

Dear Patient,

We have designed this notebook to give you basic information about your diagnosis and treatment so you can be an active participant in your care.

As partners in your care, we want you to have the most up-to-date information so you can make informed decisions regarding your care. Often information can be confusing and overwhelming. Please ask us any questions you have or clarifications you need. In addition to your physicians, the entire patient care team is available to help guide you through this journey.

This can be a difficult time for you and your family.

We are here to make your experience as comfortable as possible.

Sincerely,

UCLA Breast Center Team  
[breastcenter.ucla.edu](http://breastcenter.ucla.edu)



# Our program

At the UCLA Breast Center, our mission is to give you state-of-the-art breast cancer care that is compassionate and supportive. Many health care professionals are part of the team that cares for you.

The **breast surgeons** at UCLA offer thorough and personal treatment for each patient. At your first appointment, your surgeon will review your breast imaging and pathology, and perform a thorough clinical breast exam, to decide on the best treatment for you.

We also have **onsite coordinators** who specialize in breast cancer care. They are here to help you arrange follow-up tests, more education and appointment referrals and to coordinate your care. This helps reduce delays from diagnosis to treatment.

Your medical team may also include a **medical oncologist, radiation oncologist, genetic counselor** and **reconstructive breast surgeon**. This can depend on your individual needs.

**After surgery**, your team will review your pathology results during the weekly Breast Tumor Board meetings. All specialists weigh in on recommendations for your care. We will then discuss this with you. You make the final decisions.



# UCLA Breast Surgery locations

## Beverly Hills

120 S. Spalding Dr., Suite 401  
Beverly Hills, CA 90212  
424-259-8791 Office / 310-899-7557 Fax

## Burbank

191 S. Buena Vista St., Suite 415  
Burbank, CA 91505  
818-333-2555 Office / 818-333-2559 Fax

## Encino

15503 Ventura Blvd., Suite 240  
Encino, CA 91436  
661-255-9287 Office / 661-255-8478 Fax

## Laguna Hills

24302 Paseo De Valencia, Suite 201  
Laguna Hills, CA 92653  
949-598-1701 Office / 949-598-1711 Fax

## Orange

1010 W. La Veta Ave., Suite 475  
Orange, CA 92868  
714-565-0166 Office / 714-541-8036 Fax

## Pasadena

625 S. Fair Oaks Ave., North Tower, Suite 300  
Pasadena, CA 91105  
626-356-3167 Office / 626-356-3190 Fax

## Porter Ranch

19950 Rinaldi Ave., Suite 310  
Porter Ranch, CA 91326  
661-255-9287 Office / 661-255-8478 Fax

## Santa Barbara

309 W. Quinto St.  
Santa Barbara, CA 93105  
805-563-0041 Office / 805-563-0051 Fax

## Santa Clarita

27235 Tourney Road, Suite 2400  
Santa Clarita, CA 91355  
661-255-9287 Office / 661-255-8478 Fax

## Santa Monica 16th Street

1223 16th St., Suite 3100  
Santa Monica, CA 90404  
424-259-8791 Office / 310-899-7557 Fax

## Santa Monica Parkside

2336 Santa Monica Blvd., Suite 304  
Santa Monica, CA 90404  
424-259-8791 Office / 310-899-7557 Fax

## Torrance

3445 Pacific Coast Hwy, Suite 300  
Torrance, CA 90505  
310-325-8252 Office / 310-325-8042 Fax

## Westwood

100 Medical Plaza, Suite 310  
Los Angeles, CA 90095  
310-825-2144 Office / 310-206-2982 Fax



# What to expect when diagnosed with breast cancer: A brief overview

**Breast cancer** — it's a diagnosis all women fear. That's easy to understand. Breast cancer strikes one in every eight women in this country. Almost everyone knows someone who has been diagnosed.

The important thing to know is this: With early diagnosis and the great progress in treatments, breast cancer *can be cured*.

At first, treatment options can seem scary and confusing. We are here to help you.

Your surgeon or oncologist will explain specific treatment recommendations for YOU in detail. But here is a brief general outline of how we treat breast cancer.

## Surgery

**Surgery is most often the first treatment for breast cancer**, unless the tumor is very large, is a certain subtype or has spread to other parts of the body. In those cases, medical therapy may be used first.

The surgical options for breast cancer include:

- **Lumpectomy** (also called partial mastectomy) – The tumor and some normal tissue around it are removed. This tries to “conserve” or save breast tissue that is not affected.
- **Mastectomy** – The entire breast is removed. Reconstructing the breast is an option that can often be done during the same surgery or later. An aesthetic flat closure is an option for patients who choose not to undergo breast reconstruction.

Your best option can depend on tumor size, breast size, your preference, as well as your medical history. Talk with your surgeon.

During surgery, some lymph nodes in the armpit may need to be removed for testing to see if the cancer has spread. These nodes can be the first place breast cancer spreads.

For early breast cancer, a **sentinel lymph node biopsy** is done to sample and test the first lymph node(s) draining the breast.

If cancer is not found in the sentinel nodes, no additional lymph nodes need to be removed. This can reduce recovery time and lymphedema (swelling of the arm).

## Radiation treatment

Radiation treatment is **almost always used after lumpectomy**. It may be used after mastectomy to help reduce the risk of recurrence of cancer in the breast and lymph nodes if the breast tumor is large or the lymph nodes are involved.

High-energy X-rays are used to treat the breast and sometimes the lymph nodes. This kind of radiation is usually well tolerated and has few side effects.

## Systemic therapies

### Chemotherapy [anti-cancer drugs]

Often administered in the vein, anti-cancer drugs enter the bloodstream to target cancer cells anywhere in the body.

These powerful drugs not only attack cancer cells but can act on other cells. This is often the case for cells lining the intestine or hair follicles. This can cause side effects such as nausea and hair loss.

There is good news. Most of the side effects go away when chemotherapy is stopped. And we also now have more drugs that treat cancer better with fewer side effects.

### Anti-hormonal therapies

Anti-hormonal therapy may be recommended as an additional treatment. These drugs block estrogen's potential to promote breast cancer cell growth.

Side effects from these drugs are not dangerous, but they can impact quality of life. They can vary from person to person.

### Targeted therapies

#### HER2

A less toxic form of therapy, called **HER2-targeted therapy**, may also be recommended if your tumor tests positive for overexpression of the HER2 protein. This therapy is generally very well tolerated and works well with chemotherapy to prevent this kind of cancer from recurring.

Specific treatment recommendations vary depending on each patient's case. If you have questions about your treatment plan ask your surgeon, radiation oncologist or medical oncologist to explain your treatment.

