

About Breast Cancer

Get basic information about breast cancer, such as the different types, where they start, important statistics, and current research topics.

Breast Cancer Basics

Get an overview of the different types of breast cancer and where they start.

- [What Is Breast Cancer?](#)
- [What Causes Breast Cancer?](#)

Types of Breast Cancer

There are several types of breast cancer. The type of breast cancer you have depends on where in the breast it started and other factors.

- [Types of Breast Cancer Overview](#)
- [Ductal Carcinoma in Situ \(DCIS\)](#)
- [Invasive Breast Cancer \(IDC/ILC\)](#)
- [Triple-negative Breast Cancer](#)
- [Angiosarcoma of the Breast](#)
- [Inflammatory Breast Cancer](#)
- [Paget Disease of the Breast](#)
- [Phyllodes Tumors](#)

Research and Statistics

See the latest estimates for new cases and deaths of breast cancer in the US and what research is being done.

- [Key Statistics for Breast Cancer](#)
 - [What's New in Breast Cancer Research?](#)
-

What Is Breast Cancer?

Breast cancer is a type of cancer that starts in the breast. It can start in one or both breasts.

- [How breast cancer starts](#)
- [Where breast cancer starts](#)
- [How breast cancer spreads](#)
- [Types of breast cancer](#)

How breast cancer starts

Breast cancer occurs almost entirely in women, but [men can get breast cancer¹](#), too.

Cancer starts when cells begin to grow out of control. (To learn more about how cancers start and spread, see [What Is Cancer?²](#))

It's important to understand that most breast lumps are benign and not cancer (malignant). Non-cancer breast tumors are abnormal growths, but they do not spread outside of the breast. They are not life threatening, but some types of benign breast lumps can increase a woman's risk of getting breast cancer.

Any breast lump or change needs to be checked by a health care professional to find out if it is benign or malignant (cancer) and if it might affect your future cancer risk. See [Non-cancerous Breast Conditions³](#) to learn more.

Where breast cancer starts

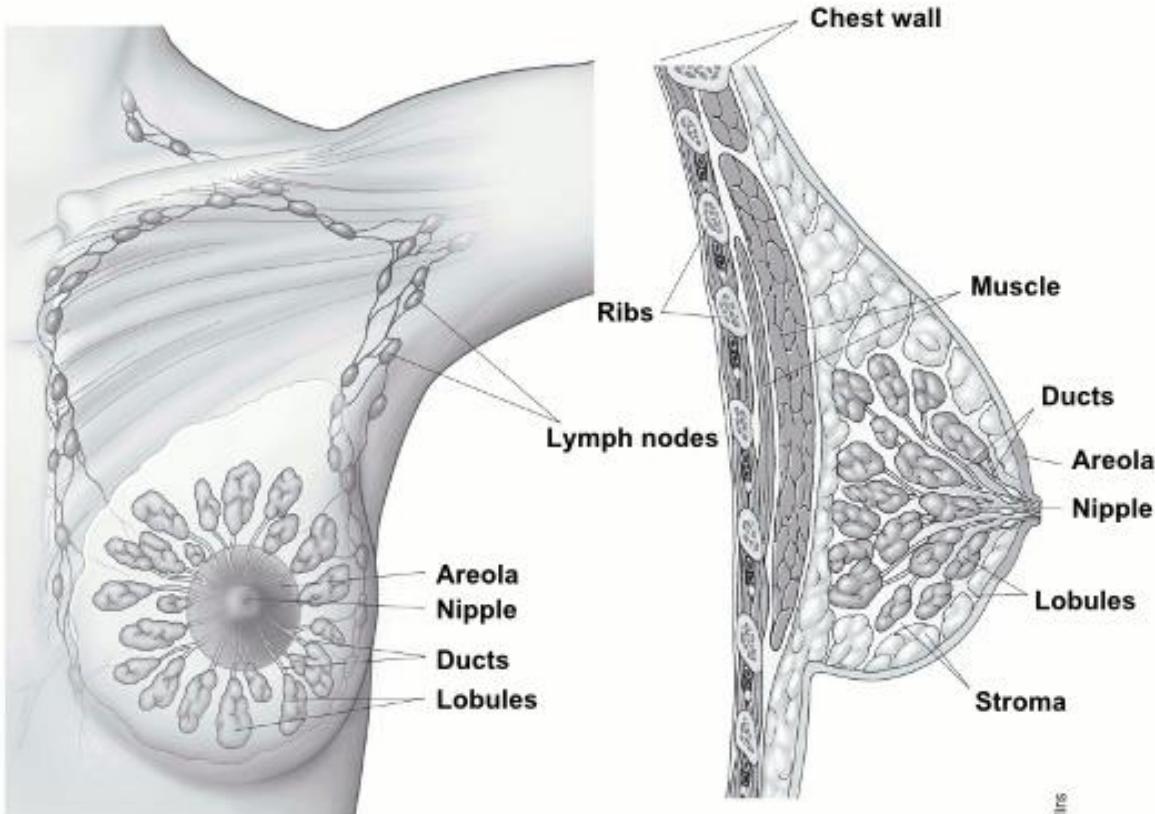
Breast cancers can start from different parts of the breast. The breast is an organ that sits on top of the upper ribs and chest muscles. There is a left and right breast and each one has mainly glands, ducts, and fatty tissue. In women, the breast makes and delivers milk to feed newborns and infants. The amount of fatty tissue in the breast determines the size of each breast.

The breast has different parts:

- **Lobules** are the glands that make breast milk. Cancers that start here are called **lobular cancers**.
- **Ducts** are small canals that come out from the lobules and carry the milk to the nipple. This is the most common place for breast cancer to start. Cancers that start here are called **ductal cancers**.
- The **nipple** is the opening in the skin of the breast where the ducts come together and turn into larger ducts so the milk can leave the breast. The nipple is surrounded by slightly darker thicker skin called the **areola**. A less common type of breast cancer called **Paget disease of the breast** can start in the nipple.
- The **fat and connective tissue (stroma)** surround the ducts and lobules and help keep them in place. A less common type of breast cancer called **phyllodes tumor⁴** can start in the stroma.
- **Blood vessels** and **lymph vessels** are also found in each breast. **Angiosarcoma** is a less common type of breast cancer that can start in the lining of these vessels. The lymph system is described below.

A small number of cancers start in other tissues in the breast. These cancers are called **sarcomas⁵** and **lymphomas⁶** and are not really thought of as breast cancers.

To learn more, see [Types of Breast Cancer](#).



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Normal breast tissue

How breast cancer spreads

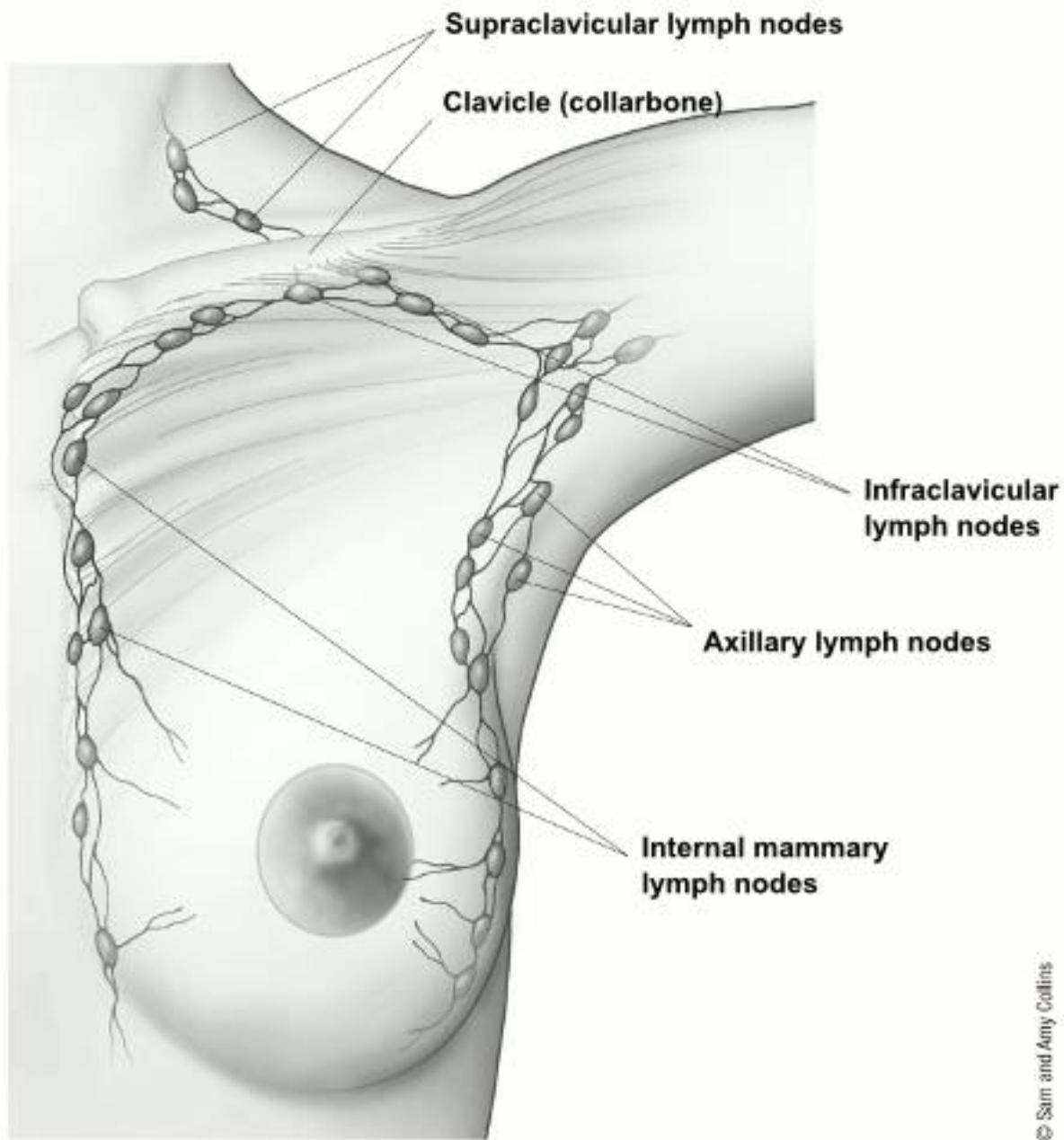
Breast cancer can spread when the cancer cells get into the blood or lymph system and then are carried to other parts of the body.

The lymph (or lymphatic) system is a part of your body's immune system. It is a network of lymph nodes (small, bean-sized glands), ducts or vessels, and organs that work together to collect and carry clear lymph fluid through the body tissues to the blood. The clear lymph fluid inside the lymph vessels contains tissue by-products and waste material, as well as immune system cells.

The lymph vessels carry lymph fluid away from the breast. In the case of breast cancer, cancer cells can enter those lymph vessels and start to grow in lymph nodes. Most of the lymph vessels of the breast drain into:

- Lymph nodes under the arm (**axillary** lymph nodes)
- Lymph nodes inside the chest near the breastbone (**internal mammary** lymph nodes)
- Lymph nodes around the collar bone (**supraclavicular** [above the collar bone] and **infraclavicular** [below the collar bone] lymph nodes)

If cancer cells have spread to your lymph nodes, there is a higher chance that the cells could have traveled through the lymph system and spread (metastasized) to other parts of your body. Still, not all women with cancer cells in their lymph nodes develop metastases, and some women with no cancer cells in their lymph nodes might develop metastases later.



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Lymph nodes in relation to the breast

Types of breast cancer

There are many different [types of breast cancer](#). The type is determined by the specific kind of cells in the breast that are affected. Most breast cancers are **carcinomas**. The

most common breast cancers such as ductal carcinoma in situ (DCIS) and invasive carcinoma are **adenocarcinomas**, since the cancers start in the gland cells in the milk ducts or the lobules (milk-producing glands). Other kinds of cancers can grow in the breast, like [angiosarcoma](#) or [sarcoma⁷](#), but are not considered breast cancer since they start in different cells of the breast.

Breast cancers are also classified by certain types of proteins or genes each cancer might make. After a biopsy is done, breast cancer cells are tested for proteins called [estrogen receptors and progesterone receptors⁸](#), and the [HER2 gene or protein⁹](#). The tumor cells are also closely looked at in the lab to find out what [grade¹⁰](#) it is. The specific proteins found and the tumor grade can help decide the stage of the cancer and treatment options.

To learn more about the specific tests done on breast cancer cells, see [Understanding a Breast Cancer Diagnosis¹¹](#).

What Causes Breast Cancer?

We don't know what causes each case of breast cancer. But we do know many of the **risk factors** for these cancers. We also know that normal breast cells can become cancer because of changes or mutations in **genes**. Hormones also seem to play a role in many cases of breast cancer, but just how this happens is not fully understood.

- [Lifestyle-related risk factors](#)
- [Hormones](#)
- [Gene mutations](#)
- [How gene changes can lead to breast cancer](#)
- [Inherited gene changes](#)
- [Acquired gene changes](#)

Lifestyle-related risk factors

Lifestyle-related risk factors, such as what you eat and how much you exercise, can increase your chance of developing breast cancer, but it's not yet known exactly how some of these risk factors cause normal cells to become cancer.

See [Lifestyle-related Breast Cancer Risk Factors¹](#) and [Breast Cancer Risk Factors You Cannot Change²](#).

Hormones

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Gene mutations

We do know that normal breast cells can become cancer because of changes or mutations in **genes**. But only about 1 in 10 breast cancers (10%) are linked with known abnormal genes that are passed on from parents (**inherited**). Many genes have not yet been discovered, so women with a family history of breast cancer might have inherited an abnormal gene that doesn't show on a [genetic test³](#). Most breast cancers (about 90%) develop from **acquired** (not inherited) gene changes that have not yet been identified.

How gene changes can lead to breast cancer

[Genes⁴](#) control how our cells function. They are made up of a chemical called DNA, which comes from both our parents. DNA affects more than just how we look; it also can influence our risk for developing certain diseases, including some kinds of cancer.

Normal cells have genes called **proto-oncogenes**, which help control when the cells grow, divide to make new cells, or stay alive. If a proto-oncogene is mutated (changed) in a certain way, it becomes an **oncogene**. Cells that have these mutated oncogenes can become cancer.

Normal cells also have genes called **tumor suppressor genes**, which help control how often normal cells divide in two, repair DNA mistakes, or cause cells to die at the right time. If a cell has a mutated tumor suppressor gene, then the cell can turn into cancer.

Cancers can be caused by gene changes that turn on oncogenes or turn off tumor suppressor genes. **Changes in many different genes are usually needed to cause breast cancer.**

Inherited gene changes

Some gene changes (mutations) are inherited or passed to you from your parents. This means the mutations are in all your cells when you are born.

Certain inherited gene changes can greatly increase the risk for developing certain

cancers and are linked to many of the cancers that run in some families. For instance, the *BRCA* genes (*BRCA1* and *BRCA2*) are tumor suppressor genes. When one of these genes changes, it no longer suppresses abnormal cell growth, and cancer is more likely to develop. A change in one of these genes can be passed from a parent to a child.

Women have already begun to benefit from advances in understanding the genetic basis of breast cancer. Genetic testing can identify some women who have inherited mutations in the *BRCA1* or *BRCA2* tumor suppressor genes as well as other less common genes such as *PALB2*, *ATM*, or *CHEK2*. These women can then take steps to reduce their risk of breast cancer by increasing awareness of their breasts and following appropriate [screening recommendations⁵](#) to help find cancer at an earlier, more treatable stage. Since these mutations are also often associated with other cancers (besides breast), women with these mutations might also consider early screening and preventive actions for other cancers.

Mutations in tumor suppressor genes like the *BRCA* genes are considered “high penetrance” because they often lead to cancer. Although many women with high penetrance mutations develop cancer, most cases of cancer (including breast cancer) are not caused by this kind of mutation.

More often, low-penetrance mutations or gene variations are a factor in cancer development. Each of these may have a small effect on cancer occurring in any one person, but the overall effect on the population can be large because the mutations are common, and people often have more than one at the same time. The genes involved can affect things like hormone levels, metabolism, or other factors that impact risk for breast cancer. These genes might also cause much of the risk of breast cancer that runs in families.

Acquired gene changes

Most gene mutations linked to breast cancer are acquired. This means the change takes place in breast cells during a person's life rather than having been inherited or born with them. Acquired DNA mutations take place over time and are only in the breast cancer cells.

These acquired mutations of oncogenes and/or tumor suppressor genes may result from other factors, like radiation or cancer-causing chemicals. But some gene changes may just be random events that sometimes happen inside a cell, without having an outside cause. So far, the causes of most acquired mutations that could lead to breast cancer are still unknown. Most breast cancers have several acquired gene mutations.

Types of Breast Cancer

There are many types of breast cancer, and many different ways to describe them. It's easy to get confused.

A breast cancer's type is determined by the specific cells in the breast that become cancer.

- [Ductal or lobular carcinoma](#)
- [Less common types of breast cancer](#)

Ductal or lobular carcinoma

Most breast cancers are **carcinomas**, which are tumors that start in the epithelial cells that line organs and tissues throughout the body. When carcinomas form in the breast, they are usually a more specific type called **adenocarcinoma**, which starts in cells in the ducts (the milk ducts) or the lobules (glands in the breast that make milk).

In situ vs. invasive breast cancers

The type of breast cancer can also refer to whether the cancer has spread or not. **In situ** breast cancer (**ductal carcinoma in situ or DCIS**) is a pre-cancer that starts in a milk duct and has not grown into the rest of the breast tissue. The term **invasive (or infiltrating)** breast cancer is used to describe any type of breast cancer that has spread (invaded) into the surrounding breast tissue.

[Ductal carcinoma in situ \(DCIS\)](#)

Ductal carcinoma in situ (DCIS; also known as intraductal carcinoma) is a non-invasive or pre-invasive breast cancer.

[Invasive breast cancer \(ILC or IDC\)](#)

Invasive (or infiltrating) breast cancer has spread into surrounding breast tissue. The most common types are invasive ductal carcinoma and invasive lobular carcinoma. Invasive ductal carcinoma makes up about 70-80% of all breast cancers.

Special types of invasive breast cancers

Some invasive breast cancers have special features or develop in different ways that influence their treatment and outlook. These cancers are less common but can be more serious than other types of breast cancer.

Triple-negative breast cancer

Triple-negative breast cancer is an aggressive type of invasive breast cancer in which the cancer cells don't have estrogen or progesterone receptors (ER or PR) and also don't make any or too much of the protein called HER2. (The cells test "negative" on all 3 tests.) It accounts for about 15% of all breast cancers and can be a difficult cancer to treat.

Inflammatory breast cancer

Inflammatory breast cancer is an aggressive type of invasive breast cancer in which cancer cells block lymph vessels in the skin, causing the breast to look "inflamed." It is rare and accounts for about 1% to 5% of all breast cancers.

Less common types of breast cancer

There are other types of breast cancers that start to grow in other types of cells in the breast. These cancers are much less common, and sometimes need different types of treatment.

Paget disease of the breast

Paget disease of the breast is rare, accounting for only about 1-3% of all cases of breast cancer. It starts in the breast ducts and spreads to the skin of the nipple and then to the areola (the dark circle around the nipple).

Angiosarcoma

Sarcomas of the breast are rare making up less than 1% of all breast cancers. Angiosarcoma starts in cells that line blood vessels or lymph vessels. It can involve the breast tissue or the skin of the breast. Some may be related to prior radiation therapy in that area.

Phyllodes tumor

Phyllodes tumors are rare breast tumors. They develop in the connective tissue (stroma) of the breast, in contrast to carcinomas, which develop in the ducts or lobules. Most are benign, but there are others that are malignant (cancer).

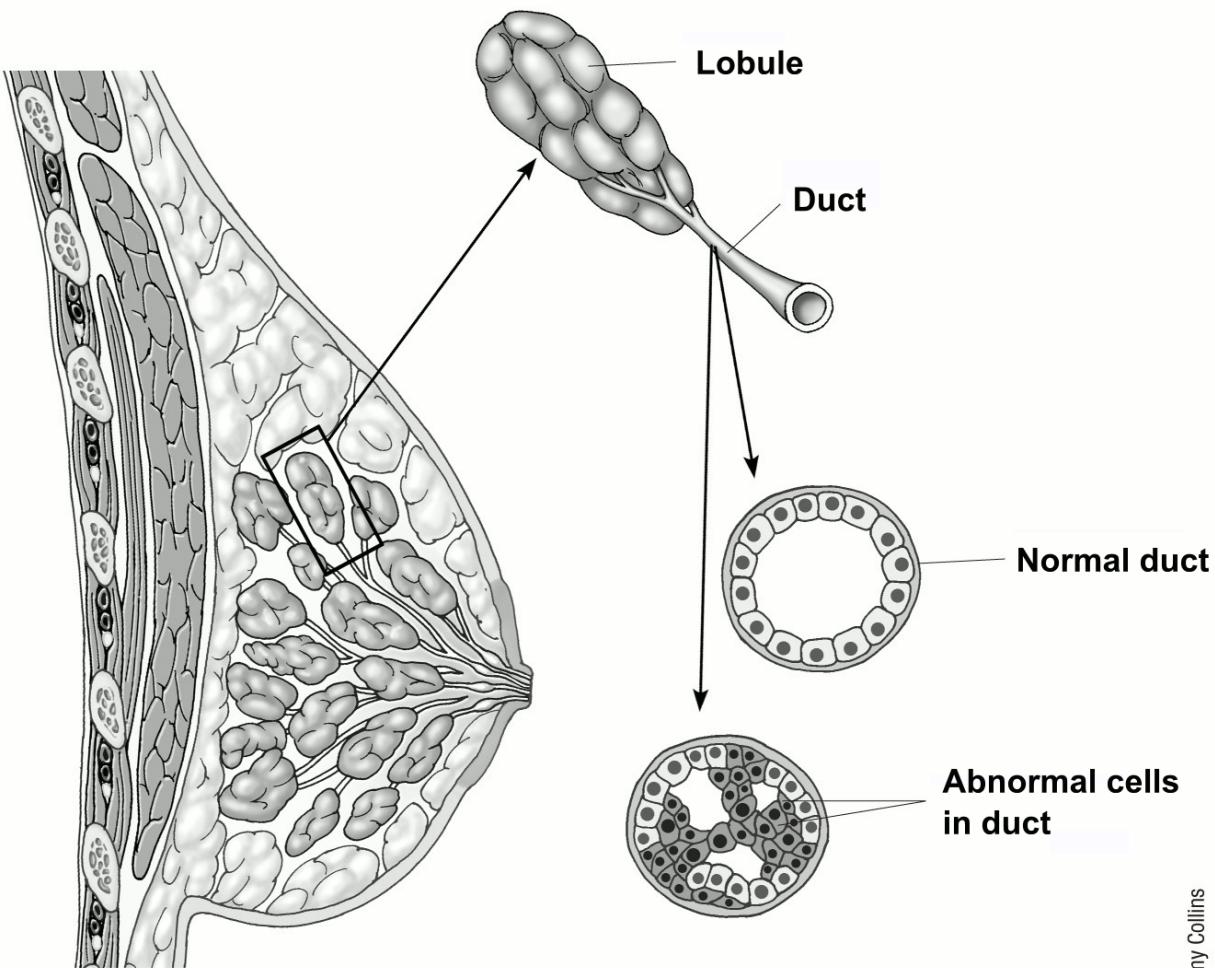
Ductal Carcinoma in Situ (DCIS)

Ductal carcinoma in situ (DCIS) is a non-invasive or pre-invasive breast cancer. It is also known as **intraductal carcinoma**.

- [Treating DCIS](#)

About 1 in 5 new breast cancers will be ductal carcinoma in situ (DCIS). Nearly all women with this early stage of breast cancer can be cured.

DCIS is also called **intraductal carcinoma** or **stage 0 breast cancer**. DCIS is a non-invasive or pre-invasive breast cancer. This means the cells that line the ducts have changed to cancer cells but they have not spread through the walls of the ducts into the nearby breast tissue.



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Ductal carcinoma in situ

Because DCIS hasn't spread into the breast tissue around it, it can't spread (metastasize) beyond the breast to other parts of the body.

However, DCIS can sometimes become an invasive cancer. At that time, the cancer has spread out of the duct into nearby tissue, and from there, it could metastasize to other parts of the body.

Right now, there's no good way to know for sure which will become invasive cancer and which ones won't, so almost all women with DCIS will be treated.

Treating DCIS

In most cases, a woman with DCIS can choose between breast-conserving surgery (BCS) and simple mastectomy. Radiation is usually given after BCS. Tamoxifen or an aromatase inhibitor after surgery might also be an option if the DCIS is hormone-receptor positive¹.

See [Treatment for Ductal Carcinoma in Situ \(DCIS\)](#)² to learn more.

Invasive Breast Cancer (IDC/ILC)

Breast cancers that have spread into surrounding breast tissue are known as **invasive breast cancers**. Most breast cancers are invasive, but there are different types of invasive breast cancer. The two most common types are **invasive ductal carcinoma (IDC)** and **invasive lobular carcinoma (ILC)**.

[Inflammatory breast cancer](#) and [triple negative breast cancer](#) are also types of invasive breast cancer.

- [Invasive \(infiltrating\) ductal carcinoma \(IDC\)](#)
- [Invasive lobular carcinoma \(ILC\)](#)
- [Less common types of invasive breast cancer](#)
- [Treating invasive breast cancer](#)

Invasive (infiltrating) ductal carcinoma (IDC)

This is the most common type of breast cancer. About 8 in 10 invasive breast cancers are invasive (or infiltrating) ductal carcinomas (IDC).

IDC starts in the cells that line a milk duct in the breast. From there, the cancer breaks through the wall of the duct, and grows into the nearby breast tissues. At this point, it may be able to spread (metastasize) to other parts of the body through the lymph system and bloodstream.

Invasive lobular carcinoma (ILC)

About 1 in 10 invasive breast cancers is an invasive lobular carcinoma (ILC).

ILC starts in the breast glands that make milk (lobules). Like IDC, it can spread

(metastasize) to other parts of the body. Invasive lobular carcinoma may be harder to detect on physical exam and imaging, like mammograms, than invasive ductal carcinoma. And compared to other kinds of invasive carcinoma, it is more likely to affect both breasts. About 1 in 5 women with ILC might have cancer in both breasts at the time they are diagnosed.

Less common types of invasive breast cancer

There are some special types of breast cancer that are sub-types of invasive carcinoma. They are less common than the breast cancers named above and each typically make up fewer than 5% of all breast cancers. These are often named after features of the cancer cells, like the ways the cells are arranged.

Some of these may have a better prognosis than the more common IDC. These include:

- Adenoid cystic (or adenocystic) carcinoma
- Low-grade adenosquamous carcinoma (this is a type of metaplastic carcinoma)
- Medullary carcinoma
- Mucinous (or colloid) carcinoma
- Papillary carcinoma
- Tubular carcinoma

Some sub-types have the same or maybe worse prognoses than IDC. These include:

- Metaplastic carcinoma (most types, including spindle cell and squamous, except low grade adenosquamous carcinoma)
- Micropapillary carcinoma
- Mixed carcinoma (has features of both invasive ductal and invasive lobular)

In general, all of these sub-types are still treated like IDC.

Treating invasive breast cancer

Treatment of invasive breast cancer depends on how advanced the cancer is (the stage of the cancer) and other factors. Most women will have some type of surgery to remove the tumor. Depending on the type of breast cancer and how advanced it is, you might need other types of treatment as well, either before or after surgery, or sometimes both.

Triple-negative Breast Cancer

Triple-negative breast cancer (TNBC) is an aggressive type of invasive breast cancer.

TNBC differs from other types of invasive breast cancer in that it tends to grow and spread faster, has fewer treatment options, and tends to have a worse prognosis (outlook).

The term **triple-negative breast cancer** refers to the fact that the cancer cells don't have estrogen or progesterone receptors¹ (ER or PR) and also don't make any or too much of the protein called HER2². (The cells test "negative" on all 3 tests.)

- [How common is triple-negative breast cancer?](#)
- [Signs and symptoms of triple-negative breast cancer](#)
- [How is triple-negative breast cancer diagnosed?](#)
- [Survival rates for triple-negative breast cancer](#)
- [Treating triple-negative breast cancer](#)

How common is triple-negative breast cancer?

Triple-negative breast cancer accounts for about 10-15% of all breast cancers. These cancers tend to be more common in women younger than age 40, who are Black, or who have a *BRCA1* mutation.

Signs and symptoms of triple-negative breast cancer

Triple-negative breast cancer can have the same [signs and symptoms](#)³ as other common types of breast cancer.

How is triple-negative breast cancer diagnosed?

Once a breast cancer diagnosis has been made using [imaging tests and a biopsy](#)⁴, the cancer cells will be checked for certain proteins. If the cells do not have estrogen or progesterone receptors (ER or PR), and also do not make any or too much of the HER2 protein, the cancer is considered to be triple-negative breast cancer.

Survival rates for triple-negative breast cancer

TNBC tends to grow quickly, is more likely to have spread at the time it's found, and is more likely to come back after treatment than other types of breast cancer. Because of this, the survival rates for TNBC are generally not quite as high as they are for other types of breast cancer.

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Talk with your doctor about how these numbers may apply to you, as they are familiar with your situation.

What is a 5-year relative survival rate?

A **relative survival rate** compares women with the same type and stage of breast cancer to women in the overall population. For example, if the **5-year relative survival rate** for a specific stage of breast cancer is 90%, it means that women who have that cancer are, on average, about 90% as likely as women who don't have that cancer to live for at least 5 years after being diagnosed.

Where do these numbers come from?

The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results Program (SEER) database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for breast cancer in the United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages⁵](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the breast.
- **Regional:** The cancer has spread outside the breast to nearby structures or lymph nodes.
- **Distant:** The cancer has spread to distant parts of the body such as the lungs, liver, or bones.

5-year relative survival rates for triple-negative breast cancer

These numbers are based on women diagnosed with TNBC between 2012 and 2018.

SEER Stage	5-year Relative Survival Rate
Localized	91%
Regional	66%
Distant	12%
All stages combined	77%

Understanding the numbers

- **Women now being diagnosed with TNBC may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on women who were diagnosed and treated at least 5 years earlier.
- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread, but your age and overall health, how well the cancer responds to treatment, [tumor grade⁶](#), and other factors can also affect your outlook.

Treating triple-negative breast cancer

Triple-negative breast cancer has fewer treatment options than other types of invasive breast cancer. This is because the cancer cells do not have the estrogen or progesterone receptors or enough of the HER2 protein to make hormone therapy or targeted HER2 drugs work. Because hormone therapy and anti-HER2 drugs are not choices for women with triple-negative breast cancer, chemotherapy is often used.

If the cancer has not spread to distant sites, surgery is an option. Chemotherapy might be given first to shrink a large tumor, followed by surgery. Chemotherapy is often recommended after surgery to reduce the chances of the cancer coming back. Radiation might also be an option depending on certain features of the tumor and the type of surgery you had.

In cases where the cancer has spread to other parts of the body (stage IV), platinum chemotherapy, targeted drugs like a PARP inhibitor or antibody-drug conjugate, or

immunotherapy with chemotherapy might be considered.

Inflammatory Breast Cancer

Inflammatory breast cancer (IBC) is a rare and aggressive type of invasive breast cancer in which cancer cells block lymph vessels in the skin. This causes the breast to look "inflamed."

- [What is inflammatory breast cancer?](#)
- [Signs and symptoms of inflammatory breast cancer](#)
- [How is inflammatory breast cancer diagnosed?](#)
- [Stages of inflammatory breast cancer](#)
- [Survival rates for inflammatory breast cancer](#)
- [Treating inflammatory breast cancer](#)

What is inflammatory breast cancer?

Inflammatory breast cancer (IBC) is rare. It accounts for only 1% to 5% of all breast cancers. Although it is a type of invasive ductal carcinoma, its symptoms, outlook, and treatment are different. IBC causes symptoms of breast inflammation like swelling and redness, which is caused by cancer cells blocking lymph vessels in the skin causing the breast to look "inflamed."

Inflammatory breast cancer (IBC) differs from other types of breast cancer in many

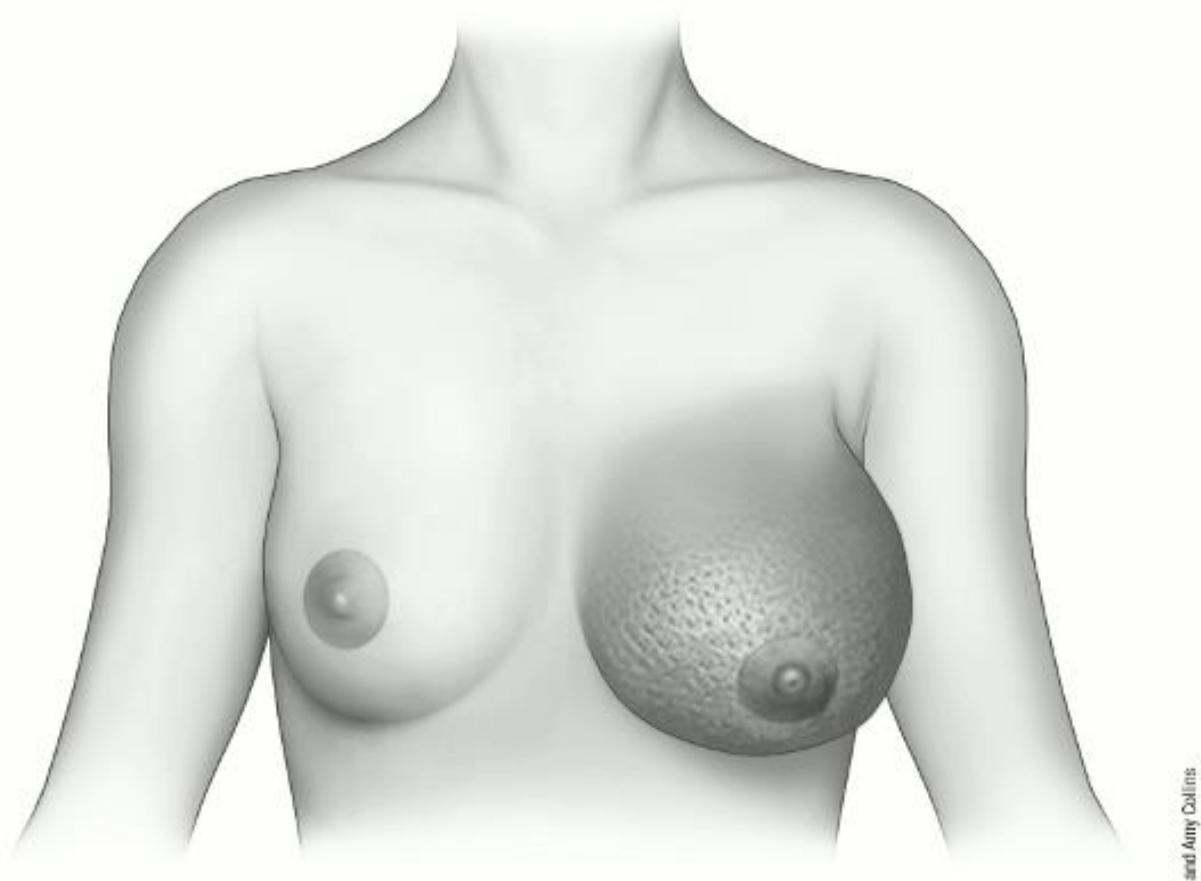
ways:

- IBC doesn't look like a typical breast cancer. It often does not cause a breast lump, and it might not show up on a mammogram. This makes it harder to diagnose.
- IBC tends to occur in younger women (younger than 40 years of age).
- Black women appear to develop IBC more often than White women.
- IBC is more common among women who are overweight or obese.
- IBC tends to be more aggressive—it grows and spreads much more quickly—than more common types of breast cancer.
- IBC is always at least at a locally advanced stage when it's first diagnosed because the breast cancer cells have grown into the skin. (This means it is at least stage III.)
- In about 1 of 3 cases, IBC has already spread (metastasized) to distant parts of the body when it is diagnosed. This makes it harder to treat successfully.
- Women with IBC tend to have a worse prognosis (outcome) than women with other common types of breast cancer.

Signs and symptoms of inflammatory breast cancer

Inflammatory breast cancer (IBC) can cause a number of signs and symptoms, most of which develop quickly (within 3 to 6 months), including:

- Swelling (edema) of the skin of the breast
- Redness involving more than one-third of the breast
- Pitting or thickening of the skin of the breast so that it may look and feel like an orange peel
- A retracted or inverted nipple
- One breast looking larger than the other because of swelling
- One breast feeling warmer and heavier than the other
- A breast that may be tender, painful, or itchy
- Swelling of the lymph nodes under the arms or near the collarbone



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Inflammatory breast cancer

If you have any of these symptoms, it does not mean that you have IBC, but you should see a doctor right away. Tenderness, redness, warmth, and itching are also common symptoms of a breast infection or inflammation, such as [mastitis¹](#) if you're pregnant or breastfeeding. Because these problems are much more common than IBC, your doctor might suspect infection at first as a cause and treat you with antibiotics.

Treatment with antibiotics may be a good first step, but if your symptoms don't get better in 7 to 10 days, more tests need to be done to look for cancer. Let your doctor know if it doesn't help, especially if the symptoms get worse or the affected area gets larger. The possibility of IBC should be considered more strongly if you have these symptoms and are not pregnant or breastfeeding, or have been through menopause. Ask to see a specialist (like a breast surgeon) if you're concerned.

IBC grows and spreads quickly, so the cancer may have already spread to nearby lymph nodes by the time symptoms are noticed. This spread can cause swollen lymph nodes under your arm or above your collar bone. If the diagnosis is delayed, the cancer

can spread to distant sites.

How is inflammatory breast cancer diagnosed?

Imaging tests

If inflammatory breast cancer (IBC) is suspected, one or more of the following imaging tests may be done:

- [Mammogram²](#)
- [Breast ultrasound³](#)
- [Breast MRI \(magnetic resonance imaging\) scan⁴](#)

Often a photo of the breast is taken to help record the amount of redness and swelling before starting treatment.

Biopsy

Inflammatory breast cancer is diagnosed by a [biopsy⁵](#), taking out a small piece of the breast tissue and looking at it in the lab. This might mean a [punch biopsy⁶](#) of the breast skin that is abnormal. Your physical exam and other tests may show findings that are "suspicious for" IBC, but only a biopsy can tell for sure that it is cancer.

Tests on biopsy samples

The cancer cells in the biopsy will be examined in the lab to determine their [grade⁷](#).

They will also be tested for certain proteins that help decide which treatments will be helpful. Women whose breast cancer cells have [hormone receptors⁸](#) are likely to benefit from treatment with hormone therapy drugs.

Cancer cells that make too much of a [protein called HER2⁹](#) or too many copies of the gene for that protein may be treated by certain drugs that target HER2.

In certain cases, [other gene mutations \(changes\) or proteins¹⁰](#) might be tested for to see if specific drugs might be helpful.

Stages of inflammatory breast cancer

All inflammatory breast cancers start as **stage III (T4dNXM0)** since they involve the skin. If the cancer has spread outside the breast to distant parts of the body, it is **stage IV**.

For more information, read about [breast cancer staging¹¹](#).

Survival rates for inflammatory breast cancer

Inflammatory breast cancer (IBC) tends to grow quickly, is more likely to have spread at the time it's found, and is more likely to come back after treatment than most other types of breast cancer. Because of this, the survival rates are generally not as high as they are for other types of breast cancer.

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Ask your doctor how these numbers may apply to you, as they are familiar with your situation.

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- **Distant:** The cancer has spread to distant parts of the body such as the lungs, liver, or bones.

5-year relative survival rates for inflammatory breast cancer

These numbers are based on women diagnosed with IBC between 2012 and 2018.

(There is no localized SEER stage for IBC since it has already reached the skin when first diagnosed.)

SEER Stage	5-year Relative Survival Rate
Regional	52%
Distant	19%
All SEER Stages	39%

Understanding the numbers

- **Women now being diagnosed with inflammatory breast cancer may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on women who were diagnosed and treated at least 5 years earlier.
- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread, but your age and overall health, how well the cancer responds to treatment, [tumor grade¹³](#), and other factors can also affect your outlook.

Treating inflammatory breast cancer

Inflammatory breast cancer (IBC) that has not spread outside the breast is stage III. In

most cases, treatment is chemotherapy first to try to shrink the tumor, followed by surgery to remove the cancer. Radiation and often other treatments, like more chemotherapy or targeted drug therapy, are given after surgery. Because IBC is so aggressive, breast conserving surgery (lumpectomy) and sentinel lymph node biopsy are typically not part of the treatment.

IBC that has spread to other parts of the body (stage IV) may be treated with chemotherapy, hormone therapy, and/or targeted drugs.

For details, see [Treatment of Inflammatory Breast Cancer¹⁴](#).

Angiosarcoma of the Breast

Angiosarcoma is a rare cancer that starts in the cells that line blood vessels or lymph vessels. It is often a complication of previous radiation treatment to the breast. It can happen 8-10 years after getting radiation treatment to the breast.

- Signs and symptoms of angiosarcoma
- How is angiosarcoma of the breast diagnosed?
- Treating angiosarcoma

Signs and symptoms of angiosarcoma

Angiosarcoma can cause skin changes like purple colored nodules and/or a lump in the breast. It can also occur in the affected arms of women with lymphedema, but this is not common. ([Lymphedema¹](#) is swelling that can develop after surgery or radiation therapy to treat breast cancer.)

How is angiosarcoma of the breast diagnosed?

One or more of the following imaging tests may be done to check for breast changes:

- [Diagnostic mammogram²](#)
- [Breast ultrasound³](#)
- [Breast MRI \(magnetic resonance imaging\) scan⁴](#)

Angiosarcoma is diagnosed by a [biopsy⁵](#), removing a small piece of the breast tissue and looking at it closely in the lab. Only a biopsy can tell for sure that it is cancer.

Treating angiosarcoma

Angiosarcomas tend to grow and spread quickly. Treatment usually includes [surgery⁶](#) to remove the breast (mastectomy). The axillary lymph nodes are typically not removed. [Radiation⁷](#) might be given in certain cases of angiosarcomas that are not related to prior breast radiation. For more information on sarcomas, see [Soft Tissue Sarcoma⁸](#).

Paget Disease of the Breast

Paget disease of the breast is a rare type of breast cancer involving the skin of the nipple and the areola (the dark circle around the nipple).

- [Signs and symptoms of Paget disease of the breast](#)
- [How is Paget disease of the breast diagnosed?](#)
- [Treating Paget disease of the breast](#)

Signs and symptoms of Paget disease of the breast

The skin of the nipple and areola often looks crusted, scaly, and red. There may be blood or yellow fluid coming out of the nipple. Sometimes the nipple looks flat or inverted. It also might burn or itch. Your doctor might try to treat this as eczema first, and if it does not improve, recommend a biopsy.

Paget disease usually affects only one breast. In 80-90% of cases, it's usually found along with either [ductal carcinoma in situ \(DCIS\)](#) or [infiltrating ductal carcinoma \(invasive breast cancer\)](#).

How is Paget disease of the breast diagnosed?

Most people with Paget disease of the breast also have tumors in the same breast. One or more of the following imaging tests may be done to check for other breast changes:

- [Diagnostic mammogram¹](#)
- [Breast ultrasound²](#)
- [Breast MRI \(magnetic resonance imaging\) scan³](#)

Paget disease of the breast is diagnosed by a [biopsy⁴](#), removing a small piece of the breast tissue and looking at it closely in the lab. In some cases, the entire nipple may be removed. Only a biopsy can show for sure that it is cancer.

Treating Paget disease of the breast

Paget disease can be treated by removing the entire breast ([mastectomy⁵](#)) or [breast-conserving surgery⁶](#) (BCS) followed by whole-breast [radiation therapy⁷](#). If BCS is done, the entire nipple and areola area also needs to be removed. If invasive cancer is found,

the lymph nodes under the arm will be checked for cancer.

If no lump is felt in the breast tissue, and your biopsy results show the cancer has not spread within the breast tissue, the outlook (prognosis) is excellent.

If the cancer has spread within the breast tissue (is invasive), the outlook is not as good, and the cancer will be [staged⁸](#) and treated like any other [invasive ductal carcinoma⁹](#).

Phyllodes Tumors of the Breast

- [Who is most at risk for phyllodes tumors?](#)
- [Diagnosis of phyllodes tumors](#)
- [How do phyllodes tumors affect your risk for breast cancer?](#)
- [Treatment of phyllodes tumors](#)

Who is most at risk for phyllodes tumors?

Phyllodes tumors are most common in women in their 40s, but women of any age can have them. Women with [Li-Fraumeni syndrome¹](#) (a rare, inherited genetic condition) have an increased risk for phyllodes tumors.

Diagnosis of phyllodes tumors

Phyllodes tumors are usually felt as a firm, painless breast lump, but some may hurt. They tend to grow large fairly quickly, and they often stretch the skin.

Sometimes these tumors are seen first on an imaging test (like an [ultrasound²](#) or [mammogram³](#)), in which case they're often hard to tell apart from [fibroadenomas⁴](#).

The diagnosis can often be made with a [core needle biopsy⁵](#), but sometimes the entire tumor needs to be removed (during an [excisional biopsy⁶](#)) to know for sure that it's a phyllodes tumor, and whether it's malignant or not.

How do phyllodes tumors affect your risk for breast cancer?

Having a benign phyllodes tumor does not affect your breast cancer risk. If you have a malignant phyllodes tumor, it does not affect your risk of getting other types of breast cancer. Still, you may be watched more closely and get regular imaging tests after treatment for a phyllodes tumor, because these tumors can sometimes come back after surgery.

Treatment of phyllodes tumors

Phyllodes tumors typically need to be removed completely with surgery.

If the tumor is found to be **benign**, an excisional biopsy might be all that is needed, as long as the tumor was removed completely.

If the tumor is **borderline or malignant**, a wider margin (area of normal tissue around the tumor) usually needs to be removed as well. This might be done with breast-conserving surgery⁷ (lumpectomy or partial mastectomy), in which part of the breast is removed. Or the entire breast might be removed with a mastectomy⁸, especially if a margin of normal breast tissue can't be taken out with breast-conserving surgery. Radiation therapy⁹ might be given to the area after surgery, especially if it's not clear that all of the tumor was removed.

Malignant phyllodes tumors are different from the more common types of breast cancer. They are less likely to respond to some of the treatments commonly used for breast cancer, such as the hormone therapy¹⁰ or chemotherapy¹¹ drugs normally used for breast cancer. Phyllodes tumors that have spread to other parts of the body are often treated more like sarcomas¹² (soft-tissue cancers) than breast cancers.

Phyllodes tumors can sometimes come back in the same place. Because of this, close follow-up with frequent breast exams and imaging tests are usually recommended after treatment.

Key Statistics for Breast Cancer

The information below is an overview of the latest statistics for breast cancer in women in the United States in 2024.

- [How common is breast cancer?](#)
- [Lifetime chance of getting breast cancer](#)
- [Trends in breast cancer incidence](#)
- [Trends in breast cancer deaths](#)
- [Differences by race and ethnicity](#)
- [Breast cancer survivors](#)

How common is breast cancer?

Breast cancer is the most common cancer in women in the United States, except for skin cancers. It accounts for about 30% (or 1 in 3) of all new female cancers each year.

The American Cancer Society's estimates for breast cancer in the United States for 2024 are:

- About 310,720 new cases of invasive breast cancer will be diagnosed in women.
- About 56,500 new cases of **ductal carcinoma in situ (DCIS)** will be diagnosed.
- About 42,250 women will die from breast cancer.

Breast cancer mainly occurs in middle-aged and older women. The median age at the time of breast cancer diagnosis is 62. This means half of the women who developed breast cancer are 62 years of age or younger when they are diagnosed. A very small number of women diagnosed with breast cancer are younger than 45.

Lifetime chance of getting breast cancer

Overall, the average risk of a woman in the United States developing breast cancer sometime in her life is about 13%. This means there is a 1 in 8 chance she will develop breast cancer. This also means there is a 7 in 8 chance she will never have the disease.

Trends in breast cancer incidence

In recent years, incidence rates have increased by 0.6% per year. The rise in incidence rates is a little steeper in women younger than 50 (1.0%).

Trends in breast cancer deaths

Breast cancer is the second leading cause of cancer death in women. (Only lung cancer kills more women each year.) The chance that any woman will die from breast cancer is about 1 in 40 (about 2.5%).

Breast cancer death rates have been decreasing steadily since 1989, for an overall decline of 42% through 2021. The decrease in death rates is believed to be the result of finding breast cancer earlier through screening and increased awareness, as well as better treatments. However, the decline has slowed slightly in recent years.

Differences by race and ethnicity

Some variations in breast cancer can be seen in racial and ethnic groups. For example:

- The median age at diagnosis is slightly younger for Black women (60 years old) compared to White women (64 years old).

- Black women have the highest death rate from breast cancer. This is thought to be partially because Black women have a higher risk of [triple-negative breast cancer](#), more than any other racial or ethnic group.
- At every age, Black women are more likely to die from breast cancer than any other race or ethnic group.
- White, Asian, and Pacific Islander women are more likely to be diagnosed with localized breast cancer than Black, Hispanic, American Indian, and Alaska Native women.
- Asian and Pacific Islander women have the lowest death rate from breast cancer.

Breast cancer survivors

At this time there are more than 4 million breast cancer survivors in the United States. This includes women still being treated and those who have completed treatment.

Survival rates are discussed in [Survival Rates for Breast Cancer¹](#).

Visit the [American Cancer Society's Cancer Statistics Center²](#) for more key statistics.

What's New in Breast Cancer Research?

Researchers around the world are working to find better ways to prevent, detect, and treat breast cancer, and to improve the quality of life of patients and survivors.

- [Research studies](#)
- [Breast cancer causes](#)
- [Breast cancer prevention](#)
- [New tests to personalize your treatment](#)
- [New imaging tests](#)
- [Breast cancer treatment](#)
- [Supportive care](#)

Research studies

Current guidance on preventing and treating breast cancer as well as what might cause it (among other things) has come mainly from information discovered from **research studies**. Research studies can range from studies done in the lab to clinical trials done with hundreds of thousands of people. Clinical trials are carefully controlled studies that can gather specific information about certain diseases as well as explore promising new

treatments.

Clinical trials are one way to get the latest cancer treatments that are being investigated. Still, they are not right for everyone. If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials, or see [Clinical Trials¹](#) to learn more.

Breast cancer causes

Studies continue to look at how certain lifestyle factors, habits, and other environmental factors, as well as inherited gene changes, might affect breast cancer risk. Here are a few examples:

- Several studies are looking at the effects of physical activity, weight gain or loss, and diet on breast cancer risk.
- Some breast cancers run in families, but many of the gene mutations (changes) that cause these breast cancers are not yet known. Research is being done to identify these gene changes.
- Several studies are focusing on the best use of genetic testing for inherited breast cancer gene mutations.
- Scientists are exploring how common gene variants (small changes in genes that are not as significant as mutations) may affect breast cancer risk. Gene variants typically have only a modest effect on risk by themselves, but when combined they could possibly have a large impact.
- Possible environmental causes of breast cancer have also received more attention in recent years. While much of the science on this topic is still in its earliest stages, this is an area of active research.

Breast cancer prevention

Researchers are looking for ways to help reduce breast cancer risk, especially for women who are at high risk. Here are some examples:

- Studies continue to look at whether certain levels of physical activity, losing weight, or eating certain foods, groups of foods, or types of diets might help lower breast cancer risk.
- Some [hormonal medicines²](#) such as tamoxifen, raloxifene, exemestane, and anastrozole have already been shown to help lower breast cancer risk for certain

women at higher risk. Researchers continue to study which groups of women might benefit most from these drugs.

- Clinical trials are also looking at whether some non-hormonal drugs might lower breast cancer risk, such as drugs used to treat blood or bone marrow disorders, like ruxolitinib.
- Studies are looking at vaccines that might help prevent certain types of breast cancer in people who are at high risk for breast cancer (due to presence of hereditary gene mutations or breast cancer in the family).

New tests to personalize your treatment

Biomarkers

Breast cancer tissue is routinely tested for the biomarkers [ER³](#), [PR⁴](#), and [HER2⁵](#) to help make treatment decisions. A [biomarker⁶](#) is any gene, protein, or other substance that can be measured in blood, tissues, or other body fluids. Some studies are looking at whether testing for other biomarkers, such as HER3, might also be helpful, but research on this is still in early phases.

Circulating tumor DNA (ctDNA) is DNA that is released into the bloodstream when cancer cells die. Identifying and testing the ctDNA in the blood for biomarkers is a rapidly growing area of study.

Some ways ctDNA might potentially be used in breast cancer include:

- Looking for new biomarkers in the tumor cells that might mean the cancer has become resistant to specific treatments (like chemo or targeted drug therapy)
- Determining if a certain drug will work on a tumor before trying it
- Predicting if the breast cancer will recur (come back) in women with early-stage breast cancer
- Predicting if neoadjuvant treatment is working to destroy the tumor instead of using imaging tests like a CT scan or US
- Determining if breast cancer or a high-risk breast condition is present before changes are found on an imaging test like a mammogram

New imaging tests

Newer types of tests are being developed for breast imaging. Some of these are already being used in certain situations, while others are still being studied. It will take time to see if they are as good as or better than those used today. Some of these tests include:

- Scintimammography (molecular breast imaging)
- Positron emission mammography (PEM)
- Electrical impedance imaging (EIT)
- Elastography
- New types of optical imaging tests

For more on these tests, see [Newer and Experimental Breast Imaging Tests⁷](#).

Breast cancer treatment

New kinds of treatments for breast cancer are always being studied. For example, in recent years, several new [targeted drugs⁸](#) have been approved to treat breast cancer.

But more and better treatment options are needed, especially for cancers like triple-negative breast cancer, where chemotherapy is the main option.

Some areas of research involving breast cancer treatment include:

- Studying if shorter courses of radiation therapy for very early-stage breast cancers are at least as good as the longer courses now often used
- Testing if different types of radiation therapy, such as proton beam radiation, might be better than standard radiation.
- Combining certain drugs (like 2 targeted drugs, a targeted drug with an immunotherapy drug, or a hormone drug with a targeted drug) to see if they work better together
- Trying to find new drugs or drug combinations that might help treat breast cancer that has spread to the brain
- Testing different immunotherapy drugs to treat triple-negative breast cancer
- Giving cancer vaccines to see if this helps keep the cancer from either worsening or coming back after treatment. There are many ways in which cancer vaccines work. For example, protein vaccines stimulate the immune system to recognize and attack specific cancer proteins. DNA vaccines contain DNA instructions so that once the vaccine is given, the DNA will instruct your body to make protein(s) to help the immune system recognize and attack cancer cells.
- Finding new ways to treat women with hereditary breast cancer, since they have a

- higher chance of the cancer recurring (coming back)
- Determining if chemotherapy is needed to treat every woman with HER2-positive breast cancer
- Finding new treatment options when breast cancer becomes resistant to current treatments

Supportive care

Supportive care helps patients and caregivers manage the symptoms of cancer and side effects of cancer treatment. Clinical trials are looking at different medicines and techniques to try to improve supportive care for people with breast cancer. For example, some studies are investigating:

- If there are better medicines or ways to prevent the [damage to nerves⁹](#) that sometimes happen with certain chemotherapy drugs
- If drugs or other treatments might be helpful in limiting memory problems and other [brain symptoms after chemotherapy¹⁰](#)
- If certain heart or blood pressure drugs, can help prevent the heart damage sometimes caused by common breast cancer drugs such as doxorubicin and trastuzumab
- If there are medicines that might be able to help treat the tired feeling that cancer can cause

[Breast Cancer Research Highlights¹¹](#)

The Society's research program has played a crucial role in saving lives from breast cancer. See examples of our current research.

Breast Cancer Risk and Prevention

There is no sure way to prevent breast cancer. But there are things you can do that might lower your risk, such as changing risk factors that are under your control.

Risk Factors for Breast Cancer

A risk factor is anything that increases your chances of getting a disease, such as cancer. But having a risk factor, or even many, does not mean that you are sure to get the disease. While you can't change some breast cancer risk factors—family history and aging, for example—there are some risk factors that you can control.

- [Lifestyle-related Breast Cancer Risk Factors](#)
- [Breast Cancer Risk Factors You Cannot Change](#)
- [Factors with Unclear Effects on Breast Cancer Risk](#)
- [Disproven or Controversial Breast Cancer Risk Factors](#)

Can Breast Cancer Be Prevented?

There is no sure way to prevent breast cancer. But there are things you can do that might lower your risk. This can be especially helpful for women with certain risk factors for breast cancer, such as having a strong family history or certain inherited gene changes.

- [Can I Lower My Risk of Breast Cancer?](#)
- [Genetic Counseling and Testing for Breast Cancer Risk](#)
- [Deciding Whether to Use Medicine to Reduce Breast Cancer Risk](#)
- [Tamoxifen and Raloxifene for Lowering Breast Cancer Risk](#)
- [Aromatase Inhibitors for Lowering Breast Cancer Risk](#)
- [Preventive Surgery to Reduce Breast Cancer Risk](#)

Breast Cancer Risk Factors You Cannot Change

A risk factor is anything that increases your chances of getting a disease, such as breast cancer. But having a risk factor, or even many, does not mean that you are sure to get the disease.

Some risk factors for breast cancer are things you cannot change, such as getting older or inheriting certain gene changes. These make your risk of breast cancer higher.

For information on other known and possible breast cancer risk factors, see:

- [Lifestyle-related Breast Cancer Risk Factors](#)
 - [Factors with Unclear Effects on Breast Cancer Risk](#)
 - [Disproven or Controversial Breast Cancer Risk Factors](#)
-
- [Being born female](#)
 - [Getting older](#)
 - [Inheriting certain gene changes](#)
 - [Having a family history of breast cancer](#)
 - [Having a personal history of breast cancer](#)
 - [Race and ethnicity](#)
 - [Being taller](#)
 - [Having dense breast tissue](#)
 - [Having certain benign breast conditions](#)
 - [Starting menstrual periods early](#)
 - [Going through menopause later](#)
 - [Having radiation to your chest](#)
 - [Exposure to diethylstilbestrol \(DES\)](#)

Being born female

This is the main risk factor for breast cancer. Men can get breast cancer, too, but this disease is much more common in women than in men.

Getting older

As you get older, your risk of breast cancer goes up. Most breast cancers are found in women age 55 and older.

Inheriting certain gene changes

About 5% to 10% of breast cancer cases are thought to be hereditary, meaning that they result directly from gene changes (mutations) passed on from a parent.

BRCA1 and BRCA2: The most common cause of hereditary breast cancer is an inherited mutation in the *BRCA1* or *BRCA2* gene. In normal cells, these genes help make proteins that repair damaged DNA. Mutated versions of these genes can lead to abnormal cell growth, which can lead to cancer.

- If you have inherited a mutated copy of either gene from a parent, you have a higher risk of breast cancer.
- On average, a woman with a *BRCA1* or *BRCA2* gene mutation has up to a 7 in 10 chance of getting breast cancer by age 80. This risk is also affected by how many other family members have had breast cancer. (It goes up if more family members are affected.)
- Women with one of these mutations are more likely to be diagnosed with breast cancer at a younger age, as well as to have cancer in both breasts.
- Women with one of these gene changes also have a higher risk of developing ovarian cancer and some other cancers. (Men who inherit one of these gene changes also have a higher risk of breast and some other cancers.)
- In the United States, *BRCA* mutations are more common in Jewish people of Ashkenazi (Eastern Europe) origin than in other racial and ethnic groups, but anyone can have them.

Other genes: Other gene mutations can also lead to inherited breast cancers. These gene mutations are much less common, and most of them do not increase the risk of breast cancer as much as the *BRCA* genes.

- ***ATM:*** The *ATM* gene normally helps repair damaged DNA (or helps kill the cell if the damaged can't be fixed). Inheriting 2 abnormal copies of this gene causes the disease ataxia-telangiectasia. Inheriting one abnormal copy of this gene has been linked to a high rate of breast cancer in some families.
- ***PALB2:*** The *PALB2* gene makes a protein that interacts with the protein made by the *BRCA2* gene. Mutations in this gene can lead to a higher risk of breast cancer.
- ***TP53:*** The *TP53* gene helps stop the growth of cells with damaged DNA. Inherited

mutations of this gene cause **Li-Fraumeni syndrome**. People with this syndrome have an increased risk of breast cancer, as well as some other cancers such as leukemia, brain tumors, and sarcomas (cancers of bones or connective tissue). This mutation is a rare cause of breast cancer.

- **CHEK2:** The *CHEK2* gene is another gene that normally helps with DNA repair. A *CHEK2* mutation increases breast cancer risk.
- **PTEN:** The *PTEN* gene normally helps regulate cell growth. Inherited mutations in this gene can cause **Cowden syndrome**, a rare disorder that puts people at higher risk for both cancer and benign (non-cancer) tumors in the breasts, as well as growths in the digestive tract, thyroid, uterus, and ovaries.
- **CDH1:** Inherited mutations in this gene cause **hereditary diffuse gastric cancer**, a syndrome in which people develop a rare type of stomach cancer. Women with mutations in this gene also have an increased risk of invasive lobular breast cancer.
- **STK11:** Defects in this gene can lead to **Peutz-Jeghers syndrome**. People affected with this disorder have pigmented spots on their lips and in their mouths, polyps (abnormal growths) in the urinary and digestive tracts, and a higher risk of many types of cancer, including breast cancer.

Inherited mutations in several other genes have also been linked to breast cancer, but these account for only a small number of cases.

Genetic counseling and testing: Genetic testing can be done to look for inherited mutations in the *BRCA1* and *BRCA2* genes (or less commonly in genes such as *PTEN*, *TP53*, or others mentioned above). This might be an option for some women who have been diagnosed with breast cancer, as well as for certain women with factors that put them at higher risk for breast cancer, such as a strong family history. While genetic testing can be helpful in some cases, not every woman needs to be tested, and the pros and cons need to be considered carefully. To learn more, see [Genetic Counseling and Testing for Breast Cancer Risk](#).

Having a family history of breast cancer

It's important to note that most women who get breast cancer do **not** have a family history of the disease. But women who have close blood relatives with breast cancer have a higher risk:

- Having a first-degree relative (mother, sister, or daughter) with breast cancer almost doubles a woman's risk. Having 2 first-degree relatives increases her risk by about 3-fold.

- Women with a father or brother who has had breast cancer also have a higher risk of breast cancer.

Having a personal history of breast cancer

A woman with cancer in one breast has a higher risk of developing a new cancer in the other breast or in another part of the same breast. (This is different from a recurrence or return of the first cancer.) Although this risk is low overall, it's even higher for younger women with breast cancer.

Race and ethnicity

Overall, White women are slightly more likely to develop breast cancer than African American women, although the gap between them has been closing in recent years. In women under age 40, breast cancer is more common in African American women. African American women are also more likely to die from breast cancer at any age. Asian, Hispanic, and Native American women have a lower risk of developing and dying from breast cancer.

Risk in different groups also varies by type of breast cancer. For example, African American women are more likely to have the less common triple-negative breast cancer.

Being taller

Many studies have found that taller women have a higher risk of breast cancer than shorter women. The reasons for this aren't exactly clear, but it may have something to do with factors that affect early growth, such as nutrition early in life, as well as hormonal or genetic factors.

Having dense breast tissue

Breasts are made up of fatty tissue, fibrous tissue, and glandular tissue. Breasts appear denser on a mammogram when they have more glandular and fibrous tissue and less fatty tissue. Women with dense breasts on mammogram have a higher risk of breast cancer than women with average breast density. Unfortunately, dense breast tissue can also make it harder to see cancers on mammograms.

A number of factors can affect breast density, such as age, menopausal status, the use of certain drugs (including menopausal hormone therapy), pregnancy, and genetics.

To learn more, see our information on [breast density and mammograms¹](#).

