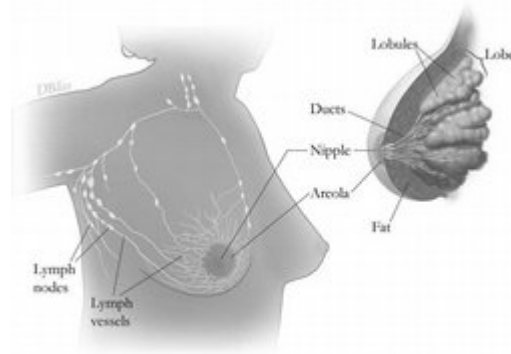


General Breast Cancer Information and Glossary of Terms

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.



Anatomy of the breast, showing lymph nodes and lymph vessels.

Each breast also has 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.

Age and health history can affect the risk of developing breast cancer. Anything that increases your chance of getting a disease is called a risk factor. Risk factors for breast cancer include the following:

- Older age.
- Menstruating at an early age.
- Older age at first birth or never having given birth.
- A personal history of breast cancer or benign (noncancer) breast disease.
- A mother or sister with breast cancer.
- Treatment with radiation therapy to the breast/chest.

- Breast tissue that is dense on a mammogram.
- Taking hormones such as estrogen and progesterone.
- Drinking alcoholic beverages.
- Being white.

Breast cancer is sometimes caused by inherited gene mutations (changes).

The genes in cells carry the hereditary information that is received from a person's parents. Hereditary breast cancer makes up approximately 5% to 10% of all breast cancer. Some altered genes related to breast cancer are more common in certain ethnic groups.

Women who have an altered gene related to breast cancer and who have had breast cancer in one breast have an increased risk of developing breast cancer in the other breast. These women also have an increased risk of developing ovarian cancer, and may have an increased risk of developing other cancers. Men who have an altered gene related to breast cancer also have an increased risk of developing this disease.

Tests have been developed that can detect altered genes. These genetic tests are sometimes done for members of families with a high risk of cancer.

Tests that examine the breasts are used to detect (find) and diagnose breast cancer.

A doctor should be seen if changes in the breast are noticed. The following tests and procedures may be used:

- Mammogram: An x-ray of the breast.



Mammography of the right breast.

- Biopsy: The removal of cells or tissues so they can be viewed under a microscope by a pathologist to check for signs of cancer. If a lump in the breast is found, the doctor may need to cut out a small piece of the lump. Four types of biopsies are as follows:
 - Excisional biopsy: The removal of an entire lump or suspicious tissue.
 - Incisional biopsy: The removal of part of a lump or suspicious tissue.
 - Core biopsy: The removal of part of a lump or suspicious tissue using a wide needle.

- Needle biopsy or fine-needle aspiration biopsy: The removal of part of a lump, suspicious tissue, or fluid, using a thin needle.
- Estrogen and progesterone receptor test: A test to measure the amount of estrogen and progesterone (hormones) receptors in cancer tissue. If cancer is found in the breast, tissue from the tumor is examined in the laboratory to find out whether estrogen and progesterone could affect the way cancer grows. The test results show whether hormone therapy may stop the cancer from growing.

Certain factors affect prognosis (chance of recovery) and treatment options.

The prognosis (chance of recovery) and treatment options depend on the following:

- The stage of the cancer (whether it is in the breast only or has spread to lymph nodes or other places in the body).
- The type of breast cancer.
- Estrogen-receptor and progesterone-receptor levels in the tumor tissue.
- A woman's age, general health, and menopausal status (whether a woman is still having menstrual periods).
- Whether the cancer has just been diagnosed or has recurred (come back).

Stages of Breast Cancer

After breast cancer has been diagnosed, 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. The information gathered from the staging process determines the stage of the disease. It is important to know the stage in order to plan treatment.

The following stages are used for breast cancer:

Stage 0 (carcinoma in situ)

There are 2 types of breast carcinoma in situ:

- Ductal carcinoma in situ (DCIS) is a noninvasive, precancerous condition in which abnormal cells are found in the lining of a breast duct. The abnormal cells have not spread outside the duct to other tissues in the breast. In some cases, DCIS may become invasive cancer and spread to other tissues, although it is not known at this time how to predict which lesions will become invasive.
- Lobular carcinoma in situ (LCIS) is a condition in which abnormal cells are found in the lobules of the breast. This condition seldom becomes invasive cancer; however, having lobular carcinoma in situ in one breast increases the risk of developing breast cancer in either breast.



Pea, peanut, walnut, and lime show tumor sizes.

Stage I

In stage I, the tumor is 2 centimeters or smaller and has not spread outside the breast.

Stage IIA

In stage IIA:

- no tumor is found in the breast, but cancer is found in the axillary lymph nodes (the lymph nodes under the arm); or
- the tumor is 2 centimeters or smaller and has spread to the axillary lymph nodes; or
- the tumor is larger than 2 centimeters but not larger than 5 centimeters and has not spread to the axillary lymph nodes.

