Breast Screening Practices Among Primary Physicians: Reality And Potential

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***Abstract*: Increased use of regular screening mammograms and clinical breast examinations (CBE) among women aged 40 years and more could have a dramatic impact on mortality from breast cancer, but patient and physician barriers to mammography impede its acceptance. We conducted a survey of 300 primary care physicians to assess their knowledge, attitudes, beliefs, and breast screening practices. Our results show that only 71 percent of the respondents ordered mammograms for all women aged 50 to 75 years, which is the recommendation by the National Cancer Institute and American Cancer Society. Approximately 46 percent of respondents performed CBE on all women patients aged 50 to 75 years. Inadequate patient insurance coverage, equivocal radiology reports, patient reluctance or worry, and patient embarrassment all appear to be barriers to physicians' utilization of breast screening. (J Am Bd Fam Pract 1990; 3:26-34.)**

Breast cancer mortality can be reduced by as much as 35 percent through population-based screening programs that include regular screening mammograms.[1-6] Screening can achieve dramatic survival benefits nationwide if it becomes a national priority.[2] While there is controversy about the benefits of mammography for women less than 50 years old, most investigators and organizations agree that mammograms should be encouraged annually after the age of 50.[7-11] By recommending annual mammograms for women aged 50 to 75 years, the National Cancer Institute's (NCI) goal is to achieve a 50 percent reduction in cancer mortality by the year 2000.[12] Unpublished data have shown, however, that only 38 percent of women aged 50 to 74 years have ever had a mammogram (The National Health Interview Survey, 1987).

There are several important patient barriers to mammography. They include: believing the test unnecessary in the absence of symptoms; lack of a strong physician recommendation; cost; misunderstanding of recommended frequency; and access barriers, including lack of time and convenience.[13-22]

Most physicians do not order screening mammograms on a routine basis. In several studies, 75 percent to 90 percent of primary physicians responded that they perform regular breast examinations, while only 11 percent to 42 percent said they ordered periodic mammograms for their asymptomatic patients aged 40 years and greater.[23-32] A study by Mann, et al.[33] showed that internists and surgeons were less likely to refer women for mammograms than were family practitioners and obstetrician-gynecologists. When chart review was added to self-report of mammography referral, the data suggested that only 4 percent to 17 percent of women aged 50 years and older were referred for screening mammograms by primary physicians.[23]

Physician reluctance to refer asymptomatic women for mammograms appears to result from a number of well-documented concerns, including the perceived low yield from the examination, cost, patient inconvenience, radiation exposure, and the perception that mammograms are unnecessary in the absence of symptoms.[23,27,29,31,34,35]

Physician endorsement of mammography can have a powerful impact on patient motivation.[20-23] Women who perceived their primary physicians as strongly recommending mammograms were significantly more likely to obtain them.[13,20,21] Fifty percent of the women surveyed in one study reported that their physicians had suggested that they have mammograms; 96 percent subsequently obtained them. Among the women whose physicians had not advocated a mammogram only 21 percent had obtained the

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examination.[36] A statewide survey of women in Rhode Island had similar findings: 60 percent of the women whose physicians had recommended screening mammograms subsequently obtained them, compared with only 8 percent of the women who had not received a recommendation.[15]

Little change in acceptance of mammography can be expected without changes in both patients and their physicians. US HEALTHCHECK, our ongoing screening mammography program, which combines service-delivery and research in an IPA-model HMO (HMO PA/NJ), allows us both to study the barriers perceived by women and physicians and to test appropriate interventions to overcome them. For women aged 40 years and greater, the cost barrier to mammography is removed by providing free mammogram referrals directly from a central screening office. A quality assurance program certifies radiology practices for participation.

Here, we present the results of a community survey conducted in a major metropolitan area to assess physicians' breast screening practices and their knowledge, attitudes, and beliefs about breast screening. The purpose of the survey was to serve as a baseline against which the results of subsequent interventions in the US HEALTHCHECK program could be assessed and to provide input to the development of physician interventions. Only minimal professional educational activities directed at physicians in the HMO had occurred at the time of the survey. The results provide an overview of primary physicians' breast screening practices in a large metropolitan area.

Methods

Two random samples of physicians were created. A sample of physicians associated with the IPA-model HMO, in which interventions for physicians and patients were being conducted, was drawn from a list of all affiliated primary care physicians. This sample included family practitioners, general practitioners, and internists. The comparison group sample of physicians was selected from the MEDEC physician list maintained by Business Mailers, Inc. (BMI). This list is compiled by BMI from the circulation list for the *Physicians' Desk Reference*. Both groups were interviewed by telephone, requiring approximately 10 minutes per interview.

