Evidence-Based Practice: Recommendations for the Early Detection of Breast Cancer

Suzanne M. Mahon, RN, DNSc, AOCN®, APNG

The American Cancer Society (ACS) estimates that in 2003, 211,300 women will be diagnosed with breast cancer and 39,800 women will die from the disease (Jemal et al., 2003). The mortality associated with breast cancer has decreased because of increased awareness of and participation in early detection methods. The three primary tools used for the early detection of breast cancer are breast self-examination (BSE), clinical breast examination (CBE) by a healthcare provider, and mammography. Each detection tool has its own inherent strengths and weaknesses.

Recommendations for the early detection of breast cancer vary among agencies. Controversy continues about the choice of screening tests, recommended intervals for testing, and populations to be screened for cancer. This confusion stems from differences in populations considered (e.g., women of different ages), varying thresholds for acceptance of effectiveness of tests (e.g., sensitivity, specificity), costs, risks associated with screening tests, and the underlying mission of the recommending agency (Foltz, 2000).

Many types of agencies issue guidelines, including governmental agencies, disease-related organizations, and organizations of health professionals. Table 1 provides an overview of some of the current recommendations from a variety of agencies for the early detection of breast cancer. Most of these recommendations do not include an upper age limit for when screening should be stopped. The decision to continue screening is individualized and usually based on the overall health of the woman.

Breast Self-Examination

Systematic monthly BSE has been recommended for the past 70 years despite a lack of compelling evidence that it reduces the morbidity associated with breast cancer (Austoker, 2003). More than 30 nonrandomized trials have produced conflicting results about the efficacy of BSE (Harvey, Miller, Baines, & Corey, 1997).

Confusion regarding BSE stems from many sources. Several methods have been suggested over the years, including vertical, strip, and circular (American Cancer Society, 2003a). Of the agencies that recommend BSE, most suggest that it be done monthly, which is based on the menstrual cycle, despite the fact that most women who develop breast cancer are postmenopausal.

Women need to be informed about the limitations of BSE. The screening method is dependent on the skill of the women performing BSE. Women who examine their breasts more carefully and regularly may be able to detect subtle changes and achieve earlier diagnosis. When women detect abnormalities in their breasts, anxiety can be heightened. When BSE results in unnecessary biopsies, the method’s financial costs are increased.

However, the regular practice of BSE has inherent strengths. Most importantly, it makes women aware of their own anatomy and the importance of engaging in the practice of early detection. Women may be able to detect subtle changes in the intervals between professional examinations (i.e., CBE and mammography, which usually are performed annually), which might lead to the earlier detection of lesions (Sterns, 1998). The financial costs of BSE to women are negligible because it is performed in the privacy of their own homes at convenient times.

Will a randomized trial ever be conducted to evaluate the effectiveness of BSE? Conducting a trial in which women would be randomized to not practice BSE when it may indeed be beneficial would be ethically difficult. Many trials examining the efficacy of BSE have been conducted outside of the United States. Whether BSE might be beneficial in the United States because the incidence of breast cancer is higher is uncertain (Humphrey, Helfand, Chan, & Woolf, 2002).

Clinical Breast Examination

CBE, like BSE, is a controversial screening tool. Few randomized CBE studies have been performed, and the method’s quantitative effectiveness is unknown. CBE’s sensitivity (the probability that the test result will be positive if breast cancer is present) has been reported to range from 40%–69%, and its specificity (the probability that the test result will be negative if breast cancer is not present) ranges from 88%–99% (Humphrey et al., 2002). To date, no trial has examined the effectiveness of CBE as a sole breast cancer screening tool. Trials in which CBE was combined with mammography have demonstrated a mortality reduction of 14%–29% (Humphrey et al.).

