

## Physician use of persuasion and colorectal cancer screening

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Cite this as: *TBM* 2015;5:87–93  
doi: 10.1007/s13142-014-0284-x

### Abstract

The impact of patient–physician communication on subsequent patient behavior has rarely been evaluated in the context of colorectal cancer (CRC) screening discussions. We describe physicians' use of persuasive techniques when recommending CRC screening and evaluate its association with patients' subsequent adherence to screening. Audio recordings of  $N=414$  periodic health examinations were joined with screening use data from electronic medical records and pre-/post-visit patient surveys. The association between persuasion and screening was assessed using generalized estimating equations. According to observer ratings, primary care physicians frequently use persuasive techniques (63 %) when recommending CRC screening, most commonly argument or refutation. However, physician persuasion was not associated with subsequent screening adherence. Physician use of persuasion may be a common vehicle for information provision during CRC screening discussions; however, our results do not support the sole reliance on persuasive techniques if the goal is to improve adherence to recommended screening.

### Keywords

Colorectal cancer, Screening, Patient–physician communication, Persuasion

Colorectal cancer (CRC) screening remains relatively underutilized compared to other evidence-based recommended preventive screening services [1]. Of the barriers and facilitators of CRC screening that have been studied, receipt of a physician recommendation has consistently been found to be associated with screening use [2]. Yet, at the same time, overall adherence to physician-recommended CRC screening remains low [3–5] and a 2010 National Institutes of Health (NIH) consensus statement on CRC screening specifically highlighted the need for research on the role of physician recommendation and CRC screening adherence [2].

There have now been over a dozen reports describing patient–physician communication and decision-making in the context of CRC screening [6–24]. Approximately half of these studies relied on patient reports to understand these processes, while the

### Implications

**Practice:** Physician use of persuasion to increase CRC screening uptake is not sufficient when used in isolation.

**Research:** Future investigations of the impact of persuasion when used in combination with other communication techniques and of various facets of persuasion, such as the quality of the persuasive communication, are needed to better understand how persuasion may be used to improve CRC screening use.

**Policy:** Although communication skills training among primary care practitioners has the potential to enhance CRC screening, such training needs to look beyond the use of persuasive communication techniques.

remainder utilized direct observation methods. Among the latter, only four studies have evaluated the association of patient–physician communication content with patients' subsequent use of CRC screening [11, 18, 24, 25]. Collectively, those studies have highlighted opportunities to improve patient–physician CRC screening decision-making processes relative to that which is recommended by experts [26]. Yet, ambiguities remain regarding key patient–physician conversational content and techniques that may enhance the decision-making processes from the patients' perspective or improve adherence to physician-recommended CRC screening. For example, Lafata and colleagues found that a physician recommendation that included not only advice to be screened but also a reason for screening, along with verbal assistance obtaining screening, resulted in a greater likelihood of screening use [25]. Ling, on the other hand, found that particular elements of an informed decision-making process (such as discussion of pros–cons and eliciting patient preferences with regards to CRC screening behavior) were negatively associated with CRC screening use [18]. Studies that have relied upon patients' perceptions of the quality of physician communication have tended to find a positive association between perceived communication quality and being screened for CRC [9, 13, 15, 27].

Physician–patient communication includes two streams. The first consists of the communication (informational) content of the conversation and the second reflects the affective tone, which includes the social influence tactics employed in healthcare settings that impact decision-making [28]. The latter can include partnership-building, empathy, and persuasion, among other things [29]. Persuasion is a form of social influence whose use is widely acknowledged in healthcare decision-making. Although much research exists about persuasive message production in general, less is available that pertains to social influence attempts specifically in healthcare contexts.

Persuasion can come in many forms (see Table 1), including the evocation of emotion and appeals to reason, largely through argumentation. Arguments generally consist of a proposition or claim backed by some sort of evidence, either data driven (e.g., statistical) or experiential (e.g., anecdotal). Frequently, persuasion can be expressed in the form of counterargument, that is, a refutation to the original argument. Use of refutation can neutralize patient reservations or build resistance to recommendations [30–33]. Although sometimes conflated with undue influence, ideal persuasion should neither be manipulative nor coercive [34]. Indeed, persuasive communication in the healthcare context should always be characterized by mutuality such that physician and patient have the opportunity to influence each other [35].

Persuasion is a multi-faceted construct that can be a valuable tool in a clinical encounter. However, not all persuasion is considered equal, and different forms of persuasion can have different consequences in terms of subsequent decision-making [36]. For example, although research has supported the effectiveness of both forms, arguments that feature statistical evidence are more powerful than anecdotal evidence in producing both cognitive reactions and overall message processing [37, 38]. Thus, it is imperative to investigate the different types of persuasion most commonly used in clinical encounters in order to tease apart any differences in effectiveness.

