Which patients are eligible for breast MRI surveillance?

The American Cancer Society (ACS)\(^1\), National Comprehensive Cancer Network (NCCN)\(^2\), American College of Obstetricians and Gynecologists (ACOG)\(^3\), American College of Radiology (ACR)\(^4\), and American Society of Breast Surgeons (ASBS)\(^5\) all advocate for annual breast MRI screening in addition to mammography for women whose estimated lifetime risks of breast cancer are at least 20%. The ACS details this risk category to include women with any of the following:\(^1\):

1. **Hereditary Breast and Ovarian Cancer (HBOC)**, which confers up to an 87% risk for breast cancer to age 70.\(^6\) With a population prevalence of 1 in 300-500,\(^7\) most physician practices are likely to include some patients with this condition, so it is important to identify them by testing for \textit{BRCA1/2} mutations. Untested first-degree relatives of HBOC patients also meet this threshold and are eligible for MRI screening. Individuals carrying rare mutations in other genes may also meet the 20% threshold. These include Li-Fraumeni and Cowden syndromes, as well as \textit{PALB2}\(^8\) mutation carriers.

2. **History of radiation therapy to the chest between the ages of 10 and 30 years for treatment of Hodgkin lymphoma**, which is associated with a significantly increased risk for breast cancer.\(^9\)

3. **Strong family history of breast or ovarian cancer.** If \textit{BRCA1/2} testing is negative, it is important to use other tools to assess whether your patient's lifetime breast cancer risk is 20% or greater. The following resources can aid in risk assessment for this category of patients:
   - The ACS guidelines include some hypothetical family histories, with estimated lifetime risks. For example, a 35 y/o woman with two 1\(^{st}\) or 2\(^{nd}\) degree relatives with breast cancer under 50 is estimated to meet this threshold.\(^1\)
   - Metcalfe et al.\(^10\) studied high risk families with \(\geq 2\) breast cancers under 50, or \(\geq 3\) breast cancers at any age, and who tested negative for \textit{BRCA1/2} mutations. The risk of breast cancer was 40% for 1\(^{st}\) degree relatives of breast cancer cases.
   - Several models can be employed to calculate lifetime risk of breast cancer: BRCAPRO, Claus, Tyrer-Cuzick or BOADICEA.\(^11\) ACS and NCCN guidelines specifically recommend against using the Gail model to determine MRI eligibility since the model does not incorporate 2\(^{nd}\) degree relatives, paternal history, or ages at breast cancer diagnosis.\(^1,2\) The Gail model may however be used to establish criteria for tamoxifen treatment for breast cancer chemoprevention.\(^12\) For more information on risk models, please contact your Myriad Regional Medical Specialist.

The ACS guideline cites insufficient data to recommend for or against MRI screening for women with no family history, but a personal history of breast cancer, carcinoma in situ, atypical hyperplasia or dense breasts.\(^1\) More recent publications have produced mixed opinions on this subject.\(^13,14\)

In \textit{BRCA} mutation carriers and other high risk women, MRI screening is more sensitive than mammography for detecting cancers.\(^15\) In these patients, the combination of annual mammography and annual MRI is recommended for surveillance, providing an apparent survival advantage.\(^16\)
REFERENCES:


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