# MEDICAL POLICY

| POLICY TITLE | SCINTIMAMMOGRAPHY/BREAST-SPECIFIC GAMMA IMAGING/MOLECULAR BREAST IMAGING |
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| POLICY NUMBER | MP-5.021 |

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## I. POLICY

Scintimammography, breast-specific gamma imaging and molecular breast imaging are considered **investigational** in all applications, including but not limited to its use as an adjunct to mammography or in staging the axillary lymph nodes. There is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with these procedures.

***Cross-references***

MP-5.025 PET Scans
MP-5.022 Radioimmunoscintigraphy Imaging (Monoclonal Antibody Imaging)/ Tumor Localization
MP-5.031 Single Photon Emission Computed Tomography (SPECT)

## II. PRODUCT VARIATIONS

*[N] = No product variation, policy applies as stated*
*[Y] = Standard product coverage varies from application of this policy, see below*

[N] Capital Cares 4 Kids
[N] PPO
[N] HMO
[N] SeniorBlue HMO
[N] SeniorBlue PPO
[N] Indemnity
[N] SpecialCare
[N] POS
[Y] FEP PPO*

*Refer to FEP Medical Policy Manual MP-6.01.18 Scintimammography/Breast-Specific Gamma Imaging/Molecular Breast Imaging. The FEP Medical Policy manual can be found at: http://bluewebportal.bcbs.com/landingpagelevel3/504100?docId=23980

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## III. DESCRIPTION/BACKGROUND

Scintimammography refers to the use of radiotracers with nuclear medicine imaging as a diagnostic tool for abnormalities of the breast. Breast-specific gamma imaging (BSGI), or molecular breast imaging (MBI), refer to specific types of imaging machines that are used in conjunction with scintimammography to improve diagnostic performance.

Scintimammography is a diagnostic modality using radiopharmaceuticals to detect tumors of the breast. After injection of a radiopharmaceutical, the breast is evaluated with planar imaging. Scintimammography is performed with the patient lying prone and the camera positioned laterally, which increases the distance between the breast and the camera. Scintimammography using conventional imaging modalities has relatively poor sensitivity in detecting smaller lesions (e.g., smaller than 15 mm), because of the relatively poor resolution of conventional gamma cameras in imaging the breast. Breast-specific gamma imaging (BSGI) and molecular breast imaging (MBI) were developed to address this issue. Breast-specific gamma cameras acquire images while the patient is seated in a position similar to that in mammography, and the breast is lightly compressed. The detector head(s) is immediately next to the breast, increasing resolution, and the images can be compared with the mammographic images. Breast-specific gamma imaging and molecular breast imaging differ primarily in the type and number of detectors used (multi-crystal arrays of cesium iodide or sodium iodide versus semiconductor materials, such as cadmium zinc telluride, respectively). In some configurations, a detector is placed on each side of the breast and used to lightly compress it. The maximum distance between the detector and the breast is therefore from the surface to the midpoint of the breast. Much of the research on BSGI and MBI has been conducted at the Mayo Clinic. The radiotracer usually utilized is technetium Tc99m sestamibi. MBI imaging takes approximately 40 minutes. (1)

Breast-specific gamma imaging and molecular breast imaging have been suggested for a variety of applications. In practice guidelines for breast scintigraphy with breast-specific gamma cameras, the Society for Nuclear Medicine provides a list of common uses, as follows:

1. Among patients with recently detected breast malignancy, initial staging; detecting multicentric, multifocal, or bilateral disease; and assessing response to neoadjuvant chemotherapy.
2. Among patients at high risk for malignancy, evaluating suspected recurrence or using it when a mammogram is limited or a previous malignancy was occult on mammogram.
3. Among patients with indeterminate breast abnormalities and remaining diagnostic concerns, evaluating lesions identified by other breast imaging techniques, palpable or non-palpable, aiding in biopsy targeting, and a number of others.
4. Among patients with technically difficult breast imaging, such as radiodense breast tissue or implants, free silicone, or paraffin injections.
5. Among patients for whom breast magnetic resonance imaging (MRI) is indicated but contraindicated, e.g., patients with implanted pacemakers or pumps, or as an alternative for patients who meet MRI screening criteria, such as BRCA1, BRCA2 mutations.
6. Among patients undergoing preoperative chemotherapy, for monitoring tumor response in order to determine the impact of therapy of plan for residual disease.

