Adherence to Cancer Screening

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Routine breast cancer screening for women 50 years of age and older can reduce mortality from breast cancer by 30% to 35%. Regular Papanicolaou tests can decrease mortality from cervical cancer dramatically, and skin cancer screening could decrease deaths from melanoma. Adherence to recommended screening procedures for breast, cervical, and skin cancer screening increases the potential to lower the risk of death and disability from these diseases. The National Cancer Institute's goals include increasing the proportion of women who get regular mammograms to 80%, and similar goals have been issued for Pap tests. Yet, most women still are not being screened for breast or cervical cancer on a regular basis, and most people do not have regular skin checks for cancer.

Introduction

Adherence in the context of cancer control means that recommended screening procedures are followed. Screening techniques for reducing mortality from breast, cervical, and skin cancers are proven, available, and cost effective. Yet, for reasons attributable to providers, the health care system, and the people themselves, screening falls short of the ideal. Nonadherence reduces the potential of screening to lower the risk of death and disability from these diseases. Clinicians play important roles in encouraging patients to undergo screening for breast, cervical, and skin cancers through effective use of their office systems, by counseling individual patients, and by responding to patient barriers. Larger-scale scientific efforts are required to overcome other barriers. These barriers and the solutions to overcoming them are similar for other screening efforts, including colorectal cancer screening.[1]

Recommendations for Breast Cancer Screening

Establishing an appropriate age guideline for screening women for breast cancer is controversial (Table 1). The National Cancer Institute (NCI), American College of Physicians, American College of Family Medicine, and the United States Preventive Services Task Force recommend mammograms every one to two years for women aged 50 through 69 years. The American Cancer Society, American College of Radiology, and American College of Obstetrics and Gynecology recommend mammograms every one to two years for women aged 40 through 49 years. Since mammography has not been shown in randomized clinical trials to unequivocally reduce mortality for women aged 40 through 49 years, the NCI in 1993 withdrew its recommendation for regular mammograms for this age group and instead issued a statement of evidence,[2,3] which has been met with considerable debate. A recent meta-analysis indicates a statistically significant reduction of mortality in the under-50 age group, but the data are as yet unverified.[4] Although too little is known about the efficacy of mammography for women aged 70 years and older, in view of the increased risk of breast cancer with advancing age, prudence dictates regular mammograms for older women who are otherwise healthy.[5]

Table 1. Current Screening Mammography Recommendations

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<tr>
<th>Organization</th>
<th>Every 1-2 Years Ages 40-49</th>
<th>Every Year or 1-2 Years Ages 50-69</th>
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<tbody>
<tr>
<td>National Cancer Institute</td>
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<td>American College of Physicians</td>
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<td>US Preventive Services Task Force</td>
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<td>American College of Family Medicine</td>
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<td>American Cancer Society</td>
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<td>American College of Radiology</td>
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<tr>
<td>American College of Obstetrics and Gynecology</td>
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The most rigorous efforts to encourage women to obtain mammograms should occur among women 50 through 69 years of age. While routine mammograms are not universally recommended for women aged 40 through 49 years, some women in this age group may require mammograms, eg, those with a strong family history of breast cancer, women with a personal history of breast cancer or atypical hyperplasia, and women who are extremely anxious about breast cancer (although screening for these women is questionable). Physicians should encourage women to make informed decisions. Many women aged 40 through 49 years receive regular mammograms. Women also should practice breast self-examination monthly and obtain a yearly clinical breast examination from a health provider.

Recommendations for Cervical Cancer Screening

Controversial issues remain for cervical cancer screening. The NCI and many other organizations recommend screening every three years when a history of negative tests has
Physicians should verify that an older woman has had a history of negative examinations, since many elderly women are dying of cervical cancer.[9]

**Approaches to Promoting Screening Adherence**

Several theoretical approaches have been developed to explain why individuals do or do not undergo screening. A widely used theoretical model, the Health Belief Model,[10] postulates that before undergoing screening, a patient must believe that the problem is serious, that he or she is susceptible to the problem, that an effective action is available, and that he or she must receive some sort of a cue to action. The Health Belief Model has limited application for screening adherence in that it explains only a small amount of the variance in health behavior.

The Transtheoretical Model is effective in planning interventions to increase mammography use on a macro level and in counseling patients on mammography, Pap tests, skin cancer screening, or smoking cessation. People in different stages have different barriers to and beliefs about mammography, and they require different information and education. For example, precontemplators need to be convinced that mammograms are necessary, while women in the action stage may need a referral, and those in the maintenance phase may require only reinforcements and reminders. Appropriately placing a patient within the cycle enables effective use of the clinician's time and efforts by matching the message to the woman's needs.

