

# BREAST CANCER

## Overview

### What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out, damaged, or dying cells.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of this out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells keep on growing and form new cancer cells. These cancer cells can grow into (invade) other tissues, something that normal cells cannot do. Being able to grow out of control and invade other tissues are what makes a cell a cancer cell.

In most cases the cancer cells form a tumor. But some cancers, like leukemia, rarely form tumors. Instead, these cancer cells are in the blood and bone marrow.

When cancer cells get into the bloodstream or lymph vessels, they can travel to other parts of the body. There they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis* (muh-tas-tuh-sis).

No matter where a cancer may spread, it is always named for the place where it started. For instance, breast cancer that has spread to the liver is still called breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is called metastatic prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their own kind of cancer.

Not all tumors are cancerous. Tumors that aren't cancer are called *benign* (be-nine). Benign tumors can cause problems-- they can grow very large and press on healthy organs and tissues. But they cannot grow into other tissues. Because of this, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

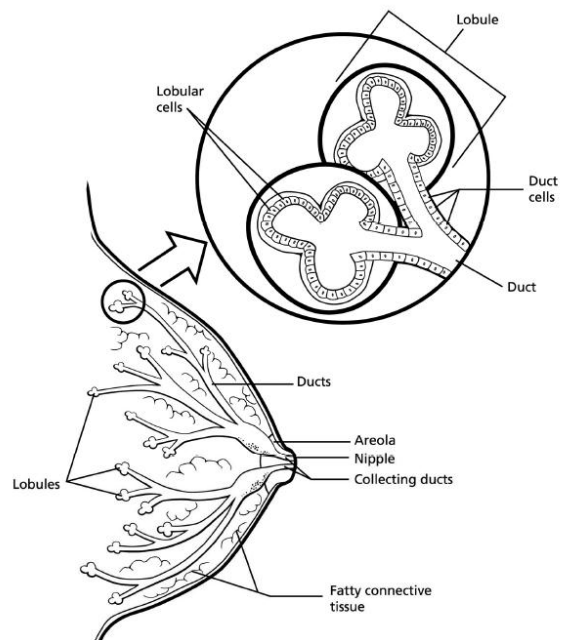
# What is breast cancer?

Breast cancer is a malignant (cancer) tumor that starts in the cells of the breast. It is found mostly in women, but men can get breast cancer, too. Here we will only talk about breast cancer in women.

## The normal breast

To understand breast cancer, it helps to know something about the normal parts of the breasts, as shown in the picture below.

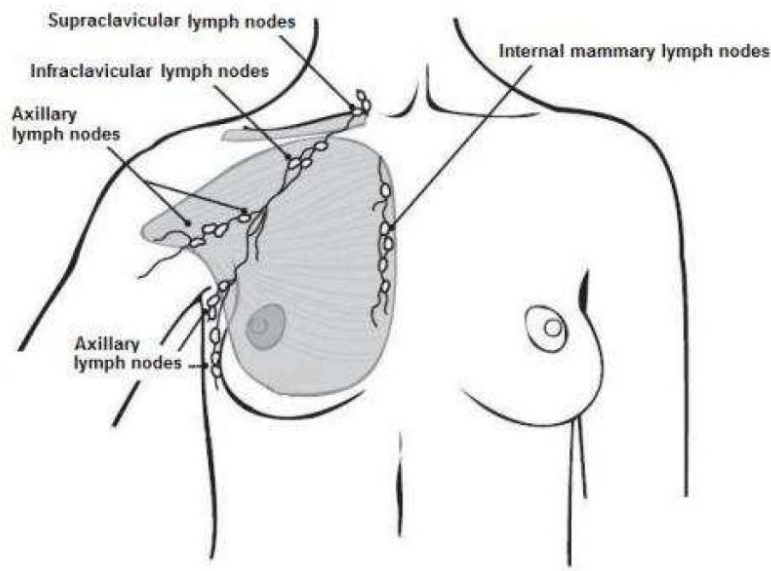
A woman's breast is made up of glands (called *lobules*) that make breast milk, *ducts* (small tubes that carry milk from the lobules to the nipple), fatty and connective tissue, blood vessels, and lymph (pronounced limf) vessels. Most breast cancers begin in the cells that line the ducts (ductal cancer), some begin in the lobules (lobular cancer), and a small number start in other tissues.