Having certain benign breast conditions

Women diagnosed with certain types of benign (non-cancer) breast conditions may have a higher risk of breast cancer. Some of these conditions are more closely linked to breast cancer risk than others. Doctors often divide benign breast conditions into different groups, depending on how they affect this risk.

Non-proliferative lesions: These conditions don't seem to affect breast cancer risk, or if they do, the increase in risk is very small. They include:

- Fibrosis and/or simple cysts (sometimes called **fibrocystic changes**)
- Mild hyperplasia
- Adenosis (non-sclerosing)
- Phyllodes tumor (benign)
- A single papilloma
- Fat necrosis
- Duct ectasia
- Periductal fibrosis
- Squamous and apocrine metaplasia
- Epithelial-related calcifications
- Other tumors (lipoma, hamartoma, hemangioma, neurofibroma, adenomyoepithelioma)

Mastitis (infection of the breast) is not a tumor and does not increase the risk of breast cancer.

Proliferative lesions without atypia (cell abnormalities): In these conditions there's excessive growth of cells in the ducts or lobules of the breast, but the cells don't look very abnormal. These conditions seem to raise a woman's risk of breast cancer slightly. They include:

- Usual ductal hyperplasia (without atypia)
- Fibroadenoma
- Sclerosing adenosis

- Several papillomas (called **papillomatosis**)
- Radial scar

Proliferative lesions with atypia: In these conditions, the cells in the ducts or lobules of the breast tissue grow excessively, and some of them no longer look normal. These types of lesions include:

- [Atypical ductal hyperplasia \(ADH\)](#)²
- [Atypical lobular hyperplasia \(ALH\)](#)³

Breast cancer risk is about 4 to 5 times higher than normal in women with these changes. If a woman also has a family history of breast cancer and either hyperplasia or atypical hyperplasia, she has an even higher risk of breast cancer.

Lobular carcinoma in situ (LCIS)

In [LCIS](#)⁴, cells that look like cancer cells are growing in the lobules of the milk-producing glands of the breast, but they are not growing through the wall of the lobules. LCIS is not considered to be cancer, and it typically does not spread beyond the lobule (that is, it doesn't become invasive breast cancer) if it isn't treated. But women with LCIS have a 7 to 12 times higher risk of developing breast cancer (which can be in either breast).

For more on these conditions, see [Non-cancerous Breast Conditions](#)⁵.

Starting menstrual periods early

Women who have had more menstrual cycles because they started menstruating early (especially before age 12) have a slightly higher risk of breast cancer. The increase in risk may be due to a longer lifetime exposure to the hormones estrogen and progesterone.

Going through menopause later

Women who have had more menstrual cycles because they went through menopause later (typically after age 55) have a slightly higher risk of breast cancer. The increase in risk may be because they have a longer lifetime exposure to the hormones estrogen and progesterone.

Having radiation to your chest

Women who were treated with [radiation therapy](#)⁶ to the chest for another cancer (such as Hodgkin or non-Hodgkin lymphoma) when they were younger have a significantly higher risk for breast cancer. This risk depends on their age when they got radiation. The risk is highest for women who had radiation as a teen or young adult, when the breasts were still developing. Radiation treatment in older women (after about age 40 to 45) does not seem to increase breast cancer risk.

Exposure to diethylstilbestrol (DES)

From the 1940s through the early 1970s some pregnant women were given an estrogen-like drug called DES because it was thought to lower their chances of losing the baby (miscarriage). These women have a slightly increased risk of developing breast cancer. Women whose mothers took DES while they were pregnant with them may also have a slightly higher risk of breast cancer.

To learn more, see our information about [DES exposure](#)⁷.

Lifestyle-related Breast Cancer Risk Factors

A risk factor is anything that increases your chances of getting a disease, such as breast cancer. But having a risk factor, or even many, does not mean that you are sure to get the disease.

Certain breast cancer risk factors are related to personal behaviors, such as diet and physical activity. Other lifestyle-related risk factors include decisions about having children and taking medicines that contain hormones.

For information on other known and possible breast cancer risk factors, see:

- [Breast Cancer Risk Factors You Cannot Change](#)
 - [Factors with Unclear Effects on Breast Cancer Risk](#)
 - [Disproven or Controversial Breast Cancer Risk Factors](#)
-
- Drinking alcohol
 - Being overweight or obese
 - Not being physically active
 - Not having children
 - Not breastfeeding
 - Birth control

- [Menopausal hormone therapy](#)
- [Breast implants](#)

Drinking alcohol

[Drinking alcohol¹](#) is clearly linked to an increased risk of breast cancer. The risk increases with the amount of alcohol consumed. Women who have 1 alcoholic drink a day have a small (about 7% to 10%) increase in risk compared with those who don't drink, while women who have 2 to 3 drinks a day have about a 20% higher risk. Alcohol is linked to an increased risk of other types of cancer, too.

[It is best not to drink alcohol. Women who do drink should have no more than 1 a day².](#)

Being overweight or obese

[Being overweight or obese³](#) after menopause increases breast cancer risk.

Before menopause, a woman's ovaries make most of her estrogen, and fat tissue makes only a small part of the total amount. After menopause (when the ovaries stop making estrogen), most estrogen comes from fat tissue. Having more fat tissue after menopause can raise estrogen levels and increase the chances of getting breast cancer.

Women who are overweight also tend to have higher blood insulin levels. Higher insulin levels have been linked to some cancers, including breast cancer.

Still, the link between weight and breast cancer risk is complex. For example:

- The risk of breast cancer **after** menopause is higher for women who gained weight as an adult.
- For women who are overweight or obese **before** menopause, the risk is actually lower.

The reasons for this aren't exactly clear.

Weight might also have different effects on different types of breast cancer. For example:

- Being overweight after menopause is more strongly linked with an increased risk of

hormone receptor-positive breast cancer⁴.

- Some research suggests that being overweight before menopause might increase your risk of the less common triple-negative breast cancer⁵.

The American Cancer Society recommends⁶ you stay at a healthy weight throughout your life and avoid excess weight gain by balancing your food and drink intake with physical activity.

Not being physically active

Evidence is growing that regular physical activity reduces breast cancer risk, especially in women past menopause. The main question is how much activity is needed. Some studies have found that even as little as a couple of hours a week might be helpful, although more seems to be better.

Exactly how physical activity might reduce breast cancer risk isn't clear, but it may be due to its effects on body weight, inflammation, and hormone levels.

The American Cancer Society recommends⁷ that adults get 150 to 300 minutes of moderate intensity or 75 to 150 minutes of vigorous intensity activity each week (or a combination of these). Getting to or going over the upper limit of 300 minutes is ideal.

Not having children

Women who have not had children or who had their first child after age 30 have a slightly higher breast cancer risk overall. Having many pregnancies and becoming pregnant at a young age reduces breast cancer risk.

Still, the effect of pregnancy on breast cancer risk is complex. For example, the risk of breast cancer is higher for about the first decade after having a child. The risk then becomes lower over time.

Not breastfeeding

Most studies suggest that breastfeeding may slightly lower breast cancer risk, especially if it continues for a year or more. But this has been hard to study, especially in countries like the United States, where breastfeeding for this long is uncommon.

A possible explanation for this effect is that breastfeeding reduces a woman's total

number of lifetime menstrual cycles (the same as starting [menstrual periods at a later age or going through early menopause](#)).

Birth control

Some birth control methods use hormones, which might increase breast cancer risk.

Oral contraceptives: Most studies have found that women using oral contraceptives (birth control pills) have a slightly higher risk of breast cancer than women who have never used them. Once the pills are stopped, this risk seems to go back to normal within about 10 years.

Birth control shots: Some studies have suggested that getting long-acting progesterone shots (such as Depo-Provera) every 3 months for birth control might increase breast cancer risk, but not all studies have found this.

Birth control implants, intrauterine devices (IUDs), skin patches, vaginal rings: These forms of birth control also use hormones, which in theory could fuel breast cancer growth. Some studies have suggested a link between use of hormone-releasing IUDs and breast cancer risk, but few studies have looked at the use of birth control implants, patches, and rings and breast cancer risk.

Menopausal hormone therapy

Menopausal hormone therapy (MHT) with estrogen (often combined with progesterone) has been used for many years to help relieve symptoms of menopause and help prevent osteoporosis (thinning of the bones). This treatment also goes by other names, such as post-menopausal hormone therapy (PHT) and hormone replacement therapy (HRT).

There are 2 main types of hormone therapy:

- For women who still have a uterus (womb), doctors generally prescribe estrogen and progesterone (known as **combined hormone therapy**, or just **HT**).
Progesterone is needed because estrogen alone can increase the risk of cancer of the uterus.
- For women who've had a hysterectomy (who no longer have a uterus), estrogen alone can be used. This is known as **estrogen replacement therapy (ERT)** or just **estrogen therapy (ET)**.

Combined hormone therapy (HT): Use of combined hormone therapy after menopause increases the risk of breast cancer. This increase in risk is typically seen after about 4 years of use. Combined HT also increases the likelihood that the cancer may be found at a more advanced stage.

The increased risk from combined HT appears to apply mainly to current and recent users. A woman's breast cancer risk seems to go back down within about 5 years of stopping treatment, although the increased risk does not go away completely.

Bioidentical hormone therapy: The word *bioidentical* is sometimes used to describe versions of estrogen and progesterone with the same chemical structure as those found naturally in people (as opposed to the slightly different versions found in most medicines). The use of these hormones has been marketed as a safe way to treat the symptoms of menopause. But because there aren't many studies comparing "bioidentical" or "natural" hormones to synthetic versions of hormones, there's no proof that they're safer or more effective. More studies are needed to know for sure. Until then, the use of these bioidentical hormones should be considered to have the same health risks as any other type of hormone therapy.

Estrogen therapy (ET): Studies of the use of estrogen alone after menopause have had mixed results. Some have found a slightly higher risk, while others have found no increase in risk, or even a slight decrease in risk. If ET does increase the risk of breast cancer, it is not by much.

At this time there aren't many strong reasons to use post-menopausal hormone therapy (either combined HT or ET), other than possibly for the short-term relief of menopausal symptoms. Along with the increased risk of breast cancer, combined HT also appears to increase the risk of heart disease, blood clots, and strokes. It does lower the risk of colorectal cancer⁸ and osteoporosis, but this must be weighed against the possible harms, especially since there are other ways to prevent and treat osteoporosis, and screening⁹ can sometimes prevent colon cancer. While it's not clear if ET increases breast cancer risk, it does increase the risk of stroke.

The decision to use HT should be made by a woman and her doctor after weighing the possible risks and benefits (including the severity of her menopausal symptoms), and considering her other risk factors for heart disease, breast cancer, and osteoporosis. If they decide she should try HT for symptoms of menopause, it's usually best to use it at the lowest dose that works for her and for as short a time as possible.

To learn more, see [Menopausal Hormone Therapy and Cancer Risk¹⁰](#).

Breast implants

Breast implants have not been linked with an increased risk of the most common types of breast cancer.

However, in rare cases they have been linked with some other types of cancer, including [breast implant-associated anaplastic large cell lymphoma \(BIA-ALCL\)¹¹](#) and other lymphomas, as well as squamous cell carcinoma. These cancers can form in the scar tissue (capsule) around the implant, and they might show up as a lump, a collection of fluid, swelling, or pain, or skin changes near the implant, or as a change in breast size or shape.

Factors with Unclear Effects on Breast Cancer Risk

There are some things that might be risk factors for breast cancer, but the research is not yet clear about whether they really affect breast cancer risk.

For information on other known and possible breast cancer risk factors, see:

- [Lifestyle-related Breast Cancer Risk Factors](#)
 - [Breast Cancer Risk Factors You Cannot Change](#)
 - [Disproven or Controversial Breast Cancer Risk Factors](#)
-
- [Diet and vitamins](#)
 - [Chemicals in the environment](#)
 - [Tobacco smoke](#)
 - [Night shift work](#)

Diet and vitamins

While being [overweight or obese and not being physically active](#) have been linked to breast cancer risk, the possible link between diet and breast cancer risk is less clear. Results of some studies have suggested that diet may play a role, while others have not found that diet influences breast cancer risk.

Studies of women in the United States have not found a consistent link between **high-fat diets** and getting breast cancer, although some studies have found a possible link between high-fat diets and a higher risk of *dying* from breast cancer. Studies have also found that breast cancer is less common in countries where the typical diet is low in total fat, low in polyunsaturated fat, and low in saturated fat. Researchers are still not sure how to explain this. Studies comparing diet and breast cancer risk in different countries are complicated by other differences (such as activity level, intake of other nutrients, and genetic factors) that might also affect breast cancer risk.

We do know that high-fat diets can lead to being overweight or obese, which is a known breast cancer risk factor. A diet high in fat is also a risk factor for some other types of

cancer. And eating certain types of fat is clearly linked to a higher risk of heart disease.

Some studies have also suggested that **diets high in fruits and vegetables and calcium-rich dairy products, but low in red and processed meats** might lower the risk of breast cancer. This remains an active area of research.

Several studies looking at women in Asian countries have found that **diets high in soy products** might lower breast cancer risk. But this link has not been as clear in studies looking at women in Western countries. This might be because Asian women generally eat more soy products (and start at an earlier age) than Western women.

Studies looking at **vitamin levels** in the body have had inconsistent results. So far, there's no strong evidence that taking vitamins (or any other type of dietary supplement) reduces the risk of breast cancer.

The lack of a strong link between diet and breast cancer in studies so far doesn't mean that there's no point in eating a healthy diet. A diet low in fat, red meat, and processed meat and high in fruits and vegetables can have many health benefits, including lowering the risk of some other types of cancer.

Chemicals in the environment

A great deal of research has been reported and more is being done to understand possible environmental influences on breast cancer risk.

Chemicals in the environment that have estrogen-like properties are of special interest. For example, substances found in some plastics, certain cosmetics and personal care products, pesticides, and PCBs (polychlorinated biphenyls) seem to have such properties. In theory, these could affect breast cancer risk.

At this time research does not show a clear link between breast cancer risk and exposure to these substances, but it is hard to study such effects in humans. More studies are needed in this area.

Tobacco smoke

Some studies have found that heavy smoking over a long time might be linked to a slightly higher risk of breast cancer. In some studies, the risk has been highest in certain groups, such as women who started smoking before they had their first child. The 2014 US Surgeon General's report on smoking concluded that there is "suggestive but not sufficient" evidence that smoking increases the risk of breast cancer.

Researchers are also looking at whether [secondhand smoke¹](#) increases the risk of breast cancer. Both mainstream and secondhand smoke contain chemicals that, in high concentrations, cause breast cancer in rodents. Studies in rodents have shown that chemicals in tobacco smoke reach breast tissue and are found in breast milk. In human studies, the evidence on secondhand smoke and breast cancer risk is not clear. Most studies have not found a link, but some studies have suggested it might increase risk, particularly in premenopausal women. The 2014 US Surgeon General's report concluded that there is "suggestive but not sufficient" evidence of a link at this point. In any case, this possible link to breast cancer is yet another reason to avoid secondhand smoke.

Night shift work

Women who work at night, such as nurses on a night shift, might have an increased risk of breast cancer. This is an active area of research. This effect may be due to changes in levels of melatonin, a hormone that's affected by the body's exposure to light, but other hormones are also being studied.

Disproven or Controversial Breast Cancer Risk Factors

There are some factors that research has shown are not linked to breast cancer. You may see information online or hear about these disproven or controversial risk factors, but it's important to learn the facts.

For information on known and possible breast cancer risk factors, see:

- [Lifestyle-related Breast Cancer Risk Factors](#)
- [Breast Cancer Risk Factors You Cannot Change](#)
- [Factors with Unclear Effects on Breast Cancer Risk](#)

- [Antiperspirants](#)
- [Bras](#)
- [Induced abortion](#)

Antiperspirants

Online and social media rumors have suggested that chemicals in underarm antiperspirants are absorbed through the skin, interfere with lymph circulation, and cause toxins to build up in the breast, eventually leading to breast cancer.

Based on the available evidence (including what we know about how the body works), there is little if any reason to believe that antiperspirants increase the risk of breast cancer. For more information, see [Antiperspirants and Breast Cancer Risk¹](#).

Bras

Online and social media rumors and at least one book have suggested that bras cause breast cancer by obstructing lymph flow. There is no scientific or clinical basis for this claim, and a 2014 study of more than 1,500 women found no association between wearing a bra and breast cancer risk.

Induced abortion

Several studies have provided very strong data that neither induced abortions nor spontaneous abortions (miscarriages) have an overall effect on the risk of breast cancer. For more detailed information, see [Abortion and Breast Cancer Risk²](#).

Can I Lower My Risk of Breast Cancer?

There is no sure way to prevent breast cancer. But there are steps you can take that might lower your risk.

- [Lowering your risk](#)
- [Steps all women can take](#)
- [What to consider for women at increased risk of breast cancer](#)
- [Is there a link between diet/vitamins and breast cancer risk?](#)

Lowering your risk

A **risk factor** is anything that increases your chances of getting a disease, like breast cancer.

Many risk factors for breast cancer are beyond your control, like being born female and getting older. But other risk factors can be changed. This includes lifestyle changes like being physically active and staying at a healthy weight. Making these changes may lower your chance of getting breast cancer.

If you are at increased risk for breast cancer, there are a few additional steps you can take that might reduce your risk.

Steps all women can take

There are several things all women can do to lower the risk of developing breast cancer.

Get to and stay at a healthy weight

Both increased body weight and weight gain as an adult are linked with a higher risk of breast cancer after menopause. The American Cancer Society recommends you stay at a healthy weight throughout your life and avoid excess weight gain by balancing your food intake with physical activity.

Be physically active

Many studies have shown that moderate to vigorous physical activity is linked with lower breast cancer risk, so it's important to get regular physical activity.

The American Cancer Society recommends that adults get at least 150 to 300 minutes of **moderate intensity** or 75 to 150 minutes of **vigorous intensity** activity each week (or a combination of these), preferably spread throughout the week. Getting to or exceeding the upper limit of 300 minutes is ideal.

Moderate activity is anything that makes you breathe as hard as you do during a brisk walk. It causes a slight increase in heart rate and breathing. You should be able to talk, but not sing during the activity.

Vigorous activity is an activity performed at a higher intensity. Vigorous activities cause an increased heart rate, sweating, and a faster breathing rate.

Avoid or limit alcohol

Alcohol¹ increases risk of breast cancer. Even drinking small amounts of alcohol has been linked with an increase in risk. It is best not to drink alcohol at all. For women who do drink, they should have no more than 1 alcoholic drink a day. A drink is 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80-proof distilled spirits (hard liquor).

Consider other factors that might lower your risk

Women who choose to breastfeed for at least several months after childbirth may also get an added benefit of reducing their breast cancer risk.

Using hormone therapy after menopause² can increase your risk of breast cancer. To

avoid this, talk to your health care provider about non-hormonal options to treat menopausal symptoms.

What to consider for women at increased risk of breast cancer

If you are at increased risk for breast cancer (for instance, because you have a strong family history of breast cancer, a known inherited gene mutation that increases breast cancer risk, such as in the [BRCA1 or BRCA2 gene](#), or you have had [DCIS³](#) or [LCIS⁴](#)), there are some things you can consider that might help lower your chances of developing breast cancer (or help find it early):

- **Genetic counseling and testing for breast cancer risk (if it hasn't been done already)**
- **Medicines to lower breast cancer risk**
- **Preventive (prophylactic) surgery**
- **Close observation to look for early signs of breast cancer**

Your health care provider can help you determine your risk of breast cancer, as well as which, if any, of these options might be right for you.

Genetic counseling and testing

If there are reasons to think you might have inherited a gene change that increases your risk of breast cancer (such having as a strong family history of breast cancer, or a family member with a known gene mutation), you might want to talk to your doctor about genetic counseling to see if you should be tested. To learn more, see [Genetic Counseling and Testing for Breast Cancer Risk](#).

If you decide to be tested and a gene change is found, this might affect your decision about using the options below to help lower your risk for breast cancer (or find it early)

Medicines to lower breast cancer risk

Prescription medicines can be used to help lower breast cancer risk in certain women at increased risk of breast cancer.

Medicines such as **tamoxifen** and **raloxifene** block the action of estrogen in breast tissue. Tamoxifen might be an option even if you haven't gone through menopause, while raloxifene is only used for women who have gone through menopause.

Other drugs, called **aromatase inhibitors**, might also be an option for women past menopause. All of these medicines can also have side effects, so it's important to understand the possible benefits and risks of taking one of them.

To learn more, see:

- [Deciding Whether to Use Medicine to Reduce Breast Cancer Risk](#)
- [Tamoxifen and Raloxifene for Lowering Breast Cancer Risk](#)
- [Aromatase Inhibitors for Lowering Breast Cancer Risk](#)

Preventive surgery for women with very high breast cancer risk

For the small fraction of women who have a very high risk of breast cancer, such as from a *BRCA* gene mutation, surgery to remove the breasts (prophylactic mastectomy) may be an option. Another option might be to remove the ovaries, which are the main source of estrogen in the body.

While surgery can lower the risk of breast cancer, it can't eliminate it completely, and it can have its own side effects. For more on this topic, see [Preventive Surgery to Reduce Breast Cancer Risk](#).

Before deciding if any of these options might be right for you, talk with your health care provider to understand your risk of breast cancer and how much these approaches might affect your risk.

Close observation

For women at increased breast cancer risk who don't want to take medicines or have surgery, some doctors might recommend **close observation**. This approach might include:

- More frequent doctor visits (such as every 6 to 12 months) for breast exams and ongoing risk assessment
- Starting breast cancer screening with yearly [mammograms](#)⁵ at a younger age
- Possibly adding another screening test, such as [breast MRI](#)⁶

While this approach doesn't lower breast cancer risk, it might help find it early, when it's likely to be easier to treat.

Is there a link between diet/vitamins and breast cancer risk?

The possible link between diet and breast cancer risk is not clear, but this is an active area of study. Some (but not all) studies have suggested that a diet that is high in vegetables, fruit, and calcium-rich dairy products, but low in red and processed meats might help lower the risk of breast cancer.

It's also not clear if specific vegetables, fruits, or other foods can lower risk. And most studies have not found that lowering fat intake has much of an effect on breast cancer risk (although some have suggested it might help lower the risk of *dying* from breast cancer).

But just because the science isn't clear on this doesn't mean that there's no point in eating a healthy diet. A diet low in fat, processed and red meat, and sugary drinks, but high in fruits and vegetables can have many health benefits, including lowering the risk of some other types of cancer.

So far, there's no strong evidence that taking vitamins or any other type of dietary supplement reduces the risk of breast cancer.

Learn more: For more on the links between body weight, physical activity, diet, alcohol, and the risk of breast cancer (as well as other cancers), see the [American Cancer Society Guidelines for Diet and Physical Activity for Cancer Prevention⁷](#).

Genetic Counseling and Testing for Breast Cancer Risk

Some people inherit changes (mutations) in certain genes that increase their risk of breast cancer (and possibly other cancers). Genetic testing can look for mutations in some of these genes.

While it can be helpful in some cases, not everyone needs to be tested, and each person should carefully consider the pros and cons of testing. It's very important to understand what genetic testing can and can't tell you before these tests are done.

- Inherited gene changes that can increase breast cancer risk
- Considering genetic counseling and testing for breast cancer risk
- Testing for BRCA and other gene mutations
- How genetic testing is done
- Getting the results of genetic testing
- Direct-to-consumer genetic tests

Inherited gene changes that can increase breast cancer risk

BRCA1 and BRCA2 gene mutations

When it comes to breast cancer risk, the most important inherited gene changes are in the ***BRCA1 and BRCA2 genes***. Women (and men) with one of these gene changes are said to have [Hereditary Breast and Ovarian Cancer \(HBOC\) syndrome¹](#).

- Women with a *BRCA* gene change have a greatly increased risk of breast cancer, as well as an increased risk of ovarian cancer, pancreatic cancer, and possibly some other cancers.
- Men with a *BRCA* gene change are at increased risk of breast cancer (although this risk is lower than in women to begin with), prostate cancer, pancreatic cancer, and possibly some other cancers.

If you have a family history of breast cancer, you have a higher risk of getting breast cancer yourself. **Most women with a family history of breast cancer do not have an inherited gene change that greatly affects their risk.** Still, an inherited gene change is more likely in women with a strong family history of breast cancer, especially if the family history also includes certain other cancers, such as ovarian, pancreatic, or

prostate cancer. The risk of having an inherited syndrome is also affected by:

- Which family members are affected (Cancer in close relatives such as a mother or sister is more concerning than cancer in more distant relatives.)
- The number of family members affected
- The age when your relatives were diagnosed (Cancer occurring at a younger age is more of a concern.)

Other inherited gene mutations

Inherited changes in some other genes can also increase breast cancer risk, including [these genes](#):

- **PALB2**
- **CHEK2**
- **ATM**
- **CDH1** (linked with hereditary diffuse gastric cancer)
- **PTEN** (linked with Cowden syndrome)
- **TP53** (linked with Li-Fraumeni syndrome)

Considering genetic counseling and testing for breast cancer risk

If you're concerned about your risk because of a personal or family history of breast cancer, talk with your doctor. As a first step, your doctor might use one of several **risk assessment tools** that are now available. These mathematical models use your family history and other factors to help give you and your doctor a better idea about your risk of having an inherited *BRCA* gene mutation. But these assessment tools aren't perfect, and each one might give different results, so doctors are still trying to figure out how best to use them.

Regardless of whether one of these tools is used, your doctor might suggest you could benefit from speaking with a genetic counselor or other health professional who is trained in genetic counseling. They can review your family history in detail to see how likely it is that you have a [family cancer syndrome](#)² such as HBOC. The counselor can also describe genetic testing to you and explain what the tests might be able to tell you, which can help you decide if genetic testing is right for you.

Genetic testing is covered by many health insurance plans, but it might not be covered

(or might be covered only partially) by some of them.

If you do decide to get tested, the genetic counselor (or other health professional) can also help explain what the results mean, both for you and possibly other family members. To learn more about genetic testing in general, see [Genetics and Cancer³](#).

Testing for *BRCA* and other gene mutations

Some expert groups have developed guidelines for which women (and men) should consider genetic counseling and possibly testing for *BRCA* and other gene mutations. These guidelines can be complex, and not all doctors agree with them, but in general they include two main groups of people:

Women who have already been diagnosed with breast cancer: Most doctors agree that not all women with breast cancer need genetic counseling and testing. But counseling and testing is more likely to be helpful if:

- You were diagnosed with breast cancer at a younger age
- You have triple-negative breast cancer
- You have been diagnosed with a second breast cancer (not a recurrence of the first cancer)
- You are of Ashkenazi Jewish descent
- You have a family history of breast cancer (especially at a younger age or in men), ovarian cancer, pancreatic cancer, or prostate cancer

Other groups of people: Genetic counseling and testing might also be recommended for other people who are at higher risk for inherited gene mutations, including:

- People with a known family history of a *BRCA* (or other) gene mutation
- Women diagnosed with ovarian cancer or pancreatic cancer, or men diagnosed with breast cancer, pancreatic cancer, or high-grade or metastatic prostate cancer
- People with a family history of breast cancer at a younger age, more than one family member with breast cancer, or breast cancer in a male family member
- People with a close family member with a history of ovarian cancer, pancreatic cancer, or metastatic prostate cancer

How genetic testing is done

Genetic testing can be done on samples of blood or saliva, or from a swab of the inside of a cheek. The samples are sent to a lab for testing.

There are many different possible mutations in the *BRCA* genes. Testing can look for one (or a few) specific mutation(s), or more extensive testing can be done to look for many different *BRCA* mutations. For example, if someone is being tested because they have a family member with a known *BRCA* mutation, testing might focus only on that specific mutation. In people of Ashkenazi Jewish descent, testing might focus on the specific *BRCA* mutations that are most common in this group of people. But if there's no reason to suspect a specific gene change, testing will likely look for many different *BRCA* mutations. Depending on the situation, testing might be done to look for changes in other genes as well.

Getting the results of genetic testing

Before getting genetic testing, it's important to know ahead of time what the results might or might not tell you about your risk. Genetic testing is not perfect. The tests might not provide clear answers for some people. This is why meeting with a genetic counselor or cancer genetics professional is important, even before being tested.

The results of genetic testing might come back as:

- **Positive for a mutation that was tested for.** If the test does find an important mutation, there might be [steps you can take to help lower your risk of breast cancer](#) (or other cancers). If you've already been diagnosed with breast cancer, a positive result might affect your breast cancer treatment options.
- **Negative for the mutation(s) tested for.** It can be reassuring to find out that the test didn't find a mutation that increases your risk. But it's important to know that genetic test results can't always guarantee that you're not at increased risk. For instance, there might be a chance that you have a gene change that is not currently being tested for.
- **Inconclusive.** In some cases, the test might not be able to tell for sure if you have a gene mutation.
- **Positive for a variant of unknown significance (VUS).** This means that the test found a gene change (variant), but it's not known if this particular change affects your risk.

To learn more about these different types of test results, see [What Happens During Genetic Testing for Cancer Risk?](#)⁴

The results of genetic testing can sometimes be complex or confusing, which is why it's important to go over them with a genetic counselor or cancer genetics professional. They can explain what they might mean for you (and possibly other family members).

Direct-to-consumer genetic tests

Some genetic tests are now available directly to the public, but there are some concerns with these types of tests. For example, a test that looks for a small number of *BRCA1* and *BRCA2* gene mutations has been approved by the FDA. However, there are more than 1,000 known *BRCA* mutations. This means there are many *BRCA* mutations that would not be detected by this test. People with a negative test result might assume they don't have to be concerned about their risk, when in fact they might still have a different *BRCA* mutation.

Our section on [genetics and cancer⁵](#) has more information about genetic mutations and testing for them.

Deciding Whether to Use Medicine to Reduce Breast Cancer Risk

For women with a higher-than-average risk of breast cancer, some medicines can help reduce this risk. But these drugs can also have side effects, so it's important to weigh their pros and cons before deciding to take one.

- [Chemoprevention](#)
- [Should I take a drug to help reduce my breast cancer risk?](#)
- [Am I at higher risk for breast cancer?](#)
- [Are there reasons not to take one of these drugs to help reduce breast cancer risk?](#)

Chemoprevention

Taking medicines to help lower the risk of getting a disease is called **chemoprevention**.

The most commonly used medicines to lower breast cancer risk are [tamoxifen](#) and [raloxifene](#). Other medicines called [aromatase inhibitors](#) (such as anastrozole and exemestane) might also be options.

Should I take a drug to help reduce my breast cancer risk?

The first step in deciding if you should take a drug to help lower your chances of getting breast cancer is to have a health care provider assess your breast cancer risk.

Most experts say that your breast cancer risk should be higher than average for you to consider taking one of these drugs. If you do have a higher-than-average risk, you need to compare the benefit of possibly reducing your chance of getting breast cancer with the risk of side effects and other problems from taking one of these drugs.

Am I at higher risk for breast cancer?

A risk factor is anything that raises your risk of getting a disease. Your risk factors will need to be assessed to find out if you are at higher-than-average risk for breast cancer. But keep in mind that having risk factors does not mean that you will definitely develop breast cancer. In fact, most women who have one or more risk factors never develop breast cancer.

Some important [risk factors for breast cancer](#) include:

- Getting older
- Having close relatives who have had breast cancer
- Having a longer menstrual history (more total menstrual cycles)
- Having had invasive breast cancer or [ductal carcinoma in situ \(DCIS\)](#)¹ before
- Being diagnosed with [lobular carcinoma in situ \(LCIS\)](#)²
- Being diagnosed with [atypical ductal hyperplasia \(ADH\)](#) or [atypical lobular hyperplasia \(ALH\)](#)³
- Having a gene mutation linked to a [family cancer syndrome](#)⁴ (such as a *BRCA* mutation)

Some of these factors can increase your risk more than others.

How is breast cancer risk assessed?

Researchers have built some statistical models to help predict a woman's risk of getting breast cancer.

For example, the [Breast Cancer Risk Assessment Tool](#)⁵ (based on the modified **Gail Model**) is commonly used to assess risk. It can estimate your risk of getting breast cancer in the next 5 years and over your lifetime, based on many of the factors listed above.

This tool only looks at family history in close relatives (like siblings, parents, and children), though. And it can't be used to estimate risk if you have a history of ductal carcinoma in situ (DCIS), lobular carcinoma in situ (LCIS), or breast cancer, or if you have a family cancer syndrome.

Also, the data that this tool is based on didn't include American Indian or Alaskan Native women, so estimates for these women may not be accurate.

Other risk assessment tools, such as the **Tyrer-Cuzick model** and the **Claus model**, are based largely on family history. These tools are used mainly by genetic counselors and other health care professionals.

These tools can give you a rough estimate of your risk, but no tool or test can tell for sure if you'll develop breast cancer.

How high does my risk need to be?

There is no single definition of a higher-than-average risk of breast cancer. But most major studies have used a 1.7% risk of developing breast cancer over the next 5 years as their cut-off point. (This is the average risk for a 60-year-old woman.)

Some medical organizations recommend that doctors discuss the use of medicines to lower breast cancer risk in women at least 35 years old who have a 5-year risk of 1.7% or higher. Others might use different cutoff points.

The American Cancer Society does not have recommendations for using medicines to help lower the risk of breast cancer.

Are there reasons not to take one of these drugs to help reduce breast cancer risk?

All drugs have risks and side effects that must be discussed when making the decision about chemoprevention.

Most experts agree that **tamoxifen and raloxifene** should not be used to reduce breast cancer risk in women who:

- Have a higher risk of serious blood clots*
- Are pregnant or planning to become pregnant
- Are breastfeeding
- Are taking estrogen (including birth control pills or shots, or menopausal hormone therapy)
- Are taking an aromatase inhibitor
- Are younger than 35 years old

*Women who have a higher risk of serious blood clots include those who have **ever** had serious blood clots (deep venous thrombosis [DVT] or a pulmonary embolism [PE]). Many doctors also feel that if you've had a stroke or heart attack, or if you smoke, are

obese, or have (or are being treated for) high blood pressure or diabetes, you also have a higher risk of serious blood clots. Women with any of these conditions should ask their doctors if the benefits of taking one of these drugs would outweigh the risks.

A woman who has been diagnosed with any type of uterine cancer or atypical hyperplasia of the uterus (a kind of pre-cancer) should not take tamoxifen to help lower breast cancer risk.

Raloxifene has not been tested in pre-menopausal women, so it should only be used if you have gone through menopause.

Aromatase inhibitors are not useful for pre-menopausal women, so they should only be used if you have gone through menopause. These drugs can cause bone thinning (osteoporosis), so they're not likely to be a good option in women who already have thin or weakened bones.

Talk with your doctor about your total health picture to make the best possible choice for you.

To learn more about the use of these medicines for chemoprevention, see:

- [Tamoxifen and Raloxifene for Lowering Breast Cancer Risk](#)
- [Aromatase Inhibitors for Lowering Breast Cancer Risk](#)

Tamoxifen and Raloxifene for Lowering Breast Cancer Risk

Tamoxifen and raloxifene have been shown to reduce the risk of breast cancer in women with a higher-than-average risk, but these drugs can have their own risks and

side effects.

- What kind of drugs are tamoxifen and raloxifene?
- How much do these drugs lower the risk of breast cancer?
- Are there other benefits to taking these drugs?
- What are the main risks and side effects of taking these drugs?

What kind of drugs are tamoxifen and raloxifene?

Tamoxifen and raloxifene are the only drugs approved in the US to help lower the risk of breast cancer, although for some women, other drugs called [aromatase inhibitors](#) might be an option as well.

Tamoxifen and raloxifene are **selective estrogen receptor modulators (SERMs)**. This means that they act against (or block) estrogen (a female hormone) in some tissues of the body, but act like estrogen in others.

Estrogen can fuel the growth of breast cancer cells. Both tamoxifen and raloxifene block estrogen in breast cells. This is why these drugs can be useful in lowering breast cancer risk.

These drugs are used more often for other reasons.

- Tamoxifen is used mainly to treat [hormone receptor-positive breast cancer](#)¹ (breast cancer with cells that have estrogen and/or progesterone receptors on them).
- Raloxifene is used mostly to prevent and treat osteoporosis (very weak bones) in post-menopausal women.

When used to lower the risk of breast cancer, these drugs are typically taken for 5 years. Both drugs are pills taken once a day. Tamoxifen also comes in a liquid form.

Tamoxifen can be an option whether or not you have gone through menopause, but raloxifene is only approved for post-menopausal women.

To learn more about who should (and should not) consider taking one of these drugs, see [Deciding Whether to Use Medicine to Reduce Breast Cancer Risk](#).

How much do these drugs lower the risk of breast cancer?

The effect of these drugs on breast cancer risk has varied in different studies. When the results of all the studies are taken together, the overall reduction in risk for these drugs is about 40% (more than a third).

What would this mean for me?

Although a medicine that cuts your risk by about 40% sounds like it must be a good thing, what it means for you depends on how high your risk is in the first place (your baseline risk).

For example, if you had a 5% risk of getting breast cancer in the next 5 years, you would be considered at increased risk. A 5% risk would mean that over the next 5 years, 5 of 100 women with your risk would be expected to get breast cancer. A 40% reduction in your risk would mean your risk goes down to 3%. This would be a 2% change overall.

Since the change in your overall risk depends on your baseline risk, you would benefit less if you had a lower baseline risk, and you would benefit more if your risk was higher. If you had a baseline risk of only 1.7% in the next 5 years (which is what many expert groups use as a cutoff point for being at 'increased risk'), a 40% change would mean that your risk would go down by less than 1% overall (to about 1%) in the next 5 years.

Your doctor can estimate your breast cancer risk based on factors like your age, medical history, and family history. This can help you see how much benefit you might get from taking one of these drugs.

Are there other benefits to taking these drugs?

Both tamoxifen and raloxifene can **help prevent osteoporosis**, a severe weakening of the bones that can increase the risk of bone fractures and is more common after menopause.

What are the main risks and side effects of taking these drugs?

Menopausal symptoms

The most common side effects of these drugs are symptoms of menopause. These include hot flashes and night sweats. Tamoxifen can also cause vaginal dryness and vaginal discharge. Pre-menopausal women taking tamoxifen can have menstrual changes. Menstrual periods can become irregular or even stop. Although periods often

start again after the drug is stopped, they don't always, and some women go into menopause. This is more likely in women who were close to menopause when they started taking the drug.

Other, more serious side effects are rare. These include serious blood clots and cancer of the uterus.

Blood clots

Both tamoxifen and raloxifene increase your risk of developing blood clots in a vein in your leg (deep venous thrombosis) or in your lungs (pulmonary embolism). These clots can sometimes cause serious problems, and even death. In the major studies looking at these drugs for breast cancer prevention, the overall risk of these blood clots over 5 years of treatment was less than 1%. This risk could be higher if you had a serious blood clot in the past, so these drugs are generally not recommended to lower breast cancer risk for anyone with a history of blood clots.

Because these drugs increase your risk of developing serious blood clots, there is also concern that they might also increase your risk of heart attack or stroke, although this is not clear. You might want to discuss this with your doctor, especially if you have a history of a heart attack or stroke, or if you are at increased risk for them. (See [Deciding Whether to Use Medicine to Reduce Breast Cancer Risk](#).)

Cancers of the uterus

Because **tamoxifen** acts like estrogen in the uterus, it can increase your risk of cancers of the uterus, including [endometrial cancer²](#) and [uterine sarcoma³](#). It's also linked to a higher risk of endometrial pre-cancers. The increased risk seems to affect women over 50, but not younger women.

The overall increase in the risk of uterine cancer with tamoxifen use is low (less than 1%), and it goes back to normal within a few years of stopping the drug.

If you have had a hysterectomy (surgery to remove the uterus), you are not at risk for endometrial cancer or uterine sarcoma and do not have to worry about these cancers.

If you are taking tamoxifen, tell your doctor if you have any abnormal vaginal bleeding or spotting, especially after menopause, as these are possible symptoms of uterine cancer.

Raloxifene does not act like estrogen in the uterus and is not linked to an increased risk

of uterine cancer.

Aromatase Inhibitors for Lowering Breast Cancer Risk

Aromatase inhibitors (AIs) are drugs used to lower breast cancer risk in some post-menopausal women. For post-menopausal women with a higher-than-average risk of breast cancer, these drugs may be an option instead of tamoxifen or raloxifene.

- [What are aromatase inhibitors?](#)
- [Can aromatase inhibitors lower the risk of breast cancer?](#)
- [What are the risks and side effects of aromatase inhibitors?](#)

What are aromatase inhibitors?

Aromatase inhibitors (AIs) lower estrogen levels by stopping an enzyme in fat tissue (called **aromatase**) from changing other hormones into estrogen. (Estrogen can fuel the growth of breast cancer cells.)

These drugs don't stop the ovaries from making estrogen. They only lower estrogen levels in women whose ovaries aren't making estrogen (such as women who have already gone through menopause). Because of this, they are used mainly in women who have gone through menopause already.

The AIs that have been shown in studies to lower breast cancer risk include:

- **Anastrozole (Arimidex)**
- **Exemestane (Aromasin)**

Like tamoxifen, these drugs are more often used to treat hormone receptor-positive breast cancer than to lower breast cancer risk.

When used to lower breast cancer risk, these drugs are typically taken for 5 years. They are pills taken once a day.

Can aromatase inhibitors lower the risk of breast cancer?

In large studies, both anastrozole and exemestane have been shown to lower breast cancer risk in postmenopausal women who are at increased risk.

While these drugs are not FDA approved to lower breast cancer risk, some expert groups include them as options (along with [tamoxifen and raloxifene](#)) to reduce breast cancer risk in post-menopausal women at increased risk. For example, they might be a reasonable option for women who have an increased risk of blood clots and therefore should not take tamoxifen or raloxifene.

What are the risks and side effects of aromatase inhibitors?

The most common side effects of AIs are **symptoms of menopause**, such as hot flashes, night sweats, and vaginal dryness.

These drugs can also cause **muscle and joint pain**. This side effect can be serious enough to cause some women to stop taking the drugs.

Unlike tamoxifen and raloxifene, AIs tend to speed up bone thinning, which can lead to **osteoporosis**. People with osteoporosis are more likely to have broken bones. Because of this, doctors often recommend checking bone density before starting one of these drugs.

AIs may **raise cholesterol**. Women with pre-existing heart disease who take an AI may be at higher risk of having a heart problem.

Preventive Surgery to Reduce Breast Cancer Risk

Some women with a very high risk of breast cancer may choose preventive surgery to remove their breasts. This surgery is called a **prophylactic mastectomy**.
(Prophylactic means something used to prevent disease.)

- Should I consider surgery to lower my risk of breast cancer?
- Prophylactic mastectomy
- Prophylactic oophorectomy (removal of the ovaries)
- Other options to reduce breast cancer risk

Should I consider surgery to lower my risk of breast cancer?

You might consider preventive surgery if you:

- Have a mutation in the *BRCA1* or *BRCA2* gene (or certain other genes that increase breast cancer risk) that is found by [genetic testing](#)
- Have a strong family history of breast cancer (such as breast cancer in several close relatives, or breast cancer in at least one relative at a young age)
- Had radiation therapy to the chest before age 30
- Have (or have had) cancer in one breast (especially if you also have a strong family history)

Like any type of surgery, a mastectomy can have risks and side effects, some of which could affect your quality of life. Because of this, preventive surgery is not usually a good option for women who are at average risk of breast cancer, or for those who are at only slightly increased risk.

For women who are known (or strongly suspected) to have a *BRCA1* or *BRCA2* gene mutation, a **prophylactic oophorectomy** (removal of the ovaries) might be recommended as well.

Prophylactic mastectomy

A prophylactic mastectomy is surgery to remove one or both breasts to lower the chances of getting breast cancer. There are [different types of mastectomies¹](#) that might be options.

A prophylactic mastectomy can lower breast cancer risk by 90% or more, but it doesn't guarantee that you will not get breast cancer. This is because it's not possible to remove all breast cells, even with a mastectomy. The breast cells that are left behind might still go on to become cancer.

A prophylactic mastectomy might be considered in two main situations.

For women at very high risk of breast cancer

For women in this group, removing both breasts (known as a **bilateral prophylactic mastectomy**) before cancer is diagnosed can greatly reduce (but not eliminate) the risk of getting breast cancer.

Unfortunately there's no way to know for sure ahead of time if a woman will benefit from this surgery. Most women with a *BRCA1* or *BRCA2* gene mutation will develop breast cancer at some point. Having a prophylactic mastectomy before the cancer develops might add many years to their lives. But not all women with *BRCA1* or *BRCA2* mutations develop breast cancer. For some women the surgery might not have been helpful. Although they might still get some important benefits from the surgery such as peace of mind, they would also have to deal with its aftereffects, which might include physical and emotional side effects.

For women already diagnosed with breast cancer

Some women who have already been diagnosed with breast cancer choose to have the other breast removed at the same time of surgery to remove the breast with cancer. This operation (known as a **contralateral prophylactic mastectomy**, or CPM) can help lower their risk of developing a second breast cancer.

This is more likely to be a good option for women who also have other factors that increase their risk of getting another breast cancer, such as a *BRCA1* or *BRCA2* mutation or a strong family history of breast cancer.

But for women who don't have a family history or other risk factors for breast cancer, the benefit of CPM is less clear. Having breast cancer does raise your risk of getting cancer in the other breast, but this risk is still usually low, and many women overestimate this risk. And while CPM lowers the risk of getting cancer in the other breast, it does not increase most women's chances of living longer.

Other issues might also be important when considering a CPM. For example, after a mastectomy, the breasts may no longer look the same, even if a woman has [breast reconstruction](#)². Removing both breasts (possibly followed by reconstruction) can help the breasts look more symmetrical after treatment.

Before having this type of surgery, it's very important to talk with a member of your cancer care team or a genetic counselor so that you understand how much you might benefit from it, versus the likelihood of risks and side effects. You might also want to get a second medical opinion, as well as talk to others who have had this surgery, before deciding if it's right for you.

Prophylactic oophorectomy (removal of the ovaries)

Women with a *BRCA1* or *BRCA2* mutation have a high risk of developing breast cancer and ovarian cancer.

Most doctors recommend that women with a *BRCA1* or *BRCA2* mutation have surgery to remove their ovaries (and usually the attached fallopian tubes as well) once they've finished having children. This operation, known as a **prophylactic oophorectomy**, greatly reduces the risk of ovarian cancer. Some studies have suggested it might lower the risk of breast cancer as well, although not all studies have found this. Some women choose to have this surgery done along with a prophylactic mastectomy.

Removing the ovaries causes a woman to go into menopause. This can lead to symptoms such as hot flashes, trouble sleeping, vaginal dryness, loss of bone density, and anxiety or depression.

Again, it's important to talk to your health care team so that you're well informed about the possible benefits, risks, and side effects of this type of surgery. You might also want to talk to other women who have had this surgery before deciding if it's right for you.

Other options to reduce breast cancer risk

If you're concerned about your breast cancer risk, talk to your health care provider. They can help you estimate your risk based on your age, family history, and other factors. If you are at increased risk, you might consider taking **medicines** that can help lower your risk. Your health care provider might also suggest you have more intensive **screening³** for breast cancer, which might include starting screening at a younger age or having other tests in addition to mammography.

There are also other things that all women can do to help lower their risk of breast cancer, such as being active, staying at a healthy weight, and limiting or not drinking alcohol. For more information, see [Can I Lower My Risk of Breast Cancer?](#)

Breast Cancer Early Detection and Diagnosis

Breast cancer is sometimes found after symptoms appear, but many women with breast cancer have no symptoms. This is why regular breast cancer screening is so important. Learn more.

Can Breast Cancer Be Found Early?

Breast cancer is sometimes found after symptoms appear, but many women with breast cancer have no symptoms. This is why regular breast cancer screening is so important. Learn more.

- [American Cancer Society Recommendations for the Early Detection of Breast Cancer](#)

Imaging Tests to Find Breast Cancer

Different tests can be used to look for and diagnose breast cancer. If your doctor finds an area of concern on a screening test (a mammogram), or if you have symptoms that could mean breast cancer, you will need more tests to know for sure if it's cancer.

- [Mammograms](#)
- [Breast Ultrasound](#)
- [Breast MRI](#)
- [Newer and Experimental Breast Imaging Tests](#)

Signs and Symptoms of Breast Cancer

The most common symptom of breast cancer is a new lump or mass, but other symptoms are also possible. It's important to have any breast change checked by a health care provider.

- [Breast Cancer Signs and Symptoms](#)

Biopsy

A biopsy is done when mammograms, other imaging tests, or a physical exam shows a breast change that may be cancer. A biopsy is the only way to know for sure if it's cancer.

- [Breast Biopsy](#)

Finding breast cancer during pregnancy

Breast cancer during pregnancy is rare. But if you find a lump or notice any unusual changes in your breasts that concern you, tell your doctor or nurse right away.

- [Finding Breast Cancer During Pregnancy](#)

American Cancer Society Recommendations for the Early Detection of Breast Cancer

Finding breast cancer early and getting state-of-the-art cancer treatment are two of the most important ways to prevent deaths from breast cancer.

If breast cancer is found early, when it's small and has not spread, it is easier to treat successfully. Getting regular screening tests is the most reliable way to find breast cancer early.

The American Cancer Society has screening guidelines for women at **average risk for breast cancer** and for those at **high risk for breast cancer**.

- [What are screening tests?](#)
- [American Cancer Society screening recommendations for women at average](#)

breast cancer risk

- American Cancer Society screening recommendations for women at high risk

What are screening tests?

Screening refers to tests and exams used to find a disease in people who don't have any symptoms. The goal of screening tests for breast cancer is to find it early, before it causes symptoms (like a lump in the breast that can be felt). **Early detection** means finding and diagnosing a disease earlier than if you'd waited for symptoms to start.

Breast cancers found during screening exams are more likely to be smaller and less likely to have spread outside the breast. The size of a breast cancer and how far it has spread are some of the most important factors in predicting the **prognosis** (outlook) of a woman with this disease.

American Cancer Society screening recommendations for women at average breast cancer risk

These guidelines are for women at **average risk** for breast cancer. For screening purposes, a woman is considered to be at average risk if she doesn't have a personal history of breast cancer, a strong family history of breast cancer, or a genetic mutation known to increase risk of breast cancer (such as in a *BRCA* gene), and has not had chest radiation therapy before the age of 30. (See below for guidelines for women at high risk.)

- **Women between 40 and 44** have the option to start screening with a mammogram every year.
- **Women 45 to 54** should get mammograms every year.
- **Women 55 and older** can switch to a mammogram every other year, or they can choose to continue yearly mammograms. Screening should continue as long as a woman is in good health and is expected to live at least 10 more years.
- **All women** should understand what to expect when getting a mammogram for breast cancer screening – what the test can and cannot do.

Clinical breast exams are not recommended for breast cancer screening among average-risk women at any age.

Mammograms

Mammograms are low-dose x-rays of the breast. Regular mammograms can help find breast cancer at an early stage, when treatment is most likely to be successful. A mammogram can often find breast changes that could be cancer years before physical symptoms develop. Results from many decades of research clearly show that women who have regular mammograms are more likely to have breast cancer found earlier, are less likely to need aggressive treatments like surgery to remove the entire breast ([mastectomy¹](#)) and [chemotherapy²](#), and are more likely to be cured.

Mammograms are not perfect. They miss some breast cancers. And if something is found on a screening mammogram, a woman will likely need other tests (such as more mammograms or a [breast ultrasound](#)) to find out if it is cancer. There's also a small chance of being diagnosed with a cancer that never would have caused any problems had it not been found during screening. (This is called *overdiagnosis*.) It's important that women getting mammograms know what to expect and understand the benefits and limitations of screening.

2D vs. 3D mammograms

In recent years, a newer type of mammogram called [digital breast tomosynthesis](#) (commonly known as **three-dimensional [3D] mammography**) has become much more common, although it's not available in all breast imaging centers.

Many studies have found that 3D mammography appears to lower the chance of being [called back](#) after screening for follow-up testing. It also appears to find more breast cancers, and several studies have shown it can be helpful in women with more dense breasts. A large study is now in progress to better compare outcomes between 3D mammograms and standard (2D) mammograms.

It should be noted that 3D mammograms often cost more than 2D mammograms, and this added cost may not be covered by insurance.

The American Cancer Society (ACS) breast cancer screening guidelines consider having had either a 2D or 3D mammogram as being in line with current screening recommendations. The ACS also believes that women should be able to choose between 2D and 3D mammography if they or their doctor believe one would be more appropriate, and that out-of-pocket costs should not be a barrier to having either one.

Clinical breast exam (CBE) and breast self-exam (BSE)

Research has not shown a clear benefit of regular physical breast exams done by either a health professional (clinical breast exams) or by women themselves (breast self-

exams). There is very little evidence that these tests help find breast cancer early when women also get screening mammograms. Most often when breast cancer is detected because of [symptoms](#) (such as a lump in the breast), a woman discovers the symptom during usual activities such as bathing or dressing. **Women should be familiar with how their breasts normally look and feel and should report any changes to a health care provider right away.**

While the American Cancer Society does not recommend regular clinical breast exams or breast self-exams as part of a routine breast cancer screening schedule, this does not mean that these exams should never be done. In some situations, particularly for women at higher-than-average risk, for example, health care providers may still offer clinical breast exams, along with providing counseling about risk and early detection. And some women might still be more comfortable doing regular self-exams as a way to keep track of how their breasts look and feel. But it's important to understand that there is very little evidence that doing these exams routinely is helpful for women at average risk of breast cancer.

American Cancer Society screening recommendations for women at high risk

Women who are at **high risk** for breast cancer based on certain factors should get a [breast MRI](#) and a mammogram every year, typically starting at age 30. This includes women who:

- Have a lifetime risk of breast cancer of about 20% to 25% or greater, according to risk assessment tools that are based mainly on family history (see below)
- Have a known [*BRCA1* or *BRCA2* gene mutation³](#) (based on having had [genetic testing⁴](#))
- Have a first-degree relative (parent, brother, sister, or child) with a *BRCA1* or *BRCA2* gene mutation, and have not had genetic testing themselves
- Had radiation therapy to the chest before they were 30 years old
- Have Li-Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome, or have first-degree relatives with one of these syndromes

The American Cancer Society recommends against MRI screening for women whose lifetime risk of breast cancer is less than 15%.

There's not enough evidence to make a recommendation for or against yearly MRI screening for women who have a higher lifetime risk based on certain factors, such as:

- Having a personal history of breast cancer, ductal carcinoma in situ (DCIS)⁵, lobular carcinoma in situ (LCIS)⁶, atypical ductal hyperplasia (ADH), or atypical lobular hyperplasia (ALH)⁷
- Having “extremely” or “heterogeneously” **dense breasts** as seen on a mammogram

If MRI is used, it should be in addition to, not instead of, a screening mammogram. This is because although an MRI is more likely to find cancer than a mammogram, it may still miss some cancers that a mammogram would find.

Most women at high risk should begin screening with MRI and mammograms when they are 30 and continue for as long as they are in good health. But this is a decision that should be made with a woman's health care providers, taking into account her personal circumstances and preferences.

Tools used to assess breast cancer risk

Several risk assessment tools can help health professionals estimate a woman's breast cancer risk. These tools give rough estimates of breast cancer risk, based on different combinations of risk factors and different data sets.

Because each of these tools uses different factors to estimate risk, they might give different risk estimates for the same woman. A woman's risk estimates can also change over time.

Risk assessment tools that include family history in first-degree relatives (parents, siblings, and children) and second-degree relatives (such as aunts and grandparents) on both sides of the family should be used with the ACS guidelines to decide if a woman should have MRI screening. The use of any of the risk assessment tools and its results should be discussed by a woman with her health care provider.

Mammograms

Mammograms are low-dose x-rays that can help find breast cancer. If you've been told you need a mammogram, or you're ready to start breast cancer screening, the topics below can help you know what to expect.

Getting a mammogram

Find out what a mammogram is, why it's done, what doctors look for, and what it's like to get one.

- [Mammogram Basics](#)
- [Tips for Getting a Mammogram](#)
- [What Does the Doctor Look for on a Mammogram?](#)
- [Getting Called Back After a Mammogram](#)

Understanding your results

Doctors use a standard system called the Breast Imaging Reporting and Data System (BI-RADS) to describe what they see on a mammogram. Learn how to understand your results, and what it means if your mammograms show dense breast tissue.

- [Understanding Your Mammogram Report](#)
- [Breast Density and Your Mammogram Report](#)
- [Limitations of Mammograms](#)

Mammograms in special circumstances

If you have had breast cancer in the past, whether or not you need to keep getting mammograms might depend on the type of surgery you had. If you have breast implants, you can and should get mammograms as recommended. But you might need to have extra pictures taken so the doctor can see as much breast tissue as possible.

- [Mammograms After Breast Cancer Surgery](#)
- [Mammograms for Women with Breast Implants](#)

Last Revised: January 14, 2022

Mammogram Basics

A **mammogram** is a low-dose x-ray that allows a special type of doctor (called a **radiologist**) to look for changes in breast tissue. Mammograms are used to look for breast cancer.

- [Why do I need mammograms?](#)

- [What are the main uses of mammograms?](#)
- [What do mammograms show?](#)
- [How do mammograms work?](#)
- [What are three-dimensional \(3D\) mammograms?](#)
- [Are mammograms safe?](#)

Why do I need mammograms?

Mammograms are used as a screening test in women without symptoms. They are also used for women who have [symptoms that might be from cancer](#).

A mammogram can often find or detect breast cancer early, when it's still small. Sometimes a mammogram can find breast cancer even before you feel a lump. When breast cancer is found early, it is usually easier to treat.

What are the main uses of mammograms?

Mammograms are used in two main ways.

Screening mammograms

A **screening mammogram** is used to look for signs of breast cancer in women who don't have any breast symptoms or problems. X-ray pictures of each breast are taken, typically from 2 different angles.

Diagnostic mammograms

Mammograms are used to look at a woman's breast if she has breast symptoms or if something unusual is seen on a screening mammogram. When used in this way, they are called **diagnostic mammograms**. They may include extra views (images) of the breast that aren't part of screening mammograms. Sometimes diagnostic mammograms are used to screen women who were treated for breast cancer in the past.

What do mammograms show?

Mammograms can often show abnormal areas in the breast. They can't tell for sure if an abnormal area is cancer, but they can help health care providers decide if more testing (such as a breast biopsy) is needed. The main types of breast changes found with a mammogram are:

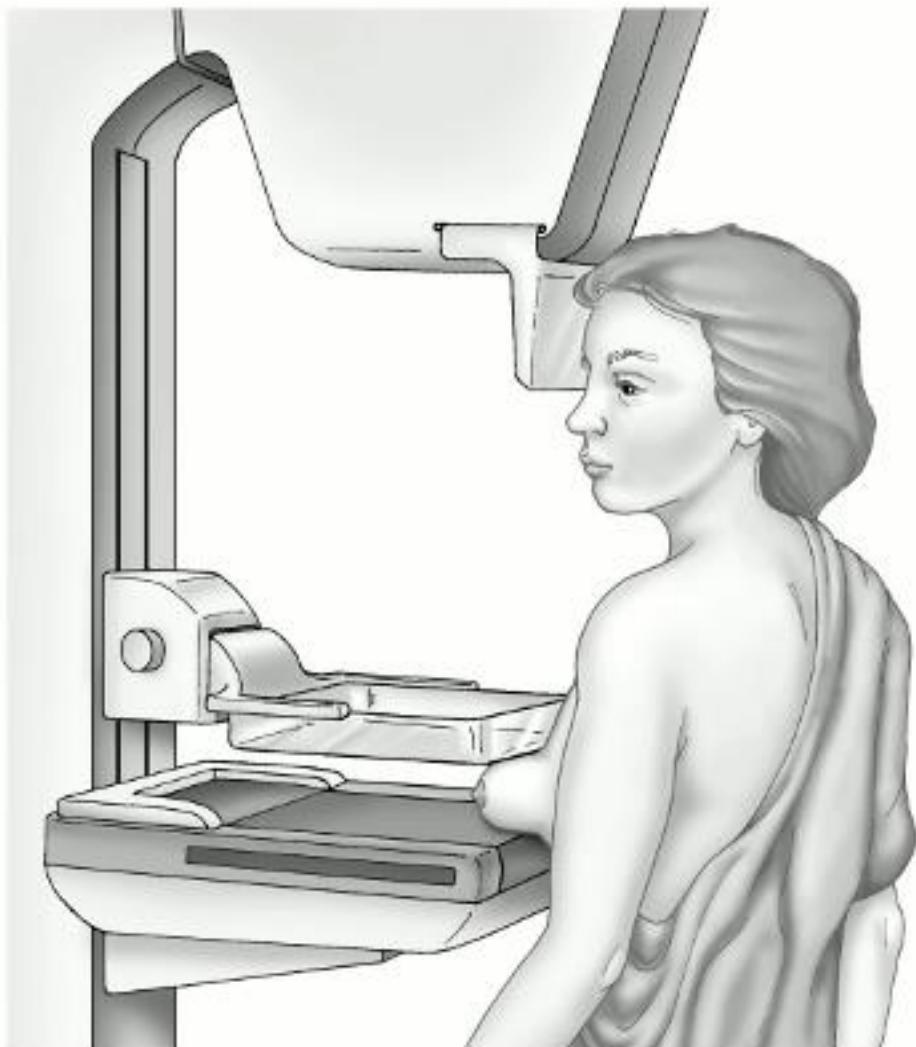
- Calcifications
- Masses
- Asymmetries
- Distortions

Learn more about these and other breast changes in [What Does the Doctor Look for on a Mammogram?](#)

How do mammograms work?

Mammograms are done with a machine designed to look only at breast tissue. The machine takes x-rays at lower doses than the x-rays done to look at other parts of the body, like the lungs or bones. The mammogram machine has 2 plates that compress or flatten the breast to spread the tissue apart. This gives a better quality picture and allows less radiation to be used.

To learn more about how they are done, see [Tips for Getting a Mammogram](#).



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Mammogram

In the past, mammograms were typically printed on large sheets of film. Today, **digital mammograms** are much more common. Digital images are recorded and saved as files in a computer.

What are three-dimensional (3D) mammograms?

Three-dimensional (3D) mammography is also known as **breast tomosynthesis** or **digital breast tomosynthesis (DBT)**. As with a standard (2D) mammogram, each breast is compressed from two different angles (once from top to bottom and once from side to side) while x-rays are taken. But for a 3D mammogram, the machine takes many

low-dose x-rays as it moves in a small arc around the breast. A computer then puts the images together into a series of thin slices. This allows doctors to see the breast tissues more clearly in three dimensions. (A standard two-dimensional [2D] mammogram can be taken at the same time, or it can be reconstructed from the 3D mammogram images.)

Many studies have found that 3D mammography appears to lower the chance of being [called back](#) for follow-up testing after screening. It also appears to find more breast cancers, and several studies have shown it can be helpful in women with [dense breasts](#). A large study is now in progress to better compare outcomes between 3D mammograms and standard (2D) mammograms.

For more on 3D mammograms, see [American Cancer Society Recommendations for the Early Detection of Breast Cancer](#).

Are mammograms safe?

Mammograms expose the breasts to small amounts of radiation. But the benefits of mammography outweigh any possible harm from the [radiation exposure](#)¹. Modern machines use low radiation doses to get breast x-rays that are high in image quality. On average the total dose for a typical mammogram with 2 views of each breast is about 0.4 millisieverts, or mSv. (A mSv is a measure of radiation dose.) The radiation dose from 3D mammograms can range from slightly lower to slightly higher than that from standard 2D mammograms.

To put these doses into perspective, people in the US are normally exposed to an average of about 3 mSv of radiation each year just from their natural surroundings. (This is called *background radiation*.) The dose of radiation used for a screening mammogram of both breasts is about the same amount of radiation a woman would get from her natural surroundings over about 7 weeks.

If there's any chance you might be [pregnant](#), let your health care provider and x-ray technologist know. Although the risk to the fetus is very small, and mammograms are generally thought to be safe during pregnancy, screening mammograms aren't routinely done in pregnant women who aren't at increased risk for breast cancer.

