Overcoming Poor Attendance to First Scheduled Colonoscopy: A Randomized Trial of Peer Coach or Brochure Support

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OBJECTIVES: Among patients unlikely to attend a scheduled colonoscopy, we examined the impact of peer coach versus educational brochure support and compared these with concurrent patients who did not receive support.

METHODS: From health system data, we identified 275 consecutive patients aged >50 who kept <75% of visits to 4 primary care practices and scheduled for a first colonoscopy from February 1, 2005 to August 31, 2006. Using block randomization, we assigned consenting patients to a phone call by a peer coach trained to address barriers to attendance or to a mailed colonoscopy brochure. Study data came from electronic medical records. Odds ratios of colonoscopy attendance were adjusted for demographic, clinical, and health care factors.

RESULTS: Colonoscopy attendance by the peer coach group (N=70) and brochure group (N=66) differed by 11% (68.6% vs 57.6%, respectively). Compared with the brochure group, the peer coach group had over twofold greater adjusted odds ratio (AOR) of attendance (2.14, 95% confidence interval [CI]=0.99–4.63) as did 49 patients who met the prespecified criteria for needing no support (2.68, 95%CI=1.05–6.82) but the AORs did not differ significantly for 41 patients who declined support (0.61, 95%CI=0.25–1.45) and 49 patients who could not be contacted (0.85, 95%CI=0.36–2.02). Attendance was less likely for black versus white race (AOR=0.37, 95%CI=0.19–0.72) but more likely for patients with high versus low primary care visit adherence (AOR=2.30, 95%CI=1.04–5.07).

CONCLUSION: For patients who often fail to keep appointments, peer coach support appears to promote colonoscopy attendance more than an educational brochure.

KEY WORDS: compliance; colonoscopy; colorectal neoplasms; minority groups; patient-centered care; peer support.

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INTRODUCTION

The potential to reduce morbidity and mortality from colorectal cancer, the second most common cause of cancer death in the U.S.,¹ has been compromised by only half of eligible patients being screened.^{2,3} Several studies have reported low rates of attendance to scheduled colonoscopy or sigmoidoscopy.^{4–6} Patients regard the colon preparation as onerous and colonoscopy as painful, invasive, and embarrassing.^{4,5,7,8} Primary care physicians often provide limited counseling when ordering these endoscopic studies,^{9,10} so patients are ill-prepared.⁵

Personalized support by patient navigators has improved adherence to cervical and breast cancer screening^{11,12} and has shown promise in promoting colorectal cancer screening.^{13,14} As an alternative to professional health educators, trained laypersons are increasingly used to offer support, especially for minority or low-income patients.¹⁵ Because patients who have never had a colonoscopy may dread this test,¹⁶ we hypothesized that a trained peer 'coach' could demystify the procedure and address common barriers to completion. This intervention's theoretical construct comes from the Theory of Planned Behavior (TPB).¹⁷ Peer coaches can address negative *attitudes* with information about the benefits of colonoscopy, change *subjective norms* by describing the experience and value of the procedure from a community member's standpoint, and increase *perceived behavioral control* by helping patients gain control over factors that concern them with regard to their ability to complete the colonoscopy.

An informational brochure significantly improved attendance to colonoscopy.¹⁸ In a randomized, controlled trial, we compared peer coach telephone support with mailed professional brochures about colorectal cancer screening in improving adherence to a first scheduled colonoscopy. We studied patients who often miss primary care appointments because they are also more likely to miss a colon study appointment.⁴ We compared colonoscopy attendance for persons receiving these interventions to attendance of concurrent patients who did not receive additional support.

METHODS

Study Population

The ambulatory scheduling and billing system (IDX Systems, Burlington, VT, USA) was used to identify all patients in 4 urban primary care practices who were scheduled for a colonoscopy from February 1, 2005 to August 31, 2006. We excluded patients with a record of a previous colonoscopy since December 1997

when our data on scheduled appointments began. Eligible subjects were at least 50 years old and had a colonoscopy scheduled by their primary care provider at 1 of 2 endoscopy suites. These suites send patients instructional sheets by mail and call several days before the appointment as a reminder.