**Current Status of Mammography in the United States**

In 1995, more than 182,000 women will be diagnosed with breast cancer and 46,240 women will die of the disease.[14] The proportion of American women who are receiving regular mammograms has increased dramatically since 1987, when only approximately one third of women had ever had a mammogram and only approximately 17% had one in the preceding year.[15] By 1990, nearly two thirds of women aged 40 years and older reported having had at least one mammogram, although only approximately 31% were following guidelines.[16] The NCI's goals include increasing the proportion of women who get regular mammograms to 80%.[17]

The 1990 National Health Interview Survey (NHIS) showed that 63% of women over 40 years of age reported having had a mammogram and that use had almost doubled since 1987. Only 39.8% of women reported having had both a clinical breast examination and a mammogram in the preceding year, and 38% of women had never had a mammogram.[18] Rakowski et al[12] concluded that only 29% of women are getting regular mammograms, according to data from the 1990 NHIS. Thus, while significant increases in screening use have occurred, the majority of women are not on a program of regular mammograms and Pap testing.

In 1987, the NHIS showed that most underusers were less educated, resided outside of metropolitan areas, or were members of a minority. By 1990, the racial gap had been reduced on a national level, although it was still significant in many regions of the US. Currently, the most relevant demographic factors for predicting mammography use are lower income status and less education,[18] which transcend the impact of race alone.

**Barriers and Facilitators to Mammography**

The characteristics of women who do not get regular mammograms are generally consistent from study to study (Table 3) and are similar to those for Pap tests.[19] The most important barrier is the lack of a recommendation by a woman's physician.[20-23] Women who are older, black, or Hispanic are less likely than middle-aged white women to report receiving such a recommendation. Other factors contributing to women's nonparticipation in mammography, according to their self-report, are an absence of breast problems or the belief that mammograms are unnecessary in the absence of symptoms.

**Table 3. Characteristics of Underusers for Breast and Cervical Screening**

<table>
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<tr>
<td>Has no regular source of care</td>
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<td>Smokes</td>
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<tr>
<td>Does not exercise regularly</td>
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<tr>
<td>Is not familiar with breast self-examination</td>
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Other barriers to mammography exist, but they account for much less of the variance in explaining the behavior. These barriers, which may be important for individual women or subgroups of women, include anxiety about the possibility of finding a problem and concern about radiation and pain. These concerns may be important for individual women or subgroups of women. For example, black and Hispanic women seem to be more concerned about pain and report more anxiety about the mammography experience. There is some evidence that older black women are more fatalistic about cancer in general,[24] and unmarried women are less likely to have had mammograms. [25] Smokers also are less likely to get mammograms,[26-27] but this behavior may correlate with lower standards of health care in general.

Access and environmental barriers also may be important factors in mammography use. A study conducted in a health maintenance organization (HMO) [27] found that nonparticipants had more difficulty getting to the facility, would have to travel farther, and were more likely to rate the facility as inconvenient. Women without health insurance are less likely to participate in mammography or Pap testing.[18] Although not a major barrier, cost has been reported as a barrier for some, eg, women aged 50 to 59 years of age or Hispanic women.[21] However, studies show that even when the cost barrier is removed, other important psychological barriers remain. [20] If these barriers are not addressed, women still may not pursue regular mammograms.

In some ways, the facilitators to mammography are the obverse of the barriers. Women are more likely to get mammograms when advised by their physicians,[15,20] when they know the recommended screening interval for their age, and when they are aware of the relationship between age and breast cancer screening.[28,29] There also is evidence that women with more social ties are more likely to have mammograms.[30]

The role of family history has been inconsistent as a predictor of screening. Some studies show that a family history of breast cancer increases the likelihood that women will get regular mammograms, while others do not.[31,32] In a review of the data, Lerman et al[33] showed that different studies found that different relationships between family risk and screening behavior produced different effects, ranging from a negative effect, no effect, or a positive effect. However, many of the studies have used self-selected groups of women who volunteered to participate in high-risk programs. Perceptions of personal risk and levels of distress may mediate actual risk in determining screening behavior. When Curry et al[34] reinforced family history as a risk factor, women were more likely to participate in a screening program. Most recently, Schildkraut et al[35] found that the majority of women in a high-risk sample did not understand the implications of the relative’s age at onset as a risk factor and as a rationale for meticulous surveillance.