To our knowledge, no prior effort has evaluated how physicians may use persuasion to promote CRC screening or how physicians' use of persuasion might impact patients' subsequent use of physician-

recommended CRC screening. In this study, we join data on patient–physician communication from primary care office visit audio recordings with data from patient surveys and electronic health records (EHRs) to (1) describe physicians' use of persuasion when recommending CRC screening, and (2) evaluate the association of both observer-coded and patient-perceived physician use of persuasion with patients' subsequent use of CRC screening following a physician recommendation.

## METHODS

### Study setting

Physician and patient samples were drawn from the universe of primary care physicians and patients in an integrated delivery system in southeast Michigan. The health system owns a 1000-member medical group that staffs 26 clinics in Detroit and surrounding suburbs and is affiliated with a non-profit health maintenance organization (HMO). At the time of the study, the medical group used an EHR that included prompts for evidence-based preventive health services including CRC screening, and all HMO enrollees had CRC screening, regardless of modality, as a covered benefit.

### Participant eligibility criteria and recruitment

Eligible clinician participants were family and general internal medicine physicians practicing within the system-owned salaried medical group. Physicians were recruited for study participation via email and personal telephone calls by the study principal investigator.

Eligible patient participants were those enrolled in the affiliated HMO aged 50 to 80 years and due for CRC screening at the time of a scheduled annual periodic health examination (PHE) with a study-participating physician between February 2007 and June 2009. Patients with a personal history of CRC, bowel resection, inflammatory bowel disease, polyposis, or hereditary non-polyposis were excluded from the study. Eligible patients were mailed a letter of study introduction, followed by a telephone call approximately 2 weeks prior to their scheduled office visit.

**Table 1** | Definition of persuasive techniques

Persuasive technique	Definition
Argument	Factual statements in support of a desired goal, often accompanied by evidence.
Refutation	Discounting information or something that has been said.
Threat	Statement indicating more severe negative consequences if provider's recommendations are not followed.
Foot in the door	Small request followed by a larger one.
Guilt	Negative thought or action consequences pointed out. Includes drawing attention to an existing inconsistency or past negative thought or action.
Altruism	Reference to helping others, being unselfish, or generous in order to secure an action.
Esteem	Referencing others' positive perceptions if the patient complies.

During the call, patients were invited to participate in the study, and among those verbally agreeing, eligibility was confirmed. Those eligible and verbally agreeing completed a brief telephone survey and were asked to arrive at their scheduled appointment 15 minutes early to enable completion of informed consent prior to visit audio recording. A brief post-visit interview and survey were completed immediately following the office visit. Patient participants received a \$20 gift card to their choice of one of two retail chain stores.

At the time of recruitment, physicians and patients were told that they were being recruited to participate in a study of how patients and physicians discussed preventive health services during routine PHEs, but were not informed of the primary research questions or specific hypotheses. The Institutional Review Boards of the Henry Ford Medical Group, Case Western Reserve University and Virginia Commonwealth University approved all aspects of the study, and all patients provided informed consent prior to study inclusion.

#### Data sources and measures

Physician socio-demographic characteristics (i.e., age, gender, and race) and specialty (i.e., family or general internal medicine) were obtained via health system records. The pre-visit patient survey solicited information on patient socio-demographic characteristics (including age, gender, race, education, employment, and marital status) as well as smoking status [39–42]. A post-visit patient survey, administered immediately upon visit completion, collected patient perceptions of their physician's use of persuasion with one item: "My physician tried to persuade me." [43] Respondents used a seven-point Likert scale (where 1=strongly agree and 7=strongly disagree) to indicate the extent to which they agreed with the statement. Patients responding 1–3 were coded as reporting that their physician tried to persuade them.

Observer-coded physician use of persuasion while discussing CRC screening was obtained from office visit audio recordings. A structured coding form was developed to measure patient–physician CRC screening-related discussion content and conversational techniques. Embedded in the coding form was an observational measurement system for identifying and analyzing various communication techniques, including the seven persuasive techniques of argument, refutation, altruism, esteem, guilt, foot in the door, and threat (see Table 1) [29]. In addition to this measurement system, qualitative content analyses resulted in the coding of one additional variable used in the current analyses: whether or not the patient was adherent to a previous physician recommendation for CRC screening [16].

