# Compliance With Referrals From a Cancer-Screening Project

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Family practice residents participated in a federally funded breast and uterine cancer-screening project as a part of their training experience. During the 2.5-year grant period, more than 1,800 women were screened and 12 cancers detected. Patient compliance with referral for Pap smear findings was significantly greater when there were also positive pelvic findings or when the Pap smear indicated a malignant or premalignant condition. Compliance with referral for clinical follow-up of breast findings was comparable to that for diagnostic mammography, and both were significantly greater than compliance with referral for a screening mammogram. Significant relationships were found among compliance and the self-reporting of breast symptoms, the physical findings on physician examination, and the source of payment for mammography. The health belief model provides a conceptual framework for consideration of study findings relating to patient motivation for preventive and curative care.

Family practice residents at Brookhaven Memorial Hospital Medical Center participated in a breast and uterine cancer-screening project as a part of a curriculum component designed to sharpen clinical skills in office gynecology and to provide a community medicine program experience.[1] Special funding for the screening project was obtained by the hospital's Department of Community Medicine from a subcontract with the Long Island Cancer Council, a nonprofit organization funded by the National Cancer Institute, Community-Based Cancer Control Program. During the 2.5-year period of funding a total of 1,822 women were screened and 12 cancers (6 breast, 2 endometrial, 3 cervical, and 1 rectal) were detected and brought to treatment.

The project was organized so that it would provide exposure to the components of a community screening effort, including experience in a team approach to the provision of preventive services. Diagnostic and referral data from the project were reviewed to assess the clinical content of the training experience. Patient compliance with screening program referrals was examined to monitor the critical aspect of follow-up. Factors associated with compliance were further explored to provide insight into patient behavior and related implications for patient education.

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## Methods

The screening sessions were staffed by an attending gynecologist preceptor and one or two family practice residents as well as a health educator and nursing and clerical personnel. These sessions were conducted approximately weekly at either the hospital or the family practice centers to increase the convenience to attendees coming from different geographic areas within the community. The women screened at the hospital were also ambulatory patients and had demographic characteristics comparable to those screened at the family practice centers. Recruitment was directed at high-risk individuals not previously known to the residency practice through an outreach program in the community targeted at senior citizens and low-income populations.

Women attending the screening saw an American Cancer Society film, received the pamphlet about breast self-examination, and subsequently had individual instruction from the health educator. The resident then checked the patient's self-examination technique, answered questions, and performed a breast, abdominal, pelvic, and rectal examination, obtained a Pap smear, and tested the stool for occult blood using the Hemoccult test.

The criteria for referral for mammography included women who were (1) aged 50 years and older, (2) aged 40 to 49 years and had a personal history of breast cancer or a history of breast cancer in first-degree relatives (mothers or sisters), (3) aged 35 to 39 years and had a personal history of breast cancer, and (4) all ages and found to have positive findings suggestive of breast cancer. Because there is no mammography equipment at the hospital or family practice centers, women were referred to private radiologists in the community for this examination. For a limited period, federal funding permitted the project to pay for the mammography examination. When this was no longer authorized, women had to pay the $60 fee to the radiologist directly, providing a natural experiment for exploring the influence of cost on obtaining mammography, since the project was able to pay for the examination for a little over one half of the women referred (56.9 percent).

Referrals from the screening were also made for a variety of positive findings that indicated cancer or other medical conditions and included those based on physical examination or Pap smear or mammography reports. In keeping with the particular findings and the woman's prior sources of care, referrals were made to community family physicians, surgeons, gynecologists, and on some occasions to the resident during his or her scheduled health center hours. The Pap examination reports from the screening were reviewed by the resident, who then recommended appropriate follow-up when indicated.

All of the women screened completed a questionnaire designed to collect sociodemographic, medical history, and health care utilization information. At this time, consent was also obtained from the patient to receive follow-up outcome information from the treating physician. This signed authorization proved useful when requesting information from physicians who were not familiar with the project and wanted a patient release before providing medical record data. Information about the outcome of referrals was sought from both the patient and physician. For the purposes of statistical analysis, women who failed to respond to two mailings of the follow-up questionnaire and a telephone call were placed in the noncompliant category. This category also included those women who responded, or whose physician responded, that they did not go for follow-up care. It is possible that some of the nonresponders visited a physician other than their family physician or specialist to whom they were referred. If so, the figures would tend to underestimate the actual compliance rate by that amount, which is believed to be small. Data on compliance with referral for mammography are most complete, since the project received a copy of the mammography report.

