

Conflicting National Recommendations and the Use of Screening Mammography: Does the Physician's Recommendation Matter?

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Background: This study evaluated whether women's perceptions of the conflicting recommendations for breast cancer screening were associated with decreased use of mammography.

Methods: We conducted a random-digit-dial telephone survey of 1024 women in four communities of western Washington State. In addition to collecting data for demographics, beliefs about mammography, and insurance coverage, we inquired whether the respondents were aware of any conflicting recommendations about when to begin or how frequently to perform screening mammography, whether their physicians had recommended a mammogram, and whether they were likely to do what their physicians recommended. After grouping women according to whether they perceived conflicting recommendations, we used chi-square statistics to compare the distribution of proportions of women by age, race, household income, education, and insurance coverage. To estimate the odds of their having a mammogram in the previous 2 years (yes or no), we used multivariate logistic regression and included the above variables as covariates.

Results: Sixty-two percent of eligible women completed the survey, and 49 percent (479 of 985) perceived conflicting recommendations. The association between perceiving conflict and mammography use was not significant. Eighty-three percent of women who perceived conflicting recommendations reported being more comfortable using their own judgment about getting the procedure. After controlling for whether women perceived conflicting recommendations and all other factors, women who said they followed their physician's advice but did not recall their physician recommending mammography were 71 percent less likely to have received a recent mammogram than were women who reported their physician did recommend it (odds ratio 0.29, confidence interval 0.16-0.51).

Conclusions: The conflicting recommendations surrounding breast cancer screening are not influencing women's choices about mammography. The physician recommendation and women's self-reported likeliness to follow it are the most important factors associated with mammography use. (J Am Board Fam Pract 1997;10:88-95.)

Despite considerable research into improved treatments and a wealth of convincing evidence that screening mammography benefits women aged 50 years and older, the number of women dying from breast cancer increased between 1973 and 1990.¹⁻³ A key to reducing the mortality rate from breast cancer is promotion of mammograms.⁴ In 1995 an estimated 46,000 deaths were

due to breast cancer.⁵ To avoid one death among women aged 50 years and older, more than 500 women must be screened, yet evidence suggests that many women still do not receive regular mammograms.^{6,7}

The physician's recommendation to get a mammogram (cue) plays an important role in mammography promotion, but it is only one of several factors associated with mammography use.⁷⁻⁹ In surveys of women, those who have not had mammograms commonly report their physician never recommended them.^{8,9} The importance of this recommendation is not clear, however, for even when a clear recommendation is given, the proportion of women who subsequently get a mammogram has been shown to be a disappointing 50 to 60 percent.^{10,11} In prospec-

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tive studies of women given a clear recommendation for a mammogram, other factors, such as the belief that mammography is good and that it finds cancers in the absence of symptoms, have been associated with subsequent mammography use.^{12,13} Conceptual models of health behavior suggest that the strength of the cue and the support of the medical community should influence adherence to the recommendation.^{14,15}

Unfortunately, there is ambiguity in the medical community that might influence women's perceptions of support for screening behavior.^{3,16} Opinions differ regarding whether to begin screening at the age of 40 or 50 years and how often it should occur among women aged 50 and older.^{3,17,18} The American Cancer Society recommends mammography every 1 to 2 years among women aged 40 to 49 years and annually thereafter.¹⁸ During the mid to late 1980s the National Cancer Institute agreed with these recommendations, but in 1993 they retracted their recommendation to begin screening at age 40 years,¹⁹ stating that the literature supported screening beginning at the age of 50 years. The US Preventive Services Task Force (USPSTF) and the American College of Physicians (ACP) also subscribe to this recommendation.²⁰

Although both the ACP and the USPSTF recommend that screening begin at the age of 50 years, they differ regarding the interval to be used.²⁰ The ACP recommends annual screening, whereas the USPSTF recommends mammography every 1 to 2 years. In 1991 Medicare began reimbursing for screening mammography performed every 2 years among women aged 65 years and older. Many insurance companies began coverage for screening mammography at about the same time, but they also differ regarding how often they will pay for it.

These differing recommendations and reimbursement schedules reflect controversy regarding the interpretation of available scientific data. This controversy is well known to physicians, but how it is perceived by women has not been evaluated, and its impact on their use of screening is unclear. We therefore conducted this survey among women 50 years old and older. For this age group there is debate among providers about how often to recommend screening mammograms but existing national guidelines agree that screening should occur.¹⁸⁻²⁰ Our goal was to eval-

uate the association between mammography use and the women's perception of conflicting screening recommendations after accounting for the influence of recognized factors. Additionally we were interested in how much the physician's recommending a mammogram increased the odds of a recent mammogram after accounting for other factors including women's perception of conflicting recommendations.