The guideline also mentions other efforts, such as the American College of Radiology's Appropriateness Criteria and the American College of Surgeons' Consensus Conference III. (2) Less emphasis is placed on detecting

positive axillary lymph nodes with BSGI or MBI than with scintimammography because with current configurations, these lymph nodes are frequently out of view. Selected studies on these modalities are discussed below.

The primary radiopharmaceutical used with BSGI or MBI is technetium Tc99m sestamibi (marketed by Draxis Specialty Pharmaceuticals Inc.; Cardinal Health 414, Dublin, Ohio; LLC, Mallinckrodt Inc., and Pharmalucence, Inc., Bedford, MA). The labeling states that technetium-99m sestamibi is "indicated for planar imaging as a second-line diagnostic drug after mammography to assist in the evaluation of breast lesions in patients with an abnormal mammogram or a palpable breast mass. Technetium Tc99m sestamibi is not indicated for breast cancer screening, to confirm the presence or absence of malignancy, and it is not an alternative to biopsy."

Several scintillation or gamma cameras have general 510(k) marketing clearance from the U.S. Food and Drug Administration (FDA), which states that they are cleared for "use in imaging the distribution of radionuclides in the human body using planar imaging techniques." Two examples of gamma cameras used in BSGI or molecular breast imaging are Dilon 6800® (Dilon Technologies, Newport News, VA) and LumaGEM™ (Gamma Medica Instruments, Northridge, CA).

The radiation dose associated with BSGI is substantial for diagnostic breast imaging modalities. According to the American College of Radiology (ACR) Appropriateness Criteria, the radiation dose from BSGI is 10 to 30 mSv, which is 15-30 times higher than the dose from a digital mammogram. (3) According to the ACR Appropriateness Criteria, at these levels BSGI is not indicated for breast cancer screening.

According to another study, (4) the radiation dose to the breast from the 20 mCi (740 MBq) technetium Tc99m sestamibi used for BSGI at this center is 0.13 rad or 1.3 mGy, less than the 0.75 rad the authors report for mammography, except that the dose is given to the entire body. The authors assert that this dose poses an "extremely low risk of harmful effects to the patient" but that it should be reduced by a factor of 5 to 10 if BSGI were to be used as a regular screening technique. The authors also estimate that the cost of BSGI is 3-4 times that of mammography.

Another article published online in August 2010 calculated mean glandular doses, and from those, lifetime attributable risk of cancer (LAR) for film mammography, digital mammography, BSGI, and positron emission mammography (PEM). (5) The author, who is a consultant to GE Healthcare and a member of the medical advisory boards of Koning (which are working on dedicated breast computed tomography [CT]) and Bracco (MR contrast agents), used BEIR VII Group risk estimates (6) to gauge the risks of radiation-induced cancer incidence and mortality from breast imaging studies. The estimated lifetime attributable risk of cancer for a patient with the average-sized compressed breast during mammography of 5.3 cm (it would be higher for larger breasts) for a single breast procedure at age 40 is

- 5 per 100,000 for digital mammography (breast cancer only),
- 7 per 100,000 for screen film mammography (breast cancer only),
- 55-82 per 100,000 for BSGI (depending on the dose of technetium Tc99m sestamibi), and
- 75 for 100,000 for PEM.

The corresponding lifetime attributable risk of cancer mortality at age 40 is

- 1.3 per 100,000 for digital mammography (breast cancer only),

- 1.7 per 100,000 for screen film mammography (breast cancer only),
- 26-39 per 100,000 for BSGI, and
- 31 for 100,000 for PEM.
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A major difference in the impact of radiation between mammography, on the one hand, and BSGI or PEM, on the other, is that for mammography, the substantial radiation dose is limited to the breast. With BSGI and PEM, all organs are irradiated, which adds to the risks associated with BSGI and PEM. A lower dose version of molecular breast imaging (MBI) has been developed and is being tested at the Mayo Clinic among 1,000 women with dense breast tissue on mammography who are at increased risk of cancer. (1) According to the authors, all of whom are from the Mayo Clinic, this new approach will "make MBI comparable with screening mammography in terms of radiation exposure." It is not clear whether this statement refers to breast exposure or whole body exposure.

NOTES:

The term "molecular breast imaging" is used in different ways, sometimes for any type of breast imaging involving molecular imaging, including positron emission mammography (PEM) and sometimes limited to imaging with a type of breast-specific gamma camera, as is used in this report.

