



## Screening Mammograms

### 1. What is a screening mammogram?

A screening mammogram is an x-ray of the breast used to detect breast changes in women who have no signs of breast cancer. It usually involves two x-rays of each breast. Using a mammogram, it is possible to detect a tumor that cannot be felt.

### 2. What is a diagnostic mammogram?

A diagnostic mammogram is an x-ray of the breast used to diagnose unusual breast changes, such as a lump, pain, nipple thickening or discharge, or a change in breast size or shape. A diagnostic mammogram is also used to evaluate abnormalities detected on a screening mammogram. It is a basic medical tool and is appropriate in the workup of breast changes, regardless of a woman's age.

### 3. What is the position of the National Cancer Institute (NCI) on screening mammograms?

The National Cancer Institute recommends that women in their forties or older get screening mammograms on a regular basis, every 1 to 2 years. Women who are at increased risk for breast cancer should seek medical advice about when to begin having mammograms and how often to be screened. (For example, a doctor may recommend that a woman at increased risk begin screening before age 40 or change her screening intervals to every year.)

### 4. What are the factors that place a woman at increased risk for breast cancer?

Every woman has some risk for developing breast cancer during her lifetime, and that risk increases as she ages. However, the risk of developing breast cancer is not the same for all women. These are the factors known to increase a woman's chance of developing this disease:

- **Personal History:** Women who have had breast cancer are more likely to develop a second breast cancer.
- **Family History:** The risk of getting breast cancer increases for a woman whose mother, sister, or daughter has had the disease; or who has two or more close relatives, such as cousins or aunts, with a history of breast cancer (especially if diagnosed before age 40). About 5 percent of women with breast cancer have a hereditary form of this disease.
- **Genetic Alterations:** Specific alterations in certain genes, such as those in the breast cancer genes BRCA1 or BRCA2, make women more susceptible to breast cancer.
- **Abnormal Biopsy:** Women with certain abnormal breast conditions, such as atypical hyperplasia or LCIS (lobular carcinoma in situ), are at increased risk.
- Other conditions associated with an increased risk of breast cancer: Women ages 45 or older that have at least 75 percent dense tissue on a mammogram are at elevated risk. (This is not only because tumors in dense breasts are more difficult to "see," but because, in older women, dense breast tissue itself is related to an increased chance of developing breast cancer.)

Women who received chest irradiation for conditions such as Hodgkin's disease at age 30 or younger are at higher risk for breast cancer throughout their lives and require regular monitoring for breast cancer. A woman who has her first child at age 30 or older has an increased risk of breast cancer.

Recent evidence suggests that menopausal women who have long-term exposure (greater than 10 years) to hormone replacement therapy (HRT) may have a slightly increased risk of breast cancer.

### **5. What are the chances that a woman in the United States might get breast cancer?**

Age is the most important factor in the risk for breast cancer. The older a woman is, the greater her chance of getting breast cancer. No woman should consider herself too old to need regular screening mammograms. A woman's chance. . .

- by age 30. . . 1 out of 2,525
- by age 40. . . 1 out of 217
- by age 50. . . 1 out of 50
- by age 60. . . 1 out of 24
- by age 70. . . 1 out of 14
- by age 80. . . 1 out of 10

(Source: NCI's Surveillance, Epidemiology, and End Results Program & American Cancer Society, 1993)

About 80 percent of breast cancers occur in women over the age of 50; the number of cases is especially high for women over age 60. Breast cancer is uncommon in women under age 40.

### **6. What is the best method of detecting breast cancer as early as possible?**

A high-quality mammogram, with a clinical breast exam (an exam done by a professional health care provider), is the most effective way to detect breast cancer early when it is most treatable. Using a mammogram, it is possible to detect breast cancer that cannot be felt. However, like any test, mammograms have both benefits and limitations. When a woman examines her own breasts, it is called breast self-exam (BSE). Studies so far have not shown that BSE alone reduces the numbers of deaths from breast cancer. Therefore, it should not be used in place of clinical breast exam and mammography.

### **7. What are the benefits of screening mammograms?**

- Saved lives: Several studies have shown that regular screening mammograms can help to decrease the chance of dying from breast cancer. The benefits of regular screening are greater for women over age 50. For women in their forties, there is recent evidence that having mammograms on a regular basis reduces their chances of dying from breast cancer by about 17 percent. For women between the ages of 50 and 69, there is strong evidence that screening with mammography on a regular basis reduces breast cancer deaths by about 30 percent.
- Estimates show that if 10,000 women age 40 were screened every year for 10 years, about four lives would be saved. In comparison, regular screening of 10,000 women age 50 would save about 37 lives.
- More treatment options: In some cases, finding a breast tumor early may mean that a woman can choose surgery that saves her breast. Also, a woman whose breast tumor is detected in its early stages may not have to undergo chemotherapy.