Stage IIB

In stage IIB, the tumor is either:

- larger than 2 centimeters but not larger than 5 centimeters and has spread to the axillary lymph nodes; or
- larger than 5 centimeters but has not spread to the axillary lymph nodes.

Stage IIIA

In stage IIIA:

- no tumor is found in the breast, but cancer is found in axillary lymph nodes that are attached to each other or to other structures; or
- the tumor is 5 centimeters or smaller and has spread to axillary lymph nodes that are attached to each other or to other structures; or
- the tumor is larger than 5 centimeters and has spread to axillary lymph nodes that may be attached to each other or to other structures.

Stage IIIB

In stage IIIB, the cancer may be any size and:

- has spread to tissues near the breast (the skin or chest wall, including the ribs and muscles in the chest); and
- may have spread to lymph nodes within the breast or under the arm.

Stage IIIC

In stage IIIC, the cancer:

- has spread to lymph nodes beneath the collarbone and near the neck; and
- may have spread to lymph nodes within the breast or under the arm and to tissues near the breast.

Stage IIIC breast cancer is divided into operable and inoperable stage IIIC.

In operable stage IIIC, the cancer:

- is found in 10 or more of the lymph nodes under the arm; or
- is found in the lymph nodes beneath the collarbone and near the neck on the same side of the body as the breast with cancer; or
- is found in lymph nodes within the breast itself and in lymph nodes under the arm.

In inoperable stage IIIC breast cancer, the cancer has spread to the lymph nodes above the collarbone and near the neck on the same side of the body as the breast with cancer.

Stage IV

In stage IV, the cancer has spread to other organs of the body, most often the bones, lungs, liver, or brain.

Inflammatory Breast Cancer



Inflammatory breast cancer of the left breast showing peau d'orange and inverted nipple.

Recurrent Breast Cancer

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

Treatment Option Overview

There are different types of treatment for patients with breast cancer.

Different types of treatment are available for patients with breast cancer. Some treatments are standard (the currently used treatment), and some are being tested in clinical trials. Before starting treatment, patients may want to think about taking part in a clinical trial. A treatment clinical trial is a research study meant to help improve current treatments or obtain information on new treatments for patients with cancer. When clinical trials show that a new treatment is better than the standard treatment, the new treatment may become the standard treatment.

Choosing the most appropriate cancer treatment is a decision that ideally involves the patient, family, and health care team.

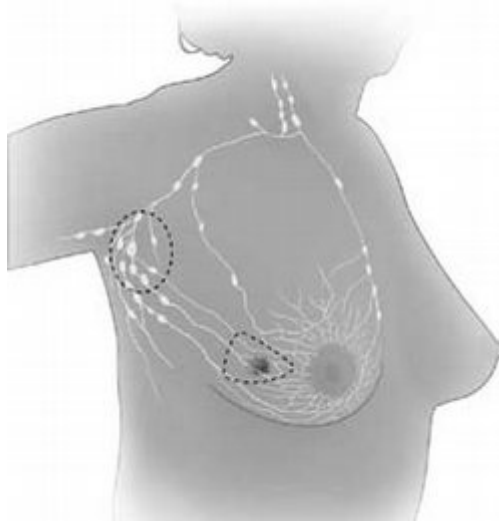
Four types of standard treatment are used:

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 they contain cancer cells.

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

- Lumpectomy: A surgical procedure to remove a tumor (lump) and a small amount of normal tissue around it.
- Partial mastectomy: A surgical procedure to remove the part of the breast that contains cancer and some normal tissue around it. This procedure is also called a segmental mastectomy.

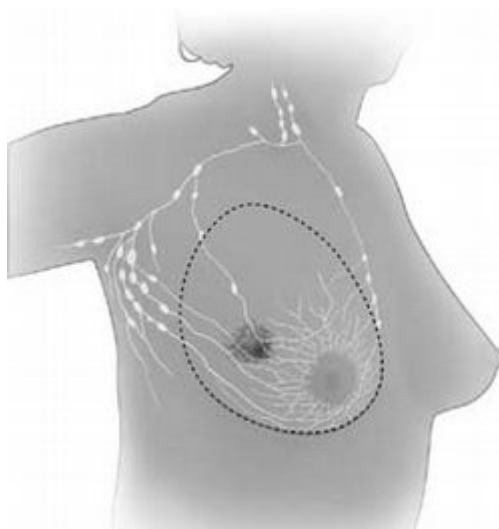


Breast-conserving surgery. Dotted lines show area containing the tumor that is removed and some of the lymph nodes that may be removed.

Patients who are treated with breast-conserving surgery may also have some of the lymph nodes under the arm removed for biopsy. This procedure is called lymph node dissection. It may be done at the same time as the breast-conserving surgery or after. Lymph node dissection is done through a separate incision.

