Predictors of Mammography Use in the Past Year Among Elderly Women

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Thirty-two personal characteristics were examined as potential predictors of mammography use in the past year in a geriatric clinic. Interviews assessed demographic, health status, health service utilization, health belief, and psychological and social variables (n = 242, mean age = 76 years). Four variables were independently associated with mammography use in logistic regression analysis: age, historical mammography use, perceived severity, and perceived barriers. The inverse relationship between age and mammography use in the past year was not modified by health status, functional status, and the other independently predictive variables. The authors conclude that geriatrics specialty care does not eliminate the age-associated decline in mammography use that has been previously described. The factors associated with mammography use in this sample were similar to those that have been described in younger populations of women. Variables examined because of specific gerontologic considerations were not independently associated with mammography use in the past year.

Mammography is underused among women older than 50 years of age despite its demonstrated efficacy in reducing the mortality due to breast cancer (Shapiro, 1989; Shapiro, Venet, Strax, Venet, & Roeser,

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1982; Tabar et al., 1992) and its widespread endorsement (Dodd, 1993; U.S. Department of Health and Human Services, 1990). This is a problem of special relevance to elderly women because the incidence of breast cancer increases with age (Ballard-Barbash, Griffin, Wold, & O'Fallon, 1987; Qualters, Lee, Smith, & Aubert, 1992; Ries, 1994), whereas the use of mammography declines (Ackermann, Brackbill, Bewerse, Cheal, & Sanderson, 1992; Calle, Flanders, Thun, & Martin, 1993). Although guidelines for mammography use vary widely, especially for older women (Costanza, 1992), there is a broad consensus that a substantial gap exists between current and optimal levels of use among elderly women (Greenwald & Sondik, 1986; Halabi, Vogel, Bondy, & Vernon, 1993; Mandelblatt, Wheat et al., 1992; National Center for Health Statistics, 1994; NCI Breast Cancer Screening Consortium, 1990; Weinberger et al., 1991).

Previous studies have demonstrated that mammography use is generally more frequent among women with higher levels of education, income, and insurance coverage, whereas its use is less frequent among older and minority women (Ackermann et al., 1992; Breen & Kessler, 1994; Hayward, Shapiro, Freeman, & Corey, 1988). Other personal characteristics that have been less consistently associated with mammography use include health beliefs (Fulton et al., 1991; Stein, Fox, Murata, & Morisky, 1992), life satisfaction (Mandelblatt, Traxler, Lakin, Kanetsky, & Kao, 1992), ethnicity (Caplan, Wells, & Haynes, 1992; Stein, Fox, & Murata, 1991), and knowledge (Burack & Liang, 1989). However, many previous studies have excluded elderly women. Further, little or no attention has previously been given to a variety of age-associated factors that may be relevant as predictors of mammography use among elderly women, such as functional status, cognitive status, social support, and the desire to continue living. We therefore studied the relationship between mammography use in the past year and a broad array of patient characteristics, including health indicators, demographic characteristics, health service utilization, health beliefs, psychological factors, and social influences among elderly women in a university-based geriatric medicine outpatient clinic.

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Method

SETTING AND SUBJECTS

Patients were recruited from the University of Michigan Turner Geriatric Clinic, where approximately 2,800 patients receive medical care annually. The clinic staff during the study included 11 faculty physicians, 12 fellows in geriatric medicine, 22 residents in internal medicine, and 3 clinical nurse specialists, all of whom participated in the study. More than 80% of patient care was provided by a faculty member in conjunction with a fellow, resident, or clinical nurse specialist, whereas a faculty physician was the primary health care provider for the remaining visits. The clinic did not have established guidelines for mammography use at the time of the study.

The study population consisted of 781 women who obtained medical care at the study site between June 1, 1989, and January 31, 1990; were older than 55 years of age; and lived less than 20 miles away. A stratified sampling method (Figure 1) was used to simultaneously recruit patients for more than one study as efficiently as possible. This stratification process required that patients be classified after each clinic visit during the study period according to mammography use in the previous year (as determined by computerized medical records) and whether they were offered a mammography referral during the recruitment period. Information regarding the offering of mammography referrals to the study subjects was not collected prior to or after subject recruitment. Therefore, the information regarding physician offering of mammography referrals during the subject recruitment period was not related to the use of mammography in the previous year and was not included in our analyses. Case-weighted analyses adjusting for the stratified sampling procedures and unweighted analyses were examined.