From administrative data, we identified patients with at least 3 scheduled visits to a study practice since 2002 and selected those who kept less than the median proportion (<75%) of their appointments because they are less likely to attend their colon endoscopy appointment.⁴ All primary care physicians in study practices consented to their patients' participation. Patients received a letter about the study and a recruitment call by a research assistant. The research assistant first asked the patient a 10-point Likert scale question about readiness to attend the colonoscopy ranging from 'not at all ready' (1) to 'completely ready' (10). No support was offered to patients with high readiness (i.e., 9 or 10 on the scale); health professionals; or patients who believed they had had a colonoscopy outside of our health system. Consenting eligible patients were randomized in blocks of 6 to peer coach support or to mailed brochures about colorectal cancer screening. Randomization was not blinded and, by design, assignment alternated between the 2 arms to limit the peer coaches' work to specific time intervals. After the colonoscopy date, the research assistant called patients in the peer coach arm to ask their reactions to this support and, if the appointment was not kept, reasons for nonattendance.

Data on patient race, gender, age, and insurance type were obtained from the electronic medical record. We identified the reason for the test (i.e., screening or diagnostic) from electronic medical records, paper charts, or test reports in our scheduling system. Diagnostic colonoscopies were ordered for following problems: anemia, positive family history, hematochezia/hemoccult positive stool, weight loss, change in bowel habits, abdominal pain, diarrhea, and inflammatory bowel disease.

Peer Coach and Brochure Interventions

Physicians from two study practices nominated 7 older patients who were good communicators and had had a colonoscopy to serve as peer coaches. Five (3 African American and 2 white) consented and completed the training program. A half-day program included a slide lecture by the study physicians (BJT and KF) about the biology and epidemiology of polyps and colorectal cancer with a focus on racial-ethnic and gender differences. The program addressed the strengths and weaknesses of screening modalities and specifics about colonoscopy. The trainees viewed Katie Couric's colonoscopy video. Trainees then listed potential barriers to colonoscopy attendance and compared these with barriers from literature review. Barriers were classified according to the TPB as: personal attitudes/behaviors, social norms, and perceived behavioral control such as completing the colon preparation and how to avoid eating the day before the procedure. The final list of barriers was integrated into a scripted guide for the peer coaches to follow during patient calls.

Trainees also learned several communication skills based on motivational interviewing (MI), a technique promoting behavioral change.¹⁹ Approaches include assessing readiness to change, expressing empathy, and supporting self-efficacy. Peer coaches followed the MI framework of elicit-provide-elicit when asking about barriers to encourage a nonconfrontational ap-

proach. The session ended with a question and answer session with a gastroenterologist.

All peer coaches completed 2 conference calls to review MI techniques and at least 2 simulated telephone interviews with an expert in MI who provided immediate feedback. The research assistant audited at least 1 actual patient call for adherence to the script and MI techniques.

The research assistant scheduled peer coach calls within 2 weeks of the colonoscopy appointment. Calls generally lasted 15 minutes. Rare clinical questions, such as which colon preparation to use, were referred to the endoscopy suite for clarification. Because of scheduling conflicts, 3 peer coaches delivered the intervention and received \$60 and \$30 for training and each completed patient call, respectively.

The brochure group received 2 brochures by the American Cancer Society (Colon Testing Can Save Your Life) and the Centers for Disease Control and Prevention (Basic Facts on Screening), which offer patient-oriented information about the reasons for screening, risk factors, benefits, and various screening modalities, especially colonoscopy. All intervention patients received a movie ticket coupon after the initial recruitment call. The peer coach group received a second ticket after completing a debriefing call after the colonoscopy date.

Analysis

The study outcome was attending the first colonoscopy appointment according to our IDX scheduling system. Patients who canceled or did not show were considered not arrived. Cancellations were frequently tantamount to not showing up because they were often within 24 hours of the test. When the endoscopy suite changed the test date, we examined the arrival status at the rescheduled visit.

Our primary analysis compared colonoscopy attendance of peer coach and brochure groups. With 70 patients in each arm, we could detect a 20% difference with an alpha of 0.05 and a beta of 0.80 using a two-tailed test. Unadjusted analyses were conducted with the chi-square test and adjusted analyses in logistic regression models including all patient characteristics (Table 1).

