Testing Reminder and Motivational Telephone Calls to Increase Screening Mammography: a Randomized Study

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Background: Prospective randomized trials have demonstrated that motivational telephone calls increase adherence to screening mammography. To better understand the effects of motivational calls and to maximize adherence, we conducted a randomized trial among women aged 50–79 years.

Methods: We created a stratified random sample of 5062 women due for mammograms within the Group Health Cooperative of Puget Sound, including 4099 women with prior mammography and 963 without it. We recruited and surveyed 3743 (74%) of the women before mailing a recommendation. After 2 months, 1765 (47%) of the 3743 women had not scheduled a mammogram and were randomly assigned to one of three intervention groups: a reminder postcard group (n = 590), a reminder telephone call group (n = 585), and a motivational telephone call addressing barriers group (n = 590). The telephone callers could schedule mammography. We used Cox proportional hazards models to estimate the hazard ratio (HR) and 95% confidence interval (CI) for documented mammography use by 1 year.

Results: Women who received reminder calls were more likely to get mammograms (HR = 1.9; 95% CI = 1.6–2.4) than women who were mailed postcards. The motivational and reminder calls (average length, 8.5 and 3.1 minutes, respectively) had equivalent effects (HR = 0.97; 95% CI = 0.8–1.2). After we controlled for the intervention effect, women with prior mammography (n = 1277) were much more likely to get a mammogram (HR = 3.4; 95% CI = 2.7–4.3) than women without prior use (n = 488). Higher income, but not race or more education, was associated with higher adherence.

Conclusions: Reminding women to schedule an appointment was as efficacious as addressing barriers. Simple intervention groups should be included as comparison groups in randomized trials so that we better understand more complex intervention effects. [J Natl Cancer Inst 2000;92: 233–42]
sions (outreach) but have also shown disappointing levels of screening adherence (10%–72%) (21–25). Because it appeared that outreach efforts afforded the best opportunity to involve the highest proportion of women in screening, the study described here tested methods of improving outreach through mailed and telephone contact with women due for mammograms.

Prospective randomized trials demonstrated that motivational telephone calls increased screening mammography adherence. King et al. (8) built on past work (2) and tested a method of improving outreach by implementing counseling calls (subsequent to mailed recommendations) to address “barriers” to screening, such as beliefs about mammography’s risks and the lack of understanding of its benefits. Addressing barriers in a telephone call tripled the odds of getting a mammogram compared with a simple reminder letter, and the positive effects have been replicated in other randomized trials (2,21,22).

These prior trials have tested both mail and telephone outreach. However, to our knowledge, they did not compare their effects among women with and without prior mammography experience (8,19,21,22,27). Effects of calls may be quite different among women in these two categories. Whether the effects are similar among women with and without prior experience is important, since intervention plans might differ in these two groups if there were differential effects (29). Women without mammography experience are the least likely to seek it when it is recommended and the most likely to have late-stage breast cancers diagnosed (30,31).

While it is appealing to believe that women’s barriers to seeking mammography are being addressed in telephone calls, it may also be that the call from the health care provider offers important motivation. Prior studies (8,21,22,32) compared counseling calls with a mailed reminder card or usual care. Whether it is necessary to address barriers or simply remind women by telephone has not been tested, although it has been shown that reminder calls alone boost adherence (28). Testing the effect of a counseling call compared with a reminder call has important practical and theoretical consequences. Since motivational calls require more staff training to learn how to address barriers, as well as more telephone time to implement, their use may be limited by resource constraints. If the call itself is sufficient motivation, then a much simpler intervention may be developed that does not directly address psychologic barriers.

To better understand motivational call effects and to maximize adherence to screening recommendations, we conducted a randomized trial among women aged 50–79 years. We compared mammography use subsequent to one of three outreach interventions among nonresponders with a mailed recommendation to schedule a mammogram: 1) reminder postcards, 2) reminder telephone calls, and 3) motivational telephone calls. Women were randomly assigned to one of these three groups if they did not schedule an examination by 2 months from a mailed recommendation that they were due. We followed women for 1 year to see whether they obtained a mammogram. We hypothesized that the motivational call would be more efficacious than the reminder call, and both would be more efficacious than the reminder postcard.

