Effect of Appointment Scheduling and Reminder Postcards on Adherence to Mammography Recommendations

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A brief, simple intervention designed to increase the adherence of female patients to their physicians' recommendations for screening mammograms was tested in several midwestern sites. Compared with a control group in which women were examined, told about mammography, and instructed to make an appointment for themselves, an intervention that scheduled appointments for women on the spot and followed up with a reminder postcard increased adherence at every site. Such an intervention, if implemented on a wide scale, would augment the value of screening mammography in controlling breast cancer. **J FAM PRACT 1990; 30:542-547.**

Authorities estimate that this year 150,000 American women will have invasive breast cancer diagnosed, and that 44,000 women will die of the disease.[1] Recent statistics show that one out of every 11 women in the United States will, at some time in her life, develop breast cancer. Considering both the severity and prevalence of this disease, methods for its control have become a primary concern for medical researchers.

There is a growing consensus that screening mammography is one of the most effective ways to reduce breast cancer mortality.[2–4] Screening mammography is underutilized, however, despite numerous pleas in the professional and lay press. It is estimated that only 31% or fewer women in the target groups for breast cancer screening have ever had a mammogram.[5] According to one study,[6] fewer than one half of this country's primary care physicians had ever referred an asymptomatic patient with no history of cancer for screening mammography. Such underutilization diminishes the effectiveness of screening mammography in reducing breast cancer mortality.

Underutilization results from reluctance on the part of physicians to recommend screening mammography[7,8] as well as a reluctance on the part of patients to adhere to such a recommendation.[9–11] In turn, these factors can be traced to historical issues, such as radiation dose levels, as well as contemporaneous concerns such as fear of cancer, and the effectiveness, convenience, cost, and discomfort of the examination itself. Previous mass media accounts detailing alleged dangers or painfulness of the test are thought to bias patient and physician alike.

Curiously, the literature is sparse on factors influencing a woman's adherence to a referral for screening mammography. Is it sufficient for a physician to recommend a screening mammogram for patients to follow through? The evidence shows that patient adherence to screening mammography recommendations cannot be taken for granted. Lane[12] examined family practice residents' referrals for screening mammograms during a 2.5-year period. Among women for whom there were no physical findings on breast examination, fewer than 30% obtained the recommended mammogram. Cummings et al[7] found that of the physicians who use mammography, "63% reported that patients 'often' or 'sometimes' refuse mammography when it is suggested to them." Indeed, not only do women refuse their physicians' referrals for screening mammograms, but that they do so is a reason given by some physicians not to recommend the test![7]

Various patient characteristics are correlated with the use of screening mammography. Bourguet et al[13] found that the strongest predictors for obtaining a mammogram among asymptomatic women aged over 50 years were a family history of breast cancer and a history of benign

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breast disease. Demographic characteristics such as marital status, race, and age were not related to referral; neither were other known breast cancer risk factors. In a study conducted in England, Calnan[11] found that married younger women (ie, between 45 and 60 years) were more likely to attend a screening mammography clinic than single or widowed older women. Because breast cancer incidence increases with age, one might expect the likelihood of screening mammography use to increase with age. Surveys[1,5] do show variation in use of mammography with age (as well as education and income level), but as Howard[1] points out, it is difficult, in such surveys, to separate screening from diagnostic mammograms. Moreover, the relationship between patient age and mammography is not always a direct one.[1]

The cost of the mammographic examination is known to influence patient adherence. In the study cited above, Lane[12] found an increase in adherence of roughly 30% among women with neither symptoms nor signs of breast cancer when the $60 mammography fee was paid by a third party.

Short of providing free examinations, what can be done to improve adherence rates for screening mammograms? In general, the fewer things a person must do to achieve a health-related outcome, the more likely that outcome is to occur[14]: thus, in automobiles, passive restraints (airbags) are preferable to seatbelts, as the former require no active intervention on the part of the user. Regarding medical adherence, Gillum and Barsky[15] wrote, "Any medical regimen necessitates some behavioral change on the part of the patient, and he is most likely to comply with those aspects of the regimen that are the least difficult and disruptive of his preexisting behavior."

