

New Mammography Technology Effective in Detecting Breast Cancer

Tuesday, Dec. 2, 2008 at 12:01 a.m. ET

AT A GLANCE

- **Positron emission mammography (PEM) is an effective tool for detecting breast cancer.**
- **Dense breast tissue and hormonal status are common limitations in mammography and breast MRI. PEM shows high sensitivity and is not limited by these factors.**
- **PEM has fewer false-positive results than breast MRI.**

CHICAGO – A study has found that high-resolution positron emission mammography (PEM), a new technique for imaging the breast, is not affected by either breast density or a woman's hormonal status, two factors that limit the effectiveness of standard mammography and MRI at detecting cancer. Results of the study were presented today at the annual meeting of the Radiological Society of North America (RSNA).

"The ability of PEM to detect cancer does not appear to be adversely affected by breast density, hormone replacement therapy or menopausal status," said lead researcher Kathy Schilling, M.D., director of breast imaging and intervention at the Center for Breast Care at Boca Raton Community Hospital in Florida. "The sensitivity of PEM is equal to or better than breast MRI, and PEM has fewer false-positive results."

The ability of x-ray mammography, a standard screening tool for breast cancer, to detect lesions is reduced when performed on dense breasts,

where tissue is less fatty and more glandular. Breast MRI is effective at detecting cancer in dense breasts and is increasingly being used to screen women at high risk for breast cancer. However, MRI has a high incidence of false-positive test results that indicate cancer is present when it is not. Researchers believe these false positives are due in part to hormonal changes that occur during a woman's menstrual cycle.

"Unless the MRI is performed on day seven through 14 of a woman's cycle, reading MRI images is extremely difficult," Dr. Schilling said. "This is a significant problem with breast MRI."

Because hormones do not have the same effect on PEM, Dr. Schilling believes the imaging technique could play a significant role both in preoperatively evaluating breast cancer patients and in screening high-risk patients.

In the study, 250 patients with breast cancer underwent high-resolution PEM, an application of positron emission tomography (PET) in which a small amount of radioactive material is injected into the body to measure metabolic activity and determine the presence of disease. The researchers used a PET unit specially developed for the breast and small body parts to perform the PEM exam.

Of 124 malignant lesions imaged, PEM detected 114 for an overall sensitivity rate of 92 percent. Eighteen percent were ductal carcinoma in situ (DCIS), a noninvasive cancer confined to the ducts of the breast; 82 percent were invasive cancer.

PEM successfully detected cancer in:

- 100 percent of fatty breasts
- 96 percent of dense breasts
- 91 percent of extremely dense breasts
- 93 percent of women both with and without a history of hormone replacement therapy
- 88 percent of pre-menopausal women
- 95 percent of post-menopausal women

According to Dr. Schilling, PEM imaging is well tolerated by patients, who sit upright during the exam and are not alone or closely confined as they would be during an MRI exam. While breast MRI exams produce more than 2,000 images to be interpreted, PEM produces just four images that can be correlated with a woman's mammogram.

"PEM is easier to use, easier to interpret and easier on the patients than MRI," Dr. Schilling said.