Methods

This study took place in western Washington State in the spring of 1993 as part of a larger project designed to evaluate the promotion of mammography.²¹ The project focused on four communities, located within four separate counties, that were selected for their medium size and geographic separation from other population areas. Each community had at least 10,000 women aged 50 years and older. Those providing breast cancer care to the population were primary care physicians, specialty physicians, screening facilities, and treatment centers located within the community. The entire county met the study criteria for three of the communities. The fourth community existed in the northern part of its county and was geographically separated from its southern inhabitants, who traveled to a larger metropolitan area for much of their care. The physicians providing primary care to these communities included family physicians and general practitioners (n = 151), internists (n = 44), and obstetrician-gynecologists (n = 29).^{22,23}

Survey

To determine mammography use, we conducted a telephone survey of community women using a modified Waksberg random-digit-dial technique.^{21,24} Women were eligible for the survey if they resided in the community for 2 years prior to 1993, were aged 50 through 75 years, and did not have breast cancer. To limit response bias regarding mammography and breast cancer, the survey instrument included a variety of questions regarding basic demographic characteristics, information about the women's regular physicians, insurance issues, and the women's experience with cervical and ovarian cancer screening. To measure mammography use, we asked when in the previous 5 years the women had had mammograms and the date of their most recent examination.

One half of the sample were randomly selected for additional questions regarding their attitudes toward mammography. These attitudinal measures evaluated factors that are consistent with the theory of reasoned action and have been associated with mammography use in previous prospective studies.^{12,13} The measures assess beliefs about mammography and women's perceptions of the expectations of their physicians (social normative influence).¹⁴ To measure beliefs, we asked women to rate, on a 7-point bipolar scale, their degree of agreement or disagreement with statements about mammography, including whether it (1) was good, (2) finds cancer the woman herself cannot find, (3) finds cancer the woman's physician or nurse cannot find, (4) finds cancer when no symptoms exist, and (5) is inconvenient. For the logistic model described in more detail below, we dichotomized responses using the upper 2 points on the 7-point scale as 1 and the lower 5 as 0.

To measure social normative influence, we asked whether women agreed that screening mammography was recommended by their regular physician, and whether they were likely to do what their physician recommended. We then grouped women into four categories: (1) those who reported that their physician recommended mammography and said they did what their physician recommended, (2) those who reported their physician recommended mammography but they did not always do what their physician said, (3) those who reported their physician did not recommend mammography and said they did what their physician recommended, and (4) those who reported their physician did not recommend mammography and they did not always do what their physician recommended. A set of three dummy variables was created for these categories and entered into the logistic model described below using category 1 as the referent group.

We considered conflicting guideline recommendations to be a social normative influence. To examine women's experience of any conflicting recommendations, we asked whether women "ever received conflicting information about either the age at which they should begin having regular mammograms or how often women should get regular mammograms or both." Responses determined whether women were aware of any conflicting recommendations and, if so, where they perceived the conflict (ie, age to be-

gin, frequency, both). For the logistic regression, a set of dummy variables was created with the referent group being women who did not perceive any conflicting recommendations among the guidelines.

To provide greater insight into our findings, we also asked how the conflicting recommendations made women feel. Among those women who reported an awareness of conflicting recommendations, we asked whether it made them feel (1) confused, (2) that nobody really knows what is best, (3) comfortable using their own judgment about what was best for them, (4) that having mammograms was not important, and (5) that they wanted to talk more about the issue with their physicians.

Analysis

We conducted the analysis in two steps that were restricted to the half of the sample group randomly selected for additional questions regarding their attitudes toward mammography. For the first step we used chi-square statistics to examine the bivariate relations between the perception of conflicting recommendations and demographic characteristics and then between perception of conflicting recommendations and mammography use in the previous 2 years.

In the second step we examined the contribution of conflicting recommendations to a multivariate model that controlled for the effect of demographic characteristics, attitudinal measures, and health care factors previously found to be associated with mammography use.^{7,12,13} This model used mammography in the last 2 years (yes or no) as the dichotomous outcome in a logistic equation that included the following variables: age (50 to 59, 60 to 69, and 70 to 75 years); income (less than \$15,000, \$15,000 to \$35,000, or more than \$35,000); race (white, nonwhite); education (none after high school, some after high school); insurance coverage (none, don't know, partial, full); whether the woman saw an obstetrician-gynecologist (no or yes); and the attitudinal measures and social normative influence as noted above. In the model the first response category is the referent for calculating an odds ratio.

