to assess the associations between the likelihood questions and the various demographic characteristics. In results, survey response rate was 88.8% (213 of 240). Respondents were 48.4% female (103 of 213), 51.6% male (110 of 213), 82.6% White (176 of 213), 11.3% African-American (24 of 213), and 6.1% other (13 of 213). Risk of internal injury and light exposure to radiation were the least desirable test features. Light sedation was the only test feature that most respondents (54.8%) indicated would make them likely or very likely to undergo a colorectal cancer screening test. The vast majority of respondents (86.8%) were willing to pay less than \$200 out of pocket for a colorectal cancer screening test. There was no statistically significant difference in the responses of males and females, or in the responses of individuals of different races or different ages regarding test features, or the amount individuals were willing to pay for a screening test. To conclude, survey results suggest that patient education emphasizing the low complication rate of computed tomographic colonography (CTC), the minimal risks associated with the low-level radiation exposure resulting from CTC, and the benefits of a sedation-free test (eg, no risk of sedation-related complication and no need for a driver) may increase patient acceptance of CTC. Additionally, an out-of-pocket cost of <\$200 would be preferable from the patient perspective.

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Introduction

Colorectal cancer is the third most common type of cancer and the second most common cause of cancer-related death in the United States.¹ An estimated 140,000 Americans were diagnosed with colorectal cancer in 2014, and an estimated 50,000 individuals died because of the disease.¹ Screening decreases mortality owing to colorectal cancer by detecting precancerous polyps and identifying earlier stage and more treatable cancers.^{2–5} However, only 65% of adults in the United States are up to date with colorectal cancer screening recommendations.⁶

Several different colorectal cancer screening options exist and include tests that detect both cancers and precancerous polyps (eg, colonoscopy and computed tomographic colonography [CTC]) and tests that detect primarily cancers (eg, fecal occult blood testing and fecal DNA testing).⁷ CTC is 78%–92% sensitive and 80%–88% specific for the detection of polyps and cancers ≥ 6 mm.^{8–10} CTC also is associated with fewer complications (eg, internal bleeding, bowel

perforation, and death) as compared with optical colonoscopy.⁸ However, although CTC utilization is increasing, it remains relatively low at our institution and nationally.^{11,12} Additionally, screening CTC is not covered by many health insurance providers.

The purpose of this pilot survey was to evaluate whether specific features would make an individual likely or unlikely to undergo a colorectal cancer screening test and how much an individual would be willing to pay out of pocket for such a test. This information likely be helpful to centers looking to grow their CTC service lines.

Materials and Methods

Pilot Survey Design

The survey consisted of 6 Likert-scale questions assessing the patients' likelihood of choosing an alternative testing mechanism based on various characteristics of the test itself (Fig 1). Additional questions measured the patients' age, race, gender, and maximum out-of-pocket cost they would be willing to pay for an alternative test mechanism.

This survey protocol was submitted to our institution's Institutional Review Board (IRB). According to the IRB's determination

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We are evaluating potential interest in a new method for screening for certain kinds of cancer (in particular, colorectal cancer). Please look at the following test features and indicate how likely you would be to try this new test.				
1. Intensive pretest procedures like laxatives				
Very unlikely				Very Likely
1	2	3	4	5
2. Light exposure to radiation				
Very unlikely				Very Likely
1	2	3	4	5
3. Risk of internal injury				
Very unlikely				Very Likely
1	2	3	4	5
4. Light sedation				
Very unlikely				Very Likely
1	2	3	4	5
5. Tests involving handling your own stool				
Very unlikely				Very Likely
1	2	3	4	5
6. Procedure involves inserting a device or tube into your body				
Very unlikely				Very Likely
1	2	3	4	5
7. If insurance did not cover this test, how much would you be willing to pay out of pocket for the test?				
< \$100	\$100 - \$199	\$200 - \$499	> \$500	
8. Gender (please circle): Male Female				
9a. Race (indicate all that apply): African-American Caucasian Other _____				
9b. Do you consider yourself Hispanic? (please circle) Yes No				
10. Age range: <50 50-59 60-69 70-75 76+				

Fig. 1. Survey instrument used to assess patient preferences regarding colorectal cancer screening test features.

letter, the survey did not require IRB review because it was an anonymous survey, and no identifiable patient information was collected.