## The lymph system of the breast

The lymph system is one of the main ways in which breast cancers can spread. Lymph nodes are small, bean-shaped groups of immune system cells (cells that fight infections) that are connected by lymphatic vessels. Lymphatic vessels are like small veins, except that they carry a clear fluid called lymph (instead of blood) away from the breast. Breast cancer cells can enter lymphatic vessels and begin to grow in lymph nodes.

Most lymph vessels of the breast lead to lymph nodes under the arm. These are called *axillary nodes*. If breast cancer cells reach the underarm lymph nodes and keep on growing, they cause the nodes to swell. The doctor needs to know whether cancer cells have spread to lymph nodes because if they have, there is a higher chance that the cells have also gotten into the bloodstream and spread to other places in the body. The more lymph nodes that have cancer in them, the more likely it is that the cancer will be found in other organs, too. This could affect the treatment plan.



## Breast lumps that are not cancer (benign breast lumps)

Most breast lumps are benign. This means they are not cancer. Benign breast tumors are abnormal growths, but they do not spread outside of the breast and they are not life threatening. But some benign breast lumps can increase a woman's risk of getting breast cancer.

Most lumps are caused by fibrocystic changes. Cysts are fluid-filled sacs. Fibrosis is the formation of scar-like tissue. These changes can cause breast swelling and pain. They often happen just before a woman's period is about to start. The breasts may feel lumpy, and sometimes there is a clear or slightly cloudy nipple discharge.

## Types of breast cancers

There are many types of breast cancer, but some of them are very rare. Sometimes a breast tumor can be a mix of these types or a mixture of invasive and in situ cancer.

**Ductal carcinoma in situ (DCIS):** This is the most common type of non-invasive breast cancer. DCIS means that the cancer is only in the ducts. It has not spread through the walls of the ducts into the tissue of the breast and so cannot spread to lymph nodes or other organs. Nearly all women with cancer at this stage can be cured. Often one of the best ways to find DCIS early is with a mammogram.

**Lobular carcinoma in situ (LCIS):** This is not a true cancer, and is discussed in the section "What causes breast cancer?"

**Invasive (or infiltrating) ductal carcinoma (IDC):** This is the most common breast cancer. It starts in a milk passage (a duct), breaks through the wall of the duct, and invades the tissue of the breast. From there it may be able to spread (metastasize) to other parts of the body. It accounts for about 8 out of 10 invasive breast cancers.

**Invasive (infiltrating) lobular carcinoma (ILC):** This cancer starts in the milk glands (the lobules) and then spreads through the wall of the lobules. It can then spread (metastasize) to other parts of the body. About 1 in 10 invasive breast cancers are of this type.

**Inflammatory breast cancer (IBC):** This uncommon type of invasive breast cancer accounts for about 1% to 3% of all breast cancers. Usually there is no single lump or tumor. Instead, IBC makes the skin of the breast look red and feel warm. It also may make the skin look thick and pitted, something like an orange peel. The breast may get bigger, hard, tender, or itchy.

In its early stages, inflammatory breast cancer is often mistaken for infection. Because there is no defined lump, it may not show up on a mammogram, which may make it even harder to catch it early. It has a higher chance of spreading and a worse outlook than invasive ductal or lobular cancer.

## CAUSES AND EPIDEMIOLOGY

### CAUSES OF BREAST CANCER

The precise reason to the development of breast cancer is still unknown. However, some thought that it is an outcome of the interplay between the following factors:

#### A. Genetic Cause

About 5%-10% of breast cancers are believed to be hereditary, as a result of mutations, or changes, in certain genes that are passed along in families. The risk of breast cancer is higher among women who have relatives with the disease.

*BRCA1* and *BRCA2*; and TP53 are abnormal genes that, when inherited, markedly increase the risk of breast cancer to a lifetime risk estimated between 40%-85%.

#### B. Hormonal Cause

Hormonal influences play a role in the development of breast cancer.

- **Menarche and the menstrual cycle**--The older a woman is when she begins menstruating, the lower her risk of breast cancer. For each 1-year delay in menarche, the risk decreases by around 5%
- **Childbearing**-- Having a child before 30 years of age may provide some protection, and having no children may increase the risk for developing breast cancer
- **Menopause**--Women who experience menopause at a late age are at a higher risk of breast cancer than those who cease menstruating earlier, with risk increasing by about 3% for each year older at menopause.
- **Oral contraceptive**--The risk of breast cancer is increased by around 25% in current users of combined oral contraceptives, but the excess risk falls after cessation of use, such that 10 or more years after use stops, no significant increase in risk is evident.
- **Endogenous hormone**--For postmenopausal women, the studies have shown a positive association between serum oestradiol concentrations and

risk; postmenopausal women with high serum oestradiol concentrations have a risk around twice that of women with lower concentrations of this hormone.

