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Medical School: Duke University Medical School

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To schedule a Breast MRI call:

Blue Ridge location 919-781-1437
Cedarhurst location 919-877-5400
Rex Healthcare 919-784-3419



Breast MRI now offered at Blue Ridge and Cedarhurst facilities

Breasts are everywhere—in the news, that is. Advances in digital mammography and high resolution breast MRI attract the media and our patients' attention. Knowing when and where to use these technologies presents a quandary.

Despite a sensitivity of 95-98% and specificity of 70-85%, breast MRI does not replace annual screening mammography. Breast MRI is most effective as a problem solving tool and to screen high risk patients.

Last year the American Cancer Society (ACS) released new guidelines suggesting that women with an increased life time risk of developing breast cancer undergo both MRI screening and mammography. This subset of women includes those with:

- BRCA1 or BRCA2 mutation
- First degree relative (parent, sibling, child) with a BRCA1 or BRCA2 mutation, even if they have not been tested
- Lifetime risk of breast cancer that has been scored at 20-25% or greater, based on one of several accepted risk assessment tools looking at family history and other factors
- History of radiation to the chest between the ages of 10 and 30
- Certain syndromes including Li-Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome

For the group of patients who have a higher than average risk of breast cancer, limited data suggest that they may also benefit from annual screening. The ACS remains neutral in its recommendations for patients with:

- Lifetime risk of breast cancer of 15-20%, based on the risk assessment tools
- Lobular carcinoma in situ (LCIS) or atypical lobular hyperplasia (ALH)
- Atypical lobular hyperplasia (ALH)
- Dense breasts on mammography
- History of previous breast cancer, including ductal carcinoma in situ (DCIS)

Breast MRI Screening Questions

Reason for Exam

- Screening due to high risk
(Must have a mammogram within 3 months)
- Implant Integrity / Rupture
(Must have a mammogram within 6 months)
- Newly diagnosed Breast Cancer
(Must have a mammogram within 6 months)

Do you have breast implants? ____ Silicone, Saline or Both ____

What year did you get them? ____

What is the address and phone number where you had your last mammogram? _____

Have you a Breast MRI before? ____ If so, when and where? _____

Are you a high risk patient? ____ Have you tested positive for the BRCA gene? _____

Last Menstrual Period Date _____. If you have tested positive for the BRCA gene, it is best to schedule the MRI between the 5th and 11th day of the cycle.

Have you had a previous breast biopsy or breast surgery? ____ When and which breast? _____

Please have the results faxed to our office.

Have you ever had chemotherapy or radiation treatment? _____

Are you currently on hemodialysis? _____



Patients who do benefit from breast MRI screening are those with recently diagnosed breast cancer. A study published in the New England Journal of Medicine reported that in a cohort of 969 patients with recently diagnosed breast cancer, MRI detected abnormalities in 121 of these patients, 30 of which were found to have invasive breast cancer. Several others had DCIS and LCIS. (2) Another recent review found that 16% of patients with breast cancer were found to have additional disease by MRI. (3)

In these cohort and others, false positive results, may lead to unnecessary biopsies and patient anxiety. False positive results include fibroadenoma, lobular carcinoma in situ, and atypical ductal hyperplasia.

Other indications for breast MRI include assessing response to neoadjuvant chemotherapy, problem solving for equivocal mammography or ultrasound findings, and evaluating implant integrity.

Optimal timing to schedule a breast MRI is during the second week of a premenopausal patient's menstrual cycle, to minimize hormonal effects on the breast. For newly diagnosed patients, this requirement can be waived so as not to delay definitive therapy. All patients receive an IV to administer gadolinium during the exam.

Despite some of the discussion surrounding indications for breast MRI, experts agree that biopsy capability is a key piece in providing the clinical service. Because of the high sensitivity of breast MRI, lesions are identified which are occult to clinical breast exam, mammography, and ultrasound. If a lesion is identified by MRI, the radiologist often suggests a "second look" or targeted ultrasound to evaluate whether a lesion is amenable to sonographically guided biopsy. A recent paper presented at the American Roentgen Ray Society (4) described a cohort of 182 patients, where breast MRI identified an additional 55 lesions, 42 of which were identified with second look ultrasound. Of these lesions, 24 of 42 were confirmed to be malignant.

If the lesion is occult sonographically, a biopsy can be performed under MRI guidance, typically at a specialized center or hospital such as Rex Healthcare. This procedure requires repeating the post contrasted images, identifying the lesion for targeting, and using a MRI compatible biopsy device to acquire tissue for histologic review.