The most commonly used radiopharmaceutical used in BSGI or MBI is technetium Tc99m sestamibi (marketed by Draxis Specialty Pharmaceuticals Inc., Cardinal Health 414, LLC, Mallinckrodt Inc., and Pharmalucence, Inc.).

## IV. RATIONALE

The current version of this policy is based on a TEC Assessment in press in May 2013. (7)

Mammography is the main screening modality for breast cancer, despite its limitations in terms of less than ideal sensitivity and specificity. This is particularly an issue for women at high risk of breast cancer, in whom the risk of cancer exceeds the inconvenience of more frequent screening starting at a younger age and having more false positive results. Furthermore, the sensitivity of mammography is lower in women with radiographically dense breasts, which is more common among younger women. The clinical utility of adjunctive screening tests, such as scintimammography or magnetic resonance imaging (MRI), is primarily in the evaluation of women with inconclusive results on mammography. A biopsy will generally be performed on a breast lesion if imaging cannot rule out malignancy with certainty. Therefore, adjunctive tests will be most useful in women with inconclusive mammograms if they have a high negative predictive value, and can obviate the need for a

biopsy. Using additional imaging among women with dense breasts who are asymptomatic and have a negative mammogram has been suggested, but the best approach is subject to debate (see TEC Special Report: Screening Asymptomatic Women with Dense Breasts and Normal Mammograms for Breast Cancer). (8)

An early step in evaluating a new imaging modality for patients who may have breast cancer is to determine whether the modality can detect breast cancer or related diagnoses in women known to have the disease. However, studies of diagnostic performance in this population may be affected by disease spectrum (spectrum effect), among other possible issues. Showing that the modality can detect breast cancer, particularly smaller lesions and types that are more difficult to detect, is important, but not sufficient to demonstrate the true diagnostic performance of a test, which may vary with tumor size, characteristics, etc. These available studies are limited by the retrospective nature of most; by small sample sizes; and by patient populations with mixed indications for imaging (e.g., (9-12).

Regarding the use of scintimammography to detect axillary metastases, a review of published studies between 1994 and 1998 (13) showed a sensitivity of 77% and specificity of 89%. More recent studies using different radiopharmaceuticals have shown sensitivities in the high 80–90% range. (14, 15) A meta-analysis published in 2011 (16) reviewed 45 studies of scintimammography and also reported sensitivities and sensitivities in this range, with summary estimates for sensitivity of 83% (95% confidence interval [CI] 82-84%) and for specificity of 85% (95% CI 83-86%). The test is still not accurate enough to replace surgical nodal dissection. No studies have examined patient outcomes comparing the strategy of using scintimammography to aid in decision making regarding nodal dissection versus standard nodal dissection. Scintimammography with conventional SPECT imaging, therefore, will not be discussed further in this policy.

In the TEC Assessment, evidence was found for women undergoing breast cancer screening, including those with dense breasts or at high risk of breast cancer, and in women with suspicious physical or imaging findings. There were also retrospective studies of women with a mix of indications. The evidence was insufficient for all other indications. A few studies reported on change in patient management following imaging, but there are insufficient data to determine whether these changes led to improvement in health outcomes (e.g., (17).

**BSGI for Women with Breast Cancer Risk Factors and/or Normal Mammograms**

Several prospective studies addressed the performance of BSGI in women at high risk for breast cancer and/or with normal mammograms. Rhodes (18) compared the performance of BSGI, mammography, and the combination of the two modalities in 936 asymptomatic women with heterogeneously or extremely dense breasts on prior mammogram, as well as additional risk factors. Of 936 women, 11 had cancer. The sample included women with dense breasts and other cancer risk factors, including both women with BRCA mutations and those

with a personal history of breast cancer. The risk in these different populations of women varies substantially. Overall sensitivity was 82% (95% CI: 52.3% to 94.9%) for BSGI, 27% (95% CI: 9.7% to 56.6%) for mammography, and 91% (95% CI: 62.3% to 98.4%) for both combined. Specificity was 93% (95% CI: 91.3% to 94.5%) for BSGI, 91% (95% CI: 88.8% to 92.5%) for mammography, and 85% (95% CI: 82.8% to 87.3%) for both (sensitivity and specificity for BSGI versus mammography, both p=0.07). The number of breast cancers diagnosed per number of biopsies performed was 28% for BSGI and 18% for mammography.

