

Breast Screening for the Menopause Physician

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In December 2006 a national consortium of researchers from MD Anderson Cancer Center, the National Cancer Institute and Harbor-UCLA Medical Center reported encouraging statistics about the decline in breast cancer incidence at the San Antonio Breast Cancer Symposium. They determined that new breast cancer diagnoses were approximately 10% below projected numbers.¹ Since that time there has been a flurry of reports concerning decreased utilization of mammography,² the role of magnetic resonance imaging (MRI) in screening patients,³ the limitations of computer-assisted detection in screening mammography,⁴ and the benefit versus risk of screening mammography for women ages 40 to 49.⁵ The information is, at times, conflicting, if not confusing.

This article serves as an overview of recently presented data, with a discussion of recommendations for menopausal women currently endorsed by many physicians/women's health organizations.

Breast Cancer in American Women

The American Cancer Society estimated that more than 211,000 American women would be diagnosed in 2007 with invasive breast cancer, an additional 58,000 would be diagnosed with in situ breast cancer, and more than 40,000 women would die

from breast cancer.⁶ It continues to be the second leading cause of cancer death in American women, surpassed only by lung cancer.⁶ No single causative agent has been identified. Prevention is still in the future. Diet and lifestyle changes have been suggested as preventive methods, but

their impact is limited and, for many women, less than desirable.⁷ Higher-risk populations may benefit from selective estrogen-receptor modulators, if the women and their physicians accept the possibility of side effects.⁸⁻¹⁰ While high-risk populations may be of particular interest, the majority of newly diagnosed patients have no family history or other significant risk factors with precise individual predictability. The Gail model has been used to assess risk but is better suited to large groups rather than to individuals.¹¹

For American women, breast cancer will continue to represent a significant health concern until the incidence of the disease approaches zero and methods of detection are 100% sensitive and specific. Until such time that preventive measures offer reliable reduction in incidence, early detection via breast imaging—although less than perfectly sensitive and specific—offers the promise of effective treatment, disease control and reduced mortality.

Screening Tests

The purpose of any screening test is to divide the population at risk into: (1) those with no signs of the disease, and (2) those with signs that require further evaluation. Not all



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those in the second group will ultimately be diagnosed with the disease. A screening exam should be noninvasive, readily available, easy to administer, well tolerated and, preferably, cost-effective. The goal of screening is to identify the disease in its preclinical phase while it is still potentially curable.

Mammography. The screening mammogram is performed on asymptomatic women starting around the age of 40 (Figure). This recommendation for the initial mammogram at age 40 and then yearly thereafter has been adopted by many professional medical societies, including the American Cancer Society, the American College of Radiology and the American College of Surgeons.¹² The American Cancer Society also recommends that yearly mammography continue “with consideration of overall health status and anticipated longevity.”¹² The impact of screening mammograms is well documented.^{13,14} Mortality from breast cancer has been reduced in those countries and groups with well-attended screening mammogram programs. Even the most conservative estimates indicate that mortality from breast cancer has, indeed, been reduced in US women—by approximately 15% in women under age 50 who are screened with mammography (if data can be accurately and reliably separated) and by 22% in women over age 50.⁵ Furthermore, screening mammography has been shown to reduce mortality by up to 50% in many well-attended European screening programs.¹³ Mammography will not detect all breast cancers, perhaps due to aggressive growth curves, lack of rec-

