

## CURRENT STATE of BREAST CANCER SCREENING

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A great deal of confusion has arisen since the United States Preventative Services Task Force (USPSTF) recently published new recommendations for screening mammography. The USPSTF is a task force of physicians and researchers who reviewed the literature on breast screening and came to a significantly different conclusion in 2009 than they did in 2004. In 2004, they concurred with the consensus that screening begin at age 40 for low risk women. However, their new recommendations suggest that screening for women 40-49 years of age is not justified. This conclusion is based in part on some different assumptions made by the committee.

Most recently, the USPSTF placed a much stronger emphasis on the anxiety women feel as a result of being recalled after a screening exam for additional imaging; on the false positive rate; and the fact that some breast cancers do not progress enough to shorten life expectancy. On this last issue, as we all know, there is no medically accepted way to accurately determine which cancers are unlikely to spread and which cancers will kill the patient.

The new USPSTF recommendations are not accepted by professional organizations dealing with the care of women, including the American College of Radiology, the Society of Breast Imaging, the American Cancer Society, the American College of Obstetrics and Gynecology, and the American College of Family Physicians, among others.

In response to the uncertainty created by USPSTF the American College of Radiology and the Society of Breast Imaging published an article in the January 2010 issue of the American College of Radiology Journal offering recommendations for breast cancer screening. The recommendations are based on available scientific evidence from randomized controlled trials. In specific areas where hard evidence is not yet available, consensus opinion was developed.

Two distinct populations of women require screening and the recommendations for each differ significantly. Women at low risk or average risk comprise one group. It is estimated that 70-80 % of breast cancers occur in this group. The second group consists of patients with increased risk of developing a breast cancer due to:

- Breast cancer gene mutation carriers (BRCA 1 and BRCA 2) and 1<sup>st</sup> degree relatives who have not had the test done.
- Women with  $\geq 20\%$  lifetime risk of developing breast cancer based on family history (maternal and paternal).
- Women with mothers or sisters with pre-menopausal breast cancer.

- Women with a history of chest radiation treatments-most often for Hodgkins disease between the ages of 10-30.

Three modalities are utilized: mammography; ultrasound; and MRI. Additional methods such as thermography, sestimbi, PET, transillumination, electrical impedance, and optical imaging have not been confirmed by large peer reviewed published studies. As an example, thermography, the most widely studied of these modalities, is shown to only have a sensitivity of 43% for the detection of breast cancer.

Since 1990 there has been a 30% reduction in breast cancer mortality. This is largely due to mammography. Mammography has been shown to be the most cost effective and successful method of screening women. However, mammography is not a panacea. It is noteworthy that 15% of cancers are not detectable by mammograms. Additionally, women with dense breasts (younger women and some women on hormone replacement therapy) are at a higher risk of developing cancer and cancer is more difficult to detect with mammography in these women.

Ultrasound alone is not an adequate screening procedure. Many cancers and precancerous conditions which are easily detected by mammography are not detectable by ultrasound. Ultrasound is very useful as a problem solving tool for findings noted on mammography or MRI. Ultrasound can find lesions in dense breasts which do not appear on mammograms.

MRI is the most expensive modality but is highly sensitive (close to 100%) in identifying cancers. However, the drawbacks of this modality include expense, length of time required for the study, injection of contrast material, and a high false positive rate. Additionally, some women are not candidates for MRI or have contraindications.

The recommendations are provided in this sidebar.

## **SOCIETY OF BREAST IMAGING AND AMERICAN COLLEGE OF RADIOLOGY RECOMMENDATIONS FOR IMAGING SCREENING FOR BREAST CANCER A. BY IMAGING TECHNIQUE**

### **1. Mammography**

#### **Women at average risk for breast cancer**

- Annual screening from age 40

#### **Women at increased risk for breast cancer**

- Women with certain *BRCA1* or *BRCA2* mutations or who are untested but have first -degree relatives (mothers, sisters, or daughters) who are proved to have *BRCA* mutations
  - Yearly starting by age 30 (but not before age 25)
- Women with  $\geq 20\%$  lifetime risk for breast cancer on the basis of family history (both maternal and paternal)

