

2013 ACR Practice Guidelines for the use of Breast Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) of the breast is a useful tool for the detection and characterization of breast disease, assessment of local extent of disease, evaluation of treatment response, and guidance for biopsy and localization. MRI findings should be correlated with clinical history, physical examination, mammography and any other prior breast imaging. The following recommendations for the use of MRI in breast cancer are based on the review of current literature and national practice guidelines. Practice outside of the scope of these recommendations should be based on patient specific needs and documented in the medical record.

Current indications for breast MRI include, but are not limited to:

1. Screening

- a. For high-risk patients – Clinical trials from the United States and Europe have demonstrated that breast MRI can significantly improve the detection of cancer that is otherwise clinically, mammographically, and sonographically occult [1-13]. Patients should be referred for screening breast MRI, preferably after risk assessment and counseling of high risk patients by personnel trained in the assessment of hereditary breast cancer or by their referring physician who has used a risk assessment model. Breast MRI may be indicated in the surveillance of women with more than a 20% lifetime risk of breast cancer (for example, individuals with genetic predisposition to breast cancer by either gene testing or family pedigree, or individuals with a history of mantle radiation for Hodgkin's disease). Although there is no direct evidence that screening with MRI will reduce mortality, it is thought that early detection by using annual MRI as surveillance, in addition to mammography, may be useful.
- b. For patients with a new breast malignancy - Screening of the contralateral breast with MRI in patients with a new breast malignancy can detect occult malignancy in the contralateral breast in at least 3% to 5% of breast cancer patients [5,14-16]. For this reason, it may be used as a diagnostic tool to identify more completely the extent of disease in patients with a recent breast cancer diagnosis.
- c. For patients with breast augmentation - Breast MRI using contrast may be indicated in the evaluation of patients with silicone or saline implants and/or free injections with silicone, paraffin, or polyacrylamide gel in whom mammography is difficult. The integrity of silicone implants can be determined by noncontrast MRI.

2. Extent of disease

- a. Invasive carcinoma and ductal carcinoma in situ (DCIS) – Breast MRI may be useful to determine the extent of disease and the presence of multifocality and multicentricity in patients with invasive carcinoma and ductal carcinoma in situ (DCIS). Multiple clinical trials in the United States and Europe show that on average MRI can detect occult disease in the ipsilateral breast (containing the index malignancy) in approximately 15% of patients, with ranges reported from 12 to 27% and disease in the contralateral breast in 4% of patients [14,15,17-23]. MRI determines the extent of disease more accurately than standard mammography and physical examination in many patients. It remains to

be shown conclusively, however, that this increased accuracy results in any reduction in recurrence rates following surgery, radiation, or systemic therapy.

b. Invasion deep to fascia – MRI evaluation of breast carcinoma prior to surgical treatment may be useful in both mastectomy and breast conservation candidates to define the relationship of the tumor to the fascia and its extension into pectoralis major, serratus anterior, and/or intercostal muscles [24,25].

c. Postlumpectomy with positive margins – Breast MRI may be used in the evaluation of residual disease in patients whose pathology specimens demonstrate close or positive margins for residual disease.

d. Neoadjuvant chemotherapy – Breast MRI may be useful before, during, and/or after chemotherapy to evaluate treatment response and the extent of residual disease prior to surgical treatment. If used in this manner, a pretreatment MRI is recommended [26] to facilitate assessment of subsequent treatment response. MRI compatible localization tissue markers placed prior to neoadjuvant chemotherapy may be helpful to indicate the location of the tumor in the event of complete response with no detectable residual tumor for resection.

3. Additional evaluation of clinical or imaging findings

a. Recurrence of breast cancer – Breast MRI may be useful in women with a prior history of breast cancer and suspicion of recurrence when clinical, mammographic, and/or sonographic findings are inconclusive.

b. Metastatic cancer when the primary is unknown and suspected to be of breast origin – MRI may be useful in patients presenting with metastatic disease and/or axillary adenopathy and no mammographic or physical findings of primary breast carcinoma. Clinical trials demonstrate that breast MRI can locate primary tumor in the breast in over half of women presenting with metastatic axillary adenopathy and an occult primary [27-30]. Breast MRI can also define the disease extent to facilitate treatment planning.

c. Lesion characterization – In rare cases, breast MRI may be indicated when other imaging examinations, such as ultrasound and mammography, and physical examination are inconclusive for the presence of breast cancer, and biopsy cannot be performed (e.g., possible distortion on only one mammographic view without a sonographic correlate). MRI should not replace ultrasound or diagnostic mammography to evaluate clinical focal signs or symptoms in the breast or to evaluate lesions identified on screening mammography [31].

d. Postoperative tissue reconstruction – Breast MRI may be useful in the evaluation of suspected cancer recurrence in patients with tissue transfer flaps.

e. MRI-guided biopsy – MRI is indicated for guidance of interventional procedures such as vacuum assisted biopsy and preoperative wire localization for lesions that are occult on mammography or sonography and demonstrable only with MRI.

Other Considerations:

1. Screening of general population

Screening breast MRI is not recommended for the general population of asymptomatic, average-risk women.

2. False positives

Breast MRI may yield findings that are not evident clinically or on mammography or ultrasound. The findings may or may not be clinically significant. As with mammography

or any other diagnostic test, false positive results can be expected, and the literature shows a wide range of specificity for breast MRI. The additional abnormalities detected on MRI may result in a follow-up examination or recommendation for biopsy. Published results for MRI directed biopsy are similar to those for mammography.

3. Treatment choices

Information from the MRI may change the planned treatment management. Caution should be exercised in changing management based on MRI findings alone without initial biopsy confirmation. Additional biopsies and/or correlation with other clinical and imaging information should be used together with clinical judgment. There is currently no evidence that identification of additional ipsilateral or contralateral occult malignancies improves patient outcomes.

4. Inappropriate uses of breast MRI

MRI should not supplant careful problem-solving mammographic views or ultrasound in the diagnostic setting. Because MRI will miss some cancers that mammography will detect, it should not be used as a substitute for screening mammograms. MRI should not be used in lieu of biopsy of a mammographically, clinically, and/or sonographically suspicious finding.