Mammograms might also result in some women getting additional tests that don't result in a [breast cancer diagnosis](#), but that might still have their own harms. For more on this, see [Limitations of Mammograms](#).

- Discuss any recent changes or problems in your breasts with your health care provider before getting the mammogram. (If you have symptoms, you may need a [diagnostic mammogram](#) so special images can be taken of the area of concern.)
- Make sure your provider is aware of any part of your medical history that could affect your breast cancer risk—such as surgery, hormone use, breast cancer in your family, or if you've had breast cancer before.

Don't be afraid of mammograms! Remember that only about 2 to 4 screening mammograms in 1,000 lead to a diagnosis of breast cancer.

What to tell your technologist

To help ensure you have a good quality mammogram, make sure your technologist knows:

- About any breast changes or problems you're having
- If you have breast implants
- If you have trouble standing and holding still alone (without the aid of a cane or walker)
- If you're breastfeeding or if you think you might be pregnant.

Tell the technologist right away if you start feeling lightheaded or dizzy during the mammogram.

What to expect when getting a screening mammogram

- You'll have to undress above the waist to get a mammogram. The facility will give you a wrap to wear.

- You and the technologist will be the only ones in the room during the mammogram.
- To get a high-quality picture, your breast must be flattened or compressed. You'll stand in front of the machine, and the technologist will place your breast on the machine. The plastic upper plate is then lowered to compress your breast for about 10 to 15 seconds while the technologist takes an x-ray. You will then need to change position so your breast is compressed from side to side before the next x-ray is taken.
- If you're getting a **3D mammogram** (also known as digital breast tomosynthesis, or DBT), the procedure is the same as above, but you'll notice that the machine will move in a small arc, either over the top of your breast or along the side of your breast, for each image. You might be asked to hold your breath each time it's being done.
- The whole procedure takes about 20 minutes. The actual breast compression only lasts about 10 to 15 seconds for each image.
- You might feel some discomfort when your breasts are compressed, and for some women it can be painful. Tell the technologist if it hurts so they can try to adjust the compression to your comfort.
- Two views of each breast are taken for a screening mammogram. But for some women, such as those with breast implants or larger breasts, more pictures may be needed.

What to expect when getting a diagnostic mammogram

A diagnostic mammogram is often done if a woman has breast symptoms or if something unusual is seen on a screening mammogram. The basic procedure is similar to that for a screening mammogram, but there are some differences.

- More pictures are taken during a diagnostic mammogram, with a focus on the area that looked different on the screening mammogram (or where the symptoms are).
- These special images may be “spot views” or “magnification views,” which are used to make the area of concern easier to see.
- Again, if a **3D mammogram** is being done, the procedure is the same, but you might be asked to hold your breath while the machine moves in a small arc around your breast to create each image.
- During a diagnostic mammogram, the images are checked by the radiologist while you're there so that more pictures can be taken if needed to look more closely at any area of concern. (Depending on the findings, a [breast ultrasound](#) may also be

done to look at the area of concern.)

How will I get my mammogram results?

A full report of the results of your mammogram will be sent to your health care provider. **If you don't hear from your health care provider within 10 days, do not assume that your mammogram was normal.** Call your provider or the facility where the mammogram was done.

The mammography facility also must provide you with an easy-to-understand summary of your mammogram results within 30 days—or “as quickly as possible” if the results suggest something abnormal is present. If you have online access to your medical records, such as through a patient portal, your results might show up there at the same time your health care provider gets them. This means you could get the results before your health care provider contacts you. Be sure to go over the results with your provider, especially if there's anything you don't understand.

We can help you learn more about [how to understand your mammogram report](#).

What Does the Doctor Look for on a Mammogram?

A **radiologist** will look at your mammogram. A radiologist is a doctor who diagnose diseases and injuries using imaging tests such as x-rays.

The radiologist reading your mammogram will look for different types of breast changes. This includes small white spots called **calcifications**, abnormal areas called **masses**, and other suspicious findings that could be signs of cancer.

- Comparing new findings to your old mammograms
- Calcifications
- Masses
- Asymmetries
- Architectural distortion
- Breast density

Comparing new findings to your old mammograms

When possible, the doctor reading your mammogram will compare it to your old mammograms. This can help show if any findings are new, or if they were already there on previous mammograms. Findings that haven't changed from older mammograms aren't likely to be cancer, which might mean you won't need further tests.

Breast changes the doctor will look for include:

Calcifications

Calcifications are tiny calcium deposits within the breast tissue. They look like small white spots on a mammogram. They may or may not be caused by cancer. There are 2 types of calcifications.

Macrocalcifications

Macrocalcifications are larger calcium deposits that are most likely due to changes caused by aging of the breast arteries, old injuries, or inflammation. These deposits are typically related to non-cancerous conditions and don't need further testing with a [biopsy](#). Macrocalcifications become more common as women get older (especially after age 50).

Microcalcifications

Microcalcifications are tiny specks of calcium in the breast. When seen on a mammogram, they are more of a concern than macrocalcifications, but they don't always mean that cancer is present. The shape and layout of microcalcifications (and whether they are near a mass) help the radiologist judge how likely it is that the change is due to cancer.

In most cases, microcalcifications don't need to be checked with a biopsy. But if they have a suspicious look and pattern, a biopsy will be recommended to check for cancer.

Masses

A **mass** is an area of abnormal breast tissue with a shape and edges that make it look different than the rest of the breast tissue on a mammogram. A mass might be seen with or without calcifications. Masses can be many things, including [cysts¹](#) (non-cancerous, fluid-filled sacs) and non-cancerous solid tumors (such as [fibroadenomas²](#)), but they may also be a sign of cancer.

Cysts are fluid-filled sacs. Simple cysts (fluid-filled sacs with thin walls) are not cancer and typically don't need to be checked with a biopsy. If a mass is not a simple cyst, it's of more concern, so a biopsy might be needed to be sure it isn't cancer.

Solid masses can be more concerning, but most solid breast masses are not cancer.

A cyst and a solid mass can feel the same. They can also sometimes look the same on a mammogram. The doctor must be sure it's a cyst to know it's not cancer, so a [breast ultrasound](#) is often done (because it is better than a mammogram at showing if the inside of a mass is solid or filled with fluid).

If it isn't clear if the mass is a cyst or a solid mass, a [thin, hollow needle](#) may be inserted into the mass during an ultrasound to try to remove (aspirate) the fluid from the area. If the mass goes away on the ultrasound as the fluid is removed, then it is most likely a cyst and no further work up is needed.

If a mass is not a simple cyst (that is, if it's at least partly solid, or if it has other concerning features), more [imaging tests](#) might be needed to decide if it could be cancer. Some masses can be watched over time with regular mammograms or ultrasound to see if they change, but others may need to be checked with a biopsy. The size, shape, and margins (edges) of the mass can help the radiologist decide [how likely it is to be cancer](#).

Asymmetries

Asymmetries are white areas seen on a mammogram that look different from the normal breast tissue pattern. There are different types of asymmetries, including focal asymmetry, developing asymmetry, and global asymmetry.

Most of the time, these findings do not mean you have breast cancer. But more imaging tests will likely be needed to make sure there is no cancer in this area.

Architectural distortion

Radiologists use this term to describe when an area of the breast tissue appears distorted or pulled toward a certain point. Sometimes this may just be due to how the breast was positioned during the mammogram. It might also be caused by a prior injury or procedure done on the breast. But architectural distortion can also sometimes be a sign of a breast cancer, so further imaging with [diagnostic mammograms](#) is typically needed to get a better look at this area.

Breast density

Your mammogram report will also contain an assessment of your [breast density](#). Breast density is a measure of how much fibrous and glandular tissue is in your breast, compared to fatty tissue. It isn't related to breast size or firmness.

Your breast tissue may be called 'dense' if you have more fibrous and glandular tissue compared to fatty tissue in the breast.

About half of all women have dense breasts. Having dense breasts is not abnormal. However, women who have dense breasts have a slightly higher risk of breast cancer.

Dense breast tissue can also make it harder to see cancers on a mammogram. This is because fibrous and glandular tissue appear white on a mammogram, which can hide many types of suspicious findings that also appear white. Still, experts don't agree what

other tests, if any, should be done along with mammograms in women with dense breasts who aren't otherwise at higher risk for breast cancer (based on gene mutations, breast cancer in the family, or other factors).

Getting Called Back After a Mammogram

Getting called back after a screening mammogram is fairly common, and it doesn't

mean you have breast cancer. In fact, fewer than 1 in 10 women called back for more tests are found to have cancer.

Often, getting called back after a mammogram just means more mammograms or other tests (such as an ultrasound) need to be done to get a closer look at an area of concern.

- Why might I be called back?
- What will happen at the follow-up appointment?
- What if I need a biopsy?
- How can I stay calm while waiting?
- What if it's cancer?

Why might I be called back?

You could be called back after your mammogram because:

- The pictures weren't clear or didn't show some of your breast tissue, so they need to be retaken.
- The radiologist (doctor who reads the mammogram) sees something suspicious, such as calcifications or a mass (which could be a cyst¹ or solid mass).
- The radiologist sees an area that just looks different from other parts of the breast.

If you do need more tests, ask your doctor about how quickly these tests can be scheduled. This can vary based on a number of factors, such as how busy the testing centers are in your area.

Getting called back is more common after a first mammogram, or when there's no previous mammogram to compare to the new mammogram. It's also more common in women who haven't gone through menopause.

Sometimes when more mammograms are taken of an abnormal-looking area, or the area is compressed more, it no longer looks suspicious. In fact, most often the additional images show the finding isn't cancer.

What will happen at the follow-up appointment?

- You'll likely get another mammogram called a *diagnostic mammogram*. (Your previous mammogram was called a *screening mammogram*.) A diagnostic

mammogram is done just like a screening mammogram, but more pictures are taken so that any areas of concern can be looked at more closely. A doctor called a radiologist will be on hand to advise the technologist (the person who operates the mammogram machine), to be sure they have all the images that are needed.

- You may also get another imaging test, such as an [ultrasound of the breast](#), which uses sound waves to make pictures of the inside of your breast at the area of concern.

You will most likely be given the results of your tests during the visit. You might be told one of the following:

- The suspicious area on the mammogram turned out to be nothing to worry about, and you can return to your normal mammogram schedule.
- The area is probably nothing to worry about, but you should have your next imaging test (mammogram and/or ultrasound) sooner than normal – usually in about 6 months – to watch the area closely and make sure it's not changing over time.
- The area could be cancer, so you will need a biopsy (see below) to know for sure.

You'll also get a letter with a summary of the findings that will tell you if you need more tests and/or when you should schedule your next mammogram.

What if I need a biopsy?

During a [breast biopsy](#), small pieces of breast tissue are removed and checked for cancer under a microscope. Even if you need a biopsy, it doesn't mean you have cancer. Most biopsy results are not cancer, but a biopsy is the only way to find out.

There are different types of breast biopsies, some of which are done using a [small, hollow needle](#) and some that are done [through a cut in the skin](#). The type you have depends on things like how suspicious the area looks, how big it is, where it is in the breast, other medical problems you might have, and your personal preferences.

How can I stay calm while waiting?

Waiting for appointments and the results of tests can be frightening, especially if you were told the results of your first mammogram weren't normal. You might have strong emotions, such as disbelief, anxiety, fear, anger, or sadness during this time. Here are some things to remember:

- It's normal to have these feelings.
- Most often, breast changes are not cancer and are not life-threatening.
- Talking with a loved one or a counselor about your feelings may help.
- Talking with other women who have been called back after a mammogram may help.
- The American Cancer Society is available at 1-800-227-2345 around the clock to answer your questions and provide support.

What if it's cancer?

If you do have breast cancer and you're referred to a breast specialist, use these tips to make your appointment as useful as possible:

- Make a [list of questions](#)² to ask.
- Take a family member or friend with you. They can serve as an extra pair of ears, take notes, help you remember things later, and give you support.
- Ask if you can record the conversations. You might also want to take notes.
- If someone uses a word you don't know, ask them to spell it and explain it.
- Ask the doctors or nurses to explain anything you don't understand.

Understanding Your Mammogram Report

A doctor called a **radiologist** will categorize your mammogram results using a numbered system. Talk to your doctor about your mammogram results and what you need to do next.

- [What is a BI-RADS assessment category?](#)
- [What do the BI-RADS categories mean?](#)
- [BI-RADS reporting breast density](#)

What is a BI-RADS assessment category?

Doctors use a standard system to describe mammogram findings and results. This system (called the **Breast Imaging Reporting and Data System** or **BI-RADS**) sorts the results into categories numbered 0 through 6.

With these categories, doctors can describe what they find on a mammogram using the same words and terms. This makes communicating about the test results and following up after the tests easier.

(**Note:** These same BI-RADS categories can also be used to describe the results of a [breast ultrasound](#) or [breast MRI](#) exam. However, the recommended next steps after these tests might be slightly different.)

What do the BI-RADS categories mean?

Category	Definition	What it means
0	Incomplete - Additional imaging evaluation and/or comparison to	This means the radiologist may have seen a possible abnormality, but it was not clear and you will need more tests, such as another mammogram with the use of spot compression (applying compression to a smaller area when doing the mammogram), magnified views, special mammogram views, and/or ultrasound . This may also

	prior mammograms (or other imaging tests) is needed.	suggest that the radiologist wants to compare your new mammogram with older ones to see if there have been changes in the area over time.
1	Negative	This is a normal test result. Your breasts look the same (they are symmetrical) with no masses (lumps), distorted structures, or suspicious calcifications . In this case, negative means nothing new or abnormal was found.
2	Benign (non-cancerous) finding	This is also a negative test result (there's no sign of cancer), but the radiologist chooses to describe a finding that is not cancer, such as benign calcifications, masses, or lymph nodes in the breast. This can also be used to describe changes from a prior procedure (such as a biopsy) in the breast. This ensures that others who look at the mammogram in the future will not misinterpret the benign finding as suspicious.
3	Probably benign finding – Follow-up in a short time frame is suggested	A finding in this category has a very low (no more than 2%) chance of being cancer. It is not expected to change over time. But since it's not proven to be benign, it's helpful to be extra safe and see if the area in question does change over time. You will likely need follow-up with repeat imaging in 6 to 12 months and regularly after that until the finding is known to be stable (usually at least 2 years). This approach helps avoid unnecessary biopsies , but if the area does change over time, it still allows for early diagnosis.
4	Suspicious abnormality – Biopsy should be considered	These findings do not definitely look like cancer but could be cancer. The radiologist is concerned enough to recommend a biopsy . The findings in this category can have a wide range of suspicion levels. For this reason, this category is often divided further: 4A: Finding with a low likelihood of being cancer (more than 2% but no more than 10%) 4B: Finding with a moderate likelihood of being cancer (more than 10% but no more than 50%)

		4C: Finding with a high likelihood of being cancer (more than 50% but less than 95%), but not as high as Category 5
5	Highly suggestive of malignancy – Appropriate action should be taken	The findings look like cancer and have a high chance (at least 95%) of being cancer. Biopsy is very strongly recommended.
6	Known biopsy-proven malignancy – Appropriate action should be taken	This category is only used for findings on a mammogram (or ultrasound or MRI) that have already been shown to be cancer by a previous biopsy. Imaging may be used in this way to see how well the cancer is responding to treatment.

BI-RADS reporting breast density

Your mammogram report will also include an assessment of your breast density, which is a description of how much fibrous and glandular tissue is in your breasts, as compared to fatty tissue. The denser your breasts, the harder it can be to see abnormal areas on mammograms. (Having dense breasts also slightly raises your risk of getting breast cancer.)

BI-RADS classifies breast density into 4 groups, which are described in [Breast Density and Your Mammogram Report](#).

Breast Density and Your Mammogram Report

Regular mammograms are the best way to find breast cancer early. But if your mammogram report says you have dense breast tissue, you might be wondering what that means for you.

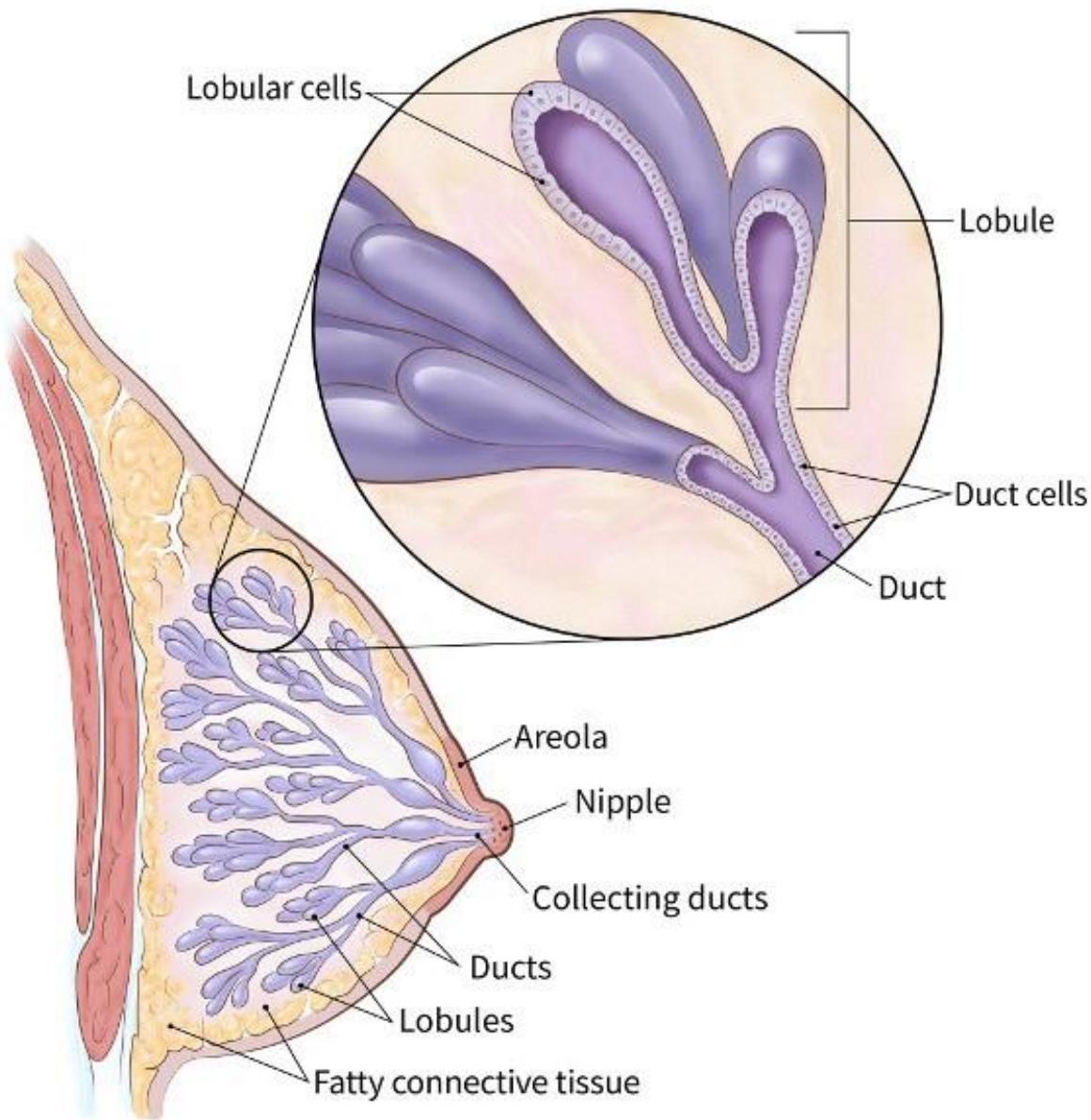
- [What is dense breast tissue?](#)
- [How do I know if I have dense breasts?](#)
- [Do mammogram reports have to include breast density?](#)
- [Understanding breast density in your mammogram report](#)
- [Why is breast density important?](#)
- [If I have dense breasts, do I still need a mammogram?](#)
- [Should I have any other screening tests if I have dense breast tissue?](#)
- [What should I do if I have dense breast tissue?](#)

What is dense breast tissue?

Breast density is a measure of how much fibrous and glandular tissue (also known as *fibroglandular tissue*) there is in your breast, as compared to fat tissue. It isn't related to breast size or firmness.

Breasts are made up of lobules, ducts, and fatty and fibrous connective tissue.

- **Lobules** are the small glands that produce milk, while **ducts** are the tiny tubes that carry the milk from the lobules to the nipple. Together, the lobules and ducts are referred to as **glandular tissue**.
- **Fibrous tissue** and **fat** give breasts their size and shape and hold the other structures in place.



Fibrous and glandular tissue are harder to see through on a mammogram, so your breast tissue may be called 'dense' if you have a lot of these tissues (and not as much fat).

Having dense breast tissue is common. Some women have more dense breast tissue than others. For most women, breasts become less dense with age. But in some women, there's little change.

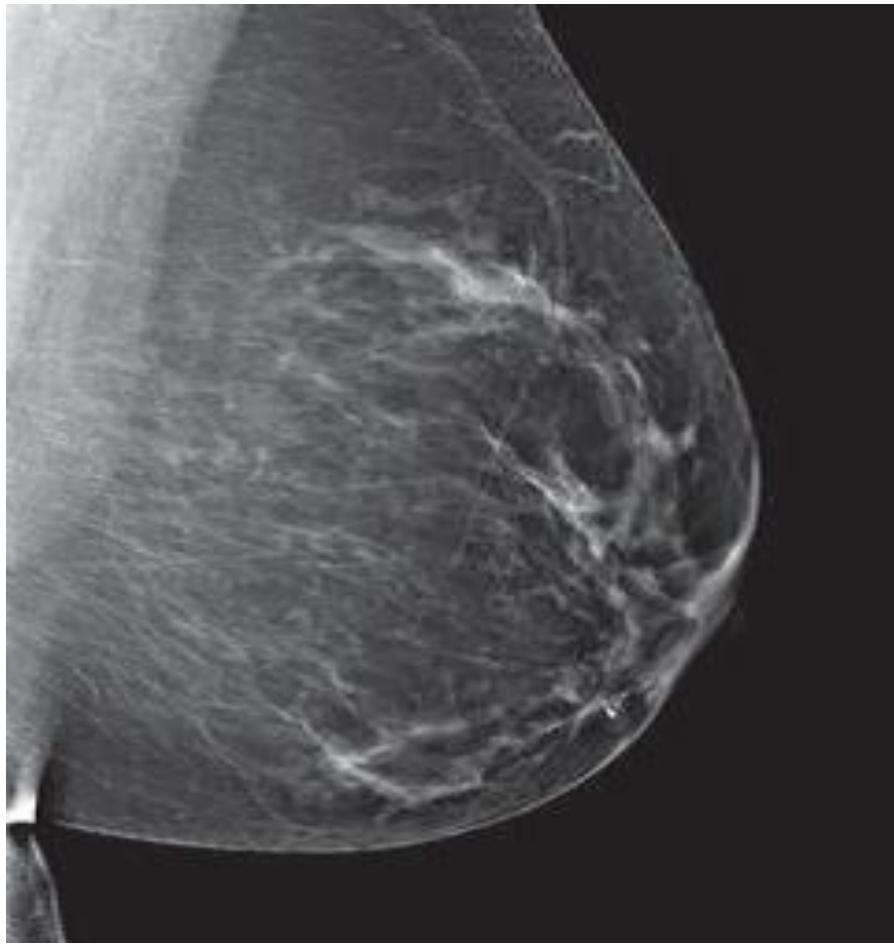
How do I know if I have dense breasts?

Radiologists are doctors who “read” mammograms (and other types of imaging tests). They check your mammogram for **abnormal areas**, and they also look at breast density.

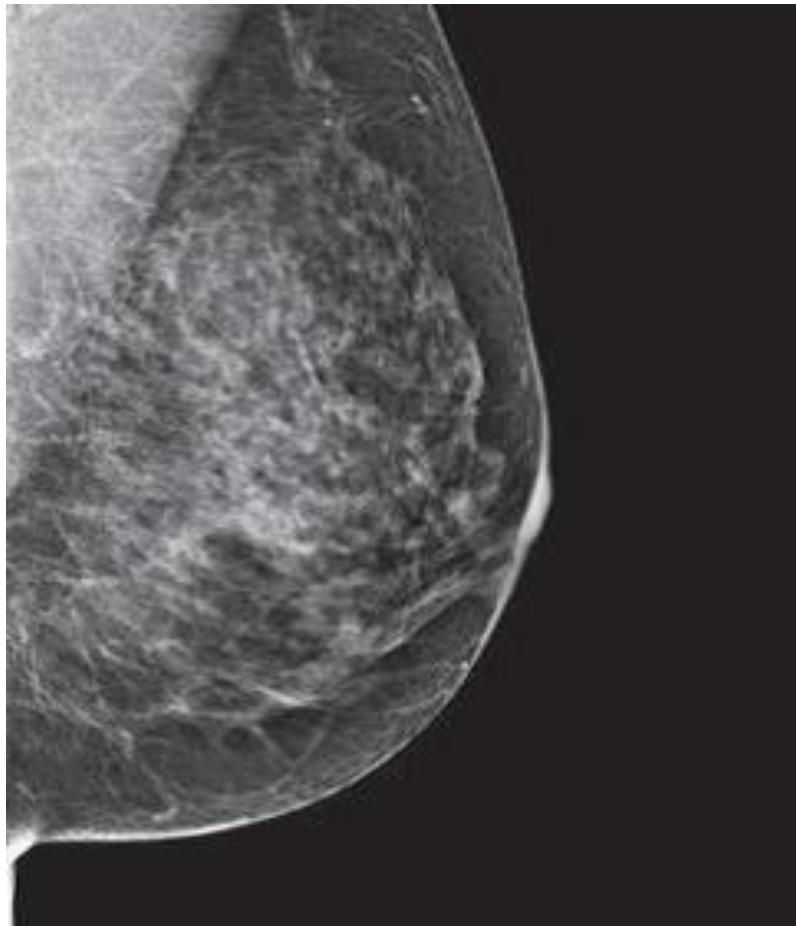
There are 4 categories of breast density. They go from almost all fatty tissue to extremely dense tissue with very little fat. The radiologist looks at your mammograms to determine which of the 4 categories best describes how dense your breasts are:



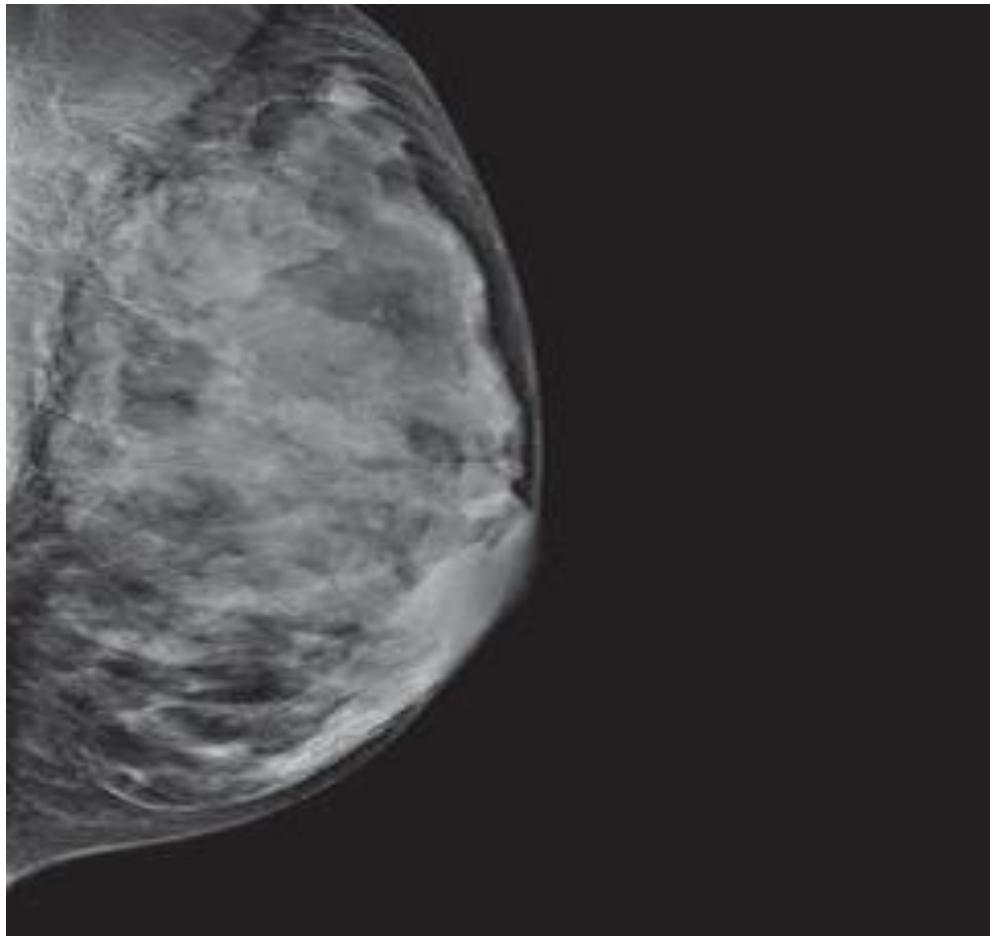
Category A: Breasts are almost all fatty tissue.



Category B: There are scattered areas of dense glandular and fibrous tissue (seen as white areas on the mammogram).



Category C: More of the breast is made of dense glandular and fibrous tissue (described as **heterogeneously dense**). This can make it hard to see small masses in or around the dense tissue, which also appear as white areas.



Category D: Breasts are **extremely dense**, which makes it harder to see masses or other findings that may appear as white areas on the mammogram.

In general, patients whose breast density falls into categories C (heterogeneously dense) or D (extremely dense) are considered to have dense breast tissue. This includes about half of all women in the US who have mammograms to look for breast cancer.

[Mammogram reports](#) sent to health care providers typically include a description of breast density, so your health care provider can tell you if your mammogram shows that you have dense breasts. Mammogram reports sent directly to patients often mention breast density as well, although the wording used in these reports is often different (see below).

Do mammogram reports have to include breast density?

As of September 10, 2024, the Food and Drug Administration (FDA) requires that all mammogram reports sent to patients must include breast density, which should be described as either “not dense” or “dense.”

If your breast tissue is **not dense**, the report will say, “Breast tissue can be either dense or not dense. Dense tissue makes it harder to find breast cancer on a mammogram and also raises the risk of developing breast cancer. Your breast tissue is not dense. Talk to your healthcare provider about breast density, risks for breast cancer, and your individual situation.”

If your breast tissue is **dense**, the report will say, “Breast tissue can be either dense or not dense. Dense tissue makes it harder to find breast cancer on a mammogram and also raises the risk of developing breast cancer. Your breast tissue is dense. In some people with dense tissue, other imaging tests in addition to a mammogram may help find cancers. Talk to your healthcare provider about breast density, risks for breast cancer, and your individual situation.”

In addition, mammogram reports sent to healthcare providers must include an overall assessment of breast density using the 4 categories described above.

Understanding breast density in your mammogram report

[Watch this video on YouTube](#) ¹

Why is breast density important?

Breast density is important for two main reasons:

- **Women who have dense breast tissue have a higher risk of breast cancer** compared to women with less dense breast tissue. It's unclear at this time why dense breast tissue is linked to breast cancer risk. It may be that dense breast tissue has more cells that can develop into abnormal cells.
- **Dense breast tissue also makes it harder for radiologists to see cancer on mammograms.** Dense (fibrous and glandular) breast tissue looks white on a mammogram. Breast masses and cancers can also look white, so the dense tissue can make it harder to see them. In contrast, fatty tissue looks almost black on a mammogram, so it's easier to see a tumor that looks white if most of the breast is fat tissue.

If I have dense breasts, do I still need a mammogram?

Yes. Most breast cancers can be seen on a mammogram even in women who have dense breast tissue, so it's still important to get regular mammograms. Mammograms

can help save women's lives.

Even if you have a normal mammogram report, you should know how your breasts normally look and feel. Anytime there's a change, you should report it to a health care provider right away.

Should I have any other screening tests if I have dense breast tissue?

At this time, experts do not agree what other tests, if any, should be done in addition to mammograms in women with dense breasts.

[Digital breast tomosynthesis \(3D mammography\)](#) can find some cancers not seen on regular (2D) mammograms. Some studies have suggested 3D mammography might be particularly helpful in women with dense breasts. It can be used as a screening test along with or instead of standard mammography, although it isn't yet available at all imaging centers.

Studies have shown that [breast ultrasound](#) and possibly [magnetic resonance imaging \(MRI\)](#) can also help find some breast cancers that can't be seen on mammograms. But ultrasound and MRI can also show more findings that are not cancer. This can lead to more tests and unnecessary [biopsies](#). And the cost of an ultrasound or MRI may not be covered by insurance.

Talk to your health care provider about whether you should consider any of these tests.

What should I do if I have dense breast tissue?

If your mammogram report says that you have dense breast tissue, talk with your health care provider about what this means for you. Be sure that your doctor or nurse knows if there's anything in your medical history that increases your risk for breast cancer. To learn more about breast cancer risk factors, see [Breast Cancer Risk and Prevention²](#).

Any woman who's already in a high-risk group (based on inherited gene mutations, a strong family history of breast cancer, or other factors) should have an MRI along with her yearly mammogram. To learn more about if you're in a higher-risk group for breast cancer, see [American Cancer Society Recommendations for the Early Detection of Breast Cancer](#).

[Flyer: Breast Density and Your Mammogram Report](#)

Learn what it means if your mammogram report says you have dense breasts.

Limitations of Mammograms

Mammograms are the best breast cancer screening tests we have at this time. But mammograms have their limits. For example, they aren't 100% accurate in showing if a woman has breast cancer. They can miss some cancers, and sometimes they find things that turn out not to be cancer (but that still need further testing to be sure).

- [False-negative results](#)
- [False-positive results](#)
- [Mammograms might not be helpful for all women](#)
- [Overdiagnosis and overtreatment](#)
- [Radiation exposure](#)

False-negative results

A **false-negative** mammogram looks normal even though breast cancer is present. Overall, screening mammograms miss about 1 in 8 breast cancers.

- Women with [dense breasts](#) are more likely to get false-negative results.
- False-negative mammograms can give women a false sense of security, thinking that they don't have breast cancer when in fact they do.
- It's important to see your doctor if you have new breast symptoms, even if you've had a normal screening mammogram recently. Additional tests such as a [diagnostic mammogram](#) and/or a [breast ultrasound](#) may be needed to look more closely at the area where you're having symptoms.

False-positive results

A **false-positive** mammogram looks abnormal even though there is no cancer in the breast. Abnormal mammograms often require extra testing ([diagnostic mammograms](#), [ultrasound](#), and sometimes [MRI](#) or even a [breast biopsy](#)) to find out if the change is cancer.

- False-positive results are more common in women who are younger, have dense breasts, have had breast biopsies, have breast cancer in the family, or are taking estrogen.
- About half of the women getting annual mammograms over a 10-year period will have a false-positive finding at some point.
- The odds of a false-positive finding are higher for the first mammogram (or if previous mammograms aren't available for comparison). Women who have past mammograms available for comparison reduce their odds of a false-positive finding by about half.
- False-positive mammograms can cause anxiety. They can also lead to [extra tests](#) to be sure cancer isn't there, which cost time and money and maybe even physical discomfort.

Mammograms might not be helpful for all women

The value of a screening mammogram depends on a woman's overall health. Finding breast cancer early may not help her live longer if she has other serious or life-threatening health problems, such as serious heart, kidney, liver, or lung disease. The [American Cancer Society breast cancer screening guidelines](#) emphasize that women with serious health problems or short life expectancies should discuss with their doctors whether they should continue having mammograms. Our guidelines also stress that age alone should not be the reason to stop having regular mammograms.

It's important to know that even though mammograms can often find breast cancers that are too small to be felt, treating a small tumor does not always mean it can be cured. A fast-growing or aggressive cancer might have already spread, even if the tumor in the breast is still small.

Overdiagnosis and overtreatment

Screening mammograms can often find invasive breast cancer and [ductal carcinoma in situ](#).

situ¹ (DCIS, cancer cells in the lining of breast ducts) that need to be treated. But it's possible that some of the invasive cancers and DCIS found on mammograms would never grow or spread. (Finding cancers that would never cause problems is called **overdiagnosis**.) These cancers are not life-threatening, and never would have been found or treated if the woman had not gotten a mammogram. The problem is that doctors can't tell these cancers from those that will grow and spread.

Overdiagnosis leads to some women getting treatment that's not really needed (**overtreatment**), because the cancer never would have caused any problems. Doctors can't always tell which cancers could be life-threatening and which would never cause problems. Because of this, they advise treating all breast cancers. This exposes some women to the side effects of cancer treatment, even though it wasn't really needed.

Still, overdiagnosis isn't thought to happen very often. There's a wide range of estimates of the percentage of breast cancers that might be overdiagnosed by mammography, but the most credible estimates range from 1% to 10%.

Radiation exposure

Because mammograms are x-ray tests, they expose the breasts to radiation. The amount of radiation from each mammogram is low, but it can still add up over time. For more on this, see [Mammogram Basics](#).

Mammograms After Breast Cancer Surgery

Nearly all women with breast cancer will have surgery at some point as part of their treatment.

The American Cancer Society does not have specific guidelines for mammograms or other breast imaging in women who have been treated for breast cancer. But there is information available about what most women will probably need to do after surgery.

- [Do I need a mammogram after breast cancer surgery?](#)

- Getting mammograms on your untreated breast
- Mammograms after breast-conserving surgery
- Mammograms after mastectomy

Do I need a mammogram after breast cancer surgery?

There are many different kinds of [breast cancer surgery](#)¹. The type of surgery you have will affect if you need to get mammograms in the future.

- If you had **breast-conserving surgery (BCS)**, you will still need to get mammograms of the treated breast.
- If you had a **mastectomy**, you most likely won't need a mammogram of that breast.

Getting mammograms on your untreated breast

If you had surgery (of any type) on only one breast, you will still need to get mammograms of the other breast. This is very important, because women who have had breast cancer have a higher risk of developing a new cancer in the other breast.

Mammograms after breast-conserving surgery

Most experts recommend that women who have had [breast-conserving surgery](#)² (BCS, sometimes called a partial mastectomy or lumpectomy) get a mammogram of the treated breast 6 to 12 months after radiation treatment ends. Surgery and radiation both cause changes in the skin and breast tissues that will show up on the mammogram, which might make it harder to read.

The mammogram done at this time serves as a new baseline for the affected breast. Future mammograms will be compared with this one, to help the doctor check on healing and look for signs that the cancer might have come back (recurred).

Follow-up mammograms of the treated breast are typically done at least yearly after that, but some doctors may recommend that you have mammograms more often. You will still need to have routine mammograms on the other (untreated) breast as well.

Mammograms after mastectomy

Women who have had a [mastectomy](#)³ (including simple mastectomy, modified radical

mastectomy, and radical mastectomy) to treat breast cancer should not need further routine screening mammograms on that side, but will still need regular mammograms on the remaining breast.

If both breasts have been removed (a double or bilateral mastectomy), mammograms should no longer be needed because there shouldn't be enough breast tissue left to do a mammogram. Cancer might come back in the skin or chest wall on that side, but if this happens it is usually found by feeling it (either during a physical exam or a breast self-exam).

It's possible for women with **reconstructed breasts** to get mammograms, but experts agree that women who have [breast reconstruction](#)⁴ after a simple, modified radical, or radical mastectomy don't need routine mammograms of the affected breast(s).

Still, if an area of concern is found during a physical exam on a woman who has had breast reconstruction, a [diagnostic mammogram](#) and [breast ultrasound](#) may be done. [Breast MRI](#) may also sometimes be used to look at the area closely if the mammogram and ultrasound results aren't clear.

For women who have had a **nipple-sparing mastectomy**, also called a **subcutaneous mastectomy**, some doctors might recommend follow-up mammograms because some breast tissue can be left behind under the nipple.

If you're not sure what type of mastectomy you had or if you need to get mammograms, be sure to ask your doctor.

Mammograms for Women with Breast Implants

If you have breast implants, you should still get regular screening mammograms. It's important to tell the technologist about your implants before you go to your appointment.

- [Do all women with breast implants need mammograms?](#)
- [Should I tell the mammogram technologist I have implants?](#)
- [What to expect when getting a mammogram with implants](#)
- [Can mammograms rupture breast implants?](#)

Do all women with breast implants need mammograms?

If you have breast implants, you should still get regular screening mammograms [as](#)

recommended (unless you had both breasts removed with a [bilateral mastectomy](#) before getting the implants).

See “[Mammograms After Breast Surgery](#)” for more information about getting mammograms after a mastectomy.

Should I tell the mammogram technologist I have implants?

It's important to tell the technologist you have implants before your mammogram starts. In fact, it's best to mention this when you make the appointment to have your mammogram done. This way you can find out if the facility has experience doing mammograms in women with breast implants.

What to expect when getting a mammogram with implants

You should be aware that both silicone and saline implants can make it hard for the doctor to see the breast tissue that is in line with them on the mammogram.

To help the doctor see as much breast tissue as possible, women with implants have 4 extra pictures done (2 on each breast), as well as the 4 standard pictures taken during a [screening mammogram](#).

In these extra pictures, called **implant displacement (ID) views**, the implant is pushed back against the chest wall and the breast is pulled forward over it and then compressed. This allows better imaging of the front part of each breast so the doctor can get a better look at the breast tissue.

Implant displacement views are harder to do and can be uncomfortable if areas of scar tissue (called *contractures*) have formed around the implants. ID views are easier if the implants were placed underneath (behind) the chest muscles.

Can mammograms rupture breast implants?

Very rarely, the mammogram process can rupture an implant. This is another important reason to make sure the mammography facility knows you have implants.

References

Elmore JG, Lee CI. Screening for breast cancer: Strategies and recommendations.

UpToDate. 2021. Accessed at <https://www.uptodate.com/contents/screening-for-breast-cancer-strategies-and-recommendations> on October 4, 2021.

Helvie MA, Patterson SK. Chapter 11: Imaging Analysis: Mammography. In: Harris JR, Lippman ME, Morrow M, Osborne CK, eds. *Diseases of the Breast*. 5th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2014.

Nahabedian M. Implant-based breast reconstruction and augmentation. UpToDate. 2021. Accessed at <https://www.uptodate.com/contents/implant-based-breast-reconstruction-and-augmentation> on October 4, 2021.

Last Revised: January 14, 2022

Breast Ultrasound

Breast ultrasound uses sound waves and their echoes to make a computer pictures of the inside of the breast. It can show certain breast changes, like fluid-filled cysts, that can be harder to identify on mammograms.

- When is breast ultrasound used?
- How is a breast ultrasound done?
- How are breast ultrasound results reported?

When is breast ultrasound used?

Ultrasound is not typically used as a routine screening test for breast cancer. But it can be useful for looking at some breast changes, such as lumps (especially those that can be felt but not seen on a mammogram). Ultrasound can be especially helpful in women with **dense breast tissue**, which can make it hard to see abnormal areas on mammograms. It also can be used to get a better look at a suspicious area that was seen on a mammogram.

Ultrasound is useful because it can often tell the difference between fluid-filled masses like **cysts¹** (which are very unlikely to be cancer) and solid masses (which might need further testing to be sure they're not cancer).

Ultrasound can also be used to help guide a **biopsy** needle into an area of the breast so

that cells can be taken out and tested for cancer. This can also be done in swollen lymph nodes under the arm.

Ultrasound is widely available and is fairly easy to have done, and it does not expose a person to radiation. It also tends to cost less than other testing options.

How is a breast ultrasound done?

Most often, ultrasound is done using a handheld, wand-like instrument called *a transducer*. First a gel is put on the skin and/or the transducer, and then the transducer is moved around over the skin. It sends out sound waves and picks up the echoes as they bounce off body tissues deeper under the skin. These echoes are made into a picture on a computer screen. You might feel some pressure as the transducer is moved around on your skin, but it should not be painful.

Automated breast ultrasound (ABUS) is an option at some imaging centers. This technique uses a much larger transducer to take hundreds of images that cover nearly the entire breast. ABUS might sometimes be done as an added screening exam for women who have dense breasts. It might also be used in women who have abnormal findings on other imaging tests or who have breast symptoms. When ABUS is done, a second handheld ultrasound is often needed to get more pictures of any suspicious areas.

How are breast ultrasound results reported?

Doctors use the same standard system to describe results of mammograms, breast ultrasound, and breast MRI. This system (called the **Breast Imaging Reporting and Data System** or **BI-RADS**) sorts the results into categories numbered 0 through 6.

By sorting the results into these categories, doctors can describe what they find on an ultrasound using the same words and terms. This makes communicating about these test results and following up after the tests much easier.

For more details on the BI-RADS categories, see [Understanding Your Mammogram Report](#). While the categories are the same for each of these imaging tests, the recommended next steps after these tests might be different.

Breast MRI

Breast MRI (magnetic resonance imaging) uses radio waves and strong magnets to make detailed pictures of the inside of the breast.

- [When is breast MRI used?](#)
- [What you need to know about getting a breast MRI](#)
- [Tips for getting ready for the test](#)
- [What's it like to get a breast MRI?](#)
- [How are breast MRI results reported?](#)

When is breast MRI used?

Breast MRI might be used in different situations.

To screen for breast cancer: For certain women at high risk for breast cancer, [a screening breast MRI is recommended along with a yearly mammogram](#). MRI is not recommended as a screening test by itself, because it can miss some cancers that a mammogram would find.

Although MRI can find some cancers not seen on a mammogram, it's also more likely to find things that turn out not to be cancer (called a *false positive*). This can result in some women getting tests and/or [biopsies](#) that end up not being needed. This is why MRI is not recommended as a screening test for women at average risk of breast cancer.

To look at the breasts if someone has symptoms that might be from breast cancer: Breast MRI might sometimes be done if breast cancer is suspected (based on [symptoms](#) or exam findings, such as suspicious nipple discharge). Other imaging tests such as [mammograms](#) and [breast ultrasound](#) are usually done first, but MRI might be done if the results of these tests aren't clear.

To help determine the extent of breast cancer: If breast cancer has already been diagnosed, breast MRI is sometimes done to help determine the exact size and location of the cancer, to look for other tumors in the breast, and to check for tumors in the other breast. Breast MRI isn't always helpful in this setting, so not every woman who has been diagnosed with breast cancer needs this test.

To check for silicone breast implant leaks: In women with [silicone breast implants¹](#), breast MRI can be used to check for implant leaks. This isn't used for women with saline breast implants.

What you need to know about getting a breast MRI

Just as mammograms are done using x-ray machines specially designed for the breasts, breast MRI also requires special equipment. This MRI machine has a special device called a *dedicated breast coil* to image the breasts. Not all hospitals and imaging centers have dedicated breast MRI equipment. If you are having a breast MRI, it's important to have it at a facility that has dedicated equipment and can do an MRI-guided breast biopsy if needed, or a facility that partners with one that can.

MRI uses strong magnets instead of radiation to make very detailed, cross-sectional pictures of the body. An MRI scanner takes pictures from many angles, as if someone were looking at a slice of your body from the front, from the side, or from above your head. MRI creates pictures of soft tissue parts of the body that would sometimes be hard to see using other imaging tests.

Unlike mammograms or breast ultrasound, breast MRI requires that you have a contrast dye injected into your vein (through an IV line) before the pictures are taken. This helps make any abnormal areas in your breasts easier to see.

Tips for getting ready for the test

Check with your insurance provider before getting an MRI: Breast MRI can cost a lot, and it may need to be approved by your insurance company before the scan is done. Most private insurance plans that pay for mammogram screening also pay for MRI as a screening test if a woman is shown to be at high risk. It might help to go to a center with a breast health or high-risk clinic, where the staff has experience getting approval for breast MRIs.

Follow all instructions: You don't usually need a special diet or preparation before an MRI, but follow any instructions you're given.

If you have trouble with enclosed spaces: Breast MRI is most often done while you are lying on your belly with your arms above your head inside a long, narrow tube. If being in a tight space might be a problem for you, you might need to take medicine to help you relax while in the scanner. Talking with the technologist or a patient counselor or getting a tour of the MRI machine before the test can also help. You'll be in the exam room alone during the test, but you can talk to the MR technologist, who can see and hear what's going on.

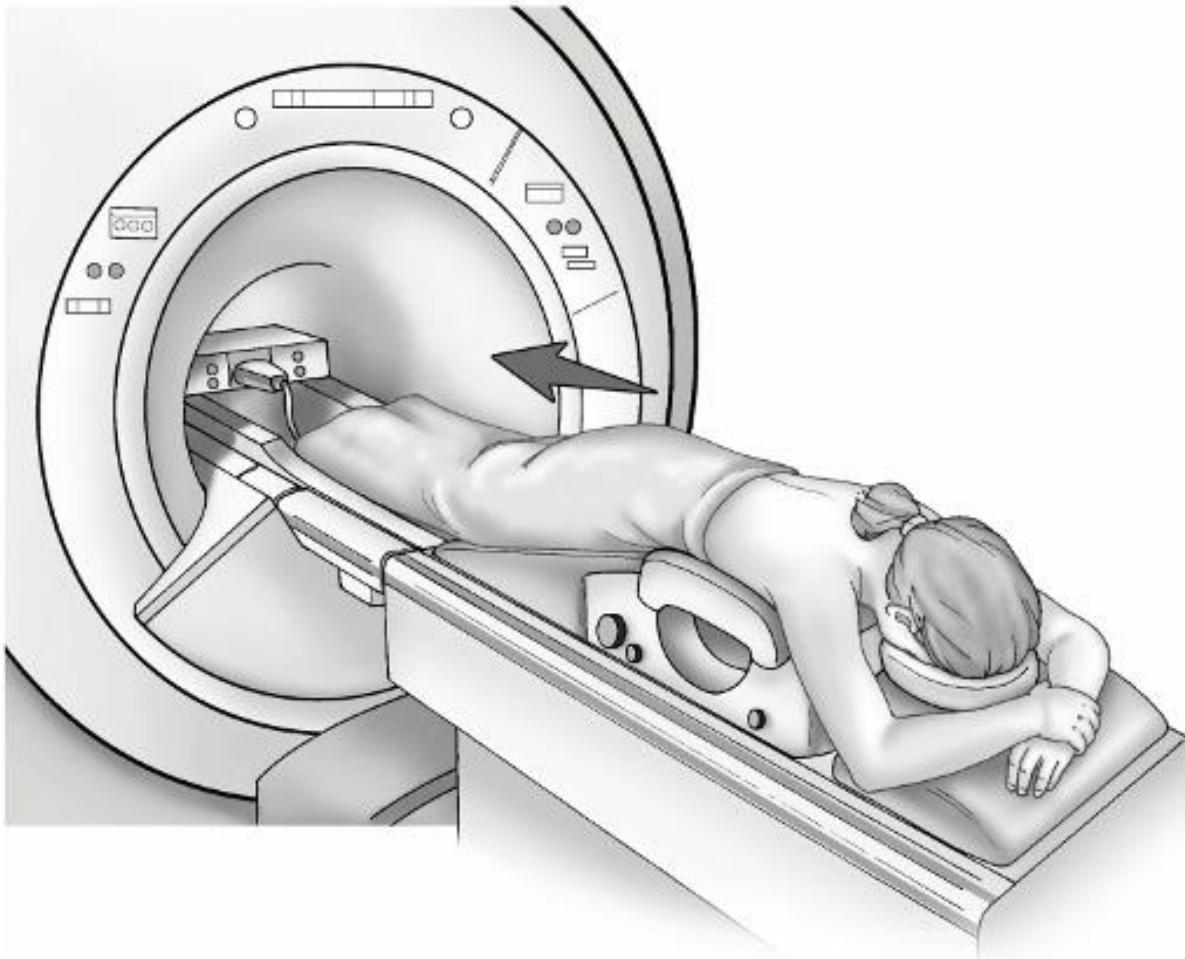
Remove metal objects: Before the test, you'll be asked to undress and put on a gown or other clothes without zippers or metal. Be sure to remove any metal objects you can,

like hair clips, jewelry, dental work, and body piercings.

If you have metal in your body: Before the scan, the technologist will ask you if you have any metal in your body. Some metallic objects will not cause problems, but others can.

Let your technologist know if you have any medical implants or clips in your body. If you have any of these types of medical implants, you should not even enter the MRI scanning area unless you're told it's OK to do so by a radiologist or technologist:

- An implanted defibrillator or pacemaker
- Clips used on a brain aneurysm
- A cochlear (ear) implant
- Metal coils inside blood vessels



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Breast MRI

What's it like to get a breast MRI?

MRI scans are usually done in an outpatient setting in a hospital or clinic. You'll first have an IV line placed a vein in your arm so that contrast material can be injected during the test.

You'll lie face down on a narrow, flat table with your arms above your head. Your breasts will hang down into an opening in the table so they can be scanned without being compressed. The technologist may use pillows to make you comfortable and help keep you from moving. The table then slides into a long, narrow tube.

The test is painless, but you have to lie still inside the narrow tube. You may be asked to hold your breath or keep very still during certain parts of the test. The machine may make loud thumping, clicking, and whirring noises, much like the sound of a washing

machine, as the magnet switches on and off. Some facilities give you earplugs or headphones to help block noise out during testing.

When breast MRI is done to look for breast cancer, a contrast material called *gadolinium* is injected into a vein in the arm during the exam, which helps show any abnormal areas of breast tissue. (This is different from the contrast dye used in CT scans.) Let the technologist know if you have any allergies or have had problems before with any contrast or dye used in imaging tests.

It's important to stay very still while the test is being done, which helps ensure the images will be of good quality.

Each set of images usually takes a few minutes, and the whole test usually takes about 30 to 45 minutes. After the test, you may be asked to wait while the pictures are checked to see if more are needed.

For a newer MRI technique, known as [abbreviated breast MRI](#), fewer images are taken, so the scan takes less time (usually about 10 minutes).

How are breast MRI results reported?

Doctors use the same standard system to describe results of mammograms, breast ultrasound, and breast MRI. This system (called the **Breast Imaging Reporting and Data System** or **BI-RADS**) sorts the results into categories numbered 0 through 6.

By sorting the results into these categories, doctors can describe what they find on a breast MRI using the same words and terms. This makes communicating about these test results and following up after the tests much easier.

For more details on the BI-RADS categories, see [Understanding Your Mammogram Report](#). While the categories are the same for each of these types of imaging tests, the recommended next steps after these tests might be different.

Newer and Experimental Breast Imaging Tests

The most commonly used breast imaging tests at this time are [mammograms](#), [ultrasound](#), and [breast MRI](#). Other tests, such as CT scans, bone scans, or PET scans might sometimes be done [to help find out if breast cancer has spread¹](#).

Newer types of tests are now being developed for breast imaging. Some of these, such as [breast tomosynthesis \(3D mammography\)](#), are already being used in some centers. Other tests are still being studied, and it will take time to see if they are as good as or better than those used today.

- Abbreviated breast MRI (fast breast MRI)
- Nuclear medicine tests (radionuclide imaging)
- Contrast-enhanced mammography (CEM)
- Elastography
- Optical imaging tests
- Electrical impedance tomography (EIT)

Abbreviated breast MRI (fast breast MRI)

This is a newer technique that is done with a standard breast MRI scanner. But fewer images are taken (over a shorter period of time) than with a standard breast MRI. As with standard breast MRI, a contrast material called *gadolinium* is given through an IV line before some of the images are taken. Abbreviated breast MRI is now being studied as a possible screening test for breast cancer, especially in women with dense breasts, to see if it provides the same information as a standard breast MRI.

Nuclear medicine tests (radionuclide imaging)

For these tests, a small amount of radioactive material (known as a *tracer*) is injected into the blood. The tracer is more likely to collect in cancer cells. A special camera can then be used to see the tracer in the breast (or other parts of the body).

For **molecular breast imaging (MBI)**, also known as **scintimammography** or **breast-specific gamma imaging (BSGI)**, a tracer called *technetium-99m sestamibi* is injected into the blood, and a special camera is then used to see the tracer while the breast is gently compressed. This test is being studied mainly as a way to follow up breast problems (such as a lump or an abnormal mammogram), or to help determine the extent of breast cancer that has already been diagnosed. It's also being studied as a screening test for use along with mammograms to look for cancer in women with **dense breasts**. One potential drawback is that it exposes the whole body to radiation, so it's unlikely this test would be used for screening every year.

For a **positron emission tomography (PET) scan**, a different type of radioactive tracer is injected into the blood. Standard PET scans, which use a form of radioactive sugar (known as *FDG*), are sometimes done if there's a concern that breast cancer might have spread to other parts of the body. A newer type of tracer, known as **fluoroestradiol F-18**, is now available to look for the spread of some advanced estrogen receptor (ER)-positive breast cancers.

Positron emission mammography (PEM) is a newer imaging test of the breast that

combines some aspects of a PET scan and a mammogram. PEM uses the same type of radioactive tracer injected into the blood as a PET scan. The breast is then lightly compressed while the images are taken, as with a mammogram. PEM may be better able to detect small clusters of cancer cells within the breast than standard mammography. This is because it takes into account how active the breast cells are, as opposed to just their structure. PEM is being studied mainly in women with breast cancer to see if it can help determine the extent of the cancer. PEM exposes the whole body to radiation, so it isn't likely to be used every year for breast cancer screening.

Contrast-enhanced mammography (CEM)

Also known as **contrast-enhanced spectral mammography (CESM)**, this is a newer test in which a contrast dye containing iodine is injected into the blood a few minutes before two sets of mammograms (using different energy levels) are taken. The contrast can help the x-rays show any abnormal areas in the breasts. This test can be used to get a better look at areas that appear abnormal on a standard mammogram, or to help assess the extent of a tumor in women just diagnosed with breast cancer. Studies are now comparing it to breast MRI in these settings (where it might be particularly useful if MRI can't be done for some reason), as well as possibly for use in screening women with dense breasts. If it proves to be as good as MRI, CEM could become more widely used because it is quicker to do and is less expensive than MRI.

Elastography

This is a test that can be done as part of an ultrasound exam. It's based on the idea that breast cancer tumors tend to be firmer and stiffer than the surrounding breast tissue. For this technique, the breast is compressed slightly, and the ultrasound can show how firm a suspicious area is. This test might prove to be useful in telling if the area is more likely to be cancer or a benign (non-cancerous) tumor.

Optical imaging tests

These tests pass light into the breast and then measure the light that returns or passes through the tissue. The technique does not use radiation and does not require breast compression. Early studies going on now are looking at combining optical imaging with other tests like MRI, ultrasound, or 3D mammography to help look for breast cancer.

Electrical impedance tomography (EIT)

EIT is based on the idea that breast cancer cells conduct electricity differently from

normal cells. For this test, small electrodes are taped to the skin to pass very small electrical currents through the breast and then detect them on the skin. EIT does not use radiation or compress the breasts. This test might prove to be useful in helping to classify tumors found on mammograms. But so far there hasn't been enough clinical testing to show if it's useful for breast cancer screening.

Breast Cancer Signs and Symptoms

Knowing how your breasts normally look and feel is an important part of your breast health.

Although having regular screening tests for breast cancer is important, mammograms do not find every breast cancer. This means it's also important for you to know what your breasts normally look and feel like, so you'll be aware of any changes in your breasts and to know the signs and symptoms of breast cancer.

The most common symptom of breast cancer is **a new lump or mass** (although most breast lumps are *not* cancer). A painless, hard mass that has irregular edges is more likely to be cancer, but breast cancers can be also soft, round, tender, or even painful.

Other possible symptoms of breast cancer include:

- **Swelling of all or part of a breast** (even if no lump is felt)
- **Skin dimpling** (sometimes looking like an orange peel)
- **Breast or nipple pain**
- **Nipple retraction** (turning inward)
- **Nipple or breast skin that is red, dry, flaking, or thickened**

- **Nipple discharge** (other than breast milk)
- **Swollen lymph nodes under the arm or near the collar bone** (Sometimes this can be a sign of breast cancer spread even before the original tumor in the breast is large enough to be felt.)

Many of these symptoms can also be caused by [benign \(non-cancerous\) breast conditions¹](#). Still, **it's important to have any new breast mass, lump, or other change checked by an experienced health care professional** so the cause can be found and treated, if needed.

Remember that knowing what to look for does not take the place of having regular [screening for breast cancer](#). Screening [mammography](#) can often help find breast cancer early, before any symptoms appear. Finding breast cancer early gives you a better chance of successful treatment.

Breast Biopsy

If breast [symptoms](#) or the results of an imaging test (such as a [mammogram](#)) suggest you might have breast cancer, you may need a breast biopsy.

- [What is a breast biopsy?](#)
- [Types of breast biopsies](#)

What is a breast biopsy?

A biopsy of the breast is a procedure done to remove a piece of breast tissue or tumor, called a sample. During a biopsy, a doctor takes samples from the suspicious area so they can be looked at in the lab to see if they contain cancer cells.

Needing a breast biopsy doesn't necessarily mean you have cancer. Most biopsy results are not cancer, but a biopsy is the only way to find out for sure.

Types of breast biopsies

There are different kinds of breast biopsies. Some are done using a hollow needle, and some use an incision (cut in the skin). The type you have depends on a number of things, like:

- How suspicious the breast change looks or feels
- How big it is
- Where it is in the breast
- If there is more than one suspicious area
- Your overall health
- Your personal preferences

Most of the time, a needle biopsy (rather than a surgical biopsy) can be done. Ask your doctor which type of biopsy you will have and what you can expect during and after the procedure.

[Fine needle aspiration \(FNA\)](#)

For a fine needle aspiration (FNA), a very thin, hollow needle attached to a syringe is used to withdraw (aspirate) a small amount of tissue or fluid from a suspicious area.

[Core needle biopsy](#)

A core needle biopsy (CNB) uses a larger hollow needle to sample breast changes felt by the doctor or seen on an ultrasound, mammogram, or MRI. This is often the preferred type of biopsy if breast cancer is suspected.

[Surgical \(open\) biopsy](#)

In rare cases, surgery is needed to remove all or part of the lump for testing. This is called a surgical or open biopsy. Most often, the surgeon removes the entire mass or abnormal area as well as a surrounding margin of normal breast tissue.

[Lymph node biopsy¹](#)

This type of biopsy might be done to check the lymph nodes under the arm for cancer spread. This might be done at the same time as a biopsy of the breast tumor, or when the breast tumor is removed during surgery. Checking the lymph nodes can be done by core needle biopsy, or with a sentinel lymph node biopsy (SLNB) and/or an axillary lymph node dissection.

Regardless of which type of biopsy you have, the biopsy samples will be sent to a lab where a doctor called a *pathologist* will look at them. It typically will take at least a few days for you to find out the results.

[Questions to Ask Before a Breast Biopsy](#)

It's important to ask questions if there's anything you're not sure about. Here you can find a detailed list of questions to ask your doctor before getting a breast biopsy.

If the doctor doesn't think you need a biopsy, but you still feel there's something wrong with your breast, follow your instincts. Don't be afraid to talk to the doctor about this or go to another doctor for a [second opinion²](#). If possible, try to see someone who specializes in breast health to discuss your concerns. A biopsy is the only sure way to diagnose breast cancer.

Fine Needle Aspiration (FNA) of the Breast

- What is an FNA of the breast?
- What should you expect if you have an FNA?
- What does an FNA show?