## Results

### *Screening Experience*

The types of conditions identified at the screening included a variety of common gynecologic disorders and are displayed in Table 1.

Of the 1,822 patients seen, 1,029, or 56.5 percent, were referred for follow-up. These figures included referrals for mammography of 236 women based on age and risk factor criteria rather than suspicious findings. In addition, many of the referrals were for follow-up of nonmalignant medical conditions.

**Table 1. Frequency and Types of Conditions Identified**

| Condition | Frequency No. | % |
|---|---|---|
| Breast findings | | |
| Diffuse fibrocystic disease | 122 | 12.2 |
| Discrete cystic mass(es) | 38 | 3.8 |
| Discrete solid mass(es) | 87 | 8.7 |
| Nipple discharge or change | 32 | 3.2 |
| Axillary node(s) (with or without breast findings) | 20 | 2.0 |
| Other (including dilated ducts, thickening, mastodynia) | 60 | 6.0 |
| Total | 359 | 35.9 |
| Pelvic findings | | |
| Cervical abnormality (including cervicitis, erosion, polyp) | 152 | 15.2 |
| Other uterine abnormality | 29 | 2.9 |
| Vaginitis/vulvitis | 36 | 3.6 |
| Disorders of the menstrual cycle | 33 | 3.3 |
| Ovarian disease | 24 | 2.4 |
| Menopausal symptoms (senile vaginitis, postmenopausal bleeding, etc) | 23 | 2.3 |
| Uterovaginal prolapse (including cystocele, rectocele) | 18 | 1.8 |
| Other (including labial lesions, endometriosis) | 44 | 4.4 |
| Total | 359 | 35.9 |
| Pap smear findings | | |
| With positive pelvic examination | 53 | 5.3 |
| With negative pelvic examination | 142 | 14.2 |
| Total | 195 | 19.5 |
| Rectal | | |
| Positive Hemoccult only | 34 | 3.4 |
| Positive physical findings (including mass, polyp, hemorrhoids) | 17 | 1.7 |
| Total | 51 | 5.1 |
| Other medical conditions | 37 | 3.7 |
| Total conditions identified | 1,001 | 100.1 |

Most women were referred for follow-up of a condition localized to one anatomic site, but a significant proportion (23.1 percent) had more than one referral (eg, to the radiologist and family physician). The overall rate of compliance with a follow-up visit for all 1,422 referrals was 45.5 percent.

Examination of the compliance rates for mammography and clinical breast follow-up are displayed in Table 2, which indicates a significantly higher compliance rate with referrals for a diagnostic mammogram in a patient with positive physical findings than for a screening mammogram in a patient with a normal examination. Compliance with clinical follow-up of breast findings was comparable to that for diagnostic mammogrpahy.

The compliance rate by the type of pelvic findings (as listed in Table 1) ranged from 50 percent for uterovaginal prolapse to 72 percent for vaginitis or vulvitis. As shown in Table 3, there was significantly greater compliance with referrals for a positive Pap smear when there were also positive

**Table 2. Compliance With Mammography and Clinical Breast Follow-Up**

| Type | Referrals No. (%) | Compliance No. (%) | Significance $\chi^2$ (*df*=1) P |
|---|---|---|---|
| Mammography | | | |
| Screening (−PE) | 362 (43.4) | 107 (29.6) | 84.09 < .001 |
| Diagnostic (+PE) | 210 (25.1) | 145 (69.0) | |
| Clinical breast follow-up | 263 (31.5) | 196 (74.5) | |
| Total | 835 (100.0) | 448 (53.7) | |

Key
−PE = negative physical examination
+PE = positive physical examination
Clinical breast follow-up = referrals to surgeons, family physician, or regular gynecologist

