MBI LEXICON

A lexicon for the description of MBI images based on the familiar Breast Imaging Reporting and Data System (BI-RADS) terminology for other diagnostic technology such as mammography, ultrasonography and MRI, was developed in 2012.[1] This allows for effective standardized reporting and communication of breast imaging findings and recommendations.

<table>
<tr><th colspan="3">MBI LEXICON</th></tr>
<tr><td colspan="3">Indications: Describe clinical problems (if any), history of biopsies (date and results), risk factors, indicate if patient is pre- (last menstrual period [LMP] less than one month ago), peri- (LMP more than one month ago and less than 12 months ago), or postmenopausal (LMP at least 1 year ago), phase of menstrual cycle (if relevant), and any use of selective estrogen receptor modulators or medications with estrogenic or progestogenic activity.</td></tr>
<tr><td colspan="3">Comparison: Prior breast imaging, including prior gamma camera breast imaging studies (if any) should be reviewed, with the dates and types of prior studies reported.</td></tr>
<tr><td colspan="3">Technical Factors: Report dose (MBq) and type of tracer injected and duration of circulation phase (time from injection to imaging). If additional views beyond routine CC and MLO projections were obtained, these should be detailed.</td></tr>
<tr><td colspan="3">Limitations: Describe any suboptimal positioning, motion, pixel dropout, “hot pixels”, electronic, or other artifacts, which are felt to affect image interpretation.</td></tr>
<tr><td colspan="3">Background: Describe degree of radiotracer uptake in background normal parenchyma, which may be uniform (homogeneous) or patchy (heterogeneous).</td></tr>
<tr><td colspan="2">Photopenic</td><td>Less than subcutaneous fat.</td></tr>
<tr><td colspan="2">Minimal-Mild</td><td>Equal to or slightly greater than subcutaneous fat.</td></tr>
<tr><td colspan="2">Moderate</td><td>Visually greater than mild, but less than twice as intense as subcutaneous fat.</td></tr>
<tr><td colspan="2">Marked</td><td>Visually at least twice as intense as subcutaneous fat.</td></tr>
<tr><th colspan="2">Findings: Categories and Terms</th><th>Description</th></tr>
<tr><td>Mass</td><td colspan="2">Uptake which has convex outward borders, no interspersed normal uptake, and is seen on two projections (if location is amenable).</td></tr>
<tr><td>Non-Mass Uptake</td><td colspan="2">Uptake distinct from the surrounding tissue that does not fit criteria for a mass and which usually contains interspersed areas of normal glandular tissue.</td></tr>
</table>

	Distribution	Focal area	< 2 cm in diameter in a confined area.
		Segmental	Uptake in linear or triangular region or cone with apex pointing toward nipple that suggests (but is not specific for) intraductal pathology.
		Regional	Uptake in a large volume of tissue, ≥ 2 cm in diameter, not conforming to a ductal distribution; may be geographic.
		Multiple Regions	Uptake in at least two large volumes of tissue; more than one area of geographic uptake.
		Diffuse	Uptake distributed throughout the breast.
	Internal Pattern of Uptake	Homogenous	Confluent, uniform uptake.
		Heterogeneous/Patchy	Variable, non-uniform uptake.
	Symmetry	Symmetric	Similar uptake pattern in both breasts.
		Non-Symmetric	More uptake in one breast compared to the other.
Associated Findings		Axillary Uptake	Uptake in the axilla usually thought to be a lymph node, which may or may not be pathologic.
		Nipple Uptake	Radiotracer uptake within the nipple, a physiologic finding if not associated with other suspicious uptake.
		Vessel Uptake	Serpiginous linear uptake corresponding with a vessel.
Location	Breast	Right, Left or Bilateral	
	In-breast location	Quadrant or clockface location, or specifically in the subareolar or central breast or axillary tail.	

	Depth/Distance from the nipple	Anterior, central or posterior third or measured distance from the nipple.	Measurement is made from the center of the finding and recorded in centimeters.
Qualitative intensity of uptake in lesion*	Photopenic	Uptake in lesion is less than surrounding background parenchyma.	
	Mild	Uptake which appears to be less than 50% of background.	
	Moderate	Uptake which appears to be at least 50% of background but not twice as intense as background.	
	Marked	Uptake which appears to be at least twice background uptake.	
Lesion Size	X	Longest measurement of the lesion, made on whichever image best depicts the lesion.	
	Y	Measurement orthogonal to X, made using the same image used to define X	
	Z	If the lesion is visible on both projections, Z should be an orthogonal measurement made on the projection (CC or MLO) not used to define X/Y.	
Assessment Categories			
Incomplete Assessment	0 - Incomplete	Additional imaging is needed before a final assessment can be rendered.	
Final Assessment	1 - Negative	No lesion found (routine follow-up).	
	2 - Benign	No malignant features; e.g., photopenia (routine follow-up).	
	3 – Probably benign	Very low probability of cancer (follow-up MBI examination is recommended in 6 months if targeted diagnostic mammogram and ultrasound are negative).	
	4 - Suspicious	Intermediate probability of cancer (biopsy is recommended).	
	4a - Low suspicion	Used for a finding which requires intervention but is of low suspicion for malignancy.	
	4b - Intermediate suspicion	Used for a finding which is judged to be of intermediate suspicion for malignancy.	

	4c - Moderate suspicion (but not classic)	Used for a finding which is judged to be of moderate suspicion for malignancy.
	5 - Highly suggestive of malignancy	High probability of malignancy (biopsy is recommended).
	6 - Known biopsy-proven malignancy.	Appropriate action should be taken.

* These are the definitions of lesion intensity provided to observers for use during the interpretation task. However, it is recommended that lesion intensity be judged relative to subcutaneous fat (rather than relative to background uptake) for greater consistency.

[1] AL Conners, CB Hruska, CL Tortorelli, RW Maxwell, DJ Rhodes, JC Boughey, WA Berg. "Lexicon for standardized interpretation of gamma camera molecular breast imaging: observer agreement and diagnostic accuracy." Eur J Nucl Med Mol Imaging (2012) 39:971–982. DOI 10.1007/s00259-011-2054-z