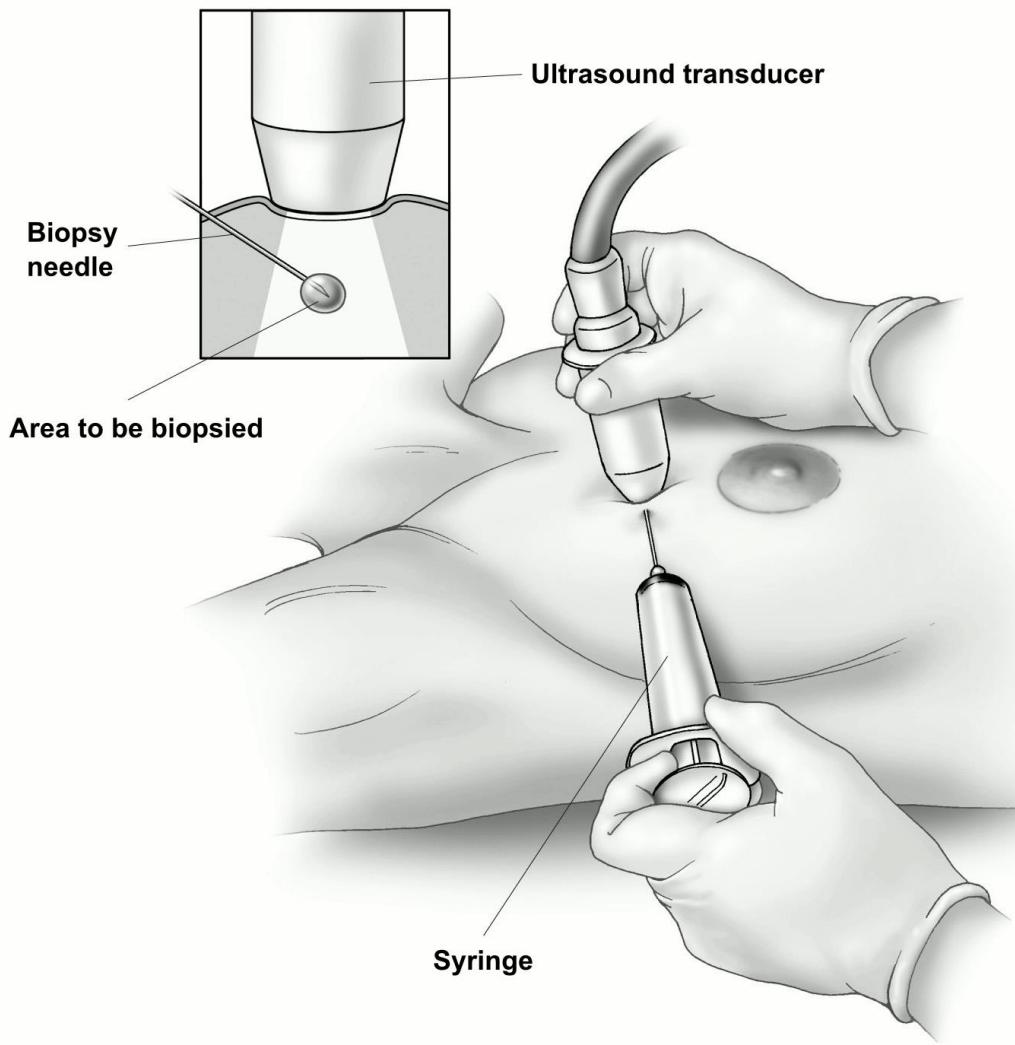
During a fine needle aspiration (FNA), a small amount of breast tissue or fluid is removed from a suspicious area with a thin, hollow needle and checked for cancer cells. This type of biopsy is sometimes an option if other tests show you might have breast cancer (although a [core needle biopsy](#) is often preferred). It might also be used in other situations.

What is an FNA of the breast?

In an FNA, the doctor uses a very thin, hollow needle attached to a syringe to withdraw (aspirate) a small amount of breast tissue or fluid from a suspicious area.

FNA is most often done if the suspicious area is likely to be a fluid-filled sac (a [cyst](#)¹). By removing fluid, the FNA can often help relieve pain from the cyst. FNA can also be helpful if the doctor is unsure if an area seen on an imaging test is a small cyst or a solid mass.

If the area to be biopsied can be felt, the needle can be guided into it while the doctor is feeling it.



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Fine needle aspiration using ultrasound

If the lump can't be felt easily, the doctor might watch the needle on an **ultrasound** screen as it moves toward and into the area. This is called an **ultrasound-guided FNA**.

If an FNA is done to test a suspicious area in the breast, the sample is then checked for cancer cells. One drawback of FNA is that it only removes a small amount of tissue and cells, so the sample usually needs to be checked right away under a microscope to make sure more samples don't need to be taken.

What should you expect if you have an FNA?

During an FNA

An FNA is an outpatient procedure most often done in the doctor's office. Your doctor might use a numbing medicine (called a *local anesthetic*), but it's not needed in all cases. This is because the needle used for the biopsy is so thin that getting an anesthetic might hurt more than the biopsy itself.

You'll lie on your back for the FNA, and you will have to be still while it's being done.

If ultrasound is used, you may feel some pressure from the ultrasound wand and as the needle is put in. Once the needle is in the right place, the doctor will use the syringe to pull out a small amount of tissue and/or fluid. This might be repeated a few times. Once the procedure is done, the area is covered with a sterile dressing or bandage.

Getting each biopsy sample usually takes about 15 seconds. The entire procedure from start to finish generally takes around 20 to 30 minutes if ultrasound is used.

After an FNA

Your doctor or nurse will tell you how to care for the area where the biopsy was done and what you can and can't do while it heals. You might be told to limit strenuous activity for a day or so, but you should be able to go back to your usual activities after that.

Biopsies can sometimes cause bleeding, bruising, or swelling. This can make it seem like a breast lump is larger after the biopsy. Most often, this is nothing to worry about, and the bruising and swelling will go away over time. Your doctor or nurse will give you instructions on what to watch for and when you should call the office.

What does an FNA show?

A doctor called a *pathologist* will look at the biopsy tissue or fluid to find out if there are cancer cells in it.

The main advantages of FNA are that it is fairly quick, it often doesn't require anesthesia, and the skin doesn't have to be cut, so no stitches are needed and there is usually no scar. Also, in some cases it's possible to get the results the same day.

However, an FNA can sometimes miss a cancer if the needle does not go into the cancer cells, or if it doesn't remove enough cells. Even if an FNA does find cancer, it might not remove enough cancer cells to do some of the other lab tests that are

needed.

If the results of the FNA biopsy do not give a clear diagnosis, or if your doctor still has concerns, you might need a more extensive type of biopsy, such as a [core needle biopsy](#) or a [surgical \(open\) biopsy](#).

Core Needle Biopsy of the Breast

- [What is a core needle biopsy?](#)
- [What should you expect if you have a CNB?](#)
- [Types of image-guided core needle biopsies](#)
- [What does a CNB show?](#)

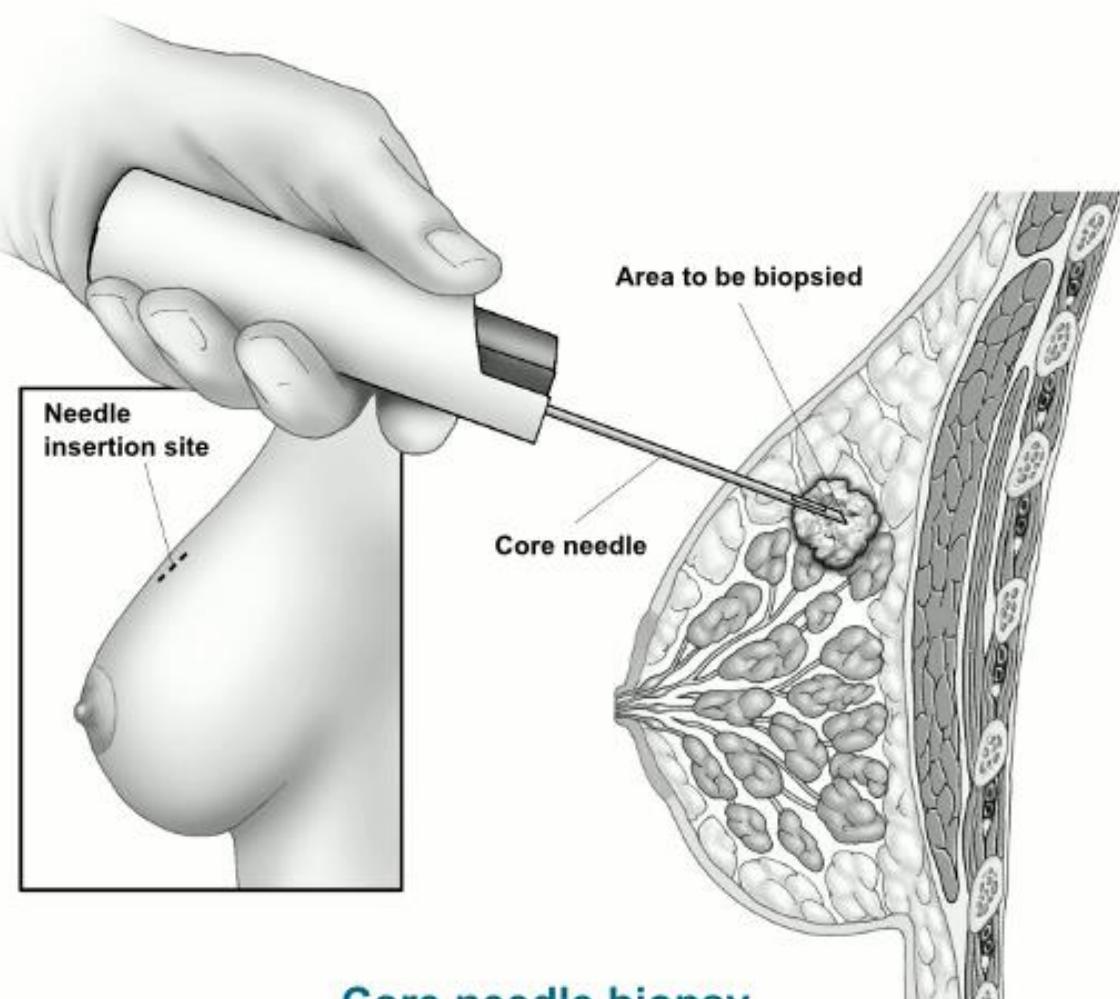
If exams or imaging tests show you might have breast cancer, your doctor might refer you for a core needle biopsy (CNB) to help find out for sure. This is often the preferred type of biopsy if breast cancer is suspected, because it removes more breast tissue than a [fine needle aspiration \(FNA\)](#), but it doesn't require [surgery](#).

During this procedure, the doctor uses a hollow needle to take out pieces of breast tissue from the area of concern. This can be done with the doctor either feeling the area or while using an imaging test to guide the needle.

What is a core needle biopsy?

For a CNB, the doctor uses a hollow needle to take out pieces of breast tissue from a suspicious area the doctor has felt on exam or has seen on an imaging test. The needle may be attached to a spring-loaded tool that moves the needle in and out of the tissue quickly, or it may be attached to a suction device that helps pull breast tissue into the needle (known as a **vacuum-assisted core biopsy**).

A small cylinder (core) of tissue is taken out in the needle. Several cores are often removed.



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Core needle biopsy

The doctor might put the needle into the abnormal area by feeling the lump. But usually some type of imaging test is used to guide the needle into the right place. Some of the imaging tests a doctor may use include:

- [Mammogram](#) (or [breast tomosynthesis](#)) (known as a *stereotactic biopsy*)
- [Ultrasound](#)
- [MRI](#)

The type of imaging test used to guide the biopsy depends on which test can best see the abnormal area, as well as which is most comfortable for the patient.

What should you expect if you have a CNB?

During the CNB

A CNB is most often done as an outpatient procedure, such as in a doctor's office. The procedure itself is usually fairly quick, though it may take more time if imaging tests are needed or if one of the special types of CNB described below is used.

If your biopsy is done using image guidance, you may be sitting up, lying flat or on your side, or lying face down on a special table with openings for your breasts to fit into. This depends on which type of imaging (mammography, ultrasound, or MRI) is done. You will have to be still while the biopsy is done.

For any type of CNB, a thin needle will be used first to put numbing medicine (local anesthesia) into the area to be biopsied. Sometimes a small cut (about $\frac{1}{4}$ inch) is then made in the breast. The biopsy needle is put into the breast tissue through this cut to remove the tissue sample. You might feel pressure as the needle goes in. Again, an imaging test may be used to guide the needle to the right spot.

Typically, a tiny **tissue marker** (also called a **clip**) is put into the area where the biopsy is done. This marker will show up on mammograms or other imaging tests so the exact area can be located for further treatment (if needed) or follow up. You can't feel or see the marker. It can stay in place and is safe during MRIs, and it will not set off metal detectors.

Once the tissue is removed, the needle is taken out. Stitches aren't usually needed, but pressure may be applied for a short time to help limit bleeding. The area is then covered with a sterile dressing.

For more on what it's like to have each type of CNB, see "Types of image-guided core needle biopsies" below.

After the CNB

You might be told to limit strenuous activity for a day or so, but you should be able to go back to your usual activities after that. Your doctor or nurse will give you instructions on this.

A CNB can cause some bleeding, bruising, or swelling. This can make it seem like the breast lump is larger after the biopsy. Most often, this is nothing to worry about, and any bruising or swelling will go away over time. Your doctor or nurse will tell you how to care for the biopsy site and when you might need to contact them if you're having any issues. A CNB usually doesn't leave a scar.

Types of image-guided core needle biopsies

There are 3 main types of image-guided biopsies:

- Stereotactic (mammogram- or tomosynthesis-guided)
- Ultrasound-guided
- MRI-guided

The type of image-guided biopsy that is best for you will depend on which type of imaging test will show the abnormal area best, as well as your comfort.

Stereotactic (mammogram- or tomosynthesis-guided) core needle biopsy

For this procedure, a doctor uses mammogram pictures taken from different angles to pinpoint the biopsy site. A computer analyzes the breast x-rays and shows where the needle tip needs to go in the abnormal area. This type of biopsy is often used to check suspicious [microcalcifications](#) (tiny calcium deposits) or small masses or other abnormal areas that can't be seen clearly on an ultrasound.

You may be sitting up, lying on your side, or lying on your belly with your breast hanging through a hole in the table for this procedure.

The breast will be positioned in the mammography machine and compressed, and an image will be taken to make sure the area in question can still be seen. The breast is then cleaned, and numbing medicine (local anesthesia) is given. The biopsy device is placed into the breast, and more images are taken to confirm that the device is in the correct spot to take samples. Several biopsy samples are then taken.

Afterwards, the device is removed from the breast, and a biopsy marker (clip) is placed in the area. Another mammogram is then done to confirm the marker is in the right place.

Ultrasound-guided core needle biopsy

For this procedure, a doctor uses [breast ultrasound](#) to view the area that needs to be biopsied. Typically this is done while you are lying down or slightly on your side, with your arm above your head.

An ultrasound is done first to view the area. Then the skin is cleaned and numbing medicine (local anesthesia) is injected. Ultrasound is then used to guide the needle into

the correct area. You might feel pressure as the needle goes in. Several biopsy samples are usually taken.

A biopsy marker (clip) is placed in the area of the biopsy. Most often, a mammogram is done after the biopsy to confirm the clip is in the right place.

MRI-guided core needle biopsy

For this procedure, a doctor uses [breast MRI](#) to locate and biopsy the suspicious area. This is most often done when something is seen on a breast MRI that is unlikely to be seen on mammogram or ultrasound. As with a breast MRI, you will be asked to lie on your belly on the MRI table with your arms above your head. However, the breast will be compressed during the procedure.

The table will slide into the MRI scanner and images will be taken. Then you'll be given contrast through an IV line (which can help make the abnormal area easier to see), and more images will be taken.

Once the suspicious area has been located, the skin is cleaned and numbing medicine (local anesthesia) is injected into the area. The biopsy device is then gently inserted into the breast. It's normal to feel pressure while this is being done.

More MRI images will then be taken to confirm to that the device is in the correct spot to take samples. Several biopsy samples are then taken, and the device is removed from the breast.

A biopsy marker (clip) is then placed in the area of the biopsy. Most often, a mammogram is done after the biopsy to confirm the clip is in the right place.

What does a CNB show?

A doctor called *a pathologist* will look at the biopsy tissue and/or fluid to check if there are cancer cells in it. A CNB is likely to clearly show if cancer is present (and often provides enough of a sample if other lab tests are needed), but it can still miss some cancers.

Ask your doctor when you can expect to get the results of your biopsy. If the results of the CNB do not give a clear diagnosis, or if your doctor still has concerns, you might need to have a second CNB or a more extensive type of biopsy, such as a [surgical \(open\) biopsy](#).

Surgical Breast Biopsy

- [What is a surgical biopsy?](#)
- [What to expect if you have a surgical biopsy](#)
- [What does a surgical biopsy show?](#)

If exams or imaging tests show you might have breast cancer, your doctor may refer you for a breast biopsy to help find out for sure. Most often this will be a [core needle biopsy \(CNB\)](#) or a [fine needle aspiration \(FNA\)](#). But in some situations, such as if the results of a needle biopsy aren't clear, you might need a surgical biopsy (sometimes called an [open biopsy](#)).

What is a surgical biopsy?

For this type of biopsy, surgery is used to remove all or part of a suspicious area so it can be checked for cancer cells.

There are 2 types of surgical biopsies:

- An **incisional biopsy** removes only part of the abnormal area.

- An **excisional biopsy** removes the entire tumor or abnormal area. An edge (margin) of normal breast tissue around the tumor may be removed as well, depending on the reason for the biopsy.

Preoperative localization to guide surgical biopsy

If the change in your breast can be felt, the surgeon can do the biopsy using their sense of touch as a guide.

But if the change can't be felt and/or is hard to find, an imaging test such as a **mammogram**, **ultrasound**, or **MRI** may be done before the surgery to help place a wire or other localizing device (such as a radioactive or magnetic seed, or a radiofrequency reflector) into the suspicious area. This can help guide the surgeon the right spot. This is called **preoperative localization**.

For **wire localization**, your breast is numbed, and an imaging test is used to guide a thin, hollow needle into the abnormal area. Once the tip of the needle is in the right spot, a thin wire is put in through the center of the needle. A small hook at the end of the wire keeps it in place, while the other end of the wire remains outside of the breast. The needle is then taken out. You then go to the operating room with the wire in your breast. The surgeon uses the wire as a guide to the area to be removed. When this method is used, it is done the same day as your surgery.

In **newer methods of localization**, a localizing device is put into the suspicious area before the day of your surgery, so you don't have to have it done the morning of your operation. Radioactive or magnetic seeds (tiny pellets that give off a very small amounts of radiation or that create small magnetic fields) or radiofrequency reflectors (small devices that give off a signal that can be picked by a device held over the breast) can be placed completely inside the breast (unlike the wire used for localization). Your surgeon can then find the suspicious area by using a handheld detector in the operating room.

What to expect if you have a surgical biopsy

During a surgical biopsy

Rarely, a surgical biopsy might be done in the doctor's office. But most often it's done in a hospital's outpatient department or a surgical center. You are typically given local anesthesia (numbing medicine), along with intravenous (IV) sedation to make you

drowsy. Another option is to have the biopsy done under general anesthesia (where you're given medicine to put you in a deep sleep and not feel pain).

The skin of the breast is cut, and the doctor removes the suspicious area. You will likely need stitches after a surgical biopsy, and pressure may be applied for a short time to help limit bleeding. The area is then covered with a sterile dressing.

After a surgical biopsy

The biopsy can cause bleeding, bruising, or swelling. This can make it seem like the breast is larger after the biopsy. Most often, this is nothing to worry about, and the bruising and swelling will go away over time. Your doctor or nurse will tell you how to care for the biopsy site, how much (and for how long) you might need to limit your activities, and when you might need to contact them if you're having any issues.

A surgical biopsy may leave a scar. You might also notice a change in the shape of your breast, depending on how much breast tissue is removed.

What does a surgical biopsy show?

A doctor called a *pathologist* will look at the biopsy tissue under a microscope to check it for cancer cells.

Ask your doctor when you can expect to get the results of your biopsy. The next steps will depend on the biopsy results.

If no cancer cells are found in the biopsy, your doctor will talk to you about whether any other tests are needed, as well as when you need to have your next mammogram and any other follow-up visits.

If breast cancer is found, other lab tests might be done on the tissue to learn more about the cancer and how best to treat it. Your doctor will talk to you about these tests and about what the next steps will be. You might need to see other doctors, too. For more on this, see [Understanding a Breast Cancer Diagnosis¹](#).

Questions to Ask Before a Breast Biopsy

There are different types of breast biopsies. It's important to understand the type of biopsy you'll have and what you can expect during and after the biopsy.

Here are some questions you might want to ask before having a breast biopsy:

- What type of biopsy do you think I need? Why?
- Will the size of my breast affect the way the biopsy is done?
- Where will the biopsy be done?
- What exactly will you do?
- How much breast tissue will you remove?
- How long will it take?
- Will I be awake or asleep during the biopsy?
- Will the biopsy area be numbed?
- If you can't feel the abnormal area in my breast, how will you find it?
- If you are using a guide wire to help find the abnormal area, how will you make sure

it's in the right place (with ultrasound or a mammogram)?

- Will I need someone to help me get home afterward?
- Will I have a hole there afterward? Will it show?
- Will my breast have a different shape or look different afterward?
- Will you put a clip or marker in my breast? If so, what will happen to it?
- Will I have a scar? Where will it be? What will it look like?
- Will I have bruising or changes in the color of my skin? If so, how long will it last?
- Will I be sore? If so, how long will it last?
- Might I have any other types of problems after the biopsy? Are there any I'd need to call your office about?
- When can I take off the bandage?
- When can I take a shower or bath?
- Will I have stitches? Will they dissolve or will I need to come back to the office and have them removed?
- When can I go back to work? How will I feel when I do?
- Do I need to limit activities like lifting things or raising my arm? If so, for how long?
- How soon will we know the biopsy results?
- Should I call you or will you call me with the results?
- Will you or someone else explain the biopsy results to me?

Finding Breast Cancer During Pregnancy

Breast cancer during pregnancy isn't common. But if you find a lump or notice any changes in your breasts that concern you, tell your health care team. There are a variety of tests a pregnant woman can have if breast cancer is suspected. And there are options for [treating breast cancer if you are pregnant¹](#).

If you are pregnant and breast cancer is found, it may be called **gestational breast cancer** or **pregnancy-associated breast cancer (PABC)**.

- [How common is breast cancer during pregnancy?](#)
- [Breast cancers can be harder to find when you're pregnant](#)

- What to look for
- Are mammograms and other imaging tests safe during pregnancy?
- Breast biopsy during pregnancy
- Imaging tests to stage breast cancer
- Treating the cancer
- Can breast cancer spread to the baby?

How common is breast cancer during pregnancy?

Breast cancer is found in about 1 in every 3,000 pregnant women. It is the most common type of cancer found during pregnancy.

Breast cancers can be harder to find when you're pregnant

Changes in hormone levels during pregnancy cause the breasts to change. The breasts may become larger, lumpy, and/or tender. This can make it harder for you or your doctor to notice a lump caused by cancer until it gets quite large.

Another reason it may be hard to find breast cancers early during pregnancy is that many women put off breast cancer screening with **mammograms** until after the pregnancy. Even when women do get mammograms, pregnancy and breastfeeding can make breast tissue denser, which can make it harder to see an early cancer on a mammogram.

Because of these challenges, when a pregnant woman develops breast cancer, it's often diagnosed at a later stage than it usually is in women who are not pregnant. For example, it's more likely to have already spread to lymph nodes.

What to look for

If you find a **lump or other changes in your breasts** that concern you, don't ignore them. Tell your doctor or nurse right away. Any suspicious breast changes should be checked out or even biopsied (see below) before assuming they are a normal response to pregnancy.

Along with a clinical breast exam, several types of imaging tests can be used to look for breast abnormalities, if needed. Typically a **breast ultrasound** and/or **mammogram** can be done. A **breast biopsy** (removing a piece of the abnormal area to check it for cancer cells) is often another option, especially if imaging tests show a suspicious finding. (See

below.)

Are mammograms and other imaging tests safe during pregnancy?

A main concern with any imaging test during pregnancy is whether it exposes the developing fetus to radiation, which could be harmful, especially during the first trimester.

Mammograms can find most breast cancers that start when a woman is pregnant, and it's generally thought to be safe to have a mammogram during pregnancy. The amount of radiation needed for a mammogram is small, and the radiation is focused on the breasts, so most of it doesn't reach other parts of the body. For extra protection, a lead shield is placed over the lower part of the belly to help keep radiation from reaching the womb. Still, small amounts of radiation might reach the fetus, and scientists can't be certain about the effects of even a very small dose of radiation on an unborn baby.

Ultrasound exams of the breast do not use radiation and are thought to be safe during pregnancy. This is typically an easy test to have, so it's often the first test used to evaluate a change in the breast (such as a lump) during pregnancy.

Other tests, such as **PET scans**, **bone scans**, and **computed tomography (CT) scans** are more likely to expose the fetus to radiation (see below).

Magnetic resonance imaging (MRI) does not use radiation. However, **breast MRIs** typically require that a contrast material called *gadolinium* is injected into the blood in order to get useful images. This contrast can cross the placenta (the organ that connects the mother to the fetus) and has been linked with fetal abnormalities in lab animals. Because of this, doctors typically don't recommend breast MRI during pregnancy.

Breast biopsy during pregnancy

If a new breast lump or abnormal imaging test result raises concerns about a breast change possibly being cancer, a **biopsy** is typically done. During a biopsy, small pieces of breast tissue are taken from the area of concern.

The most common breast biopsy technique is a **core needle biopsy**, which uses a hollow needle to remove the pieces of breast tissue. This is usually done as an outpatient procedure, even if you're pregnant. Most often, numbing medicine (local anesthesia) is used to numb just the area of the breast where the biopsy will be done. This causes little risk to the fetus.

If a core needle biopsy doesn't give a clear answer, a **surgical biopsy** is typically the next step. For this type of biopsy, a larger piece of breast tissue is removed through a small cut (incision) in the breast. Surgical biopsies are often done under general anesthesia (where you are given medicine to put you into a deep sleep), which carries a small risk to the fetus.

Imaging tests to stage breast cancer

If breast cancer is found, you might need other tests to find out if cancer cells have spread within the breast or to other parts of the body. This process is called **staging**². Different staging tests may be needed, depending on your situation.

As noted above, **ultrasound** scans do not use radiation and are safe during pregnancy.

Chest x-rays are sometimes needed to help make treatment decisions. They use a small amount of radiation to create the images. They're generally thought to be safe to have when you're pregnant, as long as your belly is shielded.

Other tests, such as **PET scans**, **bone scans**, and **computed tomography (CT) scans** are more likely to expose the fetus to radiation. These tests are not often needed to stage breast cancer, especially if the cancer is thought to be just in the breast. If one of these tests is needed, doctors might be able to make adjustments to limit the amount of radiation exposure to the fetus.

Treating the cancer

The treatment of breast cancer in pregnant women is typically similar to that used for non-pregnant women, especially for early-stage disease, although some adjustments might be needed to help protect the fetus. Learn more in [Treating Breast Cancer During Pregnancy³](#).

Can breast cancer spread to the baby?

Breast cancer has never been found to spread from the mother to the fetus. But in a few rare cases, the cancer has reached the placenta (the organ that connects the mother to the fetus). This could affect the amount of nutrition the fetus gets from the mother.

For answers to some common questions about pregnancy *after* having had breast cancer, see [Pregnancy After Breast Cancer⁴](#).

Understanding a Breast Cancer Diagnosis

If you've been diagnosed with breast cancer, you've probably heard a lot of different terms used to describe your cancer. Doctors use information from your breast biopsy to learn a lot of important things about the exact kind of cancer you have. You may also need more tests to get more details, such as the stage of the cancer or how fast it's growing.

Breast Cancer Grade and Other Tests

Doctors use information from your breast biopsy to learn a lot of important things about the exact kind of breast cancer you have.

- [Breast Cancer Grades](#)
- [Breast Cancer Ploidy and Cell Proliferation](#)
- [Breast Cancer Hormone Receptor Status](#)
- [Breast Cancer HER2 Status](#)
- [Breast Cancer Gene Expression Tests](#)
- [Other Breast Cancer Gene, Protein, and Blood Tests](#)
- [Understanding Your Pathology Report](#)

Stages and Outlook (Prognosis)

If you have been diagnosed with breast cancer, tests will be done to find out the extent (stage) of the cancer. The stage of a cancer helps determine how serious the cancer is and how best to treat it.

- [Imaging Tests to Find Out if Breast Cancer Has Spread](#)

- [Breast Cancer Stages](#)
- [Breast Cancer Survival Rates](#)

Questions to Ask About Your Breast Cancer

You can take an active role in your breast cancer care by learning about your cancer and its treatment and by asking questions. Get a list of key questions here.

- [Questions to Ask Your Doctor About Breast Cancer](#)

Connect with a breast cancer survivor

Reach To Recovery

The American Cancer Society Reach To Recovery® program connects people facing breast cancer – from diagnosis through survivorship – with trained volunteers who are breast cancer survivors. Our volunteers provide one-on-one support through our website and mobile app to help those facing breast cancer cope with diagnosis, treatment, side effects, and more.

Breast Cancer Grade

Cancer cells are given a **grade** when they are removed from the breast and checked in the lab. Knowing a breast cancer's grade helps your cancer care team understand how fast it is likely to grow and spread.

- [What is a breast cancer's grade?](#)
- [Grading invasive breast cancer cells](#)
- [Grading ductal carcinoma in situ \(DCIS\)](#)

What is a breast cancer's grade?

When cancer cells are removed from your breast, they are checked in the lab and given a **grade**. This grade is based on how much the cancer cells look like normal cells. It is used to help predict your outcome (prognosis) and to help figure out what treatments might work best.

A **low grade number (grade 1)** usually means the cancer is slower-growing and less likely to spread.

A **high grade number (grade 3)** means a faster-growing cancer that's more likely to spread.

An **intermediate grade number (grade 2)** means the cancer is growing faster than a grade 1 cancer but slower than a grade 3 cancer.

Grading invasive breast cancer cells

Three features of the invasive breast cancer cell are studied and each is given a score. The scores are then added to get a number between 3 and 9 that is used to get a grade of 1, 2, or 3, which is noted on your pathology report. Sometimes the terms *well differentiated*, *moderately differentiated*, and *poorly differentiated* are used to describe the grade instead of numbers:

- **Grade 1 or well differentiated** (score 3, 4, or 5). The cells are slower-growing, and look more like normal breast cells.
- **Grade 2 or moderately differentiated** (score 6, 7). The cells are growing at a speed of and look like cells somewhere between grades 1 and 3.
- **Grade 3 or poorly differentiated** (score 8, 9). The cancer cells look very different from normal cells and will probably grow and spread faster.

Our information about [pathology reports¹](#) can help you understand details about your breast cancer.

Grading ductal carcinoma in situ (DCIS)

DCIS is also graded on how abnormal the cancer cells look and has a similar grading system to that used for invasive breast cancer (see above).

- **Grade 1 or low grade DCIS.** The cells are growing slower, and look more like normal breast cells. These cells tend to have [estrogen and progesterone receptors \(ER-positive and PR-positive\)](#).
- **Grade 2 or intermediate grade.** The cells are growing at a speed of and look like cells somewhere between grades 1 and 3.
- **Grade 3 or high grade.** The cancer cells look very different from normal cells and are growing faster. These cells tend not to have estrogen and progesterone receptors (ER-negative and PR-negative). High grade DCIS is often more likely to turn into invasive breast cancer.

Necrosis (areas of dead or dying cancer cells) is also noted. If there is necrosis, it means the tumor is growing quickly. The term **comedo necrosis** may be used if a breast duct is filled with dead and dying cells. Comedo necrosis is often linked to a high grade of DCIS and has a higher chance of developing into invasive breast cancer.

See [Understanding Your Pathology Report: Ductal Carcinoma In Situ²](#) for more on how DCIS is described.

Breast Cancer Ploidy and Cell Proliferation

Finding out more information about the DNA in breast cancer cells can help predict how fast those cancer cells are dividing and growing. If you want to learn more about DNA and breast cancer, you should first understand two important terms: **ploidy** and **cell proliferation**.

- [What is ploidy and what does it mean?](#)
- [What is cell proliferation?](#)

What is ploidy and what does it mean?

The **ploidy** of cancer cells refers to the amount of DNA they contain.

- If there's a normal amount of DNA in the cells, they are said to be **diploid**. These cancers tend to grow and spread more slowly.
- If the amount of DNA is abnormal, then the cells are called **aneuploid**. These cancers tend to be more aggressive. They also tend to grow and spread faster.

Tests of ploidy may help figure out long-term outcomes, but they rarely change treatment and are considered optional. They are not usually recommended as part of a routine breast cancer work-up.

What is cell proliferation?

Cell proliferation is how quickly a cancer cell copies its DNA and divides into 2 cells. If the cancer cells are dividing more rapidly, it means the cancer is faster growing or more aggressive.

The rate of cancer cell proliferation can be estimated by doing a **Ki-67 test**. In some cases, Ki-67 testing to measure cell proliferation may be used to help plan treatment or estimate treatment outcomes. But test results can vary depending on things like the lab doing the testing, the testing method, and what part of the tumor is tested.

Another way to determine cell division is the **S-phase fraction**, which is the percentage of cells in a sample that are copying their DNA as it gets ready to divide into 2 new cells.

If the S-phase fraction or Ki-67 labeling index is high, it means that the cancer cells are dividing more rapidly.

Breast Cancer Hormone Receptor Status

Breast cancer cells taken out during a biopsy or surgery are tested to see if they have certain proteins that are **estrogen or progesterone receptors**. If your breast cancer cells have these receptors (proteins), this means that when the hormones estrogen and progesterone attach to the receptors, they stimulate the cancer to grow.

Cancers are called **hormone receptor-positive** or **hormone receptor-negative** based on whether or not they have these receptors (proteins).

Knowing the hormone receptor status of a cancer is important, because it helps determine the treatment options. Ask your cancer care team about your hormone receptor status and what it means for you.

- [What are estrogen and progesterone receptors?](#)
- [Why is knowing hormone receptor status important?](#)
- [How are breast tumors tested for hormone receptors?](#)
- [What do the hormone receptor test results mean?](#)

What are estrogen and progesterone receptors?

Receptors are proteins in or on cells that can attach to certain substances in the blood. Normal breast cells and some breast cancer cells have receptors that attach to the hormones estrogen and progesterone, and need these hormones for the cells to grow.

Breast cancer cells may have one, both, or none of these receptors.

- **ER-positive:** Breast cancers that have estrogen receptors are called ER-positive (or **ER+**) cancers.
- **PR-positive:** Breast cancers with progesterone receptors are called PR-positive (or **PR+**) cancers.
- **Hormone receptor-positive:** If the cancer cell has one or both of the receptors above, the term hormone-receptive positive (also called **hormone-positive** or **HR+**) breast cancer may be used.
- **Hormone receptor-negative:** If the cancer cell does not have the estrogen or the progesterone receptor, it's called hormone-receptor negative (also called **hormone-negative** or **HR-**).

Keeping the hormones estrogen and progesterone from attaching to the receptors can help keep the cancer from growing and spreading. There are [drugs that can be used to do this¹](#).

Why is knowing hormone receptor status important?

Knowing the hormone receptor status of your cancer helps doctors decide how to treat it. If your cancer has one or both of these hormone receptors, hormone therapy drugs can be used to either lower estrogen levels or stop estrogen from acting on breast cancer cells. This kind of treatment is helpful for hormone receptor-positive breast cancers, but it doesn't work on tumors that are hormone receptor-negative (both ER- and PR-negative).

All invasive breast cancers should be tested for both of these hormone receptors either on the biopsy sample or when the tumor is removed with surgery. About 3

of 4 breast cancers have at least one of these receptors. This percentage is higher in older women than in younger women. DCIS should also be checked for hormone receptors.

How are breast tumors tested for hormone receptors?

A test called an **immunohistochemistry (IHC) test** is used most often to find out if cancer cells have estrogen and progesterone receptors. The test results will help guide you and your cancer care team in making the best treatment decisions.

What do the hormone receptor test results mean?

Test results will give you your hormone receptor status. It will say a tumor is hormone receptor-positive if at least 1% of the cells tested have estrogen and/or progesterone receptors. Otherwise, the test will say the tumor is hormone receptor-negative.

Hormone receptor-positive (or hormone-positive) breast cancer cells have either estrogen (ER) or progesterone (PR) receptors or both. These breast cancers can be treated with hormone therapy drugs that lower estrogen levels or block estrogen receptors. Hormone receptor-positive cancers tend to grow more slowly than those that are hormone receptor-negative. Women with hormone receptor-positive cancers tend to have a better outlook in the short-term, but these cancers can sometimes come back many years after treatment.

Hormone receptor-negative (or hormone-negative) breast cancers have no estrogen or progesterone receptors. Treatment with hormone therapy drugs is not helpful for these cancers. These cancers tend to grow faster than hormone receptor-positive cancers. If they come back after treatment, it's often in the first few years. Hormone receptor-negative cancers are more common in women who have not yet gone through menopause.

Triple-negative breast cancer cells don't have estrogen or progesterone receptors and also don't make any or too much of the protein called **HER2**. These cancers tend to be more common in women younger than 40 years of age, who are Black, or who have a mutation in the *BRCA1* gene. Triple-negative breast cancers grow and spread faster than most other types of breast cancer. Because the cancer cells don't have hormone receptors, hormone therapy is not helpful in treating these cancers. And because they don't have too much HER2, drugs that target HER2 aren't helpful, either. Chemotherapy can still be useful. See [Triple-negative Breast Cancer²](#) to learn more.

Triple-positive cancers are ER-positive, PR-positive, and HER2-positive. These cancers can be treated with hormone drugs as well as drugs that target HER2.

Breast Cancer HER2 Status

About 15% to 20% of breast tumors have higher levels of a protein known as HER2. These cancers are called **HER2-positive breast cancers**. Ask your cancer care team about your HER2 status and what it means for you.

- [What is HER2 and what does it mean?](#)
- [How are breast tumors tested for HER2?](#)
- [What do the test results mean?](#)

What is HER2 and what does it mean?

HER2 is a protein that helps breast cancer cells grow quickly. Breast cancer cells with higher than normal levels of HER2 are called **HER2-positive**. These cancers tend to grow and spread faster than breast cancers that are HER2-negative, but are much more likely to respond to treatment with [drugs that target the HER2 protein¹](#).

All invasive breast cancers should be tested for HER2 either on the biopsy sample or when the tumor is removed with surgery.

How are breast tumors tested for HER2?

Either a test called an **immunohistochemistry (IHC) test** or **fluorescence in situ hybridization (FISH) test** is used to find out if cancer cells have a high level of the HER2 protein.

See [Testing Biopsy and Cytology Specimens for Cancer²](#) and [Understanding Your Pathology Report: Breast Cancer³](#) to get more details about these tests.

What do the test results mean?

The results of HER2 testing will guide you and your cancer care team in making the best treatment decisions.

It is not clear if one test is more accurate than the other, but FISH is more expensive and takes longer to get the results. Often the IHC test is done first.

- If the IHC result is 0, the cancer is considered **HER2-negative**. These cancers do not respond to treatment with drugs that target HER2.
- If the IHC result is 1+, the cancer is considered **HER2-negative**. These cancers do not usually respond to treatment with drugs that target HER2, but new research shows that certain HER2 drugs might help in some cases (see below).
- If the IHC result is 2+, the HER2 status of the tumor is not clear and is called "**equivocal**." This means that the HER2 status needs to be tested with FISH to clarify the result.
- If the IHC result is 3+, the cancer is **HER2-positive**. These cancers are usually treated with drugs that target HER2.

Some breast cancers that have an IHC result of 1+ or an IHC result of 2+ along with a negative FISH test might be called **HER2-low** cancers. These breast cancers are still being studied but appear to benefit from [certain HER2-targeted drugs⁴](#).

Triple-negative breast tumors don't have too much HER2 and also don't have [estrogen or progesterone receptors](#). They are HER2-, ER-, and PR-negative. Hormone therapy and drugs that target HER2 are not helpful in treating these cancers. See [Triple-negative Breast Cancer⁵](#) to learn more.

Triple-positive breast tumors are HER2-positive, ER-positive, and PR-positive. These cancers are treated with hormone drugs as well as drugs that target HER2.

Breast Cancer Gene Expression Tests

Gene expression tests are a form of [personalized medicine](#)¹. Personalized medicine is a way to learn more about your cancer and tailor your treatment.

These tests are done on breast cancer cells after surgery or biopsy to look at the patterns of a number of different genes. This process or test is sometimes called **gene expression profiling**.

- [What do the test results mean?](#)
- [Testing options](#)

What do the test results mean?

The patterns found can help predict if certain early-stage breast cancers are likely to come back after initial treatment.

Some gene expression testing/profiling can help predict which women will most likely benefit from [chemotherapy](#)² after breast surgery (adjuvant chemotherapy.) [Hormone therapy](#)³ is a standard treatment for hormone receptor-positive breast cancers, but it's not always clear when to use chemotherapy. These tests can help guide that decision. Still, these tests cannot tell any one woman for certain if her cancer will come back with or without chemotherapy.

These tests continue to be studied in large [clinical trials](#)⁴ to better understand how and when to best use them. In the meantime, ask your doctor if these tests might be useful for you.

Testing options

The **Oncotype DX, MammaPrint, and Prosigna** are examples of tests that look at different sets of breast cancer genes to see if chemotherapy is needed to help reduce the risk of cancer coming back (recurrence). More tests are in development. The type of test that's used will depend on your situation. Keep in mind that these tests are used for early-stage cancers, and testing isn't needed in all cases. For example, if breast cancer is advanced, it might be clear that chemotherapy is needed, even without gene

expression testing.

Oncotype DX

The Oncotype DX test is used for stage I, II or IIIa **hormone receptor-positive tumors** that have not spread to more than 3 lymph nodes and are **HER2 negative**. It can also be used for [DCIS \(ductal carcinoma in situ or stage 0 breast cancer\)](#)⁵.

This test looks at a set of 21 genes in cancer cells from tumor biopsy or surgery samples to get a “recurrence score,” which is a number between 0 and 100. The score reflects the risk of the breast cancer coming back (recurring) in the next 9 years if you are treated with hormone therapy alone and how likely you are to benefit from getting chemo after surgery.

For women who are older than 50 years and have no lymph nodes with cancer:

- **A low score (0-25) means a low risk of recurrence.** Most women with low-recurrence scores do not benefit from chemotherapy and have good outcomes when treated with hormone therapy.
- **A high score (26-100) means a higher risk of recurrence.** Women with high-recurrence scores are more likely to benefit from the addition of chemotherapy to hormone therapy to help lower the chance of the cancer coming back.

For women age 50 or younger and have no lymph nodes with cancer:

- **A low score (0-15) means a low risk of recurrence.** Most of these women with low-recurrence scores do not benefit from chemotherapy and have good outcomes when treated with hormone therapy.
- **An intermediate score (16-25) means that some women in this group might have a small benefit from adding chemotherapy to hormone therapy to lower the risk of the cancer coming back.** Talk to your doctor about options.
- **A high score (26-100) means a higher risk of recurrence.** Women with high-recurrence scores are more likely to benefit from the addition of chemotherapy to hormone therapy to help lower the chance of the cancer coming back.

For women age 50 or younger that have cancer in the lymph nodes:

- **A low score (0-25) means a lower risk of recurrence,** but women in this group might have a benefit from adding chemotherapy to hormone therapy. Another

option might be [ovarian suppression along with tamoxifen or an aromatase inhibitor](#)⁶.

- **A high score (26-100) means a higher risk of recurrence.** Women in this group are more likely to benefit from the addition of chemotherapy to hormone therapy to help lower the chance of the cancer coming back.

MammaPrint

The MammaPrint test can be used to help determine how likely breast cancers are to recur in a distant part of the body after treatment. It can be used for any type of invasive breast cancer that's 5cm (about 2 inches) or smaller and has spread to no more than 3 lymph nodes. This test can be done regardless of a woman's age or the cancer's hormone or HER2 status.

The test looks at 70 different genes to determine if the cancer is at low risk or high risk of coming back (recurring) in the next 10 years. The test results come back as either "low risk" or "high risk." This test is also being studied as a way to determine whether certain women might benefit from chemotherapy.

Prosigna

The Prosigna test can be used to predict the risk of recurrence in the next 10 years in women who have gone through menopause (postmenopausal) and whose invasive breast cancers are hormone receptor-positive and HER2-negative. It can be used to test early-stage cancers that have not spread to the lymph nodes, or early-stage cancers with no more than 3 positive lymph nodes.

The test looks at 50 genes and classifies the results as low, intermediate, or high risk.

Breast Cancer Index

The Breast Cancer Index test is done on your tumor sample from when you are first diagnosed. It can be used to predict the risk of recurrence in the 5 to 10 years after diagnosis in women whose invasive breast cancers are hormone receptor-positive and have not spread to nearby lymph nodes or have not spread to more than 3 lymph nodes. **It can also help predict who might benefit from hormone therapy for longer than 5 years.**

The test looks at 11 genes and classifies the results as low or high risk.

Other Breast Cancer Gene, Protein, and Blood Tests

When breast cancer is diagnosed, samples that have been collected during [biopsies¹](#), bloodwork, or other tests are sent to a pathology lab. A pathologist (a doctor who uses lab tests to diagnose diseases such as cancer) will look at the samples and may do

other special tests to help better classify the cancer.

These tests can also help choose certain drugs that might work better for your cancer. This is sometimes called [precision or personalized medicine²](#) because it is precise (or specific) for the features of your cancer.

The results of these tests are described in a pathology report, which is usually available within a week or two. If you have any questions about your pathology results or any diagnostic tests, talk to your doctor. If needed, you can get a second opinion of your pathology report by having your tissue samples sent to a pathologist at another lab.

- [Tests for certain proteins on tumor cells](#)
- [Molecular tests for gene changes](#)
- [Blood tests](#)

Tests for certain proteins on tumor cells

Lab tests might be done to look for certain proteins on the cancer cells.

Hormone receptor proteins: All breast cancers are tested for hormone receptors (proteins). Specifically, the cancer is tested for estrogen receptor (ER) and progesterone receptor (PR). Read more at [Breast Cancer Hormone Receptor Status](#).

HER2 protein: All invasive breast cancers are tested for the HER2 protein to see if too much is being made. If it is not clear how much HER2 protein is present, molecular testing might be done to see how many copies of the *HER2* gene the cancer cells have. For more information about the HER2 gene and protein see [Breast Cancer HER2 Status](#).

PD-L1 protein: People with advanced or metastatic triple-negative breast cancer might have their cancer tissue tested for the **PD-L1** protein, which can show if the cancer is more likely to respond to treatment with certain [immunotherapy³](#) drugs along with chemotherapy.

Molecular tests for gene changes

In some cases, doctors may test for specific gene changes in the breast cancer cells that could mean certain [targeted drugs⁴](#) or immunotherapy drugs might help treat the cancer.

These molecular tests (also known as **genomic tests** or **biomarker tests**) can be done on tissue taken during a biopsy or surgery for breast cancer. If the biopsy sample is too small and all the molecular tests cannot be done, the testing may also be done on blood that is taken from a vein just like a regular blood draw. This blood contains the DNA from dead tumor cells (known as **circulating tumor DNA**, or **ctDNA**). Obtaining the tumor DNA through a blood draw is sometimes called a "liquid biopsy" and can have advantages over a standard needle biopsy, which can carry risks.

Some changes that might be tested for include:

- ***BRCA1 and BRCA2 gene mutations:*** For women with an advanced HER2-negative breast cancer, your doctor might test you (not your cancer cells) for a hereditary *BRCA1* or *BRCA2* mutation⁵ (gene change). If you have one of these gene changes, treatment with the targeted drugs, olaparib (Lynparza) or talazoparib (Talzenna) might be options.
- ***PIK3CA, AKT1, and PTEN gene mutations:*** These 3 genes code for proteins in the same signaling pathway inside cells that can help them grow. Cancer cells sometimes have changes in one of these genes. If you have advanced breast cancer that is hormone receptor-positive and HER2-negative, and if the cancer cells show changes in one of these genes, a targeted drug such as capivasertib (Truqap) or alpelisib (Piqray) might be an option, along with the hormone drug⁶ fulvestrant.
- ***ESR1 gene mutations:*** The *ESR1* gene contains the cell's instructions for the estrogen receptor (ER) protein. Mutations in this gene can make breast cancers less likely to be helped by some forms of hormone therapy. But for advanced breast cancer, the hormone drug elacestrant (Orserdu) may be helpful if the cancer cells have an *ESR1* mutation. This gene change can be tested for in a sample of your blood.
- ***MSI and MMR testing:*** Breast cancer cells might be tested to see if they show high levels of gene changes called microsatellite instability (MSI). Testing might also be done to see if the cancer cells have changes in any of the mismatch repair (MMR) genes (*MLH1*, *MSH2*, *MSH6*, and *PMS2*). Breast cancer cells that have a **high level of microsatellite instability (MSI-H)** or a **defect in a mismatch repair gene (dMMR)** might be treated with the immunotherapy drugs, pembrolizumab (Keytruda) or dostarlimab (Jemperli).
- ***Tumor mutational burden (TMB):*** TMB is a measure of the number of gene mutations (changes) inside the cancer cells. Breast cancer cells that have many gene mutations (a high TMB) might be more likely to be recognized as abnormal and attacked by the body's immune system. If your breast cancer tissue is tested

and found to have a **high TMB (TMB-H)**, treatment with pembrolizumab (Keytruda) might be an option.

- **NTRK gene changes:** Some breast cancer cells might have changes in one of the *NTRK* genes. These gene changes can sometimes lead to cancer growth. Larotrectinib (Vitrakvi) and entrectinib (Rozlytrek) are drugs that target the proteins made by the abnormal *NTRK* genes and might be options for people with advanced breast cancer.

Blood tests

Blood tests are not used to diagnose breast cancer, but they can help to get a sense of a person's overall health. For example, they can be used to help determine if a person is healthy enough to have surgery or certain types of chemotherapy.

A **complete blood count (CBC)** looks at whether your blood has normal numbers of different types of blood cells. For example, it can show if you are anemic (have a low number of red blood cells), if you could have trouble with bleeding (due to a low number of blood platelets), or if you are at increased risk for infections (because of a low number of white blood cells). This test could be repeated regularly during treatment, as many cancer drugs can affect blood-forming cells of the bone marrow.

Blood chemistry tests can help find if some of your organs, such as the liver or kidneys are not working as well. For example, if cancer has spread to the bones, it might cause higher than normal levels of calcium and alkaline phosphatase. If breast cancer spreads to the liver, it can sometimes cause high levels of liver function tests, such as aspartate aminotransferase (AST) or alanine aminotransferase (ALT). Breast cancer does not spread to the kidneys, but if your bloodwork shows your kidneys are not working well, certain chemo drugs, like cisplatin, might not be used.

Breast cancer cells sometimes make substances called **tumor markers** that can be found in the blood. For breast cancer that has spread to other organs, tumor markers that might be checked include carcinoembryonic antigen (CEA), cancer antigen 15-3 (CA 15-3), and cancer antigen 27-29 (CA 27-29). Blood tests for these tumor markers are not used by themselves to diagnose or follow breast cancer.

Imaging Tests to Look for Breast Cancer

Spread

If you have been diagnosed with breast cancer, you might need more **imaging tests**. Your doctor will talk with you about which of these tests you need.

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Imaging tests might be done for a number of reasons including:

- To look at suspicious areas that might be cancer
 - To learn how far cancer might have spread
 - To help determine if treatment is working
 - To look for possible signs of cancer coming back after treatment
-
- [Chest x-ray](#)
 - [Computed tomography \(CT\) scan](#)
 - [Magnetic resonance imaging \(MRI\) scan](#)
 - [Ultrasound](#)
 - [Positron emission tomography \(PET\) scan](#)
 - [Bone scan](#)

Chest x-ray

A [chest x-ray¹](#) may be done to see if the cancer has spread to your lungs.

Computed tomography (CT) scan

A [CT scan²](#) uses x-rays to make detailed cross-sectional images of your body. Instead of taking 1 or 2 pictures, like a regular x-ray, a CT scanner takes many pictures and a computer then combines them to show a slice of the part of your body being studied. This test is most often used to look at the chest and/or belly (abdomen) to see if breast cancer has spread to other organs, like the lungs or liver.

CT-guided needle biopsy: If a suspected area of cancer is deep within your body, a CT scan might be used to guide a biopsy needle into this area to get a tissue sample to check for cancer.

Magnetic resonance imaging (MRI) scan

Like CT scans, [MRI scans](#)³ show detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. This test can be used to look at the breasts or other parts of the body, such as the brain or spinal cord to look for possible cancer spread.

Ultrasound

[Ultrasound](#)⁴ (ultrasonography) uses sound waves to create an image on a video screen. A small microphone-like instrument called a transducer that gives off sound waves is moved over the skin surface and picks up the echoes as they bounce off tissues. A computer turns these echoes into an image on the screen. An ultrasound can be done over a breast or in the underarm area, or even the liver.

Positron emission tomography (PET) scan

For a [PET scan](#)⁵, a slightly radioactive form of sugar (known as FDG) is injected into the blood and collects mainly in cancer cells.

PET/CT scan: Often a PET scan is combined with a CT scan using a special machine that can do both at the same time. This lets the doctor compare areas of higher radioactivity on the PET scan with a more detailed picture on the CT scan.

Bone scan

A [bone scan](#)⁶ can help show if the cancer has spread to your bones. A small amount of low-level radioactive material is injected into the blood and collects mainly in abnormal areas of bone. It can show all of the bones of your body at the same time and can find small areas of cancer spread not seen on plain x-ray.

Breast Cancer Stages

After someone is diagnosed with breast cancer, doctors will try to figure out if it has spread, and if so, how far. This process is called **staging**. The stage of a cancer describes how much cancer is in the body. It helps determine how serious the cancer is and how best to [treat¹](#) it. Doctors also use a cancer's stage when talking about [survival statistics](#).

- [What are the breast cancer stages?](#)
- [How is the stage determined?](#)

- [Details of the TNM staging system](#)
- [Examples using the full staging system](#)

What are the breast cancer stages?

The earliest stage breast cancers are **stage 0 (carcinoma in situ)**. It then ranges from **stage I (1)** through **IV (4)**.

As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV, means cancer has spread more. And within a stage, an earlier letter means a lower stage. Although each person's cancer experience is unique, cancers with similar stages tend to have a similar outlook and are often treated in much the same way.

How is the stage determined?

The staging system most often used for breast cancer is the American Joint Committee on Cancer (AJCC) **TNM system**. The most recent AJCC system, effective January 2018, has both clinical and pathologic staging systems for breast cancer:

- The **pathologic stage** (also called the **surgical stage**) is determined by examining tissue removed during an operation.
- Sometimes, if surgery is not possible right away or at all, the cancer will be given a **clinical stage** instead. This is based on the results of a physical exam, biopsy, and imaging tests. The clinical stage is used to help plan treatment. Sometimes, though, the cancer has spread further than the clinical stage estimates, and may not predict the patient's outlook as accurately as a pathologic stage.

In both staging systems, 7 key pieces of information are used:

- **The extent (size) of the tumor (T):** How large is the cancer? Has it grown into nearby areas?
- **The spread to nearby lymph nodes (N):** Has the cancer spread to nearby lymph nodes? If so, how many?
- **The spread (metastasis) to distant sites (M):** Has the cancer spread to distant organs such as the lungs or liver?
- **Estrogen Receptor (ER) status:** Does the cancer have the protein called an estrogen receptor?
- **Progesterone Receptor (PR) status:** Does the cancer have the protein called a

progesterone receptor?

- **HER2 status:** Does the cancer make too much of a protein called HER2?
- **Grade of the cancer (G):** How much do the cancer cells look like normal cells?

In addition, [Oncotype Dx® Recurrence Score](#) results may also be considered in the stage in certain situations.

Once all of these factors have been determined, this information is combined in a process called **stage grouping** to assign an overall stage. For more information see [Cancer Staging²](#).

Details about the first three factors (the TNM categories) are below. However, the addition of information about ER, PR, and HER2 status along with grade has made stage grouping for breast cancer more complex than for other cancers. Because of this, it is best to ask your doctor about your specific stage and what it means.

Details of the TNM staging system

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced. The categories below use the pathologic (surgical) definitions.

T categories for breast cancer

T followed by a number from 0 to 4 describes the main (primary) tumor's size and if it has spread to the skin or to the chest wall under the breast. Higher T numbers mean a larger tumor and/or wider spread to tissues near the breast.

TX: Primary tumor cannot be assessed.

T0: No evidence of primary tumor.

Tis: Carcinoma in situ (DCIS, or Paget disease of the breast with no associated tumor mass)

T1 (includes T1a, T1b, and T1c): Tumor is 2 cm (3/4 of an inch) or less across.

T2: Tumor is more than 2 cm but not more than 5 cm (2 inches) across.

T3: Tumor is more than 5 cm across.

T4 (includes T4a, T4b, T4c, and T4d): Tumor of any size growing into the chest wall or skin. This includes inflammatory breast cancer.

N categories for breast cancer

N followed by a number from 0 to 3 indicates whether the cancer has spread to lymph nodes near the breast and, if so, how many lymph nodes are involved.

Lymph node staging for breast cancer is based on how the nodes look under the microscope, and has changed as technology has gotten better. Newer methods have made it possible to find smaller and smaller groups of cancer cells, but experts haven't been sure how much these tiny deposits of cancer cells influence outlook.

It's not yet clear how much cancer in the lymph node is needed to see a change in outlook or treatment. This is still being studied, but for now, a deposit of cancer cells must contain at least 200 cells or be at least 0.2 mm across (less than 1/100 of an inch) for it to change the N stage. An area of cancer spread that is smaller than 0.2 mm (or fewer than 200 cells) doesn't change the stage, but is recorded with abbreviations (i+ or mol+) that indicate the type of special test used to find the spread.

If the area of cancer spread is at least 0.2 mm (or 200 cells), but still not larger than 2 mm, it is called a **micrometastasis** (one mm is about the size of the width of a grain of rice). Micrometastases are counted only if there aren't any larger areas of cancer spread. **Areas of cancer spread larger than 2 mm are known to influence outlook and do change the N stage.** These larger areas are sometimes called **macrometastases**, but are more often just called metastases.

NX: Nearby lymph nodes cannot be assessed (for example, if they were removed previously).

N0: Cancer has not spread to nearby lymph nodes.

N0(i+): The area of cancer spread contains fewer than 200 cells and is smaller than 0.2 mm. The abbreviation "i+" means that a small number of cancer cells (called isolated tumor cells) were seen in routine stains or when a special type of staining technique, called *immunohistochemistry*, was used.

N0(mol+): Cancer cells cannot be seen in underarm lymph nodes (even using special stains), but traces of cancer cells were detected using a technique called *RT-PCR*. RT-PCR is a molecular test that can find very small numbers of cancer cells.

N1: Cancer has spread to 1 to 3 axillary (underarm) lymph node(s), and/or cancer is

found in internal mammary lymph nodes (those near the breast bone) on sentinel lymph node biopsy.

N1mi: Micrometastases (tiny areas of cancer spread) in the lymph nodes under the arm. The areas of cancer spread in the lymph nodes are at least 0.2mm across, but not larger than 2mm.

N1a: Cancer has spread to 1 to 3 lymph nodes under the arm with at least one area of cancer spread greater than 2 mm across.

N1b: Cancer has spread to internal mammary lymph nodes on the same side as the cancer, but this spread could only be found on sentinel lymph node biopsy (it did not cause the lymph nodes to become enlarged).

N1c: Both N1a and N1b apply.

N2: Cancer has spread to 4 to 9 lymph nodes under the arm, or cancer has enlarged the internal mammary lymph nodes

N2a: Cancer has spread to 4 to 9 lymph nodes under the arm, with at least one area of cancer spread larger than 2 mm.

N2b: Cancer has spread to one or more internal mammary lymph nodes, causing them to become enlarged.

N3: Any of the following:

N3a: either:

Cancer has spread to 10 or more axillary lymph nodes, with at least one area of cancer spread greater than 2 mm,

OR

Cancer has spread to the lymph nodes under the collarbone (infraclavicular nodes), with at least one area of cancer spread greater than 2 mm.

N3b: either:

Cancer is found in at least one axillary lymph node (with at least one area of cancer spread greater than 2 mm) and has enlarged the internal mammary lymph nodes,

OR

Cancer has spread to 4 or more axillary lymph nodes (with at least one area of cancer spread greater than 2 mm), and to the internal mammary lymph nodes on sentinel lymph node biopsy.

N3c: Cancer has spread to the lymph nodes above the collarbone (supraclavicular nodes) on the same side of the cancer with at least one area of cancer spread greater than 2 mm.

M categories for breast cancer

M followed by a 0 or 1 indicates whether the cancer has spread to distant organs -- for example, the lungs, liver, or bones.

M0: No distant spread is found on x-rays (or other imaging tests) or by physical exam.

cM0(i+): Small numbers of cancer cells are found in blood or bone marrow (found only by special tests), or tiny areas of cancer spread (no larger than 0.2 mm) are found in lymph nodes away from the underarm, collarbone, or internal mammary areas.

M1: Cancer has spread to distant organs (most often to the bones, lungs, brain, or liver) as seen on imaging tests or by physical exam, and/or a biopsy of one of these areas proves cancer has spread and is larger than 0.2mm.

Examples using the full staging system

Because there are so many factors that go into stage grouping for breast cancer, it's not possible to describe here every combination that might be included in each stage. The many different possible combinations mean that two women who have the same stage of breast cancer might have different factors that make up their stage.

Here are 3 examples of how all of the factors listed above are used to determine the pathologic (surgical) breast cancer stage:

Example #1

If the cancer size is between 2 and 5 cm (T2) but it has not spread to the nearby lymph nodes (N0) or to distant organs (M0) **AND** is:

- Grade 3

- HER2 negative
- ER positive
- PR positive

The cancer stage is IB.

Example #2

If the cancer is larger than 5 cm (T3) and has spread to 4 to 9 lymph nodes under the arm or to any internal mammary lymph nodes (N2) but not to distant organs (M0) **AND** is:

- Grade 2
- HER2 positive
- ER positive
- PR positive

The cancer stage is IB.

Example #3

If the cancer is larger than 5 cm (T3) and has spread to 4 to 9 lymph nodes under the arm or to any internal mammary lymph nodes (N2) but not to distant organs (M0) **AND** is:

- Grade 2
- HER2 negative
- ER negative
- PR negative

The cancer stage is IIIB.

These are only 3 examples out of many possible combinations of factors. To understand what your breast cancer stage is, and what it means, talk to your doctor.

Survival Rates for Breast Cancer

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Talk with your doctor, who is familiar with your situation, about how these numbers may apply to you.

- [What is a 5-year relative survival rate?](#)

- [Where do these numbers come from?](#)
- [5-year relative survival rates for breast cancer](#)
- [Understanding the numbers](#)

What is a 5-year relative survival rate?

A **relative survival rate** compares women with the same type and stage of breast cancer to women in the overall population. For example, if the **5-year relative survival rate** for a specific stage of breast cancer is 90%, it means that women who have that cancer are, on average, about 90% as likely as women who don't have that cancer to live for at least 5 years after being diagnosed.

Where do these numbers come from?

The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results (SEER) database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for breast cancer in the United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the breast.
- **Regional:** The cancer has spread outside the breast to nearby structures or lymph nodes.
- **Distant:** The cancer has spread to distant parts of the body such as the lungs, liver or bones.

5-year relative survival rates for breast cancer

These numbers are based on women diagnosed with breast cancer between 2013 and 2019.

SEER Stage	5-year Relative Survival Rate
Localized*	99%
Regional	86%

Distant	31%
All SEER stages combined	91%

*Localized stage only includes invasive cancer. It does not include ductal carcinoma in situ (DCIS).

Understanding the numbers

- **Women now being diagnosed with breast cancer may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on women who were diagnosed and treated at least five years earlier.
- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread, but your age, overall health, how well the cancer responds to treatment, [tumor grade](#), the presence of [hormone receptors](#) on the cancer cells, [HER2 status](#), and other factors can also affect your outlook.
- **Survival rates for women with triple-negative breast cancer are different than those above.** See [Triple-negative Breast Cancer¹](#).
- **Survival rates for women with inflammatory breast cancer are different than those above.** See [Inflammatory Breast Cancer²](#).