**METHODS**

**Setting**

This study took place within Group Health Cooperative of Puget Sound (GHCPs), Seattle, WA, a large nonprofit health maintenance organization (HMO) controlled by its consumer board for more than 50 years. Its enrollees reflect the racial mix of the surrounding community but are somewhat less likely to be in the highest and lowest income levels (33). At the time of the study, the Puget Sound region of GHCPs included more than 70,000 women over age 40 years. A centralized Breast Cancer Screening Program (BCSP) has served these women since 1986 (31,34,35). The salient characteristics of the program include regional centers for coordinated mammography, clinical breast examination, and follow-up, as well as a centralized database that tracks women’s mammography use and mails a recommendation to schedule an examination when it is due (31,34,35).

This program uses a risk factor questionnaire to enroll women. Eighty-seven percent of all women who were age eligible for this study completed the questionnaire and were, therefore, enrolled in the screening program (31). All women in the program receive reminders within 2 years of their last bilateral examination. Their physician may also recommend them for mammography at any time. There is no additional cost for women recommended for mammography through their physician or the screening program.

**Design and Sample**

This was a prospective randomized trial to compare the effect oftelephone reminder and motivational telephone calls among women who did not schedule a mammogram by 2 months from the date of a mailed recommendation to do so (Fig. 1).

Recruitment occurred from among a random sample of the 87% of women aged 50–79 years enrolled in the BCSP who met the following criteria: 1) no history of breast cancer, 2) no prior involvement in mammography recruitment studies, 3) residence in the regions served by two screening centers, 4) due for a mammogram, and 5) English speaking. Because we wanted to test the intervention effects among women with and without prior mammography experience, we stratified our recruitment on this variable. We obtained evidence of prior mammography from automated records that included self-reported use at the time a woman enrolls in the screening program as well as use within the GHCPs subsequent to BCSP enrollment. We used a two-step consent process approved by the GHCPs Human Subjects Committee to recruit women. The steps included the following: 1) written notification of eligible women informing them about the study and advising them that they could refuse involvement by telephone or in writing and 2) informed consent at the time of a baseline telephone survey.

There were 11,570 age-eligible women who became due for mammograms during the 15-month rolling recruitment period. These 11,570 women included 1295 with no prior mammography and 10,275 with at least one. To reach an adequate sample size, study personnel approached a total of 6147 women during the recruitment period, including 1116 (86%) of women without prior mammography (n = 1295), and a 49% random sample (n = 5031) of those women with prior mammograms (n = 10,275).

Of the 6147 eligible women approached, 703 had already scheduled a mammogram at the point of recruitment and 382 were otherwise ineligible for the study (15 were deceased, 143 were too ill, 13 were out of the United States, 153 had language/hearing restrictions, 55 had left the plan, two were sample errors, and one was involved in another study). This left 5062 eligible women.

We created a stratified random sample of 5062 women due for mammograms within the GHCPs, including 4099 with prior mammography and 963 without. We recruited and surveyed 3743 (74%) women before mailing a recommendation to schedule a mammogram: 1) reminder postcards, 2) reminder telephone calls, and 3) motivational telephone calls. Women were randomly assigned to one of these three groups if they did not schedule an examination by 2 months from a mailed recommendation that they were due. We followed women for 1 year to see whether they obtained a mammogram. We hypothesized that the motivational call would be more efficacious than the reminder call, and both would be more efficacious than the reminder postcard.
and reminders. Once a behavior occurs, it has an outcome for the individual that
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Two considerations: logistics and health care system support. Logistics include providing information about the location of the centers, details regarding parking, methods of finding transportation, and help with scheduling appointments. Health care system support includes benefit packages, mailed recommendations, and reminders. Once a behavior occurs, it has an outcome for the individual that

Conceptual framework and intervention. Our study was based on a heuristic conceptual framework that combined aspects of the theory of reasoned action, social learning theory, and the Precede/Procede model for planning care (Fig. 2) (36–38). Our framework includes consideration of predisposing and enabling characteristics that predict intention and behavior in other studies (6,8,17,39–42). Predisposing characteristics include 1) personal and behavioral factors, such as demographic characteristics, perceived risk, and past health behavior (including prior mammography, use of Pap smears, and smoking) and 2) cognitive and affective factors, such as beliefs about mammography, values, perceptions of what others want them to do (social norm), and affect (emotional response to mammography). Enabling characteristics of the environment include two considerations: logistics and health care system support. Logistics include providing information about the location of the centers, details regarding parking, methods of finding transportation, and help with scheduling appointments. Health care system support includes benefit packages, mailed recommendations, and reminders.