For coding, three trained research assistants listened to the audio recordings while following associated transcripts. Inter-rater reliability for coded variables was assessed via Cohen's kappa by having  $n=$

43 visits (i.e., a random sample of approximately 10 % of all study visits) coded by all three research assistants. For five of the persuasive techniques, kappas ranged from 0.48 to 0.71, with a mean of 0.59. For the remaining two, which occurred rarely (i.e., in <5.0 % of visits), kappas were not computable. Percent agreement for these two variables was 100 % between the three research assistants.

CRC screening use in the 12-month period immediately following the audio recorded office visit was obtained from the medical group's EHR. To be consistent with the U.S. Preventive Service Task Force screening guidelines in place at the time of the study (2004), CRC screening referred to the receipt of one of the following tests: fecal occult blood testing (FOBT), colonoscopy, flexible sigmoidoscopy, or double contrast barium enema. Patients who received at least one of these tests/procedures were considered screened for CRC.

#### Statistical methods

We report the proportion of visits containing patient-reported and observer-coded physician use of persuasion. Differences in visit characteristics by the presence/absence of persuasion were assessed using univariable logistic regression. Significant associations between patient-perceived and observer-coded persuasion and subsequent colorectal cancer screening use were assessed with both adjusted and unadjusted logistic regression. Adjusted models controlled for each of the visit characteristics found to be associated with either patient-perceived or observer-coded persuasion at the  $p < 0.20$  level. Because of the nesting of visits (and therefore patients) by primary care physician, all modeling was conducted using generalized estimating equation (GEE) approaches with the SAS procedure PROC GENMOD.

## RESULTS

#### Sample characteristics

Seventy-seven physicians and 500 patients agreed to study participation (47 % physician and 50 % patient participation rate). Physician and patient participants/non-participants are described in detail elsewhere [22]. Briefly, physician participants did not differ from non-participants in terms of age or gender, but were more likely to be of African American race or a practicing family medicine physician. Patient participants did not differ from non-participants in terms of race or marital status, but were, on average, 2 years younger and more likely to be female.

Among the 500 consenting patient participants, 485 recordings were audible. Excluded from consideration here are visits with no talk related to CRC screening ( $n=29$ ) or for which talk indicated the patient was not due for CRC screening ( $n=12$ ). Also excluded are visits in which the patient had CRC screening scheduled at the time of presentation ( $n=25$ ), presented in the midst of an ongoing work-up for related symptoms

( $n=1$ ), had a recent history of recurrent lung cancer ( $n=1$ ), or for whom the pre-visit survey was not available ( $n=3$ ). The resultant sample consists of 414 patient visits to 64 physicians, with an average of seven office visit recordings completed for each physician (range 1–19). Characteristics of study-participating patients and their office visits are described in Table 2.

#### Observer-coded physician use of persuasion

Nearly two thirds of visits (64 %) were observer coded as containing physician use of persuasion specific to CRC screening (see Table 3). Over half of the visits (56 %) included physician use of “argument,” or the provision of factual statement(s) in support of desired goal(s), often accompanied by evidence. After “argument,” the most frequently used persuasive strategy was “refutation” (20 %). This was followed by “threat,” which was used in 9 % of visits. Other persuasive techniques, such as “guilt,” “foot in the door,” “altruism,” and “esteem,” were used minimally (i.e., in 4 % or less of visits). Provided in Table 3 are typical physician statements that exemplify the specific persuasive techniques used. Although containing a discussion about CRC screening, the remaining 151 visits

(36 %) contained no physician use of persuasion specific to CRC screening.

The number of persuasive techniques employed by a physician varied per visit. Thirty-nine percent of visits contained only one type of observer-coded physician use of persuasion specific to CRC screening, and an additional 25 % contained multiple types (see Table 4). Of those visits that contained multiple types of persuasion ( $n=100$ ), the mean number of persuasive techniques coded was 2.3 (range 2–4). The most common combination was “argument” paired with “refutation,” which occurred in 15 % of all visits ( $n=63$ ), or almost a quarter (24 %) of those visits that contained some type of persuasion.

The presence of observer-coded physician use of persuasion specific to CRC screening during visits did not differ significantly by any of the patient or physician characteristics described in Table 2, including the patient’s prior adherence status. The one exception was physician age. Office visits in which the physician employed observer-coded persuasive techniques were, on average, with slightly younger physicians than those where the physician did not employ observer-coded persuasive techniques (i.e., 48.8 vs. 50.7 years,  $p<0.05$ ).