### **C. Lifestyle and Dietary Causes**

The observation that breast-cancer rates are much higher in countries with high-fat diets than in less developed countries, where fat intake is much lower, led to the hypothesis that high-fat diets increase breast-cancer risk.

Observational studies have repeatedly shown that alcohol consumption is associated with a moderate increase in the risk of breast cancer; risk increases by roughly 10% per 10 g

alcohol (1 unit) consumed per day. Within the range of light to moderate alcohol intake, breast-cancer risk seems to increase linearly, so an intake of around 30 g alcohol (3 units) per day is associated with an increase of about 30% in breast-cancer risk.

### **D. Environmental Causes**

Radiation treatment and exposure to carcinogens increase the likelihood of developing breast cancer but only after a long delay.

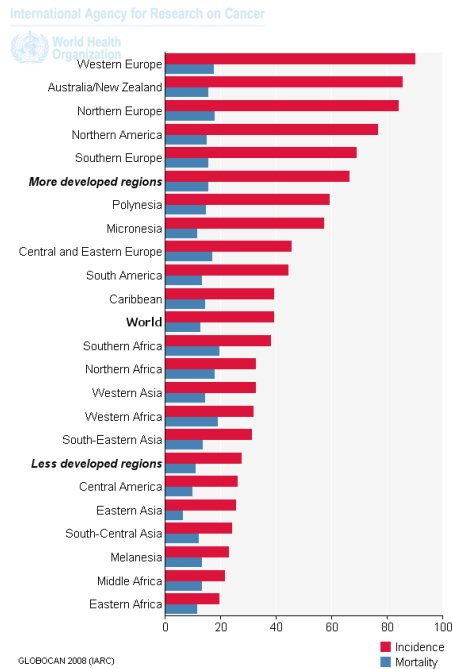
## **EPIDEMIOLOGY OF BREAST CANCER**

The general trends observed

- a) Male is less susceptible compared to
- b) the older, increases risk rate
- c) Incidence rates are high in more developed countries, whereas rates in less developed countries are low

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females worldwide, accounting for 23% (1.38 million) of the total new cancer cases and 14% (458,400) of the total cancer deaths in 2008. Although breast cancer incidence is on the rise globally, breast cancer mortality has been decreasing, especially in industrialized countries. In general, incidence rates are high in Western and Northern Europe, Australia/New Zealand, and North America; intermediate in South America, the Caribbean, and Northern Africa; and low in sub-Saharan Africa and Asia. Reflect the

long-standing high prevalence of reproductive factors associated with increased risk of breast cancer, including early menarche, late child bearing, fewer pregnancies, use of menopausal hormone therapy, as well as increased detection through mammography.



**Fig. 1. Estimated age-standardised rates (World) per 100,000 as of 2008**

Estimated numbers (thousands)	Cases	Deaths
World	1384	458
More developed regions	692	189
Less developed regions	691	269
WHO Africa region (AFRO)	68	37
WHO Americas region (PAHO)	320	82
WHO East Mediterranean region (EMRO)	61	31
WHO Europe region (EURO)	450	139
WHO South-East Asia region (SEARO)	203	93
WHO Western Pacific region (WPRO)	279	73
IARC membership (22 countries)	740	214
United States of America	182	40
China	169	44
India	115	53
European Union (EU-27)	332	89

## Signs and Symptoms of Breast Cancer

It is important to remember that most lumps found in the breast are not cancerous but are benign and that the symptoms and signs associated with breast cancer may be due to other causes. Some signs and symptoms include:

- Mass or lump in the breast
- Breast skin dimpling, reddening, or thickening
- Nipple retraction
- Breast swelling or pain
- Nipple pain and/or discharge
- Swelling or lumps in adjacent underarm lymph node

A rare form of breast cancer, inflammatory breast cancer (IBC), does not form a lump. Some of the symptoms of this condition can be similar to those of a breast infection, with warmth, tenderness, breast swelling, itching, and ridged thickened skin.