Statistical Methods

All analyses are two-sided, with a statistical significance level of .05. We compared randomized groups for differences in demographic characteristics and prior health experience by use of chi-squared tests and analysis of variance. We used Cox proportional hazards models to estimate the hazard ratio (HR) and 95% confidence interval (CI) for documented mammography use by 1 year (45). Such an analysis allowed us to account for loss of women during the postintervention period and to demonstrate the relationship between the intervention and the occurrence of the mammogram. The time axis was time since randomization. Randomization occurred approximately 2 months after the mailed recommendation. We used an intention-to-treat approach in this analysis and kept all women in their randomized group up to their departure from GHCPS, their death, or the end of the observation period. An observation was censored if the woman left GHCPS or died, or if follow-up exceeded the study observation period. An observation was censored if the woman left GHCPS or died, or if follow-up exceeded the study observation period. An observation was censored if the woman left GHCPS or died, or if follow-up exceeded the study observation period.

Mammograms after that period were excluded because women could have either positively or negatively reinforces the behavior and influences the predisposition to repeating the behavior in the future. This conceptualization of a continuous interaction between individuals and their environment is consistent with social learning theory (38).

We used reminder postcards as one type of health care system support (7). The postcard acknowledged the prior recommendation letter, informed each woman that she could still schedule an appointment, and stated that the appointment was an important part of her care.

We used reminder telephone calls as another type of health care system support. A woman (scheduler) conducted the reminder telephone call. She was already employed within one radiology department to schedule procedures on an automated appointment log. Like the motivational callers, she was allowed up to eight attempts to call a woman during evenings and weekends but stopped if no contact was made after all attempts. According to the study protocol, the scheduler could make an appointment and answer simple questions about logistics, but she could not elicit concerns about participation in screening. If concerns arose during the call, the protocol specified that the scheduler referred the woman to the BCSP office or to her primary care physician for further discussion.

The motivational call represents a more elaborate health care system support that also was designed to address predisposing characteristics of women and enabling factors in the environment. We developed the motivational call based on the framework described above and principles of motivational interviewing (37,43). Development and implementation of the call are described in detail elsewhere (44). We drafted responses to expected cognitive and affective factors regarding mammography, as well as perceived risks, and anticipated logistic considerations. Samples of these factors and responses are shown in Table 1.

Callers. Two women counselors were trained to elicit information within the theoretic framework and address the appropriate issues during the call. They were expected to engage the woman in the appropriate areas and did not systematically address every construct or offer to schedule an appointment (44). Training included 2 full days of technique, the interview protocols, and role-playing. One author (E. Ludman) met weekly with each interviewer for about 1 hour throughout the intervention period to review taped sessions and reinforce the protocol. The counselors had prior experience with telephone interventions and masters-degree level training in psychology. These counselors could schedule mammography appointments during the call by accessing the same automated appointment log used by the scheduler. Information from the baseline survey was not available to the women conducting the intervention. Variations from protocol were addressed individually with each caller and monitored throughout the intervention period.

Fig. 1. Study design. From among 11570 women who appeared to meet study criteria, we identified 5062 women who were stratified by prior mammography experience (4099 with prior mammograms and 963 without) and 3743 (3193 with prior mammograms and 550 without) who provided verbal informed consent for the study. A total of 1765 women did not schedule mammograms by 2 months and were randomly assigned to one of three interventions: a reminder postcard, a reminder telephone call, and a motivational telephone call. Superscript 1 equals no prior mammogram (n = 1295) and prior mammogram (n = 10275). Superscript 2 equals a 49% random sample of women with previous mammograms (n = 5031) and 86% of women without prior mammograms (n = 1116).
received a subsequent screening recommendation. We found a differential main effect of the interventions in analyses stratified by prior mammography experience. Therefore, in a joint model including all women, we tested for an interaction between the main effect of the intervention and mammography experience. Subsequently, we elected to perform two parallel analyses separating women by prior mammography experience. Because race, education level, and income have been shown to be associated with mammography use in other cross-sectional studies, we considered whether the interventions had differential effects across these variables by entering them in the model and testing for a main effect. If a main effect was present, we also tested for an interaction that would suggest the interventions worked differently as income and education levels increased or race varied.

