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## RSNA Press Release

### PET/CT Brings New Hope to Patients with Deadly Form of Breast Cancer

Released: November 27, 2007

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#### At A Glance

- Inflammatory breast cancer is a rare but aggressive form of breast cancer that affects women at a younger age and spreads quickly throughout the body.
- The disease is characterized by redness, swelling or warmth in the breast.
- FDG-PET/CT accurately identifies inflammatory breast cancer metastases early in the disease process, so treatment can be more effective.

CHICAGO - Researchers are improving the chances of women faced with an aggressive and difficult to diagnose form of breast cancer. Inflammatory breast cancer spreads quickly and can be lethal in six to nine months. But by using fluorodeoxyglucose positron emission tomography combined with computed tomography (FDG-PET/CT), radiologists and physicists are able to spot the spread of cancer earlier, according to a study presented today at the annual meeting of the Radiological Society of North America (RSNA).

"PET/CT is useful in staging inflammatory breast cancer, because it provides information on both the primary disease site, as well as disease involvement throughout the rest of the body," said Selin Carkaci, M.D., assistant professor of diagnostic radiology at The University of Texas M. D. Anderson Cancer Center (UTMDACC) in Houston. "In addition, PET/CT is also a practical tool for therapeutic planning."

Inflammatory breast cancer is a rare but extremely aggressive form of breast cancer that doesn't present like other forms of breast cancer. It accounts for 1 to 5 percent of all breast cancer cases in the United States. The disease tends to be diagnosed in women at a younger age and is characterized by redness, swelling or warmth in the breast. These symptoms occur within a three-month period. Often there is no palpable lump, and by the time it is diagnosed, the cancer has already metastasized, or spread, reducing the chances for survival. According to the American Cancer Society, the five-year survival rate for patients with inflammatory breast cancer is only 25 to 50 percent.

With FDG-PET/CT, researchers are able to accurately determine the location of metastases early in the disease process, when appropriate treatment can be administered.

"Breast cancer is not a local problem," said co-author Homer A. Macapinlac, M.D., chair and professor of nuclear medicine at UTMDACC. "It is a systemic disease."

The study included 41 women, mean age 50 years, who were newly diagnosed with inflammatory breast cancer. Each patient underwent a whole-body FDG-PET/CT exam.

FDG-PET/CT depicted metastases in 20 patients (49 percent). These findings were confirmed by biopsy and supplementary imaging. FDG-PET/CT produced only two false positive results, identifying those areas as cancerous when in fact no disease was present, resulting in a 95 percent accuracy rate. The PET/CT scans were also able to identify instances of cancer involvement in the patients' lymph nodes with 98 percent accuracy.

By performing PET/CT early in the treatment of inflammatory breast cancer, physicians can determine the effectiveness of the therapeutic regimen and make changes as needed.

PET provides information about how the body is functioning at the cellular level, while CT provides an anatomical rendering of the inside of the body. In an FDG-PET/CT scan, the CT first produces detailed images of the inner anatomy of the body. The patient is then injected with a small amount of a radioactive drug, which is F-18-labeled glucose, and PET is performed. Because fast-growing cancer cells feed on sugars like glucose, the PET/CT delineates areas where the glucose accumulates in the body, pinpointing the location of cancer cells.

"What's exciting about PET/CT is that it is able to detect disease in its earliest stages, when changes are happening at a functional and cellular level," Dr. Carkaci said. "This is quite different from other imaging modalities that identify disease when there is destruction of normal anatomy."

M. D. Anderson's Inflammatory Breast Cancer Clinic and Research Program, which opened in July 2007, is the world's first clinic devoted to research, diagnosis and treatment of the disease.

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RSNA is an association of more than 41,000 radiologists, radiation oncologists, medical physicists and related scientists committed to excellence in patient care through education and research. The Society is based in Oak Brook, Ill. ([RSNA.org](http://RSNA.org))

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