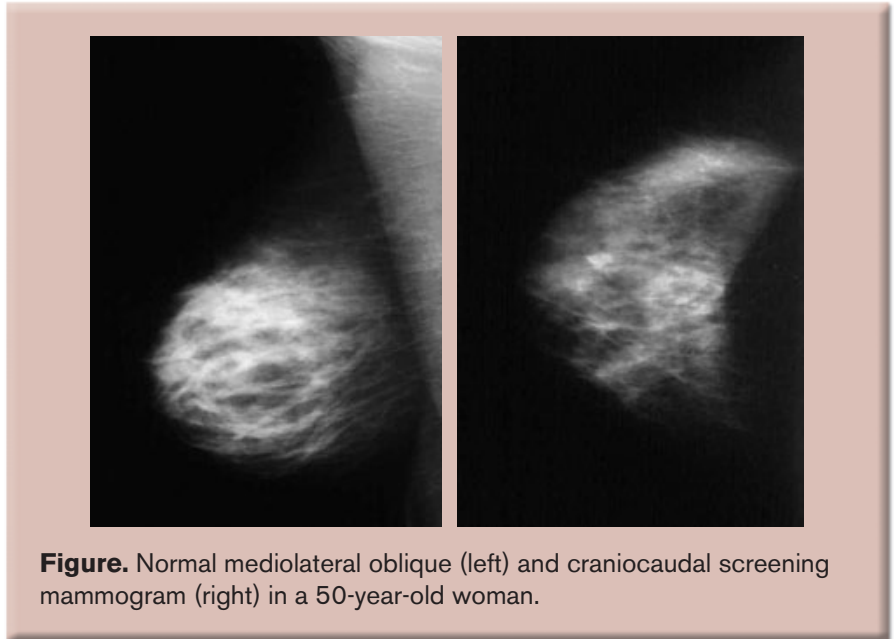


Figure. Normal mediolateral oblique (left) and craniocaudal screening mammogram (right) in a 50-year-old woman.

ognizable characteristics or overall breast tissue density.

Mammography cannot reliably diagnose breast cancer on the initial screening exam. It can, however, identify abnormalities such as calcifications, asymmetries and masses that warrant a recall and additional workup.¹⁵ In recall studies, most of the findings are diagnosed as negative or benign. This is vital information for patients who frequently assume a recall is a definite cancer diagnosis. The recall rate in mammography for all ages of women is less than 15%.¹⁶ The biopsy recommendation rate is usually less than 5%.

In the US, close adherence to mammographic standards is assured by the Mammography Quality Standards Act (MQSA), which requires ongoing accreditation, certification and inspection.¹⁷ No US mammography facility functions without MQSA accreditation. A properly conducted, well-positioned mammogram is the gold standard of early detection. This requires trained, educated and compassionate technicians who en-

gage the patient in the exam so that positioning, compression and technique are ideal.

Compression is an important but misunderstood issue. In mammography, compression will aid in the even distribution of x-ray through the tissue. A reassuring demeanor and gentle approach by the technologist are vital. The patient, however, needs to feel in control of the compression, and thus the patient and technician must act as a team. If there is insufficient compression, the radiologist will not be able to interpret the mammogram and recall of the patient may be necessary. If the compression is deemed overwhelming by the patient, she may never return for another mammogram and will therefore be lost to the possibility of early detection.

Synchronizing the mammogram to the early follicular phase in the premenopausal patient and cessation of supplemental hormone therapy in the postmenopausal female is not generally necessary and does not routinely offer an advantage in inter-

pretation.¹⁸ Synchronizing a mammogram to the follicular phase adds yet another layer of complication to a typically saturated schedule. Two standardized views of each breast are obtained, the craniocaudal (top to bottom) and mediolateral oblique (side to side).

Computer-assisted detection (CAD). CAD is a pattern-recognition software that can identify certain findings on a mammogram. It is utilized as a “second” or additional read of the mammogram and is not designed or intended to replace the radiologist’s interpretation. CAD has recently come under scrutiny and criticism. In a recent study of more than 222,000 women and more than 429,000 mammograms from 1998 to 2002, the application of CAD resulted in an increase in recall examinations above that which was anticipated.⁴ Its application also resulted in a decrease in sensitivity and an increase in biopsy for benign findings.⁴ Some critics of this recent study note that CAD is more helpful to the less experienced radiologist and could demonstrate more favorable results when newer CAD programs are evaluated.⁴

Further imaging (patient recall) will be necessary in less than 15% of patients who undergo CAD and traditional mammography.¹⁹ Additional views (ie, angled, spot compression, or magnifications) are necessary to evaluate a potential mass, architectural distortion or calcifications, all potential signs of early breast cancer. A recall for additional views does not mean that a cancer is present. For the overwhelming majority of patients who are recalled, one or two views will resolve the question and

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convert that patient to a negative or benign report, requiring the next mammogram in 1 year.