Advance letters were sent to physicians selected randomly to participate along with a $10.00 incentive and a reminder label to alert the office receptionist to expect a call. The survey phase lasted from February 1988 to March 1988. There were 182 control interviews (80.2 percent response rate) and 163 study group interviews (90.6 percent response rate).

Questions were asked about physicians' mammography and breast physical examination practices; for example, we inquired about the percentage of asymptomatic women patients for whom the physician ordered regular screening mammograms and the usual interval. Parallel questions were asked about performance of clinical breast examinations (CBE). Additional questions assessed the degree to which potential barriers, such as lack of confidence and patient embarrassment, influenced mammography and CBE. Physicians also were asked to agree or disagree with a series of statements about breast screening – for example, "negative mammograms give women a false sense of security," and "screening mammograms improve breast cancer prognosis in women aged 50 years and greater." Finally, physicians were asked about their own experiences in detecting breast cancers through screening and about their use of reminder systems for mammography and Papanicolaou smears. Many of the questions were core items developed by the National Cancer Institute's (NCI) mammography consortium for use by its six breast cancer screening grantees.

Chi-square tests of association were used to assess bivariate relations. Stepwise logistic regression was used to evaluate simultaneously the effects of multiple variables on outcomes of interest.

Results

Demographic Characteristics

The demographic characteristics of the respondents are shown in Table 1. A higher proportion of the study physicians were board-certified family practitioners; they were also younger and more recent graduates from medical school (the majority graduated 6 to 20 years ago).

Mammography Practices

Seventy-one percent said they ordered mammograms annually for women aged 50–75 years

Table 1. Demographic Characteristics of Respondents (n = 345).

	Study Physicians		Comparison Physicians		*P*
	n	Percent	n	Percent	
Have a specialty	156	96	131	91	0.054
Primary specialty					0.005
Family practice	91	58	50	38	
General practice	15	10	13	10	
Internal medicine	47	30	63	48	
Other	3	2	5	4	
Board certified	114	70	188	51	0.001
Board certified in					*
Family practice	71	62	26	35	
General practice	9	8	7	9	
Internal medicine	31	27	39	53	
Other	3	3	2	3	
Year graduated from medical school					0.000
5 years ago or less (1983–1988)	9	6	2	1	
6–10 years ago (1978–1982)	45	28	23	16	
11–20 years ago (1968–1977)	63	39	41	29	
21–30 years ago (1958–1967)	32	20	25	17	
> 30 years ago (before 1958)	12	7	52	36	
Age					0.000
30 years or less	7	4	1	1	
31–35	32	20	13	9	
36–40	50	31	25	18	
41–45	36	23	36	26	
51–60	31	19	29	21	
> 60 years	4	3	37	26	

*Contains cells with expected value < 5. Chi-square may not be a valid test.

(Table 2). This is the schedule recommended by most professional organizations, including the National Cancer Institute (NCI) and the American Cancer Society (ACS). An additional 18 percent ordered mammograms every 2 years. There were no differences between the study and comparison group physicians. A much smaller proportion of respondents ordered yearly mammograms for women aged 40–49 years—about 37 percent of the study group and 29 percent of the comparison group. For women in this age group, 43 percent of study physicians and 38 percent of control physicians ordered mammograms every 2 years. Thus, for patients aged 40–49 years, 67 percent of the comparison group physicians and 80 percent of study group physicians were following practices recommended by the NCI and the ACS. More than two-thirds said that their ordering of mammograms had increased over the past 2 years.

Practice of Clinical Breast Examinations and Teaching Breast Self-Examination (BSE)

As Table 3 shows, only about 46 percent of the physicians said they performed CBE on *all* women patients aged 50–75 years. The usual interval varied, with more than 70 percent of the respondents performing the examination annually, and about 11 percent performing it semi-annually. The differences between the study and comparison groups for CBE were not significant. The NCI and ACS have recommended a yearly CBE for women in this age group[11]; semi-annual CBE may be appropriate for women at higher risk.

The great majority of physicians reported that they teach patients to do BSE, but study physicians were more likely to do so (Table 3). Usually, it was the physician who taught the procedure, and the preferred method of instruction was demonstration. About one-third

Table 2. Mammography Practices of Respondents (n = 345).

