Mammography Screening: Who, What, When?

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Breast cancer is the most common cancer in women (except for skin cancer), and it is one of the leading causes of cancer death in women.

Many women who do not have a family history of breast cancer choose to forego mammography due to the mistaken assumption that they are not at risk for the disease. All women are at risk for breast cancer; more than 85% of breast cancer diagnoses are in women with no family history of the disease. The single most important risk factor for breast cancer is being female. The probability of developing breast cancer increases with increasing age, so that women living to age 85 have a 1 in 8 chance of developing the disease.

How is breast screening done?

There are many ways to image body parts, including plain film x-ray, ultrasound, CT scan, magnetic resonance imaging (MRI) and nuclear medicine techniques. Mammography is the only imaging tool that has been proven to reduce mortality from breast cancer, although it is not the only tool available for detecting breast cancer. Mammography is the “gold standard” for breast cancer screening.

What is a mammogram? A mammogram is an x-ray of the breasts, obtained using specialized equipment designed for this purpose only. The most advanced mammography technology currently available is digital mammography. With digital technology, images are captured electronically instead of on film. The digital mammogram machine looks virtually identical to the older film-screen mammography machine, and a digital mammogram should feel exactly the same as the film-screen mammogram technology, since breast compression is just as necessary as it was previously. Breast compression is the single most important factor in obtaining high quality images – whether the images are captured on film or digitally—since high detail and low radiation exposures depend on making the breast as thin as possible.

Digital mammography offers significant technical advantages over film-screen mammography, including that 1) imaging can be completed more quickly, 2) there are fewer repeat exposures due to the more sophisticated technology, 3) images can be optimized electronically to allow diagnosis of small tumors, 4) images can never be “lost” and 5) radiation exposure to the patient can be reduced by up to 40%.

A recent multicenter breast cancer screening trial (DMIST) compared digital mammography with film-screen mammography in 49,528 women. Digital mammography was found to be significantly superior to film-screen mammography for breast cancer detection in women under the age of 50, perimenopausal women and in women with dense breasts (dense means more connective tissue than fatty tissue; this cannot be determined by visual inspection or physical exam, but only with imaging).

What is the goal of screening mammography? The goal of screening is to detect breast tumors that are very small—too small to be felt by physical examination—since this is when they are most often curable. Screening mammography is for women who do not have a breast symptom or problem.

Who should have a mammogram, and when? The American Cancer Society and the American College of Radiology recommend that all women undergo yearly mammography screening beginning at age 40. Although there has been controversy in the past about screening women under the age of 50, there is compelling evidence that screening women in their 40’s is effective. Mammography is most effective when performed annually, since breast tumors tend to grow more quickly in younger women. Thus, to find tumors when small and curable, mammography screening is best done yearly. Since breast cancer is more prevalent with increasing age, there is not an age at which women should stop screening mammography.

What about screening for women who are at “high risk” for breast cancer? First it is important to define who is at high risk. The following situations place a woman at “high risk” for breast cancer: 1) a personal history of breast cancer, 2) a personal history of atypical hyperplasia or lobular neoplasia, 3) a first degree relative who developed premenopausal breast cancer, 4) multiple relatives with breast or ovarian cancer, 5) a BRCA gene mutation, or 6) a history of radiation to the chest between the ages of 10 and 30.

If a woman is under the age of 40 and at “high risk”, we will recommend that yearly breast screening begin before age 40. The age to begin screening young women at high risk should be decided on a case by case basis. For instance, if a woman’s mother or sister had premenopausal breast cancer, we recommend screening begin 5-10 years before the age the relative was at diagnosis (but not before age 25). For those with BRCA mutations, screening is recommended to begin between ages 25-30. Breast MRI is usually recommended in addition to mammography in those at high risk. There is evidence that breast ultrasound is useful in conjunction with mammography in high risk women who have dense breasts. MRI has been found to be more sensitive than mammography for demonstrating breast cancers, but it is also a non-specific test (many false positive tests). Neither breast MRI or mammography is 100% effective for breast cancer detection, and we recommend that they be used together for women in the high risk category. It is recommended that screening be done with mammography, except for women who are under the age of 25; for this group, MRI is recommended, to avoid radiation exposure. One of the reasons that mammography is not performed routinely in those under the age of 40 is due to concern about the radiation exposure involved with a mammogram.

Screening mammography is for women without a new breast symptom, such as a lump or other change in breast exam. The goal of screening is to find breast cancer before it is large enough to be felt (when it likely will be curable). Women with any breast problem (such as a new lump, skin changes, history of a recent abnormal breast imaging study) should have a “diagnostic mammogram”, which is a “problem-solving” study. Diagnostic mammography is checked by the radiologist before the patient leaves the imaging department, and may include non-standard mammography views and/or ultrasound. Optimally, an answer will be given at the time that study is completed. I urge women to use an imaging facility in which results are given to patients before they leave the imaging center.

If you have a breast lump, you must let someone know this at the time of your mammogram, since some cancers are not visible on a routine mammogram. Special imaging, including ultrasound, should always be done if there is a new lump. Most lumps are not cancers. Cysts, which are fluid filled sacs in the breast, are the most common cause of a lump (and these occur most commonly in women between 35 and 50). Ultrasound can show if a lump is comprised of fluid; physical examination cannot. If a new lump is solid, rather than fluid-filled, it may require biopsy, depending on its imaging features.

Where should I go for my mammogram? Mammography is a difficult examination to perform well, regardless of whether digital equipment or film-screen equipment is used. Image quality differs quite dramatically from site to site. All mammography facilities are required to be federally qualified and registered (MQSA). However, the manner in which the mammography equipment is used varies tremendously. Mammography quality is best when performed by technologists with subspecialized training, working under the direct supervision of a radiologist who specializes in mammography. Numerous studies have shown that mammography interpretations are most accurate when read by radiologists who specialize in breast imaging.