

# Family Physician Beliefs About Cancer Screening

## Development of a Survey Instrument

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*To improve rates at which physicians provide cancer control procedures, it is first necessary to identify physician and environmental characteristics that explain variations in those rates. This study used an attitude-behavior model as a guiding framework to identify beliefs, sources of influence, facilitating conditions, and critical events that may be important determinants of physicians' rates for providing eight cancer control activities. Open-ended, semistructured interviews were conducted with 26 family physicians to discuss the factors that may have affected their policies for providing each of the eight cancer control activities. Content analysis of those interviews produced unique lists of beliefs, sources of influence, facilitating conditions, and critical events for each activity. These lists of factors are more comprehensive than those identified in previous studies. A questionnaire has been developed based on these findings, and a validation study is being conducted to identify the factors that best explain variation in rates at which cancer control activities are performed. J FAM PRACT 1990; 30:313-319*

Unnecessary mortality results from cancers that could have been prevented or could have been successfully treated had they been detected earlier. Many primary care physicians do not perform cancer prevention and control activities at rates considered optimal. Although most primary care physicians agree with the American Cancer Society (ACS) guidelines for doing digital rectal examinations, occult stool blood tests, and breast physical examinations, only about one half of them reported following those guidelines for digital rectal examinations and stool blood testing.<sup>1</sup> Higher proportions reported following the guidelines for breast physical examinations (80%) and Papanicolaou smear (75%), while far lower proportions follow the guidelines for proctoscopy (18%) and mammography (11%). In addition, 42% continue, counter to the guidelines, to do screening chest x-ray examinations. A Canadian survey obtained very similar patterns.<sup>2</sup>

Other studies have measured the proportions of eligible patients for whom physicians do cancer-screening procedures. Chart reviews at Boston City Hospital revealed

that only 33% of women patients received breast examinations, 29% received Papanicolaou smears, and no mammograms were ordered during a 1-year period. Higher proportions of patients received occult stool blood tests (55%) and digital rectal examinations (41%), while 40% of patients received chest x-ray examinations.<sup>3</sup> Other studies report similar or lower rates of colorectal, cervical, and breast cancer screening.<sup>4-6</sup>

Dietrich and Goldberg<sup>7</sup> found wide variations in the rates at which physicians provide cancer-screening tests. Effective interventions to improve primary care physicians' use of cancer control activities cannot be developed without a clear understanding of factors that explain this variation in rates at which physicians provide cancer-screening tests.

Previous studies have attempted to identify factors affecting physician motivations or attitudes toward engaging in cancer control activities.<sup>2,8-15</sup> These studies typically have asked physicians to provide reasons for not following guidelines by using an open-ended format or a checklist. There are several limitations to these studies:

1. Many researchers have investigated barriers that were identified a priori by the investigator and presented to study respondents in the form of a checklist rather than eliciting the barriers from physicians themselves.

2. Researchers have concentrated on barriers and

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largely ignored positive factors that may motivate the physician to engage in the behavior.

3. Validation studies have not been conducted to demonstrate that the factors identified through physician surveys are actually associated with physician use of cancer control activities.

4. None of these studies has been based upon any theoretical framework for studying the relationship between beliefs, attitudes, motivation, and behavior.

The present study was conducted in response to the above limitations. It is a first step in better understanding the factors that affect primary care physician use of cancer control activities and ultimately the development of interventions. A modification of Fishbein's theory of reasoned action (TRA) was used as the theoretical framework in this study. The TRA is a model of the relationships between beliefs, attitudes, social influence, and behavior. According to the model,<sup>16</sup> behavior is primarily determined by the individual's (1) attitude toward the action and (2) perception of social support for or against the action. Attitude toward an action is determined by specific beliefs about outcomes or characteristics of the action, weighted by the values placed on those characteristics. Social support is determined by perceptions of support or nonsupport from all important sources of influence. Knowledge and other characteristics of the individual are considered to affect behavior only indirectly through their effects on the individual's beliefs about the action or perceptions of social support for the action.

The model has been modified to include an additional determinant of behavior, labeled *facilitating conditions*.<sup>17,18</sup> These are environmental conditions that facilitate or hinder one's ability to perform the action, independent of attitude. This modified TRA was used to guide the identification of positive and negative attitudinal factors, as well as potential sources of influence, physician experiences, and office environmental conditions, that may be associated with physicians' use of several cancer control activities.

## METHODS

### Sample

Twenty-six family physicians practicing in Washington State were asked to participate in this study. Twenty were randomly chosen from 371 King County members of the Washington Academy of Family Physicians (WAFP). This sample included both urban and rural practices, as King County contains the Seattle metropolitan area along

with a large rural component. The remaining six family physicians were a convenience sample chosen from two rural areas of the state that are a substantial distance from urban areas. All physicians agreed to participate.