RESULTS

Study Population and Randomization

The study women (n = 3743) came from among all apparently eligible women (n = 11,570) who were randomly selected to be approached (n = 6147) and then remained study eligible (n = 5062). Among the women approached, a higher proportion of women with prior mammography (3193 [63%] of 5031) consented to the study com-

Table 1. Sample topics questions and messages addressing the intervention constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Relevant topics</th>
<th>Sample open-ended question</th>
<th>Sample educational message or problem-solving strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affect</td>
<td>Fear of pain or discomfort; embarrassment about the procedure; anxiety about waiting for results</td>
<td>How does hearing about breast cancer make you feel about having a mammogram?</td>
<td>Lots of women feel anxious about having a mammogram. I could share some things that other women do to feel less nervous or perhaps you have some ideas of your own that we could talk about.</td>
</tr>
<tr>
<td>Beliefs</td>
<td>Mammography is painful.</td>
<td>What have you heard about mammograms?</td>
<td>Some women find the mammogram to be uncomfortable because the breast has to be flattened as much as possible. Flattening the breast allows the technician to use the least amount of radiation. Mammograms can detect breast cancer before it can be felt or when there are no symptoms.</td>
</tr>
<tr>
<td>Values</td>
<td>Importance of early detection; importance in absence of symptoms; not important “at my age”</td>
<td>Can you tell me why you feel it is unnecessary to have a mammogram?</td>
<td>For all women, the risk of developing breast cancer increases with age. Just because a woman is ___ y (age) does not mean she should not get the same level of health care as a younger woman.</td>
</tr>
<tr>
<td>Facilitating conditions and logistics</td>
<td>Difficulty making time; transportation concerns; concern about screening center location</td>
<td>How hard is it for you to get to the screening center?</td>
<td>[If it is hard to arrange transportation . . . ], I have some information on several transportation options that might be helpful. Shall we go over them together?</td>
</tr>
<tr>
<td>Social normative influence</td>
<td>Health care provider’s opinion; partner/spouse’s opinion; other family members’ opinions</td>
<td>Has your health care provider talked to you about getting a mammogram?</td>
<td>[If no . . . ] Providers are often pressed for time when you visit with them for a specific health concern. It is likely your provider thinks having regular mammograms is important for you, but she/he relies on us here at the Breast Cancer Screening Program to remind you to come in when it is time.</td>
</tr>
<tr>
<td>Perceived risk</td>
<td>Woman’s opinion of her own risk of breast cancer</td>
<td>What have you heard about breast cancer that leads you to believe you’re not at risk?</td>
<td>While not having a family history of breast cancer may be reassuring, unfortunately it is no guarantee that you will not get breast cancer.</td>
</tr>
</tbody>
</table>

pared with women without prior mammography (550 [49%] of 1116). Four hundred one (41%) of the 968 women who refused the study obtained a mammogram by 1 year. One thousand six hundred twenty-seven (83%) of the 1965 women who scheduled mammograms and were ineligible for the trial obtained a mammogram by 1 year after receiving the recommendation letter.

The randomized trial included 1765 women who did not schedule a mammogram by 2 months from the mailed recommendation. Table 2 shows the demographic characteristics and preventive behavior of these 1765 trial women. The table shows these characteristics categorized by prior mammography experience. Compared with women with prior mammography, women without prior mammography were more likely to report low income, low education level, and less use of Pap smears but they did not differ in age, race, marital status, employment, and smoking status.

Randomization resulted in equivalent groups with respect to mammography history, age, race, education level, living situation, marital status, employment, current health, and smoking status. Women in the postcard reminder group had a higher (88%) proportion of women with incomes more than $15,000 compared with women in the motivational call (82%) and reminder telephone call (86%), respectively (chi-squared test = 7.91; \( P = .019 \)).

### Intervention Implementation

Characteristics of the reminder and motivational telephone interventions are similar, as shown in Table 3. The proportion of women contacted and the mean number of attempts were nearly identical. The mean reminder call time was substantially shorter than the motivational call by about 5 minutes. A somewhat higher proportion of women scheduled mammography during the motivational call compared with the reminder call.