Brem (19) used a breast-specific gamma camera to evaluate 94 women considered at high risk of breast cancer despite normal mammographic findings. High risk was defined as a calculated 5-year risk of developing breast cancer of 1.66%, as determined by the Gail model. Of the 94 women in the study, 35 had a prior history of some type of breast cancer or atypical hyperplasia. A total of 16 of the 94 women (17%) had abnormal scintimammograms. Follow-up US in 11 of these 16 identified a hypoechoic lesion that was biopsied. The 5 remaining patients had normal US results and were followed up with a repeat scintimammogram at 6 months, which was normal. Of the 11 who underwent US-guided biopsy, two invasive cancers (12%) were identified. The sensitivity of BSGI was 100% (95% CI: 22% to 100%) and the specificity, 85%. The study is limited by the extremely small number of cancers detected.

While the use of BSGI or MBI has been proposed for women at high risk of breast cancer, there is controversy and speculation over whether some women, such as those with BRCA mutations, have a heightened radiosensitivity. (20, 21) If women with BRCA mutations are more radiosensitive than the population as a whole, the above estimates may underestimate the risks they face from breast imaging with ionizing radiation (i.e., mammography, BSGI, MBI, PEM, SPECT/CT, breast-specific CT, and tomosynthesis) In contrast, ultrasound and MRI do not involve the use of radiation. More research will be needed to resolve this issue. Also, the risk associated with radiation exposure will be greater for women at high risk of breast cancer, whether or not they are more radiosensitive, because they start screening at a younger age when the risks associated with radiation exposure are larger.

Conclusion: There is scant evidence on the use of BSGI in screening women at elevated risk of breast cancer or in women with factors that limit the sensitivity of mammography. Furthermore, the relatively high radiation dose currently associated with BSGI has prompted the American College of Radiology to recommend against the use of BSGI for screening. Therefore, consideration of the potential use of BSGI for screening women with dense breasts or at high risk of breast cancer should await the development of a lower-dose regimen, and if warranted, larger, higher quality studies with study populations representative of those encountered in clinical practice. In addition, a large, high-quality head-to-head comparison of BSGI and magnetic resonance imaging (MRI) would be needed, especially for women at high risk of breast cancer, since MRI, alternated with mammography, is currently the recommended screening technique.

**BSGI for Women with Indeterminate or Suspicious Lesions**

A number of prospective studies address the performance of BSGI in women with indeterminate or suspicious lesions. Spanu (22) assessed the clinical impact of BSGI in a prospective study of 467 women with suspicious lesions on physical examination, MRI, ultrasound (US), or mammogram. Histopathology reports were obtained in all cases. BSGI results were true positive in 408/420 (sensitivity =97.1%) breast cancer patients, including the detection of multifocal, multicentric disease or bilateral disease, and were false negative in 12 breast cancer patients. BSGI results were true negative in 40/47 (specificity=85.1%) patients with benign lesions. The authors calculated that BSGI provided additional value compared to mammography in 141/467 (30.2%) patients: 108 with breast cancer and 33 with benign lesions.

Another study by Spanu (23) evaluated the performance of BSGI compared to single-photon emission computed tomography (SPECT) in 157 women with suspicious breast lesions at clinical examination and/or mammography or US. Histopathologic reports were obtained in all cases. Outcomes were calculated on a per lesion basis. Sensitivity was significantly higher for BSGI compared to SPECT (95.7% vs. 90.7%, $p<0.01$), as was diagnostic accuracy (94.2% vs. 90.2%, $p<0.01$). Specificity was identical for both imaging modalities (87.9%). In a similar, earlier study by Spanu, (24) BSGI performance was compared to SPECT in 85 patients scheduled to undergo biopsies. Histopathologic findings were obtained in all cases. On a per lesion basis (90 malignant, 12 benign), BSGI sensitivity (96.7%) and accuracy (96.1%) were higher compared to SPECT (92.2% and 92.1%, respectively), but the differences were not significantly different. Specificity was identical for both imaging modalities (91.7%).