**Table 3. Relationship Between Compliance and Positive Pap Findings**

| Findings | Total No. | Compliance No. (%) | Significance $\chi^2$ (*df*=1) P |
|---|---|---|---|
| Positive Pap and positive pelvic examination | 53 | 37 (69.8) | 5.71 < .025 |
| Positive Pap and negative pelvic examination | 142 | 72 (50.7) | |
| Positive Pap: malignant or premalignant | 13 | 11 (84.6) | 4.66 < .05 |
| Positive Pap: nonmalignant condition | 182 | 98 (53.8) | |
| Total positive Pap referrals | 195 | 109 (55.9) | |

physical findings. In addition, women who had a positive Pap smear were significantly more likely to go for follow-up if the Pap smear indicated a malignant or premalignant rather than a nonmalignant condition.

Further exploration of the interaction of pelvic and Pap smear findings indicated that compliance ranged from a low of 48.5 percent for women with a negative pelvic and positive Pap smear for a nonmalignant condition to a high of 100 percent for the three women who had both positive pelvic findings and a positive Pap smear for malignant or premalignant changes.

## *Compliance Study*

A data analysis was performed to explore the relationship between compliance with referral recommendations and patient characteristics, health behavior, and physical findings. The subset of women referred for mammography were selected for this more extensive analysis because the mammography report forwarded to the project provided full documentation of the outcome of the referral. In addition, the previously described circumstances of funding permitted exploration of the role of cost in obtaining follow-up.

The overall rate of compliance for women with initial referrals for mammography was 44.6 percent. Among the 561 women referred, about 25 percent reported the presence of one or more symptoms of breast abnormality within the previous year. The self-reporting of pain was most frequent (46.8 percent) followed by a lump (23.4 percent).

As displayed in Table 4, there was a significantly higher rate of compliance among women who reported symptoms of breast disease than among asymptomatic women. In addition, there was a

**Table 4. Association of Compliance With Mammography Referral and Symptoms and Signs of Breast Disease**

| Symptoms and Signs | Total Sample No. (%) | Compliance Rate No. (Rate) | Significance $\chi^2$ ($df$=1) P |
|---|---|---|---|
| Breast symptoms | | | |
| No | 423 (75.4) | 159 (37.6) | 33.86 < .001 |
| Yes | 138 (24.6) | 91 (65.9) | |
| Breast findings | | | |
| No | 354 (63.1) | 106 (29.9) | 83.00 < .001 |
| Yes | 207 (36.9) | 144 (69.6) | |

significantly higher rate of compliance among women with positive breast findings than among women with a normal breast examination. Further exploration of the interaction between patient symptoms and physical findings indicates that, independent of examination findings, symptomatic women exhibited significantly greater compliance than asymptomatic women.

Neither age nor a personal or family history of breast cancer was found to be significantly related to compliance. Only nine women (1.5 percent) reported a personal history of breast cancer, so that this group was too small for statistical analysis. Eighty-eight women (15.7 percent) reported a history of breast cancer among first-degree relatives.

The mean age of referred women with normal examination results was higher than the mean age of the women with an abnormal examination because the bulk of referrals for the screening mammogram were in women aged 50 years or older. However, a separate analysis of compliant and noncompliant women within the normal examination and abnormal examination groups failed to indicate any relationship between age and compliance.

There was a significantly higher rate of compliance (53.6 percent) among women whose mammography was paid for by the project than among women who paid for the examination themselves (32.5 percent) ($\chi^2 = 24.42$, $P < .001$). Further analysis by income group showed that the impact of free mammography on improving the compliance rate was inversely related to income.

Examination of all combinations of the three variables is displayed in Table 5, which indicates that compliance was significantly greater when mammography was project-paid rather than participant-paid for those subgroups of women who were asymptomatic with either normal or abnormal findings or symptomatic with abnormal findings. Compliance was found to range from a low of only 7.6 percent for women who were asymptomatic with normal examination findings and who had to pay for mammography, to a high of 92.5 percent for women who were symptomatic with abnormal examination findings who had mammography free of charge. The impact of cost on compliance was most significant in the asymptomatic women with normal examination findings.