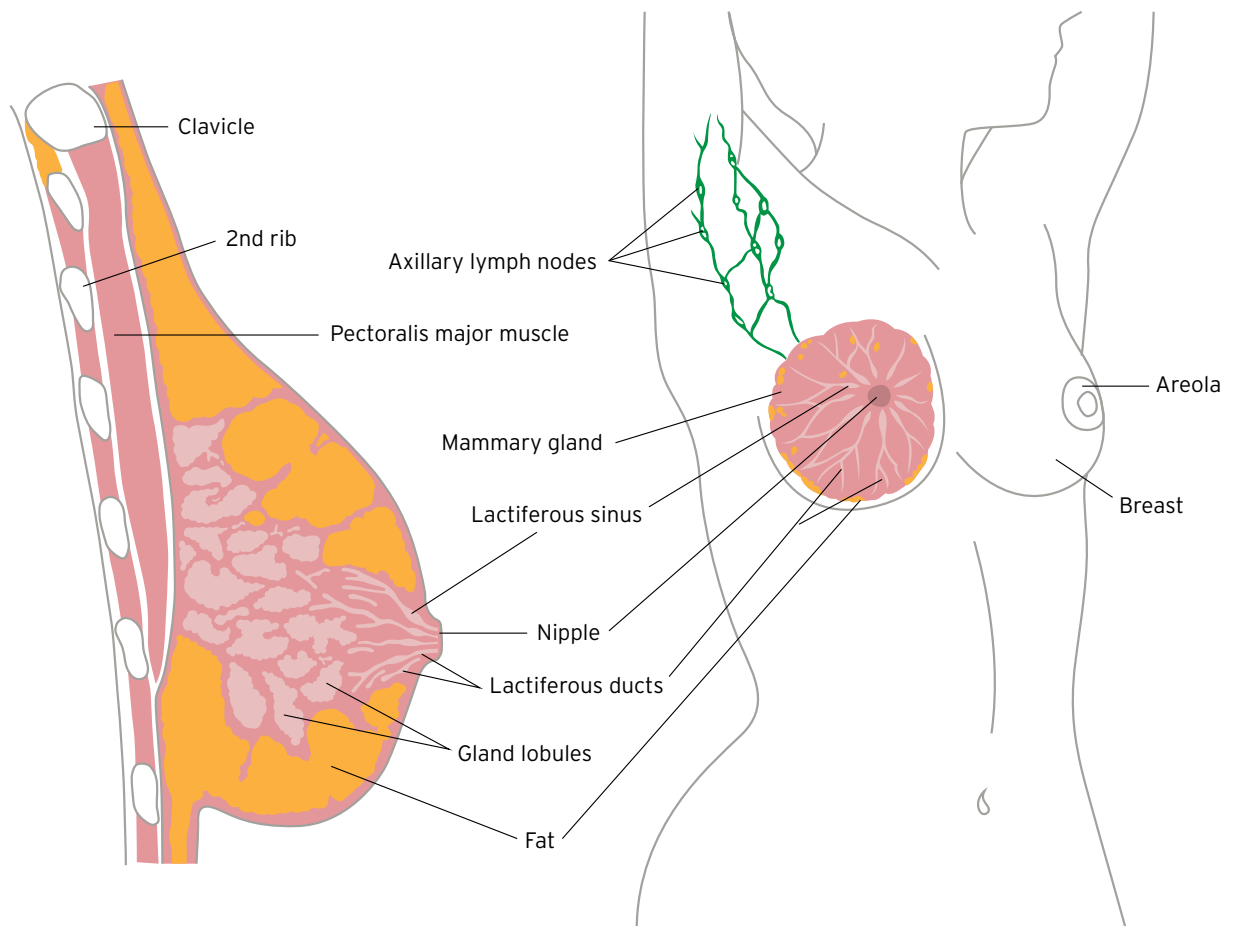
Two excellent online resources you can check for information are:

- The American Society of Breast Surgeons – <https://breast360.org>
- The American Cancer Society – <https://cancer.org/cancer/breast-cancer.html>

# Breast cancer basics

The breast is mostly made up of fatty tissue. This tissue has a network of lobes, which are made up of small, tube-like structures called lobules, which contain milk glands. Tiny ducts connect the glands, lobules, and lobes, and carry milk from the lobes to the nipple, which is in the middle of the areola (the darker area that surrounds the nipple). Cancer can start in any of these areas, including the milk glands and ducts.

Blood and lymph vessels also run throughout the breast in the support tissue outside of the ducts and lobules. Blood nourishes cells, while the lymphatic system drains protein-rich fluid from the soft tissue back into the blood stream and is an important part of our circulatory system. The lymph vessels drain to lymph nodes, tiny bean-shaped organs located throughout the body that filter this fluid, and then return it to the bloodstream.





## Breast cancer development

In the United States, breast cancer is the second most common cancer diagnosed in women, after skin cancer. Though men can also develop breast cancer, they make up less than 1% of all breast cancer diagnoses.

Breast cancer begins when healthy cells in the breast change and multiply, forming a collection of abnormal cells, called a tumor. A tumor can be **benign** (non-cancerous) or **malignant** (cancerous). A benign tumor is not life-threatening and does not spread to other parts of the body. A malignant tumor can spread beyond where it began to other parts of the body.



## Types of breast cancer

Almost 75% of all breast cancers begin in the cells lining the milk ducts. These are called **ductal carcinomas**. Cancers that begin in the lobules are called **lobular carcinomas**. After a sample of a breast tumor is removed during a biopsy, **pathologists** (doctors who specialize in evaluating tissues for cancer and other diseases) determine whether cancer is present and what kind of cancer it is.

Cancer that is only located inside the duct or lobule is called *in situ*, meaning “in place.”

*In situ* breast cancers are classified as **ductal carcinoma *in situ* (DCIS)** and are considered non-life-threatening and Stage 0 (see Staging, below).

Currently, surgeons recommend surgery to remove DCIS to help prevent the cancer from becoming an invasive breast cancer, which could be potentially life-threatening.

Radiation therapy and anti-estrogen therapy may also be recommended for DCIS to reduce recurrence in the breast. Anti-estrogen therapy can also protect the opposite breast from developing breast cancer in the future and should not be confused with hormone replacement therapy (HRT).

**Lobular carcinoma *in situ* (LCIS)**, on the other hand, is not considered breast cancer, and does not require treatment. LCIS is, however, a high-risk lesion, and patients with LCIS have an approximately 20%–30% lifetime risk of developing breast cancer in either breast and should consider additional screening and management, such as anti-estrogen therapy and sometimes surgical biopsy.

Unlike *in situ* cancers, **invasive cancers**, by definition, have broken through the wall of the duct or lobule and have invaded into the breast tissue around the ducts/lobules. The blood vessels and lymphatics live in the tissue around the ducts and lobules, so invasive cancer cells have the potential to enter the blood stream and lymphatic system: This is how cancer spreads outside of the breast to other body organs.

Other specific subtypes of ductal cancers exist and include **medullary, mucinous, tubular and papillary**, as well as other rarer types. In general, cancers that are given these specific subtypes have less aggressive behavior overall.

**Inflammatory breast cancer** is a faster-growing rare type of cancer that accounts for about 1%-5% of all breast cancers. It is a different type of breast cancer. It may be first mistakenly treated as a breast infection because it often starts with sudden breast swelling and redness, which are also signs of a breast infection. Inflammatory breast cancer is treated with chemotherapy first, followed by surgery and then radiation.

**Paget’s disease** is another rare type of breast cancer that begins in the nipple and areolar dermis. The skin often appears scaly and may be itchy and can be diagnosed by a punch biopsy of the skin that demonstrates Paget cells. It is often associated with *in situ* breast cancer but can be associated with invasive breast cancer as well.



# Understanding your diagnosis: Stages

The stage of breast cancer used to be determined by the size of the breast tumor and whether it had spread to lymph nodes or other parts of the body. Recently, the staging system was revised to include some specific features of a patient's cancer and molecular test results to reflect the effect of tumor biology on outcome.

Doctors describe the stages of breast cancer using 0 and the Roman numerals I, II, III and IV and the letters A, B and C.

Cancer that is **Stage I or II** is considered *early-stage breast cancer*.

A cancer that is **Stage IV** is *advanced cancer* that has spread to other parts of the body, such as the liver.

Stages I, II and III are potentially curable; Stage IV is not. The definite stage is often not known until after surgery to remove the tumor and one or more underarm lymph nodes. These all need to be examined under a microscope. However, your doctor can give you a "clinical" stage based on the size of your cancer on imaging and whether your lymph nodes feel or look abnormal on exam or imaging.

Another word you will hear is the "**grade**" of your cancer diagnosis. The grade describes **how aggressive** your tumor is but does not impact the stage. The higher the grade the more aggressive.

- Grade I (low grade or well differentiated),
- Grade II (intermediate grade or moderately differentiated) or
- Grade III (high grade or poorly differentiated).

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## Stage 0

Stage 0 is **carcinoma *in situ***.

In **ductal carcinoma *in situ* (DCIS)**, abnormal cells are found in the lining of the breast duct, but the abnormal cells have not gone through the duct wall or into the breast tissue around it.

**Lobular carcinoma *in situ* (LCIS)** is no longer considered a Stage 0 breast cancer.

## Stage IA

The breast tumor is **no more than 2 centimeters** (3/4 of an inch) across, and cancer **has not spread to the lymph nodes**.

## Stage IB

The tumor is **no more than 2 centimeters across**. Only a small amount of cancer cells are found in lymph nodes i.e. (0.2 – 2.0 mm).

## Stage IIA

The **tumor is less than 2 centimeters across, and the cancer has spread to anywhere from one to three underarm lymph nodes**.

Or, the tumor is between **2 and 5 centimeters** (between 3/4 of an inch and 2 inches) across, but the cancer **has not spread to underarm lymph nodes**.

## Stage IIB

The tumor is **between 2 and 5 centimeters across**, and the cancer **has spread** anywhere from **one to three underarm lymph nodes**.