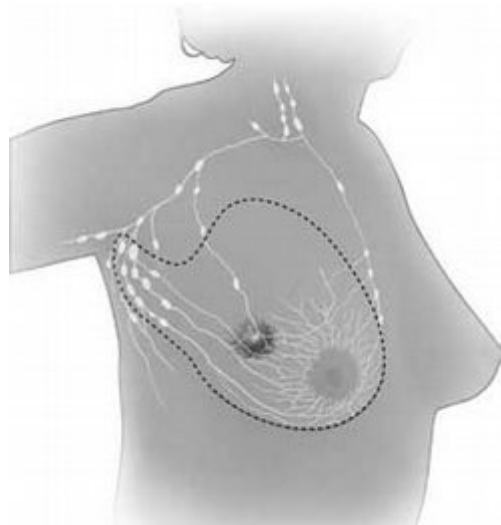
Other types of surgery include the following:

- Total mastectomy: A surgical procedure to remove the whole breast that contains cancer. This procedure is also called a simple mastectomy. Some of the lymph nodes under the arm may be removed for biopsy at the same time as the breast surgery or after. This is done through a separate incision.



Total mastectomy. Dotted line shows entire breast is removed. Some lymph nodes under the arm may also be removed.

- Modified radical mastectomy: A surgical procedure to remove the whole breast that contains cancer, many of the lymph nodes under the arm, the lining over the chest muscles, and sometimes, part of the chest wall muscles.



Modified radical mastectomy. Dotted line shows entire breast and some lymph nodes are removed. Part of the chest wall muscle may also be removed.

- Radical mastectomy: A surgical procedure to remove the breast that contains cancer, chest wall muscles under the breast, and all of the lymph nodes under the arm. This procedure is sometimes called a Halsted radical mastectomy.

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 a cancer treatment that uses high-energy x-rays or other types of radiation to kill

cancer cells. There are two types of radiation therapy. External radiation therapy uses a machine outside the body to send radiation toward the cancer. Internal radiation therapy uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer. The way the radiation therapy is given depends on the type and stage of the cancer being treated.

Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping the cells from dividing. When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (systemic chemotherapy). When chemotherapy is placed directly into the spinal column, an organ, or a body cavity such as the abdomen, the drugs mainly affect cancer cells in those areas (regional chemotherapy). The way the chemotherapy is given depends on the type and stage of the cancer being treated.

Hormone therapy

Hormone therapy is a cancer treatment that removes hormones or blocks their action and stops cancer cells from growing. Hormones are substances produced by glands in the body and circulated in the bloodstream. The presence of some hormones can cause certain cancers to grow. If tests show that the cancer cells have places where hormones can attach (receptors), drugs, surgery, or radiation therapy are used to reduce the production of hormones or block them from working.

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.

New types of treatment are being tested in clinical trials. These include the following:

Sentinel lymph node biopsy followed by surgery

Sentinel lymph node biopsy is the removal of the sentinel lymph node (the first lymph node the cancer is likely to spread to from the tumor) during surgery. A radioactive substance and/or blue dye is injected near the tumor. The substance or dye flows through the lymph ducts to the lymph nodes. The first lymph node to receive the substance or dye is removed for biopsy. A pathologist views the tissue under a microscope to look for cancer cells. If cancer cells are not found, it may not be necessary to remove more lymph nodes. After the sentinel lymph node biopsy, the surgeon removes the tumor (breast-conserving surgery or mastectomy).



Sentinel lymph node biopsy. Radioactive substance and/or blue dye is injected near the tumor (first panel), the injected material is followed visually or with a probe (middle panel), and the first lymph nodes to take up the material are removed and checked for cancer cells (last panel).

High-dose chemotherapy with stem cell transplant

High-dose chemotherapy with stem cell transplant is a method of giving high doses of chemotherapy and replacing blood-forming cells destroyed by the cancer treatment. Stem cells (immature blood cells) are removed from the blood or bone marrow of the patient or a donor and are frozen and stored. After the chemotherapy is completed, the stored stem cells are thawed and given back to the patient through an infusion. These reinfused stem cells grow into (and restore) the body's blood cells.

Studies have shown that high-dose chemotherapy followed by stem cell transplant does not work better than standard chemotherapy in the treatment of breast cancer. Doctors have decided that, for now, high-dose chemotherapy should be tested only in clinical trials. Before taking part in such a trial, women should talk with their doctors about the serious side effects, including death, that may be caused by high-dose chemotherapy.

Monoclonal antibodies as adjuvant therapy

Monoclonal antibody therapy is a cancer treatment that uses antibodies made in the laboratory, from a single type of immune system cell. These antibodies can identify substances on cancer cells or normal substances that may help cancer cells grow. The antibodies attach to the substances and kill the cancer cells, block their growth, or keep them from spreading. Monoclonal antibodies are given by infusion. They may be used alone or to carry drugs, toxins, or radioactive material directly to cancer cells. Monoclonal antibodies are also used in combination with chemotherapy as adjuvant therapy.

Trastuzumab (Herceptin) is a monoclonal antibody that blocks the effects of the growth factor protein HER2, which transmits growth signals to breast cancer cells. About one-fourth of patients with breast cancer have tumors that may be treated with trastuzumab combined with chemotherapy.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied. Information about ongoing clinical trials is available from the [NCI Web site](#).

