

## BREAST CANCER

**Breast cancer is a disease in which malignant (cancer) cells form in the tissues of the breast.**

The breast is made up of lobes and ducts. Each breast has 15 to 20 sections called lobes, which have many smaller sections called lobules. Lobules end in dozens of tiny bulbs that can produce milk. The lobes, lobules, and bulbs are linked by thin tubes called ducts.

Each breast also contains blood vessels and lymph vessels. The lymph vessels carry an almost colorless fluid called lymph. Lymph vessels lead to organs called lymph nodes. Lymph nodes are small bean-shaped structures that are found throughout the body. They filter substances in lymph and help fight infection and disease. Clusters of lymph nodes are found near the breast in the axilla (under the arm), above the collarbone, and in the chest.

The most common type of breast cancer is ductal carcinoma, which begins in the cells of the ducts. Cancer that begins in the lobes or lobules is called lobular carcinoma and is more often found in both breasts than are other types of breast cancer. Inflammatory breast cancer is an uncommon type of breast cancer in which the breast is warm, red, and swollen.

### RISK FACTORS

Risk Factors include the following:

- A family or personal history of breast cancer.
- Never having given birth.
- Menstruating at an early age.
- Older age.

### SCREENING FOR BREAST CANCER

**Breast Self-Examination** - When you examine your own breasts it is called breast self-examination (BSE). Studies so far have not shown that BSE alone reduces the number of deaths from breast cancer. Therefore, it should not be used in place of clinical breast examination and mammography.

**Clinical Breast Examination** - During your routine physical examination, your doctor or health care professional may do a clinical breast examination (CBE). During a CBE, your doctor will carefully feel your breasts and under your arms to check for lumps or other unusual changes.

**Mammogram** - A mammogram is a special x-ray of the breast that can often find tumors that are too small for you or your doctor to feel. Your doctor may suggest that you have a mammogram, especially if you have any of the risk factors listed above.

The ability of mammography to detect cancer depends on such factors as the size of the tumor, the age of the woman, breast density, and the skill of the radiologist. Studies have found that screening mammography is beneficial in women aged 50 to 69. Screening in women younger than 50 years or older than 69 years may or may not be helpful.

Ultrasonography - During ultrasonography, sound waves (called ultrasound) are bounced off tissues and the echoes are converted into a picture (sonogram). Ultrasound is used to evaluate lumps that have been identified by BSE, CBE, or mammography. Studies have not shown that ultrasonography is of any proven benefit in detecting breast cancer.

Magnetic Resonance Imaging (MRI) - A procedure in which a magnet linked to a computer is used to create detailed pictures of areas inside the body. MRIs are used to evaluate breast masses that have been found by BSE or CBE and to recognize the difference between cancer and scar tissue. The role of MRI in breast cancer screening has not yet been established.

Other screening methods are being studied. Your doctor can talk to you about what screening tests might be appropriate for you.

## **DIAGNOSIS (Tests that examine the breasts to help diagnose (find) breast cancer).**

**A doctor should be seen if changes in the breast are noticed. The following tests or procedures can help diagnose breast cancer:**

- Mammogram: An x-ray of the breast that may find tumors that are too small to feel.
- Biopsy: The removal of cells, tissues, or fluid to view under a microscope and check for signs of disease. If a lump in the breast is found, the doctor may need to cut out a small piece of the lump and look at it under the microscope to see if there are any cancer cells. Four types of biopsies are as follows:
  - Excisional biopsy: The removal of an entire tumor or lesion.
  - Incisional biopsy: The removal of part of the tumor or lesion.
  - Core biopsy: The removal of a sample of tissue with a wide needle.
  - Needle biopsy or fine-needle aspiration biopsy: The removal of a sample of tissue or fluid with a very thin needle.
- Estrogen and progesterone receptor tests: If cancer is found, these tests may tell whether estrogen and progesterone (hormones) affect the way the cancer grows. These tests may also give information about the chances of the tumor recurring (coming back). The test results show whether hormone therapy is likely to stop the cancer from growing. To perform these tests, tissue from the tumor is examined in the laboratory, usually at the time of biopsy.

## **Certain factors affect choice of treatment and prognosis (chance of recovery).**

The choice of treatment and prognosis (chance of recovery) depend on the stage of the cancer (whether it is in the breast only or has spread to other places in the body), the type of breast cancer, certain characteristics of the cancer cells, and whether the cancer is found in the other breast. A woman's age, menopausal status (whether a woman is still having menstrual periods), and general health can also affect choice of treatment and prognosis.

