

Physician Recommendations for Screening Mammography: Results of a Survey Using Clinical Vignettes

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Background. Although experts estimate that 30% of breast cancer deaths could be prevented if women were screened according to published guidelines, fewer than 50% of physicians follow screening mammography guidelines, and fewer than 30% of women are screened with mammography.

Methods. Physician recommendations for screening mammography were examined in a questionnaire mailed to 300 randomly selected physicians of the Ohio Academy of Family Physicians. Physicians responded with their likelihood of recommending screening mammography to 24 clinical vignettes that highlighted patient, mammographic, and encounter characteristics.

Results. Seventy-one percent responded. Ninety-one percent reported almost always recommending screening mammography to a 55-year-old woman at her yearly examination. They were significantly less likely to recommend mammography to women who

were young (40 years old), were old (70 years old), were poor, had small breasts, had painful mammograms, did not want the doctor to look for cancer, lived in a nursing home, or were retarded. Physicians recommended mammography less often when the mammography unit was far away or produced poor quality films or ambiguous interpretations. When physicians ran behind schedule, perceived a more urgent medical problem during the encounter, or saw a woman for an acute visit, they recommended mammography significantly less often.

Conclusions. Patient, mammographic, and encounter characteristics significantly limit physician recommendations for screening mammography as assessed by clinical vignettes. These characteristics must be addressed if breast cancer mortality is to be reduced with early screening.

Key words. Breast neoplasms, mammography, decision making. *J Fam Pract* 1991; 32:472-477.

Breast cancer is the leading cause of premature cancer mortality in women. One out of ten women in the United States develops breast cancer, and 44,000 women die each year of breast cancer.¹ Five-year survival rates fall as the stage of cancer at diagnosis advances. Ninety percent of women survive 5 years when disease is confined to the breast, 68% survive 5 years with regional spread, and only 18% survive 5 years with distant spread.² Breast cancer detected by breast self-examination or clinical examination is often in a late stage, and the patient will have a poor prognosis. Mammography, however, can identify breast cancers smaller than 1 cm in

diameter. Screening mammography programs have reduced breast cancer mortality by as much as 31%, according to several studies.³⁻⁵

Numerous specialty groups (American Academy of Family Physicians, American College of Obstetricians and Gynecologists) and expert panels (American Cancer Society, National Cancer Institute, Canadian Task Force), including the recently established United States Preventive Services Task Force, recommend annual screening mammography for women between the ages of 50 and 75 years.⁶

The vast majority of physicians understand and agree with these screening guidelines, when asked in direct surveys.⁷ Physicians estimate that they recommend mammography to from 30% to 70% of eligible women.⁷⁻⁹ Reviews of physician records, however, demonstrate that physicians recommend screening mammography to only 25% or less of eligible patients.¹⁰⁻¹² These chart reviews have been

Submitted, revised, December 7, 1990.

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small and may not be generally applicable to all physicians. The true reason for mammography (when it is for screening rather than diagnosis) may be obscure in the medical record because of the high cost of mammography and the exclusion of screening examinations by many insurance policies. Understandably, physician estimates usually consider only patients who are regularly seen. Only 25% to 43% of eligible women report they are screened annually with mammography. But these reports are also unreliable; women often report that mammography was performed more recently and frequently than actually performed. Moreover, many women do not know if their mammography was for screening or diagnosis.¹³⁻¹⁶ Women report the single largest factor in deciding to obtain screening mammography is their physician's recommendation. Even in areas where self-referral is available, self-referral has been uncommon (10% to 17%).^{17,18}

The reasons why physicians are still not recommending screening mammography are unclear. Cost has been cited as a barrier to screening mammography. The mean cost of mammography is \$93, and some centers offer screening examinations for less than \$50.⁷ As of July 1990, the legislatures of 29 states mandated that insurance companies provide some level of coverage for mammography.¹⁹ Yet when screening mammography has been offered without charge, usually to lower socioeconomic classes, many women still do not respond.²⁰ Clearly, the issue is more complicated.

Physicians see women as individuals in unique situations. General guidelines may be difficult, and in some cases inappropriate, to apply to an individual patient. Because physicians practice case by case, specific factors affecting screening decisions must be understood. Physicians learn and are often tested in a case or vignette fashion that approximates reality more closely than general statements. This study was designed to identify factors that influence physicians' screening mammography recommendations using vignettes that highlight common patient, mammographic, and encounter characteristics. The study was based on the hypothesis that the likelihood of physicians recommending screening mammography differs with these characteristics.

Methods

A 4-page questionnaire was mailed in January 1990 to 300 randomly selected physicians from the 1857 active members of the Ohio Academy of Family Physicians (OAFP). Reminder questionnaires were mailed to nonresponders 3 weeks and 6 weeks after the original mailing.