Treatment Options by Stage

Ductal Carcinoma In Situ (DCIS)

Treatment of ductal carcinoma in situ (DCIS) may include the following:

- Breast-conserving surgery with or without radiation therapy or hormone therapy.
- Total mastectomy with or without hormone therapy.
- Clinical trials testing breast-conserving surgery and hormone therapy with or without radiation therapy.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied. Information about ongoing clinical trials is available from the [NCI Web site](#)⁵.

Lobular Carcinoma In Situ (LCIS)

Treatment of lobular carcinoma in situ (LCIS) may include the following:

- Biopsy to diagnose the LCIS followed by regular examinations and regular mammograms to find any changes as early as possible. This is referred to as observation.
- Tamoxifen to reduce the risk of developing breast cancer.
- Bilateral prophylactic mastectomy. This treatment choice is sometimes used in women who have a high risk of getting breast cancer. Most surgeons believe that this is a more aggressive treatment than is needed.
- Clinical trials testing cancer prevention drugs.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied.

Stage I, Stage II, Stage IIIA, and Operable Stage IIIC Breast Cancer

Treatment of stage I, stage II, stage IIIA, and operable stage IIIC breast cancer may include the following:

- Breast-conserving surgery to remove only the cancer and some surrounding breast tissue, followed by lymph node dissection and radiation therapy.
- Modified radical mastectomy with or without breast reconstruction surgery.
- A clinical trial evaluating sentinel lymph node biopsy followed by surgery.

Adjuvant therapy (treatment given after surgery to increase the chances of a cure) may include the following:

- Radiation therapy to the lymph nodes near the breast and to the chest wall after a modified radical mastectomy.

- Systemic chemotherapy with or without hormone therapy.
- Hormone therapy.
- A clinical trial of trastuzumab (Herceptin) combined with systemic chemotherapy.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied.

Stage IIIB, Inoperable Stage IIIC, Stage IV, and Metastatic Breast Cancer

Stage IIIB and inoperable stage IIIC breast cancer

Treatment of stage IIIB and inoperable stage IIIC breast cancer may include the following:

- Systemic chemotherapy.
- Systemic chemotherapy followed by surgery (breast-conserving surgery or total mastectomy), with lymph node dissection 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.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied.

Stage IV and metastatic breast cancer

Treatment of stage IV or metastatic breast cancer may include the following:

- Hormone therapy and/or systemic chemotherapy with or without trastuzumab (Herceptin).
- Radiation therapy and/or surgery for relief of pain and other symptoms.
- Clinical trials testing new systemic chemotherapy and/or hormone therapy.
- Clinical trials of new combinations of trastuzumab (Herceptin) with anticancer drugs.
- Clinical trials testing other approaches, including high-dose chemotherapy with stem cell transplant.
- Bisphosphonate drugs to reduce bone disease and pain when cancer has spread to the bone.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied.

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 dissection 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.

This summary section refers to specific treatments under study in clinical trials, but it may not mention every new treatment being studied.

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 include the following:

- Surgery (radical or modified radical mastectomy), radiation therapy, or both.
- Systemic chemotherapy or hormone therapy.
- A clinical trial of trastuzumab (Herceptin) combined with systemic chemotherapy.

Glossary Terms

abdomen (AB-do-men)

The area of the body that contains the pancreas, stomach, intestines, liver, gallbladder, and other organs.

abnormal

Not normal. An abnormal lesion or growth may be cancerous, premalignant (likely to become cancer), or benign.

adjuvant therapy (AD-joo-vant)

Treatment given after the primary treatment to increase the chances of a cure. Adjuvant therapy may include chemotherapy, radiation therapy, hormone therapy, or biological therapy.

antibody (AN-tih-BAH-dee)

A type of protein made by plasma cells (a type of white blood cell) in response to an antigen (foreign substance). Each antibody can bind to only one specific antigen. The purpose of this binding is to help destroy the antigen. Antibodies can work in several ways, depending on the nature of the antigen. Some antibodies destroy antigens directly. Others make it easier for white blood cells to destroy the antigen.

axilla (ak-SIL-a)

The underarm or armpit.

axillary lymph node (AK-suh-LAIR-ee)

A lymph node in the armpit region that drains lymph channels from the breast.

benign (beh-NINE)

Not cancerous. Benign tumors may grow larger but do not spread to other parts of the body.

bilateral prophylactic mastectomy (by-LAT-uh-ral pro-fi-LAK-tik mas-TEK-tuh-mee)

Surgery to remove both breasts in order to reduce the risk of developing breast cancer. Also called preventive mastectomy.

biopsy (BY-op-see)

The removal of cells or tissues for examination by a pathologist. The pathologist may study the tissue under a microscope or perform other tests on the cells or tissue. When only a sample of tissue is removed, the procedure is called an incisional biopsy. When an entire lump or suspicious area is removed, the procedure is called an excisional biopsy. When a sample of tissue or fluid is removed with a needle, the procedure is called a needle biopsy, core biopsy, or fine-needle aspiration.

bisphosphonate

A type of drug used to treat osteoporosis and the bone pain caused by some types of cancer. Also called diphosphonate.