Or, the tumor is **larger than 5 centimeters across**, **but the cancer has not spread to underarm lymph nodes**.

## Stage IIIA

The breast tumor is **no more than 5 centimeters across**, and the cancer **has spread to underarm lymph nodes that are attached to one another or nearby tissue**. Or the cancer **may have spread to lymph nodes behind the breastbone**.

Or, the tumor is **more than 5 centimeters across** with **one to three lymph nodes involved**.

## Stage IIIB

The breast tumor **can be any size**, and **lymph nodes may or may not be involved**. But the **cancer has grown into the chest wall or the skin of the breast**. The breast may be swollen, or the breast skin may have lumps.

## Stage IIIC

The breast cancer tumor **can be any size**, and it **has spread to lymph nodes behind the breastbone and under the arm**.

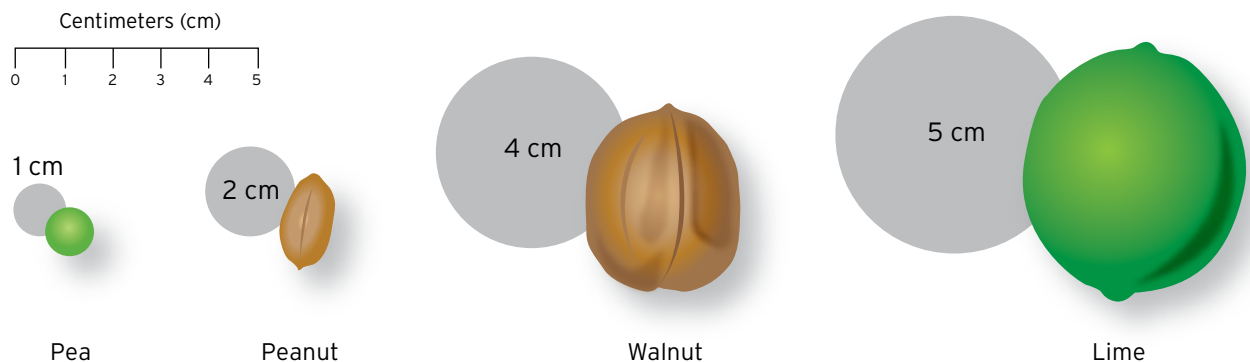
Or, the cancer **has spread to lymph nodes above or below the collarbone**.

## Stage IV

The tumor **can be any size**, and cancer cells **have spread to other parts of the body, such as the lungs, liver, bones or brain**.

## Inflammatory Breast Cancer

Inflammatory breast cancer is a rare type of invasive breast cancer that presents with swelling and redness of the breast. If this is diagnosed, it is at least Stage IIIB but it could be more advanced.



## Breast cancer markers/receptors

Breast tissue removed during your biopsy and/or surgery will be analyzed to determine:

- **Hormone receptor status:** Some breast cancers need hormones to grow. These cancers have receptors: either **estrogen receptors (ER)** and/or **progesterone receptors (PR)**. If the hormone receptor tests show that your breast cancer has these receptors, then anti-hormone therapy is often recommended as part of treatment to block the ability of the hormones to bind to the cancer cells and help them grow.
- **HER2 status:** Some breast cancers have large amounts of a protein called **HER2**. HER-2 drives cell growth and division. For patients with HER2-overexpressing cancers (**HER2-positive**), special antibody therapy can block this pathway, and is given with chemotherapy. It is quite effective treating these breast cancers.

About 15%-20% of American women with breast cancer have **triple-negative breast cancer**. They would not benefit from the above anti-hormone treatments. Their breast cancer cells have:

- No estrogen receptors (so ER-negative)
- No progesterone receptors (so PR-negative)
- No large amount of HER2 (so HER2-normal or HER2-negative)

## How breast cancer can spread

As a cancerous breast tumor grows, cancer cells may break away and spread to other parts of the body through the bloodstream or lymph system. This process is called **metastasis**. Breast cancer cells travel to other organs and grow into more tumors. One of the first places breast cancer usually spreads is to the lymph nodes under the arm on the same side as the cancer in the breast. Breast cancer can also spread right into the bloodstream and avoid the lymph system completely.

In the blood, breast cancer cells can spread to distant sites, such as bones, lungs and liver. Less commonly, they can spread to the brain. However, even if the cancer has spread, it is still named after the area of the body where it started. For example, if breast cancer spreads to the lungs, it is called **metastatic breast cancer**, and not lung cancer. No matter the size, location or metastasis, breast cancer can be treated and/or managed. But breast cancer that has spread to other organs (except lymph nodes) is currently not curable. For this reason, we aim our treatment efforts to prevent this spread.

## Additional tests

Additional testing may be needed to plan treatment.

Not all tests are needed for every person with breast cancer. Your doctors will let you know if any of the following tests are necessary. Ask questions if you have them.

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### Lymph node biopsy

Surgeons use a method called **sentinel lymph node biopsy** to remove the lymph node(s) that are the first to drain the breast to test and see if any cancer cells have entered the lymph system. To locate these specific lymph nodes for testing, your surgeon may order a **lymphoscintigraphy test**. This involves an injection of what's called a "radiolabeled marker." This marker will enter your lymph system and travel along the same pathway that tumor cells would travel should they enter the lymph system.

This test shows the surgeon which lymph node(s) to remove for testing.

This test does *NOT* show whether there is cancer in the lymph nodes. It only shows which nodes should be removed for testing. Once the lymph nodes are removed, they are sent to a pathologist, who then tests them to see if there are any cancer cells present.

If your doctor already knows you have cancer in your lymph node(s) before surgery (because a big lymph node was found during an exam or an abnormal lymph node was found via imaging), you may be recommended for a complete lymph node dissection instead of the sentinel node biopsy, or possibly even chemotherapy to shrink the nodes.

### CT scan

A CT uses a special X-ray machine connected to a computer that takes a series of detailed pictures of your chest, abdomen and/or pelvis.

You may be given what's called "**contrast material**" (by mouth or vein). This material goes through your body and highlights abnormal areas on the scans.

The pictures from a CT scan can show whether cancer has spread to the lungs or liver. This may be ordered for you based on the size or type of your cancer or if you have known lymph node involvement.

## MRI

An MRI is a special machine with a strong magnet linked to a computer. It is used to create detailed pictures of your breasts. An MRI is the most sensitive test we have to evaluate the breasts.

Your surgeon may recommend a breast MRI based on the density of your breasts or type of cancer you have. Both breasts will be evaluated. An MRI for breast cancer also requires the use of a contrast agent. An MRI does not involve any radiation, but it lasts approximately 45 minutes.

## Bone scan

Your doctor may recommend a bone scan. A radiologist (MD with special training) injects a small amount of a radioactive substance, called a tracer, through an IV into your blood. The substance travels through the body and collects in the bones. Higher amounts of the tracers collect in areas where there is cancer. A scan is then made to detect and measure radioactivity in the tracers and create images of the bones. This can determine if the cancer has spread to bones.

## PET-CT scan

If a PET-CT scan is ordered, you will receive a small injection of radioactive sugar that will circulate through your body. The sugar accumulates in cancerous areas because they consume more sugar than normal cells. The radioactive sugar emits signals that are detected by the PET scanner and the signals are changed into images of your body. These pictures are then analyzed to determine if cancer is present in other parts of the body.



# The genetics of breast cancer

In the rapidly growing area of genetic testing and technology, **genetic counselors** provide expertise to analyze, interpret and communicate complex genetic information to patients and their families.

To determine the risk of having hereditary cancer in the family, individuals can take advantage of our cancer genetic counseling services.

Cancer genetic counseling is helpful for patients with breast cancer who are/have:

- Under age 50
- A family history of one or more female relatives with breast cancer
- A family history of male breast cancer
- Triple-negative breast cancer before age 60
- Of Ashkenazi Jewish ancestry at any age
- A family history of ovarian or pancreatic cancer

Any individual who meets one of the criteria requires genetic counseling and likely genetic testing.

Breast cancer patients who do not meet the criteria but have family history of certain cancers may also benefit from genetic counseling and testing. Ask questions.

