

FIRST HILL DIAGNOSTIC IMAGING

A Swedish Medical Imaging Center

Breast Specific Gamma Imaging (BSGI):

While mammography is the acknowledged cornerstone of breast cancer diagnosis, new functional imaging methods such as MRI and BSGI provide an important adjunct to mammography in selected clinical circumstances. BSGI, a molecular imaging method, has been documented to be sensitive for detection of cancers as well as to have a high negative predictive value, which makes it particularly useful in difficult clinical and imaging cases.

Although BSGI does not in any way replace mammography, ultrasound or breast MRI, this innovative functional exam sensitively detects the heightened metabolic activity associated with breast cancer or reassuringly documents its absence. BSGI is FDA approved for breast imaging and reimbursed by Medicare and most third party payors. Since BSGI is minimally affected by breast density, it is a natural complement to mammography. These indications are guidelines, and will evolve; we invite recommendations and feedback from our clinical colleagues.

CLINICAL INDICATIONS FOR BSGI

A. Breast MRI is clinically indicated, but not possible.

1. Pacemakers, implanted pumps or other MRI contraindicated devices.
2. Ferromagnetic surgical implants.
3. Body size or weight exceeding the capacity of MRI.
4. Breasts too large to be scanned within the MR breast imaging coil.
5. Severe claustrophobia
6. Compromised renal function: Risk of nephrogenic systemic fibrosis from gadolinium
7. Gadolinium contrast allergy
8. Other factors limiting compliance with a prescribed MRI study

B. Patients with indeterminate breast abnormalities:

1. Possible alternative to short-term follow-up mammography or ultrasound for BI-RADS 3 findings.
2. Palpable masses or nipple discharge without mammographic or ultrasound abnormality
3. Triage of multiple masses or microcalcifications and selection for potential biopsy.
4. Unexplained mammographic architectural distortion of concern.

C. Patients with technically difficult breast imaging:

1. Dense breast tissue, also with concerning risk factors, but not sufficient to warrant MRI.
2. Implants, free silicone, or paraffin injections causing problematic or limited mammograms.

CLINICAL INDICATIONS FOR BREAST MRI: A brief review of selected Breast MRI indications is useful since Breast MRI is the usual first line screening or diagnostic study for a number of clinical situations:

1. High-risk surveillance/screening:
 - Known gene mutations such as BrCa 1 or BrCa 2, and their first-degree relatives.
 - Two first degree relatives with breast or ovarian cancer.
 - One first-degree relative with pre-menopausal breast cancer.
 - Lifetime risk of breast cancer 20% or greater.
2. History of chest irradiation (for lymphoma) between ages of 10-30.
3. Congenital disorders: e.g. Li-Fraumeni, Cowden's Syndromes.
4. Personal history or suspected recurrence of breast cancer, especially with dense mammograms.
5. Monitoring response to neoadjuvant chemotherapy.
6. Pre-operative assessment for extent of disease, to detect or exclude contralateral cancer, and to determine extent of and to stage newly diagnosed cancer.
7. Evaluate for occult breast cancer in cases of axillary node metastasis with unknown primary.

CLINICAL CONTRAINDICATION FOR BSGI:

There are practically none; except pregnancy or known hypersensitivity to Tc99m Sestamibi.

ABOUT BSGI:

BSGI, also called Molecular Breast Imaging or MBI, is a functional imaging study using an isotope of Tc99m Sestamibi which accumulates in the mitochondria of highly metabolic tissues, like cancer. Tc99m has a low energy and short half life and has been safely used in cardiac imaging for many years. The National Institutes of Health has categorized the radiation dose from BSGI as minimal risk, the same category as mammography and appropriate for a diagnostic exam.

BSGI has a High Negative Predictive Value (NPV)- consistently in excess of 96%

- Overall reported 92% specificity: aids differentiation of benign from malignant.
- Documented high sensitivity for DCIS and lobular carcinoma
- Low false positive rate
- Lesions smaller than 5 mm can be detected.

PROCEDURE:

No patient preparation or pre-medication needed

The date of last menses or pregnancy and lactation status should be determined.

BSGI should be performed between day 5 and day 12 of the patient's menstrual cycle *if possible*.

If pregnancy is possible, BSGI should be delayed until onset of menses.

BSGI should be postponed for 3 months following cessation of lactation.

BSGI ideally would be performed prior to biopsy or within 3 days of a biopsy if possible.

To learn more on BSGI, please call Swedish First Hill Diagnostic Imaging at: (206) 329-6767. More information is also available at www.dilon.com.