

Case Study:

Leading Women's Imaging Center Relies on Aurora 1.5 T MRI

Dedicated Facility Selects Dedicated Breast Imager



Rebecca G. Stough, M.D., and Alan B. Hollingsworth, M.D., in front of the Aurora breast MRI system.

She's seen it as a tiny shadow on a sheet of medical film, a group of microcalcifications in a darkly familiar cluster, a progression of curves on a high-resolution computer screen—and a look of fear on the face of a woman newly diagnosed with a difficult disease. As Clinical Director of Breast MRI for the Mercy Women's Center in Oklahoma City—an innovative facility in the vanguard of research and clinical application of new diagnostic imaging technologies - Dr. Rebecca D. Stough knows breast cancer.

She also has seen it using a full range of imaging modalities and is a pioneer in the use of MRI for cancer evaluation and treatment-planning as well as for screening of high-risk women. "MRI is so far superior to any breast cancer imaging tool we have, when used appropriately," she says.

"The medical community is just beginning to mine its full potential."

To deliver cutting edge care in the community, the Center has relied on the Aurora Dedicated Breast MRI with advanced RODEO image enhancement since 2005. Recently upgraded to the new 1.5 T magnet, their Aurora delivers industry-leading ultra-thin 1mm slices for superior resolution and clarity.

"Aurora's image quality is now even more spectacular. I can see every vessel and margin on a MIP (maximum intensity projection) image," explains Dr. Stough. "The sequences and image orientations are excellent. It is so intuitive. You know just where you are in space. The image processing hardware is comprehensive and some of the most advanced available today."

While many women's imaging practices are just getting started in MRI, over the years, Mercy has developed carefully defined protocols for exactly when and how to use the modality. Dr. Stough has become an internationally recognized expert in

interpreting the nuances of these complex images through long hours of dedication and practice.

While committed to bringing cutting edge diagnostic care to a full range of patients, the Center also serves as a model for how high-quality breast imaging with top-of-the-line equipment can increase the profitability of a women's center as well as an associated surgical practice.

A History of Innovation

Mercy Women's Center--on the cutting edge since it was founded in 1999--is Oklahoma's first multi-disciplinary breast center. It is a freestanding clinic associated with nearby Mercy Hospital and its staff and was the first facility in Oklahoma to acquire digital mammography as well as to incorporate breast MRI into routine clinical practice. The Center also is one of the most active research centers in the U.S. assisting with the development of a screening blood test to detect early breast cancer.



Mercy Women's Center — a part of Mercy Health Center in Oklahoma City

Aware that despite their best efforts in

mammography breast cancers were being missed, the Center made a decision in 2000 to pursue breast MRI as an adjunct to gold-standard mammography to provide patients with a higher standard of care. Originally, their radiologists utilized a whole-body MRI in the main hospital with a specialized breast coil.

“While the exams absolutely added important information in many cases, they took a full hour to perform and an additional hour to read,” reports Stough, noting that without specialized breast image processing software, all image interpretation calculations were computed manually. The technology also did little to compensate for artifacts and other image inaccuracies--and a DECIS could easily be confused with a patient's heavy breathing on a film. However, MRI had a major impact on clinical Mercy's management of breast disease, and the entire multi-disciplinary team was convinced of its value overall.

Aurora Delivers Multiple Benefits

After conducting a comprehensive search to step up its MRI equipment in 2004, the Center made the switch to the Aurora Dedicated Breast MRI, the only system specifically developed to meet the unique demands of breast imaging. Adding new efficiency and accuracy, Aurora shortened both the scanning and reading process, while dramatically improving image quality and precision.

Strough notes that image enhancements were due in part to Aurora's unique RODEO technology that automatically provides specialized pulse sequences to suppress fat and normal ductal tissue, minimizing the hot spots that can complicate other MRI

images. RODEO also yields additional information for specificity of diagnosis. Moreover, the physician review station fully automates such functions as 3-D reconstruction, measurements, MIP and sophisticated manipulation of images, making interpretation faster and more accurate.

Another benefit realized through Aurora's Dedicated Breast MRI is that rather than utilizing hospital MRI technologists, Mercy Center was able to switch to its own staff familiar with the nuances of breast imaging as well as to manage scheduling to slot in pressing cases as needed.

A Continuous Upgrade Path

Keeping up with Aurora's cutting edge upgrade path, today Mercy takes advantage of the Aurora MRI's ability to simultaneously scan both breasts, as well as the chest wall and axillae, to create a high-quality bilateral image for easy breast comparison, while paring down scanning time. "With the new 1.5 T magnet, the quality is so high," she said, "diagnosis can almost be made based on the MIP alone."

To make the most of the modality, Mercy's strict protocols call for the use of MRI only for lesion evaluation and treatment planning for newly diagnosed patients, for evaluation of treatment in progress, for carefully designated high risk patients and for obtaining additional information on patients with inconclusive screening using other modalities. Mercy adheres to strict guidelines. For example, for a patient with a palpable mass that cannot be visualized on a mammogram, an MRI would be used only following an ultrasound if that exam also failed to pick it up.

"MRI can provide vital information about the specificity of a cancer diagnosis, the location and size of a lesion and the presence of additional lesions. Often it can even identify cancers not seen on other modalities," according to Strough. "This is vital for planning early and most effective interventions. At this point, our surgeons absolutely would not operate without an MRI to guide them. It is so key to their diagnostic confidence."

Multi-Modality Interpretation Important

Dr. Strough emphasizes that key to maximizing the positive impact of MRI is using it in conjunction with both mammography and ultrasound. "Looking closely at the same area of interest on all three modalities will significantly minimize the false positive MRI rate," she says, noting that the whole is definitely greater than the sum of the parts. And naturally, the better the image, the better the diagnosis. That's another reason the high quality and intuitive presentation of an Aurora dedicated breast MRI image is so important, according to the highly experienced radiologist.

Underscoring this, Dr. Strough points to a long list of cases in which their Aurora MRI visualized lesions not seen on other modalities or significantly altered a patient's treatment plan by providing more extensive information. She adds, "At our facility, it changes the treatment about 20 percent of the time. Nationally, the return to the operating room for a second breast cancer surgery is 50 percent. At Mercy, it was 30 percent before Aurora and is now about 1 percent. That's amazing."

Significantly Increased Referrals

Contributing to the Center economically as well as clinically, according to Dr. Strough, the Aurora has helped Mercy to achieve a status similar to a tertiary referral center for the area, while affiliated Mercy surgeons become recognized as sought-after breast specialist. In fact, surgeons from all over the state now refer patients to the Mercy Women's Center for MRI exams before surgery or to work up diagnostic problems, all procedures covered by insurance. If, following this, a second look in another modality is needed, often the Center is selected for the exam. Patients with identified lesions also are being referred for stereotactic and ultrasound biopsies and then return to their surgeons for treatment.

“Insurance pays well for these studies, and they are becoming approved more frequently because more appropriate treatment saves the system money,” says Dr. Strough. “Absolutely, I think a breast MRI can make a breast center profitable.”

Another positive dividend of Mercy Center's Aurora imaging is that the hospital's surgeons, as key players in the interdisciplinary team, have dramatically increased referrals. Breast cancer surgeries rose from 150 to 250 per year immediately after installation of the Aurora and have shot up to 350 after four years.

Dr. Strough adds, “I know there are patients whose lives were saved because they had an Aurora MRI.” To the talented, dedicated radiologist, that's the true bottom line.