## Discussion

The mammography referral criteria used in the screening project were consistent with those of the National Cancer Institute.[2] There is consensus that mammography is a valuable screening method for the detection of breast cancer when used in conjunction with physical examination in women who meet the specific age and medical history criteria. In a carefully controlled study conducted by the Health Insurance Plan of Greater New York (HIP), there was a clearly demonstrated one-third reduction in mortality from breast cancer in mammographically screened women aged over 50 years after nine years of follow-up. These findings were supported by the experience of the Breast

**Table 5. Compliance With Mammography Referrals by Symptoms, Signs, and Cost**

| Symptoms | Signs | Cost | Total Sample No. (%) | Compliance No. (rate) | Significance $\chi^2$ ($df=1$) P |
|---|---|---|---|---|---|
| No | No | Yes | 118 (21.0) | 9 (7.6) | 36.98 < .001 |
| No | No | No | 185 (33.0) | 73 (39.4) | |
| Yes | No | Yes | 12 (2.1) | 5 (41.7) | 0.18 NS |
| Yes | No | No | 39 (6.9) | 19 (48.7) | |
| No | Yes | Yes | 65 (11.6) | 35 (53.8) | 6.57 < .025 |
| No | Yes | No | 55 (9.8) | 42 (76.4) | |
| Yes | Yes | Yes | 47 (8.4) | 30 (63.8) | 10.03 < .005 |
| Yes | Yes | No | 40 (7.1) | 37 (92.5) | |
| Total | | | 561 (100.0) | 250 (44.6) | |

Cancer Demonstration Projects, conducted under the combined auspices of the National Cancer Institute (NCI) and the American Cancer Society (ACS).[2-4]

The protocol followed for cervical cancer screening referrals was that recommended in an American Cancer Society professional education publication.[5] This protocol calls for repeating atypical smears at three months (after treatment of cervicitis), and referring for colposcopy those with atypical findings on repeat smear or with findings of dysplasia, in-situ or invasive carcinoma when no lesion is visualized, or for biopsy of visualized lesions.

The relatively high referral rate of 56.5 percent of women screened is in keeping with reports from other programs. Although the purpose of screening efforts is to detect early cancer in asymptomatic women, experience has indicated that 7 to 90 percent of women coming to cancer-screening projects have symptoms of disease at the time of screening.[2,6,7] In fact, the availability of screening has been found to selectively attract as participants a high-risk group for cancer.[2,8]

The findings of the mammography study were consistent with the conceptual framework of the health belief model.[9,10] Briefly, the health belief model proposes that whether an individual will undertake a recommended health action is dependent upon that individual's perceptions of personal susceptibility, severity of the consequences of the disease, and potential benefits of and barriers to the health action. Breast symptoms would be expected to influence the woman's perception of her personal susceptibility to cancer and can explain the significantly higher compliance rates of symptomatic women. In the study data, the physician's findings on physical examination were a powerful factor in patient compliance. Detection followed by patient education and information about positive findings are presumed to be initial steps in promoting compliance. The examination findings strongly influence the woman's perceived susceptibility and serve as a stimulus to appropriate follow-up behavior. The significantly lower compliance rates among asymptomatic women with a normal examination underline the need for physicians to improve the motivation of this group by emphasizing the potential benefits of mammography to women who are aged over 50 years or at high risk because of personal or family history of breast cancer.

Cost is viewed in the health belief model as a barrier to action, and the role of financial factors in obtaining such diagnostic or screening studies was highlighted in the study findings. In general, compliance was inversely related to cost across the various income categories, and the compliance with screening mammography in asymptomatic women was the most severely reduced by cost. Although unexplored in the present study, one could reason from the above findings that the availability of mammography equipment at the time and place and as a part of the package of

initial screening is most desirable for the success of community breast cancer screening efforts.

The less than complete compliance of symptomatic women is of obvious serious concern. Reports from more extensive cancer-screening efforts have also indicated that a significant proportion of those who showed positive findings at screening did not report any follow-up care or evaluation.[7] Studies comparing these results with the outcome of referral from private physicians' offices would be an area for future research in determining whether continuity of care improves compliance with referrals. The role of physician and patient attitudes toward mammography is another area requiring further study.

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