Telephone contact was initiated with 681 of the 781 women who visited the study site during the recruitment period, including a 60% sample of the 254 women who had a mammogram in the past year and were not offered a mammography referral ($n = 154$) and 100% of the other women in the study population ($n = 527$). We excluded women who had a mammogram after their clinic visit but before they could be interviewed ($n = 124$) because very recent mammography use could

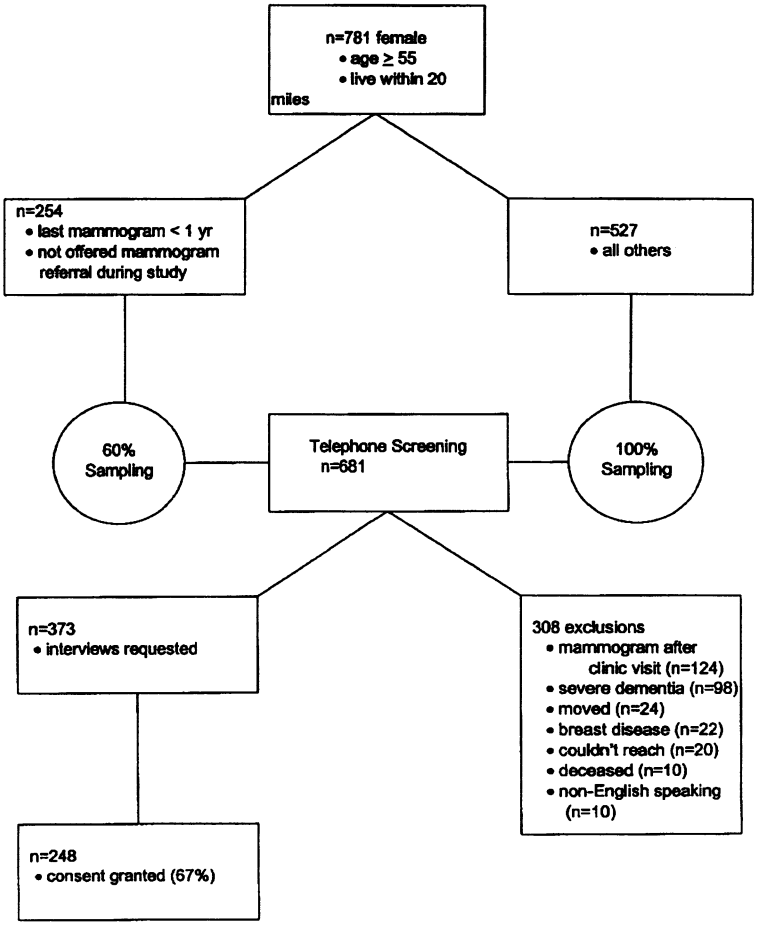

Figure 1. **Subject recruitment overview.**

have a short-term impact that could bias our results. For example, a woman who feels highly susceptible to breast cancer may experience a transient sense of relief for a few weeks after a normal screening mammogram, including the time of her interview. Thus, the relationship between perceived susceptibility and mammography use would be obscured until the relevant attitudes returned to their steady state.

Ninety-eight women were excluded because of severe dementia. Eighty-six women were excluded for other reasons, as shown in Figure 1.

Interviews were requested of 373 patients, of whom 248 consented (66%), and 242 completed face-to-face interviews. There were no significant differences between women who were and were not sampled or between sampled women who did and did not consent to be interviewed in terms of their age, race, and outpatient service utilization. The respondents chose whether to be interviewed in their own home or the clinic. Face-to-face interviews were conducted by experienced interviewers with advanced degrees in the social sciences.

MEASURES AND INTERVIEW INSTRUMENT

Previous mammography use was independently assessed by review of computerized hospital radiology records and from self-reported data. Mammography use in the past year was used as the criterion behavior because this reflected the most widely accepted recommendations for mammography use at the time of the study. Mammography use in the past year, the dependent variable, was defined as the occurrence of a mammogram during the 12 months preceding the first clinic visit during the study according to either data source. Historical mammography use, an independent variable, was defined as the number of self-reported mammograms occurring more than 1 but less than 5 years previously. Thus, historical mammography use was assessed independently of mammography use in the past year (the dependent variable).