We fit a second model with the peer coach and brochure groups as well as those groups that did not receive additional support including: (1) not contacted, (2) declined support, and (3) no support needed. Missing insurance ($N=3$) was grouped with commercial insurance but findings were similar when we grouped these with Medicaid insurance. In our final logistic regression model, the predicted probability of colonoscopy adherence is estimated as $p_i = \frac{\exp(x_i'\hat{\beta})}{1 + \exp(x_i'\hat{\beta})}$, where i indexes patients; x_i is a vector of covariates for patient i , including demographic characteristics and treatment group indicators, and $\hat{\beta}$ is a vector of estimated coefficients from the model. In a sensitivity analysis using the coefficients from our second model, we estimated the proportion of patients in the peer coach group who would have been adherent to colonoscopy had they not received this intervention.

All intervention patients consented to support for their colonoscopy and only administrative data were analyzed for the remaining patients. The study was approved by the University of Pennsylvania Institutional Review Board. This trial was registered with the NIH (<http://www.ClinicalTrials.gov>—#NCT00431327, study ID 705823).

Table 1. Characteristics of Primary Care Study Patients Scheduled for First Colonoscopy

Variable	All	Support group		No support group		
	All (N=275)	Brochure (N=66)	Peer coach (N=70)	No support needed (N=49)	No contact (N=49)	Declined support (N=41)
Mean age (yrs)	60.7	61.5	61.1	60.8	59.7	59.8
Female (%)	69.1	63.6	72.9	69.4	73.5	65.9
Race						
White (%)	34.2	24.2	21.4	49.0	46.9	39.0
Black (%)	61.5	65.2	74.3	49.0	51.0	61.0
Other race (%)	4.4	10.6	4.3	2.0	2.0	0.0
Insurance						
Commercial (%)	48.7	42.4	34.3	57.1	75.5	41.5
Medicare (%)	13.1	15.2	11.4	12.2	12.2	14.6
Medicaid (%)	37.1	42.4	52.9	26.5	12.2	43.9
Unknown (%)	1.1	0	1.4	4.1	0	0
Indication for test						
Diagnostic (%)	26.9	39.4	22.9	28.6	12.2	29.3
Screening (%)	73.1	60.6	77.1	71.4	87.8	70.7
Adherence to primary care visits (%)						
<45	25.5	24.2	35.7	16.3	26.5	19.5
45–54	25.8	24.2	18.6	30.6	24.5	36.6
55–64	24.4	25.8	25.7	24.5	16.3	29.3
65–74	24.4	25.8	20.0	28.6	32.7	14.6

RESULTS

Of 578 patients scheduled for a first colonoscopy (Fig. 1), 275 (48%) were eligible because of poor primary care visit adherence. Of these, 49 patients (18%) met the prespecified criteria for not needing additional support, whereas 49 (18%) could not be reached after at least 4 phone calls. An additional 41 (15%) declined support, often stating that they had already decided whether or not to keep the appointment. The remaining 136 patients (49%) were randomized to peer coach or brochure support.

Study patients were mostly female and black race (Table 1). Compared with the other patient groups, the peer coach group was more likely to be black, Medicaid insured, and have low primary care visit adherence. The peer coach and brochure groups had an absolute 11 percentage point difference in the

proportion attending colonoscopy (Table 2). Among the patients without additional support, we observed an absolute 33% difference in attendance between those judged to need no support and those declining support. Black patients and

Table 2. Unadjusted Associations of Patient Characteristics with Attended Colonoscopy

Characteristic	Attended colonoscopy (N=275) (%)	P value*
Overall	64.0	
Intervention group		.18
Peer coach	68.6	
Brochure	57.6	
No intervention group		.004
No support needed	81.6	
Failed contact	61.2	
Refused support	48.8	
Age (yrs)		.36
50–55	65.5	
55–64	67.2	
>65	57.3	
Gender		.06
Female	59.8	
Male	73.8	
Race		<.001
White	79.8	
Black	54.4	
Other race	75.0	
Insurance		.03
Commercial	72.4	
Medicare	61.1	
Medicaid	53.9	
Missing	66.7	
Indication for test		.50
Diagnostic	60.8	
Screening	64.1	
Percent primary care visit adherence (quartiles)		.04
<45	52.9	
45–54	61.0	
55–64	65.8	
65–74	75.3	

*P value from chi-square test.