Results

Among all eligible women (n = 3240), 2010 (62 percent) completed the survey and responded to

Table 1. Demographic Characteristics and Perceived Conflicting Recommendations Regarding Screening Mammography.

| Demographic Characteristics | Perceived Conflict No. (%) | No Perceived Conflict No. (%) | Total No. |
|----------------------------------|----------------------------|-------------------------------|-----------|
| Age, years* | | | |
| 50 - 59 | 128 (50.8) | 124 (49.2) | 252 |
| 60 - 69 | 201 (50.5) | 197 (49.5) | 398 |
| 70 - 75 | 130 (41.5) | 183 (58.5) | 313 |
| Total† | 459 (47.7) | 504 (52.3) | 963 |
| Race‡§ | | | |
| White | 445 (48.3) | 476 (51.7) | 921 |
| Nonwhite | 15 (34.1) | 29 (65.9) | 44 |
| Total | 460 (47.7) | 505 (52.3) | 965 |
| Household income | | | |
| < \$15,000 | 70 (38.7) | 111 (61.3) | 181 |
| \$15,000 - \$35,000 | 193 (47.8) | 211 (52.2) | 404 |
| > \$35,000 | 135 (53.1) | 119 (46.9) | 254 |
| Total | 398 (47.4) | 441 (52.6) | 839 |
| Education¶ | | | |
| Some after high school | 229 (57.1) | 172 (42.9) | 401 |
| None after high school | 232 (41.1) | 333 (58.9) | 565 |
| Total | 461 (47.7) | 505 (52.3) | 966 |
| Insurance coverage of mammogram# | | | |
| Full | 188 (49.6) | 191 (50.4) | 379 |
| Partial | 113 (50.0) | 113 (50.0) | 226 |
| Don't know | 108 (43.2) | 142 (56.8) | 250 |
| Not covered | 35 (41.7) | 49 (58.3) | 84 |
| Total | 444 (47.3) | 495 (52.7) | 939 |
| Sees obstetrician-gynecologist** | | | |
| Yes | 62 (50.4) | 61 (49.6) | 123 |
| No | 399 (47.3) | 445 (52.7) | 844 |
| Total | 461 (47.7) | 506 (52.3) | 967 |

* $\chi^2 = 6.991, P = 0.030$.

†The totals vary because of missing data for some variables.

‡White 95.3%, nonwhite 0.3%, African American 0.1%, Asian 1.0%, Hispanic 3.2%, other 0.1%.

§ $\chi^2 = 3.407, P = 0.065$.

|| $\chi^2 = 8.917, P = .012$.

¶ $\chi^2 = 24.2, P < 0.001$.

$\chi^2 = 4.224, P = 0.238$.

** $\chi^2 = 0.422, P = 0.516$.

the question regarding mammography use. Because we asked a random sample of one half of these women the attitudinal questions, the analysis was restricted to these 1005 women. Among the 1005 women, 235 had missing information for one or more of the dependent variables for the multivariate model, so they were excluded from that analysis. Most (n = 141) were excluded because of missing information for income level; others were excluded because of missing informa-

tion for motivation to comply with their physician (n = 59), insurance reimbursement for mammography (n = 29), and age (n = 4).

Table 1 displays the relation between demographic characteristics and awareness of conflicting recommendations. Overall, about 49 percent of women (479 of 985) reported receiving some conflicting information about mammography recommendations, though not all reported what type. The distribution of proportions among women who perceived conflicting recommendations, compared with those who did not, differed significantly from chance ($P < 0.05$) for age, household income, and education, but not for race, insurance coverage, or whether they saw an obstetrician-gynecologist. Women who perceived conflicting recommendations were somewhat younger, had higher incomes, and had more education. Among these women demographic characteristics did not differ across the types of conflicting information they received (ie, regarding age to begin, frequency to perform, or both [not shown]).

Table 2 displays the proportion of women who had at least one mammogram in the past 2 years. Overall, 73 percent of women had a recent mammogram, and it appears that mammography use was somewhat higher among women who were aware of conflicting guideline recommendations compared with those who were not. This difference was not statistically significant. To examine the association more closely, we used logistic regression as described above.