Physicians participating in the study ranged from 32 to 70 years of age and included four women and 22 men. They practiced in a variety of settings, with eight in solo practice, two in Group Health Cooperative (a staff-model HMO), and the remaining 16 in group practices ranging from two to six members.

### Interview Procedure

Open-ended, semistructured interviews were conducted individually with physicians to identify factors that may be affecting their use of eight different cancer control activities: (1) smoking counseling, (2) Papanicolaou smear, (3) clinical breast examination, (4) mammogram ordering, (5) digital rectal examination, (6) occult stool blood test, (7) sigmoidoscopy, and (8) chest x-ray examination. The modified TRA was used to guide the structure of the interviews.

Thus, the interviews were aimed at eliciting the following information: (1) beliefs about outcomes or attributes of each cancer control activity, (2) potential sources of influence affecting the physician's policy regarding the cancer control activity, and (3) conditions that may facilitate or hinder use of the activity.

Appendix 1 presents the format used in conducting the interviews. For each cancer control activity, physicians were asked to identify all the advantages and disadvantages they associated with engaging in that activity. They were also asked to indicate any individuals, groups, or experiences that have influenced their use of the activity and to describe any environmental factors that may facilitate or hinder engaging in the activity.

Interviews lasted approximately 40 minutes and were conducted in the physicians' offices during the working day. The interviews were tape recorded and transcribed to facilitate content analysis.

### Content Analysis

Interview transcripts were reviewed by two investigators (D.E.M. and D.B.M.) independently, and eight content coding sheets were filled out for each physician interviewed—one sheet for each cancer control activity. All advantages, disadvantages, sources of influence, and facilitating conditions mentioned by the physician were recorded on these coding sheets. An additional category called critical events was used to record specific events, such as death of a spouse, which were occasionally cited.



TABLE 1. SALIENT BELIEFS ABOUT DOING EACH CANCER CONTROL ACTIVITY

Cancer Control Activity	Beliefs	Frequency*
Order screening chest x-ray examinations	Would detect cancer at a stage when it is not curable	22
	Would expose my patients to excessive radiation	15
	Is something my patients want and expect me to do	13
	Would be expensive for my patients	12
	Would allow me to detect other diseases besides lung cancer	10
	Would be reassuring to my patients	8
	Would be falsely reassuring to those who smoke	8
	Would be a good income generator for my practice	7
	Would be a cost-effective means of reducing mortality from lung cancer	6
	Would allow detecting lung cancer that would be missed otherwise	6
	Would let patients know that I care and am a good doctor	3
Smoking counseling	Is effective in helping patients stop or reduce smoking	23
	Would make patients angry or upset	22
	Is a good use of time	15
	Would educate patients about the risks of smoking	14
	Results in no reimbursement for my time	8
	Is easy because I can offer a method for quitting	7
Digital rectal examination	Is something I should do in my role as a physician	6
	Would allow finding other abnormalities besides cancer	20
	Would be distasteful for my patients	19
	Would be ineffective in detecting most colorectal cancer	14
	Would seldom yield a cancer	12
	Is doing something my patients expect me to do	7
	Is inexpensive and quick	8
	Would be useful for obtaining a stool sample for an occult stool blood test	7
	Would be physically uncomfortable for my patients	5
Occult stool blood test	Would be unacceptable to my patients who are not the same sex as I am	4
	Would be distasteful for me	4
	Would result in the need to do potentially expensive and inconvenient follow-ups on false-positives	26
	Would be inexpensive for patients	12
	Would detect cancer at an asymptomatic stage	11
	Would detect occult disease other than cancer	10
	Would be distasteful for my patients	8
	Would be easy and convenient for the patient	6
	Would result in low patient compliance	5
Raises patient awareness and allows me to educate patients about diet, colon cancer, and detection	4	
Screening sigmoidoscopy	Would make doing occult stool blood tests easier for me	2
	Would be too expensive for my patients	18
	Would be very uncomfortable for my patients	16
	Would be time consuming and expensive for me	16
	Would be unacceptable to my patients	15
	Would yield a significant number of polyps or cancer	12
	Would lead to the detection of masses and polyps I cannot feel	12
	Allows finding cancer early when it is curable	9
	Would be a good income generator for my practice	8
	Would require a substantial amount of my nurse's time for cleaning and setup	8
	Would expose my patients to a significant risk of complications	8
	Would be distasteful to me	4
	Would involve my spending time and effort convincing patients to have it done	3
	Would be reassuring to my patients	3
Would be extremely cost effective	2	
Clinical breast examinations	Allows me to teach breast self-examination and educate patients about breast cancer	26



TABLE 1. (CONTINUED)