Potential predictors of mammography use were identified on the basis of a literature review and focus groups with elderly women who were not potential study subjects. A 207-item interview instrument (available on request) was developed to assess 32 patient characteristics (Tables 1 and 2) including 5 demographic, 5 health service utilization, 4 health status, 6 health belief, 7 psychological, and 5 social influence variables. The measurement of 9 variables was based on previously validated measures, including breast cancer risk (Taplin, Anderman, & Grothans, 1989), functional status (Fillenbaum, 1985), cognitive function (Pfeiffer, 1975), perceived susceptibility to breast cancer (Ronis & Harel, 1989), health motivation (Lau, Hartman, &

Table 1
Mammography Use by Patient Demographic, Health Status, and Health Service Utilization Variables

Characteristic	n	*Proportion With Mammogram < 1 Year*
Demographic		
Age (in years)***		
55-64	10	.70
65-74	92	.49
75-84	97	.37
85+	38	.16
Race		
White	216	.40
Non-White	21	.33
Education		
0-12	85	.36
13-16	99	.45
17+	53	.34
Marital status*		
Married	70	.51
Other	167	.35
Income**		
$0-$9,999	64	.25
$10,000-$30,000	64	.42
$30,000+	109	.47
Health status		
Breast cancer risk*		
High	76	.53
Medium	138	.33
Low	23	.39
Functional status (IADL)		
Unimpaired	208	.41
Any impaired	29	.28
Self-rated health		
Excellent or very good	75	.44
Good	91	.45
Fair or poor	71	.28
Cognitive function		
Normal	116	.41
Borderline	73	.45
Abnormal	48	.29
Health service utilization		
Historical mammography use**		
0	61	.15
1-2	89	.34
3+	87	.63

(continued)

Table 1 Continued

Characteristic	n	*Proportion With Mammogram < 1 Year*
Physician visits in past 6 months		
1	61	.39
2-3	92	.41
4+	84	.39
Hospital days in past 6 months		
0	208	.40
Any	29	.34
Breast exam instruction*		
Yes	195	.44
No	42	.29
Gynecologist visits in past 6 months		
Yes	15	.40
No	222	.40

Note. IADL = instrumental activities of daily living.
*$p < .05$. **$p < .01$. ***$p < .001$. (Chi-square test of significance.)

Ware, 1986), depressive symptoms (O'Hara, Kohout, & Wallace, 1985), health locus of control (Wallston, Wallston, & DeVellis, 1978), life satisfaction (Liang, 1984), and social support (Fillenbaum, 1988). Unidimensional scales were developed to assess 10 additional variables, including the perceived severity of early breast cancer, perceived severity of late breast cancer, perceived benefits of mammography, perceived barriers to mammography use, the desire to live longer, future orientation, knowledge of mammography, knowledge of cancer, perceived physician involvement in health care, and perceived family involvement in health care.

The interview items regarding breast cancer severity addressed the likelihood that major surgery, extensive chemotherapy, poor functional status, poor quality of life, and death would result from developing breast cancer. The perceived benefits of mammography use addressed the likelihood of avoiding these outcomes. The perceived barriers to mammography use that were examined included the associated inconvenience, stress, difficulty getting there and back, expense, radiation, fear of finding something wrong, time involved, embarrassment, exhaustion, pain, and concern that it was not really needed. The psychometric properties of the health belief, psychological, and social influence variables are shown in the appendix.

Table 2
Mammography Use by Patient Health Belief, Psychological, and Social Influence Variables

Characteristic	*Proportion With Recent Mammogram*		
	Scale Low	*Scale Medium*	*Scale High*
Health beliefs			
Susceptibility to breast cancer**	.54	.40	.25
Severity of early breast cancer	.41	.43	.35
Severity of late breast cancer**	.26	.41	.49
Benefits of mammography	.28	.40	.46
Barriers to mammography use***	.56	.40	.17
Health motivation	.41	.41	.34
Psychological			
Depressive symptoms	.46	.43	.31
Health locus of control	.37	.48	.33
Desire to live longer***	.27	.20	.50
Future orientation*	.31	.38	.51
Knowledge of mammography***	.09	.23	.53
Knowledge of cancer	.36	.45	.40
Life satisfaction	.40	.37	.42
Social influences			
Physician involvement in health care***	.25	.44	.52
Family involvement in health care**	.36	.29	.51
Friends with cancer (number)	.42	.39	.32
Social support	.43	.39	.37
Peer mammography use***	.26	.32	.51

*$p < .05$. **$p < .01$. ***$p < .001$. (Chi-square test of significance.)