The questionnaire (1) identified physician and practice characteristics (sex, board certification, year of med-

ical school graduation, type of practice, number of women seen each week, percentage of women offered and percentage of women refusing screening mammography in their practice, and geographic availability and cost of mammography), (2) included patient vignettes highlighting specific patient characteristics (age, economic status, risk factors, wishes, health status, and breast characteristics), mammographic characteristics (availability, quality of film, and interpretation), and encounter characteristics (type of encounter and the physician's time restraints), and (3) queried the physician's personal beliefs about breast cancer (the effectiveness of screening tests in early detection of breast cancer, the effectiveness of mammography in breast cancer mortality reduction, the frequency of screening mammography, the safety of mammography, the quality of local mammography, and the influence of malpractice concerns).

Physicians were asked to respond with their likelihood of recommending mammography using a 5-point scale (almost always, often, half the time, infrequently, almost never) for each vignette. Responders were asked to rate breast cancer screening tests on a 4-point scale (very effective, effective, somewhat effective, or not effective) and to rate their level of agreement with breast cancer beliefs on a 4-point scale (strongly agree, agree, disagree, strongly disagree).

Clinical factors and attitude statements were derived from literature review and physician suggestions on pilot tests. The questionnaire was piloted by 14 academic and private practice physicians in December 1989.

Data Analysis

To obtain 100 complete and eligible responses, 300 questionnaires were mailed. Physician characteristics of questionnaire responders were compared with those of the OAFP using chi-square analyses. Physician mammography recommendations given to a 55-year-old woman at her yearly visit (standard vignette) were examined according to physician characteristics by chi-square analyses (using the mean response of the Likert scale and assigning "almost always" as 1 and "almost never" as 5). Mean response to the standard vignette of a 55-year-old woman was compared with mean responses to the other clinical vignettes by repeated measures of analysis of variance. Significant differences were further analyzed by the Newman-Keuls range test ($\alpha = .05$).

Results

Two hundred fifteen questionnaires were returned. Two hundred twelve eligible physicians and three ineligible

physicians (retired) returned questionnaires, making a response rate of 71%.

General Demographics

Of the responders, 81.3% were male and 18.7% were female, compared with the 85.5% male and 14.5% female membership of the OAFP (NS, $\chi^2 = 2.69$); 82.1% of the responders were board certified in family practice, compared with 69.7% of the OAFP members ($\chi^2 = 13.38$, $P < .05$). Of the physicians responding, 91.1% were either practicing family physicians (81.5%) or full-time family medicine faculty (9.6%). The remaining physicians (8.9%) were in other types of practice such as emergency departments, student health centers, or company health centers. Thirty-seven percent of responders had graduated from medical school before 1970; 28% had graduated from medical school between 1970 and 1980, and 35% had graduated from medical school after 1980. Comparatively, 40%, 31%, and 29% of the OAFP members graduated before 1970, between 1970 and 1980, and after 1980, respectively (NS, $\chi^2 = 2.73$).

Mammography units were located less than 5 miles from the offices of 85.9% of responders, 5 to 9 miles away for 4.9%, and 10 to 19 miles away for 8.2% of responders.

Eighteen percent of responders were unsure about the cost of mammography locally. The number of women who refused mammography was quite variable among the physician responders. Thirty percent of responders reported that fewer than 5% of the women to whom they had recommended mammography refused. Fourteen percent reported that 5% to 9% of their patients refused. Another 24% reported that 10% to 19% of women refused mammography. Nineteen percent reported that 20% to 29% of women refused mammography, and 14% reported that more than 30% of women refused.

The sex of the physician and the era of training (medical school graduation before 1970, between 1970 and 1980, or after 1980) did not significantly change the likelihood of recommending mammography for the standard 55-year-old woman presenting for her yearly physical (Table 1). Board-certified physicians were significantly more likely to recommend mammography to the 55-year-old woman, however (Table 1). Although not statistically significant, female physicians were more likely to recommend mammography in every clinical vignette than male physicians.

Vignettes

Physician likelihood of recommending screening mammography differed significantly with various patient char-

Table 1. Physician Characteristics and Mean Response* to Standard 55-year-old Woman Vignette

Characteristic	Mean Response*	P Value
Sex		
Female	1.11	.69
Male	1.15	
Era of training		
Before 1970	1.24	.88†
1970–1980	1.09	
After 1980	1.10	
Board certification		
Yes	1.10	<.01
No	1.38	

*Mean response generated from Likert scale assigning a weight of 1 for "almost always" to a 5 for "almost never."

†Not significant.

acteristics. The standard 55-year-old woman in good health was offered screening mammography during her yearly visit by 91.3% of physicians "almost always." Physicians were significantly less likely to recommend screening mammography to a 70-year-old woman (63.6% "almost always") and to a 40-year-old woman (65.9% "almost always") during a yearly visit ($P < .05$) (Table 2).