The usefulness of CBE in the early detection of breast cancer is, in part, related to the skill of the healthcare provider performing the examination. Competent, thorough providers may be more effective in detecting clinical changes. When CBE is performed prior to mammography, it may be useful in identifying an area of suspicion that might
<table>
<thead>
<tr>
<th>AGENCY</th>
<th>FUNDING SOURCE</th>
<th>INTENDED USER</th>
<th>OBJECTIVE</th>
<th>TARGET POPULATION</th>
<th>REVIEW METHODS</th>
<th>OUTCOMES CONSIDERED</th>
<th>COST ANALYSIS</th>
<th>BSE RECOMMENDATION</th>
<th>CBE RECOMMENDATION</th>
<th>MAMMOGRAPHY RECOMMENDATION</th>
<th>PATIENT EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCO</td>
<td>3-page document for patients and physicians</td>
<td>Determine effective, evidence-based postoperative surveillance strategies for the detection and treatment of recurrent breast cancer</td>
<td>Patients with breast cancer</td>
<td>External and internal review</td>
<td>Overall survival, disease-free survival, quality of life, toxicity reduction, cost-effectiveness</td>
<td>Not stated</td>
<td>Prudent to recommend monthly practice</td>
<td>Every 3–6 months for the first three years after diagnosis; every 6–12 months for the next two years; then annually</td>
<td>Annually from time of diagnosis</td>
<td>Advise about symptoms of recurrence</td>
<td></td>
</tr>
<tr>
<td>ACS</td>
<td>4-page document for patients, physicians, nurses, allied healthcare professionals, health plans, managed care organizations</td>
<td>Determine whether new scientific findings warrant a change in ACS guidelines (reviewed annually)</td>
<td>Women 40 years of age or older</td>
<td>Peer review</td>
<td>Mortality caused by breast cancer in women aged 40 or older</td>
<td>Not stated</td>
<td>None stated</td>
<td>Every 1–3 years for women aged 20–39; annually beginning at age 40</td>
<td>Annually beginning at age 40</td>
<td>None stated</td>
<td></td>
</tr>
<tr>
<td>AAFP</td>
<td>15-page document for physicians</td>
<td>Provide recommendations that should be offered, those that should not be, those that could be considered, and those with insufficient evidence</td>
<td>Asymptomatic individuals in the general population who are not at high risk</td>
<td>Not stated</td>
<td>General health</td>
<td>Not stated</td>
<td>None stated</td>
<td>Include with periodic health checkup</td>
<td>Every 1–2 years beginning at age 40</td>
<td>Counsel about risks and benefits of mammography</td>
<td></td>
</tr>
<tr>
<td>NCCN</td>
<td>11-page document for physicians</td>
<td>Develop guidelines to facilitate decision making</td>
<td>Asymptomatic women at normal risk for breast cancer</td>
<td>Comparison of guidelines from other groups, internal review, and external review</td>
<td>Breast cancer-specific survival, overall survival, net health benefit</td>
<td>Not stated</td>
<td>Encourage practice</td>
<td>Every 1–3 years for women aged 20–39; annually beginning at age 40</td>
<td>Annually beginning at age 40</td>
<td>None stated</td>
<td></td>
</tr>
<tr>
<td>CDC</td>
<td>82-page document for nurses and physicians</td>
<td>To present morbidity and mortality data regarding breast cancer screening recommendations, an update on the National Breast and Cervical Cancer Early Detection Program</td>
<td>Uninsured and low-income women aged 50–64</td>
<td>Not stated</td>
<td>Morbidity of breast cancer, mortality of breast cancer, incidence of breast cancer, mammography usage rates</td>
<td>Not stated</td>
<td>None stated</td>
<td>None stated</td>
<td>Annually beginning at age 50; every 1–2 years for women aged 40–49</td>
<td>None stated</td>
<td></td>
</tr>
</tbody>
</table>