DATA ANALYSIS

Of the 242 patients who consented to participate in the study, 5 did not respond to 15% of the 207 interview items or to more than half of the items in a multi-item scale and were therefore excluded from analysis. Missing data were imputed using regression techniques (Dixon, Brown, Engelman, & Jennrich, 1988) for 92 respondents, including 70 respondents with less than 5% missing data and 22 with 5% to 15% missing data.

The unadjusted association between mammography use in the past year and each patient characteristic was assessed in stratified analysis (Tables 1 and 2). The statistical significance of these associations was assessed with the Pearson chi-square test.

Table 3
Logistic Regression Analysis Predicting Recent Mammography Use

Characteristic	*Adjusted Odds Ratio*	*95 % Confidence Interval*
Demographic		
Age	0.52	0.31-0.87
Income	1.07	0.81-1.42
Health status		
Breast cancer risk	1.13	0.67-1.92
Self-rated health	1.04	0.89-1.22
Health services		
Historical mammography use	1.42	1.12-1.79
Health beliefs		
Susceptibility to breast cancer	0.98	0.76-1.27
Severity of late breast cancer	1.11	1.02-1.21
Barriers to mammography use	0.84	0.76-0.93
Psychological		
Life satisfaction	0.95	0.90-1.00
Depressive symptoms	0.95	0.84-1.07
Desire to live longer	1.12	0.89-1.40
Knowledge of mammography	1.38	0.84-2.27
Social influences		
Physician involvement in health care	0.94	0.77-1.15
Peer mammography use	1.06	0.65-1.73

Note. Hosmer-Lemeshow goodness of fit = 6.2, $df = 8$, $p = .62$. -2 log likelihood = 225.4, $df = 219$, $p = .37$. Estimated $r^2 = .30$.

Blockwise logistic regression analysis was used to examine the multivariate association between mammography use in the past year and the measured patient characteristics (Agresti, 1990). This process involved examining six preliminary logistic regression models corresponding to the six domains of patient characteristics that were assessed (e.g., demographic, health status, health service utilization, health beliefs, psychological, and social influence variables). Then, all variables that were significant at the .15 level in the preliminary regression models were included in a final regression analysis (Table 3). Patient age was entered into the regression models as a continuous variable. Age in years was divided by 10 so that the computed odds ratios would represent the change in the odds of mammography use per decade of life. The r^2 statistic was estimated in a manner appropriate to logistic regression (McFadden, 1974). Goodness of fit was assessed with the Hosmer-Lemeshow statistic. First-order interaction

Table 4
Relationship of Variables Significant in Regression Analysis to Mammography Use in the Past Year by Age

	Age (in years)					
	< 70		*70-79*		*80+*	
	n	*Proportion With Mammogram < 1 Year*	n	*Proportion With Mammogram < 1 Year*	n	*Proportion With Mammogram < 1 Year*
Overall	41	.49	113	.47	83	.33
Historical mammography use		**		**		*
0	11	.27	27	.15	23	.09
1-2	15	.33	42	.45	32	.28
3+	15	.80	44	.68	28	.46
Barriers to mammography use		**		**		*
Low	18	.78	53	.62	36	.36
Medium	6	.50	24	.46	22	.28
High	17	.18	36	.25	23	.04
Severity of late breast cancer		*ns*		*ns*		*ns*
Low	11	.27	26	.35	28	.18
Medium	12	.50	44	.45	25	.28
High	18	.61	42	.57	30	.30

*$p < .05$. **$p < .01$. (Chi-square with two degrees of freedom.)

terms between the independent variables and age were examined but not reported because only one reached statistical significance, and these terms did not enhance the interpretability of the regression analysis. Exclusion of cases with a Cook's distance greater than 0.2 and case weighting to adjust for the stratified sampling methods and variable interview recruitment rates among the sampling strata did not substantively alter the results. Unweighted regression results are therefore reported.

Variables that were independently associated with mammography use in the past year were also examined in bivariate age-stratified analysis (Table 4). Chi-square statistics were used to assess the statistical significance of these relationships.

Results

Forty percent of the interviewed women (n = 242) had a mammogram in the past year, whereas 20% had never had one. The study sample had a mean age of 76 years, and 90% were White. About one quarter had incomes below $10,000 per year, and more than half had some college education. About 90% reported that the study site was their usual source for routine health care. Other characteristics of the 242 interviewed women are presented in Table 1.