Barriers for physicians and facilitators are different from those reported by women. Physicians are more likely to be deterred by cost considerations or to believe that women will reject a referral.[36] Physicians also cite the daily demands of providing acute and chronic care, failure to remember to recommend prevention and early detection, and concern about equivocal radiology reports.[36-40] As was previously stated, cost is not the major barrier for women, and most women get mammograms when recommended by their physicians. This is especially important for older minority women.

Current Status of Cervical Cancer Screening in the United States

In 1995, cervical cancer will be diagnosed in 15,800 women, and 4,800 will die of the disease.[14] Compared to breast cancer screening, less is known about the use of cervical screening among US women. According to the 1987 NHIS, the percentages of women who reported never having had a Pap test were approximately 11% of women overall, 10% of white women, 11.9% of black women, and 24.7% of Hispanic women. The proportion of women who reported having had a Pap test declined as age increased. [41] Black women aged 30 through 49 years were more likely to be screened regularly, but white women aged 70 years and older were more likely to have had a Pap test in the last three years. This shows that Pap test use is negatively related to age and positively associated with income.[42]

Barriers and Facilitators to Cervical Cancer Screening

Many of the barriers and facilitators to Pap testing are similar to those for breast cancer screening. Older women and women past childbearing age may not recognize that Pap tests are still necessary,[43] and some women and physicians believe that women who are not sexually active do not need Pap tests.[44]

Knowledge and beliefs vary by age and ethnicity. For example, Hispanic women are less likely to be aware of Pap tests and therefore may require educational information. Most studies show a relationship between a belief in the benefits of Pap tests and regular screenings.[45] Women who are embarrassed about getting a Pap test and those who say they are too busy also are less likely to be screened.[46] Women who do not participate in screening are more likely to cite procrastination or a belief that the test is unnecessary as reasons for not being screened.[47] As with mammography, women who do not pursue other preventive services are less likely to participate in Pap testing.[45,46] Minority women seem to be more embarrassed than white women about getting Pap tests.[25]

Older Hispanic women are especially at risk for underusing both mammography and Pap testing. Some studies show that women who are more knowledgeable about Pap tests, including the recommended screening interval, are more likely to be tested.[49]

Current Status of Skin Cancer Screening in the United States

Skin cancer is increasing dramatically in the United States. Cases of melanoma have increased by 120% for men and by 48% for women since 1968.[50] In 1995, approximately 800,000 new cases of skin cancer will be diagnosed in the United States, and most of the 9300 deaths will be the result of melanoma.[14] Since screening for skin cancer requires no special technology and is quick, painless, and inexpensive, it should be acceptable to most patients and clinicians. The American Cancer Society advises that adults 20 through 40 years of age have a skin examination every three years and annually after 40 years of age. Because the skin is accessible, patients also should be trained to observe their own skin and to be aware of changes.

Koh et al[51] and others have suggested that skin cancer screening should focus on high-risk individuals, eg, those who are white or those with fair skin, with dysplastic nevi, with a propensity for sunburns, or with a family history. Since the risk of skin cancer increases with age, older people require special attention.

Barriers and Facilitators to Skin Cancer Screening

Little is known about the extent to which breast and cervical cancer screening barriers apply to skin cancer screening (eg, patient embarrassment and lack of provider time).

Follow-Up of Abnormal Test Results

It is beyond the scope of this report to address the issues associated with adherence to follow-up procedures when test results are abnormal. However, extensive evidence exists that a significant proportion of people who are more likely to be screened regularly, but white women aged 70 years and older were more likely to have had a Pap test in the last three years. This shows that Pap test use is negatively related to age and positively associated with income.[42]
Interventions to Increase Screening Adherence

**Breast Cancer and Cervical Cancer**

More studies have been conducted to test interventions to increase screening for breast cancer than with other cancers. The literature shows that the best approach to screening is to use multiple interventions directed at patients, physicians, the system and, if possible, the community. Multistrategy interventions generally are more effective, although single approaches have been successful in some cases.[19] For example, a nurse practitioner in a hospital clinic was given the responsibility for identifying older, poor, black women who were due for mammograms and then approaching them.[7] This intervention resulted in a significant increase in the proportion of these women who received mammograms. In another case, a video was created that highlighted a woman’s internal attributions about her personal responsibility for getting mammograms,[55] which increased use of mammography, according to self-reports.