Imaging will not replace histologic evaluation, but a promising tool on the horizon is diffusion-weighted imaging (DWI) of the breast. Based on the difference of exchange between water molecules (diffusion) in normal and pathologic tissue, this technique has been introduced to improve specificity and provide functional information about breast tissue. In a recent study (5) of 81 patients with 85 lesions, DWI was added to conventional breast MRI. A total of 60 lesions were known to be malignant. With DWI MRI, the technique correctly retrospectively diagnosed 50 of these (83%). A total of 23 (92%) of the 25 benign lesions were diagnosed correctly.

These advances and others may improve the sensitivity and specificity of breast MRI in the future. At present, breast MRI is an effective tool to stage newly diagnosed breast cancers, screen high risk patients, and direct biopsy of lesions not depicted by other modalities.

1 Saslow D, Boetes C, Burke W, et al: American Cancer Society Guidelines for Breast Screening with MRI as an Adjunct to Mammography, CA Cancer J Clin 57: 75-89, 2007.

2 Lehman CD, Gatsonis C, Kuhl CK et al: MRI Evaluation of the Contralateral Breast in Women with Recently Diagnosed Breast Cancer. r NEJM 356: 1295-1303, 2007.

3 Houssami N, Ciatto S, Macaskill P et al: Accuracy and Surgical Impact of Magnetic Resonance Imaging in Breast Cancer Staging: Systemic Review and Met-analysis in Detection of Multifocal and Multicentric Cancer, J Clin Oncol 26: 3248-3258, 2008.

4 Pediconi F, Luciani M, Pediconi F, Dominelli V, Cagioli S, Martino V, Catalano C, Passariello R: The Value of Second Look Ultrasound as a Confirmatory Method for Incidental Enhancing Lesions Found on Breast MRI, AJR 192:A38-A40, 2009.

5 El-Khouli R., Jacobs M, Macura K, Barker P, Bluemke D: Diffusion-Weighted Imaging and Apparent Diffusion Coefficients Mapping for Characterization of Focal Breast Lesions at 3T AJR 192:A38-A40, 2009.

Sub-specialized Radiologists

- Neil A. Ramquist, MD Diagnostic
- Donald G. Detweiler, MD Diagnostic
- W. Kent Davis, MD Neuroradiology
- Andrew B. Weber, MD Vascular & Interventional
- Mark H. Knelson, MD Vascular & Interventional
- Julia K. Taber, MD Pediatric and Women's Imaging
- Gregory C. Hinn, MD Musculoskeletal
- Gregory A. Bortoff, MD, PhD Abdominal Imaging
- Jerry L. Watson, MD Abdominal Imaging
- Cynthia S. Payne, MD Vascular & Interventional, Neuroradiology
- Tracey E. O'Connell, MD Women's Imaging & Musculoskeletal
- Jennifer S. Van Vickle, MD Abdominal Imaging & Women's Imaging
- Gintaras E. Degesys, MD Women's Imaging & Musculoskeletal
- Laura O. Thomas, MD Abdominal Imaging & Women's Imaging
- John G. Alley, Jr., MD Neuroradiology
- Todd J. Roth, MD Abdominal Imaging
- Steven R. Carter, MD Musculoskeletal
- Satish Mathan, MD Vascular & Interventional
- Andrew G. Moran, MD Nuclear Medicine & Abdominal Imaging
- Joshua B. Mitchell, MD Musculoskeletal
- Michael C. Hollingshead, MD Neuroradiology
- Jason R. Harris, MD Vascular & Interventional
- Jeffrey Browne, MD Musculoskeletal

Raleigh Radiology locations

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| <p>Blue Ridge
3200 Blue Ridge Rd, Ste 100
Raleigh, NC 27612
T 919-781-1437
F 919-787-4870</p> | <p>Clayton MRI
300 Guy Road, Suite 102
Raleigh, NC 27520
T 919-877-5400
F 919-877-5480</p> |
| <p>Cedarhurst
1212 Cedarhurst Drive
Raleigh, NC 27609
T 919-877-5400
F 919-877-5480</p> | <p>Wake Forest
839 Durham Rd, Unit A
Wake Forest, NC 27587
T 919-877-5400
F 919-877-5480</p> |
| <p>Cary
251 Keisler Drive, Suite 100
Cary, NC 27518
T 919-781-1437
F 919-787-4870</p> | <p>Brier Creek location
<i>Coming in 2009</i></p> |
| <p>Breast Center
3900 Barrett Drive, Suite 100
Raleigh, NC 27609
T 919-781-1437
F 919-787-4870</p> | <p>Rex Hospital
4420 Lake Boone Trail
Raleigh, NC 27607
T 919-784-3023 24/7
F 919-784-3497
919-784-3419--Scheduling</p> |