The relationship of recent mammography use to patient age in the study sample is shown in Figure 2. Women younger than 75 years of age were more than three times as likely to have had a mammogram in the past year than were women older than 85 years of age. Approximately 25% of the study subjects older than the age of 85 had never had a mammogram as compared to 15% who were younger than this age.

Table 1 presents the bivariate association of mammography use in the past year with patient demographic, health status, and health service utilization characteristics. Among the demographic variables, age and income were associated with recent mammography use, whereas education was not. Women with incomes less than $10,000 per year were about half as likely to have had a mammogram in the past year as women with higher incomes. Women with high breast cancer risk were about one and a half times as likely to have had a recent mammogram as women of medium or low risk. Among the health status indicators, women with lower levels of self-rated health, cognitive functioning, and functional status appeared less likely to have had a mammogram in the past year, but these associations were not statistically significant. As expected, recent mammography use was strongly associated with historical mammography use (Table 1). For example, women with three or more mammograms in the past 1 to 5 years were four times as likely to have had a mammogram in the past year as compared to women with no mammograms in the past 1 to 5 years.

Table 2 presents the bivariate association of mammography use in the past year with patient health belief, psychological, and social influence variables. Three of six patient health beliefs were significantly associated with mammography use in the past year (Table 2).

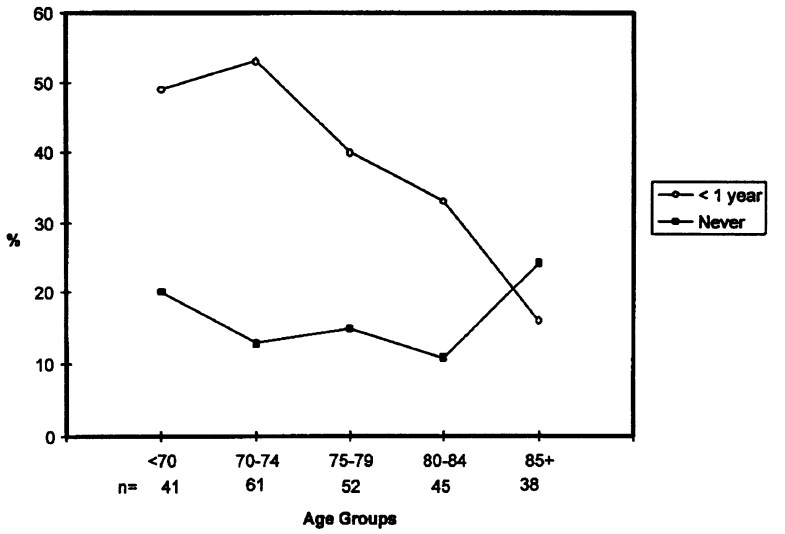

Figure 2. **Mammography use in a geriatric clinic by age (n = 237).**

Women who expected late breast cancer to be very severe were twice as likely to have had a recent mammogram as women who expected it to be of low severity. In contrast, the perceived severity of early breast cancer was unassociated with recent mammography use. Women perceiving few barriers to mammography use were more than three times as likely to have had a mammogram in the past year as women who reported many barriers.

Three of seven psychological characteristics were significantly associated with mammography use in the past year, including the desire to continue living, future orientation, and knowledge regarding mammography (Table 2). Women with high levels of knowledge regarding mammography were almost six times as likely to have had the procedure as women with low levels. Three of the five measured social influence variables were significantly associated with recent mammography use (Table 2). These included the perceived physician involvement with their health care, the perceived family involvement with their health care, and peer mammography use.

The final logistic regression model is shown in Table 3. The preliminary blockwise regression analyses that were used to select variables for the final regression model are not presented. After controlling for the other variables in the model, the odds of having had a mammogram in the previous year declined by about half with each decade of age. No other demographic factors were independently predictive. Historical mammography use (the number of mammograms more than 1 but less than 5 years in the past) was strongly associated with recent mammography use, whereas the number of physician visits and the other measured health service utilization variables were not. Among the health belief variables, women who viewed late breast cancer as more severe and those who perceived fewer barriers to mammography use were more likely to have had a mammogram in the past year. Neither the perceived susceptibility to breast cancer nor the perceived severity of early breast cancer was independently associated with recent mammography use. Interestingly, none of the health status, psychological, or social influence variables were independently associated with mammography use in the past year (Table 3). Excluding either age or historical mammography use from the model did not substantively alter the relationships of the other independent variables to recent mammography use. The logistic regression model (Table 3) had an estimated R square of 30%.