Questions to Ask Your Doctor About Breast Cancer

It's important to be able to have frank, open discussions with your cancer care team. They want to answer all of your questions so that you can make informed treatment and life decisions. Here are some questions that you can use to help better understand your cancer and your treatment options.

- When you're told you have breast cancer
- When deciding on a treatment plan
- If you need surgery
- During treatment
- After treatment
- Preparing your list of questions

When you're told you have breast cancer

- Exactly what [type of breast cancer¹](#) do I have?
- How big is the cancer? Where exactly is it?
- Has the cancer spread to my lymph nodes or other organs?
- What is the [stage](#) of my cancer? What does it mean?
- Will I need any other tests before we can decide on treatment?
- Do I need to see any other doctors or health professionals?
- What is the [hormone receptor status](#) of my cancer? What does this mean?
- What is the [HER2 status](#) of my cancer? What does this mean?
- What is the [grade](#) of my cancer? What does this mean?
- How do these factors affect my treatment options and long-term outlook (prognosis)?
- What are my chances of survival, based on my cancer as you see it?

- Should I think about [genetic testing](#)²? What are my testing options? Should I take a home-based genetic test? What would be the reasons for and against testing?
- How do I get a copy of my pathology report?
- If I'm worried about the costs and [insurance coverage](#)³ for my diagnosis and treatment, who can help me?

When deciding on a treatment plan

- How much experience do you have treating this type of cancer?
- Should I get a [second opinion](#)⁴? How do I do that? Will getting a second opinion delay my treatment and can that affect my outcome?
- What are my [treatment](#)⁵ choices?
- What treatment do you recommend and why?
- Should I think about taking part in a [clinical trial](#)⁶?
- What would the goal of the treatment be?
- How soon do I need to start treatment?
- How long will treatment last? What will it be like? Where will it be done?
- Should my biopsy tissue be sent for a [gene expression test](#) to help decide if chemotherapy might be helpful for me?
- Are there other [molecular or protein tests](#) that need to be done on my cancer tissue to help decide my treatment options?
- What should I do to get ready for treatment?
- What risks or side effects are there to the treatments you suggest? Are there things I can do to reduce these side effects?
- How will treatment affect my daily activities? Can I still work fulltime?
- Will I lose my hair? If so, what can I do about it?
- Will I go through menopause as a result of the treatment? Will I be able to have children after treatment? Would I be able to breastfeed?
- Do I have time to freeze my eggs before starting treatment? What are my options?
- What are the chances the cancer will come back (recur) after this treatment?
- What would we do if the treatment doesn't work or if the cancer comes back?
- What if I have transportation problems getting to and from treatment?

If you need surgery

- Is [breast-conserving surgery](#)⁷ (lumpectomy) an option for me? Why or why not?
- What are the positive and negative sides of breast-conserving surgery versus mastectomy?
- How many surgeries like mine have you done?
- Will you have to take out lymph nodes? If so, would you advise a sentinel lymph node biopsy? Why or why not?
- What side effects might lymph node removal cause?
- How long will I be in the hospital?
- Will I have stitches or staples at the surgery site? Will there be a drain (tube) coming out of the site?
- How do I care for the surgery site? Will I need someone to help me?
- What will my breasts look and feel like after my surgery? Will I have normal feeling in them?
- What will the scar look like?
- Is [breast reconstruction surgery](#)⁸ an option if I want it? What would it mean in my case?
- Can I have reconstruction at the same time as the surgery to remove the cancer? What are the reasons for and against having it done right away or waiting until later?
- What types of reconstruction might be options for me?
- Could you recommend a plastic surgeon I could speak to about reconstruction options?
- Will I need a breast form (prosthesis), and if so, where can I get one?
- Do I need to stop taking any medications or supplements before surgery?
- When should I call your office if I'm having side effects or concerns?

During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions may apply to you, but asking the ones that do may be helpful.

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Will I need to change what I eat during treatment?
- Are there any limits on what I can do?
- Can I exercise during treatment? If so, what kind of exercise should I do, and how often?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed?
- Will I need special tests, such as imaging scans or blood tests during treatment? If so, how often?

After treatment

- Will I need a special diet after treatment?
- Are there any limits on what I can do?
- Am I at risk for [lymphedema⁹](#)?
- What can I do to reduce my risk for lymphedema?
- What should I do if I notice swelling in my arm?
- What other symptoms should I watch for? What kind of exercise should I do now?
- What type of follow-up will I need after treatment?
- How often will I need to have follow-up exams, blood tests, or imaging tests?
- How will we know if the cancer has come back? What should I watch for?
- What will my options be if the cancer comes back?

Preparing your list of questions

It's important to be able to have frank, open discussions with your cancer care team. They want to answer all of your questions, so that you can make informed treatment and life decisions.

Not all of these questions will apply to you, but they should help get you started. Be sure to write down some questions of your own. For instance, you might want more information about recovery times or you may want to ask about nearby or online support groups where you can talk with other women going through similar situations. You may also want to ask if you qualify for any [clinical trials¹⁰](#).

Don't be afraid to take notes and tell the doctors or nurses when you don't understand what they're saying. You might want to bring another person with you when you see your doctor and have them take notes to help you remember what was said.

Keep in mind that doctors aren't the only ones who can give you information. Other

health care professionals, such as nurses and social workers, can answer some of your questions.

To find out more about speaking with your health care team, see [The Doctor-Patient Relationship¹¹](#).

Treating Breast Cancer

If you've been diagnosed with breast cancer, your cancer care team will discuss your treatment options with you. It's important that you think carefully about each of your choices and weigh the benefits of each treatment option against the possible risks and side effects.

Local treatments

Some treatments, like surgery and radiation, are **local**, meaning they treat the tumor without affecting the rest of the body.

Most women with breast cancer will have some type of surgery to remove the tumor. Depending on the type of breast cancer and how advanced it is, you might need other types of treatment as well, either before or after surgery, or sometimes both.

- [Surgery for Breast Cancer](#)
- [Radiation for Breast Cancer](#)

Systemic treatments

Drugs used to treat breast cancer are considered **systemic therapies** because they can reach cancer cells almost anywhere in the body. Some can be given by mouth, injected into a muscle, or put directly into the bloodstream. Depending on the type of breast cancer, different types of drug treatment might be used, including:

- [Chemotherapy for Breast Cancer](#)
- [Hormone Therapy for Breast Cancer](#)
- [Targeted Drug Therapy for Breast Cancer](#)
- [Immunotherapy for Breast Cancer](#)

Common treatment approaches

Typically, treatment is based on the type of breast cancer and its stage. Other factors, including your overall health, menopause status, and personal preferences are also taken into account.

[Treatment of Breast Cancer by Stage](#)
[Treatment of Triple-negative Breast Cancer](#)
[Treatment of Inflammatory Breast Cancer](#)
[Treating Breast Cancer During Pregnancy](#)

Who treats breast cancer?

Based on your treatment options, you might have different types of doctors on your treatment team. These doctors could include:

- A **breast surgeon** or **surgical oncologist**: a doctor who uses surgery to treat breast cancer
- A **radiation oncologist**: a doctor who uses radiation to treat cancer
- A **medical oncologist**: a doctor who uses chemotherapy, hormone therapy, immunotherapy, and other medicines to treat cancer
- A **plastic surgeon**: a doctor who specializes in reconstructing or repairing parts of the body

You might have many other specialists on your treatment team as well, including physician assistants (PAs), nurse practitioners (NPs), nurses, psychologists, nutritionists, social workers, patient/nurse navigators, and other health professionals.

- [Health Professionals Who Are Part of a Cancer Care Team](#)

Making treatment decisions

It's important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. It's also very important to ask questions if there's anything you're not sure about.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan

you choose.

- [Questions to Ask Your Doctor About Breast Cancer](#)
- [Breast Reconstruction Surgery](#)
- [Seeking a Second Opinion](#)

Connect with a breast cancer survivor

Reach To Recovery

The American Cancer Society Reach To Recovery® program connects people facing breast cancer – from diagnosis through survivorship – with trained volunteers who are breast cancer survivors. Our volunteers provide one-on-one support through our website and mobile app to help those facing breast cancer cope with diagnosis, treatment, side effects, and more.

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)

Considering complementary and alternative methods

You may hear about alternative or complementary methods to relieve symptoms or treat your cancer that your doctors haven't mentioned. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods are treatments that are used **along with** your regular medical care. **Alternative** treatments are used **instead of** standard medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about

using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Integrative Medicine](#)

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and they can be an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services - including rides to treatment, lodging, and more - to help you get through treatment. Call our Cancer Knowledge Hub at 1-800-227-2345 and speak with one of our caring, trained cancer helpline specialists. Or, if you prefer, you can use our chat feature on cancer.org to connect with one of our specialists.

- [Palliative Care](#)
- [Programs & Services](#)

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors as you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.

Surgery for Breast Cancer

Most women with breast cancer have some type of surgery as part of their treatment. There are different types of breast surgery, and they may be done for different reasons, depending on the situation. For example, surgery may be done to:

- Remove as much of the cancer as possible (breast-conserving surgery or mastectomy)
- Find out whether the cancer has spread to the lymph nodes under the arm (sentinel lymph node biopsy or axillary lymph node dissection)
- Restore the breast's shape after the cancer is removed (breast reconstruction)
- Relieve symptoms of advanced cancer

Your doctor may recommend a certain operation based on your breast cancer features and your medical history, or you may have a choice about which type of surgery to have. It's important to know your options so you can talk about them with your doctor and make the choice that is right for you.

- [Surgery to remove breast cancer](#)
- [Surgery to remove nearby lymph nodes](#)
- [Wire localization to guide surgery](#)
- [Breast reconstruction after surgery](#)
- [Surgery for advanced breast cancer](#)
- [More information about Surgery](#)

Surgery to remove breast cancer

There are two main types of surgery to remove breast cancer:

- **Breast-conserving surgery** is surgery to remove the cancer as well as some surrounding normal tissue. Only the part of the breast containing the cancer is removed. How much breast is removed depends on where and how big the tumor is, as well as other factors. This surgery is also called a lumpectomy, quadrantectomy, partial mastectomy, or segmental mastectomy.
- **Mastectomy** is a surgery in which the entire breast is removed, including all of the breast tissue and sometimes other nearby tissues. There are several different types of mastectomies. Some women may also have both breasts removed in a **double mastectomy**.

Choosing between breast-conserving surgery and mastectomy

Many women with early-stage cancers can choose between having breast-conserving surgery (BCS) and mastectomy. The main advantage of BCS is that a woman keeps most of her breast. But most often, she will also need radiation. Women who have mastectomy for early-stage cancers are less likely to need radiation.

For some women, mastectomy may be a better option or the only option, because of the type of breast cancer, the large size of the tumor, previous treatment with radiation, or certain other factors.

Some women might worry that having a less extensive surgery might raise the risk of the cancer coming back. But studies of thousands of women over more than 20 years show that when BCS is done with radiation, survival is the same as having a mastectomy, in people with early-stage cancer who are candidates for both types of surgery.

Surgery to remove nearby lymph nodes

To find out if the breast cancer has spread to underarm (axillary) lymph nodes, one or more of these lymph nodes will be removed and looked at in the lab. This is important to figuring out the stage (how big and where it has spread) of the cancer. Lymph nodes may be removed either as part of the surgery to remove the breast cancer or as a separate operation.

The two main types of surgery to remove lymph nodes are:

- **Sentinel lymph node biopsy (SLNB)** is a procedure in which the surgeon injects a dye and then removes only the lymph node(s) under the arm that have taken up the dye. These lymph nodes are where the cancer would likely spread first. Removing only one or a few lymph nodes lowers the risk of side effects that can happen after an axillary lymph node dissection (below), such as arm swelling that is also known as lymphedema¹.
- **Axillary lymph node dissection (ALND)** is a procedure that does not use a dye and in which the surgeon removes many (usually less than 20) underarm lymph nodes. ALND is not done as often as it was in the past, but it might still be the best way to look at the lymph nodes in some situations.

To learn more about these procedures, see [Lymph Node Surgery for Breast Cancer](#).

Wire localization to guide surgery

Sometimes, if the cancer in your breast can't be felt, is hard to find, and/or is difficult to get to, the surgeon might use a mammogram or ultrasound to guide a wire to the right spot. This is called **wire localization** or **needle localization**. If a mammogram is used you may hear the term **stereotactic wire localization**. Rarely, an MRI might be used if using the mammogram or ultrasound is not successful.

After medicine is injected into your breast to numb the area, a mammogram or ultrasound is used to guide a thin hollow needle to the abnormal area. Once the tip of the needle is in the right spot, a thin wire is put in through the center of the needle. A small hook at the end of the wire keeps it in place. The needle is then taken out. Once in the operating room, the surgeon uses the wire as a guide to find the part of the breast to be removed.

The surgery done as part of the wire localization may be enough to count as breast-conserving surgery if all of the cancer is taken out and the margins are negative. If cancer cells are found at or near the edge of the removed tissue (also called a **positive or close margin**), more surgery may be needed.

It should be noted that a wire-localization procedure is sometimes used to perform a [surgical biopsy](#)² of a suspicious area in the breast to find out if it is cancer or not.

There are other ways a surgeon can be guided to the tumor, but these techniques are newer and not used in every facility.

Breast reconstruction after surgery

Many woman having surgery for breast cancer might have the option of breast reconstruction. A woman having a mastectomy might want to consider having the breast mound rebuilt to restore the breast's appearance after surgery. In some breast-conserving surgeries, a woman may consider having [fat grafted³](#) into the affected breast to correct any dimples left from the surgery. The options will depend on each woman's situation.

There are several types of reconstructive surgery, but your options depend on your medical situation and personal preferences. You may have a choice between having breast reconstruction at the same time as the breast cancer surgery (**immediate reconstruction**) or at a later time (**delayed reconstruction**).

If you are thinking about having reconstructive surgery, it's a good idea to discuss it with your breast surgeon and a plastic surgeon **before** your mastectomy or BCS. This gives the surgical team time to plan out the treatment options that might be best for you, even if you wait and have the reconstructive surgery later.

To learn about different breast reconstruction options, see [Breast Reconstruction Surgery⁴](#).

Surgery for advanced breast cancer

Although surgery is very unlikely to cure breast cancer that has spread to other parts of the body, it can still be helpful in some situations, either as a way to slow the spread of the cancer, or to help prevent or relieve symptoms from it. For example, surgery might be used:

- When the breast tumor is causing an open wound in the breast (or chest)
- To treat a small number of areas of [cancer metastases⁵](#) in a certain part of the body, such as the brain
- When an area of cancer is pressing on the spinal cord or in a bone that weakens it or causes it to break
- To treat a blockage in the liver
- To provide relief of pain or other symptoms

If your doctor recommends surgery for advanced breast cancer, it's important that you understand if it's to try to cure the cancer or to prevent or treat symptoms.

More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery⁶](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects⁷](#).

Breast-conserving Surgery (Lumpectomy)

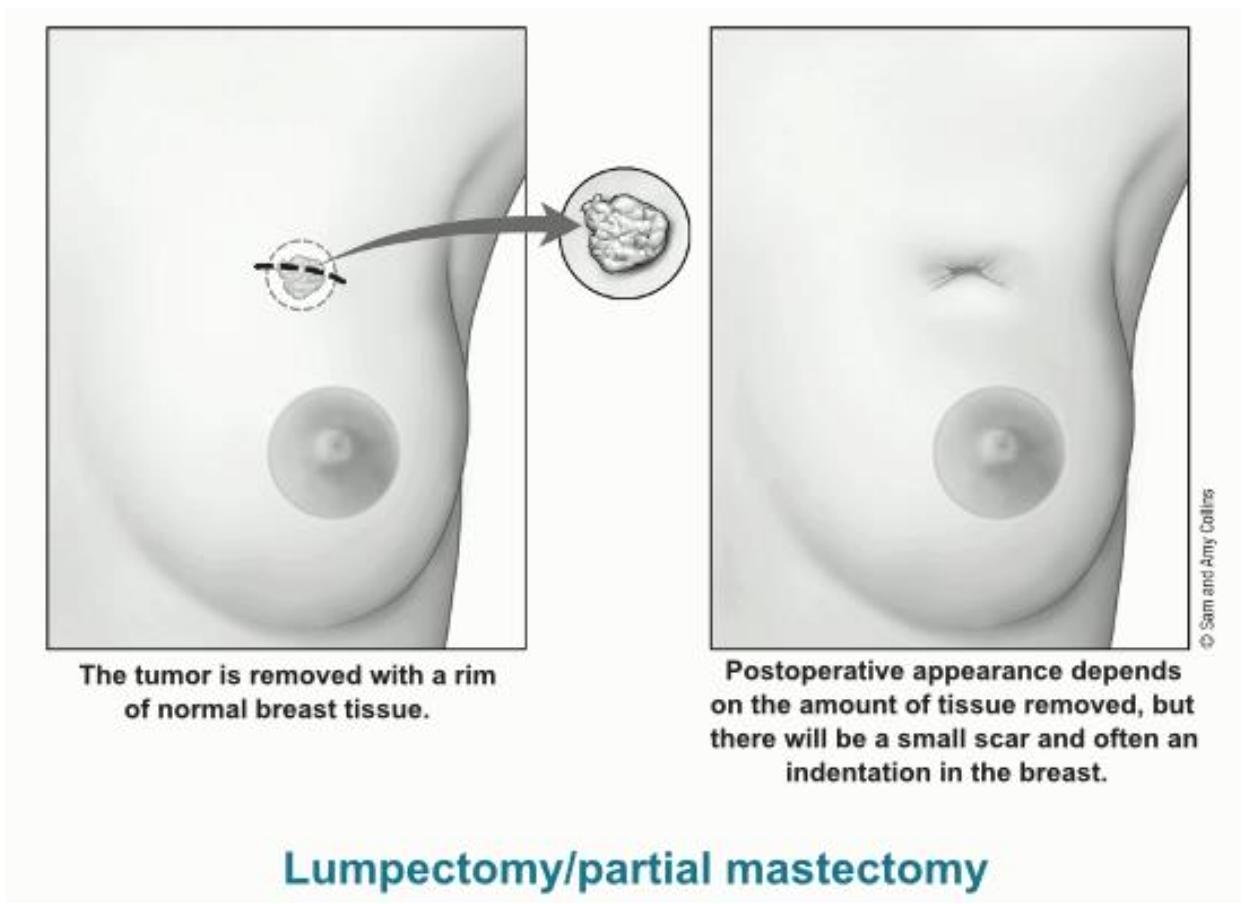
Breast-conserving surgery (BCS) removes the cancer while leaving as much normal breast as possible. Usually, some surrounding healthy tissue and lymph nodes also are removed. Breast-conserving surgery is sometimes called **lumpectomy**, **quadrantectomy**, **partial mastectomy**, or **segmental mastectomy** depending on how much tissue is removed.

- What you should know before having breast-conserving surgery
- Who can have breast-conserving surgery?
- Recovering from breast-conserving surgery
- Possible side effects of breast-conserving surgery
- Was all the cancer removed?
- Breast reconstruction surgery after breast-conserving surgery
- Treatment after breast-conserving surgery

What you should know before having breast-conserving surgery

- How much of the breast is removed depends on the size and location of the tumor, your breast size, and other factors.
- Breast-conserving surgery allows a woman to keep most of her breast, but makes it likely she will also need **radiation**.
- After BCS, most women will have radiation therapy. Some women might also get other treatments, such as **hormone therapy** or **chemotherapy**.

- Choosing BCS plus radiation over mastectomy does not affect a woman's chances of long-term survival.
- If you think you want [breast reconstruction](#)¹, talk to your doctor **before** your breast cancer surgery.
- Not all women with breast cancer can have BCS. Talk to your doctor to find out whether BCS is an option for you.
- Side effects of BCS may include pain, a scar and/or dimple where the tumor was removed, a firm or hard surgical scar, and sometimes [lymphedema](#)², a type of swelling, in the arm.



Lumpectomy/partial mastectomy

Who can have breast-conserving surgery?

Breast-conserving surgery (BCS) is a good option for many women with early-stage cancers. The main advantage is that a woman keeps most of her breast. However, most women will also need radiation therapy, given by a **radiation oncologist** (a doctor who specializes in radiation). Women who have their entire breast removed ([mastectomy](#)) for early-stage cancers are less likely to need radiation, but they may be referred to a

radiation oncologist for evaluation because each patient's cancer is unique.

BCS might be a good option if you:

- Are concerned about losing a breast
- Are willing to have radiation therapy and are able to get to the appointments (if you need help getting to and from your appointments see [Road To Recovery³](#)).
- Have not already had that breast treated with radiation therapy or BCS
- Have only one area of cancer in the breast, or multiple areas in one quadrant (multifocal) that are close enough to be removed together without changing the look of the breast too much
- Have a tumor smaller than 5 cm (2 inches), that is also small relative to the size of the breast
- Are not pregnant or, if pregnant, will not need radiation therapy immediately (to avoid risking harm to the fetus)
- Do not have a gene mutation (change) such as a *BRCA* or *ATM* mutation, which might increase your chance of a second breast cancer
- Do not have certain serious connective tissue diseases such as scleroderma or Sjögren's syndrome, which may make you very sensitive to the side effects of radiation therapy
- Do not have [inflammatory breast cancer⁴](#)
- Do not have positive margins (see Was all the cancer removed? below)

Recovering from breast-conserving surgery

This type of surgery is typically done in an outpatient surgery center, and an overnight stay in the hospital usually is not needed. Most women should be able to function after going home and can often return to their regular activities within 2 weeks. Some women may need help at home depending on how extensive their surgery was.

Ask a member of your health care team to show you how to care for your surgery site and affected arm. Usually, you and your caregiver(s) will get written instructions about care after surgery. These instructions might include:

- How to care for the surgery site and dressing
- How to care for your drain, if you have one (This is a plastic or rubber tube coming out of the surgery site that removes the fluid that collects during healing.)
- How to tell if an infection is starting

- Tips on bathing and showering after surgery
- When to call the doctor or nurse
- When to start using your arm again and how to do [arm exercises](#) to prevent stiffness
- When you can start wearing a bra again
- The use of medicines, including pain medicines and possibly antibiotics
- Any restrictions on activity
- What to expect regarding sensations or numbness in the breast and arm
- What to expect regarding feelings about body image
- When to see your doctor for a follow-up appointment
- Referral to a Reach To Recovery volunteer. Through our [Reach To Recovery program](#)⁵, a specially trained volunteer who has had breast cancer can provide information, comfort, and support.

Possible side effects of breast-conserving surgery

As with all operations, bleeding and infection at the surgery site are possible. Other side effects of breast-conserving surgery can include:

- Pain or tenderness or a "tugging" sensation in the breast
- Temporary swelling of the breast
- Hard scar tissue and/or a dimple that forms at the surgical site
- Swelling of the breast from a collection of fluid (seroma) that might need to be drained
- Change in the shape of the breast
- Neuropathic (nerve) pain (sometimes described as burning or shooting pain) in the chest wall, armpit, and/or arm that doesn't go away over time. This can also happen in mastectomy patients and is called [post-mastectomy pain syndrome](#)⁶ or PMPS.
- If [axillary lymph nodes are also removed](#), other side effects such as [lymphedema](#)⁷ may occur.

Was all the cancer removed?

During BCS, the surgeon will try to remove all the cancer, plus some surrounding normal tissue. This can sometimes be difficult depending on where the cancer is located in your breast.

After surgery, a doctor, called a pathologist, will look closely at the tissue that was removed in the lab. If the pathologist finds no invasive cancer cells at any of the edges of the removed tissue, it is said to have **negative** or clear margins. For women with DCIS, at least 2mm (0.08 inches) of normal tissue between the cancer and the edge of the removed tissue is preferred. If DCIS cancer cells are found near the edges of the tissue (within the 2mm), it is said to have a **close** margin. If cancer (invasive or DCIS) cells are found at the edge of the tissue, it is said to have a **positive** margin.

Having a **positive** margin means that some cancer cells may still be in the breast after surgery, so the surgeon often needs to go back and remove more tissue. This operation is called a **re-excision**. If cancer cells are still found at the edges of the removed tissue after the second surgery, a mastectomy might be needed.

Breast reconstruction surgery after breast-conserving surgery

Before your surgery, talk to your breast surgeon about how breast-conserving surgery might change the look of your breast. The larger the portion of breast removed, the more likely it is that you will see a change in the shape of the breast afterward. If your breasts look very different after surgery, it may be possible to have some type of [reconstructive surgery](#)⁸ or to have the size of the unaffected breast reduced to make the breasts more symmetrical (even). It may even be possible to have this done during the initial surgery. It's very important to talk with your doctor (and possibly a plastic surgeon) **before** the cancer surgery to get an idea of how your breasts are likely to look afterward, and to learn about your options.

Treatment after breast-conserving surgery

Most women will need radiation therapy to the breast after breast-conserving surgery. Sometimes, to make it easier to aim the radiation, small metallic-like clips (which will show up on x-rays) may be placed inside the breast during surgery to mark the area where the cancer was removed.

Many women will have hormone therapy after surgery to help lower the risk of the cancer coming back. Some women might also need chemotherapy after surgery. If so, radiation therapy and hormone therapy are usually delayed until the chemotherapy is completed.

Mastectomy

Mastectomy is breast cancer surgery that removes the entire breast.

A mastectomy might be done:

- When a woman cannot be treated with [breast-conserving surgery \(lumpectomy\)](#), which saves most of the breast.
 - If a woman chooses mastectomy over breast-conserving surgery for personal reasons.
 - For women at very high risk of getting a second breast cancer who sometimes choose to have a double mastectomy (the removal of both breasts).
-
- [Types of mastectomies](#)
 - [Who might get a mastectomy?](#)
 - [Breast reconstruction surgery after mastectomy](#)
 - [Going flat](#)
 - [Recovering from a mastectomy](#)
 - [Possible side effects of mastectomy](#)
 - [Treatment after mastectomy](#)

Types of mastectomies

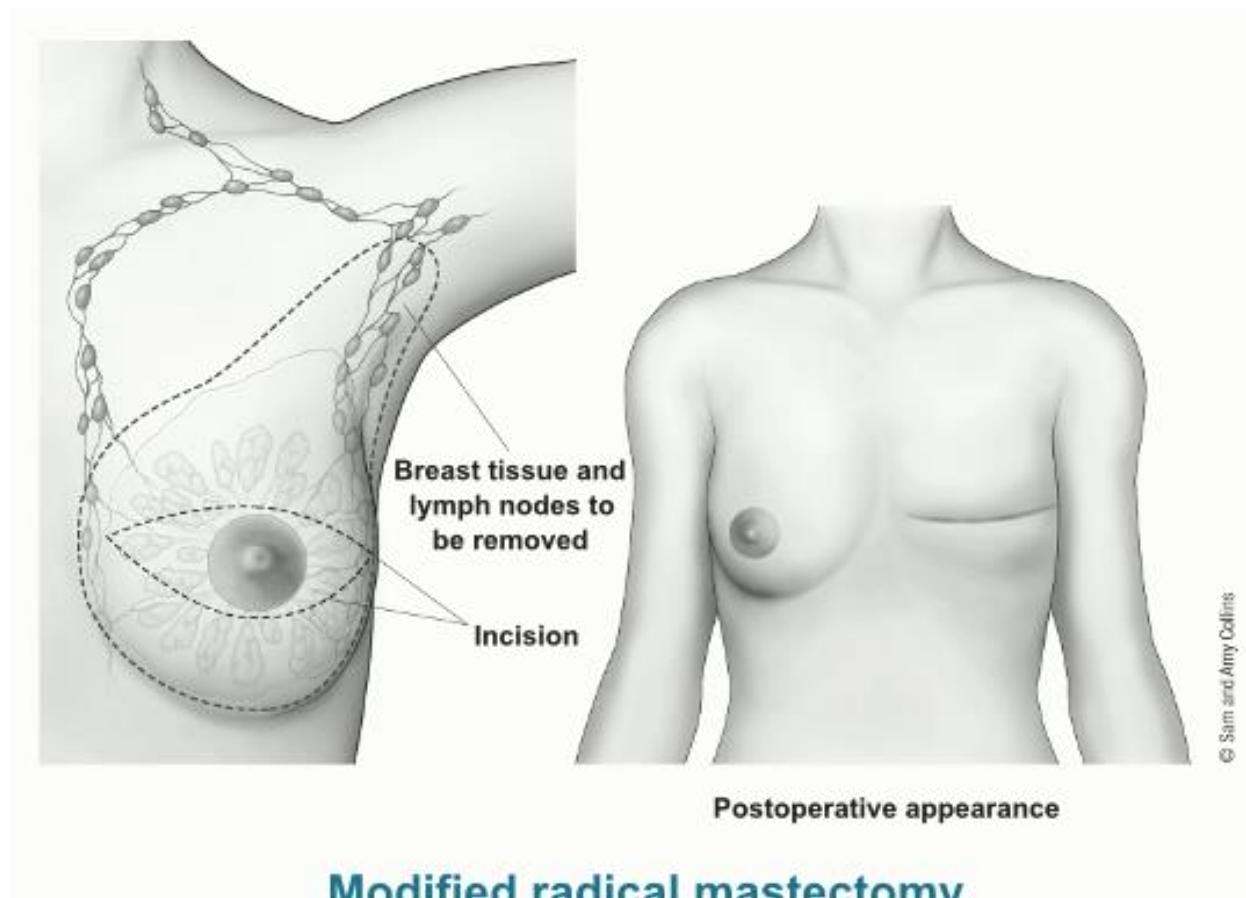
There are several different types of mastectomies, based on how the surgery is done and how much tissue is removed.

Simple (or total) mastectomy

In this procedure, the surgeon removes the entire breast, including the nipple, areola, fascia (covering) of the pectoralis major muscle (main chest muscle), and skin. A few underarm lymph nodes might be removed as part of a [sentinel lymph node biopsy](#) depending on the situation. Most women, if they are hospitalized, can go home the next day.

Modified radical mastectomy

A modified radical mastectomy combines a simple mastectomy with the removal of the lymph nodes under the arm (called an [axillary lymph node dissection](#)).



Modified radical mastectomy

Radical mastectomy

This extensive surgery is rarely done now. The surgeon removes the entire breast, axillary (underarm) lymph nodes, and the pectoral(chest wall) muscles under the breast. This surgery was once very common, but less extensive surgery (such as the modified

radical mastectomy) has been found to be just as effective and with fewer side effects. This operation might be done if the tumor is growing into the pectoral muscles.

Skin-sparing mastectomy

In this procedure, most of the skin over the breast is left place. Only the breast tissue, nipple, and areola are removed. The amount of breast tissue removed is the same as with a simple mastectomy. Implants or tissue from other parts of the body can be used during the surgery to [reconstruct the breast](#)¹.

Many women prefer a skin-sparing mastectomy because it offers the advantage of less scar tissue and a reconstructed breast that seems more natural. But it may not be suitable for larger tumors or those that are close to the surface of the skin.

The risk of local cancer recurrence with this type of mastectomy is the same as with other types of mastectomies.

Experts recommended that skin-sparing mastectomies be done by a team of breast surgeons with a lot of experience in this procedure.

Nipple-sparing mastectomy

A nipple-sparing mastectomy is similar to a skin-sparing mastectomy in that the breast tissue is removed and the breast skin is saved. But in this procedure, the nipple and areola are left in place. This can be followed by breast reconstruction. The surgeon often removes the breast tissue under the nipple and areola during the procedure to check for cancer cells. If cancer is found in this tissue, the nipple and areola must be removed.

This type of mastectomy is more often an option for women who have a small, early-stage cancer, away (more than 2cm) from the nipple and areola, with no signs of cancer in the skin or the nipple.

As with any surgery, there are risks. After the surgery, the nipple may not have a good blood supply, causing the tissue to shrink or become deformed. Because the nerves are also cut, there often may be little or no feeling left in the nipple. If a woman has larger breasts, the nipple may look out of place after the breast is reconstructed. As a result, many doctors feel that this surgery is best done in women with small to medium sized breasts. This procedure leaves fewer scars you can see, but it also has a risk of leaving behind more breast tissue than other forms of mastectomy. This could result in a higher risk of cancer developing than for a skin-sparing or simple mastectomy. However,

improvements in technique have helped lower this risk and the risk of cancer coming back in the same area is about the same as with other types of mastectomies. Most experts consider nipple-sparing mastectomy to be an acceptable treatment for breast cancer in certain cases.

As with a skin-sparing mastectomy, experts also recommended that this type of mastectomy be done by a team of breast surgeons with a lot of experience with this procedure.

Double mastectomy

When both breasts are removed, it is called a **double (or bilateral) mastectomy**. Double mastectomy is sometimes done as a risk-reducing (or preventive) surgery for women at very high risk for getting breast cancer, such as those with a *BRCA* gene mutation. Most of these mastectomies are simple mastectomies, but some may be nipple-sparing. There are other situations where a double mastectomy might be done as part of a women's breast cancer treatment plan. This is done after careful consideration and discussion between the patient and their cancer care team.

Who might get a mastectomy?

Many women with early-stage cancers can choose between breast-conserving surgery (BCS) and mastectomy. You may prefer mastectomy as a way to "take out all the cancer as quickly as possible." But the fact is that in most cases, mastectomy does not give you any better chance of long-term survival compared to BCS. Studies of thousands of women over more than 20 years show that when BCS is done along with radiation, the outcome is the same as having a mastectomy.

Mastectomy might be recommended if you:

- Are unable to have radiation therapy
- Would prefer more extensive surgery instead of having radiation therapy
- Have had the breast treated with radiation therapy in the past
- Have already had BCS with re-excision(s) that did not completely remove the cancer
- Have two or more areas of cancer in different quadrants of the same breast (multicentric) that are not close enough to be removed together without changing the look of the breast too much
- Have a tumor larger than 5 cm (2 inches) across, or a tumor that is large relative to your breast size

- Are pregnant and would need radiation therapy while still pregnant (risking harm to the fetus)
- Have a genetic factor such as a *BRCA* mutation, which might increase your chance of a second cancer
- Have a serious connective tissue disease such as scleroderma or lupus, which may make you especially sensitive to the side effects of radiation therapy
- Have inflammatory breast cancer

For women who are worried about breast cancer coming back, it is important to understand that having a mastectomy instead of breast-conserving surgery plus radiation **only** lowers your risk of developing a second breast cancer in the same breast. It does not lower the chance of the cancer coming back in other parts of the body, including the opposite breast.

Breast reconstruction surgery after mastectomy

After having a mastectomy a woman might want to consider having the breast mound rebuilt to restore the breast's appearance. This is called [breast reconstruction](#)². Although each case is different, most mastectomy patients can have reconstruction. Reconstruction can be done at the same time as the mastectomy or sometime later.

If you are thinking about having reconstructive surgery, it's a good idea to discuss it with your surgeon and a plastic surgeon before your mastectomy. This allows the surgical teams to plan the treatment that's best for you, even if you wait and have the reconstructive surgery later. Insurance companies typically cover breast reconstruction, but you should check with your insurance company so you know what is covered.

Going flat

Some women [choose not to have reconstructive surgery](#)³. Wearing a breast prosthesis (breast form) is an option for women who want to have the shape of a breast under their clothes without having surgery. Some women are also comfortable with just '[going flat](#)'⁴. Going flat involves a procedure called **aesthetic flat closure or flat closure**. A flat closure means the extra fat, skin, and other tissue in the breast area are removed and the leftover tissue is tightened and smoothed out to flatten the chest wall.

Recovering from a mastectomy

In general, women having a mastectomy stay in the hospital for 1 or 2 nights and then go home. How long it takes to recover from surgery depends on what procedures were done, and some women may need help at home. Most women should be fairly functional after going home and can often return to their regular activities within about 4 weeks. Recovery time is longer if breast reconstruction was also done, and it can take months to return to full activity after some procedures.

Ask your health care team how to care for your surgery site and arm. Usually, you and your caregivers will get written instructions about care after surgery. These instructions typically cover:

- How to care for the surgery site and dressing
- How to care for your drain, if you have one (this is a plastic or rubber tube coming out of the surgery site attached to a soft rubber ball that collects the fluid that occurs during healing)
- How to tell if an infection is starting
- Bathing and showering after surgery
- When to call the doctor or nurse
- When to start using your arm again and how to do [arm exercises](#) to prevent stiffness
- When you can start wearing a bra again
- When to begin using a prosthesis and what type to use
- Use of medicines, including pain medicines and possibly antibiotics
- Any restrictions on activity
- What to expect regarding sensations or numbness in the breast and arm
- What to expect regarding feelings about body image
- When to see your doctor for a follow-up appointment
- Referral to a Reach To Recovery volunteer. Through our [Reach To Recovery program⁵](#), a specially trained volunteer who has had breast cancer and can provide information, comfort, and support.

Possible side effects of mastectomy

Bleeding and infection at the surgery site are possible with all operations. The side effects of mastectomy can depend on the type of mastectomy you have (complex surgeries tend to have more side effects). Side effects can include:

- Pain or tenderness at the surgery site

- Swelling at the surgery site
- Buildup of blood in the wound (hematoma)
- Buildup of clear fluid in the wound (seroma)
- Limited arm or shoulder movement
- Numbness in the chest or upper arm
- Neuropathic (nerve) pain (sometimes described as burning or shooting pain) in the chest wall, armpit, and/or arm that doesn't go away over time. It is also called [post-mastectomy pain syndrome or PMPS⁶](#).
- If axillary lymph nodes are also removed, other side effects such as [lymphedema⁷](#) may occur.

Treatment after mastectomy

Some women might get other treatments after a mastectomy, such as [hormone therapy](#) to help lower the risk of the cancer coming back. Some women might also need [chemotherapy](#), or [targeted therapy](#) after surgery. If so, [radiation therapy](#) and/or hormone therapy is usually delayed until the chemotherapy is completed. Talk to your doctor about what to expect.

Lymph Node Surgery for Breast Cancer

If breast cancer spreads, it typically goes first to nearby [lymph nodes¹](#) under the arm. It can also sometimes spread to lymph nodes near the collarbone or near the breast bone (the front center of the chest). Knowing if the cancer has spread to your lymph nodes helps doctors find the best way to treat your cancer.

If you have been diagnosed with breast cancer, it's important to find out [how far the cancer has spread²](#). To help find out if the cancer has spread outside the breast, one or more of the lymph nodes under the arm (axillary lymph nodes) are removed and checked in the lab.

This is an important part of staging. If the lymph nodes have cancer cells, there is a higher chance that cancer cells have also spread to other parts of the body. More imaging tests might be done if this is the case.

Lymph node removal can be done in different ways, depending on whether any lymph nodes are enlarged, how big the breast tumor is, and other factors.

- [Biopsy of an enlarged lymph node](#)
- [Types of lymph node surgery](#)
- [Side effects of lymph node surgery](#)

Biopsy of an enlarged lymph node

If any of the lymph nodes under the arm or around the collarbone are swollen, they may be checked for cancer with a needle [biopsy³](#), either a fine needle aspiration (FNA) or a core needle biopsy. Less often, the enlarged node is removed with surgery. If cancer is found in the lymph node, more nodes will need to be removed (see below).

Types of lymph node surgery

Even if the nearby lymph nodes are not enlarged, they will still need to be checked for cancer. This can be done in two ways:

- Most often, a **sentinel lymph node biopsy (SLNB)** is done, during which only a few lymph nodes are removed.
- In some cases, an **axillary lymph node dissection (ALND)**, which removes more lymph nodes, might be needed.

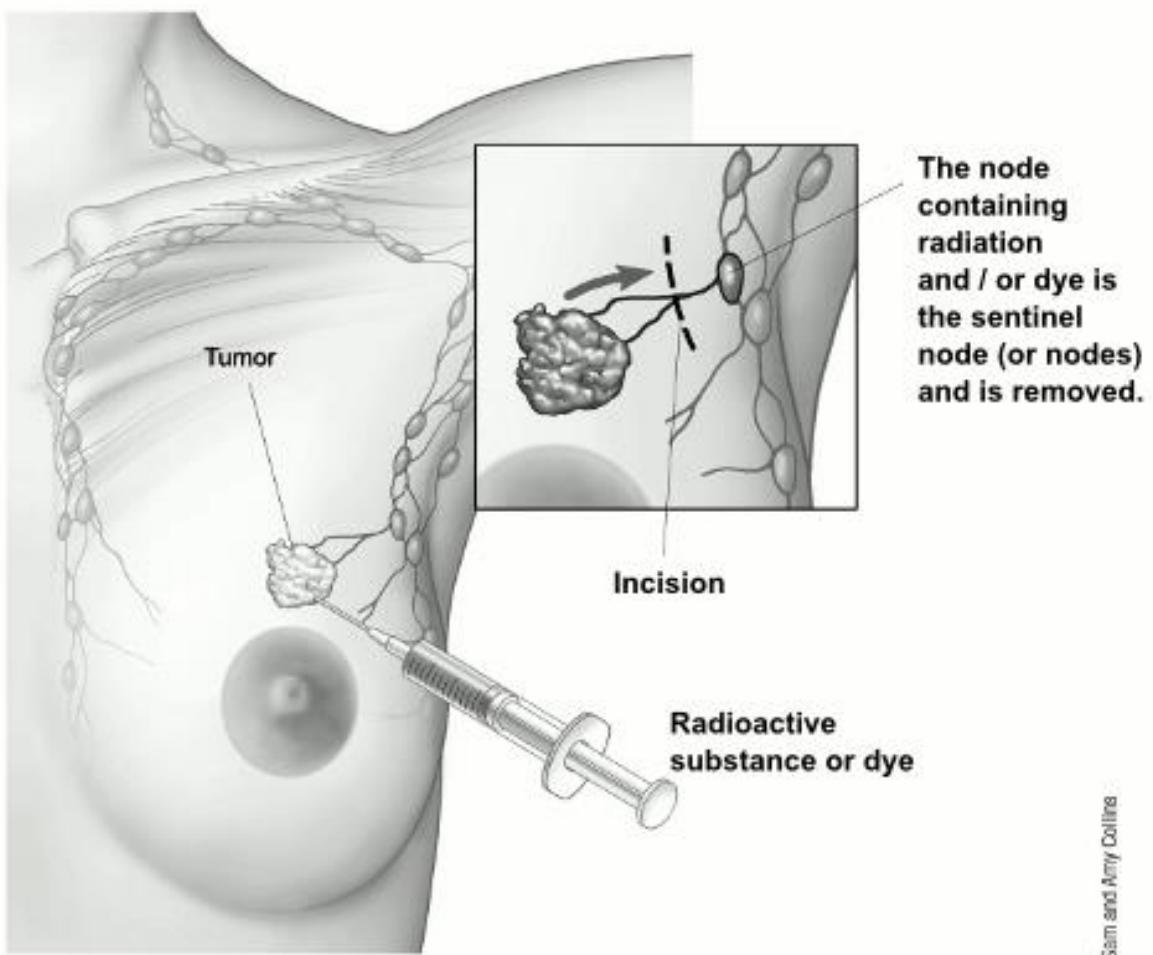
Lymph node surgery is often done as part of the main surgery to remove the breast cancer, but sometimes it might be done as a separate operation.

Sentinel lymph node biopsy

In a sentinel lymph node biopsy (SLNB), the surgeon finds and removes the first lymph node(s) to which a cancer is likely to spread (called the **sentinel nodes**). To do this, a substance is injected into the tumor, the area around it, or the area around the nipple. This can be done with either:

- A radioactive substance and/or a blue dye, OR
- A liquid containing coated iron oxide particles

Lymph vessels will carry these substances along the same path that the cancer would likely take. The first lymph node(s) the substance travels to will be the sentinel node(s).



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Sentinel lymph node biopsy

After the substance has been injected, the sentinel node(s) can be found by:

- Using a special machine to detect either radioactivity or iron oxide particles in the nodes
- Looking for nodes that have turned blue (or brown, if iron oxide particles are used)

Sometimes, both methods are used.

The surgeon cuts the skin over the lymph node area and removes the affected node(s).

The few removed lymph nodes are then checked closely in the lab for cancer cells by a pathologist. Sometimes, this is done during the surgery. Because there is a chance that

other lymph nodes in the same area will also have cancer if cancer is found in the sentinel lymph node(s), the surgeon may go ahead with an axillary dissection (ALND) to remove more lymph nodes while you are still on the operating table. If no cancer cells are seen in the node(s) at the time of the surgery, or if they are not checked by a pathologist at the time of the surgery, they will be examined more closely over the next several days.

If cancer is found in the sentinel node(s) later, the surgeon may recommend an ALND at a later time to check more nodes for cancer. Studies have shown, however, that in some cases it may be safe to leave the rest of the lymph nodes behind. This is based on certain factors, such as the size of the breast tumor, what type of surgery is used to remove the tumor, and what treatment is planned after surgery, among other things.

Based on the studies that have looked at this, skipping the ALND may be an option for:

- Women with breast tumors 5 cm (about 2 inches) across or smaller who have no more than 2 positive sentinel lymph nodes, are having breast-conserving surgery followed by radiation, and did not get any chemotherapy before surgery.
- Women who have lymph nodes with a very small amount of cancer (no more than 2 mm) and are having a [mastectomy](#).

If there is no cancer in the sentinel node(s), it's very unlikely that the cancer has spread to other lymph nodes, so no further lymph node surgery will be needed.

SLNB is often considered for women with early-stage breast cancer and is typically not used for women with inflammatory breast cancer. It might be used for women with locally advanced breast cancer in certain instances, such as after neoadjuvant treatment.

Although SLNB has become a common procedure, it requires a great deal of skill. It should be done only by a surgeon who has experience with this technique. If you are offered this type of biopsy, ask your surgeon if they do them regularly.

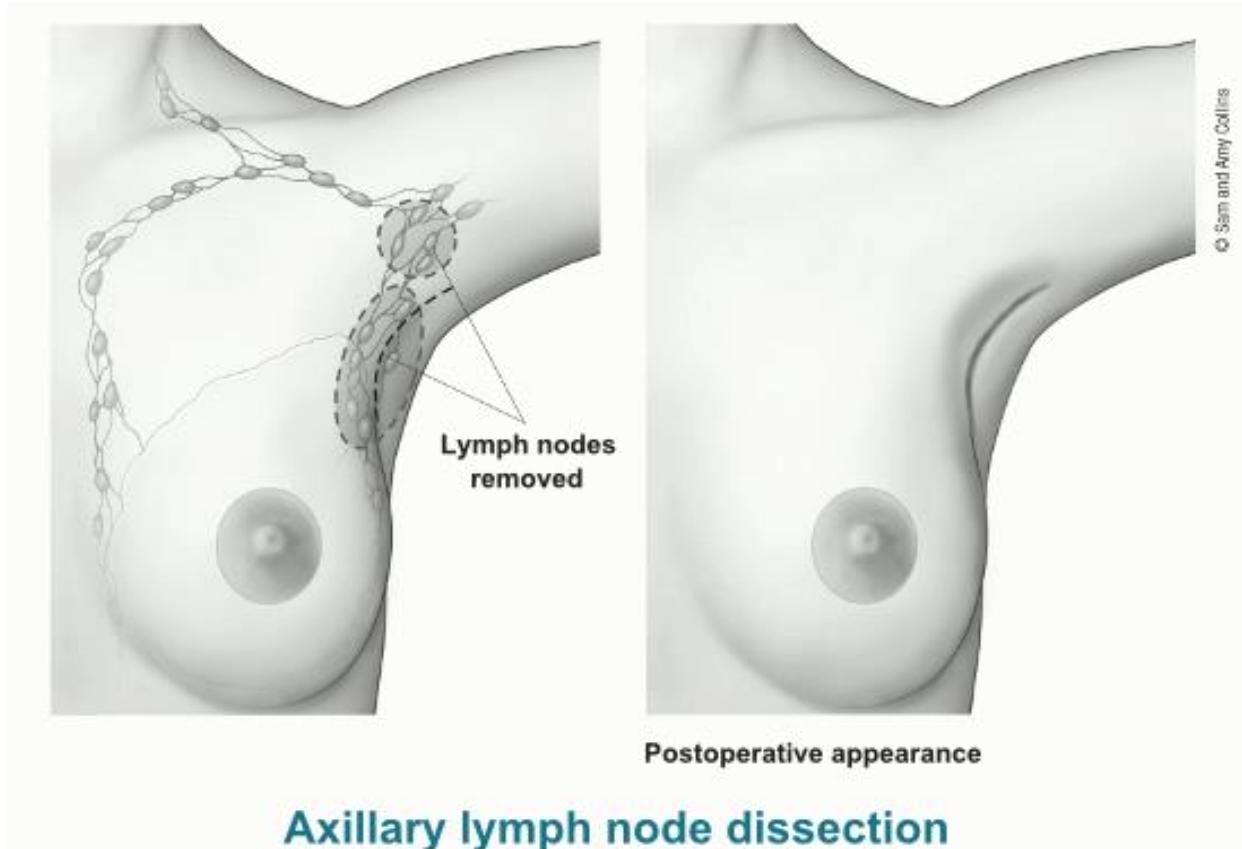
Axillary lymph node dissection (ALND)

In this procedure, anywhere from about 10 to 40 (though usually less than 20) lymph nodes are removed from the area under the arm (axilla) and checked for cancer spread. ALND is usually done at the same time as a mastectomy or [breast-conserving surgery \(BCS\)](#), but it can be done in a second operation. ALND may be needed:

- If a previous SLNB has shown 3 or more of the underarm lymph nodes have cancer

cells

- If swollen underarm or collarbone lymph nodes can be felt before surgery or seen on imaging tests and a FNA or core needle biopsy shows cancer
- If the cancer has grown large enough to extend outside the lymph node(s)
- If the SLNB is positive for cancer cells after chemotherapy was given to shrink the tumor before surgery



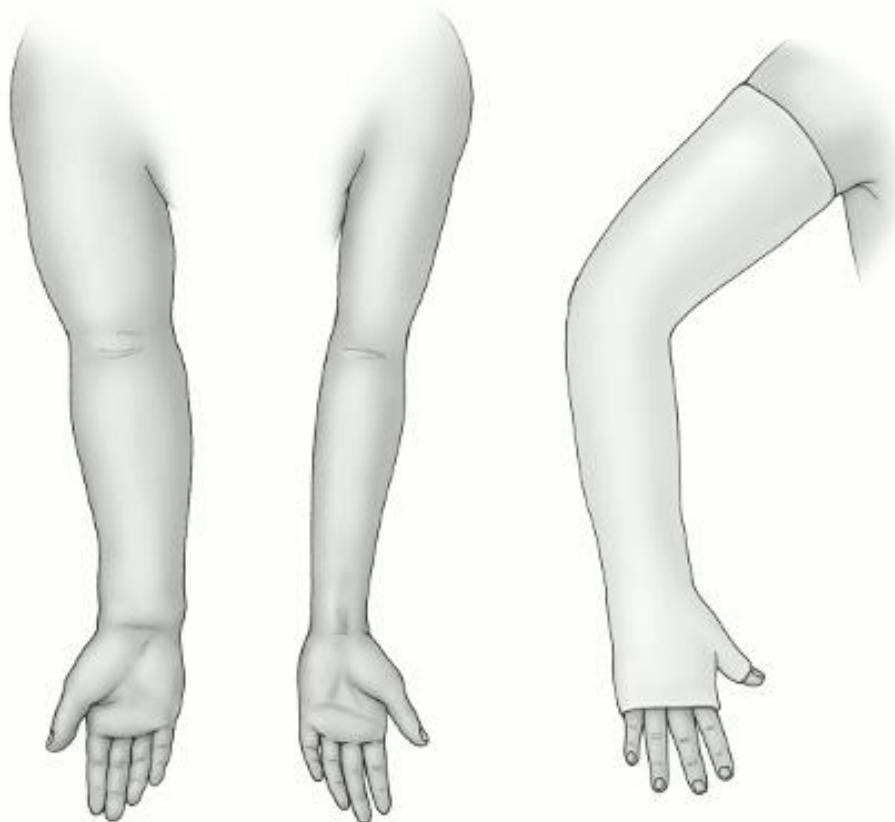
Axillary lymph node dissection

Side effects of lymph node surgery

After lymph node surgery, [pain⁴](#), swelling, bleeding, blood clots, and [infection⁵](#) are possible.

Lymphedema

A possible long-term effect of lymph node surgery is swelling in the arm or chest called [lymphedema⁶](#). Because any excess fluid in the arms normally travels back into the bloodstream through the lymph system, removing the lymph nodes sometimes blocks drainage from the arm, causing this fluid to build up.



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Left, an arm showing lymphedema swelling beside an unaffected arm. Right, a compression garment used to help control lymphedema.

Lymphedema is less common after a sentinel lymph node biopsy (SLNB) than an axillary lymph node dissection (ALND). The risk is thought to be in the range of 5% to 17% in women who have a SLNB and around 20% to 30% in women who have an ALND. It may be more common if radiation is given after surgery or in women who are obese. Sometimes the swelling lasts for only a few weeks and then goes away. But in some women, it lasts a long time. If your arm is swollen, tight, or painful after lymph node surgery, be sure to tell someone on your cancer care team right away.

Limited arm and shoulder movement

You might also have **limited movement in your arm and shoulder** after surgery. This is more common after ALND than SLNB. Your doctor may advise [exercises](#) to help keep you from having long-lasting problems (a frozen shoulder).

Some women notice a rope-like structure that begins under the arm and can extend down toward the elbow. This is sometimes called **axillary web syndrome** or **lymphatic**

cording. It is more common after ALND than SLNB. Symptoms may not appear for weeks or even months after surgery. It can cause pain and limit movement of the arm and shoulder. This often goes away without treatment, although some women may find physical therapy helpful.

Numbness

Numbness of the skin on the upper, inner arm is a common side effect because the nerve that controls sensation (feeling) here travels through the lymph node area.

Exercises After Breast Cancer Surgery

This information was developed with assistance from the Oncology Section of the American Physical Therapy Association.

Women with breast cancer often are treated with some kind of surgery which can include:

- Surgical breast biopsy
- Lymph node removal
- Breast- conserving surgery (lumpectomy)

- Mastectomy
- Breast reconstruction

Any of these can affect how well you can move your shoulder and arm or go about your daily activities, like dressing, bathing, and combing your hair. Pain and stiffness can cause weakness and limit movement of your arm and shoulder.

- Exercises can help get movement back
- The week after surgery
- General guidelines for these exercises
- Things to keep in mind after breast surgery
- Other kinds of exercise

Exercises can help get movement back

No matter what type of surgery you have, it's important to do exercises afterward to get the arm and shoulder moving again. Exercises help decrease side effects of your surgery and help you get back to your usual activities.

If you've had radiation therapy after surgery, exercises are even more important to help keep your arm and shoulder flexible. Radiation may affect your arm and shoulder long after treatment is finished. Because of this, it's important to develop a regular habit of doing exercises to maintain arm and shoulder mobility after radiation treatments for breast cancer.

It's very important to talk with your doctor before starting any exercises so that you can decide on a program that's right for you. Your doctor might suggest you see a physical therapist or occupational therapist, or a cancer exercise specialist certified by the American College of Sports Medicine. These health professionals are specially trained to design an exercise program just for you. You might need this kind of help if you do not have full use of your arm within 3 to 4 weeks of surgery.

Some exercises should not be done until drains and sutures (stitches) are removed, but others can be done soon after surgery. The exercises that increase your shoulder and arm motion can usually be started in a few days. Exercises to help make your arm stronger are added later.

Here are some of the more common exercises that women do after breast surgery. Talk to your doctor or therapist about which of these are right for you and when you should start doing them. Do not start any of these exercises without talking to your doctor first.

The week after surgery

The tips and exercises listed below should be done for the first 3 to 7 days after surgery.
Do not do them until you get the OK from your doctor.

- Use your affected arm (on the same side as your surgery) as you normally would when you comb your hair, bathe, get dressed, and eat. Be sure to ask your doctor if you can lift heavier items.
- Raise your arms up to shoulder height, or whatever height you can without pulling on your drains, and lower them again a few times. Repeat this 3 or 4 times a day. These exercises help move lymph fluid out of your arm and help restore movement.
- You can exercise your affected arm while it's raised. There are a few ways to do this. With your arm raised, open and close your hand 15 to 25 times. Next, bend and straighten your elbow several times. You can also bend your elbow and touch the shoulder on the same side a few times, then the shoulder on the opposite side a few times.
- Practice deep breathing exercises (using your diaphragm) at least 6 times a day. Lie down on your back and take a slow, deep breath. Breathe in as much air as you can while trying to expand your chest and abdomen (push your belly button away from your spine). Relax and breathe out. Repeat this 4 or 5 times. This exercise will help maintain normal movement of your chest, making it easier for your lungs to work. Do deep breathing exercises often.

General guidelines for these exercises

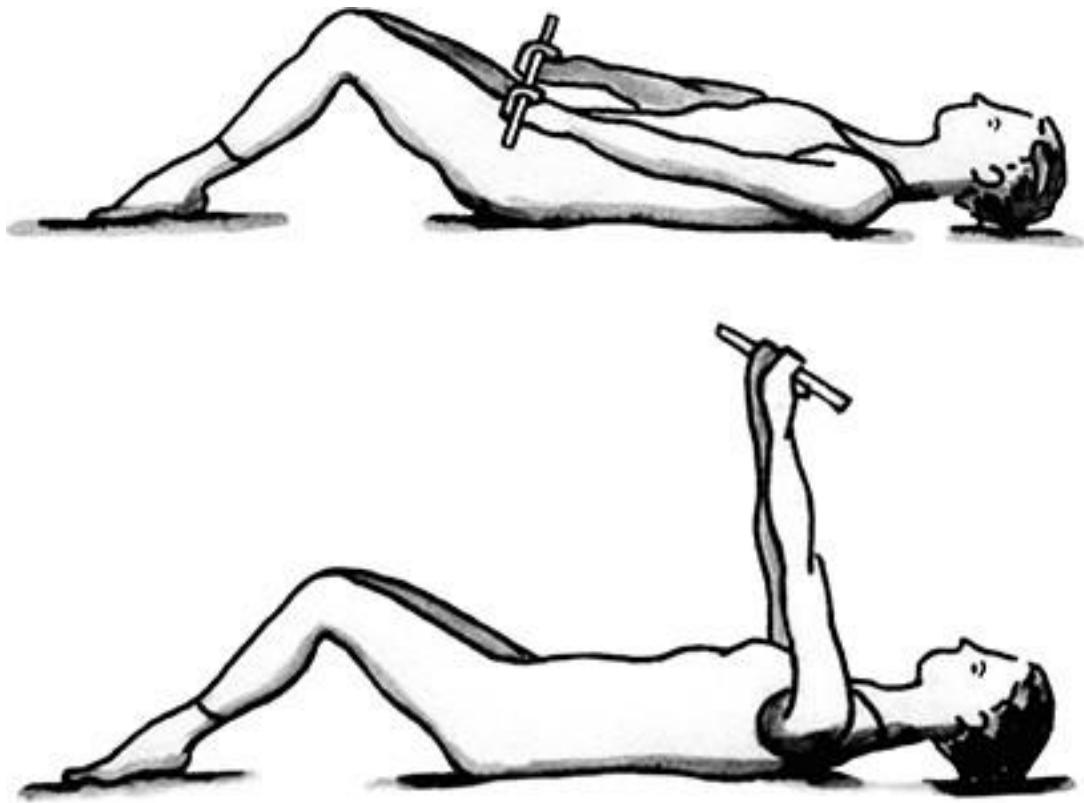
The exercises described here can be done as soon as your doctor says it's OK. They're usually started a week or more after surgery. Be sure to talk to your doctor before trying any of them. Here are some things to keep in mind after breast surgery:

- You might feel some tightness in your chest and armpit after surgery. This is normal, and the tightness should decrease as you do your exercises. If it doesn't, call your doctor.
- Many women have burning, tingling, numbness, or soreness on the back of the arm and/or on the chest wall. This is because the surgery can irritate some of your nerves. These feelings might increase a few weeks after surgery. But keep doing your exercises unless you notice unusual swelling or tenderness. (If this happens, let your doctor know about it right away.) Sometimes rubbing or stroking the area with your hand or a soft cloth can help make the area less sensitive.

- It may be helpful to exercise after a warm shower when muscles are warm and relaxed.
- Wear comfortable, loose clothing when doing the exercises.
- Do the exercises slowly until you feel a gentle stretch. Hold each stretch at the end of the motion and slowly count to 5. It's normal to feel some pulling as you stretch the skin that has been shortened because of the surgery. Do not bounce or make any jerky movements when doing any of the exercises. You should not feel pain as you do them, only gentle stretching.
- Do each exercise 5 to 7 times. Try to do each exercise correctly. Tell your cancer care team if you have trouble doing them . You may need to be referred to a physical or occupational therapist.
- Do the exercises twice a day until you get back your normal flexibility. Continuing to do some exercises during the months after surgery can help you keep moving.
- Be sure to take deep breaths, in and out, as you do each exercise.
- The exercises are set up so that you start them first lying down, then sitting, and finish them standing up.

Here are some of the more common exercises that women do after breast surgery. Talk to your doctor or therapist about which of these are right for you and when you should start doing them. Do not start any of these exercises without talking to your doctor first.

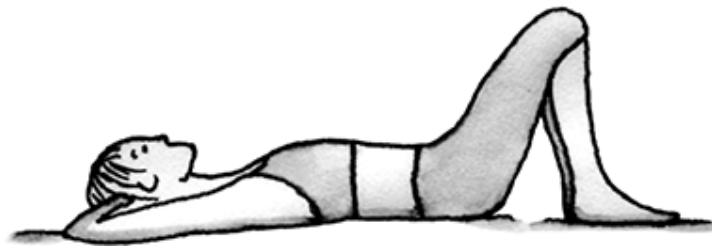
Wand exercise



This exercise helps increase your ability to move your shoulders forward. You will need a broom handle, yardstick, or other stick-like object to use as the wand in this exercise. Do these exercises on a bed or the floor. Lie on your back with your knees bent and your feet flat.

- Hold the wand across your belly in both hands with your palms facing up.
- Lift the wand up over your head as far as you can. Use your unaffected arm to help lift the wand until you feel a stretch in your affected arm.
- Hold for 5 seconds.
- Lower arms and repeat 5 to 7 times.

Elbow winging



This exercise helps increase the movement in the front of your chest and shoulder. It may take many weeks of regular exercise before your elbows will get close to the bed or floor. Do these exercises on a bed or the floor. Lie on your back with your knees bent and your feet flat.

- Clasp your hands behind your neck with your elbows pointing toward the ceiling.
- Move your elbows apart and down toward the bed or floor.
- Repeat 5 to 7 times.

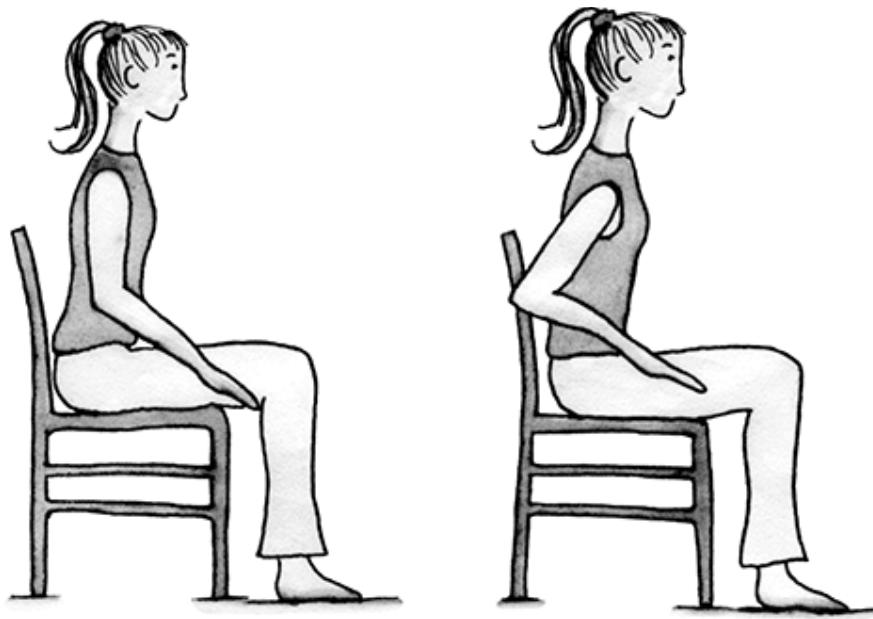
Shoulder blade stretch



This exercise helps increase your shoulder blade movement.