#### Patient-perceived physician persuasion

Among visits coded by observers as containing any physician use of persuasion specific to CRC screening, slightly less than a third (31 %) of patients reported that their physician tried to persuade them (Table 3). As depicted in the table, this proportion ranged from a low of 20 % among visits coded with physician use of altruism to a high of 53 % among those visits coded as containing physician use of “foot in the door.” As the number of types of observer-coded persuasion used by the physician increased, the likelihood that a patient reported their physician tried to persuade them also increased (Table 4). In fact, the likelihood that a patient reported physician use of persuasion was lowest, at 19 %, among those with no observer-coded persuasion, and rose steadily to a high of 67 % among those with four types of observer-coded persuasion. The likelihood that a patient reported their physician tried to persuade them did not differ significantly by patient or physician characteristics, including whether or not the patient had been adherent to a prior physician recommendation for screening (data not shown). The one exception was patient age: Patients who reported that their physician tried to persuade them were, on average, slightly older (59.6 vs. 58.4 years,  $p<0.05$ ).

#### Persuasion and CRC screening use

Among this sample of primary care patients discussing CRC screening with their physicians, 56 % went on to be screened for CRC in the year following the physician’s recommendation. Of those with any instance of observer-coded persuasion, 55 % went on to be screened compared to 58 % among those with no observer-coded persuasion during their visit. In visits

**Table 2** | Characteristics of the sample ( $N=414$  Visits)

	Percent
Patient age	
50–54 years	43
55–59 years	21
60–64 years	16
65+ years	20
Female patient	64
Patient race	
African American	27
White	66
Other	7
Patient education	
Less than high school	4
High school diploma	24
Some college or more	72
Patient currently employed	62
Patient currently married	66
Prior CRC screening recommendation status	
Non-adherent to prior CRC screening	31
Adherent to prior recommendation, due again	4
No prior recommendation	65
Patient current smoker	18
Mean age of physician	49.5 (7.7)
Female physician	56
Race of physician	
African American	16
White	48
Other	36
Specialty of physician	
General internal medicine	69
Family medicine	31

**Table 3** | Percent of visits ( $N=414$ ) with observer-coded persuasion by type of persuasive technique used and among those with each type of observer-coded persuasive techniques present, percent with patient-perceived physician use of persuasion

Persuasive technique used	Percent with observer-coded persuasion	Example quote	Percent with patient-perceived persuasion
Any	63 ( $n=263$ )	N/A	31 ( $n=82$ )
Argument	56 ( $n=232$ )	“Colon cancer’s among the top three in men and women, and you know pretty much if you catch it in the first two stages you could cure it.”	31 ( $n=73$ )
Refutation	20 ( $n=84$ )	“There is no pain involved, no discomfort involved... there is somebody going up your rectum. That is the discomfort, but there is no physical discomfort. They are very careful about that.”	43 ( $n=36$ )
Threat	9 ( $n=36$ )	“By the time you have abdominal pain, vomiting, blood in the stool...it’s probably advanced to the point where it’s too late to do much of anything.”	36 ( $n=13$ )
Foot in the door	4 ( $n=15$ )	“Why don’t we at least do that (FOBT) and then if we happen to find some that are positive, we can always talk about what the options are there.”	53 ( $n=8$ )
Guilt	4 ( $n=16$ )	“So, if you want Dr. R to get off your back for the next ten years, I would strongly suggest to get a colonoscopy.”	47 ( $n=7$ )
Esteem	1 ( $n=6$ )	“She’s (patient’s wife) going to say, I’ve been waiting. I wanted you so much, honey, to live a long time. Thank you for doing this for me.”	50 ( $n=3$ )
Altruism	1 ( $n=5$ )	“Alright. You need to. You got a lot of people counting on you.”	20 ( $n=1$ )

in which the physician used more than one type of persuasion, 51 % went on to be screened for CRC in the year following the appointment. We did not find any statistically significant association between CRC screening use by either the type of persuasion used or by the number of types of persuasive techniques coded as being used by the physician (data not shown). Nor did we find a significant association between CRC screening use and patient reports that their physician tried to persuade them. Thus, we found no statistically significant association between physician use of persuasion—whether observer-coded, patient-perceived, or both—and adherence to physician recommendation for CRC screening. This lack of association was consistent across unadjusted and adjusted models.