Table 4 shows the age-stratified association of mammography use in the past year with the other patient characteristics that were significant in regression analysis (historical mammography use, the perceived barriers to mammography use, and the perceived severity of late breast cancer). The results within each age stratum (Table 4) parallel those observed in the logistic regression analysis (Table 3). Although a consistent trend of association was evident between the perceived severity of late breast cancer and mammography use in the past year, this relationship did not achieve statistical significance due to the small sample sizes.

Discussion

The rate of mammography use in this study sample was relatively high in comparison to national samples, possibly reflecting an empha-

sis on prevention among geriatric specialists or among women choosing to attend a geriatrics clinic. However, despite the fact that all of the study subjects received primary care services at a university-based geriatric medicine outpatient clinic, mammography use declined substantially with increasing patient age. Women younger than 75 years of age were more than three times as likely to have had a recent mammogram as were women older than 85 years of age. Although poor health and psychosocial concomitants of aging might have been expected to be responsible for the observed age-associated decline in mammography use, this proved not to be the case in our study population, consistent with previous research (Mayer et al., 1992). After controlling for health status and a variety of other potentially relevant factors, the odds of having had a mammogram in the past year declined by about half per 10-year increment in age.

The mechanism for the independent effect of age on mammography use is uncertain. Physician behavior may play an important role, such as endorsing mammography less often or less vigorously with advancing patient age. Rather than necessarily arising from agist attitudes, this might reasonably result from the lack of expert consensus regarding the optimal use of mammography among women older than 75 years of age and from recognition that age-associated decrements in life expectancy reduce the expected benefit from mammography. These remain important areas for future research. It has also been suggested that an inverse relationship between age and mammography use may result from a cohort effect arising from older women never having taken up mammography (Coll, O'Connor, Crabtree, & Besdine, 1989). However, this appeared not to be the case in the present study because three quarters of the women older than 85 years of age had had the procedure at least once previously.

Health status indicators played only a modest role in predicting mammography use. Although mammography use appeared less likely among those with functional impairment, fair or poor self-rated health, and cognitive impairment in bivariate analysis, these relationships were not statistically significant. Further, in multivariate analyses, none of these measures were independently associated with mammography use. Thus, women who are healthy enough to obtain outpatient services appear similarly able to obtain mammography. It is also

evident that the age-associated decline in mammography use discussed earlier cannot be explained by variations in health status.

Among the health service utilization variables, only historical mammography use was significantly associated with mammography use in the past year. The odds of having had a recent mammogram increased by 42% with each mammogram obtained in the more distant past. The considerable strength with which past behavior predicted mammography use in the past year is consistent with related research suggesting that established patterns of mammography use persist over time (Zapka, Stoddard, Maul, & Costanza, 1991). These findings suggest that interventions that successfully increase mammography use have the potential for a sustained impact by establishing a pattern of periodic use.

The Health Belief Model (Janz & Becker, 1984) has been used extensively to examine the use of preventive health services including mammography (Calnan, 1984; Champion, 1994; Fulton et al., 1991; Stein et al., 1992; Zapka, Stoddard, Costanza, & Greene, 1989). This model relates mammography use to the perceived susceptibility to and severity of breast cancer as well as the perceived benefits of and barriers to mammography use. The present study distinguished between the perceived severity of early versus late breast cancer to avoid measurement errors that might otherwise result. For example, women who obtain mammography regularly may anticipate early detection and consider only early breast cancer when responding to questions about the perceived severity of breast cancer. Such an effect could obscure or invert the relationship between mammography use and the perceived severity of breast cancer (Ronis & Harel, 1989).

Among the health belief variables, the perceived severity of late breast cancer and the perceived barriers to mammography use were independently predictive of recent mammography use in our study population. However, none of the other health belief constructs were associated with mammography use in logistic regression analysis. These findings suggest that the decision to obtain mammography is more likely to arise from a straightforward desire to avoid a severe illness (advanced breast cancer) than from the more complex weighing of the various risks and benefits postulated by the Health Belief Model (Rosenstock, Strecher, & Becker, 1988), at least in our study population.