	Study Physicians		Comparison Physicians		*P*
	n	Percent	n	Percent	
Frequency of ordering screening mammograms for asymptomatic women					
Age 50–75 Years					0.724
Annually	113	72	92	70	
Every 2 years	28	18	25	19	
Every 3 years	8	5	3	2	
Every 4–5 years	1	1	2	2	
No usual interval	4	3	5	4	
Other	4	3	5	4	
Age 40–49 Years					0.015
Annually	60	37	42	29	
Every 2 years	70	43	54	38	
Every 3 years	11	7	14	10	
Every 4–5 years	7	4	6	4	
No usual interval	2	1	16	11	
Do not order regularly	4	2	5	3	
Other	8	5	6	4	
Number of mammograms ordered					0.018
Increased	128	80	95	66	
Decreased	0	0	2	1	
Remained the same	33	20	46	32	

Table 3. Clinical Breast Examinations (CBE) and Breast Self Examination (BSE) Practices (n = 345).

	Study Physicians		Comparison Physicians		*P*
	n	Percent	n	Percent	
CBE on asymptomatic women patients aged 50–75 years					0.676
No patients	2	1	5	4	
Less than 50 percent	22	14	21	15	
50–74 percent	22	14	21	15	
75–99 percent	39	24	29	21	
All	75	47	65	46	
Usual interval for CBE for asymptomatic female patients aged 50–75 years					0.072
Semi-annually	14	9	17	12	
Annually	131	82	99	71	
Every 2 years	9	6	7	5	
Every 3–5 years	2	1	2	1	
No usual interval	2	1	6	4	
No regular breast examination	0	0	6	4	
Other	2	1	2	1	
Taught BSE	150	93	121	84	0.019
Asked patient to demonstrate BSE	41	28	42	35	0.203

asked patients routinely to demonstrate the procedure.

Physicians' Attitudes and Beliefs about Breast Screening and Detection Practices

The majority of respondents believed that screening mammograms improved breast cancer prognosis and that doing a breast examination was an opportunity to teach BSE as well as allowing detection of lesions at an early stage (Table 4). They were nearly evenly divided on whether negative mammograms gave women a false sense of security. Twenty-seven percent agreed that doing breast examinations during visits for unrelated conditions made them uncomfortable.

Table 5 shows those factors affecting physicians' ordering of screening mammograms. Twenty percent or more said they were influenced by inadequate patient insurance coverage, equivocal radiology reports, patient reluctance or worry, patient request for mammograms, and the presence of risk factors. Similar questions were asked about CBE (Table 6). The only factor that seemed to affect physicians' practice of CBE was patient reluctance or embarrassment—21 percent said this negatively affected their practice somewhat or a great deal. Study group physicians reported being more influenced by patient requests for mammograms.

Use of Reminder Systems

Thirty-four percent of the physicians used reminder systems for cancer screening and detection. The most frequent system was a checklist with the patient's chart. Six percent used computerized reminder systems. About 12 percent of physicians had no reminder system for CBE, and 10 percent had no reminder system for mammography.

Multivariate Analyses

As can be seen from Tables 3 to 6, a number of factors were individually associated with physicians' screening behaviors. However, many of these factors, particularly some of the beliefs and attitudes, appeared to be correlated. Therefore, logistic regression analyses were conducted to assess the influence of multiple predictor variables on the following primary behavioral outcomes: (1) increase in ordering mammograms, (2) annual mammograms for eligible patients, (3) teaching BSE to patients, (4) annual CBEs, (5) the percent of patients aged 50 to 75 years who got mammo-

Table 4. Physicians' Attitudes about Breast Screening and Detection Procedures (n = 345).

	Study Physicians		Comparison Physicians		*P*
	n	Percent	n	Percent	
Number and percent who agreed that					
Negative mammograms give women a false sense of security	72	45	71	50	0.416
Screening mammograms improve breast cancer prognosis	155	97	129	91	0.013
Doing a breast examination is an opportunity to teach BSE	158	98	141	98	*
Doing a breast examination allows detection of lesions at an early stage	129	81	113	80	0.847
Doing breast examinations during visits for unrelated conditions makes me uncomfortable	46	29	36	26	0.585

*Contains cells with expected value < 5. Chi-square may not be a valid test.

Table 5. Factors Affecting the Ordering of Screening Mammograms for Asymptomatic Women Aged 50–75 Years (n = 345).

	Study Physicians		Comparison Physicians		*P*
	n	Percent	n	Percent	
Number and percent who agreed ("somewhat" or "a great deal")					
High price	26	16	31	22	0.131
Inadequate insurance	47	29	53	37	0.171
Radiation exposure	12	7	18	13	0.096
Patient discomfort, pain	12	7	6	4	0.315
Not cost-effective	14	9	13	9	0.241
Possibility of unnecessary biopsies	24	15	15	11	0.513
Equivocal radiology reports	42	26	32	23	0.168
Time required to explain mammography	9	6	9	6	0.347
Patient reluctance or worry	44	27	38	27	0.645
Patient request for mammogram	99	62	82	58	0.027
Presence of risk factors	114	70	97	68	0.788

grams, and (6) the percent of patients aged 50 to 75 years who got CBE.