### Exams and Lab Tests for diagnosing Breast Cancer

Clinical breast exam - is an exam of your breasts by a health expert such as a doctor, nurse practitioner, nurse, or physician assistant. For this exam, you undress from the waist up. The examiner will first look at your breasts for changes in size or shape. Then, using the pads of the fingers, she or he will gently feel your breasts for lumps. The area under both arms will also be checked.

Breast self-exam (BSE) – is an exam of the breast done by yourself in order to locate lumps and changes in size and shape.

**Imaging test** - These tests use different methods to create pictures of the inside of your body. The tests may be done for a number of reasons: to help find out whether a suspicious area might be cancer, to learn how far cancer may have spread, and to help figure out if treatment is working.

- **Mammogram** – Highly-sensitive digital X-ray technology that may detect small lumps that otherwise would not be detected through self-exam.
- **MRI scans** - MRI scans use radio waves and strong magnets instead of x-rays. MRI scans can be used along with mammograms for screening



women who have a high risk of getting breast cancer. Or they can be used to look at areas of concern found on a mammogram. MRI is also sometimes used for women who are known to have breast cancer in order to help figure out the size of the cancer.

- **Breast ultrasound** - An ultrasound uses sound waves to outline a part of the body. The sound wave echoes are picked up by a computer to create a picture on a computer screen. Ultrasound is a good test to use along with mammograms because it is widely available and costs less than other tests. But ultrasound should not be used instead of mammograms. Usually, it is used to look at a certain area of concern found by the mammogram. It sometimes helps to tell the difference between cysts and solid masses (tumors) without using a needle to draw out fluid.
- **Ductogram (also called a galactogram)** - is a special kind of x-ray that is sometimes helpful in finding the cause of a nipple discharge. A very thin plastic tube is placed into the opening of the duct at the nipple. A dye is injected to outline the shape of the duct on an x-ray picture. It will show if there is a tumor inside the duct. If there is a discharge, the fluid can be tested for cancer cells.

### **Biopsy lab tests**

The tissue removed during a biopsy is looked at in the lab to see whether it is benign (not cancer) or cancer. If it is not cancer, then no more treatment is needed. If it is cancer, the biopsy can help the doctor decide what type of cancer it is and show whether it is invasive or not. Other lab tests may also be done to help figure out how quickly the cancer is growing and what treatments might work best.

**Breast cancer grade** - If a biopsy sample is cancer, it is given a grade from 1 to 3. Cancers that look more like normal breast tissue tend to grow and spread more slowly. As a rule, a lower grade number means a slower-growing cancer, while a higher number means a faster-growing cancer. The grade helps predict the outcome (prognosis) for the woman. The tumor grade is one factor in deciding if further treatment is needed after surgery.

**Hormone receptor status** - Receptors are proteins on the outside surfaces of cells that can attach to hormones in the blood. Estrogen and progesterone are hormones that often attach to these receptors on some breast cancer cells to fuel their growth. The biopsy sample can be tested to see whether it has receptors for estrogen and/or progesterone. If it does, it is often referred to as ER-positive, PR-positive, or just hormone receptor-positive. People with such cancers tend to live longer than those with cancers without these receptors

because they are much more likely to respond to hormone treatment. About 2 out of 3 breast cancers have at least one of these receptors.

**Tests of gene pattern** - Research has shown that looking at the patterns of a number of genes at the same time can help tell whether or not an early breast cancer is likely to come back after the first treatment. This can help when deciding whether more treatment, such as chemotherapy, might be useful. There are now 2 of these tests which look at different sets of genes: Oncotype DX® and MammaPrint®. While some doctors are using these tests (along with other information) to help make decisions about offering chemotherapy, others are waiting for more research to show whether they are really helpful.

## DIAGNOSIS & PATHOGENESIS

### TNM staging system

**TNM (Tumor, Node, and Metastasis)** is another staging system researchers use to provide more details about how the cancer looks and behaves.

The TNM system is based on three characteristics:

- **size (T stands for tumor)**
- **lymph node involvement (N stands for node)**
- **whether the cancer has metastasized (M stands for metastasis), or moved beyond the breast to other parts of the body.**

Once the pathologist knows your T, N, and M characteristics, he or she can use them to assign a stage to the cancer.