blood

A tissue with red blood cells, white blood cells, platelets, and other substances suspended in fluid called plasma. Blood takes oxygen and nutrients to the tissues, and carries away wastes.

blood vessel

A tube through which the blood circulates in the body. Blood vessels include a network of arteries, arterioles, capillaries, venules, and veins.

bone marrow

The soft, sponge-like tissue in the center of most bones. It produces white blood cells, red blood cells, and platelets.

breast

Glandular organ located on the chest. The breast is made up of connective tissue, fat, and breast tissue that contains the glands that can make milk. Also called mammary gland.

breast cancer in situ

Abnormal cells that are confined to the ducts or lobules in the breast. There are two forms, called ductal carcinoma in situ (DCIS) and lobular carcinoma in situ (LCIS).

breast reconstruction

Surgery to rebuild the shape of the breast after a mastectomy.

breast-conserving surgery

An operation to remove the breast cancer but not the breast itself. Types of breast-conserving surgery include lumpectomy (removal of the lump), quadrantectomy (removal of one quarter, or quadrant, of the breast), and segmental mastectomy (removal of the cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor). Also called breast-sparing surgery.

cancer

A term for diseases in which abnormal cells divide without control. Cancer cells can invade nearby tissues and can spread through the bloodstream and lymphatic system to other parts of the body. There are several main types of cancer. Carcinoma is cancer that begins in the skin or in tissues that line or cover internal organs. Sarcoma is cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue. Leukemia is cancer that starts in blood-forming tissue such as the bone marrow, and causes large numbers of abnormal blood cells to be produced and enter the bloodstream. Lymphoma and multiple myeloma are cancers that begin in the cells of the immune system.

catheter (KATH-i-ter)

A flexible tube used to deliver fluids into or withdraw fluids from the body.

cell

The individual unit that makes up the tissues of the body. All living things are made up of one or more cells.

centimeter

A measure of length in the metric system. A centimeter is one hundredth of a meter. There are 2½ centimeters in an inch.

chemotherapy (kee-moh-THAYR-uh-pee)

Treatment with drugs that kill cancer cells.

chest wall

The muscles, bones, and joints that make up the area of the body between the neck and the abdomen.

clinical trial

A type of research study that tests how well new medical approaches work in people. These studies test new methods of screening, prevention, diagnosis, or treatment of a disease. Also called a clinical study.

core biopsy

The removal of a tissue sample with a needle for examination under a microscope.

diagnosis

The process of identifying a disease by the signs and symptoms.

dose

The amount of medicine taken, or radiation given, at one time.

drug

Any substance, other than food, that is used to prevent, diagnose, treat or relieve symptoms of a disease or abnormal condition. Also refers to a substance that alters mood or body function, or that can be habit-forming or addictive, especially a narcotic.

duct (dukt)

In medicine, a tube or vessel of the body through which fluids pass.

ductal carcinoma

The most common type of breast cancer. It begins in the cells that line the milk ducts in the breast.

ductal carcinoma in situ (DUK-tal KAR-sih-NOH-muh in SYE-too)

DCIS. A noninvasive condition in which abnormal cells are found in the lining of a breast duct. The abnormal cells have not spread outside the duct to other tissues in the breast. In some cases, ductal carcinoma in situ may become invasive cancer and spread to other tissues, although it is not known at this time how to predict which lesions will become invasive. Also called intraductal carcinoma.

endometrial

Having to do with the endometrium (the layer of tissue that lines the uterus).

estrogen (ES-truh-jin)

A type of hormone made by the body that helps develop and maintain female sex characteristics and the growth of long bones. Estrogens can also be made in the laboratory. They may be used as a type of birth control and to treat symptoms of menopause, menstrual disorders, osteoporosis, and other disorders.

estrogen receptor (ES-truh-jin)

A protein found inside the cells of the female reproductive tissue, some other types of tissue, and some cancer cells. The hormone estrogen will bind to the receptors inside the cells and may cause the cells to grow.

estrogen receptor test (ES-truh-jin rih-SEP-ter test)

A lab test to find out if cancer cells have estrogen receptors (proteins to which estrogen will bind). If the cells have estrogen receptors, they may need estrogen to grow, and this may affect how the cancer is treated.

excisional biopsy (ek-SI-zhun-al BY-op-see)

A surgical procedure in which an entire lump or suspicious area is removed for diagnosis. The tissue is then examined under a microscope.

external radiation (ray-dee-AY-shun)

Radiation therapy that uses a machine to aim high-energy rays at the cancer. Also called external-beam radiation.

fine-needle aspiration (as-per-AY-shun)

The removal of tissue or fluid with a needle for examination under a microscope. Also called needle biopsy.

gene

The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein.

genetic testing

Analyzing DNA to look for a genetic alteration that may indicate an increased risk for developing a specific disease or disorder.

gland

An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva, or milk. Endocrine glands release the substances directly into the bloodstream. Exocrine glands release the substances into a duct or opening to the inside or outside of the body.

growth factor

A substance made by the body that functions to regulate cell division and cell survival. Some growth factors are also produced in the laboratory and used in biological therapy.