- Sit in a chair very close to a table with your back against the back of the chair.
- Place the unaffected arm on the table with your elbow bent and palm down. Do not move this arm during the exercise.
- Place the affected arm on the table, palm down, with your elbow straight.
- Without moving your trunk, slide the affected arm forward, toward the opposite side of the table. You should feel your shoulder blade move as you do this.
- Relax your arm and repeat 5 to 7 times.

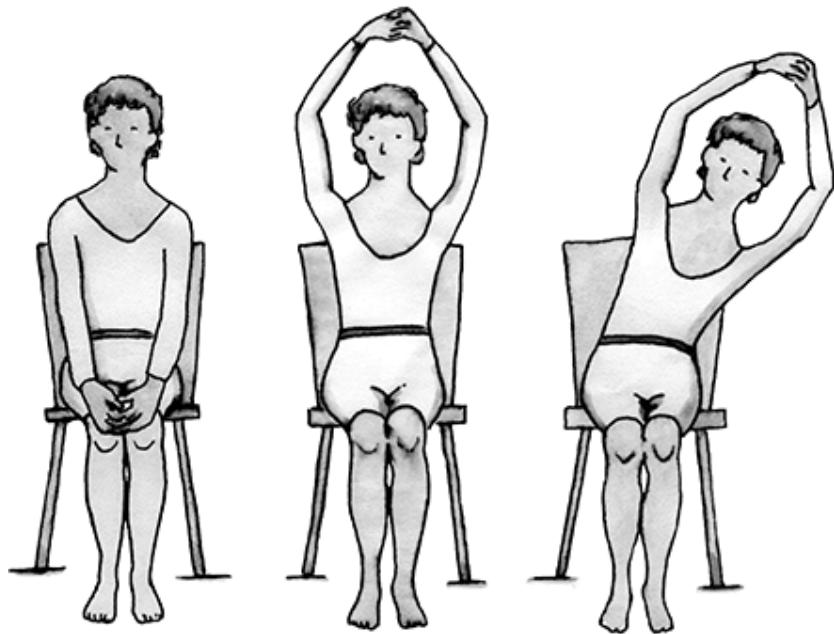
Shoulder blade squeeze



This exercise also helps increase shoulder blade movement and improve posture.

- Sit in a chair in front of a mirror. Face straight ahead. Do not rest against the back of the chair.
- Your arms should be at your sides with your elbows bent.
- Squeeze your shoulder blades together, bringing your elbows behind you toward your spine. Elbows will move with you, but don't force the motion with your elbows. Keep your shoulders level as you do this. Do not lift your shoulders up toward your ears.
- Return to the starting position and repeat 5 to 7 times.

Side bends



This exercise helps increase movement of your trunk and body.

- Sit in a chair and clasp your hands together in front of you. Lift your arms slowly over your head, straightening your arms.
- When your arms are over your head, bend your trunk to the right keeping your arms overhead.
- Return to the starting position and bend to the left.
- Repeat 5 to 7 times.

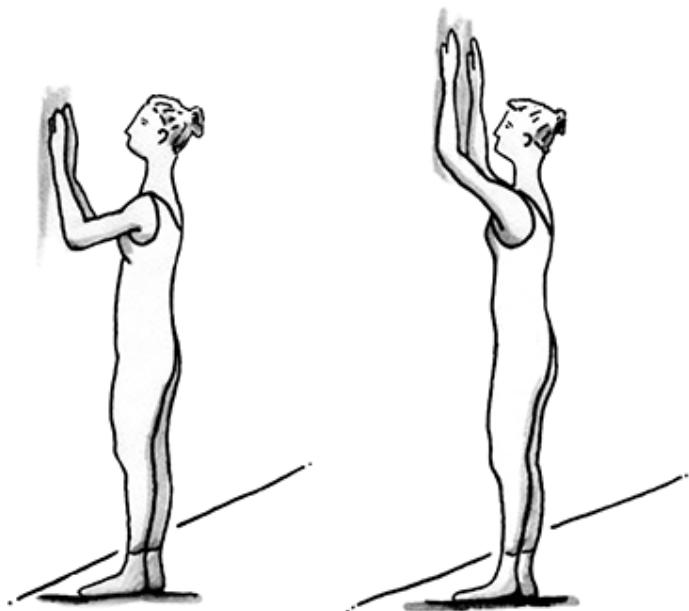
Chest wall stretch



This exercise helps stretch your chest.

- Stand facing a corner with your toes about 8 to 10 inches from the corner.
- Bend your elbows and put your forearms on the wall, one on each side of the corner. Your elbows should be as close to shoulder height as possible.
- Keep your arms and feet in place and move your chest toward the corner. You will feel a stretch across your chest and shoulders.
- Return to the starting position and repeat 5 to 7 times.
- The picture shows stretching both sides at the same time, but you may find it more comfortable to stretch one arm at a time.
- Be sure you keep your shoulders dropped far away from your ears as you do this stretch. Keep your ears over your shoulders to avoid making your neck sore.

Shoulder stretch



This exercise helps increase your mobility in your shoulder.

- Stand facing the wall with your toes about 8 to 10 inches from the wall.
- Put your hands on the wall. Use your fingers to "climb the wall," reaching as high as you can until you feel a stretch.
- Return to the starting position and repeat 5 to 7 times.
- The picture shows both arms going up at the same time, but you might find it easier to raise one arm at a time.
- Be sure you keep your shoulders dropped far away from your ears as you raise your arms. Keep your ears over your shoulders to avoid making your neck sore.

Things to keep in mind after breast surgery

Start exercising slowly and do more as you are able. Stop exercising and talk to your doctor right away if you:

- Get weaker, start losing your balance, or start falling
- Have pain that gets worse
- Have new heaviness, aching, tightness, or other strange sensations in your arm
- Have unusual swelling or swelling that gets worse
- Have headaches, dizziness, blurred vision, new numbness, or tingling in your arms or chest

It's important to exercise to keep your muscles working as well as possible, but it's also important to be safe. Talk with your doctor about the right kind of exercises for you and ask about seeing a [lymphedema¹](#) specialist who can help with safe exercise. Then set goals for increasing your level of physical activity.

Other kinds of exercise

Exercise to help **improve aerobic (heart-lung) capacity** is also important for women who have had breast cancer. There's evidence that fitness and weight loss may even help lower the risk that some types of cancer will come back after treatment. Ask your doctor about fitness exercises during and after breast cancer treatment.

Other exercises are designed to help **reduce your risk of lymphedema²**, or swelling in the arm, on the side where you had surgery. The exercises shown here are mainly designed to help regain range of motion (flexibility) in your arm and shoulder. Ask your doctor about your lymphedema risk and if you should use exercises to help reduce that risk.

Strengthening exercises are now recommended as part of regular exercise programs to improve health. These are not started until 4 to 6 weeks after surgery, and must be tailored to your general health, medical condition, and fitness. Strength building starts by using small hand weights, and is increased slowly over time. Again, this is best discussed with your doctor or physical therapist. It's probably best to start a strengthening program in a supervised setting with a cancer exercise trainer or physical therapist to be sure you're doing the exercises properly.

Radiation for Breast Cancer

Radiation therapy is treatment with high-energy rays (or particles) that destroy cancer cells. Some women with breast cancer will need radiation, in addition to other treatments.

Depending on the breast cancer's [stage¹](#) and other factors, radiation therapy can be used in several situations:

- After breast-conserving surgery (BCS), to help lower the chance that the cancer will come back in the same breast or nearby lymph nodes.
 - After a mastectomy, especially if the cancer was larger than 5 cm (about 2 inches), if cancer is found in many lymph nodes, or if certain surgical margins, such as the skin or muscle, have cancer cells.
 - If cancer has spread to other parts of the body, such as the bones, spinal cord, or brain.
- [Types of radiation therapy for breast cancer](#)

- [External beam radiation therapy \(EBRT\)](#)
- [Types and schedules of external beam radiation for breast cancer](#)
- [Brachytherapy](#)
- [Types of brachytherapy](#)
- [More information about radiation therapy](#)

Types of radiation therapy for breast cancer

The main types of radiation therapy that can be used to treat breast cancer are:

- External beam radiation therapy
- Brachytherapy

External beam radiation therapy (EBRT)

[EBRT²](#) is the most common type of radiation therapy for women with breast cancer. A machine outside the body focuses the radiation on the area affected by the cancer.

Which areas need radiation depends on whether you had a [mastectomy](#) or [breast-conserving surgery](#) (BCS) and if the cancer has reached nearby lymph nodes.

- If you had a mastectomy and no lymph nodes had cancer cells, radiation will be focused on the chest wall, the mastectomy scar, and the places where any drains exited the body after surgery.
- If you had BCS, you will most likely have radiation to the entire breast (called **whole breast radiation**). An extra **boost** of radiation to the area in the breast where the cancer was removed (called the **tumor bed**) is often given if there is a high risk of the cancer coming back. The boost is often given after the treatments to the whole breast have ended. It uses the same machine, with lower amounts of radiation aimed at the tumor bed. Most women don't notice different side effects from boost radiation than from whole breast radiation.
- If cancer was found in the lymph nodes under the arm (axillary lymph nodes), this area may be given radiation, as well. Sometimes, the area treated might also include the nodes above the collarbone (suprACLAVICULAR lymph nodes) and the nodes beneath the breast bone in the center of the chest (internal mammary lymph nodes).

If you will need external beam radiation therapy after surgery, it is usually not started until your surgery site has healed, which often takes a month or longer. If you are getting chemotherapy as well, radiation treatments are usually delayed until chemotherapy is done. Some treatments after surgery, like [hormone therapy](#) or [HER2 targeted therapy](#), can be given at the same time as radiation.

Types and schedules of external beam radiation for breast cancer

Whole breast radiation

Radiation to the entire affected breast is called **whole breast radiation**.

- The standard schedule for getting whole breast radiation is 5 days a week (Monday through Friday) for about 6 to 7 weeks.
- Another option is **hypofractionated radiation therapy** where the radiation is also given to the whole breast, but in larger daily doses (Monday through Friday) using fewer treatments (typically for only 3 to 4 weeks). For women who have had breast-conserving surgery (BCS) and whose cancer has not spread to underarm lymph nodes, this schedule has been shown to be just as good at keeping the cancer from coming back in the same breast as giving the radiation over longer periods of time. It might also lead to fewer short-term side effects.

Accelerated partial breast irradiation

After whole breast radiation or even after surgery alone, most breast cancers tend to come back very close to the area where the tumor was removed (tumor bed). For this reason, some doctors are using **accelerated partial breast irradiation** (APBI) in selected women to give larger doses over a shorter time to only one part of the breast (the tumor bed) compared to the entire breast (whole breast radiation). Since more research is needed to know if these newer methods will have the same long-term results as standard radiation, not all doctors use them. There are several different types of accelerated partial breast irradiation:

- **Intraoperative radiation therapy (IORT)**: In this approach, a single large dose of radiation is given to the area where the tumor was removed (tumor bed) in the operating room right after BCS (before the breast incision is closed). IORT requires special equipment and is not widely available.

- **3D-conformal radiotherapy (3D-CRT):** In this technique, the radiation is given with special machines so that it is better aimed at the tumor bed. This spares more of the surrounding normal breast tissue. Treatments are given twice a day for 5 days or daily for 2 weeks.
- **Intensity-modulated radiotherapy (IMRT):** IMRT is like 3D-CRT, but it also changes the strength of some of the beams in certain areas. This gets stronger doses to certain parts of the tumor bed and helps lessen damage to nearby normal body tissues.
- **Brachytherapy:** See brachytherapy below.

Women who are interested in these approaches may want to ask their doctor about taking part in [clinical trials³](#) of accelerated partial breast irradiation.

Chest wall radiation

If you had a mastectomy and none of the lymph nodes had cancer, radiation will be given to the entire chest wall, the mastectomy scar, and the areas of any surgical drains. It is typically given every day, 5 days a week, for 6 weeks.

Lymph node radiation

Whether or not you have had BCS or a mastectomy, if cancer was found in the lymph nodes under the arm (axillary lymph nodes), this area may be given radiation. In certain cases, the lymph nodes above the collarbone (supraclavicular lymph nodes) and behind the breastbone in the center of the chest (internal mammary lymph nodes) will also get radiation along with the underarm nodes. It is typically given daily 5 days a week for 6 weeks at the same time as the radiation to the breast or chest wall is given.

Possible side effects of external beam radiation

The main short-term side effects of external beam radiation therapy to the breast are:

- Swelling in the breast
- Skin changes in the treated area similar to a sunburn (redness, skin peeling, darkening of the skin)
- Fatigue

Your health care team may advise you to avoid exposing the treated skin to the sun

because it could make the skin changes worse. Most skin changes get better within a few months. Changes to the breast tissue usually go away in 6 to 12 months, but it can take longer.

External beam radiation therapy can also cause side effects later on:

- Some women may find that radiation therapy causes the breast to become smaller and the skin to become firmer or swollen.
- Radiation may affect your options for breast reconstruction later on. It can also raise the risk of problems with appearance and healing if it's given after reconstruction, especially tissue flap procedures.
- Women who have had breast radiation may not be able to breastfeed from the radiated breast.
- Radiation to the breast can sometimes damage some of the nerves to the arm. This is called **brachial plexopathy** and can lead to numbness, pain, and weakness in the shoulder, arm, and hand.
- Radiation to the underarm lymph nodes might cause [lymphedema⁴](#), a type of pain and swelling in the arm or chest.
- In rare cases, radiation therapy may weaken the ribs, which could lead to a fracture.
- In the past, parts of the lungs and heart were more likely to get some radiation, which could lead to long-term damage of these organs in some women. Modern radiation therapy equipment focuses the radiation beams better than older machines, so these problems are rare today.
- A very rare complication of radiation to the breast is the development of another cancer called an [angiosarcoma⁵](#).

Brachytherapy

[Brachytherapy⁶](#), also known as **internal radiation**, is another way to deliver radiation therapy. Instead of aiming radiation beams from outside the body, a device containing radioactive seeds or pellets is placed into the breast tissue for a short time in the area where the cancer had been removed (tumor bed).

For certain women who had breast-conserving surgery (BCS), brachytherapy can be used by itself (instead of radiation to the whole breast) as a form of accelerated partial breast irradiation. Tumor size, location, and other factors may limit who can get brachytherapy.

Types of brachytherapy

Intracavitary brachytherapy

This is the most common type of brachytherapy for women with breast cancer. A device is put into the space left from BCS and is left there until treatment is complete. There are several different devices available, most of which require surgical training for proper placement. They all go into the breast as a small catheter (tube). The end of the device inside the breast is then expanded like a balloon so that it stays securely in place for the entire treatment. The other end of the catheter sticks out of the breast. For each treatment, one or more sources of radiation (often pellets) are placed down through the tube and into the device for a short time and then removed. Treatments are typically given twice a day for 5 days in an outpatient setting. After the last treatment, the device is deflated and removed.

Interstitial brachytherapy

In this approach, several small, hollow tubes called catheters are inserted into the breast around the area where the cancer was removed and are left in place for several days. Radioactive pellets are inserted into the catheters for short periods of time each day and then removed. This method of brachytherapy has been around longer (and has more evidence to support it), but it is not used as much.

Early studies of intracavitary brachytherapy as the only radiation after BCS have had promising results as far as having at least equal cancer control compared with standard whole breast radiation, but may have more complications including poor cosmetic results. Studies of this treatment are being done and more follow-up is needed.

Possible side effects of intracavitary brachytherapy

As with external beam radiation, intracavitary brachytherapy can have side effects, including:

- Redness and/or bruising at the treatment site
- Breast pain
- Infection
- Damage to fatty tissue in the breast
- Weakness and fracture of the ribs in rare cases
- Fluid collecting in the breast (seroma)

More information about radiation therapy

To learn more about how radiation is used to treat cancer, see [Radiation Therapy⁷](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects⁸](#).

Chemotherapy for Breast Cancer

Chemotherapy (chemo) uses anti-cancer drugs that may be given intravenously (injected into your vein) or by mouth. The drugs travel through the bloodstream to reach cancer cells in most parts of the body.

Sometimes, if cancer spreads to the spinal fluid, which surrounds and cushions the brain and spinal cord, chemo may be given directly into this area (called **intrathecal chemotherapy**).

- [When is chemotherapy used for breast cancer?](#)
- [Chemotherapy drugs used for breast cancer](#)
- [How is chemotherapy for breast cancer given?](#)
- [Possible side effects of chemo for breast cancer](#)
- [More information about chemotherapy](#)

When is chemotherapy used for breast cancer?

Not all women with breast cancer will need chemo, but there are several situations in which chemo may be recommended.

After surgery (adjuvant chemotherapy)

Adjuvant chemo might be given to try to kill any cancer cells that might have been left behind or have spread but can't be seen, even on [imaging tests](#)¹. These cells are considered microscopic because they can't be seen by the naked eye. If these cells were allowed to grow, they could form new tumors in other places in the body. Adjuvant chemo can lower the risk of breast cancer coming back. Sometimes it is not clear if chemotherapy will be helpful. There are tests available, such as Oncotype DX, that can help determine which women will most likely benefit from chemo after breast surgery. See [Breast Cancer Gene Expression Tests](#)² for more information.

Before surgery (neoadjuvant chemotherapy)

Neoadjuvant chemo might be given to try to shrink the tumor so it can be removed with less extensive surgery. Because of this, neoadjuvant chemo is often used to treat

cancers that are too big to be removed by surgery when first diagnosed, have many lymph nodes involved with cancer, or are inflammatory breast cancers .

If after neoadjuvant chemo, cancer cells are still found when surgery is done (also called residual disease), you might be offered more chemotherapy (adjuvant chemotherapy) to reduce the chances of the cancer coming back (recurrence).

Some other reasons you might get neoadjuvant chemo:

- By giving chemo before the tumor is removed, doctors can see how the cancer responds to it. If the first set of chemo drugs doesn't shrink the tumor, your doctor will know that other drugs are needed. It should also kill any cancer cells that might have spread but can't be seen by the naked eye or on imaging tests. Just like adjuvant chemo, neoadjuvant chemo can lower the risk of breast cancer coming back.
- Some people with early-stage cancer who get neoadjuvant chemo might live longer if the cancer completely goes away with that treatment. This can be seen most often in women who have triple-negative breast cancer or HER2-positive breast cancer.
- Getting chemo before surgery can also give some people extra time to get genetic testing or plan reconstructive surgery.

Keep in mind that not all women with breast cancer are good candidates for neoadjuvant chemo.

For metastatic breast cancer

Chemo can be used as the main treatment for women whose cancer has spread outside the breast and underarm area to distant organs like the liver or lungs. Chemo can be given either when breast cancer is diagnosed or after initial treatments. The length of treatment depends on how well the chemo is working and how well you tolerate it.

Chemotherapy drugs used for breast cancer

In most cases, chemo has the greatest effect when more than one drug is used at a time. Often, combinations of 2 or 3 drugs are used. Doctors use many different combinations, and it's not clear that any particular drug combination is the best.

Adjuvant and neoadjuvant chemo drugs

- Anthracyclines, such as doxorubicin (Adriamycin) and epirubicin (Ellence)
- Taxanes, such as paclitaxel (Taxol) and docetaxel (Taxotere)
- 5-fluorouracil (5-FU) or capecitabine (Xeloda)
- Cyclophosphamide (Cytoxan)
- Carboplatin (Paraplatin)

Chemo drugs for breast cancer that has spread (metastatic breast cancer)

- Taxanes: Paclitaxel (Taxol), docetaxel (Taxotere), and albumin-bound paclitaxel (Abraxane)
- Ixabepilone (Ixempra)
- Eribulin (Halaven)
- Anthracyclines: Doxorubicin (Adriamycin), liposomal doxorubicin (Doxil), and epirubicin (Ellence)
- Platinum agents (Cisplatin, carboplatin)
- Vinorelbine (Navelbine)
- Capecitabine (Xeloda)
- Gemcitabine (Gemzar)
- [Antibody drug conjugates](#) (Ado-trastuzumab emtansine [Kadcyla], Fam-trastuzumab deruxtecan [Enhertu], Sacituzumab govitecan [Trodelvy])

Although drug combinations are often used to treat early breast cancer, advanced breast cancer often is treated with single chemo drugs. Still, some combinations, such as paclitaxel plus gemcitabine, are commonly used to treat metastatic breast cancer.

For cancers that are [HER2-positive³](#), one or more drugs that target HER2 may be used with chemo. (See [Targeted Therapy for Breast Cancer](#) for more information about these drugs.)

How is chemotherapy for breast cancer given?

Chemo drugs for breast cancer are typically given into a vein (IV), either as an injection over a few minutes or as an infusion over a longer period of time. This can be done in a doctor's office, infusion center, or in a hospital setting.

Often, a slightly larger and sturdier IV is required in the vein system to administer

chemo. These are known as [central venous catheters⁴](#) (CVCs), central venous access devices (CVADs), or central lines. They are used to put medicines, blood products, nutrients, or fluids right into your blood. They can also be used to take out blood for testing.

There are many different kinds of CVCs. The most common types are the port and the PICC line. For breast cancer patients, the central line is typically placed on the side opposite of the breast cancer. If a woman has breast cancer in both breasts, the central line will most likely be placed on the side that had fewer lymph nodes removed or involved with cancer.

Chemo is given in cycles, followed by a rest period to give you time to recover from the effects of the drugs. Chemo cycles are most often 2 or 3 weeks long. The schedule varies depending on the drugs used. For example, with some drugs, chemo is given only on the first day of the cycle. With others, it is given one day a week for a few weeks or every other week. Then, at the end of the cycle, the chemo schedule repeats to start the next cycle.

Adjuvant and neoadjuvant chemo is often given for a total of 3 to 6 months, depending on the drugs used. The length of treatment for metastatic (Stage 4) breast cancer depends on how well it is working and what side effects you have.

Dose-dense chemotherapy

Doctors have found that giving the cycles of certain chemo drugs closer together can lower the chance that the cancer will come back and improve survival for some women with breast cancer. For example, a drug that would normally be given every 3 weeks might be given every 2 weeks. This can be done for both neoadjuvant and adjuvant treatment. It can lead to more problems with low blood cell counts, so it's not an option for all women. For example, a chemo combination sometimes given this way is doxorubicin (Adriamycin) and cyclophosphamide (Cytoxan) every 2 weeks, followed by paclitaxel (Taxol) every 2 weeks.

Possible side effects of chemo for breast cancer

Chemo drugs can cause side effects, depending on the type and dose of drugs given, and the length of treatment. Some of the most [common possible side effects⁵](#) include:

- Hair loss
- Nail changes
- Mouth sores

- Loss of appetite or weight changes
- Nausea and vomiting
- Diarrhea
- Fatigue
- Hot flashes and/or vaginal dryness from menopause caused by chemo (see Menstrual changes and fertility issues below)
- Nerve damage (see Nerve damage below)

Chemo can also affect the blood-forming cells of the bone marrow, which can lead to:

- Increased chance of infections (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)
- Fatigue (from low red blood cell counts and other reasons)

These side effects usually go away after treatment is finished. There are often ways to lessen these side effects. For example, drugs can be given to help prevent or reduce nausea and vomiting.

Other side effects are also possible. Some of these are more common with certain chemo drugs. Ask your cancer care team about the possible side effects of the specific drugs you are getting.

Menstrual changes and fertility issues

For younger women, changes in menstrual periods are a common side effect of chemo. Premature menopause (not having any more menstrual periods) and infertility (not being able to become pregnant) may occur and could be permanent. If this happens, there is an increased risk of heart disease, bone loss, and osteoporosis. There are medicines that can treat or help prevent bone loss.

Even if your periods stop while you are on chemo, you may still be able to get pregnant. Getting pregnant while on chemo could lead to birth defects and interfere with treatment. If you have not gone through menopause before treatment and are sexually active, it's important to discuss using birth control with your doctor. It is not a good idea for women with [hormone receptor-positive breast cancer](#)⁶ to take hormonal birth control (like birth control pills), so it's important to talk with both your oncologist and your gynecologist (or family doctor) about what options would be best for you. When women have finished treatment (like chemo), they can safely go on to have children, but it's not safe to get pregnant while being treated.

If you think you might want to have children after being treated for breast cancer, talk with your doctor soon after being diagnosed and before you start treatment.

For some women, adding medicines, like monthly injections with a **luteinizing hormone-releasing hormone (LHRH) analog**, along with chemo, can help them have a successful pregnancy after cancer treatment. To learn more, see [Female Fertility and Cancer⁷](#).

If you are pregnant when you get breast cancer, you still can be treated. Certain chemo drugs can be taken safely during the last 2 trimesters of pregnancy. More details can be found in [Treating Breast Cancer During Pregnancy](#).

Heart damage

Even though it is not common, doxorubicin, epirubicin, and some other chemo drugs can cause permanent heart damage (called cardiomyopathy). The risk is highest if the drug is used for a long time or in high doses. Damage from these drugs also happens more often if other drugs that can cause heart damage (such as those that target HER2) are used. Other heart failure risk factors, such as family history of heart problems, high blood pressure, and diabetes can also put you at risk if you receive one of these drugs.

Most doctors will check your heart function with a test like an echocardiogram (an ultrasound of the heart; also called an ECHO) or a MUGA scan before starting one of these drugs. They also carefully control the doses, watch for symptoms of heart problems, and may regularly repeat heart tests during treatment. If the heart function begins to worsen, treatment with these drugs will be temporarily or permanently stopped. Still, in some people, signs of damage might not appear until months or years after treatment stops.

Nerve damage (neuropathy)

Many drugs used to treat breast cancer, including taxanes (docetaxel, paclitaxel, and protein-bound paclitaxel), platinum agents (carboplatin, cisplatin), vinorelbine, eribulin, and ixabepilone, can damage nerves in the hands, arms, feet, and legs. This can sometimes lead to symptoms in those areas like numbness, pain, burning or tingling sensations, sensitivity to cold or heat, or weakness. In most cases these symptoms go away once treatment is stopped, but in some women it might last a long time or may become permanent. There are medicines that could help with these symptoms.

Hand-foot syndrome

Certain chemo drugs, such as capecitabine (Xeloda) and liposomal doxorubicin (Doxil), can irritate the palms of the hands and the soles of the feet. This is called hand-foot

syndrome. Early symptoms include numbness, tingling, and redness. If it gets worse, the hands and feet can become swollen and uncomfortable or even painful. The skin may blister, leading to peeling or even open sores. There is no specific treatment, although some creams or steroids given before chemo may help. These symptoms gradually get better when the drug is stopped or the dose is lowered. The best way to prevent severe hand-foot syndrome is to tell your doctor when symptoms first come up, so that the drug dose can be changed or other medicines can be given.

Chemo brain

Many women who are treated with chemotherapy for breast cancer report a slight decrease in mental functioning. They may have some problems with concentration and memory, which may last a long time. Although many women have linked this to chemo, it also has been seen in women who did not get chemo as part of their treatment. Still, most women function well after treatment. In studies that have found chemo brain to be a side effect of treatment, the symptoms most often last for a few years.

Increased risk of leukemia

Very rarely, certain chemo drugs, such as doxorubicin (Adriamycin), can cause diseases of the bone marrow, such as [myelodysplastic syndromes⁸](#) or even [acute myeloid leukemia⁹](#), a cancer of white blood cells. If this happens, it is usually within 10 years after treatment. For most women, the benefits of chemo in helping prevent breast cancer from coming back or in extending life are far likely to exceed the risk of this rare but serious complication.

Feeling unwell or tired (fatigue)

Many women do not feel as healthy after chemo as they did before. There is often a residual feeling of body pain or achiness and a mild loss of physical functioning. These changes may be very subtle and happen slowly over time.

Fatigue is another common problem for women who have received chemo. This may last a few months up to several years. It can often be helped, so it's important to let your doctor or nurse know about it. Exercise, naps, and conserving energy may be recommended. If you have sleep problems, they can be treated. Sometimes fatigue can be a sign of depression, which may be helped by counseling and/or medicines.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer,

see [Chemotherapy¹⁰](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects¹¹](#).

Hormone Therapy for Breast Cancer

Some types of breast cancer are affected by hormones, like estrogen and progesterone. The breast cancer cells have receptors (proteins) that attach to estrogen and progesterone, which helps them grow. Treatments that stop these hormones from attaching to these receptors are called **hormone or endocrine therapy**.

Hormone therapy can reach cancer cells almost anywhere in the body and not just in

the breast. It's recommended for women with tumors that are hormone receptor-positive. It does not help women whose tumors don't have hormone receptors (these tumors are called hormone receptor-negative).

- [When is hormone therapy used for breast cancer?](#)
- [How does hormone therapy work?](#)
- [Drugs that block estrogen receptors](#)
- [Drugs that lower estrogen levels](#)
- [Hormone therapy after surgery for breast cancer](#)
- [If cancer comes back or has spread](#)
- [Less common types of hormone therapy](#)
- [More information about hormone therapy](#)

When is hormone therapy used for breast cancer?

Hormone therapy is often used after surgery (as adjuvant therapy) to help reduce the risk of the cancer coming back. Sometimes it is started before surgery (as neoadjuvant therapy).

It is usually taken for at least 5 years. Treatment longer than 5 years might be offered to women whose cancers have a higher chance of coming back. A test called the [Breast Cancer Index¹](#) might be used to help decide if a woman will benefit from more than 5 years of hormone therapy.

Hormone therapy can also be used to treat cancer that has come back after treatment or that has spread to other parts of the body.

How does hormone therapy work?

About 2 out of 3 breast cancers are hormone receptor-positive. Their cells have receptors (proteins) for estrogen (ER-positive cancers) and/or progesterone (PR-positive cancers) which help the cancer cells grow and spread.

There are several types of hormone therapy for breast cancer. Most types of hormone therapy either lower estrogen levels in the body or stop estrogen from helping breast cancer cells grow.

Drugs that block estrogen receptors

These drugs work by stopping estrogen from fueling breast cancer cells to grow.

Selective estrogen receptor modulators (SERMs)

These drugs block estrogen from connecting to the cancer cells and telling them to grow and divide. While they have anti-estrogen effects in breast cells, they act like an estrogen in other tissues, like the uterus and the bones.

These drugs are pills, taken by mouth.

Tamoxifen

Tamoxifen can be used to treat women with breast cancer who have or have not gone through menopause.

This drug can be used in several ways:

- In women at high risk of breast cancer, tamoxifen can be used to help lower the risk of developing breast cancer.
- For women who have been treated with breast-conserving surgery for ductal carcinoma in situ (DCIS) that is hormone receptor-positive, taking tamoxifen for 5 years lowers the chance of the DCIS coming back in the same breast. It also lowers the chance of getting an invasive breast cancer or another DCIS in both breasts.
- For women with hormone receptor-positive invasive breast cancer treated with surgery, tamoxifen can help lower the chances of the cancer coming back and improve the chances of living longer. It can also lower the risk of a new cancer developing in the other breast. Tamoxifen can be started either after surgery (adjuvant therapy) or before surgery (neoadjuvant therapy). When given after surgery, it is usually taken for 5 to 10 years. This drug is used mainly for women with early-stage breast cancer who have not yet gone through menopause. If you have gone through menopause, aromatase inhibitors (see below) are often used instead.
- For women with hormone-positive breast cancer that has spread to other parts of the body, tamoxifen can often help slow or stop the growth of the cancer, and might even shrink some tumors.

Toremifene (Fareston)

Toremifene is a SERM that works in a similar way, but it is used less often and is only approved to treat post-menopausal women with metastatic breast cancer. It is not likely to work if tamoxifen has already been used and has stopped working.

Side effects of tamoxifen and toremifene

The most common side effects of tamoxifen and toremifene are:

- Hot flashes
- Vaginal dryness or discharge
- Changes in the menstrual cycle

When tamoxifen treatment starts, a small number of women with cancer that has spread to the bones might have a **tumor flare** (the tumor gets bigger for a short time) which can cause bone pain. This usually goes away quickly, but rarely a woman may also develop a high calcium level in the blood that is hard to control. If this happens, the treatment may need to be stopped for a time.

Rare, but more serious side effects are also possible:

- If a woman has gone through menopause, SERMs can increase her risk of developing [endometrial cancer²](#) and [uterine sarcoma³](#). Tell your doctor right away about any unusual vaginal bleeding (a common symptom of this cancer). Most uterine bleeding is not from cancer, but this symptom always needs quick attention.
- **Blood clots** are another uncommon, but serious side effect. They usually form in the legs (called **deep vein thrombosis** or DVT), but sometimes a piece of clot in the leg may break off and end up blocking an artery in the lungs (**pulmonary embolism** or PE). Call your doctor or nurse right away if you develop pain, redness, or swelling in your lower leg (calf), shortness of breath, or chest pain, because these can be symptoms of a DVT or PE. Rarely, tamoxifen has been associated with **strokes** in postmenopausal women, so tell your doctor if you have severe headaches, confusion, or trouble speaking or moving.
- **Eye problems** such as cataracts can sometimes happen when taking tamoxifen. It is important to tell your doctor right away if you are having any new trouble with your eyesight.
- **Bones can be affected.** Depending on a woman's menopausal status, tamoxifen can have different effects on the bones. In pre-menopausal women, tamoxifen can cause some bone thinning, but in post-menopausal women it often strengthens bones to some degree. The benefits of taking these drugs outweigh the risks for

almost all women with hormone receptor-positive breast cancer.

Selective estrogen receptor degraders (SERDs)

Like SERMs, these drugs attach to estrogen receptors. But SERDs bind to the receptors more tightly and cause them to be broken down. These drugs have anti-estrogen effects throughout the body.

SERDs are used most often in women who are past menopause. When given to pre-menopausal women, they need to be combined with a luteinizing-hormone releasing hormone (LHRH) agonist to turn off the ovaries (see Ovarian suppression below).

Fulvestrant (Faslodex)

Fulvestrant can be used:

- Alone to treat advanced breast cancer that has not been treated with other hormone therapy.
- Alone to treat advanced breast cancer after other hormone drugs (like tamoxifen and often an aromatase inhibitor) have stopped working.
- In combination with a [CDK 4/6 inhibitor](#) or [PI3K inhibitor](#) to treat metastatic breast cancer as initial hormone therapy or after other hormone treatments have been tried.

It is given as 2 injections into the buttocks (bottom). For the first month, the 2 shots are given 2 weeks apart. After that, they are given once a month.

Elacestrant (Orserdu)

This drug can be used to treat advanced, ER-positive, HER2-negative breast cancer when the cancer cells have an [ESR1 gene mutation](#)⁴, and the cancer has grown after at least one other type of hormone therapy.

Elacestrant is taken daily as pills.

Side effects of fulvestrant and elacestrant

Common short-term side effects of these drugs can include:

- Hot flashes and/or night sweats
- Headache
- Nausea
- Feeling tired
- Loss of appetite
- Muscle, joint, or bone pain
- Injection site pain

Elacestrant can also increase cholesterol and fat levels in the blood.

Drugs that lower estrogen levels

Because estrogen stimulates hormone receptor-positive breast cancers to grow, lowering the estrogen level can help slow the cancer's growth or help prevent it from coming back.

Aromatase inhibitors (AIs)

Aromatase inhibitors (AIs) are drugs that stop most estrogen production in the body. Before menopause, most estrogen is made by the ovaries. But in women whose ovaries aren't working, either because they have gone through menopause or because of certain treatments, estrogen is still made in body fat by an enzyme called aromatase. AIs work by preventing aromatase from making estrogen.

These drugs are useful for women who have gone through menopause, although they can also be used in pre-menopausal women when they are combined with ovarian suppression (see below).

These AIs are pills taken every day to treat breast cancer:

- Letrozole (Femara)
- Anastrozole (Arimidex)
- Exemestane (Aromasin)

Possible side effects of AIs

The most common side effects of AIs are:

- Hot flashes
- Vaginal dryness
- Bone and joint pain
- Muscle pain

AlIs tend to have side effects different from tamoxifen. They don't cause uterine cancers and very rarely cause blood clots. They can, however, cause **muscle pain and joint stiffness and/or pain**. The joint pain may be similar to a feeling of having arthritis in many different joints at one time. Options for treating this side effect include, stopping the AI and then switching to a different AI, taking a medicine called duloxetine (Cymbalta), or routine exercise with nonsteroidal anti-inflammatory drugs (NSAIDs).

But the muscle and joint pain has led some women to stop treatment. If this happens, most doctors recommend using tamoxifen to complete 5 to 10 years of hormone treatment.

Because AlIs drastically lower the estrogen level in women after menopause, they can also cause **bone thinning**, sometimes leading to osteoporosis and even fractures. If you are taking an AI, your bone density may be tested regularly and you may also be given bisphosphonates (zoledronic acid [Zometa] for example) or denosumab (Xgeva, Prolia), to strengthen your bones.

Ovarian suppression

For pre-menopausal women, removing or shutting down the ovaries (ovarian suppression), which are the main source of estrogen, is effectively making them post-menopausal. This may allow some other hormone therapies, such as AlIs, to be used. Ovarian suppression along with tamoxifen or an AI might be recommended for women whose breast cancer is at high risk of coming back.

There are several ways to remove or shut down the ovaries to treat breast cancer:

- **Oophorectomy:** Surgery to remove the ovaries. This is permanent and is also called ovarian ablation.
- **Luteinizing hormone-releasing hormone (LHRH) agonists:** These drugs, also called **LHRH analogs**, are used more often than oophorectomy. They stop the signal that the body sends to the ovaries to make estrogen, which causes temporary menopause. Common LHRH drugs include goserelin (Zoladex) and leuprolide (Lupron). They can be used alone or with other hormone drugs (tamoxifen, aromatase inhibitors, fulvestrant) as hormone therapy in pre-menopausal women.

- **Chemotherapy drugs:** Some chemo drugs can damage the ovaries of pre-menopausal women so they no longer make estrogen. Ovarian function can return months or years later in some women, but in others the damage to the ovaries is permanent and leads to menopause.

All of these methods can cause symptoms of menopause, including hot flashes, night sweats, vaginal dryness, and mood swings.

Hormone therapy after surgery for breast cancer

After surgery, hormone therapy can be given to reduce the risk of the cancer coming back. Taking an AI, either alone or after tamoxifen, has been shown to work better than taking just tamoxifen for 5 years.

These hormone therapy schedules are known to be helpful for women who are **post-menopausal when diagnosed:**

- Tamoxifen for 2 to 3 years, followed by an AI for 2 to 3 years (5 years total of treatment)
- Tamoxifen for 2 to 3 years, followed by an AI for 5 years (7 to 8 years of treatment)
- Tamoxifen for 4½ to 6 years, followed by an AI for 5 years (9½ to 11 years of treatment)
- Tamoxifen for 5 to 10 years
- An AI for 5 to 10 years
- An AI for 2 to 3 years, followed by tamoxifen for 2 to 3 years (5 years total of treatment)
- For women who are unable to take an AI, tamoxifen for 5 to 10 years is an option

For most post-menopausal women whose cancers are hormone receptor-positive, most doctors recommend taking an AI at some point during adjuvant (after surgery) therapy. Standard treatment is to take these drugs for about 5 years, or to take in sequence with tamoxifen for 5 to 10 years. For women at a higher risk of recurrence, hormone treatment for longer than 5 years may be recommended. Tamoxifen is an option for some women who cannot take an AI. Taking tamoxifen for 10 years is considered more effective than taking it for 5 years, but you and your doctor will decide the best schedule of treatment for you.

These therapy schedules are known to be helpful for women who are **pre-menopausal when diagnosed:**

- Tamoxifen (with or without ovarian suppression) for 5 to 10 years.
- Tamoxifen (with or without ovarian suppression) for 5 years followed by an AI for 5 years if you have gone through menopause.
- An AI plus some sort of ovarian suppression (see above) for 5 to 10 years.

If you have early-stage breast cancer and had not gone through menopause when you were first diagnosed, your doctor might recommend taking tamoxifen first, and then taking an AI later if you go through menopause during treatment. Another option is ovarian suppression by getting a drug called a luteinizing hormone-releasing hormone (LHRH) agonist, which turns off the ovaries, along with an AI. **Pre-menopausal women should not take an AI alone for breast cancer treatment because it is unsafe and can increase hormone levels.**

If cancer comes back or has spread

Tamoxifen, AIs, elacestrant, and fulvestrant can be used to treat more advanced hormone-positive breast cancers, especially in post-menopausal women. They are often continued for as long as they are helpful. Pre-menopausal women might be offered tamoxifen alone or an AI in combination with an LHRH agonist for advanced disease.

Less common types of hormone therapy

Some other types of hormone therapy that were used more often in the past, but are rarely given now include:

- Megestrol acetate (Megace), a progesterone-like drug
- Androgens (male hormones), like testosterone
- Estradiol (a form of estrogen)

These might be options if other forms of hormone therapy are no longer working, but they can often cause side effects.

More information about hormone therapy

To learn more about how hormone therapy is used to treat cancer, see [Hormone Therapy](#)⁵.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)⁶.

Targeted Drug Therapy for Breast Cancer

Targeted drug therapy uses medicines that are directed at (target) proteins on breast cancer cells that help them grow, spread, and live longer. Targeted drugs work to destroy cancer cells or slow down their growth. They have side effects different from [chemotherapy](#).

Some targeted therapy drugs, for example, monoclonal antibodies, work in more than one way to control cancer cells and may also be considered [immunotherapy](#) because they boost the immune system.

Like chemotherapy, these drugs enter the bloodstream and reach almost all areas of the body, which makes them useful against cancers that have spread to distant parts of the body. Targeted drugs sometimes work even when chemo drugs do not. Some targeted drugs can help other types of treatment work better.

Several types of targeted therapy drugs can be used to treat breast cancer.

- [Targeted therapy for HER2-positive breast cancer](#)
- [Targeted therapy for hormone receptor-positive breast cancer](#)
- [Targeted therapy for women with BRCA gene mutations](#)
- [Targeted therapy for triple-negative breast cancer](#)
- [More information about targeted therapy](#)

Targeted therapy for HER2-positive breast cancer

In about 15% to 20% of breast cancers, the cancer cells make too much of a growth-promoting protein known as [HER2](#)¹. These cancers, known as HER2-positive breast cancers, tend to grow and spread more aggressively than HER2-negative breast cancers. Different types of drugs have been developed that target the HER2 protein.

Monoclonal antibodies

Monoclonal antibodies are man-made versions of immune system proteins (antibodies) that are designed to attach to a specific target. In this case, they attach to the HER2 protein on cancer cells, which can help stop the cells from growing.

Trastuzumab (Herceptin, [other brand names](#)²): Trastuzumab can be used to treat

both early-stage and advanced breast cancer. This drug is often given with chemo, but it might also be used alone (especially if chemo alone has already been tried). When started before (neoadjuvant) or after (adjuvant) surgery to treat early breast cancer, this drug is usually given for 6 months to a year. For advanced breast cancer, treatment is often given for as long as the drug is helpful. This drug is given into a vein (IV).

Another form of trastuzumab, called **trastuzumab and hyaluronidase injection (Herceptin Hylecta)**, is given as a subcutaneous (under the skin) shot over a few minutes.

Pertuzumab (Perjeta): This HER2 monoclonal antibody can be given with trastuzumab and chemo, either before or after surgery to treat early-stage breast cancer, or to treat advanced breast cancer. This drug is given into a vein (IV).

Trastuzumab, pertuzumab, and hyaluronidase injection (Phesgo): This is a combination of these drugs given as a subcutaneous (under the skin) shot over several minutes.

Margetuximab (Margenza): This HER2 monoclonal antibody can be used along with chemo to treat advanced breast cancer, typically after at least 2 other drugs that target HER2 have been tried. This drug is given into a vein (IV).

Antibody-drug conjugates

An antibody-drug conjugate (ADC) is a monoclonal antibody linked to a chemotherapy drug. In this case, the anti-HER2 antibody acts like a homing signal by attaching to the HER2 protein on cancer cells, bringing the chemo directly to them.

Ado-trastuzumab emtansine (Kadcyla): This antibody-drug conjugate connects the HER2 antibody to the chemo drug emtansine, which is similar to paclitaxel. It is used by itself to treat early-stage breast cancer after surgery (when chemo and trastuzumab were given before surgery, and there was cancer still present at the time of surgery), or to treat advanced breast cancer in women who have already been treated with trastuzumab and chemo. This drug is given into a vein (IV).

Fam-trastuzumab deruxtecan (Enhertu): This antibody-drug conjugate connects the HER2 antibody to a chemo drug deruxtecan, which is similar to irinotecan. It can be used by itself to treat breast cancer that can't be removed with surgery or that has spread (metastasized) to another part of the body, typically after at least 1 other anti-HER2 targeted drug has been tried. This drug is given into a vein (IV).

Fam-trastuzumab deruxtecan can also be used to treat HER2-low breast cancers that

can't be removed with surgery or that has spread to another part of the body, typically after chemotherapy has been tried or if the cancer recurs within 6 months of finishing adjuvant chemotherapy.

Kinase inhibitors

HER2 is a type of protein known as a kinase. Kinases are proteins in cells that normally relay signals (such as telling the cell to grow). Drugs that block kinases are called **kinase inhibitors**.

Lapatinib (Tykerb): This drug is a pill taken daily. Lapatinib is used to treat advanced breast cancer. It is typically given along with trastuzumab and the chemo drug capecitabine.

Neratinib (Nerlynx): This kinase inhibitor is a pill taken daily. Neratinib is used to treat early-stage breast cancer after a woman has been treated with trastuzumab for one year, and it is usually given for one year. It can also be given along with the chemo drug capecitabine to treat people with metastatic disease, typically after at least 2 other anti-HER2 targeted drugs have been tried.

Tucatinib (Tukysa): This kinase inhibitor is taken as a pill, typically twice a day. Tucatinib is used to treat advanced breast cancer, after at least one other anti-HER2 targeted drug has been tried. It is usually given along with trastuzumab and the chemo drug capecitabine.

Side effects of HER2 targeted drug therapy

The side effects of HER2 targeted drugs are often mild, but some can be serious. Discuss what you can expect with your doctor. **If you are pregnant, you should not take these drugs.** They can harm and even cause death to the fetus. If you could become pregnant, talk to your doctor about using effective birth control while taking these drugs.

Monoclonal antibodies and antibody-drug conjugates can sometimes cause **heart damage** during or after treatment. This can lead to **congestive heart failure**. For most (but not all) women, this effect lasts a short time and gets better when the drug is stopped. The risk of heart problems is higher when these drugs are given with certain chemo drugs that also can cause heart damage, such as doxorubicin (Adriamycin) and epirubicin (Ellence). Other factors that can increase your risk of heart problems are being older than 50, being overweight or obese, having heart problems, and taking medicines for high blood pressure.

Because these drugs can cause heart damage, doctors often check your heart function (with an echocardiogram or a MUGA scan) before treatment, and regularly while you are taking the drug. Let your doctor know if you develop symptoms such as **shortness of breath**, a **fast heartbeat**, **leg swelling**, and **severe fatigue**.

Lapatinib, neratinib, tucatinib, and the combination of pertuzumab with trastuzumab can cause **severe diarrhea**, so it's very important to let your health care team know about any changes in bowel habits as soon as they happen.

Lapatinib and tucatinib can also cause **hand-foot syndrome**, in which the hands and feet become sore and red, and may blister and peel.

Lapatinib, neratinib, and tucatinib can cause **liver problems**. Your doctor will do blood tests to check your liver function during treatment. Let your health care team know right away if you have possible signs or symptoms of liver problems, such as itchy skin, yellowing of the skin or the white parts of your eyes, dark urine, or pain in the right upper belly area.

Fam-trastuzumab deruxtecan (Enhertu) can cause **serious lung disease** in some women. In some cases this might even be life threatening. It's very important to let your doctor or nurse know right away if you're having symptoms such as coughing, wheezing, trouble breathing, or fever.

Targeted therapy for hormone receptor-positive breast cancer

About 3 of 4 breast cancers are hormone (estrogen or progesterone) receptor-positive. For women with these cancers, treatment with [hormone therapy](#) is often helpful. Certain targeted therapy drugs can make hormone therapy even more effective, although these targeted drugs might also add to the side effects.

CDK4/6 inhibitors

Palbociclib (Ibrance), **ribociclib (Kisqali)**, and **abemaciclib (Verzenio)** are drugs that block proteins in the cell called cyclin-dependent kinases (CDKs), particularly CDK4 and CDK6. Blocking these proteins in hormone receptor-positive breast cancer cells helps stop the cells from dividing. This can slow cancer growth.

These drugs are approved to treat some hormone receptor-positive, HER2-negative breast cancers.

There are different ways to use these drugs.

- Any of these drugs can be given along with an aromatase inhibitor (AI) or fulvestrant to women with advanced breast cancer who have gone through menopause.
- Any of these drugs can be given with fulvestrant or an aromatase inhibitor to women with advanced breast cancer who are still having regular periods (premenopausal) or are almost in menopause (perimenopausal). These women, however, must also be on medicines, such as luteinizing hormone-releasing hormone (LHRH) analogs, that stop the ovaries from making estrogen or have their ovaries removed with surgery.
- Abemaciclib can also be used by itself in women with advanced breast cancer who have previously been treated with hormone therapy and chemotherapy.
- For women with early-stage breast cancer that has spread to the lymph nodes and has a high chance of coming back after surgery, abemaciclib can be given as adjuvant treatment along with tamoxifen or an AI. It is typically given for 2 years.

These drugs are taken as pills, typically once or twice a day.

The most common **side effects of CDK4/6 inhibitors** include low blood cell counts and fatigue. Nausea and vomiting, mouth sores, hair loss, diarrhea, and headache are less common side effects. Very low white blood cell counts can increase the risk of serious infection. A rare but possible life-threatening side effect is inflammation of the lungs, also called interstitial lung disease or pneumonitis.

mTOR inhibitor

Everolimus (Afinitor) blocks mTOR, a protein in cells that normally helps them grow and divide. Everolimus may also stop tumors from developing new blood vessels, which can help limit their growth. When used for treating breast cancer , it seems to help hormone therapy drugs work better.

This drug is used for women who have gone through menopause and have advanced hormone receptor-positive, HER2-negative breast cancer. It is used with the aromatase inhibitor exemestane (Aromasin) for women whose cancers have grown while being treated with either letrozole or anastrozole (or if the cancer started growing shortly after treatment with these drugs was stopped). It might also be used with fulvestrant, a hormone therapy drug.

Everolimus is taken as a pill, typically once a day.

Common **side effects of everolimus** include mouth sores, rash, diarrhea, nausea,

feeling weak or tired, low blood counts, shortness of breath, and cough. Everolimus can also increase blood lipids (cholesterol and triglycerides) and blood sugars, so your doctor will check your blood work regularly while you are taking this drug. It can also increase your risk of serious infections, so your doctor will watch you closely for infection.

PI3K inhibitor

Alpelisib (Piqray) blocks a form of the PI3K protein in cancer cells. This can help stop them from growing.

This drug can be used along with the hormone drug fulvestrant to treat women with advanced hormone receptor-positive, HER2-negative breast cancer with a *PIK3CA* gene mutation that has grown during or after treatment with an aromatase inhibitor. (The *PIK3CA* gene is the gene that tells the cell to make the PI3K protein.) Your doctor will test your blood or tumor for this mutation before starting treatment with this drug.

This drug is taken as a pill, typically once a day.

Side effects of alpelisib can include skin rash, high blood sugar levels, signs of kidney, liver, or pancreatic problems, diarrhea, low blood counts, nausea and vomiting, fatigue, decreased appetite, mouth sores, weight loss, low calcium levels, blood clotting problems, and hair loss.

Very severe skin reactions, such as rashes with peeling and blistering, are possible and should be reported to a doctor. People with a history of severe skin reactions should tell their doctor before taking alpelisib. Your cancer care team might recommend that you take an antihistamine medicine to help prevent the rash and may also check your blood sugar levels regularly.

AKT inhibitor

Capivasertib (Truqap) blocks forms of the AKT protein, which is part of a signaling pathway inside cells (including cancer cells) that can help them grow. Other proteins in this pathway include the PI3K and PTEN proteins.

This drug can be used along with the hormone drug fulvestrant to treat advanced hormone receptor-positive, HER2-negative breast cancer, if the cancer cells have changes in any of the *PIK3CA*, *AKT1*, or *PTEN* genes, and if the cancer has grown during or after treatment with hormone therapy. Your doctor will test your blood or tumor for these mutations before starting treatment with this drug.

This drug is taken as pills, typically twice a day for 4 days, followed by 3 days off each week.

Side effects of capivasertib can include:

- High blood sugar levels: Your cancer care team will check your blood sugar levels before and during your treatment.
- Diarrhea (which may be severe): Tell your cancer team right away if start to have loose stools or diarrhea.
- Skin rash or other skin reactions: Very severe skin reactions, such as rashes with peeling and blistering, are possible and should be reported to a doctor.

Other possible side effects can include nausea, vomiting, mouth sores, and changes in certain blood tests.

Antibody-drug conjugate

An antibody-drug conjugate (ADC) is a monoclonal antibody joined to a chemotherapy drug. The antibody acts like a homing signal by attaching to a specific protein on cancer cells, bringing the chemo directly to them.

Sacituzumab govitecan (Trodelvy): In the case of this ADC, the monoclonal antibody part attaches to the Trop-2 protein on breast cancer cells and brings the chemo directly to them. (Some breast cancer cells have too much Trop-2, which helps them grow and spread quickly.)

This ADC can be used to treat advanced hormone receptor-positive, HER2-negative breast cancer, in people who have already received hormone therapy and at least 2 chemo regimens.

This drug is given into a vein (IV) weekly for 2 weeks, followed by one week off, then restarted.

Some common **side effects** of this drug include nausea, vomiting, diarrhea, constipation, feeling tired, rash, loss of appetite, hair loss, low red blood cell counts, and belly pain. Serious side effects can include very low white blood cell counts (with an increased risk of infection), severe diarrhea, and infusion reactions (similar to an allergic reaction) when the drug is infused. Medicines are normally given before each treatment to lower the chances of vomiting and infusion reactions.

Targeted therapy for women with *BRCA* gene mutations

Olaparib (Lynparza) and talazoparib (Talzenna) are drugs known as *PARP inhibitors*. PARP proteins normally help repair damaged [DNA inside cells](#)³. The *BRCA* genes (*BRCA1* and *BRCA2*) also help repair DNA (in a slightly different way), but mutations in one of those genes can stop this from happening. PARP inhibitors work by blocking the PARP proteins. Because tumor cells with a mutated *BRCA* gene already have trouble repairing damaged DNA, blocking the PARP proteins often leads to the death of these cells. These drugs are pills and are taken once or twice a day. They can be used in different ways to treat breast cancer.

- Olaparib can be given to women with a *BRCA* mutation with early-stage HER2-negative breast cancer after surgery who have been treated with chemotherapy (before or after surgery) and are at high risk of the cancer recurring. It is typically given for one year. When given in this way, it can help some women live longer.
- Olaparib and talazoparib can be used to treat advanced or metastatic, HER2-negative breast cancer in women with a *BRCA* mutation who have already had chemotherapy. If the cancer is hormone receptor-positive, olaparib can also be used in women who have already received hormone therapy.

Only a small portion of women with breast cancer are born with a [mutated *BRCA* gene](#),⁴ which is in all the cells of the body. This is different from the gene change happening after you are born which is found only in the cancer cells. If you are not known to have a *BRCA* mutation, your doctor will test your blood to be sure you have one before starting treatment with these drugs.

Side effects can include nausea, vomiting, diarrhea, fatigue, loss of appetite, taste changes, low red blood cell counts (anemia), low platelet counts, and low white blood cell counts. Rarely, some people treated with a PARP inhibitor have developed a blood cancer, such as [myelodysplastic syndrome](#)⁵ or [acute myeloid leukemia \(AML\)](#)⁶.

Targeted therapy for triple-negative breast cancer

In triple-negative breast cancer (TNBC), the cancer cells don't have estrogen or progesterone receptors and they make very little or none of the HER2 protein.

Antibody-drug conjugate

An antibody-drug conjugate (ADC) is a monoclonal antibody joined to a chemotherapy drug. The antibody acts like a homing signal by attaching to a specific protein on cancer

cells, bringing the chemo directly to them.

Sacituzumab govitecan (Trodelvy): In the case of this ADC, the monoclonal antibody part attaches to the Trop-2 protein on breast cancer cells and brings a chemo drug, similar to irinotecan, directly to them. (Some breast cancer cells have too much Trop-2, which helps them grow and spread quickly.)

This antibody-drug conjugate can be used by itself to treat advanced TNBC, after at least 2 other chemo regimens have been tried. This drug is given in a vein (IV) weekly for 2 weeks, followed by one week off, then restarted.

Some common **side effects** of this drug include nausea, vomiting, diarrhea, constipation, feeling tired, rash, loss of appetite, hair loss, low red blood cell counts, and belly pain. Serious side effects can include very low white blood cell counts (with an increased risk of infection), severe diarrhea, and infusion reactions (similar to an allergic reaction) when the drug is infused. Medicines are normally given before each treatment to lower the chances of vomiting and infusion reactions.

More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy⁷](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects⁸](#).

Immunotherapy for Breast Cancer

Immunotherapy is the use of medicines to boost a person's own immune system to recognize and destroy cancer cells more effectively. Immunotherapy typically works on specific proteins involved in the immune system to enhance the immune response. These drugs have side effects different from those of chemotherapy.

Some immunotherapy drugs, for example, monoclonal antibodies, work in more than one way to control cancer cells and may also be considered [targeted therapy](#) because they block a specific protein on the cancer cell to keep it from growing.

Immunotherapy is used to treat some types of breast cancer.

- [Immune checkpoint inhibitors for breast cancer](#)
- [More information about immunotherapy](#)

Immune checkpoint inhibitors for breast cancer

An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses proteins (or "checkpoints") on immune cells that

need to be turned on (or off) to start an immune response. Breast cancer cells sometimes use these checkpoints to avoid being attacked by the immune system. Drugs that target these checkpoint proteins, help restore the immune response against breast cancer cells.

PD-1 inhibitor

Pembrolizumab (Keytruda) for breast cancer

Pembrolizumab (Keytruda) is a drug that targets PD-1 (a protein on immune system T cells that normally helps keep them from attacking other cells in the body). By blocking PD-1, these drugs boost the immune response against breast cancer cells. This can often shrink tumors.

It can be used with chemotherapy to treat [triple-negative breast cancer](#):

- Before and after surgery for stage 2 or 3 cancers
- That has come back (recurred) locally but can't be removed by surgery
- That has spread to other parts of the body.

This drug is given as an intravenous (IV) infusion, typically every 3 or 6 weeks. In certain situations, your doctor might test your cancer cells for the PD-L1 protein to show that the cancer is more likely to respond to treatment with pembrolizumab.

Possible side effects of immune checkpoint inhibitors

Side effects of these drugs can include fatigue, cough, nausea, skin rash, poor appetite, constipation, and diarrhea.

Other, more serious side effects occur less often.

Infusion reactions: Some people might have an infusion reaction while getting these drugs. This is like an allergic reaction, and can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It's important to tell your doctor or nurse right away if you have any of these symptoms while getting these drugs.

Autoimmune reactions: These drugs remove one of the protections on the body's immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It's very important to report any new side effects to your health care team quickly. If serious side effects do occur, treatment may need to be stopped and you may get high doses of corticosteroids to suppress your immune system.

More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy¹](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects²](#).

Treatment of Breast Cancer by Stage

This information is based on AJCC Staging systems prior to 2018 which were primarily based on tumor size and lymph node status. Since the updated staging system for breast cancer now also includes estrogen receptor (ER), progesterone receptor (PR), and HER2 status, the stages may be higher or lower than previous staging systems. Whether or not treatment strategies will change with this new staging system are yet to be determined. You should discuss your stage and treatment options with your doctor.

The [stage¹](#) of your breast cancer is an important factor in making decisions about your treatment options. In general, the more the breast cancer has spread, the more treatment you will likely need. But other factors can also be important, such as:

- If the cancer cells have [hormone receptors²](#) (that is, if the cancer is ER-positive or PR-positive)
- If the cancer cells have large amounts of the[HER2 protein³](#) (that is, if the cancer is HER2-positive)
- If the cancer cells have a certain gene mutation (change)
- Your overall health and personal preferences
- If you have gone through menopause or not
- How fast the cancer is growing (measured by grade or other measures) and if it is affecting major organs like the lungs or liver

Talk with your doctor about how these factors can affect your treatment options.

[Stage 0⁴](#)

Stage 0 cancers are limited to the inside of the milk duct and are non-invasive (does not invade nearby tissues). Ductal carcinoma in situ (DCIS) is a stage 0 breast tumor. Lobular carcinoma in situ (LCIS) used to be categorized as stage 0, but this has been changed because it is not cancer. Still, it does indicate a higher risk of breast cancer. See [Lobular Carcinoma in Situ \(LCIS\)](#) for more information.

- [Treatment of Ductal Carcinoma in Situ \(DCIS\)](#)

[Stages I-III](#)

Treatment for stages I to III breast cancer usually includes surgery and radiation therapy, often with chemo or other drug therapies either before (neoadjuvant) or after (adjuvant) surgery. Stage I: These breast cancers are still relatively small and either have not spread to the lymph nodes or have only a tiny area of cancer spread in the sentinel lymph node (the first lymph node to which cancer is likely to spread). Stage II: These breast cancers are larger than stage I cancers and/or have spread to a few nearby lymph nodes. Stage III: These tumors are larger or are growing into nearby tissues (the skin over the breast or the muscle underneath), or they have spread to many nearby lymph nodes.

- [Treatment of Breast Cancer Stages I-III](#)

[Stage IV \(metastatic breast cancer\)](#)

Stage IV cancers have spread beyond the breast and nearby lymph nodes to other parts of the body.

- [Treatment of Stage IV \(Metastatic\) Breast Cancer](#)

[Recurrent breast cancer](#)

Cancer is called recurrent when it comes back after primary treatment. Recurrence can be local (in the same breast or in the surgery scar), regional (in nearby lymph nodes), or in a distant area. Treatment for recurrent breast cancer depends on where the cancer comes back and what treatments you've had before.

- [Treatment of Recurrent Breast Cancer](#)

Treatment of Ductal Carcinoma in Situ (DCIS)

Ductal carcinoma in situ (DCIS) means the cells that line the milk ducts of the breast have become cancer, but they have not spread into surrounding breast tissue.

DCIS is considered non-invasive or pre-invasive breast cancer. DCIS can't spread outside the breast, but it is often treated because if left alone, some DCIS cells can continue to undergo abnormal changes that cause it to become invasive breast cancer (which can spread).

In most cases, a woman with DCIS can choose between breast-conserving surgery (BCS) and simple mastectomy. But sometimes, if DCIS is throughout the breast, a mastectomy might be a better option. There are clinical studies being done to see if observation instead of surgery might be an option for some women.

- [Breast-conserving surgery \(BCS\)](#)
- [Mastectomy](#)
- [Hormone therapy after breast surgery](#)

Breast-conserving surgery (BCS)

In [breast-conserving surgery](#)[sentinel lymph node biopsy \(SLNB\)](#) (BCS), the surgeon removes the tumor and a small amount of normal breast tissue around it. Lymph node removal is not usually needed with BCS. It might be done after the first surgery if an area of invasive cancer is found. The chances an area of DCIS contains invasive cancer goes up with tumor size and how fast the cancer is growing. If lymph nodes are removed, this is usually done as a .

