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Breast MRI for the Early Detection of Breast Cancer [1]

This section has been reviewed and approved by the [Cancer.Net Editorial Board](#) [2], 03/2014

Key Messages:

- Breast magnetic resonance imaging (MRI) may be used in addition to mammography to detect breast cancer in its earliest stage for some women who are at high risk for developing the disease.
- Breast MRI has a number of limitations and should not replace mammography screening, even for women at high risk for breast cancer.
- Talk with your doctor about your breast cancer risk and which screening test(s) are right for you.

[Breast magnetic resonance imaging \(MRI\)](#) [3] is an imaging test that creates detailed pictures of the inside of the breasts. Although breast MRI is not regularly used for breast cancer [screening](#) [4], it may help detect breast cancer in its earliest stage for some women who are at high risk for developing the disease. The most common type of breast cancer discovered at this stage (stage 0) is ductal carcinoma in situ (DCIS). DCIS is a noninvasive cancer, which means cancer cells have only been found in ducts of the breast and the cancer has not spread past the layer of tissue where it began.

A breast MRI is not a replacement for mammography for high risk women. Instead, it should be used as a complementary screening tool. This is because although an MRI may be more likely to find cancer than mammography, it often misses some cancers that mammography easily detects. For women with an average risk of breast cancer, [mammography](#) [5] is still the standard method for diagnosing early-stage breast cancer.

Recommendations for breast cancer screening

For women at high risk for breast cancer, [American Cancer Society guidelines](#) [6] recommend having a breast MRI and mammography every year starting at the age 30. This "high risk" group includes women who have at least one of these characteristics:

- Have a known *BRCA1* or *BRCA2* gene mutation
- Have a 20% or greater lifetime risk of breast cancer. This can be determined using a scientific

tool that calculates a person's lifetime risk of developing breast cancer primarily based on their family history [7].

- Received radiation therapy to the chest between the ages of 10 and 30
- Have a first-degree relative (parent, brother, sister, or child) with a *BRCA1* or *BRCA2* gene mutation but have not had genetic testing themselves
- Have been diagnosed with a condition that increases their risk of breast cancer, such as Li-Fraumeni syndrome [8], Cowden syndrome [9], or Bannayan-Riley-Ruvalcaba syndrome, or who have a first-degree relative with one of these syndromes

There is not enough evidence to show whether women with a moderately increased risk of breast cancer (a lifetime risk between 15% and 20%); women who have had breast cancer, DCIS, lobular carcinoma in situ, or a precancerous conditions of the breast; or women with dense breasts based on mammography would benefit from yearly MRI screening. Research on using breast MRI for early detection continues, including its ability to find contralateral breast cancer (breast cancer in the opposite breast) at the time of a first breast cancer occurrence.

Drawbacks of breast MRI for general screening

Although breast MRI is a more sensitive test than mammography in many ways, this increased sensitivity may cause areas of the breast that do not have cancer to appear abnormal, producing an increased number of false-positive test results. False-positive test results indicate cancer when no cancer is actually present. This may lead to unnecessary biopsies [10] (removal of breast tissue for further study) and increased anxiety for many women.

At the same time, breast MRI cannot visualize the calcium deposits, known as calcifications or microcalcifications, that typically surround DCIS lesions (the suspicious area). Mammography, on the other hand, can detect these calcium deposits accurately.

Finally, breast MRI is more expensive than mammography. Under the Affordable Care Act [11], private insurance companies are required to pay the full cost of mammography every one to two years for women starting at the age of 40, and Medicare now covers yearly mammography screening at no cost to women starting at age 40. Not all insurance companies pay for breast MRI for women at average risk for breast cancer, and some do not cover breast MRI for women at high risk. Medicare allows for "reasonable and necessary" breast MRI if performed on equipment approved by the U.S. Food and Drug Administration.

Questions to ask your doctor

Breast MRI has certain limitations and is not intended for all women. Talk with your doctor about any concerns you may have about early breast cancer detection. You may want to ask the following questions:

- What is my risk of developing breast cancer during my lifetime?
- Based on my risk, do you recommend any additional screening tests, such as breast MRI, besides yearly mammography?
- What are the risks and benefits of having a mammogram?
- What are the risks and benefits of having a breast MRI?
- Before I schedule a breast MRI, should I contact my insurance provider to see if it is covered?

- Should the facility I go to be accredited through the American College of Radiology [12] to perform mammography and breast MRI?
- When will I learn the results? How will they be communicated to me?
- Who will explain the results to me?
- What other tests will I need if the mammogram or breast MRI shows evidence of cancer?

More Information

Guide to Breast Cancer [13]

ASCO Answers: Breast Cancer[14]

Understanding Cancer Risk [15]

Additional Resources

RadiologyInfo: Breast MRI [16]

National Cancer Institute: Breast Cancer Screening [17]

Links:

- [1] <http://www.cancer.net/navigating-cancer-care/diagnosing-cancer/tests-and-procedures/breast-mri-early-detection-breast-cancer>
- [2] <http://www.cancer.net/about-us>
- [3] <http://www.cancer.net/node/24415>
- [4] <http://www.cancer.net/node/24972>
- [5] <http://www.cancer.net/node/24584>
- [6] <http://www.cancer.org/cancer/breastcancer/moreinformation/breastcancerearlydetection/breast-cancer-early-detection-ac-s-recs>
- [7] <http://www.cancer.net/node/30761>
- [8] <http://www.cancer.net/node/19133>
- [9] <http://www.cancer.net/node/18715>
- [10] <http://www.cancer.net/node/24406>
- [11] <http://www.cancer.net/node/24921>
- [12] <http://www.acr.org/>
- [13] <http://www.cancer.net/node/18618>
- [14] <http://www.cancer.net/breastguide>
- [15] <http://www.cancer.net/node/25007>
- [16] <http://www.radiologyinfo.org/en/info.cfm?pg=breastmr>
- [17] <http://www.cancer.gov/cancertopics/pdq/screening/breast/Patient/page3#Keypoint8>