



## Scintimammography

Scintimammography uses small amounts of radioactive material, a special camera and a computer to help investigate a breast abnormality. Scintimammography can detect cancer even when dense breast tissue and breast implants are present. It can reduce unnecessary procedures by helping determine whether a biopsy is needed.

This exam requires little to no special preparation. Tell your doctor if there is any chance you are pregnant or you are breastfeeding. List any recent illnesses, medical conditions, allergies and medications you are taking, including vitamins and herbal supplements. Leave jewelry at home and wear loose, comfortable clothing. You may need to wear a gown.



## What is scintimammography?

Scintimammography is also known as nuclear medicine breast imaging, Breast Specific Gamma Imaging (BSGI) and Molecular Breast Imaging (MBI). Your doctor may use this exam to investigate a breast abnormality found with mammography.

Nuclear medicine imaging uses small amounts of radioactive material to diagnose, evaluate or treat a variety of diseases. These include many types of cancers, heart disease, gastrointestinal, endocrine or neurological disorders and other abnormalities. Because nuclear medicine exams can pinpoint molecular activity, they have the potential to identify disease in its earliest stages. They can also show whether a patient is responding to treatment.

This exam is noninvasive. It uses an injection of a radiotracer, a drug that emits radioactivity. The radiotracer accumulates differently in different kinds of tissue. This can help your doctor determine whether cancer could be present. It also helps your doctor to determine whether a biopsy or additional follow-up is necessary.

After injection, the radiotracer eventually accumulates in the breast, where it gives off energy in the form of gamma rays. This energy is detected by a device called a gamma camera. The camera and a computer

measure the amount of radiotracer absorbed by the body and produce pictures that detail organ and tissue structure and function.

## What are some common uses of the procedure?

Doctors use scintimammography as a follow-up to physical breast exams, mammograms, and/or ultrasounds. It helps doctors decide whether a breast abnormality requires biopsy. Scintimammography can detect breast cancer even when dense breast tissue or breast implants are present.

Scintimammography is not a primary screening tool. It does not replace mammography. Some doctors use it as an additional screening option in women who are at higher risk for breast cancer but cannot undergo an MRI.

## How should I prepare?

No special preparation is necessary.

You will wear a gown during the exam.

Women should always tell their doctor and technologist if there is any possibility that they are pregnant or they are breastfeeding. See the Safety page for more information about pregnancy and breastfeeding related to nuclear medicine imaging.

Tell your doctor and the technologist performing your exam about any medications you are taking, including vitamins and herbal supplements. List any allergies, recent illnesses and other medical conditions.

## What does the equipment look like?

Scintimammography uses high resolution gamma cameras that are placed next to the breast while in compression, similar to a mammogram. The machines used look similar to a mammography machine.

Most nuclear medicine exams use a gamma camera to detect radiation and take pictures from different angles. Scintimammography uses a specific kind of gamma camera that is much smaller than the usual camera. This makes it very easy to position the breasts while taking very detailed pictures.

## How does the procedure work?

Ordinary x-ray exams create an image by passing x-rays through the body. Nuclear medicine exams use a radioactive material called a radiopharmaceutical or radiotracer. This material is injected into the bloodstream, swallowed or inhaled as a gas. The material accumulates in the area of your body under

examination, where it gives off a small amount of energy in the form of gamma rays. Special cameras detect this energy and, with the help of a computer, create pictures that offer details on the structure and function of organs and tissues.

Unlike other imaging techniques, nuclear medicine exams focus on processes within the body, such as rates of metabolism or levels of various other chemical activity. Areas of greater intensity, called "hot spots," indicate where large amounts of the radiotracer have accumulated and where there is a high level of chemical or metabolic activity. Less intense areas, or "cold spots," indicate a smaller concentration of radiotracer and less activity.

Areas of greater intensity could require further evaluation through biopsy. Breast cancer, as well as some benign lesions, can cause areas of greater intensity in the breast.

## How is the procedure performed?

Scintimammography is usually performed on an outpatient basis.

The exam should take approximately 45-60 minutes.

Prior to imaging, the doctor or technologist will inject you with a small amount of radiotracer. One breast at a time will be placed next to the gamma camera and compressed with a flat plate, similar to a mammogram. Some machines place a gamma camera on each side of the breast. Each image takes about 10 minutes to capture. Two images of each breast are typically obtained. More images may be obtained depending upon the size of the breast or if a potential abnormality is identified. Therefore, the exam takes 45-60 minutes in most cases.