Specific techniques can improve patients' adherence to recommendations for cancer screening tests. Thompson et al[16] studied different interventions in the context of screening for occult blood in the stool for colon cancer. A postcard reminding the patient to return the specimen proved to be the most effective, as well as the least expensive, intervention.

The study reported here investigated the effects of on-the-spot scheduling and a reminder postcard on adherence to physicians' referrals for screening mammography among asymptomatic women. Postcard reminders were chosen because of their low cost, easy implementation, and success in improving adherence in other settings. Besides their obvious value in jogging memory, reminder postcards may serve as a tangible symbol of the importance of the procedure they refer to. The rationale for on-the-spot scheduling was that it reduces the behavioral burden on the patient and may amplify the perceived importance of obtaining a mammogram.

METHODS

Site Selection and Preparation

The study took place in 1987 and 1988. Sites were family physicians' offices selected primarily among graduates of Memorial Hospital of South Bend's Family Practice Residency Program. The protocol was developed and submitted to the hospital's Institutional Review Board. After approval, the protocol was circulated among recent program graduates as well as among the program's part-time precepting faculty. Ultimately, nine practice sites initiated the study, including the residency program's ambulatory care facility. Characteristics of the sites are detailed in Table 1.

Each site (save one that was 150 miles away) was visited by a program representative so as to gain the physicians' commitment to the protocol and to teach the protocol to office personnel. A physician at each site was asked to agree to certain conditions, specifying, among other things, that all eligible patients, without exception, would be assigned alternately to an experimental or a control group until 50 women had been assigned to each group.

Materials

Each site was provided with a notebook containing the necessary instructions and supplies for conducting the study and divided into four sections entitled Instructions, Assignment, Flowsheets, and Monthly Reports. The Instructions section contained a statement of expectations and responsibilities by which the practice agreed to abide during the course of the study, as well as a script for the physician covering what he or she needed to tell each patient referred for mammography. The Assignment section contained materials by which office staff assigned patients alternately to an experimental or control group as they came into the office during the study period. The Flowsheets section contained materials for each patient enrolled in the study: instructions to the physician to conduct a breast examination, and, if normal, to refer the patient for screening mammography within the next 30 days, and to explain screening mammography and deal with any concerns expressed by the patient; instructions for the office staff on what to do with patients in the experimental and control groups; and a space for recording the date of receipt of the patient's mammography report. The Monthly Reports section contained forms for managing the clerical tasks of the study. Reminder postcards and opaque adhesive dots were provided.

TABLE 1. SITE CHARACTERISTICS

Site	Practice Type	Community Size	Percent with Medicare/ Medicaid*	Mammogram Cost, Proximity
1	Residency	246,000	55	$48, mobile unit†
2	Family practice group	246,000	50	$48, mobile unit
3	Solo	1,200	40	$90, 5 miles
4	Family practice group	3,600	0	$48, mobile unit
5	Solo	3,300	55	$60, 5 miles
6	Family practice group	3,600	30	$54, 5 miles
7	Solo	1,100	50	$51, 10 miles
8‡	Solo	1,500	5	$48, mobile unit
9‡	Multispecialty group	37,000	60	$45, on site

*Percentage of patients enrolled in these programs as estimated by office personnel.
†A mobile mammography screening unit, visiting sites on a periodic basis.
‡These sites withdrew from the study.

Subjects

A woman was declared eligible for the study according to the following American Cancer Society guidelines[17]:

1. Aged 35 to 40 years with no previous "baseline" mammogram
2. Aged 40 to 50 years with no mammogram within the past 1 or 2 years
3. Aged over 50 years with no mammogram within the past year

In addition, the woman had to meet the following inclusion criteria:

1. Signs: No signs (lumps, discharge) noted on breast examination
2. Symptoms: No symptoms (pain, reports of lumps or discharge) elicited in the history
3. Current illness: No acute problems requiring immediate hospitalization or precluding breast examination

Although the protocol specified that any woman meeting the above criteria be included, the final decision regarding inclusion in the study was left up to the physician. That the physician was always blind to the patient's group assignment did not alter the random allocation of patients to the experimental or control group.