Our hypothesis that psychological and social factors would be of particular relevance to mammography use in this population was only partially supported. Although several of these factors were associated with recent mammography use in bivariate analysis, none were statistically significant in multivariate analysis. These findings did not result from an association of the measured psychological and social factors with age, because removing age from the multiple regression analysis and inclusion of first-order interaction terms with age did not substantively change these results. Although we recognize their importance in specific clinical circumstances, we conclude that the measured psychosocial factors were not primary determinants of mammography use in our study population. Recognizing the heterogeneity of the elderly population, further research examining whether psychological and social factors assume greater significance in specific subgroups of patients would be valuable.

The present study suggests that similar factors motivate the use of mammography among elderly and younger adult women in three ways: First, the patient characteristics that were significantly associated with mammography use in this elderly cohort (i.e., patient age, health beliefs, and historical mammography use) were similar to those that have been identified in younger populations of women older than 50 years of age. Second, and consistent with the findings of other investigators (Halabi et al., 1993), age did not appear to significantly alter the relationships between recent mammography use and the other patient characteristics that were independent predictors in this study (Table 4). Finally, none of the patient characteristics examined because of specifically gerontologic considerations were independently predictive of mammography use. Based on these findings, we infer that some parallels may be appropriate in planning interventions to optimize mammography use among elderly and younger adult women. For example, both groups may benefit from a two-phased intervention consisting of a brief screening process that would identify individuals at high risk for not using mammography appropriately and a targeted high-intensity intervention focused on relevant attitudes and health beliefs. However, it is important to recognize that the content of the interventions may need to be age specific. Although it will likely be useful to reduce the perceived barriers to obtaining mammography

among women of all ages, the specific barriers that need to be overcome may be quite different among younger and elderly women.

The present study has certain limitations. The generalizability of our findings may be limited because our study population was predominantly Caucasian and had a higher than average educational level. The observed relationships between the measured patient characteristics and recent mammography use may be different in other populations. Additional research in other primary care settings would be useful to address this issue. Limited heterogeneity in the study sample with respect to race, functional status, and the use of gynecologic services may have obscured associations between these variables and mammography use. Finally, it should be noted that women with severe dementia were excluded. Therefore, our observations may not apply to this group of elderly women.

The mechanism through which the measured patient characteristics are associated with mammography use remains to be clarified. The demonstrated associations could result from any combination of effects on the offering of mammography referrals by health care providers, patient adherence with offered referrals, and self-referral patterns. No information was available in this retrospective study regarding these behaviors as determinants of mammography use. Prospective studies are needed to clarify the relative importance of physician and patient behaviors in limiting the use of mammography.

In summary, a strong inverse relationship was demonstrated between aging and recent mammography use despite controlling for a wide variety of potentially relevant patient characteristics. This finding is unlikely to represent physician bias against the elderly because the study was conducted in a geriatrics outpatient practice. Our findings do not support the hypotheses that poor health or psychosocial concomitants of aging are substantially responsible for the age-associated decline in mammography use. The strong association between historical and recent mammography use suggests, but does not prove, that establishing regular use of mammography among middle-aged women could result in greater use of the procedure among elderly women. We believe that subsequent interventions to alter patterns of mammography use among older women should pay

special attention to the barriers to mammography use and patient perceptions of the severity of breast cancer that is not detected early. Further attention to physician referral patterns and organizational factors is also likely to be helpful.

APPENDIX
The Psychometric Properties of Interview Scales

Characteristic	*Mean*	*Standard Error*	*Number of Items*	*Reliability*
Health Beliefs				
Susceptibility	7.5	.900	2	.62
Severity of late breast cancer	28.7	.273	7	.78
Severity of early breast cancer	20.0	.315	7	.82
Benefits of mammography use	23.8	.132	5	.67
Barriers to mammography use	18.0	.420	11	.84
Health motivation	11.4	.150	4	.64
Psychological				
Life satisfaction	40.46	.533	11	.72
Health locus of control	6.64	.172	4	.65
Desire to live longer	8.84	.133	2	.66
Future orientation	5.07	.181	2	.60
Depressive symptoms	6.05	.247	11	.54
Knowledge of cancer	.82	.053	2	.58
Knowledge of mammography	3.40	.062	4	.65
Social influence				
Family involvement in health care	7.90	.168	2	.81
Friends with cancer	.55	.046	2	a
Social support	2.50	.058	7	a
Peer mammography use	4.30	.050	1	a
Physician involvement in health care	6.91	.135	2	.78

a. Internal reliability statistics are not interpretable for single item and multidimensional variables.

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