HEALTH EVIDENCE REVIEW COMMISSION (HERC)

COVERAGE GUIDANCE: MRI FOR BREAST CANCER SCREENING

Initial HERC approval 06/14/2012
Reaffirmed 11/13/2014

This coverage guidance was created under HERC's 2012 coverage guidance process and does not include strength of recommendation, a GRADE-informed framework or coverage guidance development framework.

As a part of the normal evidence review process, the Health Technology Assessment Subcommittee reviewed new evidence in September, 2014 (see Appendix A) and two completed reviews and one guideline were identified in the trusted sources. In addition, two reviews were in the process of being updated. They elected to deter action on this guidance until those reviews are completed.

HERC Coverage Guidance

Breast MRI is not recommended for coverage for breast cancer screening.

RATIONALE FOR GUIDANCE DEVELOPMENT

The HERC selects topics for guideline development or technology assessment based on the following principles:

- Represents a significant burden of disease
- Represents important uncertainty with regard to efficacy or harms
- Represents important variation or controversy in clinical care
- Represents high costs, significant economic impact
- Topic is of high public interest

Coverage guidance development follows to translate the evidence review to a policy decision. Coverage guidance may be based on an evidence-based guideline developed by the Evidence-based Guideline Subcommittee or a health technology assessment developed by the Heath Technology Assessment Subcommittee. In addition, coverage guidance may utilize an existing evidence report produced by one of HERC's trusted sources, generally within the last three years.

EVIDENCE SOURCES

Washington State Health Care Authority Health Technology Assessment Program. (2010). *HTA Report: Breast MRI in diagnosis and treatment of cancer in women at high risk*. Olympia, WA: Health Technology Assessment Program. Retrieved from http://www.hta.hca.wa.gov/documents/breast_mri_072310_final.pdf

The summary of evidence in this document is derived directly from this evidence source, and portions are extracted verbatim.

SUMMARY OF EVIDENCE

Clinical background

In 2009, an estimated 192,370 cases and 40,170 deaths occurred in women with breast cancer. In 2002, the United States Preventive Services Task Force found adequate evidence of film mammography's sensitivity and specificity and evidence of mammography's effectiveness in decreasing breast cancer mortality in women at average risk and concluded that film mammography was the standard for detecting breast cancer in women at average risk of developing breast cancer. In 2007, the American Cancer Society (ACS) issued guidelines recommending that women at high risk of developing breast cancer be screened with MRI. The ACS recommends annual mammography and MRI screening for women starting at age 30 if their lifetime risk is approximately 20% to 25%. Women with *BRCA1* mutations are estimated to have a 65% risk by age 70 years for developing breast cancer; the corresponding risk for for *BRCA2* mutations is 45%.

EVIDENCE REVIEW

Diagnostic Accuracy

Adding yearly screening with MRI to mammographic (+/- US+/- clinical breast exam) screening in women at high risk of breast cancer (family history of breast cancer, ≥ approximately 20% lifetime risk of breast cancer, known BRCA1/2 carriers and/or previous history of breast cancer) will increase detection of breast cancer. Increased breast cancer detection will also occur in women with increased breast density or fibroglandular breast tissue. The increase in cancer detection of approximately 2 to 5 breast cancers per 100 screenings is offset by a higher rate of false positive tests.

Changes in Treatment

Changes in care, such as recall of patients, subsequent benign breast biopsies and possibly unnecessarily more extensive breast tissue resections and unnecessary mastectomies will occur in some women who undergo MRI testing. Approximately 11 additional benign biopsies will occur per 100 screenings, and many women will undergo more extensive breast resection surgery (up to 44% change in treatment plans).

The evidence regarding the effect of adding MRI to mammographic screening on incomplete cancer excision rates or breast cancer recurrence rates is inconclusive. No RCTs have assessed the effect of adding MRI to conventional breast cancer screening on mortality rates.

Safety

Gadolinium-based MRI contrast agents appear to be safe. There is no evidence of adverse events associated with MRI radiation exposure. We found no evidence that breast implants increase the risk of developing breast cancer. The evidence is insufficient to conclude that false-positive breast cancer screening or testing results lead to clinically meaningful negative psychological outcomes.

Technical and Provider Issues in MRI Testing

The evidence is insufficient to establish technical MRI specifications or provider qualifications.

Cost and Cost-effectiveness

The evidence suggests that adding MRI to mammographic breast cancer screening in women at high risk of developing breast cancer will increase the detection of breast cancers, lead to false positive tests with increased diagnostic and therapeutic interventions and costs, and may increase the number of women who undergo unnecessary mastectomies. However, accurately estimating cost-effectiveness may not be possible because RCTs evaluating the mortality reduction with screening or testing women at high-risk for breast cancer have not been conducted. QALYs gained by adding MRI to mammographic breast cancer screening vary greatly depending upon assumptions about sensitivity of MRI, yearly cancer risk, the number and frequency of diagnostic tests, the type and costs of therapeutic interventions, risk of recurrence, development of cancer in the contralateral breast and mortality assumptions.