## **After breast cancer has been diagnosed (found), tests are done to find out if cancer cells have spread within the breast or to other parts of the body.**

The process used to find out whether the cancer has spread within the breast or to other parts of the body is called staging. It is important to know the stage of the disease in order to plan the best treatment.

### **STAGES OF BREAST CANCER:**

#### **Stage 0 (carcinoma in situ)**

There are 2 types of breast carcinoma in situ:

- Ductal carcinoma in situ (DCIS) is a very early breast cancer that may develop into an invasive type of breast cancer (cancer that has spread from the duct into surrounding tissues).
- Lobular carcinoma in situ (LCIS) is not cancer, but rather a marker or indicator that identifies a woman as having an increased risk of developing invasive breast cancer (cancer that has spread into surrounding tissues). It is common for both breasts to be affected.

#### **Stage I**

In stage I, the cancer is no larger than 2 centimeters (about 1 inch) and has not spread outside the breast.

#### **Stage IIA**

In stage IIA, the cancer is either:

- no larger than 2 centimeters (about 1 inch) but has spread to the axillary lymph nodes (the lymph nodes under the arm); or
- between 2 and 5 centimeters (1 to 2 inches) but has not spread to the axillary lymph nodes.

#### **Stage IIB**

In stage IIB, the cancer is either:

- between 2 and 5 centimeters (1 to 2 inches) and has spread to the axillary lymph nodes (the lymph nodes under the arm); or
- larger than 5 centimeters (about 2 inches) but has not spread to the axillary lymph nodes.

### **Stage IIIA**

In stage IIIA, the cancer is either:

- smaller than 5 centimeters (about 2 inches) and has spread to the axillary lymph nodes (the lymph nodes under the arm), and the lymph nodes are attached to each other or to other structures; or
- larger than 5 centimeters and has spread to the axillary lymph nodes and the lymph nodes may be attached to each other or to other structures.

### **Stage IIIB**

In stage IIIB, the cancer has either:

- spread to tissues near the breast (the skin or chest wall, including the ribs and muscles in the chest); or
- spread to lymph nodes inside the chest wall along the breastbone.

### **Stage IV**

In stage IV, the cancer has either:

- spread to other organs of the body, most often the bones, lungs, liver, or brain; or
- spread to the lymph nodes in the neck, near the collarbone.

## **Inflammatory Breast Cancer**

In inflammatory breast cancer, the breast looks red and swollen and feels warm. The redness and warmth occur because the cancer cells block the lymph vessels in the skin. The skin of the breast may also show the pitted appearance called peau d'orange (like the skin of an orange).

## **Recurrent Breast Cancer**

Recurrent breast cancer is cancer that has recurred (come back) after it has been treated. Recurrent breast cancer may come back in the breast, in the chest wall, or in another part of the body.

## **TREATMENT OF BREAST CANCER:**

### **Surgery**

Most patients with breast cancer have surgery to remove the cancer from the breast. Some of the lymph nodes under the arm are usually taken out and looked at under a microscope to see if cancer cells have spread to the lymph nodes.

Breast-conserving surgery, an operation to remove the cancer but not the breast itself, includes the following:

- **Lumpectomy:** Removal of the tumor and a small amount of normal tissue around it. Lumpectomy is usually followed by radiation therapy to the breast. Most doctors also take out some of the lymph nodes under the arm.
- **Partial or segmental mastectomy:** Removal of the cancer, some of the breast tissue around the tumor, and the lining over the chest muscles below the tumor. Some of the lymph nodes under the arm are usually taken out. In most cases, partial mastectomy is followed by radiation therapy.

Other types of surgery include the following:

- **Total or simple mastectomy:** Removal of the whole breast. Sometimes lymph nodes under the arm are also taken out.
- **Modified radical mastectomy:** Removal of the breast, many of the lymph nodes under the arm, the lining over the chest muscles, and sometimes, part of the chest wall muscles.
- **Radical mastectomy (sometimes called the Halsted radical mastectomy):** Removal of the breast, chest muscles, and all of the lymph nodes under the arm. This surgery is used only when the tumor has spread to the chest muscles.

Even if the doctor removes all of the cancer that can be seen at the time of surgery, the patient may be given radiation therapy, chemotherapy, or hormone therapy after surgery to try to kill any cancer cells that may be left. Treatment given after surgery to increase the chances of a cure is called adjuvant therapy.

