

## **Elaine M. Junca Women's Imaging Centre First In the State to Offer Automated 3D Whole Breast Ultrasound Screening to Patients with Mammographically Dense Breasts**

For decades, mammography has been the standard for screening the general population for breast cancer. Periodic screening for breast malignancy has resulted in a significant reduction in breast cancer mortality, having more of an impact on mortality reduction than any combination of therapeutic regimens. It has been demonstrated that breast cancer is a local disease at its inception, a progressive disease, and that if disease progression is arrested at an early stage, patients will have an excellent outcome. When lesions are detected at small sizes (in the absence of casting calcifications), less than 14mm, survival is excellent with 25-year survival of over 90%. It is thus imperative that Radiologists find these early cancers.

The Digital Mammographic Imaging Screening Trial (DMIST) has shown that digital mammography is superior to film mammography in 3 separate subgroups: Those with mammographically dense breasts, patients that are perimenopausal, and patients that are younger than 50. Still though, mammography is significantly limited for the detection of small breast cancers, particularly for patients with dense breasts. Despite the use of digital technique, mammographic sensitivity for breast cancer for those with extremely dense breasts is probably less than 50%. What makes matters worse, as discussed in the January, 2007 issue of *The New England Journal of Medicine*, patients with mammographically dense breasts have as much as a 5 fold greater risk of developing breast cancer. Accordingly, it is extremely useful to use adjunctive studies in addition to mammography to find detect small lesions in these patients.

Ultrasound does an excellent job at finding small breast lesions, even in patients with mammographically dense breasts, and represents an important adjunct to screening mammography for these patients. Ultrasound has been shown in multiple single center studies to provide benefit to these patients in terms of early cancer detection, and in a recent multi-institutional ACRIN study published in the May, 2008 issue of *JAMA*, has been proven to result in an incremental cancer pick up rate of 28% when added to screening mammography for high risk patients with mammographically dense breasts. Importantly, the incremental lesions that were detected by the adjunctive ultrasound exam tended to be small, and node negative, thus providing significant benefit to the patient.

One of the challenges of performing Breast Ultrasound screening for dense breasted patients on a large scale is work force limitation. In many instances, there are simply not enough ultrasound technologists and ultrasound devices to screen all of these patients. Also, the fact that ultrasound is an operator dependent exam causes some problems. In the U.S., ultrasound exams are performed by technologists and interpreted by Radiologists. If a cancerous lesion is not detected by the ultrasound technologist (and thus not recorded), the Radiologist would not be able to make the diagnosis. Having Radiologists actually perform the exam is probably not a solution, again, because of workforce constraints, and variable skill sets of different Radiologists in terms of performing (rather than just interpreting) the exams.

In response to the above challenges, an excellent solution is Automated Whole Breast Ultrasound (ABUS). Using the ABUS System (Some V.™) at The Elaine M. Junca Women 's Imaging Centre, the patient is positioned in supine position on the table. A large plate like device containing a high frequency transducer is placed on the patient's breast by the technologist, and after pressing a single button, the breast is scanned in an automated fashion, and subsequently, volume 2D and 3D datasets of the breast are transmitted to the Radiologist to review on a special workstation having the necessary evaluation tools. This process is effective, and enables a workflow that is similar to MR and CT. This enables us to effectively perform whole breast ultrasound screening in addition to mammography for our mammographically dense breasted patients in a standardized, efficient manner.

It is acknowledged that by adding screening breast ultrasound to mammography for patients with dense breasts, we may prompt additional biopsies, many of which can be benign. Although modern breast biopsy techniques are non surgical, done with vacuum assisted needle devices under imaging guidance, these procedures are minimally invasive, and require percutaneous introduction of a device through a skin puncture after local anesthesia injection. Although an increase in benign biopsy rate is an important consideration, our opinion is that the decision as to whether or not to add ultrasound screening to mammography for those with dense breasts should be a personal decision on the part of the patient in conjunction with her physician. We believe though, that it is important is that our patients are empowered by being informed and educated about their particular mammographic breast density so that they can make an informed decision as to whether or not they would like this additional testing.

Interestingly, the state of Connecticut is the first to have passed legislation requiring mammography providers by law to inform patients of their mammographic breast density, and the benefits of supplementary ultrasound evaluation for those with dense breasts. This legislation, which became effective October 1, 2009, also requires health insurance companies that operate in Connecticut to provide benefits for comprehensive whole breast ultrasound screening for patients that have dense breasts on screening mammography.

Although similar legislation is not yet passed in Louisiana, our assessment facility is conscious of the benefits of multimodality screening for breast cancer detection. Consequently, we contact our patients that have optically dense breasts on screening mammography, educate them, and invite them to our facility for whole breast ultrasound screening.

If your patients would like more information on the limitations of mammography for those with dense breasts, and benefits of adjunctive breast ultrasound screening, and excellent resource on the web is [www.areyoudense.org](http://www.areyoudense.org)

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