### **8. What are some of the limitations of screening mammograms?**

- Detection does not always mean saving lives: Even though mammography can detect most tumors that are 5 millimeters in size, (5 millimeters is about 1/4 inch) and some as small as 1 millimeter, finding a small tumor does not always mean that a woman's life will be saved. Mammography may not help a woman with a fast-growing or aggressive cancer that has already spread to other parts of her body before being detected.
- False Negatives: False negatives occur when mammograms appear normal even though breast cancer is actually present. False negatives are more common in younger women than in older women. The dense breasts of younger women contain many glands and ligaments, which make breast cancers more difficult to spot in mammograms. As women age, breast tissues become more fatty and breast cancers are more easily "seen" by screening mammograms. Screening mammograms miss up to 25 percent of breast cancers in women in their forties compared with about 10 percent of cancers for older women.



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- **False Positives:** False positives occur when mammograms are read as abnormal, but no cancer is actually present. For women at all ages, between 5 percent and 10 percent of mammograms are abnormal and are followed up with additional testing (a diagnostic mammogram, fine needle aspirate, ultrasound, or biopsy). Most abnormalities will turn out not to be cancer. False positives are more common in younger women than older women. About 97 percent of women ages 40 to 49 who have abnormal mammograms turn out not to have cancer, as compared with about 86 percent for women age 50 and older. But all women have to undergo followup procedures when they have an abnormal mammogram.
- **DCIS:** Over the past 30 years, improvements in mammography have resulted in an ability to detect a higher number of small tissue abnormalities called ductal carcinomas in situ (DCIS), abnormal cells confined to the milk ducts of the breast. Some of these can eventually go on to become actual cancers, but many do not. Because it is not possible to predict which ones will progress to invasive cancer, DCIS is commonly removed surgically; some are treated with mastectomy, some with breast-sparing surgery. There is disagreement among experts about the extent of surgery necessary for DCIS. Younger women have a higher proportion of DCIS than older women. Approximately 45 percent of breast cancers detected by screening mammograms in women ages 40 to 49 are DCIS compared with about 20 to 30 percent of those detected in women age 50 and older.

### **9. How much does a mammogram cost?**

Most screening mammograms cost between \$50 and \$150. Most states now have laws requiring health insurance companies to reimburse all or part of the cost of screening mammograms. Details can be provided by insurance companies and health care providers. Currently, Medicare pays for part of the cost of one screening mammogram every 2 years for women who are eligible for Medicare benefits. On January 1, 1998, this coverage will increase to one screening mammogram every year.

Information on coverage is available through the Medicare Hotline at 1-800-638-6833.

Some state and local health programs and employers provide mammograms free or at low cost. Information on low-cost or free mammography screening programs is available through the NCI's Cancer Information Service at 1-800-4-CANCER.

### **10. Where can a woman get a high quality mammogram?**

Women can get high quality mammograms in breast clinics, radiology departments of hospitals, mobile vans, private radiology offices, and doctors' offices. Through the Mammography Quality Standards Act, all mammography facilities are required to display certification by the Food and Drug Administration (FDA). To be certified, facilities must meet standards for the equipment they use, the people who work there, and the records they keep. Women should go to an FDA-certified facility and look for the certificate and expiration date. Women can ask their doctors or staff at the mammography facility about FDA-certification before making an appointment. Information about local FDA-certified mammography facilities is available through NCI's Cancer Information Service at 1-800-4-CANCER.

### **11. What technologies are under development for breast cancer screening?**

The NCI is supporting the development of several new technologies to detect breast tumors. This research ranges from technologies under development in research labs to those that have reached the stage of testing in humans, known as clinical trials. Efforts to improve conventional mammography include digital mammography, where computers assist in the interpretation of the x-rays. Other studies are aimed at

developing teleradiology, sending x-rays electronically, for long-distance clinical consultations. A non-X-ray based technology under development is magnetic resonance imaging (MRI).

In addition to imaging technologies, NCI-supported scientists are exploring methods to detect markers of breast cancer in blood, urine, or nipple aspirates that may serve as early warning signals for breast cancer.

## **12. What studies is NCI supporting to find better ways to prevent and treat breast cancer?**

NCI is supporting many studies that are looking for improved prevention and treatment for breast cancer.

- **Basic Research:** Many studies are taking place to identify the causes of breast cancer, including an analysis of the role that alterations in the BRCA1 and BRCA2 genes play in the development of cancer. Scientists also are looking at how these genes interact with other genes and with hormonal, dietary, and environmental factors to determine what influences the development of breast cancer.
- **Prevention:** Researchers are looking for ways to prevent breast cancer in women who are at increased risk. In addition, studies currently under way involving diet, nutrition, and environmental factors could also lead to new prevention strategies.
- **Treatment:** Several studies are aimed at finding treatments for breast cancer that are more effective and less toxic than current methods. Women who would like more information on cancer prevention, treatment, or screening studies can call NCI's Cancer Information Service at 1-800-4-CANCER.