If a patient is going to have a mastectomy, breast reconstruction (surgery to rebuild a breast's shape after a mastectomy) may be considered. Breast reconstruction may be done at the time of the mastectomy or at a future time. The reconstructed breast may be made with the patient's own (nonbreast) tissue or by using implants filled with saline or silicone gel. The Food and Drug Administration (FDA) has decided that breast implants filled with silicone gel may be used only in clinical trials. Before the decision to get an implant is made, patients can call the FDA's Center for Devices and Radiologic Health at 1-888-INFO-FDA (1-888-463-6332) for more information.

## Radiation therapy

Radiation therapy is the use of x-rays or other types of radiation to kill cancer cells and shrink tumors. Radiation therapy may use external radiation (using a machine outside the body) or internal radiation. Internal radiation involves putting radioisotopes (materials that produce radiation) through thin plastic tubes into the area where cancer cells are found. Radiation may be used after surgery in addition to chemotherapy, and hormone therapy. Breast cancer is treated with external radiation.

## Chemotherapy

Chemotherapy is the use of drugs to kill cancer cells. Chemotherapy may be taken by mouth, or it may be put into the body by inserting a needle into a vein or muscle. Either type of chemotherapy is called systemic treatment because the drugs enter the bloodstream, travel through the body, and can kill cancer cells throughout the body.

## Hormone therapy

Hormones are chemicals produced by glands in the body and are circulated in the bloodstream. Estrogen and progesterone are hormones that affect the way some cancers grow. If tests show that the cancer cells have estrogen and progesterone receptors (molecules found in some cancer cells to which estrogen and progesterone will attach), hormone therapy is used to block the way these hormones help the cancer grow. This may be done by using drugs that block the way hormones work or by surgically removing organs that make hormones, such as the ovaries.

Hormone therapy with tamoxifen is often given to patients with early stages of breast cancer and those with metastatic breast cancer (cancer that has spread to other parts of the body). Hormone therapy with tamoxifen or estrogens can act on cells all over the body and may increase the chance of developing endometrial cancer. Women taking tamoxifen should have a pelvic examination every year to look for any signs of cancer. Any vaginal bleeding, other than menstrual bleeding, should be reported to a doctor as soon as possible.

## Treatment Options for Inflammatory Breast Cancer

Treatment of inflammatory breast cancer may include the following:

- Systemic chemotherapy.
- Systemic chemotherapy followed by surgery (breast-conserving surgery or total mastectomy), with lymph node removal followed by radiation therapy. Additional systemic therapy (chemotherapy, hormone therapy, or both) may be given.
- Clinical trials testing new anticancer drugs, new drug combinations, and new ways of giving treatment.

## Treatment Options for Recurrent Breast Cancer

Treatment of recurrent breast cancer (cancer that has come back after treatment) in the breast or chest wall may be:

- Surgery (radical or modified radical mastectomy), radiation therapy, or both.
- Systemic chemotherapy or hormone therapy.

## **BREAST CANCER PREVENTION**

Breast cancer is second only to lung cancer as the leading cause of cancer death among women in the United States. Breast cancer occurs in men also, but the number of new cases is small. Early detection and effective treatment is expected to reduce the number of women who die from breast cancer, and development of new methods of prevention continue to be studied.

Breast cancer can sometimes be associated with known risk factors for the disease. Many risk factors are modifiable though not all can be avoided.

### Tamoxifen for Prevention of Breast Cancer

Tamoxifen is a drug that blocks the effect of estrogen on breast cancer cells. A large study has shown that tamoxifen lowers the risk of getting breast cancer in women who are at elevated risk of getting breast cancer. However, tamoxifen may also increase the risk of getting some other serious diseases, including endometrial cancer, stroke, and blood clots in

veins and in the lungs. Women who are concerned that they may be at an increased risk of developing breast cancer should talk with their doctor about whether to take tamoxifen to prevent breast cancer. It is important to consider both the benefits and risks of taking Diet and Lifestyle

Diet is being studied as a risk factor for breast cancer. Studies show that in populations that consume a high-fat diet, women are more likely to die of breast cancer than women in populations that consume a low-fat diet. It is not known if a diet low in fat will prevent breast cancer. Studies also show that certain vitamins may decrease a woman's risk of

breast cancer, especially premenopausal women at high risk. Exercise, especially in young women, may decrease hormone levels and contribute to a decreased breast cancer risk. Breast feeding may also decrease a woman's risk of breast cancer. Studies suggest that the consumption of alcohol is associated with a slight increase in the risk of developing

breast cancer. Postmenopausal weight gain, especially after natural menopause and/or after age 60, may increase breast cancer risk.