- Yearly starting by age 30 (but not before age 25), or 10 years earlier than the age of diagnosis of the youngest affected relative, whichever is later
  - Women with mothers or sisters with pre-menopausal breast cancer
    - Yearly starting by age 30 (but not before age 25), or 10 years earlier than the age of diagnosis of the youngest affected relative, whichever is later
- Women with histories of mantle radiation (usually for Hodgkin's disease) received between the ages of 10 and 30
  - Yearly starting 8 years after the radiation therapy, but not before age 25
- Women with biopsy-proven lobular neoplasia (lobular carcinoma in situ and atypical lobular hyperplasia), atypical ductal hyperplasia (ADH), ductal carcinoma in situ (DCIS), invasive breast cancer or ovarian cancer
  - Yearly from time of diagnosis, regardless of age

#### ***a. Screening Mammography by Age***

##### ***i. Age at Which Annual Screening Mammography Should Start***

###### **Age 40**

- Women at average risk

###### **Younger Than Age 40**

- *BRCA1* or *BRCA2* mutation carriers: by age 30, but not before age 25
- Women with mothers or sister with pre-menopausal breast cancer: by age 30 but not before age 25, or 10 years earlier than the age of diagnosis of relative, whichever is later
- Women with  $\geq 20\%$  lifetime risk for breast cancer on the basis of family history (both maternal and paternal): yearly starting by age 30 but not before age 25, or 10 years earlier than the age of diagnosis of the youngest affected relative, whichever is later
- Women with histories of mantle radiation received between the ages of 10 and 30: beginning 8 years after the radiation therapy but not before age 25
- Women with biopsy-proven lobular neoplasia, ADH, DCIS, invasive breast cancer, or ovarian cancer regardless of age

***ii. Age at Which Annual Screening With Mammography Should Stop***

- When life expectancy is <5 to 7 years on the basis of age or comorbid conditions
- When abnormal results of screening would not be acted on because of age or comorbid conditions.

**2. Ultrasound (in Addition to Mammography)**

- Can be considered in high-risk women for whom magnetic resonance imaging (MRI) screening may be appropriate but who cannot have MRI for any reason
- Can be considered in women with dense breast tissue as an adjunct to mammography

**3. MRI**

- Proven carriers of a deleterious *BRCA* mutation
  - Annually starting by age 30
- Untested first-degree relatives of proven *BRCA* mutation carriers
  - Annually starting by age 30
- Women with >20% lifetime risk for breast cancer on the basis of family history
  - Annually starting by age 30
- Women with histories of chest irradiation (usually as treatment for Hodgkin's disease)
  - Annually starting 8 years after the radiation therapy
- Women with newly diagnosed breast cancer and normal contralateral breast by conventional imaging and physical examination
  - Single screening MRI of the contralateral breast at the time of diagnosis
  - May be considered in women with between 15% and 20% lifetime risk for breast cancer on the basis of personal history of breast or ovarian cancer or biopsy-proven lobular neoplasia or ADH

**B. BY RISK FACTOR**

**1. Average Risk**

- Annual mammogram starting at age 40

**2. High Risk**

- *BRCA1* or *BRCA2* mutation carriers, untested first-degree relatives of *BRCA* mutation carrier
  - Annual mammogram and annual MRI starting by age 30 but not before age 25
- Women with  $\geq 20\%$  lifetime risk for breast cancer on the basis of family history
  - Annual mammography and annual MRI starting by age 30 but not before age 25, or 10 years before the

age of the youngest affected relative, whichever is later

- History of chest irradiation received between the ages of 10 and 30
  - Annual mammogram and annual MRI starting 8 years after treatment; mammography is not recommended before age 25
- Personal history of breast cancer (invasive carcinoma or DCIS), ovarian cancer, or biopsy diagnosis of lobular neoplasia or ADH
  - Annual mammography from time of diagnosis; either annual MRI or ultrasound can also be considered; if screening MRI is performed in addition to mammography, also performing screening ultrasound is not necessary
- Women with dense breasts as the only risk factor
  - The addition of ultrasound to screening mammography may be useful for incremental cancer detection

## **Reference**

Lee, C.H., Dershaw, D. D., Kopans, D, et al. Breast cancer screening with imaging: recommendations from the Society of Breast Imaging and the ACR on the use of mammography, breast MRI, breast ultrasound, and other technologies for the detection of clinically occult breast cancer. *J Am Coll Radiol* 2010;7:18-27

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