Procedure

For any particular patient the procedure was as follows: Office personnel were to determine the patient's age and mammography status. If she was eligible, they filled out the patient identification section of the flowsheet, consulted the assignment sheet to determine group assignment, and indicated group assignment on the flowsheet. They then covered the indication with an opaque adhesive dot to prevent the physician from learning the patient's group assignment, and placed the flowsheet in the patient's chart. When the physician saw the patient, he or she was to notice the flowsheet and, without removing the opaque dot, follow the directions on it. Thus, regardless of

TABLE 2. ADHERENCE TO MAMMOGRAPHY RECOMMENDATIONS, BY GROUP AND SITE

Site	No.	Percent Adherent: Control Group	Percent Adherent: Experimental Group	χ^2	P
1	100	32	58	5.82	<.025
2	100	54	76	4.39	<.05
3	100	42	62	3.24	<.10
4	100	80	84	.07	NS
5	100	64	80	2.43	NS
6	98	50	84	11.30	<.001
7	89	58	70	1.15	NS

the patient's group assignment, the physician was to explain the rationale for mammography to the patient and discuss any concerns she might have about the procedure (pain, radiation, cost, concerns about findings), conduct a breast examination, and, if normal, tell the patient that she should get a mammogram within the next 30 days. (An abnormal breast examination automatically excluded the patient from the study.) The physician indicated that office personnel would provide information about obtaining the mammogram. The physician was not aware of the group to which the patient had been assigned.

At the end of the physician's visit, the flowsheet was turned back to office staff, who removed the dot, noted the group to which the patient had been assigned, and proceeded accordingly. Patients in the control group were given information about how to obtain a mammogram and were told, again, that they should make an appointment to get one within the next 30 days. Patients in the experimental group were given similar information. In addition, an offer was made to telephone for an appointment before the patient left the physician's office. If accepted, the appointment was made, and experimental group patients were told when and where to go to get the mammogram. A reminder postcard was sent to experimental group patients approximately 4 days before their scheduled appointment.

The dependent variable was whether the patient obtained a screening mammogram. For the purposes of the study, a patient was deemed adherent if a screening mammogram report, dated no later than 60 days from the date of the recommendation, was received by the referring physician. Otherwise, she was deemed nonadherent. The 30-day grace period was given, as it was expected that some women would delay getting the examination. Generally, mammograms could be obtained within 2 weeks of the referral. The mammography locations used in the study sent all study patient mammography reports to the referring physician, either routinely or by special agreement.

RESULTS

Site Performance

Despite efforts to keep study sites committed to the protocol by follow-up visits and telephone calls, two rural sites found they could not carry out the study and withdrew. Other sites varied in the speed with which they completed the protocol. At the termination of the study in September 1988, all but two sites had entered the requisite 100 women. Results are reported for seven sites.

Adherence Rates

It was expected that control group adherence rates would differ across sites, which, in fact, occurred. Table 2 shows that the percentage of adherent women in the control group varied from 32% to 80%. The difference between sites was significant ($\chi^2 = 78.29$, $df = 6$, $P < .001$). Presumably this difference reflects the operation of some combination of differences in patient population, in physician or office staff commitment to mammography, in study implementation, and in factors such as distance to a test site and cost. It was hypothesized that women assigned to the experimental group would obtain mammograms at a higher rate than those assigned to the control group. Table 2 shows that, for every site, the percentage of adherent women in the experimental group exceeded the percentage in the control group. Table 2 also shows results of chi-square analyses of each site's data; for three sites, the increase was statistically significant ($P < .05$ or smaller); for one, the increase was statistically marginal; for the remaining sites, there was no significant difference. The magnitude of the excess in adherence rates ranged from 4% at site 4 to 34% at site 6. In general, the effect of experimental intervention was larger in those sites where the control group rate was smaller. The mean difference in adherence rates between the two conditions was 19%. Overall, 54% of women in the control group adhered to the recommendation, whereas 73% of women in the ex-