HER2/neu

Human epidermal growth factor receptor 2. The HER2/neu protein is involved in the growth of some cancer cells. Also called c-erbB-2.

hereditary (ha-RED-ih-tair-ee)

Transmitted from parent to child by information contained in the genes.

high-dose chemotherapy (hy-dose kee-moh-THAYR-uh-pee)

An intensive drug treatment to kill cancer cells, but that also destroys the bone marrow and can cause other severe side effects. High-dose chemotherapy is usually followed by bone marrow or stem cell transplantation to rebuild the bone marrow.

hormone

A chemical made by glands in the body. Hormones circulate in the bloodstream and control the actions of certain cells or organs. Some hormones can also be made in a laboratory.

hormone therapy (HOR-mone THAYR-uh-pee)

Treatment that adds, blocks, or removes hormones. For certain conditions (such as diabetes or menopause), hormones are given to adjust low hormone levels. To slow or stop the growth of certain cancers (such as prostate and breast cancer), synthetic hormones or other drugs may be given to block the body's natural hormones. Sometimes surgery is needed to remove the gland that makes a certain hormone. Also called hormonal therapy, hormone treatment, or endocrine therapy.

immune system (im-YOON)

The complex group of organs and cells that defends the body against infections and other diseases.

incision (in-SIH-zhun)

A cut made in the body to perform surgery.

incisional biopsy (in-SIH-zhun-al BY-op-see)

A surgical procedure in which a portion of a lump or suspicious area is removed for diagnosis. The tissue is then examined under a microscope.

infection

Invasion and multiplication of germs in the body. Infections can occur in any part of the body and can spread throughout the body. The germs may be bacteria, viruses, yeast, or fungi. They can cause a fever and other problems, depending on where the infection occurs. When the body's natural defense system is strong, it can often fight the germs and prevent infection. Some cancer treatments can weaken the natural defense system.

inflammatory breast cancer

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

infusion

A method of putting fluids, including drugs, into the bloodstream. Also called intravenous infusion.

injection

Use of a syringe and needle to push fluids or drugs into the body; often called a "shot."

inoperable

Describes a condition that cannot be treated by surgery.

internal radiation (ray-dee-AY-shun)

A procedure in which radioactive material sealed in needles, seeds, wires, or catheters is placed directly into or near a tumor. Also called brachytherapy, implant radiation, or interstitial radiation therapy.

invasive cancer

Cancer that has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues. Also called infiltrating cancer.

lesion (LEE-zhun)

An area of abnormal tissue. A lesion may be benign (noncancerous) or malignant (cancerous).

liver

A large organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile.

lobe

A portion of an organ, such as the liver, lung, breast, thyroid, or brain.

lobular carcinoma in situ (LOB-yoo-lar KAR-sih-NOH-muh in SYE-too)

LCIS. A condition in which abnormal cells are found in the lobules of the breast. LCIS seldom becomes invasive cancer; however, having lobular carcinoma in situ in one breast increases the risk of developing breast cancer in either breast.

lobule (LOB-yule)

A small lobe or a subdivision of a lobe.

lumpectomy (lump-EK-toe-mee)

Surgery to remove the tumor and a small amount of normal tissue around it.

lung

One of a pair of organs in the chest that supplies the body with oxygen, and removes carbon dioxide from the body.

lymph (limf)

The clear fluid that travels through the lymphatic system and carries cells that help fight infections and other diseases. Also called lymphatic fluid.

lymph node (limf node)

A rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Lymph nodes filter lymph (lymphatic fluid), and they store lymphocytes (white blood cells). They are located along lymphatic vessels. Also called a lymph gland.

lymph node dissection (limf node dis-EK-shun)

A surgical procedure in which the lymph nodes are removed and examined to see whether they contain cancer. For a regional lymph node dissection, some of the lymph nodes in the tumor area are removed; for a radical lymph node dissection, most or all of the lymph nodes in the tumor area are removed. Also called lymphadenectomy.

lymph vessel (limf)

A thin tube that carries lymph (lymphatic fluid) and white blood cells through the lymphatic system. Also called lymphatic vessel.

mammogram (MAM-o-gram)

An x-ray of the breast.

menopause (MEN-uh-pawz)

The time of life when a woman's menstrual periods stop. A woman is in menopause when she hasn't had a period for 12 months in a row. Also called "change of life."

menstrual cycle (MEN-stroo-al)

The monthly cycle of hormonal changes from the beginning of one menstrual period to the beginning of the next.

menstruation (MEN-stroo-AY-shun)

Periodic discharge of blood and tissue from the uterus. From puberty until menopause, menstruation occurs about every 28 days when a woman is not pregnant.

metastatic cancer

Cancer that has spread from the place in which it started to other parts of the body.

modified radical mastectomy (mas-TEK-toe-mee)

Surgery for breast cancer in which the breast, most or all of the lymph nodes under the arm, and the lining over the chest muscles are removed. Sometimes the surgeon also removes part of the chest wall muscles.