### Intervention Effect

Table 4 shows the proportion of trial women who obtained mammograms by 1 year subsequent to the mailed recommendation to schedule an examination. The proportion is lower in the postcard reminder group (35.4% [209 of 590]) compared with
either the reminder call (51.8\% [303 of 585]) or the motivational telephone call (49.8\% [294 of 590]) groups and nearly identical in these latter two groups. Eighty-two women left GHCPS without prior mammograms before the completion of the 1-year follow-up period and, therefore, are in the denominator but not the numerator of these proportions.

The joint model that accounts for disenrollment during the follow-up period and tests the effects of the intervention, income, and prior mammography experience confirms that there is no interaction in the effect of the reminder call compared with the motivational call. Women who received reminder calls were more likely to get mammograms (HR = 1.9; 95\% CI = 1.6–2.4) than women who were mailed postcards. Adjusting for income differences across the three intervention groups slightly increases the estimated effect.

The motivational and reminder calls (average length, 8.5 and 3.1 minutes, respectively) had equivalent effects (HR = 0.97; 95\% CI = 0.8–1.2) (not shown in Table 4). After we controlled for the intervention effect, women with prior mammography (n = 1277) were much more likely to get a mammogram (HR = 3.4; 95\% CI = 2.7–4.3) than women without prior use (n = 488). Higher income (HR = 1.6; 95\% CI = 1.59–2.4) but not race or more education was associated with higher adherence (not shown in Table 4). Tests for interactions between income or prior mammography use and the effect of any telephone intervention were not statistically significant.

Table 5 shows separate models among women with and without prior mammograms. The effects of the reminder and motivational calls are the same within each strata of prior mammography experience. The effect of any call (i.e., either the reminder call or the motivational call) appears to be larger among women without prior mammography examinations. As noted above, this apparent difference is not statistically significant when tested for in a joint model. Models 1, 2, and 3 in Table 5 test, respectively, for an effect of age, race, or education level over and above the intervention and do not show statistically significant associations. Model 4 tests for the additional association of higher versus low income ($\leq $15\,000 per year and $>$ $15\,000 per year) and demonstrates a statistically significant association. Both women with and without mammography are more likely to get a mammogram if they have higher incomes.

Fig. 3 shows the Kaplan–Meier plots of mammography use among women with and without prior mammography experience. The curves demonstrate the rate of “failure” in the population. A failure occurs when a woman gets a mammogram; therefore, the curve demonstrates the proportion without a mammogram at any given point in time subsequent to the intervention. The curves demonstrate that most women receive their mammogram within 2 months of the intervention. During this time, women obtain mammograms most rapidly.

**Discussion**

In this study, we examined the effect of telephone interventions compared with reminder postcards among women who failed to schedule a mammography examination within 2 months of a mailed recommendation. We estimated the effect of our intervention by use of a Cox proportional hazards model that allowed us to account for the loss of women during the follow-up period. For purposes of discussion, the HR estimated from the Cox model is nearly equivalent to an odds ratio (OR) estimated from the logistic models used in other studies. Either a reminder call or a motivational telephone call nearly doubles the likelihood of getting a mammogram. Although we did not find a statistically significant difference in the effect across strata of women with and without prior mammography, this may have been due to a relatively small number of women without prior mammography experience. The motivational call does not result in increased mammography use compared with a reminder telephone call. Higher income remains a statistically significant predictor of mammography use, even after accounting for intervention effects, and prior mammography use.

One potential limitation of this trial is that it occurred within a staff-model HMO. Although the population of women served by this HMO is predominantly English speaking, Caucasian, and educated, historically, only 65\% adhered to a mailed recommendation (31). At the baseline, many demographic factors associ-
ated with prior mammography use in other studies were also found in these women, including higher education levels, higher income, and using other preventive services such as Pap tests (6,17,39). These similarities suggest that the findings from these women may have application beyond the HMO population alone. However, other factors, such as younger age, being married, and being a nonsmoker, were not associated with mammography use in this population, although they have been elsewhere (6).