Overall summary

While screening for breast cancer with MRI has been shown to increase the detection of breast cancer when compared to screening with mammography alone, there is no evidence of a benefit on morbidity or mortality, and there is the possibility of over diagnosis associated with harm.

Procedure

MRI for breast

Diagnoses

Screening for breast cancer

APPLICABLE CODES

CODES	DESCRIPTION
ICD-9 Diagnosis Codes	
V10.3	Personal history of malignant neoplasm, breast
V16.3	Family history of malignant neoplasm, breast
V76.10	Special screening for malignant neoplasms, breast, unspecified
V76.19	Special screening for malignant neoplasms, breast, other screening breast examination
V84.01	Genetic susceptibility to malignant neoplasm of breast
CD-9 Volume 3 (Procedure Codes)	
None	
CPT Codes	
77058	MRI breast, with or without contrast, unilateral
77059	MRI breast, with or without contrast, bilateral
HCPCS Level II Codes	
C8903	Magnetic resonance imaging with contrast, breast; unilateral
C8904	Magnetic resonance imaging without contrast, breast; unilateral
C8905	Magnetic resonance imaging without contrast followed by with contrast, breast; unilateral
C8906	Magnetic resonance imaging with contrast, breast; bilateral
C8907	Magnetic resonance imaging without contrast, breast; bilateral
C8908	Magnetic resonance imaging without contrast followed by with contrast, breast; bilateral

Note: Inclusion on this list does not guarantee coverage

APPENDIX A

Scanning results

One AHRQ review was identified on the use of breast MRI for evaluation of abnormalities identified during routine screening (mammography). Two reviews and one guideline were identified in the core sources that specifically addressed the use of MRI for breast cancer screening and were published after the date of the WA HTA report (an update is in progress and due for publication in December 2014). In addition, the USPSTF report on Screening for Breast Cancer is currently being updated; the final research plan was posted in July 2014. Summary results and/or conclusions of the two completed reviews and the one guideline are presented below.

Hayes. (2014). *Magnetic Resonance Imaging (MRI) for Surveillance for Breast Cancer Recurrence Following Mastectomy and Breast Reconstruction*. Lansdale, PA: Hayes.

Authors' conclusions

- While the risk of locoregional recurrence is low after mastectomy, recurrences in residual breast tissue or the chest wall may be difficult to detect in a timely manner. Breast MRI is more sensitive than mammography for diagnosis of breast cancer; however, the rates of false-positive findings on postoperative MRI images of the breast limit the clinical utility of this test in women who have undergone reconstruction.
- Because there are numerous surgical techniques for reconstruction after breast cancer, and various histological types of breast cancer, designing a clinical trial with adequate power to examine the usefulness of breast MRI for surveillance for recurrence in patient subgroups could be challenging.
- The use of breast MRI increases facility utilization and costs due to the need for contrast media and the possibility that the test findings will prompt additional testing including biopsy. Centers that provide breast MRI for surveillance should be equipped to perform MRI-guided breast biopsy.

Hayes Rating: D2

BCBS. (2014). *Screening asymptomatic women with dense breasts and normal mammograms for breast cancer*. Chicago, IL: BCBS. Retrieved from http://www.bcbs.com/blueresources/tec/vols/28/28_15.pdf

Authors' conclusions

As with mammography in general, the decision on which imaging modality(s) to use hinges in part on the tradeoff between detecting cancers and performing a much higher number of

unnecessary biopsies to detect those cancers. This topic is clearly subject to continued controversy, as the response to recommendations to potentially reduce the number of screening mammograms for asymptomatic women in their 40s has shown. A related, but probably less difficult, issue is how many screening tests women undergo.

There are several areas where technologies are changing and where future studies may clarify the choices to be made. For example, ABUS performs faster and is less operator-dependent than handheld ultrasound. How the differences between ABUS and handheld US will translate into differences in health outcomes for women with dense breasts remain to be seen. Additional research on tomosynthesis may also be helpful. Given the variety of potential choices, careful studies of multiple modalities on the same women are useful. Because different types of imaging may be more or less accurate in detecting different types of breast cancer (e.g., invasive tumors versus ductal carcinoma in situ or larger [e.g., greater than 1 cm] or smaller tumors) or detecting it in women with different characteristics besides breast density (e.g., large versus small breasts), comparing the results of various types of breast imaging in different populations cannot be addressed simply by adjusting for women's age, tumor stage, etc. There is also a trade-off between enhancing the number of expected cancers by, for example, selecting women with additional risk factors, versus testing these technologies in a true screening population likely to be encountered in clinical practice. Finally, the assumption that finding more cancers using additional techniques besides mammography produces better health outcomes on a population level will need to be verified.