### Stages of Breast Cancer

#### Stage 0

--non-invasive breast cancers; no evidence of cancer cells or non-cancerous abnormal cells breaking out of the part of the breast in which they started, or getting through to or invading neighboring normal tissue

#### Stage 1

-- invasive breast cancer (cancer cells are invading normal surrounding breast tissue) in which the tumor measures up to 2 cm; no lymph nodes are involved

#### Stage 2

--divided into subcategories known as IIA and IIB.

**Stage IIA** describes invasive breast cancer in which no tumor can be found in the breast, but cancer cells are found in the lymph nodes; the tumor measures 2 cm or smaller and has spread to the axillary lymph nodes

**Stage IIB** describes invasive breast cancer in which the tumor is larger than 5 cm but has not spread to the axillary lymph nodes

#### Stage 3

--divided into subcategories known as IIIA, IIIB, and IIIC.

**Stage IIIA** describes invasive breast cancer in which no tumor is found, but cancer is found in axillary lymph nodes, which are clumped together or sticking to other structures, or cancer may have spread to lymph nodes near the breastbone

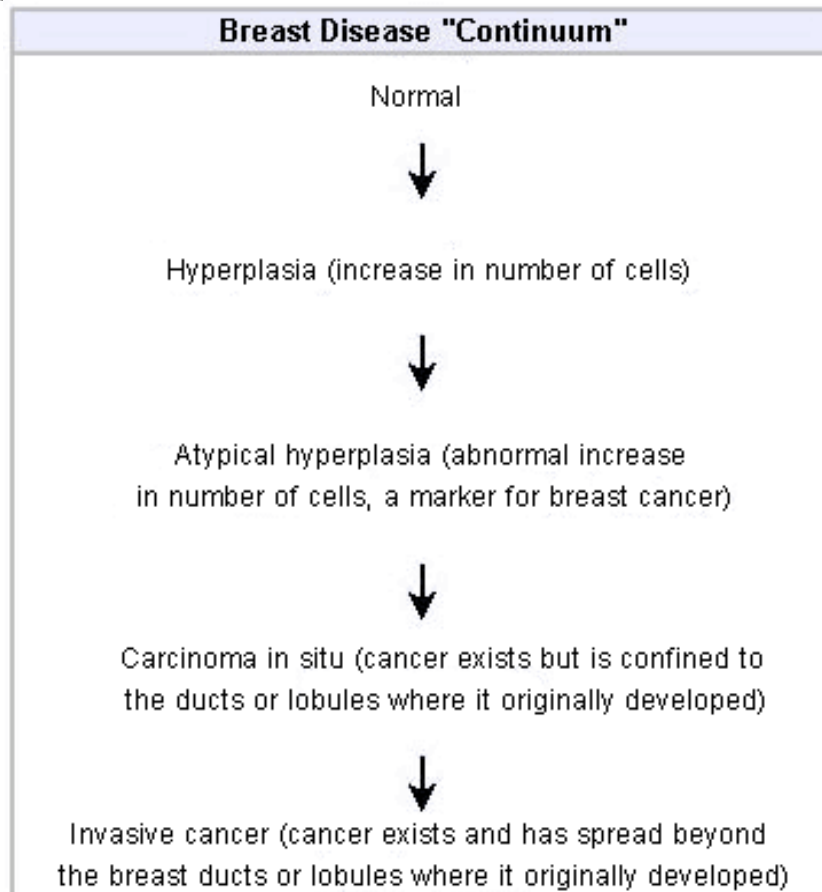
**Stage IIIB** describes invasive breast cancer in which the cancer may be any size and has spread to the chest wall and/or skin of the breast and may have spread to axillary lymph nodes, which are clumped together or sticking to other structures or cancer may have spread to lymph nodes near the breastbone

**Stage IIIC** describes invasive breast cancer in which there may be no sign of cancer in the breast or, if there is a tumor, it may be any size and may have spread to the chest wall and/or the skin of the breast; the cancer has spread to lymph nodes above or below the collarbone and the cancer may have spread to axillary lymph nodes or to lymph nodes near the breastbone