Cancer Control Activity	Beliefs	Frequency*
Order screening mammograms	Allows detecting lesions at an early stage, requiring less-radical interventions	20
	Would make patients embarrassed	13
	Would be easy and not take much time	9
	Is something patients want and expect me to do	7
	Would allow me to detect other breast-related problems	6
	Gives me peace of mind and protects me legally	6
	Is something patients find reassuring	4
	Would be expensive for my patients	26
	Would allow detecting lesions I cannot feel or that are difficult to feel	21
	Would be difficult or inconvenient for my patients	19
	Would involve my having to spend time discussing patients' concerns such as radiation exposure	19
	Allows detecting lesions at an early stage, requiring less radical interventions	13
	Would be reassuring to my patients	11
	Would cause my patients to undergo a painful procedure	9
	Would protect me legally	6
	Would result in quite a few patients following through to obtain the mammogram	5
Papanicolaou smear	Would result in equivocal reports that require me to spend time explaining them to my patients	4
	Would lead to the need for an increased number of biopsies of lesions that will turn out to be benign	4
	Would be "lining the wallets" of radiologists	3
	Allows early detection of cervical cancer when it is still curable	16
	Results in false-positives that cause patients anxiety and require expensive follow-ups	13
	Allows detection of other pelvic disease	11
	Presents an opportunity to talk about preventive medicine and other medical concerns	11
	Is expensive for those who do not have insurance	10
	Causes patients to feel embarrassed and uncomfortable	10
	Is something my patients dislike	5
Gives me an opportunity to counsel my patients regarding birth control, family dynamics, and other matters	5	
Is reassuring to them	3	
Generates income for my practice	1	

\*Number of physicians who mentioned each belief.

The 26 content coding sheets filled out for each cancer control activity were next aggregated. Similar items were combined by consensus among the authors. Both positive and negative belief statements often were made about a certain attribute of a cancer control activity. For example, some physicians felt that mammography is expensive, while others felt that it is inexpensive. In this case the statements were combined into a single item measuring belief about cost.

This process resulted in separate comprehensive lists of beliefs, sources of influence, facilitating conditions, and critical events for each of the eight cancer control activities under investigation.

## RESULTS

### Beliefs

The results of the content analysis of the beliefs about each cancer control activity are shown in Table 1. The total number of physicians who mentioned each belief, whether positively or negatively, is listed to the right of each statement. Clearly many of these beliefs could be further aggregated into common themes that recur across the eight activities, such as, (1) efficacy of the test including detection rate, early detection, detection of other disease; (2) impact on the patient including risk, cost, reassurance, discomfort; (3) impact on the physician including



TABLE 2. SOURCES OF INFLUENCE AND FREQUENCY OF MENTION

Cancer Control Activity	Professional Literature	Training	Continuing Medical Education	Discussions with Colleagues	Employer or Practice Policy
Chest x-ray examination	21	9	6	2	2
Smoking counseling	11	7	2	2	1
Digital rectal examination	0	20	3	3	0
Occult stool blood test	13	14	10	5	1
Sigmoidoscopy	7	5	11	5	2
Clinical breast examination	9	19	11	0	1
Screening mammogram	13	1	14	7	3
Papanicolaou smear	16	14	6	3	0
Total frequency	90	89	63	27	10

discomfort, reimbursement, explaining results, meeting patient expectations. Aggregation into these common themes, however, would result in loss of detail in the beliefs about the activity. Thus, further aggregation has not been done so that this detail and specificity of each belief as it relates to each cancer control activity can be maintained.

### Sources of Influence

The sources of influence are presented in Table 2, accompanied by the number of times each was mentioned for each cancer control activity.

Physicians cited training and other sources of information as influential factors affecting their use of cancer screening tests. Nearly all of these sources of influence were elicited for each of the screening procedures.

An aggregation of responses across all eight of the procedures revealed that the sources of influence, in descending order of frequency, were professional literature (90), training (89), continuing medical education (CME) (63), discussions with colleagues (27), and policy of employer or practice (10). Although "patient request" was cited only once in the segment of the interview specifically addressing sources of influence, patient expectations and desires were alluded to often during other parts of the interviews.

### Facilitating Conditions

Conditions that help or hinder physicians in their use of cancer-screening activities differed across procedures. Table 3 presents a list of the conditions most frequently mentioned for five of the activities studied. No particular facilitating conditions were cited for digital rectal examination, occult stool blood test, and clinical breast examination.

### Critical Events

Physicians occasionally cited important personal experiences that motivated them to do particular cancer-screening procedures at a high rate. These experiences involved the physician's experience with diagnosing cancer as well as the death of a family member, friend, or patient as a result of cancer. Table 4 presents these experiences.