## What will I experience during and after the procedure?

You will feel a slight pin prick when the radiotracer is injected. After the injection, you may experience a brief metallic taste.

You will need to remain as still as possible while the camera takes each picture. Typically, you will be seated while the images are acquired. The breast compression must be firm to keep the breast from moving while the image is being obtained, but is not usually as tight as a regular mammogram.

Scintimammography does not cause pain. However, you may have some discomfort from having to remain still or maintain a particular position during imaging. If you think you may have difficulty remaining still or tolerating breast compression, tell your technologist before the exam begins.

When the examination is complete, you may be asked to wait until the technologist checks the images in case more images are needed. Sometimes, more images are obtained to clarify or better visualize certain areas or structures. The need for more images does not necessarily mean there was a problem with the exam or that something abnormal was found. It should not cause you concern.

Unless your doctor tells you otherwise, you may resume your normal activities after your exam. A

technologist, nurse or doctor will provide you with any necessary special instructions before you leave.

## Who interprets the results and how do I get them?

A radiologist or other doctor specially trained in nuclear medicine will interpret the images and send a report to your referring physician.

## What are the benefits vs. risks?

### Benefits

- Scintimammography can reduce unnecessary invasive procedures by helping doctors determine whether a breast abnormality requires biopsy.
- Scintimammography can detect breast cancer even when dense breast tissue or breast implants are present.

### Risks

- Because only a small dose of radiotracer is used, nuclear medicine exams have a relatively low radiation exposure. This is acceptable for diagnostic exams. Thus, the radiation risk is very low when compared with the potential benefits.
- Nuclear medicine diagnostic procedures have been used for more than five decades, and there are no known long-term adverse effects from such low-dose exposure.
- Treatment risks are always weighed against the potential benefits for nuclear medicine therapeutic procedures. Your doctor will inform you of all significant risks prior to the treatment and give you an opportunity to ask questions.
- Other imaging tests, such as mammography, ultrasound, and breast MRI, are lower in radiation dose than scintimammography. Therefore, they may be more useful for most women. However, scintimammography may be an alternative for women who cannot undergo these other exams.
- Allergic reactions to radiotracers are extremely rare and usually mild. Always tell the nuclear medicine personnel of any allergies you may have or other problems that may have occurred during a previous nuclear medicine exam.
- Injection of the radiotracer may cause slight pain and redness. This should rapidly resolve.
- Women should always tell their doctor and radiology technologist if there is any possibility that they are pregnant or they are breastfeeding. See the Safety in X-ray, Interventional Radiology and Nuclear Medicine Procedures page for more information about pregnancy, breastfeeding and nuclear medicine imaging.

## What are the limitations of scintimammography?

Scintimammography is not a primary breast cancer screening tool. It is not a replacement for mammography or ultrasound.

Nuclear medicine procedures can be time-consuming.

The image resolution of nuclear medicine images may not be as high as that of mammography or MRI.

An abnormality detected on scintimammography may be difficult to find using other imaging exams. This can make it difficult to perform a biopsy.

### Disclaimer

This information is copied from the RadiologyInfo Web site (<http://www.radiologyinfo.org>) which is dedicated to providing the highest quality information. To ensure that, each section is reviewed by a physician with expertise in the area presented. All information contained in the Web site is further reviewed by an ACR (American College of Radiology) - RSNA (Radiological Society of North America) committee, comprising physicians with expertise in several radiologic areas.

However, it is not possible to assure that this Web site contains complete, up-to-date information on any particular subject. Therefore, ACR and RSNA make no representations or warranties about the suitability of this information for use for any particular purpose. All information is provided "as is" without express or implied warranty.

Please visit the RadiologyInfo Web site at <http://www.radiologyinfo.org> to view or download the latest information.

**Note:** Images may be shown for illustrative purposes. Do not attempt to draw conclusions or make diagnoses by comparing these images to other medical images, particularly your own. Only qualified physicians should interpret images; the radiologist is the physician expert trained in medical imaging.

### Copyright

This material is copyrighted by either the Radiological Society of North America (RSNA), 820 Jorie Boulevard, Oak Brook, IL 60523-2251 or the American College of Radiology (ACR), 1891 Preston White Drive, Reston, VA 20191-4397. Commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is prohibited.

Copyright © 2019 Radiological Society of North America, Inc.