Digital mammography. Digital mammography uses conventional x-ray but stores the image on a computer rather than x-ray film. Positioning and compression are almost identical to that of traditional mammography. The technologist performs image quality assessment “online,” making close adherence to a schedule possible. The images are interpreted by the radiologist on a computer monitor. Digital mammography has been shown to be of benefit in screening women under age 50, and in those anticipated to have increased breast density.²⁰ The technology is still being evaluated by the Digital Mammographic Imaging Screening Trial study group and investigations are ongoing. At present, fewer than 10% of mammography facilities in the US offer digital imaging. Its costs are significant and its advantages are still being evaluated. The monetary costs can, however, be anticipated to drop as technology and

utilization improve and increase. No woman should refuse a yearly mammogram because it is not digital. Both film and digital mammography are able to detect breast cancer, with a slight advantage for digital mammography in women under 50 and in those with dense parenchyma.²¹

As with film mammography, compression and conventional x-ray are utilized with digital mammography but the presentation of the images is via soft copy (monitor) not hard copy (film). For transfer of records, hard-copy films or CDs can be generated as department policy dictates.

The digital mammogram does not eliminate the need for recall studies. Although contrast, brightness and other visual manipulations can be performed by the interpreting radiologist, recalls will still be necessary. Coned compression and spot magnification views are still needed in the workup of a potential finding.

The advantages of a digital mammogram have been highlighted by the media, particularly the media directed toward women of mammography-screening age. There are advantages to digital imaging but these advantages should not be misconstrued as vital to a screening mammogram. A future consideration with digital mammography is that remote consultation may become a possibility. Electronic transfer of digital images to experts at a distance from the mammography site is now being evaluated.

Ultrasound. Ultrasound is familiar to most female patients because of its utilization in obstetrics. It is a comfortable modality for most patients. The American College of Radiology

Imaging Network study group is evaluating screening ultrasound and, as yet, only preliminary findings have been released.²² Dr. Steven Feig has presented an informed and tempered discussion of the potential for screening ultrasound.²³

There are considerable limitations, including operator variability, technical variations and lack of standardization. To date, ultrasound screening is not a substitute for routine mammography. Its role as a screening tool has not been approved by the American College of Radiology, the Society of Breast Imaging or the American Cancer Society.²³ Ultrasound is, however, very helpful in evaluating masses seen on the mammogram or a newly palpable finding identified by the patient. If a mass or asymmetry is identified on screening mammogram and the finding persists on additional imaging at recall, then focused ultrasound may be recommended.

MRI. MRI is the newest modality to be evaluated for breast cancer screening. Its applications in appropriate populations are still being developed. Recently, the American Cancer Society recommended screening with MRI in patients who are known carriers of the BRCA mutation, women with first-degree relatives who are BRCA mutation carriers, women who have undergone early chest radiation therapy (between the ages of 10 and 30 years) and women with rare conditions such as Li-Fraumeni.³ All of these patients are at higher risk for cancers that frequently occur at a young age and may even be bilateral. Breast density would be anticipated to be greater in this group of young

MRI will eventually find its place in the screening armamentarium; at present, however, it is best reserved for select populations.

patients and the early signs of breast cancers—ie, microcalcifications—may not be reliable findings in this group, limiting the value of screening mammography. For these and other reasons, MRI is recommended as a screening tool for this select population. It is not a replacement for a screening mammogram in the normal-risk population and will not replace a breast biopsy if there is sufficient concern, either clinically or mammographically.