Prior work has already shown that older women are more likely to schedule a mammogram when it is recommended, so the lack of an age differential among women with and without mammography here reflects the program’s regular reminders (40,46). The lack of other differences may also reflect response to these reminders, but the possibility that women enrolled in HMOs differ from other women must also be considered. Replication of the trial in more diverse populations is indicated to evaluate whether simple reminder calls are efficacious. A simple intervention would have distinct advantages for groups where intervention resources may be less than those available in this HMO.

Even though the results may be best generalized to populations within HMOs, those numbers are growing. They now cover more than 140 million individuals and this number grew nearly 42% between 1992 and 1994, according to the American Association of Health Plans (47). Within managed care, there is a rising reliance on process measures to evaluate their performance (48). Mammography use is one key measure, so the findings of this trial should have a growing audience, with an increased interest. Within this growing potential audience, the findings are best generalized to Caucasians with a somewhat higher than average education level. However, this population is at somewhat increased risk for breast cancer and will benefit from promotion activities, since mammography use after a recommendation barely meets the level of the earliest randomized trial (2,31,49).

Table 5. The additional effect after accounting for the intervention of demographic characteristics on mammography use among women with and without prior mammography experience

<table>
<thead>
<tr>
<th>Model and components</th>
<th>Mammography history</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No prior mammogram</td>
</tr>
<tr>
<td></td>
<td>Hazard ratio</td>
</tr>
<tr>
<td>Model 1: age</td>
<td></td>
</tr>
<tr>
<td>Any call versus postcard</td>
<td>2.7</td>
</tr>
<tr>
<td>Motivational call versus reminder call</td>
<td>0.9</td>
</tr>
<tr>
<td>Age (age 50 y referent)</td>
<td>1.0</td>
</tr>
<tr>
<td>Model 2: race</td>
<td></td>
</tr>
<tr>
<td>Any call versus postcard</td>
<td>2.7</td>
</tr>
<tr>
<td>Motivational call versus reminder call</td>
<td>0.9</td>
</tr>
<tr>
<td>Race (Caucasian referent)</td>
<td>1.0</td>
</tr>
<tr>
<td>Model 3: education level</td>
<td></td>
</tr>
<tr>
<td>Any call versus postcard</td>
<td>2.6</td>
</tr>
<tr>
<td>Motivational call versus reminder call</td>
<td>0.9</td>
</tr>
<tr>
<td>Education level (some college versus high school)</td>
<td>1.2</td>
</tr>
<tr>
<td>Education level (finished college versus high school)</td>
<td>1.0</td>
</tr>
<tr>
<td>Model 4: income</td>
<td></td>
</tr>
<tr>
<td>Any call versus postcard</td>
<td>3.2</td>
</tr>
<tr>
<td>Motivational call versus reminder call</td>
<td>0.9</td>
</tr>
<tr>
<td>Income &gt;$15 000/y versus ≤$15 000/y</td>
<td>2.0</td>
</tr>
</tbody>
</table>

*CI = confidence interval.
†Either a motivational call or reminder call (any call).
One of the advantages of using the defined population of an HMO is that we can identify who is in the study and who is not and we can measure the behavior of each. The proportion of women getting mammograms among all potentially eligible women was larger among those who consented to the study than among those who did not. There is always suspicion that people who consent to studies are different from those who do not, and these results give credence to that suspicion.

We can also see that there was differential study enrollment among women with and without prior mammograms. Only 49% of the women without prior mammograms enrolled in the study compared with 64% with prior mammograms. However, within our study, we randomly assigned women within the strata of women with and without prior mammography experience and then conducted the analysis within those strata. The statistical significance of the relative effects of the interventions should, therefore, be valid.

It should be clear from these numbers that prior mammography experience influences future mammography experience. Knowing the proportion of women who have prior mammography experience is critical to understanding results from this and other trials. It is also apparent that women without prior mammograms are a group who have a low, but not zero, probability of getting a mammogram. Some of them may have good reason not to get mammograms. For example, 143 women who appeared eligible were actually too ill.