monoclonal antibody (MAH-no-KLO-nul AN-tih-BAH-dee)

A laboratory-produced substance that can locate and bind to cancer cells wherever they are in the body. Many monoclonal antibodies are used in cancer detection or therapy; each one recognizes a different protein on certain cancer cells. Monoclonal antibodies can be used alone, or they can be used to deliver drugs, toxins, or radioactive material directly to a tumor.

needle biopsy

The removal of tissue or fluid with a needle for examination under a microscope. Also called fine-needle aspiration.

observation

Closely monitoring a patient's condition but withholding treatment until symptoms appear or change. Also called watchful waiting.

operable

Describes a condition that can be treated by surgery.

organ

A part of the body that performs a specific function. For example, the heart is an organ.

ovarian

Having to do with the ovaries, the female reproductive glands in which the ova (eggs) are formed. The ovaries are located in the pelvis, one on each side of the uterus.

partial mastectomy (mas-TEK-toe-mee)

The removal of cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor. Usually some of the lymph nodes under the arm are also taken out. Also called segmental mastectomy.

pathologist (pa-THOL-o-jist)

A doctor who identifies diseases by studying cells and tissues under a microscope.

PDQ

Physician Data Query. PDQ is an online database developed and maintained by the National Cancer Institute. Designed to make the most current, credible, and accurate cancer information available to health professionals and the public, PDQ contains peer-reviewed summaries on cancer treatment, screening, prevention, genetics, complementary and alternative medicine, and supportive care; a registry of cancer clinical trials from around the world; and directories of physicians, professionals who provide genetics services, and organizations that provide cancer care. Most of this information, and more specific information about PDQ, can be found on the NCI's Web site at <http://www.cancer.gov/cancertopics/pdq>.

peau d'orange

A dimpled condition of the skin of the breast, resembling the skin of an orange, sometimes found in inflammatory breast cancer.

pelvic

Having to do with the pelvis (the lower part of the abdomen located between the hip bones).

precancerous (pre-KAN-ser-us)

A term used to describe a condition that may (or is likely to) become cancer. Also called premalignant.

progesterone (pro-JES-ter-own)

A female hormone.

progesterone receptor (proh-JES-tuh-rone)

PR. A protein found inside the cells of the female reproductive tissue, some other types of tissue, and some cancer cells. The hormone progesterone will bind to the receptors inside the cells and may cause the cells to grow.

progesterone receptor test (proh-JES-tuh-rone rih-SEP-ter test)

A lab test to find out if cancer cells have progesterone receptors (proteins to which the hormone progesterone will bind). If the cells have progesterone receptors, they may need progesterone to grow, and this can affect how the cancer is treated.

prognosis (prog-NO-sis)

The likely outcome or course of a disease; the chance of recovery or recurrence.

protein (PRO-teen)

A molecule made up of amino acids that are needed for the body to function properly. Proteins are the basis of body structures such as skin and hair and of substances such as enzymes, cytokines, and antibodies.

radiation (ray-dee-AY-shun)

Energy released in the form of particles or electromagnetic waves. Common sources of radiation include radon gas, cosmic rays from outer space, and medical x-rays.

radiation therapy (RAY-dee-AY-shun THAYR-uh-pee)

The use of high-energy radiation from x-rays, gamma rays, neutrons, and other sources to kill cancer cells and shrink tumors. Radiation may come from a machine outside the body (external-beam radiation therapy), or it may come from radioactive material placed in the body near cancer cells (internal radiation therapy, implant radiation, or brachytherapy). Systemic radiation therapy uses a radioactive substance, such as a radiolabeled monoclonal antibody, that circulates throughout the body. Also called radiotherapy.

radical mastectomy (RAD-ih-kul mas-TEK-toe-mee)

Surgery for breast cancer in which the breast, chest muscles, and all of the lymph nodes under the arm are removed. For many years, this was the breast cancer operation used most often, but it is used rarely now. Doctors consider radical mastectomy only when the tumor has spread to the chest muscles. Also called the Halsted radical mastectomy.

radioactive (RAY-dee-o-AK-tiv)

Giving off radiation.

radioactive seed

A small, radioactive pellet that is placed in or near a tumor. Cancer cells are killed by the energy given off as the radioactive material decays (breaks down).

receptor

A molecule inside or on the surface of a cell that binds to a specific substance and causes a specific physiologic effect in the cell.

recurrent cancer

Cancer that has returned after a period of time during which the cancer could not be detected. The cancer may come back to the same place as the original (primary) tumor or to another place in the body. Also called recurrence.

regional chemotherapy (REE-juh-nul KEE-moh-THAYR-uh-pee)

Treatment with anticancer drugs directed to a specific area of the body.

risk factor

Something that may increase the chance of developing a disease. Some examples of risk factors for cancer include age, a family history of certain cancers, use of tobacco products, certain eating habits, obesity, lack of exercise, exposure to radiation or other cancer-causing agents, and certain genetic changes.

segmental mastectomy (mas-TEK-toe-mee)

The removal of cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor. Usually some of the lymph nodes under the arm are also taken out. Also called partial mastectomy.