TABLE 3. CONDITIONS FACILITATING CANCER CONTROL ACTIVITIES

Activity and Condition	Frequency
<b>Papanicolaou smear</b>	
Reminder systems designed to notify patients to schedule appointments	16
<b>Mammography</b>	
Distance from clinic to radiologist	19
Relationship with radiologist	14
Availability of lower cost screening package	7
<b>Chest x-ray examinations</b>	
X-ray machine in office or building	10
<b>Smoking counseling</b>	
Availability of nicotine-containing gum	14
Personal smoking history	10
<b>Sigmoidoscopy</b>	
Clinic ownership of flexible scope	13
Training in medical school, residency, or special course	12
Room in clinic for regular use of sigmoidoscope	8
Availability of staff trained to assist in sigmoidoscopic evaluation	7
Perceived skill level in use of sigmoidoscope	5



TABLE 4. CRITICAL EVENTS

Cancer Control Activity	Critical Event
Papanicolaou smear	Cared for patient who had not had Papanicolaou smears for 2 years and presented in the 3rd year with cervical cancer During medical school cared for cervical cancer patient who died painfully Obtained class 3 Papanicolaou smear reading on patient who refused follow-up treatment and subsequently died of cervical cancer
Mammography	Had patients with surgical cures after unpalpable cancer was diagnosed with mammography
Clinical breast examination	Had friend who died at age 25 years from breast cancer Had patient who refused breast physical examination, then died of breast cancer Has history of breast cancer in own family Has seen young patients die of breast cancer quickly
Chest x-ray examination	Have two patients alive today because cancer was found with a screening x-ray Found curable cancer in a nonsmoking young woman
Smoking counseling	Had staff member successfully quit Husband died of lung cancer due to smoking In medical school saw man lose leg due to complications related to smoking Father died of emphysema
Digital rectal examination	Had patient who delayed annual examination and subsequently died of rectal cancer In medical school missed rectal cancer during physical examination of patient who was later diagnosed with it
Occult stool blood test	Had professor in medical school who died after having colorectal cancer misdiagnosed Mother died of colorectal cancer Found colorectal cancers in 10 patients in last 18 months, 7 of whom tested negative for occult stool blood
Sigmoidoscopy	Uncle died of colorectal cancer Convinced surgeon to remove suspicious polyps that proved to be malignant Found unexpected rare bowel cancer recently with screening sigmoidoscopy

## DISCUSSION

This study successfully identified the important beliefs, sources of influence, facilitating conditions, and critical events associated with each of eight cancer control activities. Past studies have focused on the identification of beliefs about cancer control procedures that act as barriers to their use. The lists of beliefs elicited in this study are far more comprehensive, as they include both beliefs that act as barriers and beliefs that are motivators. Additionally, past studies have generally been restricted to the identification or measurement of beliefs. In contrast, this study used the modified theory of reasoned action as a guiding framework for the elicitation of three other categories of factors that may affect behavior (ie, sources of influence, facilitating conditions, and critical events).

The theoretical framework employed in this study asserts that motivation or attitude is determined by certain key beliefs. The set of key beliefs must be very specific to the behavior of interest. Therefore, these beliefs are likely to be different for different cancer control activities, as was found in this study. The effectiveness of interventions to change motivation and hence behavior depends upon identifying these key underlying beliefs and directing the intervention toward changing these beliefs. In addition, the framework asserts that other factors, including sources of influence, facilitating conditions, and critical events, are important in determining motivation and behavior. Accordingly, attention should be paid to these factors in developing interventions. Other individual characteristics such as demographics or knowledge are assumed to affect behavior only through their influence on the key beliefs held by the individual.

This study elicited unique beliefs and other factors that may be important determinants of eight physician cancer control behaviors. The necessary next step is to test empirically whether these identified factors are actually associated with physician behavior.

A questionnaire has been developed based upon the findings of this research. It measures the strength of a physician's belief that performance of each cancer control behavior is associated with each of the attributes or outcomes identified in this study. It also measures the values the physician places on each of the attributes. In addition perceptions of influence from various sources, facilitating conditions, and critical events are measured for each behavior. A validation study funded by the National Cancer Institute is being conducted.

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**APPENDIX 1**

**Interview Questions**

*This set of questions was asked for each screening procedure investigated in this study. Chest x-ray examination is used here as an example of the interview format:*

**Chest X-Ray Examination**

What are the advantages of doing chest x-ray examinations for lung cancer screening from your perspective as well as your patients'?

What are the disadvantages of doing chest x-ray examinations to screen for lung cancer?

How did you come up with your protocol for lung cancer screening? Did you listen to any particular persons or groups?

What factors can you think of that make it easier or more difficult to order x-ray examinations for lung cancer screening?

The American Cancer Society does not recommend that chest x-ray examinations be done to screen for cancer. What is your opinion about this recommendation?