Strategies that physicians can use to increase their mammography referrals and their performance of Pap tests include using audits with periodic feedback, detailing strategies, and implementing computerized reminders. These strategies have not been used widely outside of academic medical centers. Costanza et al[31] recently showed that a hospital-based, in-service program significantly improved mammography referrals in their intervention community.

The most effective behavior change investigations used a mix of intervention strategies directed at physicians, patients and, in some cases, the community.[31,56-58] The physician-directed strategies included traditional continuing medical education programs at community hospitals, as well as office-based strategies based on the academic detailing model.[59] Most used reminder systems as integral to the interventions. Austin et al[60] recently demonstrated the cost-effectiveness of such reminders. All of these successful studies also developed and tested special interventions for women.

In one study, women in an independent practice association model HMO were invited to participate in breast cancer screening.[56] Nonadherent women were sent reminders, which significantly increased adherence. For women who remained nonadherent, telephone counseling tripled the chances that a woman would get a mammogram. During a brief counseling session that averaged five minutes, the counselor’s goal was to identify and overcome a woman’s personal barriers to mammography.

Costanza et al[31] conducted patient education in a community health center, and Fletcher et al[58] implemented a community-wide media campaign. Lane et al[57] used community health education strategies, including a game.[23] These studies also included free or low-cost mammograms as part of the intervention package. Thus, these programs included strategies that were patient-directed, physician-directed, system-directed, and sometimes community-based.

Although less research has been applied to cervical cancer screening compared with breast cancer screening, many of the same approaches appear to be effective. Community health workers can increase use of cervical cancer screening, and in-reach interventions within community health centers can be effective.[51,62] In addition, attempts to streamline the process of appointments and waiting time contribute to improved adherence.[63] and invitations from providers also increase cervical cancer screening.[64] There is some evidence that screening of emergency hospital patients can be a useful component of case finding.[65,66] The literature shows that usually more than one intervention strategy is required and that those interventions should be directed not only at patients, but also at physicians, other providers, and the health care system.

**Skin Cancer Screening**

The United States lags behind many other countries in the creative application of interventions to reduce the incidence of and mortality from melanoma and other skin cancers. Australia, which has the highest reported incidence of melanoma, has mounted successful population-based programs that have produced dramatic results.[67,68] Because early sun exposure is a predictor of skin cancer and particularly melanoma, education of children and interventions with their parents is necessary components of programs, whereas interventions for breast and cervical cancer screening focus on adult behaviors.

Because prevention strategies are available (eg, using sunscreens, limiting sun exposure), prevention must be a major feature of education programs. Many intervention strategies have been used to decrease sun exposure.[69] In general, the literature shows that combinations of interventions, including mass-media and community-based education, can increase the number of people who practice safe-sun behaviors. However, fewer concerted efforts have occurred in promoting skin cancer screening. Skin cancer screening is not technology-driven, thus checks can be performed almost anywhere. Programs have been conducted in mobile settings and at churches, health fairs, and county fairs.[51] The American Academy of Dermatology sponsors an annual free skin cancer screening day. As with similar breast and cervical cancer screening events, individuals with low income are under-represented.

Skin cancer screening should be integrated into routine primary care, since over 90% of the US population has a routine source of medical care and 85% consult a physician every two years. Thus, use of the same prompting systems that increase breast and cervical cancer screening also can increase skin cancer screening.

**The Clinician’s Role in Promoting Cancer Screening**

Although breast cancer screening lags behind Pap testing, they can be considered as integrated behaviors, since some women do not participate in either test. In addition, the Pap test is often the gateway to preventative medicine for women. A Pap test, as well as breast and skin examinations, can be incorporated into a routine checkup and can be performed in the context of women’s health. A referral for a mammogram also can be given at the same visit. The clinician can increase the use of breast and cervical cancer screening by including the following recommendations in clinical practice (Table 4).