The overall effect of our telephone intervention was similar to that found in other studies. To our knowledge, of the three other trials (8,21,22) that tested telephone counseling, only Janz et al. (22) report that prior mammography was considered. An effect was not reported (22). The study by King et al. (8) is closest in design to ours and was conducted in the early 1990s. They used motivational calls compared with a reminder card and tripled the odds of getting a mammogram (OR = 3.0; 95% CI = 1.8–5.1) (8). We demonstrated a similar effect among women without prior mammograms, but our interventions had a somewhat lower effect among other women and we could not distinguish between the motivational and reminder calls. Since King and colleagues did not report prior mammography use, we cannot evaluate whether the magnitude of their reported effect is due to a more influential call or a higher proportion of women without mammography experience. On the basis of the results of our work, future studies of motivational calls should account for prior screening in their analyses and include a reminder call arm as a control.

For women with and without prior mammography, a brief reminder telephone call may be as effective as a motivational call to promote adherence. The relative effect of the two calls is important to evaluate for both practical and theoretical reasons. Both calls had an effect similar to the motivational call in King’s earlier work. With the growing pressure to increase efficiency and productivity, use of a brief reminder call has distinct advantages over the costs and complexity of a motivational contact. Although the results may have their greatest application in managed care, the implementation of prevention in practice has become a high priority, and this simple approach may have appeal, even for physicians in small group or solo practices (50,51). From the theoretic standpoint, it is important to understand how interventions work and may, therefore, generalize to other situations. The absence of a simple reminder call in other studies makes it impossible to know whether the effect of their intervention was due to addressing barriers or simply to calling and reminding. This study suggests that calling and reminding may be as important as addressing barriers.

Although it may be that the reminder call is as effective as the motivational call, an alternative explanation is that the motivational call did not address women’s barriers. This alternative is not supported by evidence from the logs kept by the counselors. Previous work and our conceptual model predict that women with prior mammography experience may be more concerned with logistical issues and that women without prior mammography may be more concerned about its risks and benefits (41,52). The counselors’ notes show that they addressed beliefs about mammography more frequently among women without prior mammography. Among women with prior mammography experience, the counselors addressed facilitating conditions, such as parking and logistics (44). Although the motivational calls appear to address barriers differentially, it does not appear that this work delivered advantages over simply providing a reminder call. There is the potential that the effect of a call is larger among women without prior mammography.

Both the reminder and motivational callers had the capability to schedule appointments. It may be that this capability was the most important factor in promoting mammography. Prior studies did not have this capability, although it has now become more widely available and was included in a study by Davis et al. (53). Davis and colleagues showed a positive effect of the call compared with a birthday card reminder but only among women already contemplating getting a mammogram (OR = 3.6; 95% CI = 1.7–7.6). They did not compare their motivational call with a scheduling call, so, like our study, the independent effect of being able to schedule an appointment cannot be determined. It appears that having the capability to schedule an appointment during a call is a wise strategy but needs further testing to measure its additional effect over the reminder call alone.

There is now a strong set of studies (23,54) demonstrating that reminder mailings subsequent to a recommendation to schedule will increase mammography use. In prior work (24), we demonstrated that reminder cards increased the odds of a mammogram by 80% over usual care. This study demonstrates that telephone calls result in a higher proportion of women getting the mammogram compared with simply sending a card. One logical approach would, therefore, be to use the interventions in series. Those women who do not schedule mammography subsequent to a reminder card could be subsequently contacted for a reminder call. Such an approach may provide a cost-effective option compared with planning telephone contacts to all women.

Given the increased interest in implementing prevention and achieving high rates of mammography, simple interventions have an appeal. Even under the best circumstances where health care is covered and women are regularly reminded to seek mammography, surprisingly small proportions take advantage of the opportunity (31). This randomized trial demonstrates that higher proportions of women can be encouraged to adhere to recommendations. Reminding women to schedule a mammography appointment was as efficacious as addressing barriers, regardless of prior mammography experience. To promote adherence to screening mammography recommendations, reminding may be as important as addressing barriers. Simple interventions should be included as comparison groups in randomized trials so that we better understand more complex intervention effects. Doing
the simple things first has the potential to increase the proportion of women screened.

REFERENCES


NOTES

Supported by Public Health Service grants CA63188 and CA63731 from the National Cancer Institute, National Institutes of Health, Department of Health and Human Services.

We acknowledge the diligent attention to detail and persistence of Nancy Snell during the study and manuscript preparation.

Manuscript received February 9, 1999; revised November 15, 1999; accepted November 22, 1999.