This analytic approach allowed us to examine the combination of variables with the most impact on the outcomes. Of particular interest was the role of specialty and whether, for example, family practitioners were more likely than other physicians to follow recommended breast screening practices. Other possible predictor variables included age, board certification, and attitudes toward screening.

In presenting the results from logistic regression analyses, the impact of a predictor variable on a given outcome is expressed as the odds ratio (OR). This statistic is (approximately) the ratio of the rate of the outcome of interest among those with and without a given characteristic. For example, the odds ratio of 2.7 for study versus control physicians with respect to an increase in mammogram ordering frequency means that study physicians were about 2.7 times more likely to have increased their ordering of mammograms. Odds ratios will only be presented for variables with a statistically significant impact on a given outcome. For each odds ratio, a 95 percent confidence interval also is presented. This indicates the amount of *uncertainty* in the estimated odds ratio due to random variation and can be thought of as the lowest and highest values of the odds ratio that would still be compatible with the observed data. All of the models presented (except for the model predicting the percentage of eligible women for whom mammograms were ordered) were highly statistically significant ($P < 0.001$) by the likelihood ratio test.

Increase in Mammograms

Three variables predicted an increase in ordering mammograms: the study group (OR = 2.7 [1.5, 4.8] for study physicians versus control physicians); year of medical school graduation (OR = 0.4 [0.2, 0.8] for those graduating 1–10 years ago versus ≥ 20 years); concern over equivocal radiology reports (OR = 2.2 [1.2, 3.9] for physicians reporting any concern versus those reporting no concerns). There were no significant differences between physicians who graduated 11–20 years ago compared with graduates of ≥ 20 years. The finding for concern about equivocal reports was contrary to our expectations and cannot be explained at this time.

Annual Mammograms for Women Aged 50–75 Years

Three variables were predictors of annual mammograms for women aged 50 to 75 years: physician concern about patients' insurance coverage (OR = 2.8 [1.4, 5.3] for those with less concern versus those with more concern); type of practice (OR = 0.5 [0.3, 0.8] for private practitioners versus group practice physicians); physician's belief

Table 6. Factors Affecting Performance of Clinical Breast Examinations (CBE) for Asymptomatic Women Aged 50–75 Years (n = 345).

	Study Physicians		Comparison Physicians		*P*
	n	Percent	n	Percent	
Number and percent who agreed ("somewhat" or "a great deal")					
Patient embarrassment or reluctance	34	21	27	20	0.760
Time, effort required to do examination	8	5	9	7	0.907
Lack confidence in palpation skills	6	4	12	9	0.273
Lack confidence in procedure effectiveness	9	6	19	14	0.076
Too many other health problems	26	16	21	15	0.988
Patient in a low-risk category	14	9	19	14	0.542

that screening mammography improves breast cancer prognosis (OR = 2.1 [1.1, 4.0] for those who strongly agree versus those who are less certain or disagree).

Percentage of Eligible Patients for Whom Mammograms Were Ordered

Values for the outcome variable were grouped into the following tertiles for this analysis: 0–50 percent, 51–99 percent, 100 percent. Only one variable was an independent predictor of percentage of eligible patients: board certification (OR = 2.0 [1.3, 3.2] for board certified versus noncertified physicians).

Teaching BSE

Two variables predicted teaching BSE to patients: the study group (OR = 2.5 [1.1, 5.6] for study physicians versus control physicians); and practice specialty (OR = 3.6 [1.4, 9.3] for family practitioners versus internists).

Annual CBE for Eligible Patients

Four variables predicted physicians' CBE practice: two variables for year of graduation from medical school (OR = 8.4 [1.8, 38.3] for those who graduated 1–10 years ago, and OR = 2.7 [1.1, 6.6] for those who graduated 11–20 years ago, both compared with graduates of > 20 years); patient embarrassment or reluctance (OR = 0.3 [0.1, 0.7] for physicians who were strongly influenced by patient reaction versus those who were less influenced); patient in low-risk category (OR = 0.3 [0.1, 0.9] for those who were strongly influenced by their perception of patient risk versus those who were less influenced).