In a study by Hruska, (25) 150 patients with BI-RADS classification 4 or 5 lesions smaller than 2 cm identified on mammography or US who were scheduled for biopsy underwent scintimammography using a dual-head, breast-specific gamma camera. The results from 3 blinded readers were averaged. In 88 patients, 128 cancers were found. The per-lesion sensitivity with the dual-head camera was 90% (115/128) for all lesions and 82% (50/61) for lesions 1 cm or smaller. Overall, MBI specificity (by patient) was 69%. The proportion of patients with cancer in this study was higher than might be expected in a screening population with suspicious lesions on mammography. In selecting patients, preference was given to those with a high suspicious of cancer or who were likely to have multifocal or multicentric disease.

In another study, Spanu (26) evaluated 145 consecutive patients scheduled for breast biopsy. With an 86% prevalence of disease, the sensitivity of BSGI was 97.6% per patient (100% for tumors larger than 10 mm and 91.1% for tumors 10 mm or smaller). The per-lesion specificity was 86.4%. A total of 4 cancers were missed, 3 of which were detected by mammography. The authors suggest using BSGI for surgical planning or to avoid biopsy, but the negative predictive value (NPV), calculated to be 83%, is not high enough to forgo biopsy.

Brem (27) compared the performance of BSGI and MRI in 23 women with 33 indeterminate lesions. Eight patients had 9 pathologically confirmed cancers. BGSI demonstrated a significantly greater specificity (71%, 95% CI: 49% to 87%) than MRI (25%, 95% CI: 11% to 47%; $p<0.05$). BSGI was comparable to MRI for sensitivity (BSGI, 89%, 95% CI: 51% to 99% vs. MRI, 100%, 95% CI: 63% to 100%), PPV (BSGI, 53%, 95% CI: 27% to 78% vs. MRI, 33%, 95% CI: 17% to 54%), and NPV (BSGI, 94%, 95% CI: 71% to 100% vs. MRI, 100%, 95% CI: 52% to 100%). The authors point out that the 100% sensitivity and 25% specificity of MRI is probably due to the small number of cancers in this study.

Conclusions: The value of BSGI in evaluating indeterminate or suspicious lesions must be compared to other modalities that would be used, such as spot views for diagnostic mammography. Given the relative ease and diagnostic accuracy of the gold standard of biopsy, coupled with the adverse consequences of missing breast cancer, the NPV of BSGI would have to be extremely high to alter treatment decisions. Since the NPV is partially determined by the prevalence of disease, the NPV will be lower in a population of patients with mammographic abnormalities highly suggestive of breast cancer than in a population of patients with mammographic abnormalities not suggestive of breast cancer. Therefore, any clinical utility of BSGI as an adjunct to mammography would vary according to the type of mammographic abnormalities included in the studies.

**Retrospective Studies of BSGI for Women with a Mixed Set of Indications**

Several retrospective studies examined the use of BSGI in women with mixed indications. Brem (28) examined the performance of BSGI in a retrospective study of 146 consecutive patients who had a mixed set of indications, including palpable lesions with no mammographic correlation, diagnosis of multicentricity or multifocality in women with known breast cancer, or screening women at high risk of breast cancer. The analysis was performed per lesion (n=167), not per patient. Eighty-three of the lesions were malignant (49.7%). The overall sensitivity of BSGI was 96.4% (95% CI: 92% to 99%), and the specificity was 59.5% (95% CI: 49% to 70%). The PPV was 68.8% (95% CI: 60% to 78%), and the NPV was 94.3% (95% CI: 88% to 99%). The performance of BSGI in detecting smaller tumors in particular requires further investigation. As the authors point out, additional larger studies are needed to confirm or modify these findings.

Park et al. (29) compared the performance of BSGI performed shortly after injection of the radiotracer with dual-phase imaging, in which BSGI was repeated one hour after the injection. The assumption was that technetium-99 sestamibi uptake might persist on the delayed images for malignant lesions, while for benign conditions it would not, thereby reducing false positive results. The population consisted of 76 women (mean age 49.3 years, range 33-61) being evaluated for a palpable lesion or a diagnosis of multicentricity and/or multifocality in women with biopsy-proven breast cancer, women being screening for breast cancer, or women with

multiple lesions detected by mammography or ultrasound in which BSGI is used to determine an appropriate biopsy site. Thirteen women had breast cancer. Comparing single-phase and dual-phase BSGI, the sensitivity was 77% and 69%, respectively (p=1.0); while the specificity was 83% and 95%, respectively (p=0.0078). Thus, the dual-phase imaging appeared to increase the specificity significantly without a significant effect on the sensitivity. However, as the authors note, the sample size was small.