Figure 1. Colonoscopy adherence study population.

persons with Medicaid were less likely to keep the first colonoscopy appointment. The proportion of patients keeping the colonoscopy appointment increased linearly with increasing primary care visit adherence.

The most common barriers to colonoscopy adherence reported by the peer coach group were: the colon preparation (43%), poor knowledge about the test (37%), and confusion about taking current medications (33%). Attitudinal barriers such as fear (30%) and worrying about results (21%) were also common.

In a model with the groups that received support, the peer coach group had over twofold higher adjusted odds ratios of keeping the colonoscopy appointment compared with the brochure group (2.04, 95%CI=0.93–4.45). In a model of all patients, the adjusted odds ratios of colonoscopy adherence was still over twofold greater for the peer coach group and significantly increased for patients judged to need no support compared with the brochure group (Table 3). Conversely, the failed contact and declined support groups did not differ significantly from the brochure group.

The adjusted odds ratios of colonoscopy attendance was 63% lower for black versus white race, whereas the highest level of primary care visit adherence had twofold greater adjusted odds ratios of attendance than the lowest level. Because more patients in the peer coach group were black and had low primary care visit adherence than the other groups, we estimated the adherence level if these patients had not received this intervention. Based on this analysis, we estimate that only 52% of these patients would have attended the colonoscopy without peer coach support compared with 69% with this support.

Table 3. Adjusted Odds of Completing Scheduled Colonoscopy Among Patient Groups With and Without Additional Support (N=275)

Characteristic	Adjusted odds ratio	95 % confidence interval	P value
Patient study group			
Brochure	1.0		
Peer coach	2.14	0.99–4.63	.05
No support needed	2.68	1.05–6.83	.04
Failed contact	0.85	0.36–2.02	.71
Refused support	0.61	0.26–1.45	.27
Age (per yr)	0.98	0.94–1.01	.16
Gender			
Male	1.0		
Female	0.60	0.32–1.13	.11
Race			
White	1.0		
Black	0.37	0.10–0.72	.004
Other race	0.69	0.15–3.19	.63
Insurance			
Commercial	1.0		
Medicare	0.86	0.34–2.17	.74
Medicaid	0.62	0.33–1.19	.15
Indication for test			
Screening	1.0		
Diagnostic	1.07	0.58–1.97	.84
Primary care visit adherence (%)			
<45	1.0		
45–54	1.62	0.74–3.53	.23
55–64	1.70	0.82–3.55	.16
65–74	2.30	1.04–5.07	.04

Follow-up phone calls with 65 patients (93%) in the peer coach arm confirmed our colonoscopy arrival data. The peer coach was endorsed by 80% as very helpful and only 6% offered negative comments with the remainder being neutral. Most appreciated hearing about another patient's experience and commented on their physician's failure to address their concerns. Most said that the peer coaches helped them with the logistics of the procedure. Negative comments focused on not needing support because of having already decided about attending the appointment (or not). Of the 22 patients in the peer coach group who did not keep the appointment, 18 were subsequently contacted. Nonattendance was most often because of personal health problems (27%), a family member's health (16%), or logistical issues such as lack of transportation or a companion (16%).

DISCUSSION

Our study focuses on patients at increased risk of not keeping their first colonoscopy appointment because they frequently miss primary care visits. Compared with patients who received brochure support, the peer coach intervention group had over twofold greater adjusted odds ratios of attending the scheduled colonoscopy. The patients who met our prespecified criteria for not needing additional support also had over twofold greater adjusted odds ratios of attendance compared with the brochure group. Conversely, the patient groups that received no additional support, either because they could not be contacted or declined support, had similar adjusted odds ratios of colonoscopy attendance compared with the brochure group. Attendance to colonoscopy for the brochure, not contacted, and refused support groups ranged from 49% to 61%. In our study of adherence to scheduled colon studies in 1999–2001, only 56% of patients with a similar low level of primary care visit attendance were found to keep their colon study appointment. Thus, adherence has been relatively static over a 5- to 7-year timeframe in our study practices. However, with peer coach support, nearly 70% of patients attended their colonoscopy.