sentinel lymph node

The first lymph node to which cancer is likely to spread from the primary tumor. When cancer spreads, the cancer cells may appear first in the sentinel node before spreading to other lymph nodes.

sentinel lymph node biopsy

Removal and examination of the sentinel node(s) (the first lymph node(s) to which cancer cells are likely to spread from a primary tumor). To identify the sentinel lymph node(s), the surgeon injects a radioactive substance, blue dye, or both near the tumor. The surgeon then uses a scanner to find the sentinel lymph node(s) containing the radioactive substance or looks for the lymph node(s) stained with dye. The surgeon then removes the sentinel node(s) to check for the presence of cancer cells.

stage

The extent of a cancer in the body. Staging is usually based on the size of the tumor, whether lymph nodes contain cancer, and whether the cancer has spread from the original site to other parts of the body.

stage I breast cancer

The tumor is 2 centimeters or smaller and has not spread outside the breast.

stage II breast cancer

Stage II is divided into stage IIA and stage IIB based on tumor size and whether it has spread to the axillary lymph nodes (the lymph nodes under the arm). In stage IIA, the cancer is either no larger than 2 centimeters and

has spread to the axillary lymph nodes, or between 2 and 5 centimeters but has not spread to the axillary lymph nodes. In stage IIB, the cancer is either between 2 and 5 centimeters and has spread to the axillary lymph nodes, or larger than 5 centimeters but has not spread to the axillary lymph nodes.

stage IIIA breast cancer

Stage III breast cancer is divided into stages IIIA, IIIB, and IIIC. In stage IIIA, (1) no tumor is found in the breast, but cancer is found in axillary (under the arm) lymph nodes that are attached to each other or to other structures; or (2) the tumor is 5 centimeters or smaller and has spread to axillary lymph nodes that are attached to each other or to other structures; or (3) the tumor is larger than 5 centimeters and has spread to axillary lymph nodes that may or may not be attached to each other or to other structures.

stage IIIB breast cancer

Stage III breast cancer is divided into stages IIIA, IIIB, and IIIC. In stage IIIB, the cancer may be any size, has spread to tissues near the breast (the skin or chest wall, including the ribs and muscles in the chest), and may have spread to lymph nodes within the breast or under the arm.

stage IIIC breast cancer

Stage III breast cancer is divided into stages IIIA, IIIB, and IIIC. In stage IIIC, cancer has spread to lymph nodes beneath the collarbone and near the neck; and may have spread to lymph nodes within the breast or under the arm and to tissues near the breast.

stage IV breast cancer

Cancer has spread to other organs of the body, most often the bones, lungs, liver, or brain.

staging (STAY-jing)

Performing exams and tests to learn the extent of the cancer within the body, especially whether the disease has spread from the original site to other parts of the body. It is important to know the stage of the disease in order to plan the best treatment.

standard therapy

In medicine, treatment that experts agree is appropriate, accepted, and widely used. Health care providers are obligated to provide patients with standard therapy. Also called standard of care or best practice.

stem cell

A cell from which other types of cells develop. Blood cells develop from blood-forming stem cells.

stem cell transplantation

A method of replacing immature blood-forming cells that were destroyed by cancer treatment. The stem cells are given to the person after treatment to help the bone marrow recover and continue producing healthy blood cells.

surgeon

A doctor who removes or repairs a part of the body by operating on the patient.

surgery (SER-juh-ree)

A procedure to remove or repair a part of the body or to find out whether disease is present. An operation.

symptom

An indication that a person has a condition or disease. Some examples of symptoms are headache, fever, fatigue, nausea, vomiting, and pain.

systemic chemotherapy (sis-TEH-mik kee-moh-THAYR-uh-pee)

Treatment with anticancer drugs that travel through the blood to cells all over the body.

tamoxifen (ta-MOK-si-FEN)

A drug used to treat breast cancer, and to prevent it in women who are at a high risk of developing breast cancer. Tamoxifen blocks the effects of the hormone estrogen in the breast. It belongs to the family of drugs called antiestrogens.

tissue (TISH-oo)

A group or layer of cells that work together to perform a specific function.

total mastectomy (mas-TEK-toe-mee)

Removal of the breast. Also called simple mastectomy.

toxin

A poison produced by certain animals, plants, or bacteria.

trastuzumab (tras-TOO-zuh-mab)

A type of monoclonal antibody used to detect or treat some types of cancer. Monoclonal antibodies are laboratory-produced substances that can locate and bind to cancer cells. Trastuzumab blocks the effects of the growth factor protein HER2, which transmits growth signals to breast cancer cells. Also called Herceptin.

tumor (TOO-mer)

An abnormal mass of tissue that results when cells divide more than they should or do not die when they should. Tumors may be benign (not cancerous), or malignant (cancerous). Also called neoplasm.

vaginal

Having to do with the vagina (the birth canal).

x-ray

A type of high-energy radiation. In low doses, x-rays are used to diagnose diseases by making pictures of the inside of the body. In high doses, x-rays are used to treat cancer.