#### **Stage 4**

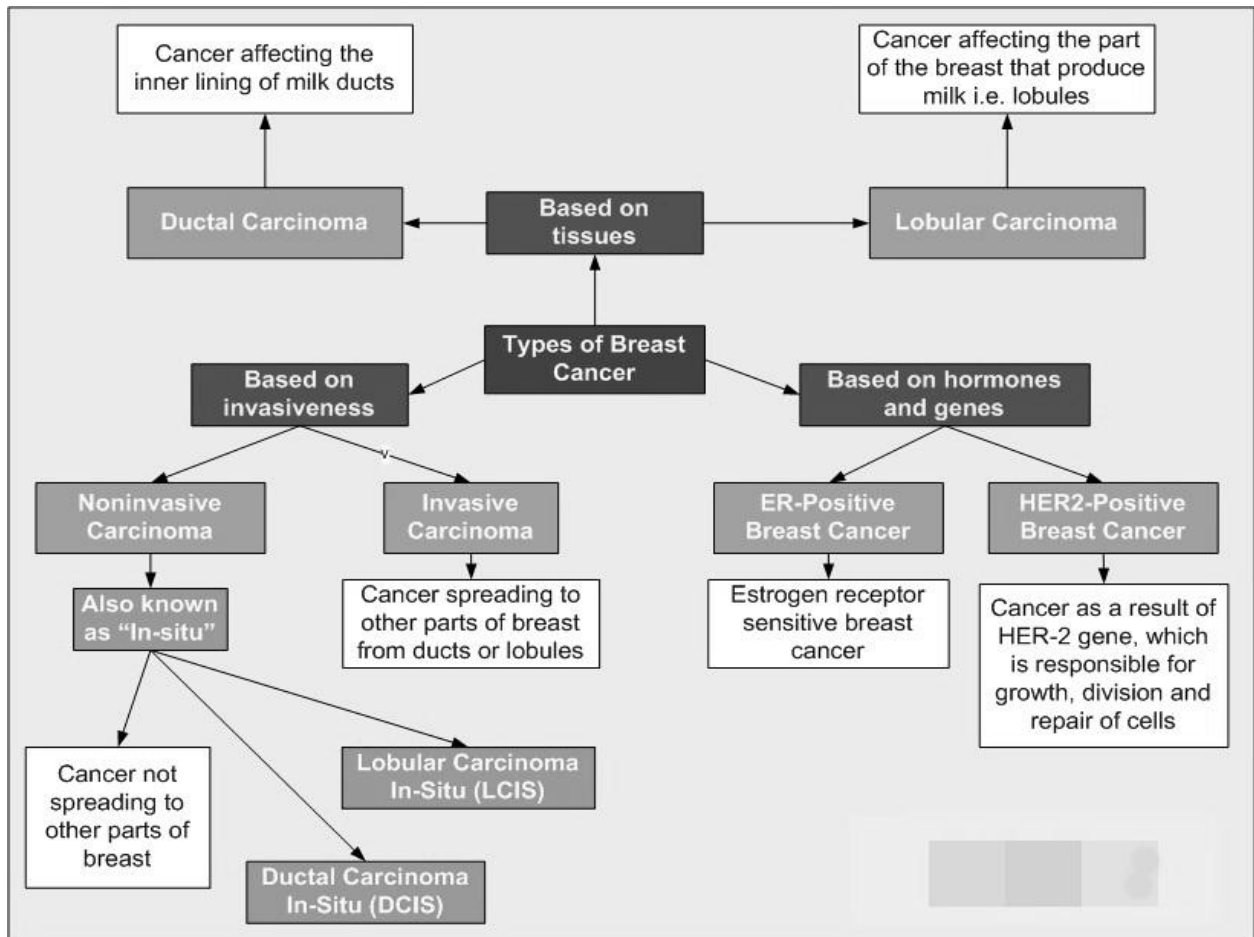
--invasive breast cancer that has spread beyond the breast and nearby lymph nodes to other organs of the body, such as the lungs, distant lymph nodes, skin, bones, liver, or brain.

**Figure 1. Summarized (breast cancer stages-continuous)**



Breast cancer is a common type of cancer in women after lung cancer and the most common cause of cancer death. The common causes include family history, exposure to radioactive rays, exposure to harmful chemicals, late child bearing, hormone replacement therapy, smoking and alcoholic intake.

Each breast has milk producing glands called lobules that make milk which is carried by milk ducts to the nipple. The space in between the lobules is filled with connective and fatty tissue. The most common type of breast cancer, begin either in the breast milk ducts called ductile carcinoma or in the milk producing glands namely lobular carcinoma. A change in the gene of a single normal epithelial cell of duct affects the set of instructions in the genes and the cell no longer function normally. This abnormal cell releases chemical resulting in their outburst and is uncontrollable division along the lining of milk duct. The cancer's growth can spread locally through the lymphatic system to the draining lymph nodes nearby and distally through blood to the brain, lung, bone and liver resulting in invasive ductile carcinoma.