## During your genetic counseling appointment, your counselor will:

- Review your medical history, family history and other cancer risk factors
- Provide an estimate of your risks for developing specific cancers
- Estimate the likelihood that the cancers in a family are hereditary
- Provide cancer screening and risk-reduction recommendations tailored to your level of risk
- Discuss the risks, benefits and limitations of genetic testing
- Provide genetic testing for appropriate persons and follow-up counseling to discuss the results within the context of your personal and family history of cancer
- Discuss insurance coverage and potential discrimination issues



# Breast cancer treatment options

In cancer care, doctors with different specialties often work together to create an overall treatment plan. We call this **your oncology treatment team**. It often includes:

- A **surgical breast oncologist** – who treats breast cancer with surgery.
- A **medical oncologist** – who treats cancer with medical therapies.
- A **radiation oncologist** – who treats cancer with radiation.

At the UCLA Breast Center, your **FIRST** appointment is typically with a surgical breast specialist. If your treatment recommendation involves surgery first, you will often meet with a medical oncologist and radiation oncologist *after* your surgery so that a specific treatment plan can be discussed based on the final pathology results from surgery.

You are always welcome to meet with any individual member of your team at any time if you have questions and would like to discuss treatment recommendations. Your treatment options and recommendations by the team will depend on several factors, including:

- Stage and grade of your tumor
- Whether your cancer has spread
- Your menopausal status
- Your age and overall health
- Your tumor's hormone receptors (ER, PR) and HER2 status
- Presence of known mutations in inherited breast cancer genes (for example, BRCA1 or BRCA2)

Before any treatment begins, it is important to discuss the goals and possible side effects with your team, including the likelihood that the treatment will be successful and its potential effects on your quality of life and life expectancy.

When making treatment decisions, you may be encouraged to consider participating in a **clinical trial**. A clinical trial is a research study that tests whether a new treatment is safe, effective and better than the standard treatment. This is how we have made progress in cancer treatment over the years. Please ask questions if you would like to be a part of a study. Before you may participate in any study you must sign an informed consent form and be told of all the possible benefits and risks in participating in the clinical trial.



## A few questions to ask our specialists

- What are my treatment options?
- Will I need more than one type of treatment?
- What treatment plan do you recommend for me? Why?
- What is the goal of the treatment(s) you are recommending? Is it to:
  - Eliminate the cancer
  - Relieve my symptoms
  - Or both
- What is the expected timeline for my treatment plan?
- When do I need to make a decision about starting treatment?



## Surgery – More details

Surgery is often one of the first treatments for someone diagnosed with breast cancer. Our **breast surgeon** performs this procedure. The goal is to remove the tumor along with healthy tissue around it, known as a **margin**.

Generally, the smaller the tumor, the more surgical options a person has. These options include:

**Lumpectomy:** This surgery removes the tumor as well as a small, clear (cancer-free) margin of healthy tissue around it. Most of the breast remains.

For both DCIS and invasive cancer, **follow-up radiation therapy** to the remaining breast tissue is typically recommended. A lumpectomy may also be called *breast-conserving surgery*, a *partial mastectomy* or *segmental mastectomy*.

**Mastectomy:** This surgery removes the entire breast and may or may not be combined with reconstructive (plastic) surgery.

- In some cases, a skin-sparing or even nipple-sparing mastectomy may be an option. For this approach, the surgeon removes as little skin as possible and may preserve the nipple.
- In **total (simple) mastectomy**, the surgeon removes the whole breast with the nipple and areolar complex along with excess redundant skin but, not the underarm lymph nodes.
- In modified **radical mastectomy**, the surgeon removes the whole breast and two levels (more than 10) lymph nodes under the arm. Often, the lining over the chest muscle is removed.

The **choice** between breast-conserving surgery and mastectomy depends on many factors:

- The size, location and stage of the tumor
- The size of your breast
- How you feel about how surgery will change the appearance of your breast
- How you feel about radiation therapy
- Your ability to travel to a radiation treatment center for daily treatment sessions

Surgery is also used to evaluate nearby lymph nodes for cancer cells. This helps the doctor figure out the most appropriate treatment. Lymph nodes serve as collecting stations for lymph, a clear fluid that flows throughout the body. As lymph drains out of the breast and into nearby lymph nodes, it can transport cancer cells that may have detached from the original tumor.

The type of procedure you have will depend on a variety of factors, including the type of breast cancer and whether there is evidence of cancer in the lymph nodes before surgery. The lymph node options include *sentinel lymph node biopsy* and *axillary lymph node dissection*.

## Sentinel lymph node biopsy

During a sentinel lymph node biopsy, the surgeon finds and removes the sentinel lymph nodes: the first group of nodes that receive drainage from the breast. The pathologist then examines them for cancer cells. On average, patients have one to three sentinel nodes.

To find the sentinel lymph node(s), the surgeon injects a dye and/or a radioactive tracer into the area of the cancer and/or around the nipple. The dye travels to the lymph nodes, arriving at the sentinel nodes first, allowing the surgeon to locate these nodes because they take up the injected tracer or dye.

- *If the sentinel lymph nodes are cancer-free* - research shows there is a good chance the remaining lymph nodes will also be free of cancer and no further surgery is needed.
- *If the sentinel lymph nodes show evidence of cancer* - recent data also supports that removal of additional lymph nodes (by axillary dissection) may still not be necessary.

## Axillary lymph node dissection

The surgeon's decision to perform an axillary lymph node dissection depends on:

- The type of breast surgery planned (lumpectomy versus mastectomy)
- The stage of the cancer and the number of cancer cells found in the sentinel lymph nodes.

During axillary lymph node dissection, the surgeon removes lymph nodes from under the arm, which are then examined by the pathologist for cancer cells. Two out of three levels of lymph nodes, typically containing 10-20 lymph nodes, are removed.

After surgery (lumpectomy or mastectomy) the breast may be scarred and may be a different shape or size than before surgery. The area around the surgical site may also be harder.

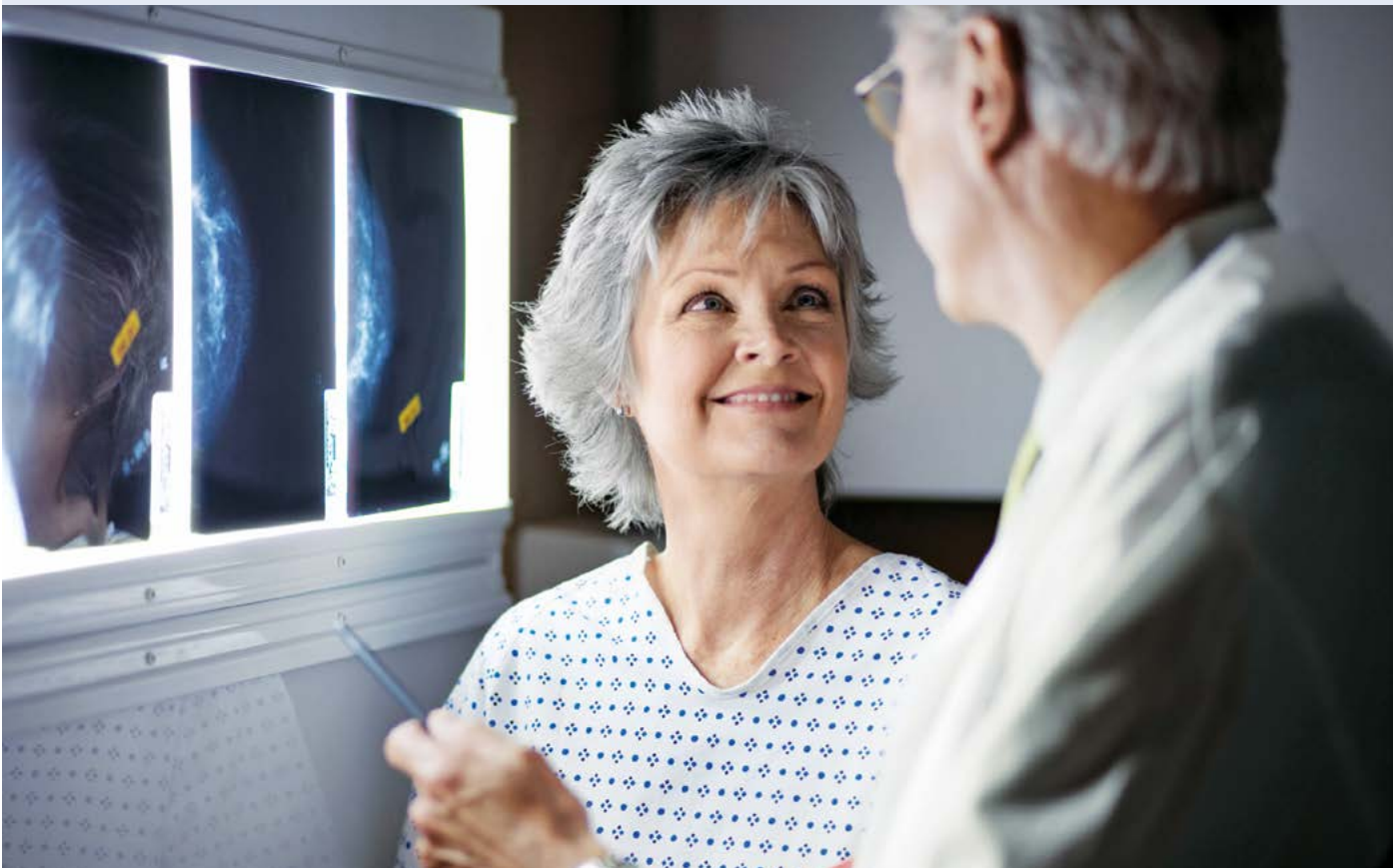
If several lymph nodes were removed as part of the surgery, or were affected during treatment, **lymphedema** (swelling of the hand and/or arm) may occur; this is a lifelong risk.

