



## Appendix C: Diagnostic Imaging Modalities and Procedures of the Breast

**Screening mammography:** an imaging examination (x-ray) of the breast performed to detect unsuspected breast cancer in asymptomatic women. Standard views consisting of a Medial–Lateral Oblique view and a Cranio–Caudal view of both breasts are obtained.<sup>1</sup>

**Diagnostic mammography:** an imaging examination (x-ray) of the breast performed to evaluate symptomatic women, image findings of concern, or to follow-up from a previous image. Includes additional views to those in screening mammography such as magnification views (for characterization of calcifications) and spot compression views.<sup>1</sup>

Breast Imaging Reporting and Database System (BI-RADS<sup>®</sup>) is a standardized classification system (scale 0-6) for radiologists to use to communicate mammogram findings to the family physician. Follow-up recommendations, including which method of sampling is required for the lesion(s) in question, will be suggested by the radiologist.

**Table 1.** Breast Imaging Reporting and Database System (BI-RADS<sup>®</sup>) – 4th Edition<sup>2</sup>

Category	Assessment	Finding	Follow-up Recommendation	
0	Incomplete	Need additional imaging evaluation and/or prior mammograms for comparison.	Additional imaging and/or obtain prior images for comparison	
1	Complete	Negative	Routine screening mammograms	
2		Benign finding(s)	Routine screening mammograms	
3		Probably benign finding	Follow-up 6-month mammogram	
4		Suspicious abnormality	Biopsy should be considered	
		<i>Optional subdivisions:</i>		
		<i>4A: Finding needing intervention with a low suspicion for malignancy</i> <i>4B: Lesions with an intermediate suspicion of malignancy</i> <i>4C: Findings of moderate concern, but not classic for malignancy</i>		
5	Highly suggestive of malignancy	Biopsy required		
6	Known biopsy-proven malignancy	Appropriate action should be taken		

**Diagnostic ultrasound:**<sup>3</sup> an imaging examination of the breast performed to examine a targeted area for the evaluation of any abnormalities. It may be used as initial diagnostic investigation in women aged  $\leq 30$  years due to their denser breasts. It may also be performed in conjunction with a mammogram to assist in a diagnose. Ultrasound is useful for characterization of cysts (simple versus complex) and is very accurate for characterizing simple cysts which can then be aspirated if symptomatic. Ultrasound is not considered as an acceptable screening tool for breast cancer.<sup>3,4</sup>

**Core biopsy:** a procedure that removes tissue samples from breast lesions using a hollow needle. An image-guided (ultrasound, MRI, stereotactic) core biopsy is the standard of care for the establishment of a histological diagnosis.<sup>5</sup>

**Fine Needle Aspiration:** a procedure that removes breast tissue samples using a very fine needle from an abnormal area. It is limited to sampling of lymph nodes suspected of metastatic disease or aspiration of symptomatic cysts.

**Excisional biopsy:** a procedure that removes the entire breast lesion by surgery. It is limited to instances where a core biopsy for diagnosis is not possible for physical reasons or patient preference.

**Thermography:** an imaging examination that uses infrared cameras to produce images of temperature variations within the breast. There is no scientific evidence to support the use of thermography as a screening or diagnostic tool for breast cancer. Thermography can miss an abnormality that requires further investigation, and has a high false-positive rate which may lead to unnecessary tests.<sup>6</sup> Thermography equipment has not been licensed for breast cancer screening in Canada.<sup>7</sup>

**Magnetic Resonance Imaging (MRI):**<sup>4</sup> an imaging examination of the breast performed to examine a targeted area for the evaluation of any abnormalities. However, the use of a breast MRI in any specific cancer indication lacks any strong supporting evidence. A breast MRI should only be considered after a mammogram and an ultrasound have been performed. Recommended uses of a breast MRI include screening of women with the *BRCA 1* and/or *BRCA 2* gene and for the evaluation of occult breast cancer. It is also appropriate for the assessment of rupture/integrity/complications of silicone implants. **A breast MRI is not appropriate for screening purposes in the general population**, or determining if the lesion is benign or not. For more information on who should receive a breast MRI, refer to BCCA, [www.bccancer.bc.ca](http://www.bccancer.bc.ca).

## ► References

- 1 American College of Radiology Joint Committee on Breast Imaging. ACR practice guideline for the performance of screening and diagnostic mammography. 2008 (Resolution 24).
- 2 D'Orsi CJ, Bassett LW, Berg WA, et al. BI-RADS: Mammography, 4th edition. In: D'Orsi CJ, Mendelson EB, Ikeda DM, et al. Breast Imaging Reporting and Data System: ACR BI-RADS – Breast Imaging Atlas, Reston, VA, American College of Radiology, 2003.
- 3 Meisner A, Fekrazad, MH, Royce, ME. Breast disease: Benign and malignant. *Med Clin N Am*. 2008; 92:1115-1141.
- 4 BC Cancer Agency. Cancer management guidelines (Breast). Available from [www.bccancer.ca](http://www.bccancer.ca).
- 5 Schueller G, Schueller-Weidekamm C, Helbich TH. Accuracy of ultrasound-guided, large-core needle breast biopsy. *Eur Radiol*. 2008; 18:1761-1773.
- 6 Fitzgerald A, Berentson-Shaw J. Thermography as a screening and diagnostic tool: a systematic review. *NZ Med J*. 2012; 125:80-91.
- 7 Health Canada. Mammography. Available from <http://hc-sc.gc.ca>.