Percentage of Eligible Patients Who Received CBE

Values of the outcome variable were grouped into tertiles as in the analysis of percentage of patients receiving mammograms. Three variables were predictors of the percentage of patients receiving CBE: two variables for practice specialty (OR = 0.3 [0.1, 0.7] for general practitioners, and OR = 0.5 [0.3, 0.8] for family practitioners, both compared with internists); board certification (OR = 1.6 [1.0, 2.6] for board-certified physicians versus nonboard certified).

Discussion

In contrast to studies that have examined patient use of mammography and have identified a few powerful barriers, the explanation of physicians' behavior is both more complex and less clear. Although the models identified subgroups of physicians who adhere more closely to recommended screening practices, characteristics other than those identified probably play a large role in influencing physician behavior (such as experience with local radiology providers). Our study suffers from the usual limitations of self-report. In studies of health professionals' behavior, self-report generally provides an overestimate of actual practices. Finally, the study groups differed on some sociodemographic characteristics, including specialty, board certification, and age. Nevertheless, the sample represents primary physicians from a major metropolitan area, and the response rates were high, so the results do provide some direction for future efforts.

The data from this survey show that not all physicians are ordering mammograms for women aged 50–75 years on the schedule recommended by the NCI; only 71 percent of the study physicians said they followed this schedule. The fact that the majority reported an increase in ordering mammograms indicates that physicians' mammography practices are improving. Formal reminder systems could improve use by helping physicians to create individual patient schedules and to track them. Reminders sent to patients could have an additional positive impact on mammography and CBE use.[37-39]

It is of some concern that less than one-half of the respondents said they performed CBE on all women patients aged 50–75 years. In view of the fact that women past childbearing may not visit gynecologists regularly, the role of the primary physician in performing CBE becomes more important. And while 88 percent of physicians reported teaching patients to perform BSE, the overall quality of the learning experience could be improved if patients were asked to demonstrate their technique. Then the physician could correct improper technique and reinforce the patient's confidence in her ability to detect abnormalities. Opportunities to practice a skill and to develop confidence in one's abilities are important components of health behavior.[40]

While attitudes and beliefs were not of overwhelming importance in explaining physicians' breast screening behavior, a few are noteworthy. Physicians seem to be negatively affected by pa-

tients' embarrassment and reluctance to be examined. More discussion of the importance of CBE by the physician or other staff might reduce patients' discomfort. Also, patients could be given printed information describing the importance of breast screening and the components of a comprehensive examination. Office posters and other materials should reinforce this and create an environment supportive of early cancer detection. Special care should be taken with older patients who may experience more embarrassment about breast cancer screening. This is especially important, because most studies show decreasing acceptance of both mammography and CBE with increasing age of the patient.[41] Concern about equivocal radiology reports is persistent among physicians. Not until primary physicians begin to work more closely with radiologists in developing meaningful reporting systems for mammography will this situation be improved.

Not surprisingly, physicians who believed that screening mammograms improved breast cancer prognosis were more likely to order them. This suggests that educational programs should address the impact of mammography on stage of disease and mortality. In one study, continuing medical education for family physicians led to an increase in mammography referral rates that was maintained for at least 6 months after the seminar.[42]

More recent graduates were more likely to follow the recommended breast screening practices, suggesting that older physicians might be targeted in continuing education efforts. Differences in screening practices among subspecialties were equivocal.

Conclusion

While results of this study and national data have indicated an increase in mammography ordering by physicians, the rates are not yet at the level recommended by the NCI. The fact that our study group physicians evidenced some more desirable practices suggests that organizational support for breast screening and the lack of an economic disincentive for patients might facilitate physicians' breast screening use. Future studies should examine the impact of these variables on the screening practices of primary physicians.

Continuing education programs should emphasize the role of screening mammography in early cancer detection and seek to improve those attitudes and beliefs that are related positively to the appropriate practice of breast screening. Certain physicians, such as those who graduated more than 20 years ago, may require special attention. Education programs should provide learning and scheduling options; e.g., where possible, they could be office-based or individually oriented, which would not require primary physicians to attend formal programs. As part of the US HEALTHCHECK program, we have created a breast screening tutorial; upon receiving a passing score on an enclosed test, participants receive 5 credit hours. Some relatively simple and inexpensive patient education measures, such as conveying an unequivocal recommendation for mammography, providing targeted printed materials, and asking patients to demonstrate BSE, could improve patient acceptance of breast screening.

To achieve by the year 2000 the NCI objectives in breast screening requires a working collaboration of family physicians, patients, and radiologists. Family physicians can be leaders in ensuring that this collaboration is meaningful and effective.

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