Lymphedema develops when a blockage in the lymph system causes fluid to build up in the arm. Lymphedema can be *acute* (lasting no more than six months) or *chronic* (lasting years).

Talk with your team about ways to reduce your risk of lymphedema, symptoms you may experience and ways to manage this condition.

## Questions you may want to ask your doctor about surgery

- Am I a candidate for a lumpectomy? Why or why not?
- What are the benefits, if any, if I choose a mastectomy?
- If I have a mastectomy on one side, is it better for me to remove both breasts?
- Is a mastectomy with reconstruction similar to breast augmentation surgery?
- Will I need to be admitted to the hospital after surgery?
- For the lymph node biopsy, why does the entire lymph node need to be removed?
- How many lymph nodes are removed for biopsy?
- Am I at risk for developing lymphedema? If so, how can I reduce that risk?
- Will I need a drain after surgery?
- Will I need physical therapy after surgery?
- Where will the incision be?





# Breast reconstruction

Breast reconstruction is surgery to restore the shape of a breast after a mastectomy.

It is an option for most women who have had their breasts removed because of cancer.

Breast reconstruction may help a woman feel better about her appearance. However, it is important to note that the reconstructed breast will look and feel somewhat different than a natural breast.

## Immediate and delayed reconstruction

If breast reconstruction is desired, it may be done at the same time as mastectomy (called immediate reconstruction) or weeks to years later (delayed reconstruction).

In either case, it is important to **discuss options with your breast surgeon before your mastectomy**. The choices you make may influence where incisions are made and how much skin is saved.

## Types of breast reconstruction

There are two basic types of breast reconstruction:

- Implant reconstruction
- Tissue reconstruction.

Our **plastic surgeon** who performs reconstructions will explain which option is best for your age, overall health, body type, lifestyle, treatment history and personal goals.

## Reconstruction with implants

With implant reconstruction, a two-step procedure is usually required to recreate the breast mound. The first step involves placing a temporary tissue expander over the chest muscle. In some instances, the expander may be placed under the muscle. Over the next few weeks to months, the tissue expander is gradually filled with a saline (salt) solution until the tissue has been adequately stretched and the mound recreated. Next, the expander is replaced by an implant (saline or silicone gel) as an outpatient procedure. If needed and desired, nipple and areola reconstruction requires additional procedures.

### Potential problems

In addition to the risks with any surgery, the most common long-term problems with implant reconstruction are rupture (breakage of the implant cover) and capsular contracture (scar tissue forming around the implant). Breast implants do not last forever. One or more replacement surgeries may be needed later.



## Reconstruction with your own tissue

Tissue reconstruction uses a woman's own fatty tissue to rebuild the breast. The tissue is most often taken from the abdomen but may be taken from the back, buttocks or, more rarely, the thighs. With abdominal tissue reconstruction, which is called DIEP (deep inferior epigastric perforator), flap surgery is typically recommended. This involves removing the abdominal fat and overlying skin and transferring it to the chest wall along with reattachment of the blood vessels using a microscope.

An earlier surgery, TRAM flap surgery, where abdominal muscle is also removed, has grown out of favor. It has been replaced with a muscle-sparing approach, if possible.

### Possible problems

Tissue reconstruction is major surgery. Large surgical wounds, considerable discomfort, swelling and bruising after surgery are common from both donor and operated sites. Decreased strength in the area of the body where the tissue was taken may also result. Complications such as excessive bleeding, excessive scar tissue, fluid collection and problems with healing, including flap failure, while not typical are possible. The chance that the cosmetic result will not be as pleasing as expected is also possible. However, long-term studies of patient satisfaction show that patients who undergo tissue reconstruction are more satisfied than patients who have implants because once a patient recovers from the larger surgery, no additional maintenance or upkeep is necessary.

## Nipple and areola reconstruction

Reconstruction of the nipple and areola (the dark area around the nipple) is an option with either implant or tissue reconstruction. It is usually performed on an outpatient basis, under local anesthesia and after the reconstructed breast has had time to heal (about two to four months).

A variety of techniques may be used to create the new nipple and areola. Tattooing is often used for matching the areola to a woman's natural color. Women can also undergo 3D tattooing of both the nipple and areola.



## Questions you may want to ask your doctor about plastic surgery for breast reconstruction:

- What type of reconstruction surgery do you recommend? Why?
- Will this surgery interfere with chemotherapy or radiation therapy?
- Do I need any breast imaging in the future?
- What results can I expect?
- Do you have photographs of reconstructed breasts I can see?
- How will my reconstructed breast feel? Will it match my other breast in size and shape?
- What is fat grafting?
- What type of sensation (feeling) will the reconstructed breast(s) have?
- What if I become pregnant in the future?
- Are there any options for reconstruction after a lumpectomy?
- Is a prosthesis a better option for me?
- How can I get fitted for a breast prosthesis?
- Will my insurance cover this?
- Where will the scar be, and what will it look like?
- Will my arm be affected by surgery? If so, for how long? Will I need physical therapy?



## Radiation therapy

Radiation therapy is almost always used after lumpectomy and may be used after mastectomy to help decrease the risk of recurrence. The doctor who specializes in giving radiation therapy to treat cancer is called a **radiation oncologist**. Omission of radiation may also be recommended for certain patients, and this will be discussed with your radiation oncologist.

During radiation treatments, high-energy X-rays are used to treat the breast and sometimes the surrounding lymph nodes. Radiation is typically delivered daily, Monday through Friday. Each treatment session lasts for 10 to 15 minutes. The duration of radiation treatment varies and can be as short as five days or as long as six to seven weeks, depending on your particular breast cancer, your breast size, stage and type of breast surgery. The radiation oncologist will discuss your personal treatment options in detail.

Radiation therapy for breast cancer can be delivered to the tumor cavity (the area where the breast tumor was removed), to the whole breast following breast conservation surgery or to the chest wall/reconstructed breast following a mastectomy.

The most common type of radiation treatment is called **external-beam radiation therapy**, which uses machines called *linear accelerators* to generate beams of radiation outside the body and deliver them to cancerous areas of the body. You will not see or feel the radiation as it is being delivered.

Side effects are typically limited to gradual changes in skin color, much like a sunburn, and possibly fatigue. There also may be some long-term cosmetic effects of radiation. However, risks to normal organs such as the heart and lung are very low with modern radiation treatments.



## Questions you may want to ask your doctor about radiation therapy

- Which type of radiation therapy should I consider? Are there options for me?
- When will treatment start? When will it end? How often will I have treatment?
- How will I feel during treatment?
- Will I need to stay in the hospital?
- Will I be able to drive myself to and from the appointments?
- What can I do to take care of myself before, during and after treatment?
- How will we know the treatment is working?
- Will radiation therapy harm my skin?
- Are there any precautions I need to take during radiation, such as avoiding sun exposure?
- How will my chest look afterward?
- Are there any lasting effects?
- What are the chances that the cancer will come back in my breast with and without radiation?





