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Breast Density and Choosing Optimal Breast Screening



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DenseBreast-info.org was set up in 2015 to provide education to patients and healthcare providers about dense breasts. How aware are women in the USA about breast density? What still needs to be done?

As of 1 August 2016, at least 27 states in America require some form of notification about breast density as part of the mammography results letter to patients (densebreast-info.org/legislation.aspx). As such, more than half of American women are receiving some information about breast density. Breast density is described as one of four categories: a) fatty; b) scattered fibroglandular tissue; c) heterogeneously dense which could obscure detection of small masses; or d) extremely dense which lowers the sensitivity of mammography. The latter two categories are considered "dense". About 40 percent of women of mammography age have dense breasts, and dense breasts are normal.

Despite increasing requirements to inform women about breast density, I think there remains a gap when women are instructed to talk with their physicians about breast density and what to do about it if they have dense breasts. I am very proud to be part of the educational website DenseBreast-info.org, which launched in April 2015 as a collaboration between myself, JoAnn Pushkin (patient advocate and founder of DENSE-New York), and Cindy Henke-Sarmiento (technologist and entrepreneur). Our website provides much needed information for both women and their healthcare providers including defining breast density, discussing how normal dense tissue can mask cancer detection on mammography and that it is also a risk factor for developing breast cancer. Most importantly, we discuss the potential benefits and downsides to supplemental screening with ultrasound or, when appropriate, MRI. We also present areas of ongoing development in breast imaging such as contrast-enhanced mammography and molecular breast imaging. Importantly, breast cancer is often still hidden even on tomosynthesis (3D mammography).

What needs to be done in order to include all 50 states in the dense breast notification policy? Are you aware of similar policies overseas?

There is a need for a federal standard, either through a federal law or preferably through regulation with an update to the Mammography Quality Standards Act: (densebreast-info.org/is-there-a-federal-law.aspx). There are ongoing discussions about informing women of their breast density in several European countries. In Austria, for example, women with dense breasts are routinely offered screening with ultrasound as well as mammography (Graf 2014).

What role should MRI play in screening for women at high risk of breast cancer?

In 2007, based mostly on studies done in Europe, the American Cancer Society issued guidelines for screening high-risk women with MRI (Saslow et al. 2007), which have also been adopted in Europe. The challenge since then has been how to identify such women, and how to make sure those women who are at high risk for developing breast cancer know about the option to have screening with MRI. Our table: "Is My

Mammogram Enough?" (densebreast-info.org/dense-breast-screening.aspx), is a good place to start, and the flowchart "Who Needs More Screening" (densebreastinfo.org/who-needs-more-breast-screening.aspx) is also very helpful. Even in normal-risk women, MRI allows detection of more cancers than we see with the combination of mammography and ultrasound. There are many barriers to widespread use of MRI screening, however. MRI requires an intravenous injection of contrast, and the examination is performed with women lying on their stomach in a tunnel so that women with claustrophobia may have trouble enduring a breast MRI examination. Even when MRI is covered by insurance, there can be a substantial copay or deductible in the United States. I am glad that I knew enough about the risk models and options to choose for myself to have a screening MRI as my 3D mammogram (tomosynthesis) did not show my own cancer. I have dense breasts, and ultrasound also showed my cancer. Fortunately, while my cancer was invasive, it was caught early, and I did not require chemotherapy. That is the goal of screening. When screening works well, chemotherapy can be mostly avoided. That said, like mammography, ultrasound and MRI can result in the need for additional testing such as a needle biopsy for findings that look suspicious but turn out not to be cancer (false positives). I hope that our website will provide women the information they need to have educated discussions with their healthcare providers to help them choose what is best for themselves, given individual variation in tolerance for risks and benefits.

Should MRI be used as an alternative for screening? Is ultrasound a reliable tool?

MRI is better at depicting breast cancer than the combination of ultrasound and mammography across all breast densities (densebreast-info.org/breast-imaging-technologies.aspx). MRI is also more expensive and not very well tolerated by patients. Pioneered by Dr. Christiane Kuhl and colleagues, there is the potential to use a shortened MRI examination for screening to improve patient tolerance and reduce costs (Kuhl et al. 2014). Several sites in the United States are offering this and prospective multicentre evaluation of this approach is planned. Ultrasound is widely available, inexpensive, well-tolerated, and does not require any injection. Unlike mammography, there is no ionising radiation exposure from either ultrasound or MRI. While some cancers can be found earlier on MRI, it appears that with the combination of ultrasound and mammography, there is a very low rate of "interval" cancers found because of symptoms before the next recommended screening (Berg WA et al JAMA 2012). As such, ultrasound remains an excellent option for most women with dense breasts. For women at high risk because of known or suspected disease-causing genetic mutations (such as some mutations in BR CA1 or BR CA2), annual MRI is recommended in addition to mammography beginning by age 30.

Women who had radiation therapy to the chest before age 30 and at least 8 years earlier (such as for Hodgkin's disease) are also recommended to have annual MRI. It is less clear at what age to stop screening with MRI, but certainly it is not cost effective beyond age 74. Our patient checklist (densebreast-info.org/img/risk_checklist.pdf) can help prepare a patient to discuss their risk factors and determine their personalised optimal screening strategy with their physician.

You have raised the question of "Is having dense tissue the cause of the risk, or just the amount of tissue density?" Please elaborate.

Not only can dense tissue mask cancer on mammography, but dense tissue is also a risk factor for the development of breast cancer. This is likely due to several factors, including the presence of more glandular tissue where cancers develop and also due to growth factors produced by the supporting tissue. We also know that tamoxifen, a drug which blocks oestrogen receptors, cuts in half the risk of developing breast cancer. Several studies have shown that tamoxifen only produces that benefit in women who experience a measurable decrease in breast density while taking the drug. Most importantly, women with dense breasts should be aware of any changes in their breasts even if their mammogram is normal. Women need to advocate for optimal screening so that breast cancer, if present, can be caught early and easily treated.

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