Table 4. Clinical Approaches to Improve Adherence

<table>
<thead>
<tr>
<th>Approach</th>
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<tr>
<td>Use an office system.</td>
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<tr>
<td>Maintain a detailed family history.</td>
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<tr>
<td>Counsel patients about the importance of screening.</td>
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<tr>
<td>Use age- and ethnicity-appropriate patient education materials.</td>
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<tr>
<td>Take a stage-based approach.</td>
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<tr>
<td>Get feedback from patients.</td>
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<tr>
<td>Have a system in place for follow-up.</td>
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<tr>
<td>Track effectiveness.</td>
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<tr>
<td>Consider adjuncts to increase counseling.</td>
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<tr>
<td>Participate in low-cost, community-based screening activities.</td>
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**Use an office system.** – System-wide innovations, such as prompts and manual- or computer-generated reminders, can increase the use of breast and cervical cancer screening and are cost effective.[60,70-73] Such systems also could increase the acceptance of skin cancer screening. Fewer than one third of physicians report using office systems, but without planned systems, recommendations for cancer screening often are sporadic and inconsistent. Ideally, yearly reminders for Pap testing and breast cancer screening should be sent, and most women welcome these reminders. Skin cancer screening can be integrated into annual checkups for both men and women.

**Maintain a detailed family history** – Genetic information will become increasingly available to characterize the 5% of patients who are at increased risk for cancer due to family history. A detailed family history should be maintained for all patients, and the impact of risk on recommendations for surveillance should be discussed with patients in order to determine if they should be offered genetic screening and counseling and if they should be on more aggressive screening schedules.
Counsel patients about the importance of screening -- The most important reason why women receive screening is that they do so. Patients rarely refuse breast and cervical screening when recommended by physicians.[74] Brief, articulate advice regarding the importance of screening can be effective in increasing the use of mammography and Pap testing. This recommendation should be accompanied by a referral, which facilitates the behavior, or the receptionist or office nurse can schedule the mammogram appointment while the woman is in the office. Similarly, women should be given a strong message about the importance of regular Pap testing. Ideally, the test could be performed during a routine visit, or a follow-up visit could be scheduled.[76] During a routine checkup, a physician should not only perform a skin examination, but also emphasize the importance of regular, thorough breast and skin self-examinations.

Counseling should reflect a recognition of the patient's personal health behaviors that may affect risk. For example, current or previous smoking, sexual history, and oral contraceptive use affect the risk of cervical cancer, and these factors should be considered when counseling patients.

Use age- and ethnicity-appropriate patient education materials -- The impact of counseling can be enhanced when augmented with education materials that are appropriate to the patient's age and ethnicity. Excellent materials are available at no cost from the American Cancer Society (1-800-ACS-2345) and the NCI's Cancer Information Service (1-800-4-CANCER).

Take a stage-based approach -- The clinician's advice can be most effective when a stage-based approach is used.[11] The woman who refuses to consider a mammogram has different educational needs from one who has regular mammograms. The former may benefit from information about the relationship between age and breast cancer incidence or the ability of mammography to detect early, curable cancers, while older precontemplators may not know that women need to continue regular Pap testing and may benefit most from recommendations for regular screenings and a referral. Still other patients may not appreciate the value of sun protection or regular skin examinations. Thus, the most effective recommendations address each patient's individual circumstance.

Get feedback from patients -- Women who are referred for mammograms or Pap tests can provide important information about mammography facilities and other referral services. If they complain about waiting time for appointments or how they are treated, it may be time to identify a new facility.

Have a system in place for follow-up -- Women who are given referrals for mammograms will not always follow through with their appointments, and even those who do not return with abnormal Pap or mammography test results may not complete the recommended diagnostic tests. Compliance to recommended skin cancer diagnostic procedures also may be incomplete. The reminder system or another follow-up system should be used to track adherence to recommended procedures.

Track effectiveness -- Many clinicians believe they are doing better than they actually are. Chart audits and other procedures can be used to obtain this information on a regular basis. Areas of below-par performance then can be identified and appropriate strategies can be devised for improvement.

Consider adjuncts to improve counseling -- Reminder letters are one of the cost-effective techniques that can double the proportion of women who receive cancer screening.[76] Telephone counseling, in which a trained counselor calls a woman to identify and overcome her individual barriers to mammography, can triple the odds that a woman will have a mammogram.[78] Telephone counseling currently costs approximately $5.00 per successful call. Patients also can be referred to the NCI's free telephone information line, the Cancer Information Service (1-800-4-CANCER).

Participate in low-cost, community-based screening activities -- Many communities now offer organized approaches to cancer screening that can reduce financial barriers for many low-income people. These events also should include referral and follow-up for those with abnormal findings.

Conclusions

Regular screening for breast cancer, cervical cancer, and skin cancer can reduce mortality from these cancers. Physicians can do much to overcome patients' barriers to participation in screening. Most of these steps require only a modest amount of time but could exert a major impact on mortality from cancer.

References