Other studies have investigated patient navigators to promote colonoscopy attendance.^{13,14,20} However, Nash et al. combined the patient navigator with multiple organizational changes so that the independent effect of this support could not be distinguished.¹³ A randomized trial primarily in Latinos found that 9 (23%) of 38 patients in the navigator arm completed colon endoscopic screening after 6 months versus only 2 (5%) of 40 controls, $P=.02$.¹⁴ A community-based, randomized trial with primarily African Americans reported that telephone outreach significantly improved receipt of colorectal cancer screening with 27% screened within 6 months.²⁰ Yet these studies were not conducted in the context of a primary care practice and had much lower proportions of patients who completed these tests.

In their primary care cohort, Denberg et al. reported that the main barrier to colonoscopy completion was failing to schedule the procedure after it had been ordered.⁵ In a randomized trial of a mailed brochure that addressed specifics about scheduling and completing the test, they found that the brochure significantly increased colonoscopy adherence from 59% to 70%. This effect is similar to that observed for our peer coach intervention but our study targeted patients at increased risk of nonattendance. Our brochure intervention primarily ad-

dressed reasons to complete screening rather than scheduling issues. In other studies, a similar generic brochure and a mailed educational video about colon screening have shown small effects.^{21,22}

Our peer coach intervention followed the framework of Azjen's TPB.¹⁷ In particular, we hypothesized that patients' attitudes and perceived behavioral control (i.e., practical barriers) needed to be addressed because of the limited support offered by primary care physicians.^{9,10} Other researchers have also found that patients commonly have practical concerns about the colon preparation, analgesia, and embarrassment.²³ Peers can affect patient's social norms because they are seen as experiencing similar stressors, whereas succeeding with the desired health behavior.²⁴ Health educators deliver a personalized approach to address concerns and have been found to increase adherence to cervical, breast, and prostate cancer prevention tests by vulnerable populations.^{11,12,25} Our peer coaches also used techniques derived from Miller and Rollnick's motivational interviewing to promote a nonconfrontational interaction. A recent systematic review of motivational interviewing reported that it outperforms traditional advice giving in achieving behavioral change.²⁶

Of the patients in the peer coach group, 80% endorsed it as helpful. In this group, patients who missed their appointment often cited health reasons that the peer coach could not have addressed. Only 1 patient cited her fear as still being too great and another said that the peer coach could not change her mind. This qualitative feedback indicates a largely favorable response to the peer coaches.

Our study has a number of limitations. Our sample size was small. Despite block randomization, the peer coach group was more likely to be minority, enrolled in Medicaid, and have poor visit adherence. Because these characteristics were associated with a lower likelihood of attending the colonoscopy in our study and others,^{4,16,27} the peer coach group was biased against finding an effect. We estimated that the intervention was associated with a 17% increase in colonoscopy attendance for this group. We only examined adherence to the first scheduled colonoscopy. In our earlier study, one-third of the patients who missed their first appointment did not complete the test in the following 6 months.⁴ In the future, peer coach support could be offered again to those who miss their first colonoscopy appointment.

Our peer coach training sessions were relatively brief so it is possible that, with additional training, they might have been even more effective. Two peer coaches—a white woman and an African-American man—performed most calls. We did not match the race or gender of the peer coach to that of the patient but most patients were pleased with their peer coach. We did not address the cost-benefit of peer coach support and did not evaluate sustainability. The intervention groups received movie tickets but this did not appear to motivate them because the brochure arm had similar colonoscopy adherence to patients who received no support or tickets. The brochure might have been less effective in patients with a low literacy level but we did not have a measure of reading level or educational attainment to assess this. One appeal of the peer coach approach is avoiding problems with health literacy. Finally, our findings are likely to be most relevant to patients in academic-affiliated primary care practices.

In summary, our study offers several tools to increase colonoscopy attendance rates. First, we employed a novel ap-

proach to identify patients with a greater need for support to keep their colonoscopy appointment. Other studies focus on race or socioeconomic status to predict an increased risk of poor adherence,²⁸ but primary care appointment-keeping behavior offers a less stigmatizing alternative. Second, our peer coach support was well received and increased attendance to colonoscopy in an especially challenging group of patients. Third, we distinguished a subset of patients who need less support to attend the test. If confirmed in other settings, payers and providers should consider adopting peer coach support with the ultimate goal of reducing unnecessary morbidity and mortality from colorectal cancer.

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Conflicts of Interest: None disclosed.

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