If the patient belonged to a prepaid health plan or was financially secure, physicians were more likely to recommend screening mammography during the yearly visit (97.3% and 93.5%, respectively, "almost always") than for the standard 55-year-old woman. If she was poor and did not qualify for Medicaid, screening mammography was offered less frequently (75.7% "almost always"). The likelihood of recommending mammography to the woman belonging to the prepaid health plan and the poor woman was statistically different compared with the standard 55-year-old woman ($P < .05$) (Table 2).

Mammography was recommended more frequently to women with risk factors for breast cancer (mother with breast cancer "almost always" 96.7%, nulliparity 94.6%, and previous breast biopsy, 94.6%) compared with the standard woman ("almost always" 91.3%). Although all women with risk factors for breast cancer were offered mammography more often, statistical significance was reached only in those women whose mothers had had breast cancer ($P < .05$) (Table 2).

The likelihood of recommending mammography changed with the health of the woman. Physicians were less likely to recommend mammography if the woman had multiple medical problems: hypertension, diabetes, heart disease, and depression (84.2% "almost always"), or was retarded, living in a group home (66.8% "almost always"), or if she was in a nursing home for Alzheimer's disease (15.3% "almost always") as compared with the standard. Statistically significant differences were identi-

Table 2. Patient, Mammography, and Office Encounter Factors Associated with Physicians "Almost Always" Recommending Mammography

Variables	Percent "Almost Always" Recommending Mammography	Statistical Significance Compared with the Standard 55-Year-Old Woman
Patient age (y)		
55	91.3	—
70	63.6	<.05
40	65.9	<.05
Patient insurance status		
Prepaid health plan	97.3	<.05
Financially secure	93.5	NS
Poor, without Medicaid	75.7	<.05
Patient risk factors		
Mother with breast cancer	96.7	<.05
Nulliparity	94.6	NS
Previous breast biopsy	94.6	NS
Patient health		
Multiple medical problems	84.2	NS
Retarded, living in group home	66.8	<.05
Alzheimer's disease, living in nursing home	15.3	<.05
Patient concerns		
Requests mammogram	98.4	<.05
Previous painful mammogram	76.1	<.05
Requests not to look for cancer	75.1	<.05
Breast characteristics		
Multiple nodules	99.5	<.05
Large breasts	94.1	NS
Small, atrophic breasts	63.3	<.05
Mammography factors		
Unit more than 40 miles away	76.5	NS
Provides ambiguous reports	64.2	<.05
Produces poor quality films	38.3	<.05
Patient encounter factors		
Physician behind schedule	49.5	<.05
Urgent patient problem	15.8	<.05
Visit for acute problem	35.7	<.05

NS denotes not significant.

fied for the retarded woman and the woman in a nursing home ($P < .05$) (Table 2).

Physicians differed in their likelihood of recommending mammography depending on patient wishes. If the patient requested a mammogram at her yearly visit, 98.4% of physicians "almost always" recommended mammography, whereas if she reported a previous painful mammogram or requested that the physician not look for cancer, only 76.1% and 75.1%, respectively, were offered mammography "almost always" ($P < .05$) (Table 2).

If the woman had multiple nodules in her breast or large breasts, physicians were more likely to recommend mammography (99.5% and 94.1% "almost always," respectively). Statistical significance was found for the

woman with multiple nodules ($P < .05$). On the other hand, if she had small atrophic breasts, physicians offered mammography significantly less frequently (63.3% "almost always") ($P < .05$) (Table 2).

Recommendations varied with mammographic factors. Physicians were less likely to recommend mammography to the 55-year-old woman if the unit was more than 40 miles away ("almost always" 76.5%), if the radiologist gave ambiguous reports and often recommended ultrasounds ("almost always" 64.2%), or if the quality of films was poor ("almost always" 38.3%). Statistical significance ($P < .05$) was reached in the vignettes with ambiguous interpretations and poor quality films (Table 2).

Factors affecting the patient encounter influenced

the physician's recommendations. Physicians were statistically ($P < .05$) less likely to recommend mammography during the woman's yearly physical examination when they were running behind (49.5% "almost always") or discovered a more urgent patient problem (new chest pain, 15.8% "almost always") or when they were seeing the patient for an acute visit (35.7% "almost always"), as compared with the standard 55-year-old woman's yearly visit (91.3% "almost always") (Table 2).