Pilot Survey Location

Surveys were included in the paperwork given to consecutive patients at time of check-in in the Seavey Clinic (Emory Healthcare, Atlanta, GA). Patients completed the survey while in the clinic waiting room and were instructed to return the survey to either the clinic front desk staff or to their exam room nurse. The Seavey Clinic is a general internal medicine clinic within Emory Healthcare. The clinic serves adult patients and is staffed by 6 board certified internists and 1 nurse practitioner. In 2014, the clinic had 12,456 patient visits, and sees patients for routine preventative care visits, episodic visits, as well as visits for long-term care of chronic diseases. The primary patient catchment area is metropolitan Atlanta. Overall, 60% of patients have commercial insurance as their primary payer, 37% Medicare, and 3% are self-pay or have Medicaid or other insurance.

Statistical Analysis

Chi-square tests were used to assess the associations between the likelihood questions and the various demographic characteristics. Owing to the large number of tests, we used $P = 0.001$ to determine significance. All analyses were carried out using SAS 9.4 (Cary, NC).

Results

Survey response rate was 88.8% (213 of 240). Respondents were 48.4% female (103 of 213), 51.6% male (110 of 213), 82.6% White (176 of 213), 11.3% African-American (24 of 213), and 6.1% other (13 of 213). In all, 6 respondents identified as Hispanic. Overall, 70.5% of respondents were 50-75 years of age (Fig 2).

Responses related to test features are reported in Table 1. "Risk of internal injury" was the least desirable test feature (Table 1). Most respondents reported that they would be "very unlikely" to undergo a colorectal cancer screening test that had a risk of internal injury. "Light exposure to radiation" was the second least

desirable test feature with 48.2% of respondents reporting that they would be very unlikely or unlikely to undergo a test that involved light exposure to radiation. In all, 40% of respondents reported that they would be very unlikely or unlikely to undergo a colorectal cancer screening test that required inserting a tube or device into their body.

"Light sedation" was the only test feature that most respondents (54.8%) indicated would make them likely or very likely to undergo a colorectal cancer screening test. In all, 42% of respondents reported that "handling your own stool" would make them likely or very likely to undergo a colorectal cancer screening test. Regarding "intensive pretest procedures like laxatives," a nearly equal percentage of respondents reported that this test feature would make them unlikely or very unlikely (36.7%) or likely or very likely (39.5%) to undergo a colorectal cancer screening test.

There was no statistically significant difference in the responses of males and females, or in the responses of individuals of different races, or different ages regarding test features.

The vast majority of respondents (86.8%) were willing to pay less than \$200 out of pocket for a colorectal cancer screening test (Table 2). The amount that an individual was willing to pay for a colorectal cancer screening test did not vary based on age, gender, race, or test feature.

Discussion

Risk of internal injury and light exposure to radiation were the least desirable test features among survey respondents. These results suggest that emphasizing the lower complication rate of CTC as compared with optical colonoscopy and improved patient education regarding the minimal risks of low-level ionizing radiation may improve patient acceptance of CTC. Fear of procedural complication has been identified as a barrier to colonoscopy in prior studies.¹³⁻¹⁷ Serious complications (eg, bleeding, perforation, severe pain, a cardiovascular event, or death) have been reported to occur at a rate of approximately 2.8 per 1000 colonoscopies.⁸ By comparison, the risk of serious complication because of CTC is thought to be very small with no perforations reported in 2 studies that included > 14,000 screening CTCs.^{8,18,19}

We were surprised that light exposure to radiation was the second most undesirable test feature. A meta-analysis of observational studies found that in most studies comparing CTC with optical colonoscopy, patients preferred CTC.²⁰ A limitation of prior studies is that they evaluated patients who had already undergone CTC.²¹⁻²⁴ It may be that such individuals place less importance on the risk of low-level radiation if they have already decided to

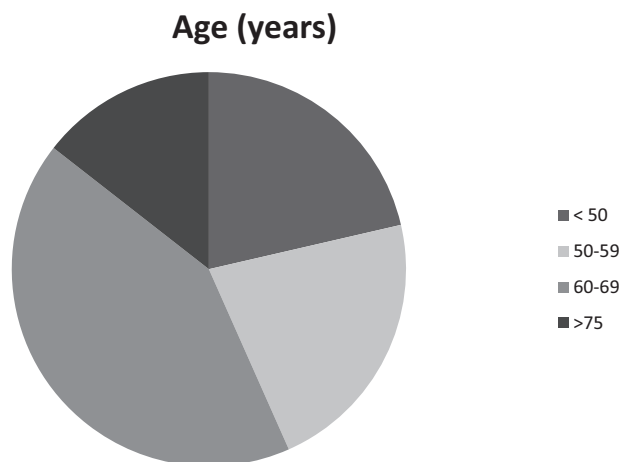


Fig. 2. Distribution of respondent ages.

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