Weigert (30) reported data from a retrospective multicenter patient registry. This study analyzed 1,042 patients drawn from a total of 2,004 patients in the registry. Women included in the study had BSGI imaging, pathological diagnosis by biopsy, and at least 6 months follow-up. BSGI had been recommended for patients with at least 2 of the following indications: equivocal or negative mammogram/US and an unresolved clinical concern; personal history of breast cancer or current cancer diagnosis; palpable masses negative on mammogram or US; radiodense breast tissue; or high risk for breast cancer. In this population, BSGI had a reported sensitivity of 91%, a specificity of 77%, a positive predictive value of 57%, and a negative predictive value of 96%. In 139 patients with a suspicious lesion on mammography, BSGI imaging was negative in 21 cases, 13 of which were true-negatives and 8 of which were false-negatives.

Conclusions: The mix of indications in these studies makes it difficult to generalize the results or to determine whether the performance of BSGI varies by indication. Also, the accuracy of the test may vary by indication and its intended use. For example, high sensitivity is important if the objective is to identify multifocal or multicentric disease, while a high negative predictive value is desirable if the goal is to reduce the number of biopsies among women referred for biopsy.

**Meta-Analysis of BSGI**

Sun et al. (31) performed a systematic review and meta-analysis on the "clinical usefulness of [BSGI] as an adjunct modality to mammography for diagnosis of breast cancer." The authors included 19 studies in 5 separate analyses. Some of these studies were included in the evidence tables of the TEC Assessment, while others did not meet our inclusion criteria, e.g., the study population was composed of women with breast cancer. Random effects models were used when there was substantial heterogeneity.

The first analysis assessed the diagnostic performance of BSGI based on 8 studies. Heterogeneity was substantial ($I^2$=53% for sensitivity and $I^2$=91% for specificity). The pooled sensitivity was 95% (95% CI: 93% to 96%), while the pooled specificity was 80% (95% CI: 78% to 82%). In their analysis, studies with different indications for BSGI were combined, and therefore the results on accuracy are difficult to interpret. They also conducted analyses on other groups of studies. The authors also used a modification of the original QUADAS

instrument, (32) which was subsequently revised by the developers. (33) Overall, their ratings of the studies were more favorable (i.e., higher quality) than those in the TEC Assessment.

No studies were identified that address the health outcomes of interest, nor is there sufficient indirect evidence to infer that the use of BSGI would produce changes in health outcomes.

**Summary**

The evidence to date does not provide sufficient support for any of the uses discussed. The published literature on BSGI, MBI, and scintimammography with breast-specific gamma camera is limited by a number of factors. The studies include populations that usually do not represent those encountered in clinical practice and that have mixed indications. There are methodologic limitations in the available studies, which have been judged to have medium to high risk of bias, and they lack information on the impact on therapeutic efficacy. Limited evidence on the diagnostic accuracy of BSGI reports that the test has a relatively high sensitivity and specificity for detecting malignancy. However, the evidence does not establish that BSGI improves outcomes when used as an adjunct to mammography for breast cancer screening. In the available studies, the negative predictive value of BSGI has not been high enough to preclude biopsy in patients with inconclusive mammograms. The relatively high radiation dose also should be taken into account. In addition, the evidence is not sufficient to conclude that BSGI is better than MRI for this purpose. Larger, higher-quality studies are required to determine whether BSGI has a useful role as an adjunct to mammography. For these reasons, BSGI is considered investigational.

**Clinical Trials**

According to online site clinicaltrials.gov, about 12 trials are currently underway on BSGI or MBI, and many of them are being conducted at the Mayo Clinic. They include the following:

- An evaluation of the use of BSGI in women with dense breasts who are at increased risk of breast cancer (NCT00620373); n=2,000; estimated primary completion date of September 2012.
- A comparison of MBI and MRI for detecting breast cancer (NCT00591864); n=120; estimated primary completion date of September 2010.
- MBI with patients with suspected DCIS (NCT00890994); n=200; estimated primary completion date of December 2013.
- Low-dose Molecular Breast Imaging: Comparison of Breast Cancer Detection Rate at Initial Screening and Two-year Follow-up (NCT01723124); n=2,000; estimated primary completion date of July 2016.