# Chemotherapy

## Adjuvant and neoadjuvant therapy

Anti-cancer drugs, known as **chemotherapy**, are often given after surgery. They are given through an IV into a vein or port, allowing them to enter the bloodstream and target cancer cells anywhere in the body. Depending on the timing, your doctor may call chemotherapy **adjuvant** (after surgery) or **neoadjuvant** (before surgery).

### Adjuvant therapy

Adjuvant therapy is chemotherapy used after surgery to *lower the risk of breast cancer recurrence* (in the breast and throughout the body).

Even when all of the cancer appears to be gone, doctors sometimes recommend chemotherapy as an added measure of safety in case some cancer cells escaped into the bloodstream. Over time, these cells could spread cancer to other places in the body. Chemotherapy helps to lower this risk.

### Neoadjuvant therapy

Neoadjuvant therapy is *used before surgery to check on the body's response to treatment, and in some cases to shrink the cancer.*

Shrinking the size of a cancer gives some women with larger cancers the option of choosing breast-conserving surgery over mastectomy. Using this chemotherapy before surgery also gives doctors and patients a chance to see how well a certain drug or combination of drugs is going to work in a woman's case.

### Potential problems

Prior to initiating chemotherapy, patients will spend time with their oncologist (or oncology nurse) reviewing the potential risks, side effects and benefits of therapy.

The **side effects** of chemotherapy vary depending on the drugs used, the dosages, the overall length of treatment and the individual woman.

The most common side effects are

- Weakness and fatigue
- Nausea and vomiting
- Mouth sores, diarrhea or constipation
- Numbness and tingling of fingers and toes
- Loss of appetite
- Weight changes
- Nail changes
- Hair loss (Hair usually grows back after treatment. Using a scalp-cooling device during chemotherapy infusion may limit hair loss and can be discussed with your oncologist.)

Ask your doctor about medicines and methods that can be used for managing these and other possible side effects.

Some other things you need to know:

- Infections are more likely during treatment, so take special care to protect yourself and avoid situations that increase this risk.
- Short- or longer-term cognitive changes to thinking and memory are possible.
- Certain chemotherapy drugs can cause lasting damage to the heart, lungs, liver and kidneys.
- In younger women, chemotherapy can cause infertility or premature menopause.
- Women planning to become pregnant (or who are able to become pregnant but not taking birth control) should talk with their doctors before starting treatment.

## Anti-hormonal therapy

Anti-hormonal therapy is another form of systemic therapy. It fights breast cancer by blocking the action or lowering the amount of specific hormones in the body.

It is used for women whose breast cancers need hormones to grow (these are called *hormone-receptor-positive breast cancers*). A hormone-receptor test of your tumor tells you and your doctor if your breast cancer is hormone-receptor-positive. Two out of three breast cancers are hormone-receptor-positive.

### Types of anti-hormonal therapy

Based on whether your tumor is estrogen-driven, there are different types of anti-hormonal therapy. Most are pill-based and are given anywhere from five to 10 years after surgery. Some block the effect of hormones. Others lower the amount of hormones in the body. The most effective treatment may be using more than one type over the course of several years. Your doctor will work with you to determine the most appropriate plan for you.

**Tamoxifen**, for example, works to stop or slow cancer by blocking the effect of estrogen hormones on cancer cells. It has been the standard drug for treating women with hormone-receptor-positive breast cancer for more than 30 years. Taken after surgery for invasive cancers, tamoxifen lowers the risk of cancer recurrence by about half and improves the chances for long-term survival.

Tamoxifen also helps women whose cancer has spread and women who have no personal history of breast cancer but whose risk for developing breast cancer is higher than average and wish to lower their risk.



## Aromatase inhibitors

Aromatase inhibitors are newer drugs that work to lower the amount of hormones in the body. Examples are anastrozole (Arimidex®), letrozole (Femara®) and exemestane (Aromasin®). Used either alone or after a course of tamoxifen, these drugs have been found to work as well or better than tamoxifen alone for reducing the risk of cancer recurrence.

While tamoxifen can be used for women who are either premenopausal (still have menstrual periods) or postmenopausal (no longer have menstrual periods), aromatase inhibitors can only be used for women who do not have functioning ovaries. It can only be used for women who have gone into menopause or have had ovaries removed or their function has been suppressed by drugs such as leuprolide or goserelin.

## Potential problems

Anti-hormonal therapy can cause side effects that mimic symptoms of menopause (hot flashes, weight gain, vaginal dryness, headaches, mood swings, hair thinning, etc.).

Rare but serious side effects of tamoxifen include increased risk for:

- Cancers of the uterus
- Blood clots
- Stroke
- Vision problems such as cataracts
- Liver toxicities
- Fertility issues

**Aromatase inhibitors** have less serious side effects than tamoxifen. Potential side effects include upset stomach, an increase in cholesterol, joint stiffness or pain, and potential loss of bone strength. Aromatase inhibitors do not increase risk for uterine cancers and very rarely cause blood clots.

## Targeted therapy

Targeted therapy is a newer whole-body therapy option.

Women with breast cancers that contain too much of the HER2 protein (called HER2-positive breast cancer) are often helped by a drug called trastuzumab (more commonly known as Herceptin®) and, in some cases, pertuzumab (also known as Perjeta®). About one in five women with breast cancer have HER2-positive cancer.

Used with chemotherapy, trastuzumab (alone or with pertuzumab) can lower the risk of cancer recurrence after surgery. It can also shrink or slow the growth of HER2-positive breast cancer that has spread. Lapatinib, another targeted therapy drug, is used to treat HER2-positive breast cancer in women with metastatic cancer that no longer responds to trastuzumab. Kadcyla, a HER2 antibody linked to chemotherapy, may be recommended after surgery for patients who received neoadjuvant chemotherapy and still had cancer left after chemotherapy. This treatment has been called the “smart bomb” and works by binding to the HER2 receptor and then delivering the chemotherapy payload directly into the cell, so it minimizes chemotherapy side effects to other cells in the body and only attacks the cells that overexpress HER2. Other targeted drugs are being studied in clinical trials.

### Potential problems

Flu-like symptoms, such as fever, chills and nausea, are common with trastuzumab, especially after the first dose. Less common, it can cause mild to severe heart damage. In combination with chemotherapy, trastuzumab may increase risks for other side effects as well, such as anemia and/or infection. Rarely, it can cause severe or life-threatening breathing problems and/or allergic reactions.



## Questions you may want to ask your doctor about chemotherapy

- Which type of chemotherapy do you recommend? Why?
- When do you recommend I have chemotherapy — before surgery or after?
- How long will I need to receive chemotherapy?
- How will the treatment be administered? Do I need a port or temporary IV?
- How will we know if the treatment is working?
- How will chemotherapy affect my daily life? Will I be able to work, exercise and perform my usual activities?
- Can I stay alone after my treatments, or do I need someone to stay with me?
- What are the potential short- and long-term side effects of each medication?
- Will I lose my hair?
- Where can I get more information about the medication(s) I will be taking?
- If I am worried about the cost of treatment, who can help me with this concern?



# Clinical trials

When making treatment decisions, your oncologist may encourage you to consider participating in a clinical trial. A clinical trial is a research study that tests whether a new treatment is safe, effective and better than standard treatment.

We are always looking for more effective ways to treat people with breast cancer. To make scientific advances, doctors conduct clinical trials, special research studies, involving volunteers.

These types of studies evaluate new drugs, different combinations of existing treatments, new approaches to radiation therapy or surgery, and new methods of treatment.

Those who participate in clinical trials are often among the first to have a chance to receive new treatments before they are widely available. However, there is no guarantee that a new treatment will be safe, effective or better than the standard treatment, or that you will receive it.

People decide to participate in clinical trials for many reasons. For some people, a clinical trial is the best treatment option available. Because standard treatments may not be optimal for some patients, many are willing to face the uncertainty of a clinical trial in the hope of a better result. Other people volunteer for clinical trials because they know these studies are the only way to make progress in treating breast cancer. Even if they will not benefit directly from the clinical trial, their participation may help other people with breast cancer in the future.

If you decide to participate in a clinical trial, you will participate in a process called **informed consent**. During informed consent, the doctor will list all of your options and help you understand how the new treatment is different from the standard treatment. They must also list all of the risks of the new treatment, which may or may not be different from the risks of current treatment. Finally, the doctor must explain what will be required of you in order to participate in the clinical trial, including the number of doctor visits, tests, the treatment schedule and associated costs.