Physician Attitudes

Ninety-seven percent of the responders felt that mammography was an effective or very effective screening test for early breast cancer detection. Eighty-seven percent of the responders agreed or strongly agreed with the statement that women between the ages of 50 and 75 years should be screened yearly with mammography. Seventy-nine percent of responders agreed or strongly agreed with the statement that women between the ages of 40 and 50 years should be screened with mammography every 1 to 2 years. Ninety-eight percent agreed that screening mammography posed minimal risk from radiation. Ninety-four percent of responders agreed or strongly agreed that women in their practice wanted screening for breast cancer. Ninety-eight percent agreed that their local mammography interpretations were excellent. Fifty-four percent agreed or strongly agreed that malpractice concerns influenced their breast cancer screening recommendations.

Discussion

This study identifies many patient mammographic and encounter characteristics that influence physicians' recommendations for mammography.

Physicians reported recommending mammography significantly less often to the exceptions: the woman who was old, was young, was poor, was retarded, lived in a nursing home, had small breasts, or had had a painful mammogram. These findings are supported by other studies.^{12,15,21} Whether making these exceptions is good medical practice is unknown. Physicians reported recommending mammography more often to those women with risk factors for breast cancer. Since known breast cancer risk factors are poor predictors of women who develop breast cancer (only one out of four women with breast cancer have a risk factor other than age), basing screening on risk factors is a poor screening strategy. Physicians also reported recommending mammography significantly less often to the woman who seeks medical attention only for sick care; this practice is confirmed in

other studies.¹² In spite of the recent increased attention to preventive medicine, women who seek only episodic care when sick remain a significant fraction of the population. Physicians fail to follow screening guidelines when the mammography unit is inaccessible, delivers poor quality films, or provides ambiguous interpretations. The 1989 ACS physician survey⁷ reported similar mammographic barriers to screening mammography. The accuracy of physicians' perceptions is uncertain. Less than 50% of physicians comply with guidelines when they run behind schedule, and only 16% recommend mammography if a more urgent medical problem is identified at the yearly visit. Although the frequency of either occurrence is unknown, both are common for the busy family physician.

Similar to the 1989 ACS telephone survey, physicians in this survey had a good understanding of and agreement with published screening guidelines.⁷ However, unlike earlier studies, the era of training did not significantly alter the physician's responses⁹ (Table 1). Perhaps continuing medical education favoring mammography has negated the earlier seen differences in physicians who were trained at different times. The results might also be explained by a greater percentage of the OAFP board-certified members responding to this questionnaire than noncertified members; furthermore, board certification may significantly improve a physician's reported likelihood of recommending mammography.

One half of the physicians reported that malpractice issues influenced their screening recommendations. In the 1989 ACS survey only 6% of physicians reported ordering mammography to prevent lawsuits.⁷ Failure to diagnose breast cancer is the second highest cause of professional liability actions. Several successful malpractice cases have involved women who were not offered screening mammography.²²

Limitations of the study include physician estimation of their behaviors rather than actual practices. Dietrich and Goldberg,²³ and Woo et al²⁴ found the frequency of physicians' self-reported screening recommendations much higher than their actual screening recommendations. Whether vignettes are more reliable predictors of physician behaviors than physician self-reports is unknown. Some authors believe questions pertaining to vignettes or cases may more accurately reflect attitudes and behaviors than general questions.^{25,26} Physicians are highly experienced with clinical vignettes, which abound in medical literature and medical school teaching as well as in board certification examinations. Although the physician self-reports may not accurately reflect their practices, they do identify some specific factors that influence physicians' screening mammography recommendations.

The study population was limited to family physicians in Ohio. Dietrich and Goldberg²³ found no significant differences in mammography recommendations between family physicians and internists in California. Ohio physicians fell in the middle third percentile nationwide for screening mammography (19% of women over age 50 years had screening mammograms within the last year) in a nationwide telephone survey conducted by the Centers for Disease Control in 1987.²⁷

To reduce breast cancer mortality, attention must be given to those characteristics associated with physician failure to follow breast-screening guidelines. Increased attention must be given to the older woman. The cost of screening mammography must be lowered, or alternative methods of payment be made available to poor women. Physicians must be educated about the poor predictive value of breast cancer risk factors. Although studies support screening the average woman over 40 years of age, further studies should address the incidence of breast cancer in women with small breasts and the cost-benefit ratio of screening mammography for women in poor health. Mammographic units should be accessible; radiologists should provide fewer ambiguous readings and recommend fewer unnecessary, costly follow-up studies. Women should be educated about the importance of mammography, thus prompting requests for screening mammography from patients. Physicians should educate women about the importance of scheduling health maintenance visits during which there would be ample time to discuss screening tests. Also, physicians should develop office reminder systems or protocols ensuring that recommendations for mammography screening are made in spite of busy schedules, and in the context of acute illness visits rather than only during a checkup.

By focusing on these clinical characteristics of the patient, mammography unit, and patient encounter, breast cancer mortality may be reduced.

Acknowledgment

Statistical analysis was performed by Daniel J. Nordlund, PhD, Medical College of Ohio, Department of Family Medicine.

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