Women with dense breasts on mammography are at higher risk of breast cancer and of having any cancer missed by mammography. One possibility is to use additional imaging for women with dense breasts and normal mammograms. Both MRI and US have been suggested by different groups. Existing evidence on US suggests that adding it to mammography will increase the cancer yield while also increasing the number of recalls and unnecessary biopsies. One study showed that adding MRI to mammography and US increases the sensitivity while decreasing the specificity. Digital mammography is more sensitive than film mammography for women with dense breasts. Insufficient evidence is available on other modalities, such as tomosynthesis and automated breast ultrasound.

National Institute for Health and Care Excellence (NICE). ***Familial breast cancer: Classification and care of people at risk of familial breast cancer and management of breast cancer and related risks in people with a family history of breast cancer*****. London, UK: NICE. Retrieved from http://www.nice.org.uk/guidance/cg164/resources/guidance-familial-breast-cancer-pdf**

Authors' conclusions

Surveillance for women with no personal history of breast cancer

MRI surveillance

Offer annual MRI surveillance to women:

- Aged 30–49 years who have not had genetic testing but have a greater than 30%
- Probability of being a BRCA carrier[1]
- Aged 30–49 years with a known BRCA1 or BRCA2 mutation
- Aged 20–49 years who have not had genetic testing but have a greater than 30% probability of being a TP53 carrier
  Aaged 20–49 years with a known TP53 mutation. [new 2013]

Consider annual MRI surveillance for women aged 50–69 years with a known TP53 mutation. [new 2013]

Do not offer MRI to women:

- Of any age at moderate[2] risk of breast cancer
- Of any age at high[3] risk of breast cancer but with a 30% or lower probability of being a BRCA or TP53 carrier
- Aged 20–29 years who have not had genetic testing but have a greater than 30% probability of being a BRCA carrier
- Aged 20–29 years with a known BRCA1 or BRCA2 mutation
- Aged 50–69 years who have not had genetic testing but have a greater than 30% probability of being a BRCA or a TP53 carrier, unless mammography has shown a dense breast pattern4
- Aged 50–69 years with a known BRCA1 or BRCA2 mutation, unless mammography has shown a dense breast pattern.[5] [new 2013]

Surveillance for women with a personal and family history of breast cancer

MRI surveillance

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[1] Guidance recommends use of carrier probability calculation method such as BOADICEA (http://ccge.medschl.cam.ac.uk/boadicea)
[2] Lifetime risk of developing breast cancer is at least 17% but less than 30%.
[3] Lifetime risk of developing breast cancer is at least 30%. High risk group includes rare conditions that carry an increased risk of breast cancer, such as Peutz-Jegher syndrome, (STK11), Cowden (PTEN), familial diffuse gastric cancer (E-Cadherin).
[4] Surveillance recommendations for this group reflect the fact that women who at first assessment had a 30% or greater BRCA carrier probability and reach 60 years of age without developing breast or ovarian cancer will now have a lower than 30% carrier probability and should no longer be offered MRI surveillance.
[5] Surveillance recommendations for this group reflect the fact that women who at first assessment had a 30% or greater TP53 carrier probability and reach 50 years of age without developing breast cancer or any other TP53-related malignancy will now have a lower than 30% carrier probability and should no longer be offered MRI surveillance.

Offer annual MRI surveillance to all women aged 30–49 years with a personal history of breast cancer who remain at high risk of breast cancer, including those who have a BRCA1 or BRCA2 mutation. [new 2013]

Do not offer MRI surveillance to any women aged 50 years and over without a TP53 mutation unless mammography has shown a dense breast pattern. [new 2013]

Consider annual MRI surveillance for women aged 20–69 years with a known TP53 mutation or who have not had a genetic test but have a greater than 30% probability of being a TP53 carrier. [new 2013]

Surveillance for women who remain at moderate risk of breast cancer

Ensure that surveillance for people with a personal history of breast cancer who remain at moderate risk of breast cancer is in line with *Early and Locally Advanced Breast Cancer* (NICE clinical guideline 80). [new 2013]

Summary

The recently published evidence addresses three different clinical scenarios, which are distinct from the current coverage guidance. One addresses women with a personal history of breast cancer; another, women with dense breasts and the third, women with a history of familial breast cancer. Because there are two sources that are currently being updated and likely apply to a broader population, it may be desirable to delay update of this guidance until those reports are available.