

# Health & Wellness News

SPRING 2007

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## To Catch a Cancer Earlier:

*How Two New Screening Tools Are Enhancing Care and Saving Lives*

### Breast-Specific Gamma Imaging

It's a common scenario: A woman goes for her annual screening mammogram. The radiologist tells her there are numerous areas of "asymmetry" and "calcifications" on her images that may or may not be cancer. A biopsy is considered, but the radiologist is uncertain whether it's necessary, or even what area to biopsy. Often, the recommendation is to wait another six months for a follow-up mammogram.

For some women, however, there may be another option. In 2005, Lahey Clinic became the first hospital in Massachusetts to offer an innovative, noninvasive screening method known as breast-specific gamma imaging (BSGI).

#### What Is BSGI?

BSGI is part of the nuclear medicine family of diagnostic tools, also referred to as molecular imaging technologies, which allow radiologists to detect changes on a cellular or metabolic level before structural changes can be detected.

"Breast gamma imaging provides us with another way of looking at breast tissue to diagnose breast cancer," explains Betsy Angelakis, MD, director of breast imaging at Lahey. "It's not the first line of breast cancer screening...the gold standard continues to be the mammogram. BSGI, however, is very helpful when we still have questions after a mammogram."

BSGI is a safe and painless test that involves injecting a small amount of a radioactive



*Betsy Angelakis, MD*

substance (radiopharmaceutical) called a tracing agent or tracer into a patient and then observing the substance through a high-resolution camera similar to an X-ray camera.

According to Angelakis, "Cancer cells absorb radioactive material, so if there is an area of cancer in the breast, it lights up. We call it a hot spot."

#### The Key to Earlier Diagnosis

While other imaging technologies such as magnetic resonance imaging (MRI) and ultrasound are also commonly used to help clarify inconclusive mammograms, BSGI is different in that it can detect changes indicative of cancer earlier, on a metabolic level, before changes in anatomy have even occurred. This is critical because disease always causes metabolic changes prior to anatomical changes.

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*To Catch a Cancer Earlier (Continued from page 1)*

“Molecular imaging technologies are powerful diagnostic tools because they are based on the biological activity of the tissue,” explains Angelakis. “Not only does BSGI allow us to detect cancer earlier, but, when the test is negative, we can also eliminate unnecessary biopsies. When the test is positive, we can obtain information that can help guide our physicians to the best treatment decisions for our patients.”

Currently BSGI is most useful in select patients with

- Dense breast tissue
- Suspicious areas on a mammogram
- Lumps that can be felt but not seen with mammography or ultrasound
- Implants and breast augmentation
- Scarring from previous breast surgery

“Having an inconclusive mammogram can be an extremely anxiety-provoking event for a woman,” says Angelakis. “In some circumstances, BSGI can give a definitive result immediately rather than waiting six months.

“With tools such as digital mammography and now BSGI at our disposal, we’re saving more lives. If we can catch cancer earlier, that’s another life saved.”

nologies available, Lahey Clinic Medical Center recently became one of the first hospitals in the area to acquire a state-of-the-art hybrid positron emission technology (PET) and computerized tomography (CT) scanner, known as a PET/CT for short.

### What Is PET/CT?

PET is a highly sensitive imaging tool that assesses the level of biochemical activity and blood flow in various organ systems of the human body. While PET offers the benefit of earlier cancer detection by identifying metabolic changes caused by cancer cells in the body, CT scanning provides doctors with a detailed picture of anatomical changes, including the size and shape of a cancer. By having access to these two powerful imaging technologies in one machine, physicians can more accurately and rapidly distinguish cancerous tissue from healthy tissue.

“Lahey’s new PET/CT scanner is an excellent imaging tool with multiple benefits for cancer patients,” explains Edward Pinkus, MD, director of nuclear medicine and PET/CT at Lahey. “It is particularly effective in identifying

marker levels can now have a PET/CT scan to determine if the cancer has recurred and to what extent, rather than having to undergo a surgical procedure called a laparotomy.

### How It Works

Patients undergoing a PET scan receive an intravenous injection of a radiopharmaceutical—a combination of sugar (glucose) and a radionuclide (radioactive element)—approximately 60 to 90 minutes before their exam. The radiopharmaceutical is then tracked and measured through the body using a special camera called a PET scanner.

“Different degrees of colors or brightness on a PET image indicate different levels of tissue or organ function,” explains Alison Lampke, MHA, CNMT, process manager of PET/CT. “Since cancer tissue accumulates more glucose than healthy tissue, any areas of cancer will appear brighter on the PET images.”

Cancers for which PET is considered particularly effective include lung; head and neck; colorectal; esophageal; lymphoma; melanoma; breast; thyroid; cervical; pancreatic and brain; as well as other less-frequently occurring cancers.



*Since cancer tissue accumulates more glucose than healthy tissue, any areas of cancer will appear brighter on the PET images.*

### PET/CT Scanning

What if doctors could detect both cellular and anatomical changes indicative of cancer in one quick and comprehensive scan?

In an ongoing effort to provide patients with the most progressive imaging tech-

whether cancer is present or not, if it has spread, if it is responding to treatment, and if a person is cancer free after treatment. A PET/CT scan can also help eliminate the need for biopsies and other invasive tests.” For example, a patient with a history of colon cancer who presents with elevated tumor

In addition to cancer detection, PET/CT is also useful in assessing certain cardiovascular and neurological conditions.

*For more information about nuclear medicine at Lahey, visit our Web site at [www.lahey.org](http://www.lahey.org).*