BSE—breast self-examination; CBE—clinical breast examination (Continued on next page)
**TABLE 1. OVERVIEW OF SELECTED AGENCY RECOMMENDATIONS FOR THE EARLY DETECTION OF BREAST CANCER (CONTINUED)**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Funding Source</th>
<th>Intended User</th>
<th>Objective</th>
<th>Target Population</th>
<th>Review Methods</th>
<th>Outcomes Considered</th>
<th>Cost Analysis</th>
<th>BSE Recommendation</th>
<th>CBE Recommendation</th>
<th>Mammography Recommendation</th>
<th>Patient Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>American College of Radiology (ACR) (2000), medical specialty society</td>
<td>ACR 5-page document for physicians</td>
<td>To revise screening guidelines for breast cancer in light of mounting evidence that women younger than 50 years old have a shorter lead time for mammographic detection of breast cancer</td>
<td>Women 40 years old or older without signs or symptoms of breast cancer; women of any age at high risk for breast cancer but without signs or symptoms of breast cancer</td>
<td>Peer review</td>
<td>Mortality rate reduction because of screening for breast cancer, cost-effectiveness of screening mammography (e.g., cost per year of life saved)</td>
<td>Yes</td>
<td>Monthly beginning at age 40</td>
<td>Annually beginning at age 40</td>
<td>Not stated</td>
<td>None stated</td>
<td></td>
</tr>
<tr>
<td>U.S. Preventive Services Task Force (USPSTF) (2002), independent expert panel</td>
<td>United States 3-page document for physicians, nurses, and allied healthcare professionals</td>
<td>To summarize the current USPSTF recommendations on screening for breast cancer and the supporting scientific evidence</td>
<td>Women aged 40 and older</td>
<td>Comparison of guidelines from other groups, internal and external review</td>
<td>Sensitivity, specificity, and positive predictive values of screening methods; morbidity and mortality caused by breast cancer</td>
<td>Insufficient evidence to recommend for or against</td>
<td>Insufficient evidence to recommend for or against</td>
<td>Every 1–2 years for women starting at age 40</td>
<td>Insufficient evidence to recommend for or against teaching BSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian Task Force on Preventive Health Care (CTFPHC) (Baxter &amp; CTFPHC, 2001; Ringash &amp; CTFPC, 2001), national (non-U.S.) governmental agency</td>
<td>Canada 10-page document for physicians, nurses, and allied healthcare professionals</td>
<td>To evaluate the evidence relating to the effectiveness of BSE to screen for breast cancer; to provide recommendations for teaching BSE to women as part of a periodic health examination</td>
<td>Asymptomatic women of all ages in the general population in Canada</td>
<td>External peer review and internal peer review</td>
<td>Prevention of breast cancer mortality, incidence, stage detected, benign biopsy rate, number of visits for breast complaints, and psychological benefits; morbidity; to consider the available new and updated evidence regarding the effect of screening mammography on mortality among women aged 40–49 at average risk of breast cancer; to consider effects of screening mammography among women aged 40–49</td>
<td>Not stated</td>
<td>Not stated</td>
<td>No recommendation for or against in women aged 40–49; every 1–2 years beginning at age 50</td>
<td>Women aged 50–69; for women aged 40–49, routine teaching of BSE should be excluded; for women younger than age 40, risk for net harm is more likely because of the low incidence of breast cancer; for women aged 70 and older, insufficient evidence exists; at 40, women should be informed of the potential risks and benefits to determine whether they wish to undergo mammography</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BSE—breast self-examination; CBE—clinical breast examination
not be readily visible on mammography or providing guidance in selecting additional imaging techniques, such as ultrasound (Smith et al., 2003). As with BSE, the biggest benefit of CBE probably is that it heightens awareness about the early detection of breast cancer and provides an opportunity to further educate women about early detection and prevention strategies.

Mammography

Most research related to the early detection of breast cancer focuses on the use of mammography. The primary evidence that supports mammography comes from seven large randomized clinical trials that found a statistically significant mortality reduction from breast cancer in women aged 40–69 who underwent regular screening mammography (Smith et al., 2003). Overall, the trials suggested that a 24% mortality reduction is associated with mammography use. Some of the trials involved annual screening, and others used a two-year interval. Evidence now suggests that the benefit of annual screening may be greater in premenopausal women (Smith et al.).

Mammography is not without limitations. Some women find mammography to be very uncomfortable. Although the amount of radiation exposure is small, it does occur. Every woman needs to be educated about the risks. Mammography does not achieve perfect sensitivity or specificity. Sensitivity for annual mammography ranges from 71%–96%, with less sensitivity observed in younger women (Humphrey et al., 2002). Specificity ranges from 94%–97%. False-negative mammograms may be related to the women being tested. Younger women, significant risk factors, breast density, hormone use, and tumor growth rates may limit the sensitivity of a mammogram. Women need to be instructed about the possibility of having false-negative or false-positive films.

When abnormalities are detected by mammography, further evaluation is needed. Additional testing contributes to higher medical care costs. The 10-year probability of a false-positive mammogram leading to a biopsy is 19% (Smith, 2003). Another concern associated with the use of mammography is increased detection and possible overtreatment of ductal carcinoma in situ (Smith et al., 2003). The psychosocial costs and anxiety associated with false positive mammograms cannot be ignored. Research findings suggest that little evidence exists of lasting anxiety or negative attitudes toward future mammographic screening (Smith).

Implications for Nurses

First, nurses should review the scientific bases for each of these breast cancer screening guidelines. Each agency that issues a guideline should make this information available. To obtain information about the scientific bases and review processes for guidelines, contact the individual agencies that generated them or the National Guideline Clearinghouse, available online at www.guideline.gov.

Second, nurses have a key role in interpreting data about screening to women. Nurses should explain why a particular set of guidelines is being used for each woman. They should remind women that these are guidelines and that some modifications may be made based on assessment of risk factors and findings on clinical examination. With some women who are in declining health, nurses may discuss discontinuing breast cancer screening, although none of the guidelines provides specific direction in this area. Clearly, the benefits, risks, and potential limitations of BSE, CBE, and mammography must be discussed with each woman and tailored to assessment of her risk factors.

Author Contact: Suzanne M. Mahon, RN, DNSc, AOCN®, APNG, can be reached at mahonsm@slu.edu.

References