### Hormonal Factors

Hormones produced by the ovaries appear to increase a woman's risk for developing breast cancer. The removal of one or both ovaries reduces the risk. The use of drugs that suppress the production of estrogen may inhibit tumor cell growth. The use of hormone replacement therapy may be associated with an increased risk of developing breast cancer, mostly in recent users. The use of oral contraceptives may also be associated with a slight increase in breast cancer risk.

### Radiation

Studies have shown that reducing the number of chest x-rays, especially at a young age, decreases the risk of breast cancer. Radiation treatment for childhood Hodgkin's disease may put women at a greater risk for breast cancer later in life. A small number of breast cancer cases can be linked to radiation exposure.

### Prophylactic Mastectomy

Following cancer risk assessment and counseling, the removal of both breasts may reduce the risk of breast cancer in women with a family history of breast cancer

## **MALE BREAST CANCER**

Breast cancer may occur in men. Men at any age may develop breast cancer, but it is usually diagnosed (found) in men between 60 and 70 years of age. Male breast cancer makes up less than 1% of all cases of breast cancer.

### **RISK FACTORS**

Risk factors for breast cancer in men may include the following:

- Exposure to radiation.
- Having a disease related to high levels of estrogen in the body, such as cirrhosis (liver disease) or Klinefelter's syndrome (a genetic disorder).
- Having several female relatives who have had breast cancer

### **DETECTING BREAST CANCER IN MALE.**

A doctor should be seen if changes in the breasts are noticed. Typically, men with breast cancer have lumps that can be felt. A biopsy can be done to check for cancer.

### **Survival for men with breast cancer is similar to survival for women with breast cancer.**

Survival for men with breast cancer is similar to that for women with breast cancer when their stage at diagnosis is the same. Breast cancer in men, however, is often diagnosed at a later stage. Cancer found at a later stage may be less likely to be cured.

### **Four types of standard treatment are used to treat MEN with breast cancer:**

## Surgery

Surgery for men with breast cancer is usually a modified radical mastectomy (removal of the breast, the lining over the chest muscles, and sometimes part of the chest wall muscles). Some of the lymph nodes (small organs that help fight infection and disease) under the arm may also be removed and examined under a microscope.

## Chemotherapy

Chemotherapy is the use of drugs to kill cancer cells. Chemotherapy may be taken by mouth, or it may be put into the body by inserting a needle into a vein or muscle. Either type of chemotherapy is called systemic treatment because the drugs enter the bloodstream, travel through the body, and can kill cancer cells throughout the body.

## Hormone therapy

Hormones are chemicals produced by glands in the body and are circulated in the bloodstream. Estrogen and progesterone are hormones that affect the way a cancer grows. If tests show that the cancer cells have estrogen and progesterone receptors (proteins found in some cancer cells to which estrogen and progesterone will attach), hormone therapy is used to block the way these hormones help the cancer grow. This may be done by using drugs that block the way hormones work or by surgically removing organs that make hormones, such as the testicles. Although estrogen is commonly thought of as a female hormone, it does occur in small amounts in males. Patients with early stages of breast cancer often receive hormone therapy with tamoxifen (an anticancer drug that blocks the effects of estrogen in the body).

## Radiation therapy

Radiation therapy is the use of x-rays or other types of radiation to kill cancer cells and shrink tumors. Radiation therapy may use external radiation (using a machine outside the body) or internal radiation. Internal radiation involves putting radioisotopes (materials that produce radiation) through thin plastic tubes into the area where cancer cells are found.

## BREAST CANCER AND PREGNANCY

- Breast cancer is a disease in which malignant (cancer) cells form in the tissues of the breast.
- Breast cancer is sometimes diagnosed (found) in women who are pregnant or have just given birth.
- It may be difficult to diagnose (find) breast cancer early in pregnant or nursing women, whose breasts are often tender and swollen.
- Breast examination should be part of prenatal care.
- Tests that examine the breasts are used to diagnose (find) breast cancer.

- Certain factors affect choice of treatment and prognosis (chance of recovery).
- Survival rates of pregnant women with breast cancer may be lower than for women who are not pregnant.
- There are treatments for all patients with breast cancer.
- Treatment options for pregnant women depend on the stage of the disease and the age of the fetus.
- Ending the pregnancy does not seem to improve the mother's chance of survival and is not usually a treatment option.
- Lactation (breast milk production) and breast-feeding should be stopped if surgery or chemotherapy is planned.
- Breast cancer does not appear to harm the fetus.
- Pregnancy does not seem to affect the survival of women who have had breast cancer in the past.

Effects of certain cancer treatments on later pregnancies are not known.