If BCS is done, it is usually followed by radiation therapy. This lowers the chance of the cancer coming back in the same breast (either as more DCIS or as an invasive cancer). BCS without radiation therapy is not a standard treatment, but it might be an option for older women, women with other significant health problems, or women who had small areas of low-grade DCIS that were removed with large enough cancer-free surgical margins.

Many women with early-stage breast cancer, like DCIS, can choose between breast-conserving surgery (BCS) and mastectomy. The main advantage of BCS is that a woman keeps most of her breast. Some women might worry that having less extensive surgery might raise their risk of the cancer coming back. But studies following thousands of women for more than 20 years show that when BCS is done with radiation in women with early-stage cancer , survival is the same as having a mastectomy.

Mastectomy

Simple [mastectomy](#) (removal of the entire breast) may be needed if the area of DCIS is very large, if the breast has several separate areas of DCIS in different quadrants (multicentric), or if BCS cannot remove the DCIS completely (that is, the BCS specimen and re-excision specimens still have cancer cells in or near the surgical margins). If a mastectomy is needed for any of the reasons stated above, many doctors will do a SLNB along with the mastectomy because there is a higher chance that invasive cancer might be found. If an area of invasive cancer is found in the tissue removed during a mastectomy, the doctor won't be able to go back and do SLNB later, and as a result may have to do a full axillary lymph node dissection (ALND) instead.

Women having a mastectomy for DCIS typically don't need radiation therapy and may

choose to have [breast reconstruction](#)¹ right away or later.

Hormone therapy after breast surgery

If the DCIS is hormone receptor-positive (estrogen or progesterone), treatment with tamoxifen (for any woman) or an aromatase inhibitor, such as exemestane or anastrozole, (for women past menopause) for 5 years after surgery can lower the risk of another DCIS or invasive cancer developing in either breast. If you have hormone receptor-positive DCIS, discuss the reasons for and against hormone therapy with your doctor.

Treatment of Breast Cancer Stages I-III

The [stage](#)¹ of your breast cancer is an important factor in making decisions about your treatment.

Most women with breast cancer in stages I, II, or III are treated with [surgery](#), often followed by [radiation therapy](#). Many women also get some kind of systemic drug therapy (medicine that travels to almost all areas of the body). In general, the more the breast cancer has spread, the more treatment you will likely need. But your treatment options are affected by your personal preferences and other information about your breast cancer, such as:

- If the cancer cells have [hormone receptors](#)². That is, if the cancer is estrogen receptor (ER)-positive or progesterone receptor (PR)-positive.
- If the cancer cells have large amounts of the HER2 protein (that is, if the cancer is [HER2-positive](#)³)
- How fast the cancer is growing (measured by [grade](#)⁴ or [Ki-67](#)⁵)
- Your overall health
- If you have gone through menopause or not

Talk with your doctor about how these factors can affect your treatment options.

- [What type of drug treatment\(s\) might I get?](#)
- [Treating stage I breast cancer](#)
- [Treating stage II breast cancer](#)
- [Treating stage III breast cancer](#)

What type of drug treatment(s) might I get?

Most women with breast cancer in stages I, II, or III will get some kind of systemic therapy as part of their treatment. This might include:

- [Chemotherapy](#)
- [Hormone therapy](#) (tamoxifen, an aromatase inhibitor, or one followed by the other)
- [Targeted drugs](#), such as trastuzumab (Herceptin), pertuzumab (Perjeta), or abemaciclib (Verzenio)
- [Immunotherapy](#)
- Some combination of these

The types of drugs that might work best depend on the tumor's hormone receptor status, HER2 status, and other factors.

Treating stage I breast cancer

These breast cancers are still fairly small and either have not spread to the lymph nodes or have spread to only a tiny area in the sentinel lymph node (the first lymph node to which cancer is likely to spread).

Local therapy (surgery and radiation therapy)

Surgery is the main treatment for stage I breast cancer. These cancers can be treated with either [breast-conserving surgery](#) (BCS; sometimes called lumpectomy or partial mastectomy) or [mastectomy](#). The nearby [lymph nodes](#) will also need to be checked, either with a sentinel lymph node biopsy (SLNB) or an axillary lymph node dissection (ALND).

Some women can have [breast reconstruction](#)⁶ at the same time as the surgery to remove the cancer. But if you will need radiation therapy after surgery, it is better to wait to get reconstruction until after the radiation is complete.

If BCS is done, radiation therapy is usually given after surgery to lower the chance of the cancer coming back in the breast and to also help people live longer.

In a separate group, women who are at least 65 years old may consider BCS **without** radiation therapy if ALL of the following are true:

- The tumor was 3 cm (a little more than 1 inch) or less across and it has been removed completely.
- None of the lymph nodes removed contained cancer.
- The cancer is ER-positive or PR-positive, and hormone therapy will be given.

Radiation therapy given to women with these characteristics still lowers the chance of the cancer coming back, but it has not been shown to help them live longer.

If you had a mastectomy, you are less likely to need radiation therapy, but it might be given depending on the details of your specific cancer. You should discuss if you need radiation treatment with your doctor. You might be sent to a doctor who specializes in radiation (a radiation oncologist) for evaluation.

Systemic therapy (chemo and other drugs)

If a woman has a hormone receptor-positive (ER-positive or PR-positive) breast cancer, most doctors will recommend hormone therapy (tamoxifen or an aromatase inhibitor, or one followed by the other) as an adjuvant (after surgery) treatment, no matter how small the tumor is. Women with tumors larger than 0.5 cm (about ¼ inch) across may be more likely to benefit from it. Hormone therapy is typically given for at least 5 years.

If the tumor is larger than 0.5 cm (about 1/4 inch) across, chemo after surgery (adjuvant chemotherapy) is sometimes recommended. A woman's age when she is diagnosed may help in deciding if chemo should be offered or not. Some doctors may suggest chemo for smaller tumors as well, especially if they have any unfavorable features (a cancer that is growing fast; hormone receptor-negative, HER2-positive; or having a [high score on a gene panel such as Oncotype DX⁷](#)).

After surgery, some women with HER2-positive cancers will be treated with trastuzumab (with or without pertuzumab) for up to 1 year.

Many women with HER2-positive cancers will be treated with neoadjuvant (before surgery) chemo and trastuzumab (with or without pertuzumab) followed by surgery and more trastuzumab (with or without pertuzumab) for up to 1 year. If after neoadjuvant therapy, residual cancer is found during surgery, trastuzumab may be changed to a different drug, called ado-trastuzumab emtansine, which is given every 3 weeks for 14 doses.

For women with a BRCA mutation and hormone-positive, HER2-negative breast cancer who received neoadjuvant chemotherapy but still have residual cancer at the time of surgery, the targeted drug olaparib might be given after surgery. It is usually given for one year. When given this way, it can help some women live longer.

Treating stage II breast cancer

Stage II breast cancers are larger than stage I cancers and/or have spread to a few nearby lymph nodes.

Local therapy (surgery and radiation therapy)

Stage II cancers are treated with either breast-conserving surgery (BCS; sometimes called lumpectomy or partial mastectomy) or mastectomy. The nearby [lymph nodes](#) will also be checked, either with a sentinel lymph node biopsy (SLNB) or an axillary lymph node dissection (ALND).

Women who have **BCS** are treated with radiation therapy after surgery. Women who have a **mastectomy** are typically treated with radiation if the cancer is found in the lymph nodes. Some patients who have a SLNB that shows cancer in a few lymph nodes might not have the rest of their lymph nodes removed to check for more cancer. In these patients, radiation may be discussed as a treatment option after mastectomy.

If you were initially diagnosed with stage II breast cancer and were given a systemic treatment such as chemotherapy or hormone therapy before surgery, radiation therapy might be recommended if cancer is found in the lymph nodes during mastectomy. A **radiation oncologist** may talk with you to see if radiation would be helpful.

If chemotherapy is also needed after surgery, the radiation will be delayed until the chemo is done.

In some women, breast reconstruction can be done during the surgery to remove the cancer. But if you will need radiation after surgery, it is better to wait to get reconstruction until after the radiation is complete.

Systemic therapy (chemo and other drugs)

Systemic therapy (drugs that travel to almost every part of the body) is recommended for some women with stage II breast cancer. Some systemic therapies are given before surgery (neoadjuvant therapy), and others are given after surgery (adjuvant therapy). For some women, systemic therapy will be started before surgery and then continued after surgery. Neoadjuvant treatments are a good option for women with large tumors, because they can shrink the tumor before surgery, possibly enough to make BCS an option.

Neoadjuvant treatment is also a preferable option for women with triple-negative breast cancer (TNBC) or HER2-positive breast cancer because the treatment given after surgery is often chosen depending on how much cancer is still in the breast and/or lymph nodes at the time of surgery. Some women with early-stage cancer who get neoadjuvant treatment might live longer if the cancer completely goes away with that treatment.

To help decide which women with stage II hormone receptor-positive, HER2-negative breast cancer will benefit from chemotherapy, a gene panel test such as Oncotype DX⁸ may be done on the tumor sample.

The drugs used will depend on the woman's menopause status, as well as tumor test results. Treatment might include:

- **Chemotherapy:** Chemo can be given before and/or after surgery.
- **HER2 targeted drugs:** Some women with HER2-positive cancers will be treated with adjuvant (after surgery) chemotherapy with trastuzumab with or without pertuzumab for up to 1 year. Many women with HER2-positive cancers will be treated first with trastuzumab (with or without pertuzumab) followed by surgery and then more trastuzumab (with or without pertuzumab) for up to a year. If after neoadjuvant therapy, residual cancer is found at the time of surgery, the targeted drug, ado-trastuzumab emtansine, may be used instead of trastuzumab. It is given every 3 weeks for 14 doses. For women with hormone receptor-positive cancer found in the lymph nodes after completing 1 year of trastuzumab, the doctor might also recommend additional treatment with an oral targeted drug called neratinib for 1 year.
- **Hormone therapy:** If the cancer is hormone receptor-positive, hormone therapy (tamoxifen, an aromatase inhibitor (AI), or one followed by the other) is typically used. It can be started before surgery, but because it continues for at least 5 years, it needs to be given after surgery as well.
- **Targeted drug therapy:** For women with early-stage breast cancer that is hormone receptor-positive, HER2-negative, has cancer in the lymph nodes, and has a high chance of coming back, the targeted drug abemaciclib can be given after surgery along with tamoxifen or an AI. It is a pill typically given for 2 years twice a day. For women who have a BRCA mutation with a hormone receptor-positive, HER2-negative tumor who still have cancer in the tissue removed at surgery after neoadjuvant chemo, the targeted drug olaparib might be given for one year to help lower the chance of the cancer recurring. When given this way, it can help some women live longer.
- **Immunotherapy:** Women with TNBC might get the immunotherapy drug, pembrolizumab, before surgery and then again after surgery. See [Treatment of Triple-negative Breast Cancer](#) for more details.

Treating stage III breast cancer

In stage III breast cancer, the tumor is large (more than 5 cm or about 2 inches across) or growing into nearby tissues (the skin over the breast or the muscle underneath), or the cancer has spread to many nearby lymph nodes.

If you have inflammatory breast cancer: Stage III cancers also include some inflammatory breast cancers that have not spread beyond nearby lymph nodes. These

cancers are treated slightly different from other stage III breast cancers. You can find more details in [Treatment of Inflammatory Breast Cancer](#).

There are two main approaches to treating stage III breast cancer:

Starting with neoadjuvant therapy

Most often, these cancers are treated with neoadjuvant (before surgery) chemotherapy. For HER2-positive tumors, the targeted drug trastuzumab is given as well, often along with pertuzumab (Perjeta). This may shrink the tumor enough for a woman to have [breast-conserving surgery \(BCS\)](#). If the tumor doesn't shrink enough, a [mastectomy](#) is done. Nearby [lymph nodes](#) will also need to be checked. A sentinel lymph node biopsy (SLNB) is often not an option for stage III cancers, so an axillary lymph node dissection (ALND) is usually done.

Often, radiation therapy is needed after surgery. If breast reconstruction is planned, it is usually delayed until after radiation therapy is done. For some, additional chemo is given after surgery as well.

After surgery, some women with HER2-positive cancers will be treated with trastuzumab (with or without pertuzumab) for up to a year. Many women with HER2-positive cancers will be treated first with trastuzumab (with or without pertuzumab) followed by surgery and then more trastuzumab (with or without pertuzumab) for up to a year. If after neoadjuvant therapy, any residual cancer is found at the time of surgery, ado-trastuzumab emtansine may be used instead of trastuzumab. It is given every 3 weeks for 14 doses. For women with hormone receptor-positive cancer that is in the lymph nodes, who have completed a year of trastuzumab, the doctor might also recommend additional treatment with an oral targeted drug called neratinib for a year.

Women with hormone receptor-positive (ER-positive or PR-positive) breast cancers will also get adjuvant hormone therapy which can typically be taken at the same time as trastuzumab.

For women with hormone receptor-positive, HER2-negative breast cancer that is in the lymph nodes, and has a high chance of coming back, abemaciclib can be given after surgery along with tamoxifen or an AI. It is a pill typically given twice a day for 2 years.

For women who have a BRCA mutation and hormone receptor-positive, HER2-negative breast cancer and still have cancer in the tissue removed at surgery after neoadjuvant chemo, the targeted drug olaparib might be given for one year to help lower the chance of the cancer recurring. When given this way, it can help some women live longer.

Neoadjuvant treatment is a preferable option for women with stage III TNBC or HER2-positive breast cancer because the treatment given after surgery is chosen depending on how much cancer is still in the breast and/or lymph nodes at the time of surgery. Some women with stage III cancer who get neoadjuvant treatment might live longer if the cancer goes away completely with that treatment.

Women with TNBC might get the immunotherapy drug, pembrolizumab, before surgery and then again after surgery. See [Treatment of Triple-negative Breast Cancer](#) for more details.

Starting with surgery

Surgery first is an option for some women with stage III cancers. Because these tumors are fairly large and/or have grown into nearby tissues, this usually means getting a mastectomy. For women with fairly large breasts, BCS may be an option if the cancer hasn't grown into nearby tissues. SLNB may be an option for some patients, but most will need an ALND. Surgery is usually followed by adjuvant chemotherapy, and/or hormone therapy, and/or targeted drug therapy, and/or HER2-positive treatment (trastuzumab, pertuzumab, or neratinib) depending on the traits of the cancer cells. Radiation is recommended after surgery.

Treatment of Stage IV (Metastatic) Breast Cancer

Stage IV cancers have spread (metastasized) beyond the breast and nearby lymph nodes to other parts of the body. When breast cancer spreads, it most commonly goes to the bones, liver, and lungs. It may also spread to the brain or other organs.

For women with stage IV breast cancer, systemic drug therapies are the main treatments. These may include:

- [Hormone therapy](#)
- [Chemotherapy \(chemo\)](#)
- [Targeted drugs](#)
- [Immunotherapy](#)
- Some combination of these

[Surgery](#) and/or [radiation therapy](#) may be useful in certain situations (see below).

Treatment can often shrink tumors (or slow their growth), improve symptoms, and help some women live longer. These cancers are considered incurable.

- [Systemic \(drug\) treatments for stage IV breast cancer](#)
- [Local or regional treatments for stage IV breast cancer](#)
- [Relieving symptoms of advanced breast cancer](#)
- [Advanced cancer that progresses during treatment](#)

Systemic (drug) treatments for stage IV breast cancer

Treatment often continues until the cancer starts growing again or until side effects become unacceptable. If this happens, other drugs might be tried. The types of drugs used for stage IV breast cancer depend on the hormone receptor status, the HER2 status of the cancer, and sometimes gene mutations that might be found.

Hormone receptor-positive cancers

Women with hormone (estrogen or progesterone) receptor-positive cancers are sometimes treated first with hormone therapy (tamoxifen or an aromatase inhibitor). This may be combined with a targeted drug such as a CDK4/6 inhibitor.

If the initial hormone therapy stops working, another type can be tried, often along with a targeted drug such as everolimus, a PI3K inhibitor such as alpelisib (Piqray) or an AKT inhibitor such as capivasertib (Truqap), if the cancer cells have certain gene changes. (See “Advanced cancer that progresses during treatment” below.)

Women who haven’t yet gone through menopause are often treated with tamoxifen or with medicines that keep the ovaries from making hormones along with other drugs.

Hormone receptor-negative cancers

Chemo is the main treatment for women with hormone (estrogen and progesterone) receptor-negative cancers, because hormone therapy isn’t helpful for these cancers.

HER2-positive cancers

The first therapy given is usually chemotherapy in combination with trastuzumab (Herceptin, [other names¹](#)) and pertuzumab (Perjeta), both HER2 targeted drugs. If the cancer grows, other options might include:

- An [antibody-drug conjugate](#)
- A [kinase inhibitor](#) with an anti-HER2 drug or with a [chemo](#) drug or both
- Other [HER2 targeted drugs](#) with chemo

Hormone therapy might be added to these drug combinations if the cancer is also hormone-receptor positive.

HER2-low cancers

For breast cancers that are considered [HER2-low²](#) and have spread to distant sites, the antibody-drug conjugate fam-trastuzumab deruxtecan (Enhertu) might be an option.

HER2-negative cancers in women with a *BRCA* gene mutation

These women are typically treated with a targeted drug called a PARP inhibitor, such as olaparib or talazoparib. Chemotherapy drugs and hormone drugs are also very helpful in treating these cancers.

Triple-negative breast cancer (TNBC)

An immunotherapy drug along with chemotherapy might be used in people with advanced triple-negative breast cancer whose tumor makes the PD-L1 protein. The PD-L1 protein is found in about 1 in 5 women with triple-negative breast cancer. For women with TNBC and a *BRCA* mutation, drugs called PARP inhibitors (like olaparib or talazoparib) may be considered.

For breast cancers in which the cancer cells show high levels of gene changes called microsatellite instability (**MSI**) or changes in any of the mismatch repair (**MMR**) genes (*MLH1*, *MSH2*, *MSH6*, or *PMS2*), immunotherapy with the drug pembrolizumab might be used. Pembrolizumab might also be an option for TNBC that has other gene or protein changes.

For TNBC that does not have any specific gene or protein changes, chemo alone or the [antibody-drug conjugate](#) sacituzumab govitecan (Trodelvy) might be an option.

You can find more treatment details in [Treatment for Triple-negative Breast Cancer](#).

Local or regional treatments for stage IV breast cancer

Although systemic drugs are the main treatment for stage IV breast cancer, local and regional treatments such as surgery, radiation therapy, or regional chemotherapy are sometimes used as well. These can help treat breast cancer in a specific part of the body, but they are very unlikely to get rid of all of the cancer. These treatments are more likely to be used to help prevent or treat symptoms or complications from the cancer.

Radiation therapy and/or surgery may also be used in certain situations, such as:

- When the breast tumor is causing an open or painful wound in the breast (or chest)
- To treat a small number of metastases in a certain area, such as the brain
- To help prevent or treat bone fractures
- When a cancer is pressing on the spinal cord
- To treat a blood vessel blockage in the liver
- To provide relief of pain or other symptoms anywhere in the body

In some cases, regional chemo (where drugs are delivered directly into a certain area, such as into the fluid around the brain and spinal cord, called intrathecal chemo) may be useful as well.

If your doctor recommends such local or regional treatments, it is important that you

understand the goal—whether it is to try to cure the cancer or to prevent or treat symptoms.

Relieving symptoms of advanced breast cancer

Treatment to relieve symptoms depends on where the cancer has spread. For example, pain from bone metastases may be treated with radiation therapy, drugs called bisphosphonates such as pamidronate (Aredia) or zoledronic acid (Zometa), or the drug denosumab (Xgeva). For more, see [treatment of bone metastases³](#).

Advanced cancer that progresses during treatment

Treatment for advanced breast cancer can often shrink the cancer or slow its growth (sometimes for many years), but after a time, it tends to stop working. Further treatment options at this point depend on several factors, including previous treatments, where the cancer is located, a woman's menopause status, general health, desire to continue getting treatment, and whether the hormone receptor status and HER2 status have changed on the cancer cells.

Progression during hormone therapy

For hormone receptor-positive (ER-positive or PR-positive) cancers that were being treated with hormone therapy, switching to another type of hormone therapy and/or adding a [targeted drug](#) sometimes helps. For example:

- If either letrozole (Femara) or anastrozole (Arimidex) was given first, using exemestane, possibly with the targeted drug everolimus (Afinitor), may be an option.
- Another option might be using elacestrant (Orserdu), fulvestrant (Faslodex), or a different aromatase inhibitor, sometimes along with a targeted drug known as a CDK4/6 inhibitor.
- If the cancer has a *PIK3CA* gene mutation and has grown while being treated with an aromatase inhibitor, fulvestrant with the targeted drug alpelisib (Piqray) might be considered.
- If the cancer has a *PIK3CA*, *AKT1*, or *PTEN* gene mutation, fulvestrant with the targeted drug capivasertib (Truqap) might be an option.

If the cancer is no longer responding to any hormone drugs, chemotherapy immunotherapy, or PARP inhibitors might be options depending on specific features of

the cancer or any gene changes that might be present.

Progression during chemotherapy

If the cancer is no longer responding to one chemo regimen, trying another may be helpful. Many different drugs and combinations can be used to treat breast cancer. However, each time a cancer progresses during treatment, it becomes less likely that further treatment will have an effect. Sometimes, other options include adding an immunotherapy drug to the chemo or using a PARP inhibitor alone depending on specific features of the cancer or any gene changes that might be present.

Progression while being treated with HER2 drugs

HER2-positive cancers that no longer respond to trastuzumab (Herceptin) might respond to other drugs that target the HER2 protein. Options for women with HER2-positive cancers might include:

- Pertuzumab (Perjeta) with chemo and trastuzumab
- Ado-trastuzumab emtansine (Kadcyla)
- Fam-trastuzumab deruxtecan (Enhertu)
- Margetuximab (Margenza) with chemo
- Lapatinib (Tykerb) and the oral chemo drug capecitabine
- Lapatinib and an aromatase inhibitor (for hormone receptor-positive cancers)
- Neratinib (Nerlynx) and the chemo drug capecitabine (this combination can be helpful for cancers that have spread to the brain)
- Tucatinib (Tukysa), trastuzumab, and the chemo drug capecitabine (this combination can be helpful for cancers that have spread to the brain)

Because current treatments are very unlikely to cure metastatic breast cancer, if you are in otherwise good health, you may want to think about taking part in a [clinical trial⁴](#) testing a newer treatment.

Treatment of Recurrent Breast Cancer

For some women, breast cancer may come back after treatment – sometimes years later. This is called a recurrence. **Recurrence can be local (in the same breast or in the surgery scar), regional (in nearby lymph nodes), or in a distant area.** Cancer that is found in the opposite breast without any cancer elsewhere in the body is not a recurrence—it is a new cancer that requires its own treatment.

- [Treating local recurrence](#)
- [Treating regional recurrence](#)
- [Treating distant recurrence](#)

Treating local recurrence

For women whose breast cancer has recurred locally, treatment depends on their initial treatment.

- If you had breast-conserving surgery (lumpectomy), a local recurrence in the breast is usually treated with [mastectomy](#).
- If the initial treatment was mastectomy, recurrence near the mastectomy site is treated by removing the tumor whenever possible. This is often followed by [radiation therapy](#) if not given before.

In either case, [hormone therapy](#), [targeted therapy](#) (like trastuzumab), [immunotherapy](#), [chemotherapy](#), or some combination of these may be used after surgery and/or radiation therapy. These drugs might also be used if surgery or radiation are not options.

Treating regional recurrence

When breast cancer comes back in nearby lymph nodes (such as those under the arm or around the collar bone), it is treated by [removing those lymph nodes](#), if possible. This may be followed by radiation aimed at the area if it was not given before. Systemic treatment (such as chemo, targeted therapy, or hormone therapy) may be considered after surgery as well.

Treating distant recurrence

In general, women whose breast cancer comes back in other parts of the body, such as the bones, lungs, or brain, are treated the same way as those found to have stage IV breast cancer in these organs when they were first diagnosed. See [Treating Stage IV](#)

(Metastatic) Breast Cancer. The only difference is that treatment may or may not include treatments or drugs a woman has already had.

Recurrent breast cancer can sometimes be hard to treat. If you are in otherwise good health, you might want to think about taking part in a [clinical trial](#)¹ testing a newer treatment.

Should your cancer come back, see [Understanding Recurrence](#)²for more on how to manage and cope with this phase of your treatment.

Treatment of Triple-negative Breast Cancer

Triple-negative breast cancer (TNBC) doesn't have estrogen or progesterone receptors and also makes too little or none of the HER2 protein. Because the cancer cells don't have these proteins, hormone therapy and drugs that target HER2 are not helpful, so chemotherapy (chemo) is the main **systemic** treatment option. And even though TNBC tends to respond well to chemo initially, it also tends to come back (recur) more frequently than other breast cancers.

- [Stages I-III triple-negative breast cancer](#)
- [Stage IV triple-negative breast cancer](#)
- [Recurrent triple-negative breast cancer](#)

Stages I-III triple-negative breast cancer

Surgery first: If the early-stage TNBC tumor is small enough to be removed by [surgery](#), then breast-conserving surgery or a mastectomy with a check of the lymph nodes may be done. In certain cases, such as with a large tumor or if the lymph nodes are found to have cancer, [radiation](#) may follow surgery. You might also be given chemo after surgery (adjuvant chemotherapy) to reduce the chances of the cancer coming back. For women who have a *BRCA* mutation and at surgery are found to have:

- A tumor larger than 2cm but no bigger than 5cm OR
- 1 to 3 axillary (underarm) lymph nodes with cancer

the [targeted drug olaparib \(Lynparza\)](#) might be given for a year after adjuvant chemo. When given this way, it can help some women live longer.

Surgery second: Chemo is often given before surgery (neoadjuvant chemotherapy) by itself or with [pembrolizumab](#)(Keytruda) to shrink a large tumor and/or lymph nodes with cancer. If cancer is still found in the tissue removed by surgery after neoadjuvant chemo has been given, your doctor may recommend:

- an oral chemo drug called capecitabine (Xeloda) for 18 to 24 weeks. This might help some women live longer.
- more pembrolizumab after surgery (adjuvant treatment) to reduce the chances of the cancer coming back.

- the targeted drug olaparib for one year for women who have a BRCA mutation to help lower the chance of the cancer recurring. When given this way, it can help some women live longer.

Stage IV triple-negative breast cancer

Chemo is often used first when the cancer has spread to other parts of the body (stage IV). Common chemo drugs used include anthracyclines, taxanes, capecitabine, gemcitabine, eribulin, and others. Chemo drugs might be used alone or in combination.

For women with TNBC who have a **BRCA mutation** and whose cancer no longer responds to common breast cancer chemo drugs, other platinum chemo drugs (like cisplatin or carboplatin) or **targeted drugs** called PARP inhibitors (such as olaparib [Lynparza] or talazoparib [Talzenna]), may be considered.

For advanced TNBC in which the cancer cells have the **PD-L1 protein**, the first treatment may be **immunotherapy** (pembrolizumab) plus chemo . The PD-L1 protein is found in about 1 out of 5 TNBCs.

For advanced TNBC in which at least 2 other drug treatments have already been tried, the **antibody-drug conjugate** sacituzumab govitecan (Trodelvy) might be an option.

For advanced TNBC in which the cancer cells show high levels of gene changes called microsatellite instability (**MSI**) or changes in any of the mismatch repair (**MMR**) genes (MLH1, MSH2, MSH6, and PMS2), immunotherapy with the drug pembrolizumab might be used. Pembrolizumab might also be an option for TNBC that has a **high tumor mutational burden (TMB-H)** which is a measure of the number of gene mutations (changes) inside the cancer cells. Cells that have many gene mutations (a high TMB) might be more likely to be recognized as abnormal and attacked by the body's immune system.

Surgery and **radiation** may also be options in certain situations.

See [Treatment of Stage IV \(Metastatic\) Breast Cancer](#) for more information.

Recurrent triple-negative breast cancer

If TNBC comes back (recurs) locally, cannot be removed with surgery, and makes the

PD-L1 protein, [immunotherapy](#) with the drug pembrolizumab along with chemotherapy is an option. Other treatments might be options as well, depending on the situation.

If the cancer recurs in other parts of the body, options might include chemotherapy or the [antibody-drug conjugate](#) sacituzumab govitecan (Trodelvy).

Regardless of the stage of the cancer, participation in a [clinical trial¹](#) of new treatments for TNBC is also a good option because TNBC is uncommon and tends to have a poor prognosis (outcome) compared to other types of breast cancer, and because these studies often allow patients to have access to drugs not available for standard treatment.

Treatment of Inflammatory Breast Cancer

Inflammatory breast cancer (IBC) is an uncommon type of invasive breast cancer that typically makes the skin on the breast look red and feel warm. It also may give the breast skin a thick, pitted appearance that looks a lot like an orange peel. These changes are caused by cancer cells blocking lymph vessels in the skin.

Because inflammatory breast cancer has reached these lymph vessels and has caused changes in the skin, it is considered to be at least a stage III breast cancer when it is diagnosed. IBC that has spread to other parts of the body is considered stage IV. These cancers typically grow quickly and can be challenging to treat.

Regardless of the stage of the cancer, participation in a [clinical trial¹](#) of new treatments for IBC is also a good option because IBC is rare, has a poor prognosis (outcome), and

these studies often allow access to drugs not available for standard treatment.

- Treating stage III inflammatory breast cancer
- Treating stage IV inflammatory breast cancer

Treating stage III inflammatory breast cancer

IBC that has not spread outside the breast or to nearby lymph nodes is stage III. Treatment usually starts with chemotherapy (chemo) to try to shrink the tumor. If the cancer is HER2-positive, targeted therapy is given along with the chemo. This is typically followed by surgery (mastectomy and lymph node dissection) to remove the cancer. Radiation therapy often follows surgery. Sometimes, more chemo may be given after surgery but before radiation. If the cancer is hormone receptor-positive, hormone therapy is given as well (usually after all chemo has been given). Combining these treatments has improved survival significantly over the years.

Chemotherapy (possibly along with targeted therapy)

Using **chemo** before surgery is called **neoadjuvant** or **preoperative** treatment. Most women with IBC will receive two types of chemo drugs (although not always at the same time):

- An anthracycline, such as doxorubicin (Adriamycin) or epirubicin (Ellence)
- A taxane, such as paclitaxel (Taxol) or docetaxel (Taxotere)

Other chemo drugs may be used as well.

If the cancer is HER2-positive (the cancer cells make too much of a protein called HER2), the **targeted therapy drug** trastuzumab (Herceptin) is usually given, sometimes along with another targeted drug, pertuzumab (Perjeta). These drugs can lead to heart problems when given with an anthracycline, so one option is to give the anthracycline first (without trastuzumab or pertuzumab), followed by treatment with a taxane and trastuzumab (with or without pertuzumab).

For IBC that is **triple-negative**², the **immunotherapy drug** pembrolizumab can be given with chemo before surgery (neoadjuvant treatment) and then continued by itself after surgery (adjuvant treatment).

For women who have:

- a BRCA mutation AND
- triple-negative or HER2-negative IBC AND
- residual cancer in the tissue removed by surgery after neoadjuvant chemo

the targeted drug olaparib (Lynparza) might be given to lower the risk of the cancer recurring. It is typically given for one year. When given this way, olaparib can help some women live longer.

Surgery and further treatments

If the cancer improves with chemo, **surgery** is typically the next step. The standard operation is a modified radical mastectomy, where the entire breast and the lymph nodes under the arm are removed. Because IBC affects so much of the breast and skin, breast-conserving surgery (partial mastectomy or lumpectomy) and skin-sparing mastectomy are not options. It isn't clear that sentinel lymph node biopsy (where only one or a few nodes are removed) is reliable in IBC, so it is also not an option.

If the cancer does not respond to chemo (and the breast is still very swollen and red), surgery cannot be done. Either other chemo drugs will be tried, or the breast may be treated with radiation. Then if the cancer responds (the breast shrinks and is no longer red), surgery may be an option.

If breast radiation isn't given before surgery, it is given after surgery, even if no cancer is thought to remain. This is called **adjuvant** radiation. It lowers the chance that the cancer will come back. Radiation is usually given 5 days a week for 6 weeks, but in some cases a more intense treatment (twice a day) can be used instead. Depending on how much tumor was found in the breast after surgery, radiation might be delayed until further chemo and/or targeted therapy (such as trastuzumab) is given. If breast reconstruction is to be done, it is usually delayed until after the radiation therapy that most often follows surgery.

Treatment after surgery often includes additional (adjuvant) systemic treatment. This can include chemo, targeted therapy, hormone therapy (tamoxifen or an aromatase inhibitor) if the cancer cells have hormone receptors, the oral chemo drug capecitabine (Xeloda) if the cancer is triple-negative, the PARP inhibitor olaparib (Lynparza) if the woman has a BRCA mutation, and/or trastuzumab, pertuzumab or ado-trastuzumab emtansine if the cancer is HER2-positive.

Treating stage IV inflammatory breast cancer

Patients with metastatic (stage IV) IBC are treated with systemic therapy. This may include:

- Chemotherapy
- Hormonal therapy (if the cancer is hormone receptor-positive)
- Targeted therapy with a drug that targets HER2 (if the cancer is HER2-positive)
- Immunotherapy if the cancer makes a protein called PD-L1
- Targeted drug therapy with a PARP inhibitor called olaparib if the woman has a *BRCA* mutation

One or more of these treatments might be used. Many times, a targeted drug is given along with chemotherapy or with hormone therapy. Surgery and radiation may also be options in certain situations. See [Treatment of Stage IV \(Metastatic\) Breast Cancer](#) for more information.

Treating Breast Cancer During Pregnancy

If you are diagnosed with breast cancer while pregnant, your treatment options will be more complicated because you will want to get the best treatment for your cancer while also protecting the baby. The type and timing of treatment will need to be planned carefully and coordinated between your cancer care team and your obstetrician.

When treating a pregnant woman with breast cancer, the goal is the same as when

treating a non-pregnant woman: to cure the cancer whenever possible, or to control it and keep it from spreading if it can't be cured. But the extra concern of protecting a growing fetus may make treatment more complicated.

- [Is it safe to have breast cancer treatment during pregnancy?](#)
- [Breast cancer surgery during pregnancy](#)
- [Treatment after surgery](#)
- [Can I breastfeed during cancer treatment?](#)
- [Does pregnancy affect survival rates for breast cancer?](#)

Is it safe to have breast cancer treatment during pregnancy?

If you are pregnant and have breast cancer, you might have hard choices to make, so get expert help and be sure you know all your options. Pregnant women can safely get treatment for breast cancer, although the types of treatment used and the timing of treatment might be affected by the pregnancy. If you are pregnant and have been diagnosed with breast cancer, your treatment recommendations will depend on:

- The size of the tumor
- Where the tumor is located
- If the cancer has spread and if so, how far
- How far along you are in the pregnancy
- Your overall health
- Your personal preferences

It is generally safe to have surgery for breast cancer while you're pregnant.

Chemotherapy seems to be safe for the baby if given in the second or third trimester of pregnancy, but it isn't safe in the first trimester. Other [breast cancer treatments](#), such as hormone therapy, targeted therapy, and radiation therapy, are more likely to harm the baby and are not usually given during pregnancy.

Treatment choices can become complicated if there is a conflict between the best known treatment for the mother and the well-being of the baby. For example, if a woman is found to have breast cancer early in her pregnancy and needs chemotherapy right away, she may be advised to think about ending the pregnancy. A counselor or psychologist should also be part of your health care team to help give you the emotional support you may need.

Some older studies found that ending a pregnancy in order to have cancer treatment didn't improve a woman's prognosis (outlook). Even though there were flaws in these

studies, ending the pregnancy is no longer routinely recommended when breast cancer is found. Still, this option may be discussed when looking at all the treatment choices available, especially for metastatic (stage IV) or aggressive cancers that may need treatment right away, such as [inflammatory breast cancer](#)¹.

Breast cancer surgery during pregnancy

Surgery to remove the cancer in the breast and nearby lymph nodes is a major part of treatment for any woman with early breast cancer, and generally is safe in pregnancy.

Options for breast cancer surgery might include:

- Removing the entire breast ([mastectomy](#))
- Removing just the part containing the cancer ([lumpectomy](#) or [breast-conserving surgery](#) [BCS])

The type of surgery a woman might have depends on the extent of her cancer and when the cancer is diagnosed during the pregnancy.

Checking lymph nodes for cancer spread

In addition to removing the tumor in the breast, one or more [lymph nodes](#) in the underarm area (axillary lymph nodes) also need to be removed to check if the cancer has spread. One way to do this is an axillary lymph node dissection (ALND). This is often the standard procedure for pregnant women with breast cancer and removes many of the lymph nodes under the arm. Another procedure, called a [sentinel lymph node biopsy \(SLNB\)](#), might be an option depending on how far along you are in pregnancy and your cancer stage. SLNB allows the doctor to remove fewer nodes, but there are concerns about the effects the SLNB dye might have on the baby. Because of these concerns, most experts recommend that SLNB only be used in certain situations such as later in pregnancy, and that the blue dye not be used during the procedure.

Is anesthesia safe during pregnancy?

Surgery for breast cancer generally carries little risk to the baby. But there are certain times in pregnancy when anesthesia (the drugs used to make you sleep for surgery) may be risky for the baby.

Your surgeon and anesthesiologist, along with a high-risk obstetrician (OB), will need to work together to decide the best time during pregnancy to operate. If the surgery is

done later in the pregnancy, your obstetrician may be there just in case there are any problems with the baby during surgery. Together, your doctors will decide which anesthesia drugs and techniques are the safest for both you and the baby.

Treatment after surgery

Depending on the cancer's [stage²](#), you may need more treatment such as chemotherapy, radiation therapy, hormone therapy, and/or targeted therapy after surgery to help lower the risk of the [cancer coming back³](#). This is called **adjuvant treatment**. In some cases, this treatment can be put off until after delivery.

Chemotherapy

Chemotherapy (chemo) may be used after surgery (as adjuvant treatment) for some earlier stages of breast cancer. It also can be used by itself for more advanced cancers.

Chemo is not given during the first 3 months (first trimester) of pregnancy. Because a lot of the baby's development occurs during this time, the safety of chemo hasn't been studied in the first trimester. The risk of miscarriage (losing the baby) is also the greatest during this time.

For many years, it was thought that all chemo would harm an unborn baby no matter when it was given. But studies have shown that certain [chemo drugs](#) (such as doxorubicin, cyclophosphamide, fluorouracil, and the taxanes) used during the second and third trimesters (months 4 through 9 of pregnancy) don't raise the risk of birth defects, stillbirths, or health problems shortly after birth, though they may increase the risk of early delivery. Researchers still don't know if these children will have any long-term effects.

If you have early breast cancer and you need chemo after surgery (adjuvant chemo), it will usually be delayed until at least your second trimester. If you are already in the third trimester when the cancer is found, chemo may be delayed until after birth. The birth may be induced (brought on) a few weeks early in some women. These same treatment plans may also be used for women with more advanced cancer.

Chemo is generally not recommended after 35 weeks of pregnancy or within 3 weeks of delivery because it can [lower the mother's blood cell counts⁴](#). This could cause bleeding and increase the chances of infection during birth. Holding off on chemo for the last few weeks before delivery allows the mother's blood counts to return to normal before childbirth.

Treatments that typically are on hold until after delivery

Some treatments for breast cancer can harm the baby and are not safe during pregnancy. If these treatments are needed, they are usually scheduled after the baby is born.

Radiation therapy: Radiation therapy to the breast is often used after breast-conserving surgery (lumpectomy) to help reduce the risk of the cancer coming back. The high doses of radiation used for this can harm the baby any time during pregnancy. This may cause miscarriage, birth defects, slow fetal growth, or a higher risk of childhood cancer. Because of this, doctors don't use radiation treatment during pregnancy.

For some women whose cancer is found later in the pregnancy, it may be possible to have a lumpectomy during pregnancy and then wait until after the baby is born to get radiation therapy. But this treatment approach has not been well-studied. Waiting too long to start radiation can increase the chance of the cancer coming back.

Hormone therapy: Hormone therapy is often used as treatment after surgery or as treatment for advanced breast cancer in women with hormone receptor-positive (estrogen or progesterone) breast cancer. Hormone therapy drugs used for breast cancer include tamoxifen, anastrozole, letrozole, and exemestane.

Hormone therapy should not be given during pregnancy because it can affect the baby. It should be delayed until after the woman has given birth.

Targeted therapy: Drugs that target HER2, such as trastuzumab (Herceptin), pertuzumab (Perjeta), ado-trastuzumab emtansine (Kadcyla) and lapatinib (Tykerb), are important in treating HER2-positive breast cancers. In women who aren't pregnant, trastuzumab is used as a part of treatment after surgery, pertuzumab can be used with trastuzumab before surgery, and all of these drugs can be useful in treating advanced cancer. But based on studies of women who were treated during pregnancy, none of these drugs are considered safe for the baby if taken during pregnancy.

Everolimus (Afinitor) and palbociclib (Ibrance) are also targeted drugs that can be used with hormone therapy to treat advanced breast cancer. Again, these and other targeted drugs are thought to be unsafe to use during pregnancy.

Can I breastfeed during cancer treatment?

Most doctors recommend that women who have just had babies and are about to be

treated for breast cancer should stop (or not start) breastfeeding. Many chemo, hormone, and targeted therapy drugs can enter breast milk and be passed on to the baby. Breastfeeding isn't recommended if you are being treated with systemic drugs and sometimes shouldn't be restarted for months after treatment has ended. Sometimes, if a woman has hormone-positive breast cancer, she might be given drugs to stop the production of breast milk.

If breast surgery is planned, stopping breastfeeding will help reduce blood flow to the breasts and make them smaller. This can help with the operation. It also helps reduce the risk of infection in the breast and can help avoid breast milk collecting in biopsy or surgery areas.

If you have questions, such as when it might be safe to start breastfeeding, talk with your health care team. If you plan to start breastfeeding after you've stopped for a while, plan ahead. Breastfeeding (lactation) experts can give you extra help if you need it.

Does pregnancy affect survival rates for breast cancer?

Pregnancy can make it harder to find, diagnose, and treat breast cancer. Most studies have found that the outcomes among pregnant and non-pregnant women with breast cancer are about the same for cancers found at the same stage.

Some doctors believe that ending the pregnancy may help slow the course of more advanced breast cancers, and they may recommend that for some women with advanced breast cancer. It's hard to do research in this area, and good, unbiased studies don't exist. Ending the pregnancy makes treatment simpler, but so far no evidence shows that ending the pregnancy improves a woman's overall survival or cancer outcome.

Studies have not shown that the treatment delays that are sometimes needed during pregnancy have an effect on breast cancer outcome, either. But this, too, has proven to be a difficult area to study. Finally, there are no reports showing that breast cancer itself can harm the baby.

Breast Reconstruction Surgery

Women who have surgery as part of their breast cancer treatment may choose breast reconstruction surgery to rebuild the shape and look of the breast. There are different types of breast reconstruction. Learn about all your options and what to expect before and after your surgery.

Deciding Whether to Have Breast Reconstruction

Many women choose to have reconstruction surgery, but it might not be right for everyone. Learn more about the risks and benefits of breast reconstruction, as well as other options.

- [Should I Get Breast Reconstruction Surgery?](#)
- [Breast Reconstruction Alternatives](#)

Breast Reconstruction Options

There are many different types of breast reconstruction procedures. Some are done (or started) at the same time as mastectomy or lumpectomy, while others are done later. Learn more about your options.

- [Breast Reconstruction Options](#)

Know What to Expect

If you're planning to have breast reconstruction surgery, it's important to be prepared. Find out what you should ask your surgeon, and what to expect before and after your surgery.

- [Questions to Ask Your Surgeon About Breast Reconstruction](#)
- [Preparing for Breast Reconstruction Surgery](#)
- [What to Expect After Breast Reconstruction Surgery](#)

Should I Get Breast Reconstruction Surgery?

A woman who has surgery to treat breast cancer might also choose to have surgery to rebuild the shape and look of her breast. This is called **breast reconstruction surgery**.

If you are thinking about having this done, it is best to talk about it with your surgeon and a plastic surgeon experienced in breast reconstruction **before** you have surgery to remove the tumor or breast. This lets the surgical teams plan the best treatment for you, even if you decide to wait and have reconstructive surgery later.

- [Reasons to have breast reconstruction](#)
- [Risks of breast reconstruction](#)
- [Can reconstructed breasts hide cancer or make it come back?](#)
- [Some important things to think about](#)
- [Help and support from someone who's been there](#)

Reasons to have breast reconstruction

A woman might choose to have breast reconstruction for many reasons:

- To make her chest look balanced when she is wearing a bra or swimsuit
- To help make clothes fit better
- To permanently regain her breast shape
- So she won't have to use a breast form that fits inside the bra (an external prosthesis)
- To feel better about her body

Breast reconstruction often leaves scars, but they usually fade over time. Newer techniques have also reduced the amount of scarring. When you're wearing a bra, your breasts should be alike enough in size and shape to let you feel comfortable about how you look in most types of clothes.

After a lumpectomy or mastectomy, breast reconstruction can make you feel better about how you look and renew your self-confidence. But keep in mind that the reconstructed breast will not be a perfect match or substitute for your natural breast. If tissue from your tummy, back, thigh, or buttocks was used as part of the reconstruction, those areas will also look different after surgery. Before you make your decision, talk with your surgeon about scars and changes in shape or contour. Ask where they will be, and how they will look and feel after they heal.

Risks of breast reconstruction

Of course, it's important to consider the potential risks and side effects of breast reconstruction surgery as well. These are discussed in [What to Expect After Breast Reconstruction Surgery](#).

Can reconstructed breasts hide cancer or make it come back?

Studies show that reconstruction does not make breast cancer come back. If the cancer does come back, reconstructed breasts should not cause problems finding the cancer or treating it.

If you are thinking about having breast reconstruction, either with an [implant](#) or [tissue flap](#) (your own tissue), you need to know that reconstruction rarely hides a return of breast cancer. You should not consider this a big risk when deciding to have breast reconstruction.

Some important things to think about

- You might have a choice between having breast reconstruction at the same time as your breast cancer surgery (**immediate reconstruction**) or later (**delayed reconstruction**).
- Some women don't want to make decisions about reconstruction while being treated for breast cancer. If this is the case, you might choose to wait until after your surgery to decide about delayed reconstruction.
- You might not want to have more surgery than is absolutely needed.
- Not all reconstructive surgery is a total success, and the result might not look the way you had hoped. It is important to discuss expectations with your plastic surgeon.
- The cancer surgery and reconstruction surgery will leave scars on your breast and any areas where tissue was moved to create the new breast mound, such as the

buttocks, tummy, thigh, or back areas.

- A rebuilt breast will not have the same feeling as the natural breast. Sometimes, it may have little or no feeling at all. The places the tissue to rebuild the breast was taken from (donor sites) might also lose some feeling. Over time, the skin might become more sensitive, but it won't feel the same as it did before the surgery.
- You might have extra concerns if you tend to bleed or scar more than most people.
- Poor blood flow might cause some or all areas of the breast skin or flaps to die after reconstructive surgery. This death of the tissue is called **necrosis**. If it happens, healing is delayed and more surgery is often needed to fix the problem.
- Healing could be affected by previous surgery, chemotherapy, or radiation therapy. It can also be affected by smoking, diabetes, being obese¹, and other factors.
- Surgeons might suggest you wait to have reconstruction, especially if you smoke or have other health problems. It's often recommended to quit smoking at least 2 months before reconstructive surgery to allow for better healing. You might not be able to have reconstruction at all if you are obese, actively smoke, or have blood circulation problems.
- The surgeon might suggest surgery to reshape your other breast to match the reconstructed breast. This is called a **symmetrizing procedure**. This could include reducing or enlarging its size, or even surgically lifting the breast.
- If radiation² will be part of a woman's treatment, the types of immediate reconstruction surgery she will be able to have might be limited. Certain types of reconstruction done before radiation can cause problems and lower the chances the rebuilt breast will look and feel as natural as possible, after the radiation is given. You should discuss your best options with your plastic surgeon before surgery.
- Meeting with a plastic surgeon and knowing your reconstruction options before surgery can help you have more realistic expectations for the outcomes.

Help and support from someone who's been there

It's important to know that there is advice and support out there to help you understand your reconstruction options as well as cope with the changes you're going through if you have chosen reconstruction. Speaking with your doctor or other members of your health care team is often a good place to start. If you would like to talk with someone who has had your type of reconstruction, ask about our [Reach To Recovery® program](#)³. Reach To Recovery volunteers are breast cancer survivors trained to support others facing breast cancer, as well as those who are thinking about having breast reconstruction.

They can give you suggestions, reading material, and advice. Ask someone on your cancer care team to refer you to a volunteer .

Breast Reconstruction Alternatives

Some women who have breast cancer surgery as part of their breast cancer treatment decide not to have breast reconstruction.

They might decide they don't want to have any more surgery than they need to treat the cancer, or that they want to be able to get back to their normal activities as soon as possible. Some women are just more comfortable with how they look and feel after the surgery to remove their cancer. Cost might also be an issue, especially for women who don't have insurance coverage.

If a woman changes her mind later, reconstruction is usually still an option. But keep in mind that it may be easier to get the result you want if you make the decision before you have the breast cancer surgery.

For other women, breast reconstruction might be difficult, or even not possible, because of other health issues they have. For example, you might not be able to have reconstruction if you are obese or have blood circulation problems, such as from continued smoking or poorly controlled diabetes.

Women who don't want breast reconstruction after surgery have two options:

- Using a breast form or prosthesis (inside the bra or attached to the body to wear under their clothes)
 - Going flat (not wearing a breast form)
- [• Using a breast form or prosthesis](#)
- [• Going flat](#)

Using a breast form or prosthesis

A **breast form** is a prosthesis (artificial body part) worn either inside a bra or attached to the body to simulate the look and feel of a natural breast. Wearing a breast form is an option for women who have decided not to get reconstructive surgery but want to keep the same look under their clothes. If you haven't decided about reconstruction, or are having reconstruction later, you might decide to use a breast form for a while.

Most breast forms are made from materials that try to copy the movement, feel, and weight of natural breast tissue. A properly weighted form provides the balance your body needs for correct posture and anchors your bra, keeping it from riding up. At first,

these forms may feel too heavy, but in time they should begin to feel natural.

If you are planning to use a breast form, your doctor will tell you when you have healed enough to be fitted for a permanent breast form or prosthesis.

Choosing the right bra for your breast form

The right bra for you may very well be the one you have always worn. It may or may not need adjustments. If there is tenderness during healing, a bra extender (small pieces of fabric that attach to your bra fastener) can help by increasing the width of the bra so that it does not wrap around the chest too tightly. Women with large, heavy breasts can lessen pressure on shoulder straps by sliding a bra shoulder pad under one or both straps.

If you decide to wear your breast form in a pocket in your bra, you can have your regular bra altered. There are also special mastectomy bras with the pockets already sewn in. If the breast form causes any kind of skin irritation, use a bra with a pocket. If your bra has underwires, you may be able to wear it, but be sure to clear this with your doctor.

If you want to wear your prosthesis under sleepwear but would like something more comfortable than a regular bra, look for a soft bra, sometimes called a **leisure or night bra**. These are in most department stores.

Finding and paying for breast prostheses

Prices for breast forms vary considerably. High price doesn't necessarily mean that the product is the best for you. Take time to shop for a good fit, comfort, and an attractive, natural appearance in the bra and under clothing. Your clothes should fit the way they did before surgery.

Insurance coverage of breast prostheses is not all the same. Be sure to contact your health insurance company to find out what will be covered and how you must submit claims. Also, ask your doctor to write prescriptions for your prosthesis and for any special mastectomy bras. When purchasing bras or breast forms, mark the bills and any checks you write "surgical." [Medicare and Medicaid¹](#) can be used to pay for some of these expenses if you are eligible. The cost of breast forms and bras with pockets and the cost of having a bra altered might be tax deductible. [Keep careful records²](#) of all related expenses.

Some insurance companies will not cover both a breast prosthesis and reconstructive

surgery. That can mean that if you submit a claim for a prosthesis or bra to your insurance company, in some cases the company **will not** cover reconstruction, should you choose this procedure in the future. Make sure you get all the facts before submitting any insurance claims.

Going flat

Some women, who do not have reconstruction surgery, decide not to wear a breast form, either.

For most women, there aren't likely to be any added health issues from going flat, especially if both breasts were removed. But if you've only had one breast removed, you might notice issues with balance, posture, or back pain, especially if you have large breasts. This is one reason some women prefer to wear a breast form – to balance out the weight on their chest. Talk to your doctor about your options if you think this might be an issue for you.

Some women might use a breast form when they are out, but not when at home. This might be because they find breast forms uncomfortable or too expensive, or just because they're comfortable with how they look and feel without a breast form and don't feel the need to wear one.

If the idea of going flat appeals to you but you're worried about what others might think, try going without a breast form in different situations, such as at home, out with friends, or while out running errands. You might find that most people won't notice a difference. If you find you still feel self-conscious, you can always go back to wearing a breast form.

If you decide to go flat, you might want to consider wearing clothing that might help you feel more comfortable with your appearance. Try wearing tops that are not tight fitting and that have busy patterns, or layer sweaters or jackets over close-fitting tops. Scarves and shawls can also cover all or part of your chest.

Some women might like the idea of going flat but are uncomfortable about not having nipples. Some companies now make **nipple prosthetics**, which are made of silicone or other materials and look and feel like real nipples. They can be attached to the chest and then taken off when you choose.

Breast Reconstruction Options

Women who have had surgery to treat breast cancer can choose from several types of breast reconstruction. When deciding what type is best for you, you and your doctors should discuss factors including your health and your personal preferences.

Take the time to learn what options are available to you. Before you make your decision, also consider talking to others who have had that procedure.

- [Types of breast reconstruction procedures](#)
- [Choosing which type of breast reconstruction to have](#)

Types of breast reconstruction procedures

Several types of reconstructive surgery are available, and often the process means more than one operation. Give yourself plenty of time to make the best decision for you. You should make your decision about breast reconstruction only after you are fully informed.

The two main types of breast reconstruction are **implant reconstruction** and **tissue (flap) reconstruction**. Sometimes the implant and flap procedures are used together to rebuild a breast.

For all types of breast reconstruction there is often an opportunity for future “touch up” procedures, such as [fat grafting](#) and scar revisions. Breast reconstruction can also recreate the nipple-areolar area that can be done with a small surgical procedure, tattooing, or a combination of both. This is done to help make the reconstructed breast look more like the original breast.

For information about the procedures to reconstruct the shape of your breast or breasts see the following pages:

- [Breast Reconstruction After Breast-Conserving Surgery](#)
- [Breast Reconstruction Using Implants](#)
- [Breast Reconstruction Using Your Own Body Tissues \(Flap Procedures\)](#)
- [Reconstructing the Nipple and Areola After Breast Surgery](#)

Choosing which type of breast reconstruction to have

If you've decided to have breast reconstruction, you'll still have many things to think about as you and your doctors talk about what type of reconstruction might be best for you. Some of the factors you and your doctors will need to think about when considering your options include:

- Your overall health (including issues that might affect your healing, such as smoking or certain health conditions)
- The size and location of your breast cancer
- Your breast size
- The extent of your breast cancer surgery - if you are a candidate for lumpectomy or mastectomy, and the possibility to keep your nipple
- Whether you will need cancer treatments other than surgery
- The amount of tissue available for reconstruction (for example, very thin women may not have enough extra tummy tissue to use this area for breast reconstruction and having a "tummy tuck" in the past makes the tummy tissue not usable for breast reconstruction)
- Whether you want reconstructive surgery on one or both breasts
- Your desire to match the look of the other breast
- Your insurance coverage and related costs for the unaffected breast
- How quickly you want to be able to recover from surgery
- Your willingness to have more than one surgery as part of the reconstruction
- How different types of reconstructive surgery might affect other parts of your body

Your surgeon will review your medical history and overall health, and will explain which reconstructive options might be best for you based on your age, health, body type, lifestyle, goals, and other factors. Talk with your surgeon openly about your preferences. Be sure to voice any concerns and priorities you have for the reconstruction and find a surgeon you feel comfortable with. Your surgeon should explain the limits, risks, and benefits of each option.

Breast Reconstruction After Breast-conserving Surgery

Breast-conserving surgery¹ does not remove the entire breast and women are often able to keep their nipples. Most women who have this type of surgery do not need breast reconstruction. However, some women might end up having a breast deformity as a result of the cancer surgery; for example, dimpling caused by removing a large tumor from a small breast. Some doctors are addressing this type of problem by combining cancer surgery and plastic surgery techniques, known as **oncoplastic surgery**. This type of reconstruction can often be done at the same time as your breast cancer surgery without the need for more operations.

These women may be candidates for different types of breast reconstruction to reshape the breast. One or more of the following techniques may be used to get the best results:

- Breast lift (mastopexy)
- Breast reduction (reduction mammoplasty)
- **Tissue flaps** from areas close by like the back

Breast Reconstruction Using Implants

Mastectomy¹ removes the entire breast, but the skin and nipple can sometimes be saved. Using a breast implant is one option for reconstructing the shape of your breast after mastectomy.

This usually means having at least two operations.

- The **first surgery** places a tissue expander, a flat “water balloon” that will be gradually filled (expanded) during office visits until a desired size is reached.
- The **second surgery** replaces the tissue expander with a breast implant. Additional procedures could be done to reconstruct the nipple-areola area or revisions to improve the overall look.

There are a few different types of breast implants, and other factors to consider before you make your choice.

- **What types of implants are used for breast reconstruction?**
- **How are implant procedures done?**
- **Risks of illness from breast implants**
- **Things to think about before getting implants**

What types of implants are used for breast reconstruction?

Several types of breast implants can be used to rebuild the breast. Most implants in the US are made of a flexible silicone outer shell, and they can contain saline or silicone

gel. Other types of implants that have different shells and are filled with different materials are being studied, but these are only available if you are taking part in a clinical trial.

It's important to discuss the benefits and risks of the different types of implants with your doctor.

Saline breast implants

Saline implants are filled with sterile (germ-free) salt water. These types of implants have been used the longest. A newer type, called a **structured saline implant**, is also filled with sterile salt water, but is made with an inner structure to help give the reconstructed breast a more natural look and feel.

Silicone breast implants

Silicone gel implants tend to feel a bit more like natural breast tissue. All silicone breast implants in the US are made of **cohesive gel**, which is a thicker type of silicone implant. Form-stable implants, the thickest ones, are sometimes called **gummy bear** or **highly cohesive** breast implants. The name means that they keep their shape even if the shell is cut or broken. They are firmer than regular implants and might be less likely to rupture (break), although this still might happen.

There are different shapes and sizes of saline and silicone implants, and they can have either a **smooth** or **textured (rough)** surface. Any type of implant might need to be replaced at some point if it leaks or ruptures.

How are implant procedures done?

You might have a choice between having breast reconstruction at the same time as the surgery to treat the cancer (**immediate reconstruction**) or later (**delayed reconstruction**).

Immediate breast reconstruction

Immediate breast reconstruction starts at the same time as the mastectomy. It is usually completed in stages and at least two operations are needed. The first stage is during the mastectomy, when the plastic surgeon places a tissue expander ("water balloon") under the skin or muscle on your chest. Mesh is sometimes used to hold the expander in place, much like a hammock or sling. The water balloon starts off flat and is then

expanded during office visits until the desired size is reached. The second stage removes the tissue expander and replaces it with a permanent breast implant. The timing of the second stage (implant placement) can be planned and safely postponed if needed, because of cancer treatments such as chemotherapy. If necessary, additional procedures could recreate the nipple-areola area or could be revisions to improve the overall look.

A small number of women might be candidates for a **direct to implant** breast reconstruction. This means the breast implant is put in place at the same time as the mastectomy. Women most often suitable for this type of reconstruction are young, have small breasts, and have no health problems. In this situation, a tissue expander is not used. After the surgeon removes the breast tissue, a plastic surgeon puts in a breast implant. The implant can be put under the skin or muscle on your chest. Mesh is sometimes used to hold the implant in place, much like a hammock or sling.

Delayed breast reconstruction

Delayed breast reconstruction means that rebuilding happens later, often months, after the mastectomy. The reconstruction starts when the chest is flat. A tissue expander is placed under the chest wall muscle or skin. This will help to make a pocket to put the implant into at a later date. The tissue expander is a balloon-like sac that starts off flat and is slowly expanded to the desired size to allow the skin to stretch. Once the skin over the breast area has stretched enough, a second surgery is done to remove the expander and put in the permanent implant.

If radiation therapy after mastectomy is part of your cancer treatment, you might not be a good candidate for implant reconstruction and should discuss other reconstruction options, such as **tissue flaps**, with your plastic surgeon.

Tissue expanders are filled by the surgeon injecting a salt-water solution through a tiny valve under the skin at regular intervals (every 1, 2, or 3 weeks) to fill the expander over several months.

You might choose to delay breast reconstruction if:

- **You don't want to think about reconstruction while coping with the cancer treatment.** If this is the case, you might choose to wait until after your breast cancer surgery to decide about reconstruction.
- **You have other health problems.** Your surgeon might suggest you wait for one reason or another, especially if you smoke or have other health problems. It's best to quit smoking at least 2 months before reconstructive surgery to allow for better

healing.

- **You need radiation therapy.** Many doctors recommend that women not have immediate reconstruction if they will need radiation treatments after surgery. Radiation can cause problems after surgery such as delayed healing and scarring, and can lower the chances of success. Flap reconstruction surgery (using other body tissues to create the new breast) is often delayed until after radiation.

Your surgical team will discuss your best reconstruction options, taking into account your medical history, body shape, cancer treatment, and personal goals.

Tissue support for implants

Some plastic surgeons choose to use donated human skin or pig skin to support tissue expanders or implants. These are known as **acellular dermal matrix** (ADM) products because they have had the human or pig cells removed. This reduces any risk that they carry diseases or that the woman's body will reject them. They are mainly made of collagen so the person's own connective tissue can grow over the framework to extend and support natural tissues and help them grow and heal. ADMs can help support and position the tissue expander or implant.

The use of acellular matrix products in breast surgery first started in the early 2000s. Studies that look at outcomes are still being done, but they have been promising overall. This type of tissue is not used by every plastic surgeon, but it is becoming more widely available. Talk with your doctor about whether these materials will be used in your reconstruction and about their benefits and risks.

Risks of illness from breast implants

In the past, there were concerns about possible health issues from ruptured silicone-filled implants, such as connective tissue disease, breast cancer, or reproductive problems. So far, studies show that silicone implants do not increase the risk of these health problems. Some people with breast implants may have symptoms of joint pain, memory loss, or fatigue. It is not clear if these symptoms are related to the breast implants and more research is being done.

Rare cancers

Breast implants have been linked with some rare types of cancer, which can develop in the scar tissue (capsule) around the implant.

For example, **breast implant-associated anaplastic large cell lymphoma (BIA-ALCL)** is a rare type of non-Hodgkin lymphoma that can develop several years after the implant is placed. It occurs more often when the implants have textured (rough) surfaces rather than smooth surfaces. BIA-ALCL can show up as a collection of fluid, a lump, pain, or swelling near the implant, or as asymmetry (uneven breasts). If you have any concerning symptoms, discuss them with your doctor.

Early-stage BIA-ALCL is often treated with surgery to remove the implant and capsule. Radiation therapy may be used if the lymphoma can't be removed completely. More advanced disease might require chemotherapy and/or other treatments.

There have also been rare reports of other types of cancer forming in the scar tissue around a breast implant, including some types of **lymphomas** (other than BIA-ALCL) and **squamous cell carcinoma**. These reports are fairly recent, so not much is known about these cancers at this time.

Things to think about before getting implants

Most women will do well with implants. But there are some important factors to keep in mind if you are thinking about having implants to reconstruct the breast and/or to make the other breast match the reconstructed one:

- The longer you have breast implants, the greater the chance you might need more surgery to remove and/or replace your implant later.
- You might have problems with breast implants. They can break (rupture) or cause infection or pain. Scar tissue may form around the implant (called capsular contracture), which can make the breast hard or change shape, so that it no longer looks or feels like it did just after surgery. Most of these problems can be fixed with surgery, but others might not.
- Breast MRIs may be recommended every few years to make sure silicone gel implants have not broken. Your health insurance might not cover this. Talk to your plastic surgeon if you have any questions regarding the indication for breast MRIs.