Even if you decide to participate in a clinical trial, you can stop participating at any time for any personal or medical reason.

# Managing symptoms and side effects

Fear of side effects of breast cancer treatment is normal. But it may help you to know that preventing and controlling side effects is a major concern of your health care team, too.

Before starting treatment, talk with your team about which side effects are most likely to occur. Then, once treatment begins, let your health care team know what side effects you are having so they can help you manage them.

Everyone's experience with breast cancer treatment is different. Specific side effects that can occur during and after treatment depend on a number of factors, including the cancer's location, your treatment plan and your overall health. In this section, we describe some of the potential physical, emotional and social effects people report while receiving treatment for breast cancer.

## Physical effects

### Fatigue

Cancer and its treatment often cause a constant sense of tiredness or exhaustion. Most people on cancer treatment experience some type of fatigue, which can make even a small effort, such as walking across a room, seem overwhelming. Fatigue often seriously affects ability to do any daily activities, including to even talk to or be around others. Tell your doctor if you are experiencing fatigue, because your team can help you design a plan to help decrease these symptoms.

### Pain

Pain can be caused by the cancer treatment or from causes not related to the cancer, and less likely from the cancer itself. Untreated pain can make the other aspects of cancer seem worse. It can add to fatigue, weakness, nausea, constipation, sleep disturbance, depression, anxiety and mental confusion. Your doctor can work with you to find effective pain-relief strategies. Intermittent breast pain after treatment is not uncommon. This can last for a few years after breast surgery and radiation. Typically, it is not a sign of cancer recurrence.

## Lymphedema

Lymphedema is the abnormal buildup of fluid in the arm caused by a blockage in the lymph system. It can happen immediately after surgery or radiation therapy, or months or years after cancer treatment has ended. In some cases, the swelling goes away on its own as the body heals and normal lymph fluid flow resumes. However, lymphedema may become chronic when the lymphatic system changes and can no longer meet the body's demand for fluid drainage. There is no cure for chronic lymphedema, but there are ways to treat it.

The greatest risk factors for lymphedema are obesity, complete lymph node dissection and radiation to the armpit.

If you are considered at risk for lymphedema, you will be referred to a physical therapist and lymphedema specialist after treatment, before lymphedema can develop, to help prevent it.

The risk of lymphedema with a sentinel lymph node biopsy is only 2%–3% so is the preferred method to assess for lymph node involvement.

If you required an **axillary (armpit) dissection**, we recommend you **AVOID** the following in the arm on the side of surgery:

- Blood draws
- Tight or restrictive clothing
- Blood pressure cuffs applied
- Placement of IVs

This is only a precaution as these things might cause infection or a blood clot, which could increase your risk of lymphedema. If you only had a sentinel lymph node biopsy, these precautions usually do not apply. If you notice swelling of your arm, consult with your doctor.

## Infertility

Some breast cancer treatments may cause temporary or permanent infertility, meaning the inability to become pregnant or have children. If this is a concern for you, please talk with your health care team **before treatment begins** about any fertility-related side effects of your treatment plan and options for preserving your fertility.



## Psychosocial effects

We feel it is important to address the needs of the whole person, not just your medical needs. We have clinical social workers or psychologists who specialize in breast cancer as an important part of the care our team provides to patients and families dealing with the emotional roller coaster of a cancer diagnosis. An expert can validate and normalize patient concerns and provide guidance on coping with cancer. This is extremely helpful. We want to make sure our patients have all the support and resources they need to move forward with their treatment.

The clinicians from Simms/Mann-UCLA Center for Integrative Oncology can also provide information about other support services available at the center, such as nutritional consultations, support groups and individual counseling. Ask your doctor about a referral to the Simms/Mann team.



# Follow-up care

Follow-up care will be determined primarily by the type of treatment you receive and your cancer stage. Follow-up care may be provided by your breast surgeon, radiation oncologist, medical oncologist, oncology nurse practitioner, plastic surgeon and/or your primary-care doctor. It is important to keep a regular check-up schedule and share details about your status with your treating doctors, even years after treatment is completed.

The purpose of follow-up care is to monitor and manage any late, long-term effects of treatment and to check for any signs that the cancer has returned. The risk of a cancer returning in another part of the body varies depending on cancer type. You should follow up with your medical oncologist to monitor for distant recurrences based on your cancer type. The risk of cancer returning in the breast is highest in the first five years, so follow-up with your breast surgeon or his/her oncology nurse practitioner during that time period may be most beneficial.

Your doctor will ask about any symptoms you may be experiencing and may draw blood or order additional imaging and tests as needed.

The recommended follow-up schedule for patients with breast cancer is the following:

**If you had breast-conserving surgery**, you should still have mammograms once a year. The first mammogram is typically scheduled one year from the most recent mammogram before your diagnosis. You should have a clinical breast exam every six to 12 months for the first two years after surgery and then yearly. You may be followed by your breast surgeon or oncology nurse practitioner for these exams for the first two to five years, and then you should continue long-term follow-up with the oncology nurse practitioner, your primary-care physician, gynecologist or medical oncologist. Any additional imaging recommendations, including a breast MRI and/or breast ultrasound, will be discussed with you as necessary.

**If you had a mastectomy**, you no longer require routine imaging on the affected side. However, you should still have follow-up clinical breast exams, as recommended above. After five to 10 years, patients generally no longer require breast exams because the risk of local recurrence at that point is exceedingly low. Follow-up with the medical oncologist may still be recommended long term depending on your cancer stage and type regardless of mastectomy.

**Women taking tamoxifen** should have yearly pelvic exams.

**Patients being treated with an aromatase inhibitor** should have a bone density test before, during and after treatment, as recommended by their doctors.

## Monthly breast self-examination

The value of self-exams has been debated. You may choose to do a monthly breast self-examination but should not worry if you feel that you cannot examine your breast well. Your primary-care provider can show you the proper way to check for breast changes. The goal is to get a sense of what your breast feels like at baseline and to report any of the following so that potential problems can be diagnosed and treated early:

- A new lump in the breast or chest area
- A new lump in the armpit or neck
- A change in the shape of the breast
- A skin rash, swelling or change in the color of the skin over the breast or chest

## Women recovering from breast cancer

Women recovering from breast cancer need to follow established guidelines for good health. These include maintaining a healthy weight, not smoking, minimizing alcohol intake, eating a balanced diet and receiving recommended cancer screening tests.

Talk with your team to develop a plan that is best for your needs. Moderate physical activity can help rebuild your strength and energy and may lower the risk of cancer recurrence. Your team can help you create a safe exercise plan based upon your needs, physical abilities and fitness level.

## Questions to ask your team about follow-up care

- How often should I see a doctor for follow-up care?
- Whom will I see for my follow-up visits?
- What follow-up tests will I need and how often will I need them?
- What is the chance that the cancer will return?
- Is there anything I can do to reduce the risk of recurrence?
- What are the most common long-term and late effects associated with the treatment I received?

# Breast cancer glossary

## Aromatase inhibitor

A drug that prevents the formation of estradiol, a female hormone, by interfering with an aromatase enzyme. Aromatase inhibitors are used as a type of hormone-blocking therapy for postmenopausal women who have a hormone-dependent breast cancer.

## Axilla

The underarm or armpit.

## Axillary dissection

Surgery to remove at least 10 lymph nodes found in the armpit region. Also called *axillary lymph node dissection*.

## Axillary lymph node

A lymph node in the armpit region that drains lymph from the breast and nearby areas.

## Benign

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

## Biopsy

The removal of cells or tissues for examination by a pathologist to establish a diagnosis. The pathologist will study the tissue under a microscope or perform other tests on the cells or tissue. A breast biopsy is most often performed with a needle device by the breast imagers and less often with surgery.

## Blood vessel

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

## Breast-conserving surgery

An operation to remove the breast cancer but not the breast itself. Breast-sparing surgery is called a lumpectomy (removal of a lump of breast tissue including a rim of normal tissue around the tumor). Not all cancers present with a lump that you can feel but the surgery is still referred to as a lumpectomy. It can also be called partial mastectomy, quadrantectomy and segmental mastectomy.

## Cancer

A term for diseases in which abnormal cells divide uncontrollably and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymphatic systems.

## Carcinoma *in situ*

A group of abnormal cells that remain where they first formed. They have not spread. These abnormal cells may become cancer which can then spread into nearby normal tissue. Also called Stage 0 disease.