**Table 4** | Percent of visits ( $N=414$ ) with observer-coded persuasion by the number of persuasive techniques used and among those with each number of observer-coded persuasive techniques used, percent with patient-perceived physician use of persuasion

Number of persuasive techniques used	Percent of visits with observer-coded persuasion	Percent with patient-perceived physician use of persuasion
None	36 ( $n=151$ )	19 ( $n=28$ )
One	39 ( $n=163$ )	24 ( $n=39$ )
Two	18 ( $n=73$ )	40 ( $n=29$ )
Three	6 ( $n=24$ )	50 ( $n=12$ )
Four	<1 ( $n=3$ )	67 ( $n=2$ )

## DISCUSSION

Physician recommendation remains one of the most effective means to increase CRC screening use [25]. Nationally, CRC screening rates have been increasing and by some estimates are now over 60 % [44, 45]. Fifty-six percent of the sample in this study went on to be screened for CRC following a physician recommendation for screening, with no significant differences between visits with and without observer-coded use of physician persuasion. This number compares favorably to a recent study examining post-physician recommendation rate of colonoscopy in a Midwestern practice-based research network, which found that only 39 % of participants followed through with a colonoscopy after a physician recommendation [46]. Similarly, another study conducted in two academic primary care clinics in California found that, following a discussion about CRC screening with their physicians, only 45 % of patients completed the recommended screening [11].

Our findings indicate that primary care physicians frequently use at least one persuasive technique (63 %) when recommending CRC screening to their patients. Yet, only a third of patients whose physician employed a persuasive technique when recommending CRC screening reported that their physician tried to persuade them during the visit. Furthermore, physician use of persuasion, whether identified via observers or by the patients themselves, was not associated with patients’ subsequent adherence to physician-recommended CRC screening.

While persuasion may come in many forms, of note here is that physicians tended to use “argument” and “refutation,” either alone or in tandem, most frequently when recommending CRC screening to their patients. These two types of persuasive tactics are often provided in parallel with information provision and the discrediting of misinformation. As such, they may represent elements of physician communication that are critical to facilitating a patient’s ability to make an informed decision regarding CRC screening.

Previous studies have highlighted both patients’ general desire for information as well as their information preferences specific to cancer screening [12, 47, 48]. There is also now consistent evidence showing that only minimal information exchange occurs in the context of patient–physician CRC screening discussions, leaving little doubt that CRC decisions more often than not fall short of that recommended for informed decision-making [7, 12, 18, 49]. Furthermore, prior studies have found associations between CRC screening and patient reports of informative discussions [9], physician enthusiasm [13], not having unanswered questions [6], and physician use of risk-specific messaging about the consequences of CRC [24].

In this study, no particular persuasive technique was more or less associated with patients’ perceptions of physician persuasion. We did, however, find that patients’ perception of persuasion steadily increased as the number of persuasive techniques employed by their physician increased. However, regardless of whether persuasive techniques were observer-coded, patient-perceived, or both, physician use of persuasion was not associated with patient adherence to physician-recommended CRC screening. Because the available sample size did not enable the use of propensity scores or other methods to formally account for potential selectivity in terms of which patients’ CRC screening discussion included physician use of persuasion, there may be unmeasured differences between those patients whose discussions did and did not include persuasive techniques. As such, it remains unknown what the resulting CRC screening use would have been had persuasion not been used with those patients.

Results should be interpreted in the context of a number of limitations. First, data for the current study were drawn from primary care visits with insured patients in a single health care organization. The degree to which these findings are generalizable to other patients and healthcare contexts is not known. Second, it is possible that the use of direct observation methods may have affected physicians’ preventive health conversations given their awareness of being monitored; however, this effect is most likely minimal [50] and, if anything, would have led to increased discussion of services. Furthermore, patient perceptions of persuasion were solicited with regards to the entire visit and not specifically to CRC screening. Thus, some of the discrepancy between observer-coded physician use of persuasion and patient-perceived physician persuasion may be due to instrumentation. Similarly, while the

presence and absence of persuasion was considered, we did not consider the quality of the persuasive arguments made. This omission may have limited further our ability to detect associations present.

## CONCLUSIONS

When studied in isolation, physician use of persuasion does not appear to alter patients’ subsequent adherence to recommended CRC screening. As such, one could argue that relying solely upon the use of persuasion may not be an effective means of influencing patients’ uptake of CRC screening. However, results here also indicate that in the context of CRC screening, physician use of persuasion is often intertwined with the provision of factual information. Thus, calls to reduce physician use of persuasive techniques in the context of CRC screening should be made with caution as it appears that physician use of persuasion may be a common vehicle for information provision during patient–physician CRC screening discussions.

**Acknowledgements:** This research was supported by a grant from the National Institutes of Health (NIH R01 CA112379). The funder had no role in the study design, conduct, or analyses, or in the reporting of findings.

**Conflict of interest:** None of the authors report having a conflict of interest.

**Statement of adherence to ethical standards:** All study procedures were conducted in accordance with established ethical standards, and all participants provided informed consent prior to study inclusion. The Institutional Review Boards at Henry Ford Medical Group, Case Western Reserve University and Virginia Commonwealth University approved all aspects of the research.

**Funding:** NIH R01 CA112379

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