## **TREATMENT, PROGNOSIS, AND PREVENTION**

### **Treatment**

Surgery, radiation, and chemotherapy all may be used in the treatment of breast cancer. Depending on the stage, they will be used in different combinations or sequences to effect an appropriate strategy for the type and stage of the disease being treated.

### **Surgery**

Historically, surgical removal of the entire breast and axillary lymph nodes, along with the muscles down to the chest wall (radical mastectomy), was performed as the preferred therapy for breast cancer. In the past 30 years, surgery remains a primary option, but other therapies have risen in importance. Recent studies have suggested that breast conserving treatment (as opposed to radical mastectomy) improves the quality of life for women without compromising survival. Ultimately, the extent of surgery depends on the type of breast cancer, whether the disease has spread, and the patient's age and health.

If the tumor is less than 1.5 (4 cm) in size and located so that it can be removed without destroying the reasonable cosmetic appearance of the residual breast, just the primary tumor and a rim of normal tissue will be removed. The axillary nodes will still be removed for staging purposes, usually through a separate incision. Because of the risk of recurrence in the remaining breast tissue, radiation therapy is used to lessen the chance of local recurrence. This type of primary therapy is known as lumpectomy, (or segmental mastectomy), and axillary dissection.

Sentinel lymph node biopsy, a technique for identifying which nodes in the axilla drain the tumor, has been developed to provide selective sampling and further lessen the degree of surgical trauma the patient experiences.

When patients are selected appropriately based on the preoperative clinical stage, all of these surgical approaches have been shown to produce similar results. In planning primary surgical therapy, it is imperative that the operation is tailored to fit the clinical circumstance of the patient.

The pathologic stage of the cancer is evaluated after surgical treatment and defines additional treatment. In addition to stage, other tests may be necessary to aid in decisions regarding additional adjuvant therapies. Adjuvant therapies are treatments

used after the primary treatment to help ensure that no microscopic disease exists and to help prolong patients' survival time or reduce pain.

### **Radiation therapy**

Like surgical therapy, radiation therapy is a local modality-it treats only the specific tissue exposed to radiation and not the rest of the body. Radiation is usually given post-operatively after surgical wounds have healed. The pathologic stage of the primary tumor is now known and this aids in treatment planning. The extent of the local surgery also influences the planning. Radiation may not be needed at all after modified radical mastectomy for stage I disease but is usually used when breast-preserving surgery is performed. If the tumor was extensive or if multiple nodes were involved, the field of tissue exposed will vary accordingly. Radiation is used as an adjunct to surgical therapy and is considered important to gaining local control of the tumor. In the past, radiation was used as an alternative to surgery on occasion. However, now that breast-preserving surgical protocols have been developed, primary radiation treatment of the tumor is no longer performed. Radiation also has an important role in the treatment of the patient with widespread (disseminated) disease, particularly if it involves the skeleton. Radiation therapy can affect pain control and prevention of fracture in this circumstance.

### **Chemotherapy**

Survival after breast cancer surgery is improved by the addition of postoperative chemotherapy. Post-surgical chemotherapy therapy in patients who have no evidence of residual disease is now performed on the basis that some patients have metastases that are too small to be detectable. This occurs because it is unlikely that the surgeon has removed every single cancerous cell. Loose cancer cells, if not killed by chemotherapy, may travel through the circulatory system and form new tumors elsewhere. Chemotherapy may also be given in some circumstances before surgery. Chemotherapy is administered either orally or by injection into a blood vessel and usually involves multiple drugs. It is given in cycles, followed by a period of time for recovery, followed by another course of drugs.

Chemotherapy can produce significant side effects, including nausea and vomiting, temporary hair loss, mouth or vaginal sores, fatigue, weakened immune system, and infertility. Complementary therapies are often helpful in reducing some of these side effects.

### **Hormone therapy**

Many breast cancers, particularly those originating in post-menopausal women, are responsive to hormones. These cancers have receptors on their cells for the hormone estrogen. Part of the post-surgery primary tumor assessment is evaluation for the presence of estrogen and progesterone receptors. If they are present on the cancer cells, altering the hormone status of the patient will slow tumor growth and have a positive impact on survival. Hormonal status may be changed with drug therapy. The drug tamoxifen binds to estrogen receptors on the cancer cells, so that hormones cannot interact with the cells and stimulate their growth. If the patient has these receptors present, tamoxifen is commonly prescribed for five years as an adjunct to primary treatment. In women whose cancer cells have estrogen receptors, tamoxifen reduces the chance of breast cancer reoccurring by about 50%.