Table 3 displays the results of the multivariate logistic regression. In this model an awareness of conflicting recommendations takes on the expected negative association with mammography use, but it is not statistically significant. For women who believed that mammography was good and among women who reported seeing an obstetrician-gynecologist, the odds of mammography were significantly increased after controlling for all other demographic characteristics, beliefs about mammography, social norma-

Table 2. Recent Mammography Use According to Awareness of Conflicting Recommendations.

| Perceived Conflicting Recommendations | At Least 1 Mammogram in Last 2 Years No. (%) | No Mammogram in Last 2 Years No. (%) | Total No. |
|---------------------------------------|--|--------------------------------------|-----------|
| None | 356 (71.5) | 142 (28.5) | 498 |
| Age and frequency | 260 (74.5) | 89 (25.5) | 349 |
| Frequency alone | 28 (70.0) | 12 (30.0) | 40 |
| Age alone | 46 (75.4) | 15 (24.6) | 61 |
| Total | 690 (72.8) | 258 (27.2) | 948 |

Note: differences in proportion with 1 mammogram in last 2 years were not significantly different across perceived conflict categories.

tive influences, and facilitating conditions. Women who did not recall their physicians recommended mammography ($n = 106$) and women who reported they do not do what their physician recommends ($n = 117$) were about one third as likely to have had a mammogram as those who recalled their physicians recommended a mammogram and in general said they do what is recommended ($n = 740$).

Table 4 displays how women categorized their responses to conflicting recommendations, with results grouped by where the women perceived the conflicting recommendations. Differences in their responses did not vary by type of conflicting recommendation with one exception. Women who were aware of conflicting recommendations about the age to begin mammography were much less likely to feel the need to talk with their physician than were women who were aware of conflicting recommendations about frequency or both frequency and the age to begin ($\chi^2 = 5.993$, $P = 0.050$).

The overwhelming majority (84 percent) of women reported that the conflicting recommendations let them feel more comfortable about using their own judgment to decide what was best for them. Only a small proportion of women (7 percent) reported that the conflicting recommendations made them think mammography was not important. These findings are consistent with the overall conclusion that an awareness of conflicting recommendations regarding mammography use is not associated with decreased mammography use.

Discussion

Organizations are concerned that conflicting guideline recommendations for breast cancer

screening might confuse women and discourage the use of mammography.²⁵ Disagreement regarding what age to begin screening mammography and how frequently to perform it among women aged 50 years or older continues in the medical community.^{3,26} The results of our study suggest that women aged 50 years and older are not discouraged by the existing controversy. The surprising finding is that only about one half of the women (49 percent) reported being aware of any conflicting guideline recom-

mendations, and their recent use of mammography was not reduced. Among those who were aware of the conflicting recommendations, the overwhelming majority (85 percent) responded that they felt more comfortable about making their own decision.

Despite these convincing findings there are some limitations to the study that temper our conclusions. We did not consider the effect of family history of breast cancer on our results. Because a family history of breast cancer is associated with increased likelihood of getting a mammogram, it is possible that conflicting mammography recommendations might have had a differential effect among these women.¹¹ Nevertheless, less than 15 percent of the population has any first- or second-degree family history of breast cancer, and its effect on mammography use is modest, so the absence of this information should not affect our conclusions substantially.^{10,27} A more serious study limitation is that relatively few racial minorities were represented in this study, so generalization to nonwhite groups is not appropriate.

Finally, although the controversy regarding when to begin having mammograms reflects long-standing differences of opinion,^{28,29} this controversy was particularly salient in 1993, when the survey was conducted, and could have heightened women's awareness of this issue. That we found that conflicting recommendations regarding when to begin mammography were not associated with use among older women is therefore more convincing. Also, because the survey occurred among women aged 50 years and older, the controversy about whether to start screening mammography at 40 or 50 years did not affect them directly in 1993, and they were less inclined

Table 3: Multivariate Model of the Odds of a Recent Mammogram.