- Use of Low-dose Molecular Breast Imaging for the Detection of Small Breast Lesions (Lowdoseprebx) (NCT01285440); n=150; estimated primary completion date of January 2014.

**Practice Guidelines and Position Statements**

As noted in the Description section, the Society for Nuclear Medicine released a procedure guideline on breast scintigraphy with breast-specific gamma camera. (2) It lists a set of potential indications with references apparently to support each set of indications but does not provide a systematic review of the literature on the uses of breast scintigraphy with breast-specific gamma camera, which would take into account the quality of the studies. The guideline is based on consensus, and most of it is devoted to the procedures and specifications of the examination, documentation, and recording, quality control, and radiation safety.

The American College of Obstetricians and Gynecologists practice bulletin on breast screening notes scintimammography was considered but not recommended for routine screening. (34)

Appropriateness Criteria from the American College of Radiology for breast cancer screening, breast microcalcifications — initial diagnostic workup, palpable breast masses all rated BSGI a 1, which refers to "usually not appropriate." (3, 35, 36)

## V. DEFINITIONS

**RADIOPHARMACEUTICAL** is a radioactive chemical or drug that has a specific affinity for a particular body tissue or organ. It can be used in nuclear medicine to obtain images of structures, or to treat radiation-sensitive diseases.

## VI. BENEFIT VARIATIONS

The existence of this medical policy does not mean that this service is a covered benefit under the member's contract. Benefit determinations should be based in all cases on the applicable contract language. Medical policies do not constitute a description of benefits. A member's individual or group customer benefits govern which services are covered, which are excluded, and which are subject to benefit limits and which require preauthorization. Members and providers should consult the member's benefit information or contact Capital for benefit information.

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## VII. DISCLAIMER

*Capital's medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. Capital considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.*

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## IX. CODING INFORMATION

**Note:** This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

**Investigational when used for scintimammography or breast-specific gamma imaging; therefore the following are not covered:**

| CPT Codes ® | | | | | | | |
|---|---|---|---|---|---|---|---|
| 78800 | 78801 | 78803 | | | | | |



| HCPCS Code | Description |
|---|---|
| A4641 | RADIOPHARMACEUTICAL DIAGNOSTIC NOC |
| A4642 | INDIUM IN-111 SATUMOMAB PENDETIDE DX UP TO 6 MCI |
| A9500 | TECHNETIUM TC-99M SESTAMIBI, DIAGNOSTIC, PER STUDY DOSE |
| A9502 | TECHNETIUM TC-99M TETROFOSMIN, DIAGNOSTIC, PER STUDY DOSE |
| A9568 | TECHNETIUM TC-99M ARCITUMOMAB, DIAGNOSTIC, PER STUDY DOSE, UP TO 45 MILLICURIES |
| A9572 | INDIUM IN-111 PENTETREOTIDE, DIAGNOSTIC, PER STUDY DOSE, UP TO 6 MILLICURIES |

**Investigational; therefore not covered:**

| HCPCS Code | Description |
|---|---|
| S8080 | SCINTIMAMMOGRAPHY (RADIOIMMUNOSCINTIGRAPHY OF THE BREAST), UNILATERAL, INCLUDING SUPPLY OF RADIOPHARMACEUTICAL |

| POLICY TITLE | SCINTIMAMMOGRAPHY/BREAST-SPECIFIC GAMMA IMAGING/MOLECULAR BREAST IMAGING |
|---|---|
| POLICY NUMBER | MP-5.021 |

## X. POLICY HISTORY

| | |
|---|---|
| **MP 5.021** | **CAC 5/27/03** |
| | **CAC 4/26/05** |
| | **CAC 4/25/06** |
| | **CAC 4/24/07** Consensus |
| | **CAC 7/29/08** |
| | **CAC 7/28/09** Consensus Review |
| | **CAC 5/25/10** Adopted BCBSA Criteria |
| | **CAC 4/26/11** Changed title to match BCBSA title change. Changed policy statement to include "molecular imaging" as investigational to match BCBSA changes. |
| | **CAC 6/26/12** Consensus, no change to policy statement, references updated. |
| | **7/25/13** Admin coding review complete--rsb |
| | **CAC 9/24/13** Consensus, no change to policy statements, references updated. Changed FEP variation to reference the policy manual. Added rationale section. Updated Background/Description. |





**[Note: Final page is signature page and is kept on file, but not issued with Policy.]**