Toremifene (Fareston) and fulvestrant (Faslodex) are drugs similar to tamoxifen in that they target hormone receptors on cancer cells. They are often used when cancer cells are unresponsive to tamoxifen. In addition, a new group of drugs called aromatase inhibitors that block the enzymes that produce estrogen in postmenopausal (but not premenopausal) women have been used to treat both early and late advanced breast cancer. These drugs include letrozole (Femara), anastrozole (Arimidex), and exemestane (Aromasin). Because of these agents, there is rarely any need for surgical removal of hormone-producing glands, such as the ovary or adrenal, that was sometimes necessary in the past.

## **Biotherapeutics**

Biotherapeutics are a type of targeted therapy. Large amounts of antibodies of a single type (called monoclonal antibodies) that react with specific receptors on cancer cells are made in the laboratory. When given to the patient, they inactivate or destroy those cells containing that specific receptor, but do not react with other cells. Trastuzumab (Herceptin) and Lapatinib (Tykerb) target cells that contain a growth protein known as HER/2. Between 15% and 25% of women have breast cancer that responds to these drugs. Bevacizumab (Avastin) is a biotherapeutic used to treat breast cancer that has metastasized. It helps prevent tumors from becoming established by interfering with the growth of blood vessels into the tumor. Without access to nutrients in the blood, the tumors cannot increase in size. Biotherapeutics are normally used in addition to chemotherapy drugs.



## **Complementary adjuvant therapy**

Complementary treatments used along with conventional medicine are often successful in moderating side effects and improving the patient's quality of life. For example, acupuncture and guided imagery may be useful tools in treating pain symptoms and side effects of chemotherapy associated with breast cancer. Acupuncture involves the placement of a series of thin needles into the skin at targeted locations on the body, known as acupoints, in order to harmonize the energy flow within the human body. Guided imagery involves creating a visual mental image of pain. Once the pain can be visualized, the patient can adjust the image to make it more pleasing, and thus more manageable.

Many herbal remedies are available to lessen pain symptoms and chemotherapy side effects such as nausea, and to promote relaxation and healing. However, breast cancer patients should consult with their healthcare professional before taking any herbal treatments. Depending on the preparation and the type of herb, these remedies may interact with and enhance or diminish the effects of other prescribed medications. One herb that is generally regarded as helpful in relieving the nausea that accompanies chemotherapy, is ginger (*Zingiber officinale*).

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Biotherapeutics are a type of targeted therapy. Large amounts of antibodies of a single type (called monoclonal antibodies) that react with specific receptors on cancer cells are made in the laboratory. When given to the patient, they inactivate or destroy those cells containing that specific receptor, but do not react with other cells. Trastuzumab (Herceptin) and Lapatinib (Tykerb) target cells that contain a growth protein known as HER/2. Between 15% and 25% of women have breast cancer that responds to these drugs. Bevacizumab (Avastin) is a biotherapeutic used to treat breast cancer that has metastasized. It helps prevent tumors from becoming established by interfering with the growth of blood vessels into the tumor. Without access to nutrients in the blood, the tumors cannot increase in size. Biotherapeutics are normally used in addition to chemotherapy drugs.

## **Complementary adjuvant therapy**

Complementary treatments used along with conventional medicine are often successful in moderating side effects and improving the patient's quality of life. For example, acupuncture and guided imagery may be useful tools in treating pain symptoms and side effects of chemotherapy associated with breast cancer. Acupuncture involves the placement of a series of thin needles into the skin at targeted locations on the body, known as acupoints, in order to harmonize the energy flow within the human body. Guided imagery involves creating a visual mental image of pain. Once the pain can be visualized, the patient can adjust the image to make it more pleasing, and thus more manageable.

Many herbal remedies are available to lessen pain symptoms and chemotherapy side effects such as nausea, and to promote relaxation and healing. However, breast cancer patients should consult with their healthcare professional before taking any herbal treatments. Depending on the preparation and the type of herb, these remedies may interact with and enhance or diminish the effects of other prescribed medications. One herb that is generally regarded as helpful in relieving the nausea that accompanies chemotherapy, is ginger (*Zingiber officinale*).

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