| Variables | β | Standard Error | Odds Ratio* | 95% Confidence Interval | |
|--|---------|----------------|-------------|-------------------------|-------|
| | | | | Lower | Upper |
| Demographics | | | | | |
| Age: 60-69 years | -0.27 | 0.27 | 0.76 | 0.45 | 1.28 |
| Age: 70-75 years | -0.21 | 0.30 | 0.82 | 0.46 | 1.50 |
| Race: white | 0.08 | 0.50 | 1.08 | 0.41 | 2.88 |
| Income between \$15,000 - \$35,000 | -0.22 | 0.40 | 0.80 | 0.37 | 1.74 |
| Income > \$35K | 0.23 | 0.44 | 1.26 | 0.53 | 2.99 |
| Education: some after high school | 0.07 | 0.22 | 1.07 | 0.70 | 1.63 |
| Beliefs about mammography | | | | | |
| Is good | 0.83 | 0.28 | 2.28 | 1.31 | 3.96 |
| Finds cancer women cannot | 0.76 | 0.41 | 2.15 | 0.97 | 4.76 |
| Finds cancer physicians and nurses cannot | -0.37 | 0.44 | 0.69 | 0.29 | 1.65 |
| Finds cancer without symptoms | 0.24 | 0.41 | 1.27 | 0.57 | 2.81 |
| Is inconvenient | -0.16 | 0.26 | 0.86 | 0.51 | 1.43 |
| Social normative influence | | | | | |
| Physician did not recommend; woman would follow recommendation | -1.26 | 0.30 | 0.29 | 0.16 | 0.51 |
| Physician recommended; woman does not always follow recommendation | -0.99 | 0.32 | 0.37 | 0.20 | 0.70 |
| Physician did not recommend; woman does not always follow recommendation | -1.35 | 0.52 | 0.26 | 0.09 | 0.72 |
| Experienced conflicting recommendations regarding | | | | | |
| Age to begin | -0.16 | 0.40 | 0.85 | 0.39 | 1.86 |
| Frequency | -0.19 | 0.46 | 0.83 | 0.34 | 2.03 |
| Both | -0.20 | 0.22 | 0.82 | 0.54 | 1.26 |
| Facilitating conditions | | | | | |
| Insurance coverage full | 0.91 | 0.54 | 2.48 | 0.86 | 7.20 |
| Insurance coverage partial | 0.84 | 0.69 | 2.31 | 0.60 | 8.90 |
| Insurance coverage unknown | -0.49 | 0.36 | 0.61 | 0.30 | 1.23 |
| Provider: obstetrician-gynecologist | 0.95 | 0.39 | 2.60 | 1.20 | 5.60 |

*Odds ratios and confidence intervals calculated from logistic model, with reference group as described in the Methods section. The model includes responses of 770 women who had complete information on all variables. Most missing data (n = 141) were for income, followed by motivation to comply with physician's recommendation (n = 59).

to talk with their physicians about this issue than they were about frequency of mammography.

A physician's recommendation for mammography and a woman's regard for her physician's advice were associated with mammography use. Women whose physicians did not recommend mammography were 71 percent less likely to have had a mammogram after accounting for other factors using a multivariate model. Though the importance of the physician recommendation has been recognized for some time, to our knowledge its relative importance, after accounting for other factors, has not been previously evaluated.⁸ Our analysis shows that the physician's recommendation nearly triples the odds of getting a mammogram. Though mammography has been advocated actively for more than a decade, physicians should not underestimate the impact of their individual recommendations.

Our findings also show, however, that the 15

percent of women (117 of 770) who reported not always following their physician's recommendation were also about one third as likely to get a mammogram. This finding indicates a need to explore further the factors affecting these women's choices. It also indicates a potential limitation of holding physicians solely responsible for promoting mammography use.

Awareness of conflicting guideline recommendations is not associated with decreased mammography in this model. Perhaps physicians resolved any confusion that existed for the 52 percent of women who did not report awareness of conflicting recommendations, or perhaps the controversy over recommendations occurred in forums that were obscure to these women. Even when the women did perceive conflicting recommendations, it did not deter them from getting a mammogram, and very few concluded that mammography was not important. From these results

Table 4. Women's Reactions to Conflicting Recommendations Regarding Mammography.

| Women's Reactions (Conflict made me feel...) | Types of Conflicting Recommendations | | | |
|---|--------------------------------------|----------------------------------|---|-------------------------------|
| | Age to Begin (n = 359) Percent | Frequency (n = 40) Percent | Both Age and Frequency (n = 62) Percent | Total (n = 461) Percent |
| Confused | 31.7 | 40.0 | 35.5 | 33.0 |
| That nobody knows what is best | 59.3 | 52.5 | 62.9 | 59.2 |
| More comfortable using my own judgment | 84.4 | 75.0 | 80.6 | 83.1 |
| That mammography is not important | 7.0 | 7.5 | 6.4 | 6.9 |
| Like talking more with my physician* | 38.4 | 32.5 | 22.6 | 35.8 |

* $\chi^2 = 5.993, P = 0.050$.

it seems apparent that the scientific controversy regarding when to begin screening mammography and how frequently to perform it needs to be resolved on the basis of the evidence about its benefits to women rather than out of fear that it is reducing mammography use among women aged 50 through 75 years.

Whether the controversy contributes to decreasing recommendations by physicians is unclear and should be addressed in other work. Additionally, we need to explore methods of reaching the group of women who would follow their physician's recommendation for a mammogram. Systems now exist to help the physician recommend mammography. There is considerable evidence that implementing these systems rather than clarifying the guidelines would have more impact on promoting mammography.³⁰

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