## Cell

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

## Chemotherapy

Treatment with drugs that kill cancer cells.

## Clinical trial

A type of research study that tests the efficacy of new medical approaches. These studies test new methods of screening, prevention, diagnosis or treatment of a disease, comparing it to standard care, to see if it is safe and/or better.

## CT scan

The short name for a computed tomography (CT) scan. A series of detailed X-ray pictures of areas inside the body taken from different angles. The pictures are created by a computer linked to an X-ray machine. Also known as a CAT scan (computerized axial tomography).

## Duct

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

## Ductal carcinoma

Cancer that begins in the cells that line the breast's milk ducts. This is the most common type of breast cancer.

### Ductal carcinoma *in situ* (DCIS)

Where the abnormal cells are found only in the lining of a breast duct. The abnormal cells have not spread outside the duct wall to the surrounding **tissues in the breast and it is considered noninvasive**. 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. DCIS can turn into invasive cancer and, therefore, requires treatment.

### Early-stage breast cancer

Breast cancer that has not spread beyond the breast or the axillary lymph nodes. This includes ductal carcinoma in situ and Stage I, Stage IIA, Stage IIB and Stage IIIA breast cancers.

### Estrogen

A hormone produced by the body that helps develop and maintain female sex characteristics and the growth of long bones. Estrogen can also be made in the laboratory. It may be used in birth control pills and as a treatment for the symptoms of menopause, menstrual disorders, osteoporosis and other conditions.

### External radiation therapy

A type of radiation therapy that uses a machine to aim high-energy rays at the cancer from outside of the body. Also called *external-beam radiation therapy*.

### Fibrous

Containing or resembling fibers.

### Gland

An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva or milk.

### HER2

A protein involved in normal cell growth. It is found in some types of cancer cells, including breast and ovarian. It has implications for effective treatment of breast cancer. Cancer cells removed from the body may be tested for the presence of HER2/neu to help decide the best type of treatment. Also called c-erbB-2, human EGF receptor 2 and human epidermal growth factor receptor 2.

### Hormone receptor

A cell protein that binds a specific hormone. The hormone receptor may be on the surface of the cell or inside the cell. Many changes take place in a cell after a hormone binds to its receptor. Common hormones tested for are estrogen and progesterone. This can influence treatment options.

### Hormonal therapy

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, and these are considered anti-hormonal therapies. Sometimes surgery is needed to remove the gland(s) that produces a certain hormone, and this is also a form of anti-hormonal therapy.

### Inflammatory breast cancer

A rare type of breast cancer where the breast becomes red, swollen and feels warm. The skin of the breast may show a pitted appearance called *peau d'orange* (like an orange peel). The redness and warmth occur because the cancer cells block the lymph vessels in the breast which causes the swelling. It can be sudden. It can sometimes be first treated as a breast infection, delaying cancer treatment.

### Intravenous

Into or within a vein. Intravenous usually refers to a way of giving a drug (or other substance) through a needle or tube inserted into a vein. Abbreviated as IV.

### Lobe

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

### Lobular carcinoma

Cancer that begins in the lobules (the glands that make milk) of the breast. In lobular carcinoma *in situ* (LCIS) abnormal cells are only found in the lobules. Classic LCIS is not considered pre-cancerous and does not require treatment. LCIS, rather, is a marker for increased risk (such as family history) of breast cancer development in either breast. When cancer has spread from the lobules to surrounding tissues, it is termed *invasive lobular carcinoma*.

### Lobule

A small lobe or a subdivision of a lobe.

### Lumpectomy

Surgery to remove abnormal tissue or cancer from the breast and a small amount of normal tissue around it. It is a type of breast-conserving surgery.

### Lymph node

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

### Lymph vessel

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

### Lymphedema

A condition in which excess fluid collects in surrounding tissues and causes swelling. It may occur in the arm or leg after lymph vessels or lymph nodes in the underarm or groin are removed or treated with radiation. It can be “acute” (short lived) or “chronic” (last a long time).

### Magnetic resonance imaging (MRI)

A procedure where radio waves and a powerful magnet linked to a computer are used to create detailed pictures of areas inside the body. These pictures can show the difference between normal and diseased tissue. MRI provides better images of organs and soft tissue than other scanning techniques, such as computed tomography (CT) or X-ray. MRI is especially useful for imaging the breast, brain, spine, soft tissue of joints and insides of bones.

### Malignant

Cancerous. Malignant tumors can invade and destroy nearby tissue and spread to other parts of the body.

### Mammogram

An X-ray of the breast.

### Mastectomy

Surgery to remove the breast (or as much of the breast tissue as possible).

### Medical oncologist

A doctor who specializes in diagnosing and treating cancer using chemotherapy, targeted therapy, hormonal therapy and biological therapy. A medical oncologist often is the main health care provider for someone who has cancer. A medical oncologist also gives supportive care and may coordinate treatment given by other specialists.

### Menopause

The time of life when a woman’s ovaries stop producing estrogen and progesterone, and menstrual periods end. Natural menopause usually occurs around age 50. A woman is said to be in menopause when she has not had a period for 12 consecutive months. Symptoms of menopause include hot flashes, mood swings, night sweats, vaginal dryness, trouble concentrating and infertility.

### Menstrual period

The periodic discharge of blood and tissue from the uterus. From puberty until menopause, menstruation occurs about every 28 days. It does not occur during pregnancy.

### Metastatic

Having to do with metastasis, which is the spread of cancer from one part of the body to another.

### Modified radical mastectomy

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. Less commonly the surgeon also removes part of the chest wall muscles.

### Oncology nurse

A nurse who specializes in treating and caring for people who have cancer.

### Organ

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

### Ovary

One of a pair of female reproductive glands in which the ova, or eggs, are formed. The ovaries are located in the pelvis, one on each side of the uterus.



### Partial mastectomy

The removal of cancer as well as some of the breast tissue around the tumor. Also called segmental mastectomy or lumpectomy.

### Physical therapist

A health professional who teaches physical activities that help condition muscles and restore strength and movement.

### Plastic surgery

An operation that restores or improves the appearance of body structures.

### Positron emission tomography (PET) scan

A procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed computerized pictures of areas inside the body where the glucose is used. Because cancer cells often use more glucose than normal cells, the pictures can be used to find cancer cells in the body.

### Progesterone

A type of hormone produced by the body that plays a role in the menstrual cycle and pregnancy. Progesterone can also be made in the laboratory. It may be used as a type of birth control and to treat menstrual disorders, infertility, symptoms of menopause and other conditions.

### Radiation

Energy released in the form of particle or electromagnetic waves. Common sources of radiation include radon gas, cosmic rays from space, medical X-rays and energy emitted by a radioisotope (an unstable form of a chemical element that releases radiation as it breaks down and becomes more stable).

### Radiation oncologist

A doctor who specializes in using radiation to treat cancer.

### Radiation therapy

The use of high-energy radiation from X-rays, gamma rays, neutrons, protons 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). Systemic radiation therapy uses a radioactive substance, such as a radiolabeled monoclonal antibody, that travels in the blood to tissues throughout the body. Also called irradiation and radiotherapy.

### Radioactive

Emitting radiation.

### Segmental mastectomy

The removal of cancer as well as some of the breast tissue around the tumor. Also called partial mastectomy or lumpectomy.

### 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 and/or blue dye near the tumor. The surgeon then uses a special 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.

### Side effect

A problem that occurs when treatment affects healthy tissues or organs. Some common side effects of cancer treatment are fatigue, pain, nausea, vomiting, decreased blood cell counts, hair loss and mouth sores.

### Social worker

A professional trained to talk with people and their families about emotional or physical needs, and who also helps them find support services.

### Surgery

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

### Tamoxifen

A drug used to treat certain types of breast cancer in women and men. It is also used to prevent breast cancer in women who have had ductal carcinoma in situ (abnormal cells in the ducts of the breast) and in women who are at a high risk of developing breast cancer. It blocks the effects of the estrogen hormone in the breast.

### Targeted therapy

A type of treatment that uses drugs or other substances, such as monoclonal antibodies, to identify and attack specific cancer cells. Targeted therapy may have fewer side effects than other types of cancer treatments.

### Tissue

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

### Total mastectomy

Removal of the breast. Also called simple mastectomy.

### Tumor

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

### X-ray

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