

# PET and breast cancer

---

## Breast cancer

Breast cancer is the second most common form of cancer in women in the United States (after skin cancer). Based on the current life expectancy for women in the United States, one out of nine women will develop breast cancer in her lifetime – a risk that was one out of 14 in 1960.

In 2003, 211,300 new cases of female invasive breast cancer (cancer that has spread to nearby tissue, lymph nodes under the arm, or other parts of the body) and 55,700 cases of female in situ breast cancer (non-invasive cancer) will be diagnosed. Of these non-invasive breast cancers, approximately 85 percent will be DCIS – ductal carcinoma in situ (abnormal cells that are found only in the lining of a milk duct and have not spread outside the duct). Breast cancer alone is expected to account for 32 percent of all new cancer cases among women in 2003 and a new case will be diagnosed every two and a half minutes.

This year, 39,800 women are expected to die of breast cancer. Breast cancer is the second leading cause of cancer death for all women (after lung cancer), and the leading overall cause of cancer death in women between the ages of 20 and 59. A woman will die from breast cancer every 13 minutes and more than one million women in the United States have died of this disease since 1970.

---

## Risk factors

Although every woman is at risk for breast cancer, the majority of breast cancer cases occur in women with no identifiable risk factors. Risk factors include:

- Personal or family history of breast cancer.
  - Not having children or having a first child after age 30.
  - Radiation therapy (RT) to the chest or upper body to treat Hodgkin's Disease, thyroid conditions or cancer
  - A history of previous breast biopsies and benign (not cancerous) breast disease with certain findings [such as atypical hyperplasia (cells that are both abnormal and increased in number) or LCIS – lobular carcinoma in situ (abnormal cells in the lining of the milk-producing tissue of the breast)] indicate cell changes that could progress to pre-malignant (pre-cancerous) or invasive breast cancer.
- 

## Early detection

A screening mammogram (a simple, low-dose X-ray) can detect breast cancer at its earliest stage, when it is most treatable, up to two years before it is large enough to be felt by a medical professional. More widespread use of regular screening mammography has been a major contributor to recent improvements in the breast cancer survival rate. A recent national survey showed that on average, 63 percent of women in the United States between the ages of 40 and 64 had received a mammogram within the past year.

NABCO recommends the following three-step program for good breast health:

1. Annual screening mammography should begin at age 40, or as directed by a medical professional, and continue as long as a woman is healthy and able to undergo the test.
  2. Annual clinical breast examinations (CBE) by a medical professional, starting at age 20.
  3. Every woman should learn the normal feel of her breasts, and check them herself regularly.
- 

## Diagnosis, treatment and survivorship

In the United States, over 80 percent of biopsied breast abnormalities prove to be benign, but any breast lump or symptom must be evaluated by a medical professional. New, less invasive biopsy procedures (such as stereotactic core needle biopsy) permit removal and evaluation of breast tissue in a surgeon's or radiologist's office, and require no special preparation or recovery period.

If detected early, breast cancer can be treated effectively with surgery that preserves the breast, followed by radiation therapy. This local therapy is often accompanied by chemotherapy and/or hormonal therapy. Currently, 63 percent of breast cancers are discovered at an early, "localized" stage, and five-year survival after treatment for early-stage breast cancer is 97 percent.

Today, only six percent of breast cancers are diagnosed at an advanced or metastatic stage, when the five-year survival rate is 23 percent.

There are over two million breast cancer survivors in the United States today.

---

## Role of PET

PET is known to be comparatively more accurate than mammography or other anatomic imaging techniques in instances of dense, fibrous breast tissue, or where implants are present. These conditions make conclusive diagnosis with conventional means challenging. Since PET is a metabolic, or functional method of imaging, its effectiveness is unimpaired by dense fibrous tissue or implants.

---

## Reimbursement for PET

Effective October 1, 2002, Medicare will reimburse PET as: (1) an adjunct to other imaging modalities for staging patients with distant metastasis and restaging patients with locoregional recurrence or metastasis, and (2) an adjunct to other imaging modalities for monitoring women with locally advanced and metastatic breast cancer when a change in therapy is contemplated.

Private insurance carriers may reimburse for PET in specific diagnostic workups for breast cancer. Insurance pre-certification is recommended. A letter of medical necessity with appropriate references is recommended for submission with the claim. Advance discussions with insurers regarding their policies and the rationale for specific PET studies are very helpful in preparing for the submission of claims as patient needs arise.

### Sources of statistics:

American Cancer Society, *Cancer Facts and Figures 2003*, January 2003. [www.cancer.org](http://www.cancer.org).

American Cancer Society, "Cancer Statistics, 2003," *A Cancer Journal for Clinicians*, January/February 2003.

*Manual of Clinical Oncology*, 4th edition, Lippincott Williams & Wilkins, 2000.

---

### Scan protocol:

Injected dose: 9.1 mCi 18F-FDG inj. i.v.

Patient weight: 65 kg (143 lbs)

Emission: 3 min/bed position

Low dose CT performed for PET attenuation correction and localization (parameters: mAs: 15, kVp: 140)

---

### Patient history:

Female diagnosed with breast and ovarian cancer.

---

### PET/CT findings:

PET/CT reveals significant pleural involvement of the left lung.

---

### Relevant articles and papers on breast cancer:

1. Yap CS, Valk P, Ariannejad M, et al. Evaluation of FDG-PET for the clinical management of breast cancer patients [abstract]. *J Nucl Med*. 2000;41:109P.
2. Schirmeister HH, Kuehn T, Buck AT, Reske SN. FDG-PET in preoperative staging of breast cancer [abstract]. *J Nucl Med*. 2000;41:28P.
3. Coleman RE. PET in Lung Cancer. *J Nucl Med*. 1999;40(5):814-820.
4. Schiepers C, Meta J, Yap C, et al. Characterization of solitary pulmonary nodules and lung cancer with FDG-PET. *J Nucl Med*. 2000.