TABLE 3. DEMOGRAPHIC CHARACTERISTICS, BY GROUP AND ADHERENCE, SITE 1 (FAMILY PRACTICE CENTER AMBULATORY CARE CENTER)

	Group					
	Control			Experimental		
Characteristic	Adherent	Nonadherent	Total	Adherent	Nonadherent	Total
Number	16	34	50	29	21	50
Median age (years)	64.5	58.0	61.5	57.0	70.0	60.5
Race						
White	16	28	44	24	16	40
Black	0	4	4	4	5	9
Other	0	2	2	1	1	1

perimental group adhered. The difference in overall adherence rates was statistically significant ($\chi^2 = 27.14$, $df = 1$, $P < .001$).

One of the sites for which a significant difference was found was the ambulatory care center of a family practice residency program. Demographic analysis by age and race of this site's data was undertaken to ascertain whether, by chance, extraneous factors accounted for the observed adherence difference. The results are shown in Table 3. The median ages of the women in the two groups are almost the same—61.5 and 60.5 years. Moreover, the racial composition of the groups was similar (88% and 80% white). It is thus unlikely that age or race, rather than the experimental variation, caused the difference.

DISCUSSION

The experimental intervention consisted of two parts—on-the-spot scheduling and reminder postcards. Although there is no rigorous way to disentangle their effects in this study, some evidence from the residency program ambulatory care center suggests that it was the scheduling component that caused most of the observed difference in adherence rates. At that site at least, many patients could be scheduled within 4 days of their clinic appointments, and hence were not even sent reminders. Nonetheless, patients at that site assigned to the experimental group adhered significantly more often than those assigned to the control group. Indeed, reminder postcards should only be necessary when an examination appointment is not available within the next few days.

The study was conducted in several midwestern sites including a residency program and urban and rural private practices. The following are advantages of a multisite study: (1) Numbers (and hence, the power of statistical tests) can be increased without undue burden on any particular practice. (2) Greater generalizability of results can be achieved, since specific characteristics of one practice, such as patient population, proximity to and cost of mammography, etc, are not likely to be duplicated in other practices. (3) Comparative feedback regarding their own performance can be given to participating practitioners. The following are disadvantages of such studies: (1) There is a loss of control over adherence to the protocol and more difficult data collection. (2) Consequently, there is a greater need for training and monitoring of personnel at the various sites. The observed variation among sites validated one of the reasons for conducting the study in multiple sites—to test whether the experimental intervention would increase adherence in differing practice environments. That the intervention did so in all study sites, albeit to differing degrees, suggests that the intervention is able to overcome the influence of a variety of site-specific factors.

The major limitation of this study has to do with the degree to which results can be generalized. In conducting practice-based research, patient flow considerations can and do interfere with study demands. Although all study physicians signed a statement agreeing to adhere to the protocol, which specified that all eligible women were to be enrolled in the study, it is not known how many eligible women were not enrolled, or whether (and how) they differed from enrollees. Moreover, it is possible that differences in study implementation from site to site accounted for the lack of significant differences observed in some sites, since departures from the protocol would be expected to reduce the impact of the intervention relative to other influences.

Patients' use of health screening measures is a complex mix of their own motives,[11,12,18] access to and characteristics of the screening measure,[19] and attitudes and practices of health care providers including physicians.[20,21] According to McLellan,[21] "... physicians must be aggressive in their approach to breast cancer screening" if they want to improve breast cancer mortality and morbidity. This study demonstrated that a brief, simple, and inexpensive intervention can be of real help in that task.

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