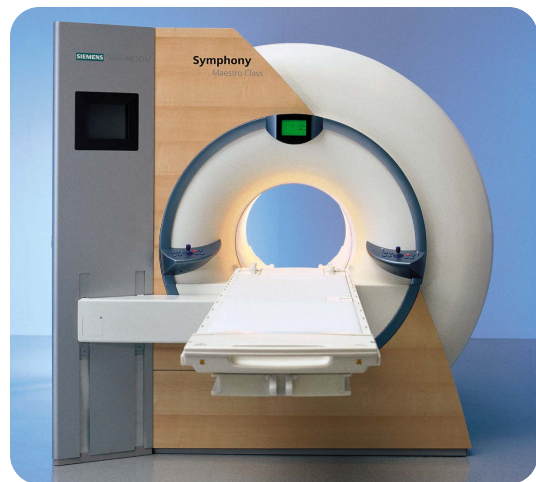


Understanding Breast Magnetic Resonance Imaging (MRI)

MRI became a significant diagnostic imaging modality in the 1970s, using a horizontal magnetic tube—bore—with radio waves to non-invasively visualize the inside of the human body. In addition to being accurate and highly sensitive, MRI does not carry the inherent risks of radiation or invasive imaging procedures. The ability of MRI to deliver high quality images often eliminates the need for more expensive and invasive procedures.

During an MRI of the breast, the patient lies on her stomach on a scanning table. The breasts are suspended in a depression in the scanning table, which contains coils that detect the magnetic signal. The scanning table is moved into the bore of the MRI. After an initial series of images have been taken, the patient may be given a contrast agent intravenously. The contrast agent is sometimes used to improve the visibility of a tumor. Additional images are acquired. The examination takes approximately 30 minutes to one hour.



Breast MRI Today

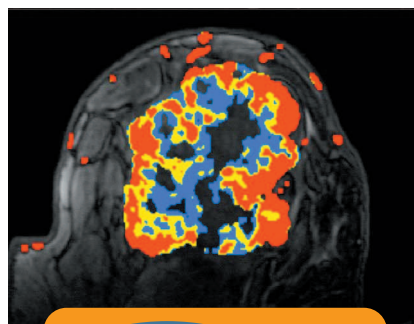
Clinical indications for breast MRI exams continue to expand as physicians increasingly recognize the value of this highly useful study. Since 1999, there has been a 40 percent per year increase in the number of breast MRI examinations in the United States.¹ Breast MRI is primarily used for determining extent of disease (staging), monitoring response to therapy in breast cancer patients and screening high risk patients. Clinical research has reported that MRI demonstrates high sensitivity for detecting invasive breast cancer.²

Scientific literature also shows the effectiveness of MRI in screening women at high risk for breast cancer. In May 2003, the American Cancer Society released updated guidelines for breast cancer screening indicating that breast MRI, when used with mammography, may enhance the effectiveness of screening and diagnosis.³ Approximately 8.5 million women are at high risk for breast cancer in the United States.

As clinical indications and study numbers expand, the amount of data produced per breast MRI exam has increased tremendously, with exams often producing 800 images. Physicians and MRI technologists spend a significant amount of time—sometimes several hours—manually processing and interpreting a breast MRI study. A more efficient method for processing and interpretation is needed, without compromising high quality patient care.

MRI Analysis with Computer-Aided-Detection (CAD)

Computer-aided-detection (CAD) plays a significant role in improving efficiency, standardization and quality in women's imaging programs. **CADstream™**, the first CAD application designed exclusively for MRI, automates image processing functions and corrects for patient movement during the study. The result is more standardized image processing and analysis, higher quality images and more rapid interpretation of the MRI study. The use of CAD ultimately makes breast MRI more accessible to women who would benefit from this valuable study.



Clinical Indications for Breast MRI

Based on the expert opinion and peer-reviewed literature, the following clinical indications are considered appropriate and useful applications for breast MRI.

High Risk Patients	MRI is a valuable adjunct to mammography for improved detection of breast cancer in high risk patients, such as women with a BRCA mutation, history of childhood treatment for Hodgkin lymphoma and first degree relative with breast cancer (particularly if present at an early age). Breast MRI can be particularly useful in women with mammographically dense breasts.
Neoadjuvant Chemotherapy	MRI clearly and accurately depicts tumor size and vascularity before and during therapy to assess response to chemotherapy and residual disease prior to surgery.
Occult Breast Cancer	MRI can be effective in locating the primary or occult (invisible) tumor, allowing better breast conservation surgery.
Lobular Carcinoma	MRI is the most accurate method for detection of lobular carcinoma. Lobular carcinoma can be extremely difficult to detect by mammography alone. It is commonly multifocal/multicentric (more than one site of disease in one breast) or bilateral (in both breasts) and a frequent cause of positive surgical margins, requiring re-operation.
Detecting Breast Cancer in Women with Breast Implants	MRI is an extremely valuable study for detecting cancer in women with implants. Breast MRI can also be used to assess the integrity of implants.
Suspected Multiple or Bilateral Cancers	Breast MRI is sensitive for detecting multifocal or multicentric tumors.
Post-Operative Evaluation	MRI is useful in differentiating post-surgical scars and recurrent cancer (cancer that occurs in the same location after treatment).

1. MRI Census Market Summary Report, June 2002. IMV Medical Information Division, Des Plaines, IL.
2. Tillman, Gayle F. Effect of Breast Magnetic Resonance Imaging on the Clinical Management of Women with Early-Stage Breast Carcinoma. *J Clin Onc.* 2002; 16:3413-3423.
3. Smith RA, Saslow D, Sawyer KA, et al. American Cancer Society Guidelines for Breast Cancer Screening: Update 2003. *Cancer J Clin.* 2003; 53:141-169.

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