Unlike the proven reduction in breast cancer mortality in mammographically screened patients, no similar findings of a reduction in mortality due to MRI screening of high-risk patients are yet available. MRI will eventually find its place in the screening armamentarium; at present, however, it is best reserved for select populations. MRI is also a consideration for the woman who is newly diagnosed with breast cancer, and can identify unsuspected cancer in the opposite breast. It is not, however, routinely recommended for women with a past history of invasive or intraductal breast cancer.³

Other screening modalities. Tc99 sestamibi, thermography and positron emission tomography are not preferred breast screening modalities. Their application, if any, is in the diagnostic workup, evaluation of surgical treatment and chemotherapy, or long-term follow-up of the breast cancer patient.²⁴

Additional Imaging

Recall after a screening study requires additional imaging. If there is a focal asymmetry or mass, spot compression or additional angled views can be performed. This is done in an attempt to demonstrate the persistence and characteristics of the screening finding. For most patients, one or two additional views are sufficient to characterize the initial finding as overlapped normal tissue and no further evaluation is necessary. If the finding persists, focused ultrasound and a diagnostic evaluation can be performed; if necessary, sampling can also be obtained with ultrasound guidance. Hand-held automated and single-fire sampling devices have been shown to be effective in the retrieval of diagnostic material.²⁵

Biopsy. If calcifications are the screening finding, magnification views are obtained. Many calcifications can be characterized with magnification as benign, such as teacup and pearl-type in fibrocystic tissue, or coarse calcification in a degenerating fibroadenoma. If, however, there is uncertainty as to the etiology or suspicion of a malignant type of calcifications, stereotactic biopsy may be offered to the patient. Stereotactic biopsy is a nonsurgical sampling procedure that uses com-

puter-aided targeting. Twelve-gauge automated sampling needles have aided in obtaining adequate tissue for diagnosis. The ability to lie prone, patient weight restrictions (as designated by the table manufacturer) and location of the calcifications (ie, adjacent to the chest wall) are important pre-procedure considerations. Samples are x-rayed to verify the presence of calcifications.

Although the appointment time may be 1 hour, the sampling procedure may be completed within 10 minutes and the patient leaves the appointment with a small skin nick covered by a small adhesive bandage. A local anesthetic with lidocaine/sodium bicarbonate is easily tolerated and a sensation of pressure is the most common complaint. Oral acetaminophen is sufficient as post-procedure analgesia.

Correlation of pathology findings with imaging findings is vital and best performed by the mammographer. If there is an incongruent finding, referral for excisional biopsy may be recommended. Pathology results are available within days of the biopsy and, in some institutions, may be reported directly to the patient by the performing radiologist with additional surgical consult appointments if pathology is positive. In other institutions, all patient communication is directed by the referring physician.

Summary and Conclusions

Randomized controlled trials have demonstrated that routine screening mammography decreases breast cancer mortality. Patients depend upon the referring physician's recommendations for their breast

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health. The American College of Physicians supports this close and personal interface with the menopausal patient to assess the individual's need for routine screening mammograms, and recommends re-assessment every 1 to 2 years.⁵ Other groups, such as the American Cancer Society, endorse yearly mammography for all women over age 40, continued until and unless general health considerations are of concern.

Although a mammogram cannot detect all breast cancers, its role is significant and proven. Additional imaging tools may be of use in select patients. The best approach currently available for the early detection of breast cancer is to create a team consisting of the menopause physician, mammography radiologist, and the informed and empowered patient. Screening mammography, consisting of two views of each breast, should be performed yearly in asymptomatic women from age 40 on, until general health status or anticipated lifespan does not warrant it.

Use of ultrasound for breast screening is currently under evaluation by the American College of Radiology Imaging Network.

Screening ultrasound is frequently utilized in diagnostic work-ups. Screening MRI should be considered in high-risk populations only. ■

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