Breast Reconstruction Using Your Own Tissue (Flap Procedures)

A tissue flap procedure (also known as **autologous tissue reconstruction** or **tissue-based reconstruction**) is one way to rebuild the shape of your breast after surgery to remove the cancer. As with any surgery, you should learn as much as possible about the benefits and risks, and discuss them with your doctor, before having the surgery.

- [Advantages of tissue flaps](#)
- [Disadvantages of tissue flaps](#)
- [Types of tissue flap procedures](#)

Advantages of tissue flaps

These procedures use tissue from other parts of your body, such as your tummy, back, thighs, or buttocks to rebuild the breast shape. Tissue flaps look and feel more natural and act more like natural breast tissue than [breast implants](#). Unlike implants, tissue flaps will change like any other tissue in your body. For instance, they may get bigger or smaller as you gain or lose weight. And while breast implants sometimes need to be replaced (if the implant ruptures, for example), this is not a concern with tissue flaps. Tissue flaps are often used by themselves to reconstruct the breast, but some tissue flap procedures can be used with a breast implant if more volume is needed.

Disadvantages of tissue flaps

Tissue flap procedures can also have some downsides that need to be considered:

- In general, flaps require more surgery and a longer recovery time than breast implant procedures
- Flap operations leave 2 surgical sites and scars – one where the tissue was taken from (the donor site) and one on the reconstructed breast. The scars fade over time, but never go away completely
- Some women can have donor site problems such as abdominal bulging, muscle damage or weakness, and contour distortions such as dimpling of the skin

Types of tissue flap procedures

There are many different types of flap procedures. They are often named by the muscle or artery that is being used and they mainly fall in two groups:

Pedicle flaps: A pedicle flap moves tissue from its site to the breast or chest wall while it is still attached to its original blood supply. The most common pedicle flap used for breast reconstruction is the **latissimus dorsi** (LD) flap, where tissue from the back (skin, fat, and muscle) is used to make a new breast. Tissue from the abdominal wall (tummy) can also be used as a pedicle flap (transverse rectus abdominis muscle or TRAM flap). But this has been largely replaced by its free flap version, where the muscle can be totally or partially saved.

Free flaps: A free flap moves tissue, fat, skin, and some or none of the muscle from one area of the body to make a new breast. This tissue is completely removed from the body and moved up to the chest. The blood vessels (arteries and veins) must then be reconnected to the chest wall vessels for the tissue to survive. This requires the use of a microscope (microsurgery) to connect the tiny vessels, and the surgery takes longer than a pedicle flap. Most of the time, free flaps don't need to take the muscle from the donor site, so there is less risk of losing muscle strength, and the donor site often looks better than if the muscle had been removed. The main risk is that sometimes the blood vessels get clogged and the flap doesn't work because of poor or no blood supply. The abdominal wall (tummy) is the most popular and common donor site for free flap breast reconstruction. Other possible donor site areas for breast free flap reconstruction are the thighs, buttocks, and lower back.

Restoring feeling to the reconstructed breast

During a mastectomy, nerves are cut causing a loss of sensation (feeling) on that side.

The skin on the chest wall can feel numb (no feeling) or be more sensitive. The feeling might return after a few months or years or not at all. Finding ways to restore the feeling in the reconstructed breast has become a goal of tissue (flap) breast reconstruction. It is often possible to keep a sensory nerve (a nerve that controls feeling) within the flap. On the chest wall, a nerve in between the ribs is isolated and then reconnected with the nerve of the flap. This connection helps stimulate the tissue flap to regain feeling. There are studies that show improvement of sensation using this technique.

Abdominal (tummy) flaps

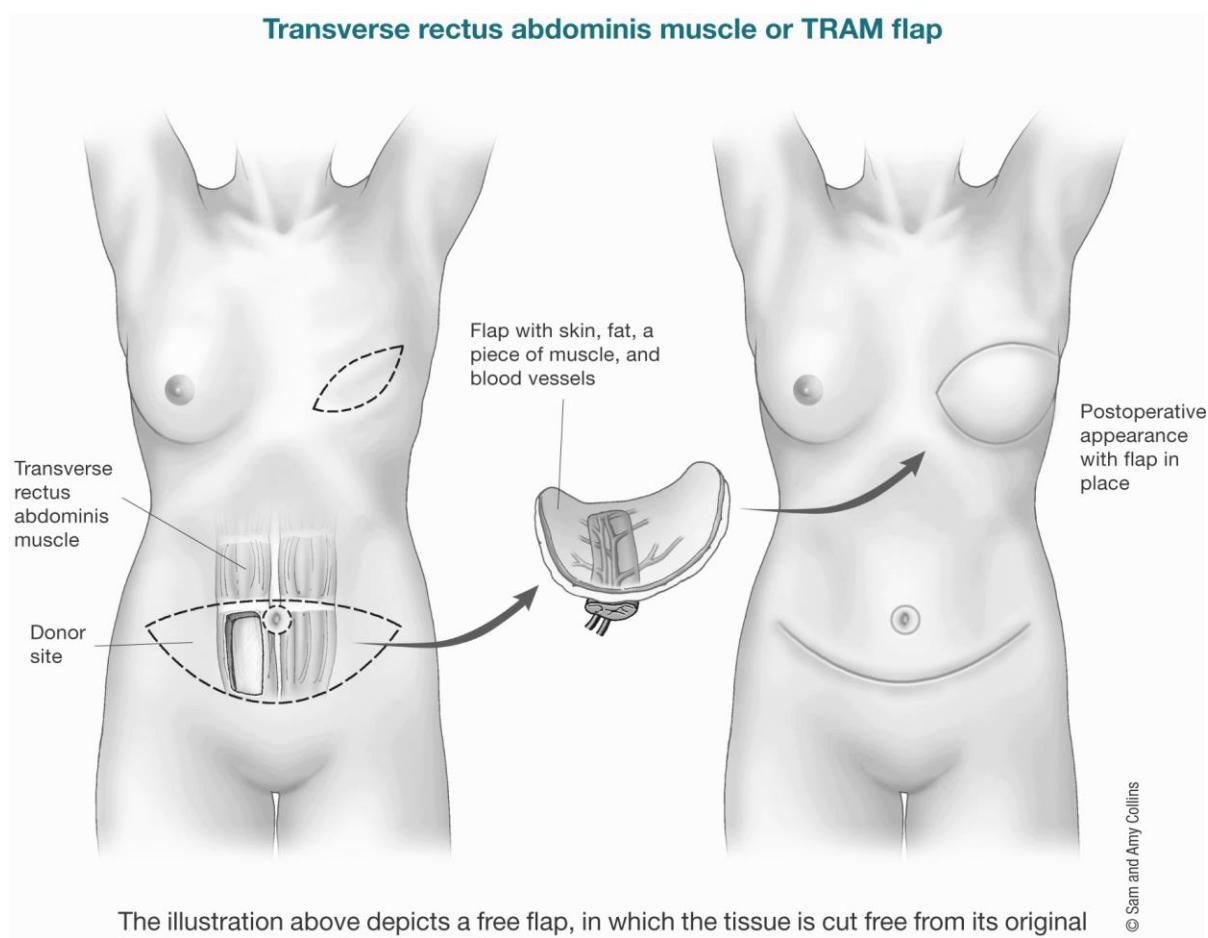
An abdominal wall flap procedure uses tissues from the tummy. Most times the tummy provides enough tissue for breast reconstruction, so no breast implants are needed. The tummy flap names are based on how the tissue is transferred and if the abdominal wall muscle is used or not. The donor site of the abdominal wall flap may look like a "tummy tuck," but it can also reduce the strength in your belly muscles and cause bulging depending on what technique was used. Tummy flaps may not be possible in women who are very thin or who have had a tummy tuck before.

There are different types of abdominal wall (tummy) flaps:

- A **pedicle transverse rectus abdominal muscle (TRAM) flap** leaves the flap attached to its original blood supply and tunnels it under the skin to the chest. It usually requires removing most if not all of the rectus abdominis (6-pack) muscle on that side, which means an increased risk of bulging on one side of the abdomen. This can also mean your abdominal (belly) muscles may not be as strong as before the surgery.
- A **free TRAM flap** moves tissue and most, if not all, of the muscle from the same part of the lower abdomen as a pedicle TRAM flap, but the flap is completely removed and moved up to the chest. The blood vessels (arteries and veins) must then be reattached. A microscope is required to connect the tiny vessels (microsurgery), and the surgery takes longer than a pedicle TRAM flap. The main advantage of a free TRAM flap is that the blood supply to the flap is usually better than with a pedicle TRAM flap. The main risk of free flaps is that sometimes the blood vessels get clogged and the flap doesn't work, but this is rare. There is also a higher risk of abdominal wall weakness and bulging.

A **free muscle-sparing TRAM (MS-TRAM) flap** is like a free TRAM flap except only part of the muscle from the same part of the lower abdomen, is completely removed and moved up to the chest. The blood vessels (arteries and veins) must then be reattached with microsurgery. Here the plastic surgeon saves most of the abdominal wall muscles;

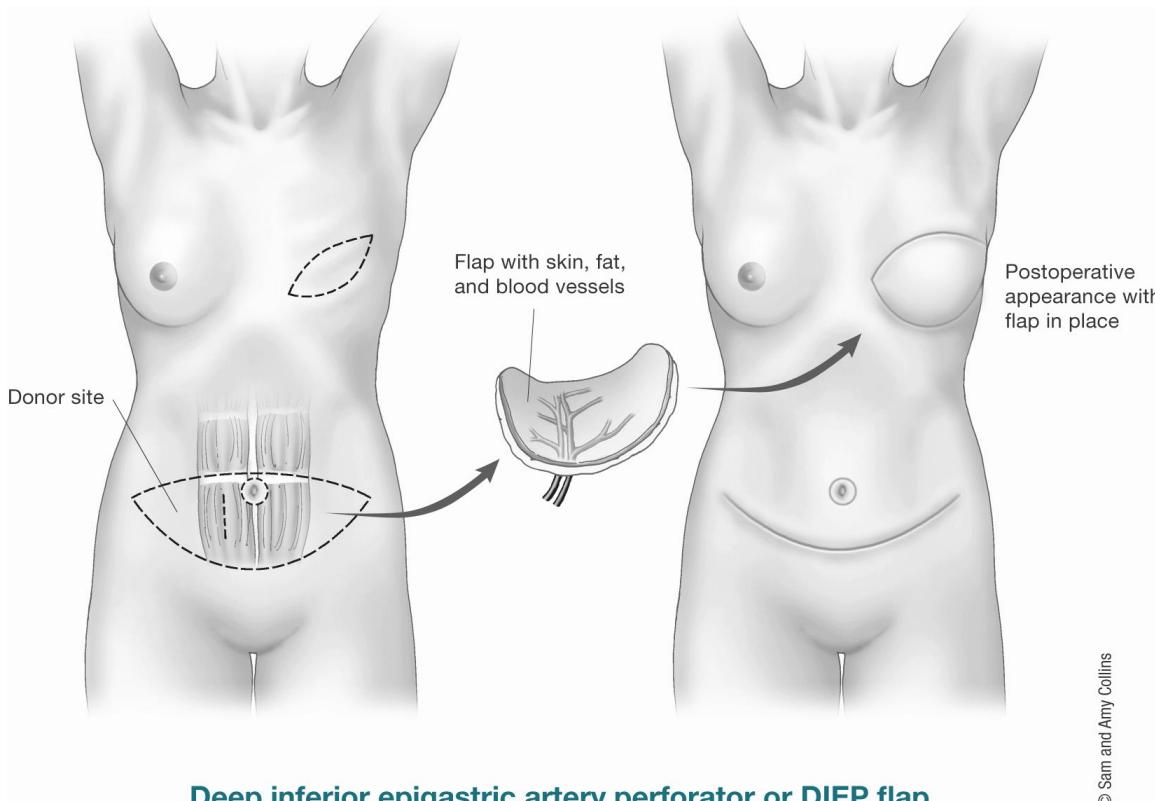
only a small piece of muscle is taken with the flap. There is less risk of abdominal wall bulging and losing abdominal muscle strength, and the donor site (abdomen) often looks better.



The **DIEP (deep inferior epigastric perforator) free flap** uses fat and skin from the same area as the TRAM flap to form the breast shape. The difference compared to a free TRAM flap is that no muscle is taken from the abdominal wall. The tissue is completely cut free from the tummy and then moved to the chest. As in the free TRAM flap surgery, a microscope is needed to connect the tiny blood vessels. There's much less risk of a bulge because no muscle is taken. The free MS-TRAM flap and DIEP free flap are very similar to each other; in one (MS-TRAM flap) you just take a small piece of muscle, and in the other one (DIEP flap) no muscle.

Another possible abdominal wall (tummy) flap is the **SIEA (superficial inferior epigastric artery) free flap**. Basically, it uses the same tissues as the TRAM and DIEP

flaps, but different blood vessels. The blood vessels used for the SIEA flap are more superficial (shallow) and not every person has them. Very few people are candidates for a SIEA flap.



Deep inferior epigastric artery perforator or DIEP flap

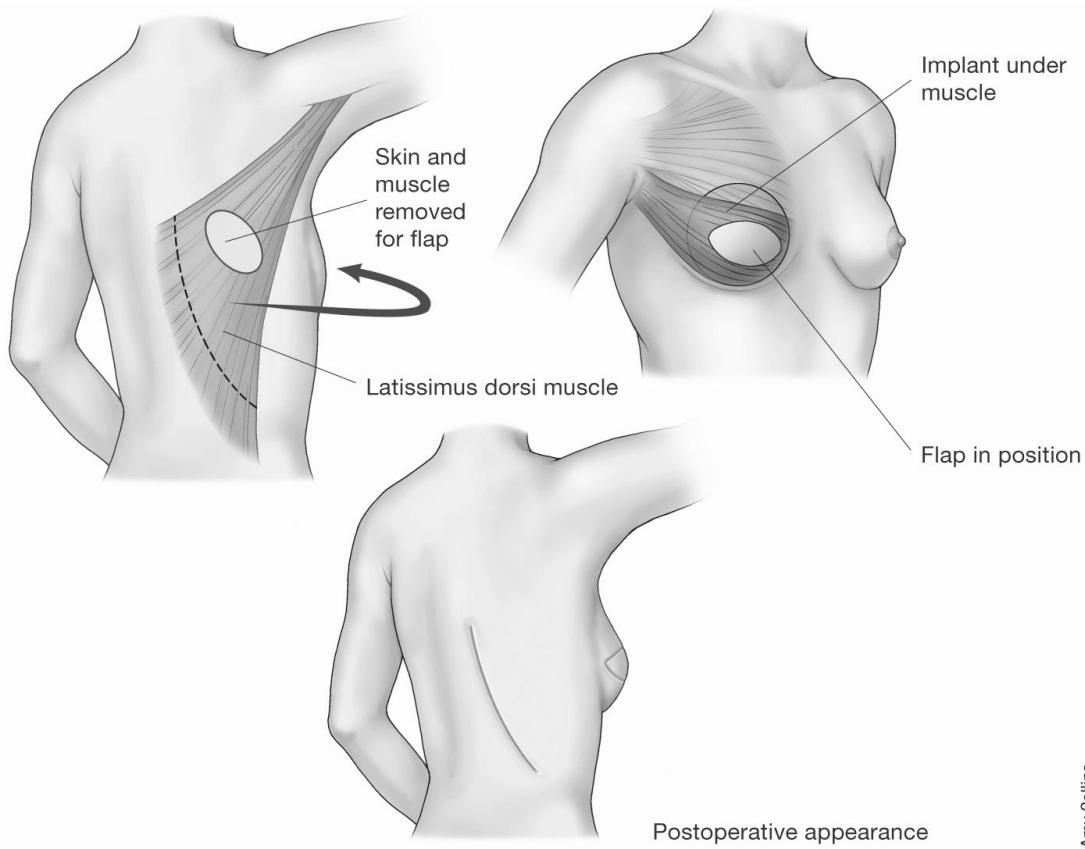
Back flaps

The **latissimus dorsi flap** is a pedicle flap used for breast reconstruction. Since there is usually not as much tissue there as from an abdominal wall (tummy) donor site, this type of flap is often used with a breast implant to add volume (size) to breast reconstruction. For this procedure, the surgeon tunnels muscle, fat, skin, and blood vessels from your upper back, under the skin to the front of the chest. This type of reconstruction can sometimes be used without an implant depending on the amount of tissue and the desired breast size. Even though one muscle from the back is taken with the flap, rarely do women have weakness in their back, shoulder, or arm after this surgery.

There are also pedicle back flaps that do not take any muscle. The **thoracodorsal artery perforator (TDAP) flap** takes skin and fat from the upper back, but does not

take any muscle. It is usually used for reconstruction after lumpectomy or partial mastectomy when needed.

A newer type of procedure, called a **lumbar artery perforator (LAP) free flap**, might be an option if there is not enough abdominal wall (tummy) tissue to use as a donor site . The skin, fat, and blood vessels are removed from the lower back area (also sometimes called “love handles”) and moved to the chest and the blood vessels are reconnected. No muscle is removed. The LAP free flap can only be done on one side at a time (one breast at a time), has an extra step to reconnect the blood vessels, and it is offered only at a few hospitals in the US.



Latissimus dorsi muscle or LAT flap

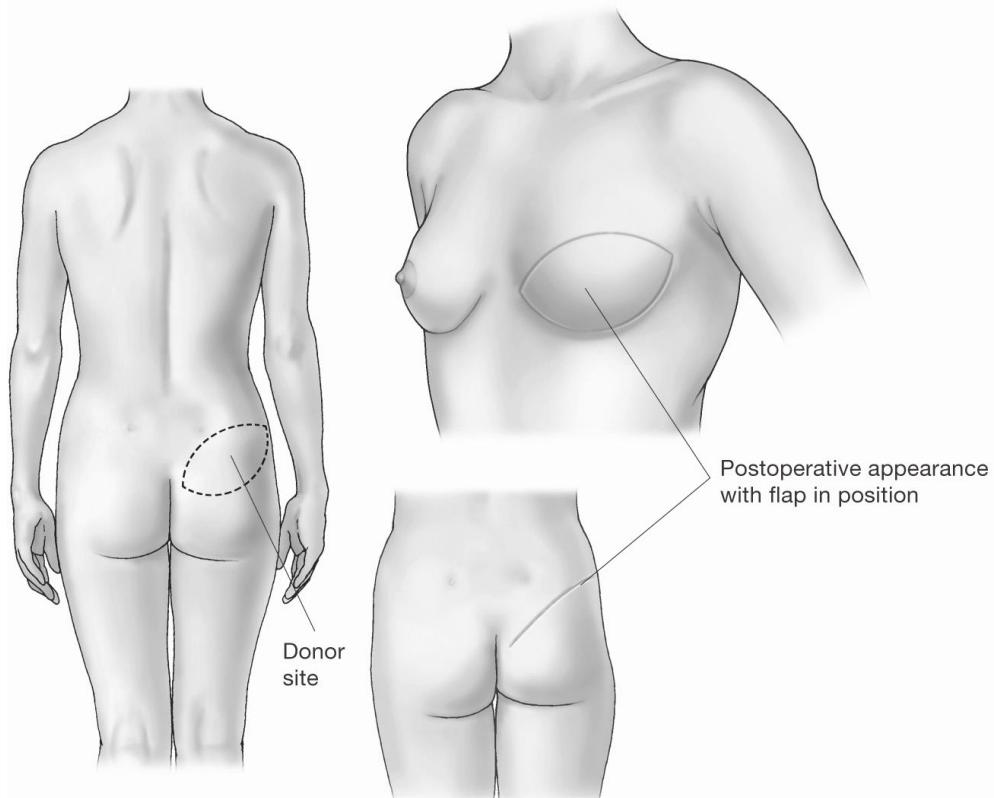
© Sam and Amy Collins

Buttock (bottom) flaps

The **gluteal free flap** or **gluteal artery perforator (GAP) flap** uses tissue from the buttocks (bottom) to create the breast shape. The gluteal free flap might be an option for

women who cannot or do not wish to use the tummy site because they are thin, have previous incisions, have had a previous tummy tuck, or for other reasons, but it's not offered at all surgical centers. The skin, fat, and blood vessels are cut out of the buttocks and then moved to the chest. No muscle is removed. The blood vessels will also be reattached. You might see this type of flap called a **superior gluteal artery perforator (SGAP) flap** if the artery in the upper buttocks is used. The **IGAP flap (inferior gluteal artery perforator flap)** is a similar surgery except the artery in the bottom part of the buttocks is used. The major drawback of this flap is the possible change in the buttock contour, such as skin dimpling. For this reason, it has not become very popular.

Gluteal free flap or GAP flap



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Thigh flaps

If tissue from the abdominal wall (tummy) cannot be used, the tissues in the thighs are often looked at for breast reconstruction.

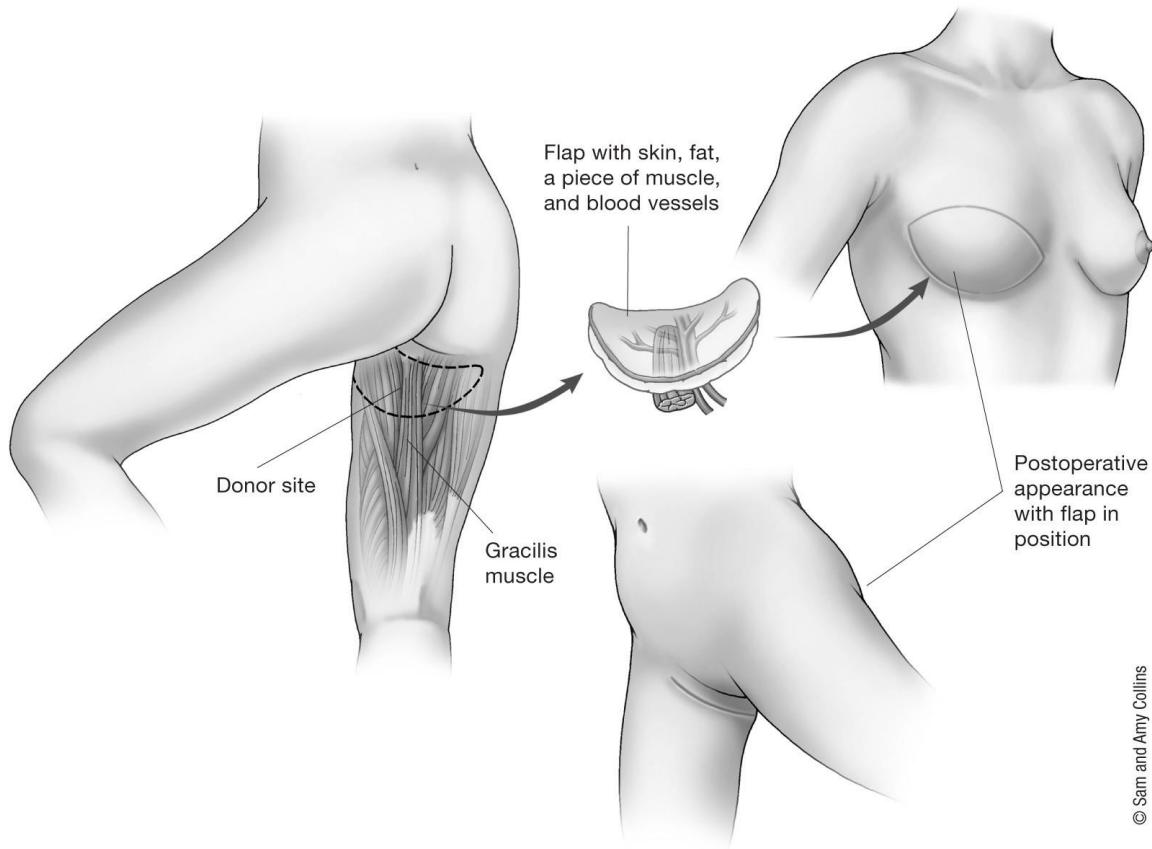
Depending on a women's body build and preferences, there are good free flap options from tissues of the inner and outer thighs. All the options require the use of microsurgery and reconnection of the blood vessels in the chest. Most of the time, the thighs only provide enough tissue to make a small or medium-sized breast. In some cases, two flaps, each one from a different thigh, can be used to reconstruct one breast.

Inner thigh: The main options for free flaps from the inner thighs are.

- **Upper Gracilis flap:** Here skin, fat, and part of the gracilis muscle are taken to make a new breast. Depending on the shape and which part of the muscle is used, it can be called a transverse upper gracilis (TUG) flap, vertical upper gracilis (VUP) flap, or diagonal upper gracilis (DUG) flap.
- **Profunda artery perforator (PAP) flap:** This flap only takes skin and fat. No muscle is removed. It can also be called horizontal, vertical, or diagonal. This flap has gained popularity lately. It spares a muscle from the donor site and the vessels are easier to work with.

Outer thigh: Another option for women who might have more fatty tissue on the outer part of their thighs and cannot have or choose not to have a DIEP flap is the **lateral thigh perforator (LTP) flap**. Also called the "saddlebag" flap. The skin, fat, and other tissue is removed from the area in the upper outer thigh and upper buttock and moved to the chest. No muscle is taken.

Transverse upper gracilis or TUG flap



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Fat grafting

Fat grafting is usually used for breast revisions or “touch up” surgeries. Your own fat is used to help fix any shape abnormalities that may be seen after the initial breast reconstruction surgery is done. The fat is not removed with skin, muscle, or other tissues.

The fat is obtained by liposuction, cleaned and then prepared so it can be injected easily into the areas it is needed. This is an outpatient procedure and you can go home the same day. Often, more than one session of fat grafting is needed to correct some contour deformities. This procedure has been found to be safe as far as cancer recurrence in patients who have had mastectomies.

Reconstructing the Nipple and Areola After Breast Surgery

When treating breast cancer with a mastectomy, the nipple is typically removed along with the rest of the breast. (Some women might be able to have a nipple-sparing mastectomy, where the nipple is left in place. This is discussed in more detail on our page about [mastectomy¹](#).)

If you're having breast reconstruction after your mastectomy, you can decide if you want to have the nipple and the dark area around the nipple (areola) reconstructed through surgery or tattooing, or both.

- [Nipple and areola reconstruction](#)
- [Nipple prosthetics](#)

Nipple and areola reconstruction

The nipple and areola are usually the final phase of breast reconstruction. This is a separate surgery done to make the reconstructed breast look more like the original breast. It can be done as an outpatient surgery or sometimes as an office procedure. It's usually done about 3 to 4 months after surgery after the new breast has had time to heal.

Ideally, nipple and areola reconstruction tries to match the position, size, shape, texture, color, and projection of the new nipple to the natural one (or to each other, if both nipples are being reconstructed). Tissue used to rebuild the nipple and areola comes from the newly created breast or, less often, from skin from another part of your body (such as the inner thigh). If a woman wants to match the color of the nipple and areola of the other breast, tattooing may be done a few months after the surgery.

Some women opt to have just the tattoo, without nipple and areola tissue reconstruction. A skilled plastic surgeon or other professional may be able to use pigment in shades that make the flat tattoo look 3-dimensional.

Nipple prosthetics

Another option for women who might not want further surgery or tattooing are nipple prosthetics, which are made of silicone or other materials and look and feel like real nipples. They can be attached to the chest and then taken off when you choose.

Questions to Ask Your Surgeon About Breast Reconstruction

If you've been diagnosed with breast cancer and are considering breast reconstruction, it's important to find out as much as you can about what to expect. Your breast surgeon can help you find a plastic surgeon who should be able to explain all of your choices and answer your questions.

Here are some questions to ask to help get you started. Be sure you get all of your questions answered, so that you can make the best decisions for you about breast reconstruction.

- [Finding the right plastic surgeon for your breast reconstruction](#)
- [Getting a second opinion](#)
- [Questions to ask about breast reconstruction](#)

Finding the right plastic surgeon for your breast reconstruction

If you decide to have breast reconstruction, it is best to find an experienced board-certified plastic surgeon. Your breast surgeon can suggest doctors for you. To find a board-certified plastic surgeon in your area, or to find out if your surgeon is board certified, contact the [American Board of Plastic Surgeons](#)¹.

Getting a second opinion

You might want to get a [second opinion](#)² before having surgery, so you know all of your options before reconstruction surgery, or even [mastectomy](#).³ It's important for you to make the right decisions based on complete information.

Questions to ask about breast reconstruction

It's very important to get all of your questions answered by your plastic surgeon before having breast reconstruction. If you don't understand something, ask your surgeon about it. You might want to take notes or bring a partner or friend with you to the doctor's appointment to help remember what was said and to help ask other questions.

Here are some questions to get you started. Write down other questions as you think of them. The answers to these questions may help you make your decisions.

- Can I have breast reconstruction?
- When can the reconstruction be done?
- What are the reasons for and against doing it at the same time as my cancer surgery (immediate reconstruction) versus waiting (delayed reconstruction)?
- Will reconstruction interfere with chemotherapy?
- Will reconstruction interfere with radiation therapy?
- [What types of reconstruction could I have?](#)
- What are the risks and benefits of each option?

- What type of reconstruction do you think would be best for me? Why?
- What's the average cost of each type? Will my insurance cover them?
- How long would it take me to recover from each type?
- How many of these procedures have you (plastic surgeon) done each year?
- What [results](#) can I expect?
- Will the reconstructed breast look like my other breast?
- Should I consider surgery on the other breast also to help them look alike?
- Could I have the nipple reconstructed if I choose to? How would this be done?
- How will my reconstructed breast(s) feel to the touch? Will I have any feeling in my reconstructed breast(s)?
- What possible problems should I know about?
- If using a tissue flap, will there be pain, scars, or other changes in the parts of my body where the tissue is taken from?
- If using a tissue flap, will you also need to place an implant to give the reconstructed breast a better shape?
- If I get a breast implant, how long will it last?
- What type of implant will you use for my reconstructed breast--smooth or textured? Saline or silicone?
- Will I need to get extra imaging tests depending on the type of implant I get? Will my insurance cover those extra tests?
- What kinds of changes to the breast can I expect over time?
- Will I need more surgery in a few years because of possible complications?
- How will aging affect the reconstructed breast?
- How will I know if the implant is ruptured?
- Are there any new reconstruction options that I should know about, including [clinical trials](#)⁴?
- Can you show me pictures of typical results?
- Can I talk with other women who have had the same surgery?

Preparing for Breast Reconstruction Surgery

As you get ready for breast reconstruction surgery, ask your surgeon what to expect. Your surgeon can help you be as prepared as possible. You want to have realistic expectations of how your body will look and feel after surgery, and understand the benefits and risks of the type of reconstruction you are having.

Ask questions and follow your surgeon's instructions carefully.

- Gathering your list of questions
- Understanding your surgery costs
- Getting ready for surgery
- Where your surgery will be done
- What anesthesia will be used
- Possible risks of breast reconstruction surgery

Gathering your list of questions

Some questions that may help you know what to expect include:

- What should I do to get ready for surgery?
- If I smoke, when is the best time to stop before surgery?

- How much discomfort or pain will I feel after surgery?
- How long will I be in the hospital?
- Will I need blood transfusions?
- How long will it take me to recover?
- What will I need to do at home to care for my incisions (surgical scars)?
- Will I have a drain (tube that lets fluid out of the wound) when I go home?
- How much help will I need at home to take care of my drain and wound?
- Will I be taught exercises to do after surgery? When can I start them?
- How much activity can I do at home?
- What do I do if [my arm swells¹](#)?
- When will I be able to go back to normal activities such as driving and working?

Breast reconstruction can make you feel better about how you look and renew your self-confidence, but keep in mind that the reconstructed breast will not be a perfect match or substitute for your natural breast. If tissue from your tummy, back, thigh, or buttocks will be used, those areas will also look different after surgery. Talk with your surgeon about surgical scars and changes in shape or contour. Ask where they will be, and how they will look and feel after they heal.

Your surgeon or other involved doctors/staff should explain the details of your surgery, including:

- The drugs (anesthesia) that will be used to make you sleep and not feel pain during the surgery
- Where the surgery will be done
- How long the surgery will take
- Possible complications of surgery (long-term and short-term)
- What to expect after surgery
- The plan for follow-up
- Costs associated with the surgery

Understanding your surgery costs

Health insurance policies often cover most or all of the cost of reconstruction after a [mastectomy²](#), but this might not always be the case if you have reconstruction after [breast-conserving surgery³](#) (lumpectomy or partial mastectomy). Check your policy to make sure you are covered, and find out what portion of the bill you'll be expected to pay. Also, see if there are any limits on what types of reconstruction are covered.

Before surgery, make sure your insurance company will not deny breast reconstruction costs (for mastectomy or lumpectomy). Your surgeon may be able to help you with this if your insurance plan wants to deny coverage, so be sure to ask if you need help. It may take some time and effort. In the past, health plans have denied coverage for certain reconstruction procedures despite federal laws that require coverage in most cases. They often reverse such decisions on appeal.

Getting ready for surgery

Your breast surgeon and your plastic surgeon should give you clear instructions on how to prepare for surgery. These will probably include:

- [Help with quitting smoking.](#)⁴ if you smoke
- Instructions to take or avoid certain vitamins, medicines, and dietary or herbal supplements for a period of time before your surgery
- Instructions on eating and drinking before surgery

Plan to have someone take you home after your surgery or your stay in the hospital. You may also need them to stay and help you out for a few days or longer.

Where your surgery will be done

Breast reconstruction often means having more than one operation. The first creates the breast mound. This may be done at the same time as the mastectomy or later on. It's usually done in a hospital.

Follow-up procedures such as filling expanders or creating the nipple and areola are most often done in an outpatient facility. But this decision depends on how much surgery is needed and what your surgeon prefers, so you'll need to ask about this.

What anesthesia will be used

The first stage of reconstruction is almost always done using general anesthesia. This means you'll be given drugs to make you sleep and not feel pain during the surgery.

Follow-up procedures may only need local anesthesia. This means that only the area the doctor is working on will be numbed. A sedative drug may also be used to make you feel relaxed but awake. You might feel some discomfort.

Possible risks of breast reconstruction surgery

Any type of surgery has risks , and breast reconstruction may pose certain unique problems for some women. Your surgeon will go over the possible risks of reconstruction surgery with you. Be sure to ask questions if there's anything you're not sure about. For more on the possible risks after surgery, see [What to Expect After Breast Reconstruction Surgery](#).

What to Expect After Breast Reconstruction Surgery

It's important to have an idea of what to expect after surgery to rebuild your breast, including the possible risks and side effects.

How long it takes you to recover from breast reconstruction surgery will depend on the type of reconstruction you have. Most women begin to feel better in a couple of weeks and can return to usual activities in a couple of months. Talk to your cancer care team about what you can expect.

Be sure you understand how to take care of your surgery sites and how to follow up with your breast care. Follow up care could include regular [mammograms¹](#) and other breast imaging tests, depending on the surgery you had.

- [Possible risks during and after reconstruction surgery](#)
- [Recovering after reconstruction surgery](#)
- [Talk to your doctor about mammograms](#)

Possible risks during and after reconstruction surgery

Any type of surgery has risks, and breast reconstruction may pose certain unique problems for some women. Even though many of these are not common, some of the possible risks and [side effects²](#) during or soon after surgery include:

- Problems with the anesthesia
- Bleeding
- [Blood clots³](#)
- Fluid build-up in the breast or the donor site (for a tissue flap), with swelling and pain
- [Infection⁴](#) at the surgery site(s)
- [Wound healing problems⁵](#)
- Extreme tiredness ([fatigue⁶](#))

Problems that can develop later on include:

- Tissue death (necrosis) of all or part of a tissue flap, skin, or fat
- Loss of or changes in nipple and breast sensation
- Problems at the donor site, such as loss of muscle strength, bulging of the abdominal (belly) wall, and dimples in the skin
- The need for more surgery to fix problems that come up
- Changes in the arm on the same side as the reconstructed breast
- Problems with a breast implant, such as movement, leakage, rupture, rippling (when an implant or the skin over the implant wrinkles), or scar tissue formation (capsular contracture)
- Development of a [rare type of cancer](#) in the scar tissue around a breast implant
- Uneven breasts

Risks of infection

Infection can happen with any surgery, most often in the first couple of weeks after the operation. If you have an implant, it might have to be removed until the infection clears. A new implant can be put in later. If you have a tissue flap, surgery may be needed to clean the wound.

Risks of capsular contracture

The most common problem with breast implants is **capsular contracture**. A scar (or capsule) can form around the soft implant. As it tightens, it can start to squeeze the implant, making the breast feel hard and look distorted. Capsular contracture can be treated. Sometimes surgery can remove the scar tissue, or the implant can be removed or replaced.

Additional risks for women who smoke

Using tobacco narrows blood vessels and reduces the supply of blood, nutrients, and oxygen to tissues. Smoking can delay healing in any surgery and is linked to a higher chance of wound complications. This can cause more noticeable scars and a longer recovery time. Sometimes these problems are bad enough that a second operation is needed to fix them. You may be asked to [quit smoking](#)⁷ a few weeks or months before surgery to reduce these risks. This can be hard to do, so ask your doctor for help. Sometimes your plastic surgeon might choose to delay your surgery until you stop smoking.

Recovering after reconstruction surgery

You're likely to feel tired and sore for a week or 2 after [implant surgery](#), or longer after a [flap procedure](#)(which will leave you with 2 surgical wounds). Your doctor will give you medicines to help control pain and other discomfort.

Depending on the type of surgery you have, you will most likely be able to go home from the hospital within a few days. You may be discharged with one or more drains in place. A drain is a small tube that's put in the wound to remove extra fluid from the surgery site while it heals. In most cases, fluid drains into a little hollow ball that you'll learn how to empty before you leave the hospital. The doctor will decide when the drains can be safely removed depending on how much fluid is collecting each day. Follow your doctor's instructions on wound and drain care. Also be sure to ask what kind of support garments you should wear. If you have any concerns or questions, ask someone on your cancer care team.

Getting back to normal

Most women can start to get back to normal activities within 6 to 8 weeks. If implants are used without flaps, your recovery time may be shorter. Some things to keep in mind:

- Certain types of reconstruction surgery do not restore normal feeling to your breast, but in other types some feeling might return over time.

- It may take up to about 8 weeks for bruising and swelling to go away. Try to be patient as you wait to see the final result.
- It may take as long as 1 to 2 years for tissues to heal fully and scars to fade (the scars never go away completely).
- Ask when you can wear regular bras. Talk with your surgeon about the type of bra to wear – sometimes it will depend on the type of surgery you had. After you heal, underwires and lace in your bra might feel uncomfortable if they press on scars or rub your skin.
- Follow your surgeon's advice on when to begin stretching exercises and normal activities, because it's different with different types of reconstruction. As a basic rule, you'll want to avoid overhead lifting, strenuous sports, and some sexual activities for 4 to 6 weeks after reconstruction. Check with your surgeon for specific guidance.
- Women who have reconstruction months or years after a [mastectomy](#)⁸ may go through a period of emotional adjustment once they've had their breast reconstructed. Just as it takes time to get used to the loss of a breast, it takes time to start thinking of the reconstructed breast as your own. Talking with other women who have had breast reconstruction might be helpful. Talking with a mental health professional might also help you deal with [anxiety](#)⁹ and other distressing feelings.
- Silicone gel implants can open up or leak inside the breast without causing symptoms. Surgeons usually recommend getting regular magnetic resonance imaging (MRI) of implants to make sure they aren't leaking. (This isn't needed with saline implants.) You'll likely have your first MRI 1 to 3 years after your implant surgery and every 2 years from then on, although it may vary by implant. Your insurance might not cover this. Be sure to talk to your doctor about long-term follow-up.
- Call your doctor right away if you notice any new skin changes, swelling, lumps, pain, or fluid leaking from the breast, armpit, or flap donor site, or if you have other symptoms that concern you.

Talk to your doctor about mammograms

Women who have had a mastectomy to treat breast cancer generally do not need routine screening mammograms on the side that was affected by cancer (although they still need them on the other breast). There isn't enough tissue remaining after a mastectomy to do a mammogram. Cancer can come back in the skin or chest wall on that side, but if this happens it's more likely to be found on a physical exam.

It's possible for women with reconstructed breasts to get mammograms, but experts agree that women who have breast reconstruction after a mastectomy don't need routine mammograms. Still, if an area of concern is found during a physical exam, a diagnostic mammogram may be done. ([Ultrasound¹⁰](#) or [MRI¹¹](#) may also be used to look at the area closely.)

If you're not sure what type of mastectomy you had or if you need to have mammograms, ask your doctor.

Living as a Breast Cancer Survivor

Whether you are living with breast cancer or have finished treatment, you may have questions and concerns about life as a survivor.

Living as a Survivor

Learn more about living as a breast cancer survivor and get information about next steps.

- [Follow-up Care After Breast Cancer Treatment](#)
- [Can I Lower My Risk of Breast Cancer Progressing or Coming Back?](#)
- [Body Image and Sexuality After Breast Cancer](#)

Other Concerns After Treatment

Treatment may remove or destroy the cancer, but you might still have other concerns after treatment.

- [Pregnancy After Breast Cancer](#)
 - [Menopausal Hormone Therapy After Breast Cancer](#)
 - [Second Cancers After Breast Cancer](#)
-

Follow-up Care After Breast Cancer Treatment

After you complete your breast cancer treatment, your cancer care team will still want to watch you closely. It's important to understand your care schedule and go to all of your follow-up appointments.

- [What to expect during follow-up care](#)
- [Typical follow-up schedules](#)
- [Ask your doctor for a survivorship care plan](#)
- [Keeping health insurance and copies of your medical records](#)
- [If the cancer comes back](#)

What to expect during follow-up care

Many women are relieved to be finished with breast cancer treatment, but also worry about the cancer coming back and can feel lost when they don't see their cancer care team as often.

But for some women with advanced breast cancer, the cancer may never go away completely. These women may continue to get treatments to help keep the breast cancer under control and to help relieve symptoms from it. Learning to live with advanced breast cancer that doesn't go away can have its own types of stress and uncertainty.

Even if you have completed breast cancer treatment, your doctors still will want to watch you closely, so it's very important for you to go to all of your follow-up appointments. During these visits, your doctors will ask if you are having any problems and will examine you. Lab tests and imaging tests typically aren't needed after treatment for most early-stage breast cancers. But they might be done in some women who are having symptoms to see if they're the result of the cancer returning or are from treatment-related side effects.

Almost any cancer treatment can have [side effects¹](#). Some might only last for a few days or weeks, but others might last a long time. Some side effects might not even show up until years after you have finished treatment. Your doctor visits are a good time for you to ask questions and talk about any changes or problems you notice or concerns you have. However, if concerns about your cancer come up between visits, you shouldn't wait until your next scheduled visit. Call your doctor's office right away.

Typical follow-up schedules

Your follow-up schedule can depend on many factors, including the type of breast

cancer, how advanced it was when it was found (the [stage²](#) of the cancer), and how it was (or is being) treated.

- **Doctor visits:** If you have finished treatment, your follow-up visits will probably be every few months at first. The longer you have been free of cancer, the less often the appointments are needed. After 5 years, they are typically done about once a year.
- **Mammograms:** If you had [breast-conserving surgery³](#) (lumpectomy or partial mastectomy), you will probably have a [mammogram⁴](#) about 6 to 12 months after surgery and radiation are completed, and then at least every year after that. Women who've had a [mastectomy⁵](#) (removal of the entire breast) typically no longer need mammograms on that side. But unless you've had both breasts removed, you still need to have yearly mammograms on the remaining breast. To learn more, see [Mammograms After Breast Cancer Surgery⁶](#).
- **Pelvic exams:** If you are taking either of the hormone drugs tamoxifen or toremifene and still have your uterus, your doctor will likely recommend pelvic exams every year because these drugs can increase your risk of [uterine \(endometrial\) cancer⁷](#). This risk is highest in women who have gone through menopause. Be sure to tell your doctor right away about any unusual vaginal bleeding, such as bleeding or spotting after menopause, bleeding or spotting between periods, or a change in your periods. Although this is usually caused by something that isn't cancer, it can also be the first sign of uterine cancer.
- **Bone density tests:** If you are taking a hormone drug called an aromatase inhibitor (such as anastrozole, letrozole, or exemestane) for early-stage breast cancer, or if treatment puts you into menopause, your doctor will want to monitor your bone health and may consider testing your bone density.
- **Other tests:** Other tests such as blood tests and imaging tests (like bone scans, x-rays, or CT or PET scans) are not a standard part of follow-up for most women who've been treated for breast cancer, because they haven't been shown to help them live longer. But one or more of these tests might be done if you have symptoms or physical exam findings that suggest that the cancer might have come back.

If symptoms, exams, or tests suggest your cancer might have returned, [imaging tests⁸](#) such as an x-ray, CT scan, PET scan, MRI scan, bone scan, and/or a [biopsy⁹](#) may be done.

If the cancer recurrence is confirmed, your doctor may also check your blood for

circulating tumor cells (CTCs), or for levels of blood tumor markers such as CA-15-3, CA 27-29, or CEA. Tumor marker levels go up in some women if their cancer recurs or has spread, so if a tumor marker level is high, your doctor might use it to monitor the results of further treatment. But tumor marker levels don't go up in all women, so these tests aren't always helpful, and they aren't used to watch for cancer recurrence in women without any symptoms.

Ask your doctor for a survivorship care plan

Talk with your doctor about developing a [survivorship care plan¹⁰](#) for you. This plan might include:

- A summary of your diagnosis, the tests that were done, and the treatment you received
- A suggested schedule for follow-up exams and tests
- A schedule for other tests you might need in the future, such as early detection (screening) tests for other types of cancer, or tests to look for long-term health effects from the breast cancer or its treatment
- A list of possible late- or long-term side effects from your treatment, including what to watch for and when you should contact your doctor
- Diet, physical activity, and other lifestyle modification suggestions

Keeping health insurance and copies of your medical records

Even after treatment is finished, it's very important to keep your [health insurance¹¹](#). Tests and doctor visits cost a lot, and even though no one wants to think their cancer might come back, this could happen.

At some point after your treatment, you might find yourself seeing a new doctor who doesn't know about your medical history. It's important to keep copies of your medical records so you can give your new doctor the details of your diagnosis and treatment. Learn more in [Keeping Copies of Important Medical Records¹²](#).

If the cancer comes back

If cancer does return, your treatment options will depend on where it comes back, what treatments you've had before, and your current health and preferences. For more information, see [Treatment of Recurrent Breast Cancer¹³](#).

It's important to know that women who have had breast cancer can also still get other types of cancer, so it's important to follow the [American Cancer Society guidelines for the early detection of cancer¹⁴](#), such as those for colorectal cancer and cervical cancer.

Women who have had breast cancer are actually at higher risk for certain other cancers. To learn more about the risks of second cancers, see [Second Cancers After Breast Cancer](#).

Can I Lower My Risk of Breast Cancer Progressing or Coming Back?

If you have (or have had) breast cancer, you probably want to know if there are things

you can do (aside from your treatment) that might lower your risk of the cancer growing or coming back, such as getting or staying active, eating a certain type of diet, or taking nutritional supplements. Fortunately, breast cancer is one of the best studied types of cancer in this regard, and research has shown there are some things you can do that might be helpful.

[Staying as healthy¹](#) as possible is more important than ever after breast cancer treatment. Controlling your weight, being physically active, and eating well may help you lower your risk of breast cancer coming back, as well as help protect you from other health problems.

- [Getting to a healthy weight](#)
- [Being physically active](#)
- [Eating a healthy diet](#)
- [Dietary supplements](#)
- [Alcohol](#)
- [If the cancer comes back](#)

Getting to a healthy weight

If you have had breast cancer, getting to and staying at a healthy weight might help lower your risk. A lot of research suggests that being overweight or obese (very overweight) raises the risk of breast cancer coming back. It has also been linked with a higher risk of getting [lymphedema²](#), as well as a higher risk of dying from breast cancer.

However, there is less research to show whether losing weight during or after treatment can actually lower the risk of breast cancer coming back. Large studies are now looking at this issue. This is complicated by the fact that many women gain weight (without trying) during breast cancer treatment, which itself might increase risk.

Of course, for women who are overweight, getting to a healthy weight can also have other health benefits. For example, weight loss has been shown to improve quality of life and physical functioning among overweight breast cancer survivors. Getting to a healthy weight might also lower your risk of getting some other cancers (including a new breast cancer), as well as some types of chronic diseases.

Because of the possible health benefits of losing weight, many health care providers now encourage women who are overweight to get to and stay at a healthy weight. Even losing a few pounds may be helpful. Still, it's important to discuss this with your doctor before trying to lose weight, especially if you are still getting treatment or have just finished it. Your health care team can help you create a plan to lose weight safely.

Being physically active

Among breast cancer survivors, studies have found a consistent link between physical activity and a lower risk of breast cancer coming back and of dying from breast cancer, as well as dying of any cause. Physical activity has also been linked to improvements in quality of life, physical functioning, and fewer [fatigue³](#) symptoms.

It's not clear exactly how much activity might be needed, but more seems to be better. More vigorous activity may also be more helpful than less vigorous activity. But further studies are needed to help clarify this.

In the past, breast cancer survivors with **lymphedema** were often advised to avoid certain arm exercises and vigorous activities. But studies have found that such physical activity is safe when done the right way. In fact, it might actually lower the risk of lymphedema, or improve lymphedema for women who already have it.

As with other types of lifestyle changes, it's important to talk with your treatment team before starting a new physical activity program. This will likely include meeting with a physical therapist as well. Your team can help you plan a safe and effective program.

Eating a healthy diet

Most research on possible links between diet and the risk of breast cancer coming back has looked at broad dietary patterns, rather than specific foods. In general, it's not clear if eating any specific type of diet can help lower your risk of breast cancer coming back.

Studies have found that breast cancer survivors whose eating patterns include more vegetables, fruits, whole grains, chicken, and fish tend to live longer than those who eat more refined sugars, fats, red meats (such as beef, pork, and lamb), and processed meats (such as bacon, sausage, luncheon meats, and hot dogs). But it's not clear if this is due to effects on breast cancer or possibly to other health benefits of eating a healthy diet.

Two large studies (known as WINS and WHEL) have looked at the effects of lowering **fat intake** after being diagnosed with early-stage breast cancer. One study found that women on a low-fat diet had a small reduction in the risk of cancer coming back, but these women also lost weight as a result of their diet, which might have affected the results. The other study did not find a link between a diet low in fat and the risk of cancer coming back.

Many women have questions about whether **soy products** are safe to eat after a

diagnosis of breast cancer. Soy foods are rich sources of compounds called **isoflavones** that can have estrogen-like properties in the body. Some studies have suggested that soy food intake might lower the risk of breast cancer coming back, although more research is needed to confirm this. While eating soy foods doesn't seem to pose a risk, the evidence regarding the effects of taking soy or isoflavone supplements, which often contain much higher levels of these compounds, is not as clear.

The links between specific types of diets and breast cancer coming back are not certain, but there are clearly health benefits to eating well. For example, diets that are rich in plant sources are often an important part of getting to and staying at a healthy weight. Eating a healthy diet can also help lower your risk for some other common health problems, such as heart disease and diabetes.

Dietary supplements

Women often want to know if there are any [dietary or nutritional supplements⁴](#) they can take to help lower their risk. So far, no dietary supplements (including vitamins, minerals, and herbal products) have been shown to clearly help lower the risk of breast cancer progressing or coming back. This doesn't mean that there aren't any that will help, but it's important to know that none have been proven to do so.

Dietary supplements are not regulated like medicines in the United States – they do not have to be proven effective (or even safe) before being sold, although there are limits on what their makers are allowed to claim they can do. If you're thinking about taking any nutritional supplement, talk to your health care team. They can help you decide which ones you can use safely while avoiding those that might be harmful.

Alcohol

It's clear that alcohol – even as little as a few drinks a week – increases a woman's risk of **developing** breast cancer. But whether alcohol affects the risk of breast cancer **coming back** is not as clear. Drinking alcohol can raise the levels of estrogen in the body, which in theory could increase the risk of breast cancer coming back. But there is no strong evidence from studies to support this.

[It is best not to drink alcohol.⁵](#) Women who do drink should limit it to no more than 1 drink a day to help lower their risk of getting certain types of cancer (including breast cancer). For women who have completed cancer treatment, the effects of alcohol on cancer recurrence risk are largely unknown.

Because this issue is complex, it's important to discuss it with your health care team, taking into account your risk of breast cancer coming back (or you getting other cancers) and your risk of other health issues linked to alcohol use.

If the cancer comes back

If breast cancer does return, your treatment options will depend on where it comes back, what treatments you've had before, and your current health and preferences. For more information, see [Treatment of Recurrent Breast Cancer⁶](#).

Body Image and Sexuality After Breast Cancer

Learning to be comfortable with your body during and after breast cancer treatment is a personal journey that is different for every woman. Information and support can help you cope with these changes over time.

- Feeling good about your body during and after breast cancer treatment
- Sexuality after breast cancer
- Finding help and support after breast cancer treatment

Feeling good about your body during and after breast cancer treatment

Along with the emotional, mental, and financial stresses that cancer and its treatment can cause, many women with breast cancer also find themselves coping with changes in their appearance as a result of their treatment.

Some changes may be temporary, such as [hair loss¹](#). But even short-term changes can have a profound effect on how a woman feels about herself. A number of options are available to help women cope with hair loss, including wigs, hats, scarves, and other

accessories. Alternatively, some choose to use their baldness as a way to identify themselves as breast cancer survivors.

Other changes can be permanent, like the loss of part or all of a breast (or breasts) after surgery. Some women choose to have [reconstructive surgery](#)² to rebuild the breast mound, while others might choose not to. If you decide not to have breast reconstruction, you can decide [whether to wear a breast form or prosthesis or not](#)³.

Sexuality after breast cancer

You may have concerns about sexuality after breast cancer. Physical changes, especially after breast surgery, can make some women less comfortable with their bodies. There may be a loss of sensation in the affected breast. Other treatments for breast cancer, such as [chemotherapy](#)⁴ and [hormone therapy](#)⁵, can change your hormone levels and may affect your sexual interest and/or response.

Relationship issues are also important. Your partner might worry about how to express love physically and emotionally after treatment, especially after surgery. But breast cancer can be a growth experience for couples – especially when both partners take part in decision making and go to treatments.

To learn more, see [Sex and the Adult Female with Cancer](#)⁶.

Finding help and support after breast cancer treatment

Regardless of the changes you may experience, it's important to know that there is advice and support out there to help you cope. Speaking with your doctor or other members of your health care team is often a good starting point to find it. There are also many support groups available, such as the [American Cancer Society Reach To Recovery program](#)⁷. This program matches you with a local volunteer who has had breast cancer. Your Reach To Recovery volunteer can answer many of your questions and can give you suggestions, additional reading material, and advice. Remember that she's been there and will probably understand.

Some studies suggest that younger women tend to have more problems adjusting to the stresses of breast cancer and its treatment. It can feel socially isolating. Younger women might also be more affected by issues of sexuality or [fertility](#)⁸ (the ability to have children). Some younger women might be thinking about starting a family or having more children, and they might worry about how the cancer and its treatment might affect this. Others might have already started families and might worry about how family members might be affected. For more on this, see [Pregnancy After Breast Cancer](#).

If you are having trouble adjusting after a breast cancer diagnosis, a counselor or a support group can often be helpful. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345. We can put you in touch with a group or resource that may work for you.

Pregnancy After Breast Cancer

Breast cancer is most common in older women. But if you are a younger woman who has had breast cancer, you might question if this has affected your fertility (ability to have children) and if there are any extra risks if you become pregnant.

Many women are able to become pregnant after being treated for breast cancer. However, some treatments can make it harder to get pregnant. If you think you might want to have children one day, or just want to keep your options open, the best time to talk to your doctor about this is **before** you begin breast cancer treatment.

- [Can I have a baby after having breast cancer?](#)
- [Could pregnancy or breastfeeding make my breast cancer come back?](#)
- [How long after breast cancer treatment should I wait before becoming pregnant?](#)
- [If I get pregnant, would my history of breast cancer put my baby at risk?](#)
- [Could breast cancer treatment affect my unborn baby?](#)
- [Can I breastfeed after breast cancer treatment?](#)
- [Talk to your doctor](#)

Can I have a baby after having breast cancer?

Some treatments for breast cancer might affect a woman's fertility. For example, chemotherapy for breast cancer might damage the ovaries, which can sometimes cause immediate or delayed infertility. Still, many women are able to become pregnant after treatment. For more about how cancer treatment can affect fertility, see [Female Fertility and Cancer¹](#).

Could pregnancy or breastfeeding make my breast cancer come back?

Many breast cancers are sensitive to estrogen, so there has been concern that for women who have had breast cancer, the high hormone levels that result from a **pregnancy** might increase the chance of the cancer coming back. However, studies have not shown that pregnancy increases the risk of the cancer coming back after successful treatment.

Some women might not be able to **breastfeed** after breast cancer treatment, depending on the treatment they received and other factors (see below). But for those who are able to, breastfeeding after treatment is not thought to increase the risk of breast cancer

recurrence. Breastfeeding (especially for a year or more) is linked to a [lower risk of developing breast cancer](#)², although there is less research about whether it can help lower the risk of breast cancer coming back after treatment.

How long after breast cancer treatment should I wait before becoming pregnant?

Breast cancer survivors who want to become pregnant are sometimes advised to wait at least 2 years after treatment is finished before trying. The best length of time to wait is not clear, but 2 years is thought to be enough time to find any early return of the cancer, which could affect your decision to become pregnant.

For women with hormone receptor-positive breast cancer, adjuvant [hormone therapy](#)³ is typically recommended for 5 to 10 years after the initial treatment. Women who want to have children during this time are often advised to take hormone therapy for at least 2 years before stopping it and then waiting a few months before trying to become pregnant. Hormone therapy can then be started again after the baby is born.

Keep in mind that the advice about waiting 2 years is not based on data from any clinical trials. And some breast cancers can come back after the 2-year mark, so every case is different. Your decision should take into account many things, including your age, desire for more pregnancies, type of breast cancer, and the risk of the cancer coming back early.

If I get pregnant, would my history of breast cancer put my baby at risk?

Having a history of breast cancer does seem to be linked to an increased risk of some possible complications of pregnancy, including pre-term delivery, having a low-birth-weight baby, and the need for a cesarean section (C-section).

But research has not found that a woman's past breast cancer has any direct effect on her baby. There is no increased rate of birth defects or other long-term health concerns in children born to women who have had breast cancer.

Could breast cancer treatment affect my unborn baby?

If you are still getting any type of treatment for breast cancer, including chemotherapy, hormone therapy, targeted therapy, or immunotherapy, talk to your doctor before trying to become pregnant. Many of these drugs might affect a growing fetus, so it is safer to

wait until all treatment is complete before getting pregnant.

It's also important to remember that stopping treatment early can increase the risk of the cancer growing or coming back. See [Treating Breast Cancer During Pregnancy⁴](#) for more on this.

Can I breastfeed after breast cancer treatment?

If you have had breast surgery and/or radiation, you might have problems breastfeeding from the affected breast. This might include reduced milk production in that breast as well as structural changes that can make breastfeeding painful, or make it harder for the baby to latch onto the breast. Still, many women are able to breastfeed.

If you are still taking any medicines to treat your breast cancer (such as hormone therapy), it's very important to talk with your doctor before trying to breastfeed. Some drugs can enter the breast milk and might affect the baby.

Talk to your doctor

If you have or have had breast cancer and are thinking about having children, talk with your doctor. Ask how the cancer and its treatment might affect your chances for pregnancy, as well as if being pregnant could affect your risk of the cancer coming back.

In many cases, counseling can help you sort through the choices that come with surviving breast cancer and planning a pregnancy.

Menopausal Hormone Therapy After Breast Cancer

Taking **post-menopausal hormone therapy (PHT)**, also called **hormone replacement therapy (HRT)**, to help with menopause symptoms may not be safe for women who have had breast cancer. If you are bothered by menopause symptoms, talk to your doctor about ways to get relief.

- Menopause symptoms after breast cancer
- Can I take menopausal hormone therapy after breast cancer?
- Relieving menopausal symptoms without hormone therapy

Menopause symptoms after breast cancer

Many women have menopause symptoms such as hot flashes after treatment for breast

cancer. This can happen naturally as women get older, but it can also be caused by some breast cancer treatments.

Some pre-menopausal women have menopause symptoms as a result of [chemotherapy](#)¹ or from [hormone therapy drugs](#)² used to treat breast cancer (such as tamoxifen and aromatase inhibitors). Women who are past menopause might also get symptoms if they had to stop taking post-menopausal hormone therapy when they were diagnosed with breast cancer.

Can I take menopausal hormone therapy after breast cancer?

When women reach menopause, some choose to take [post-menopausal hormone therapy](#)³ (PHT), which is made up of female hormones (estrogen, sometimes along with progesterone) to help reduce menopause symptoms. But there have been concerns about women who have had breast cancer using PHT, because of the known link between estrogen levels and breast cancer growth.

A well-designed clinical trial (the HABITS study) found that breast cancer survivors taking PHT were much more likely to develop a new or recurrent breast cancer (cancer that comes back after treatment) than women who were not taking these hormones. Because of this, doctors generally do not recommend PHT if a woman was previously treated for breast cancer.

Relieving menopausal symptoms without hormone therapy

If you are having trouble with menopause symptoms, such as hot flashes, talk to your doctor about ways other than PHT to help with specific symptoms. Some women might want to try using non-hormonal medicines or other methods first to see if they help.

Losing weight

Some women find that losing weight helps with menopausal symptoms such as hot flashes.

Diet and dietary supplements

Some women find that changing the way they eat, such as eating smaller meals and avoiding ‘triggers’ (such as spicy foods) is helpful for them.

The effects of specific foods and dietary supplements on menopausal symptoms are not

clear. This doesn't mean they won't help, but it's important to understand that the evidence supporting their use is limited.

Phytoestrogens: These are estrogen-like substances found in certain plants, such as soy, red clover, and black cohosh. Some women take supplements containing these substances to try to help with symptoms of menopause.

Eating soy foods seems to be safe for breast cancer survivors, although it's not clear if it can help relieve menopause symptoms. Women can get higher doses of phytoestrogens in some dietary supplements (such as soy or isoflavone supplements). However, not enough is known about these supplements to know for sure if they are safe and if they work. If you are considering taking one of these supplements, be sure to talk with your doctor first.

Exercise, relaxation techniques, and behavioral therapies

Some women find these types of approaches help them with menopausal symptoms. Although there is only limited research showing these techniques might be helpful, there's likely to be little harm in trying them. Before starting any exercise program after being diagnosed with breast cancer, it's important to speak with your doctor or someone on your health care team.

Some research has suggested that **acupuncture** might be helpful in treating hot flashes, although not all studies have found this. This might be another option to discuss with your doctor.

Non-hormone medicines for hot flashes

Drugs without hormone properties that may be helpful in treating hot flashes include:

- Certain antidepressant drugs, such as venlafaxine (Effexor), citalopram (Celexa), or paroxetine (Paxil)*
- The nerve drug gabapentin (Neurontin)
- The blood pressure drug clonidine
- Oxybutynin, a drug used to treat overactive bladder
- Fezolinetant (Veozah), a drug that targets the nervous system activity that can lead to hot flashes

*If you are taking tamoxifen, it's important to note that some antidepressants can interact with tamoxifen and could make it less effective. Ask your doctor about any

possible interactions between tamoxifen and any drugs you are taking.

Treatments for vaginal dryness

Vaginal dryness and discomfort can be bothersome menopausal symptoms for some women.

Several non-hormone treatments, including vaginal moisturizers, lubricants, and gels, are available to help treat vaginal dryness. If these aren't helpful, low-dose hormonal rings, tablets, capsules, or creams that are put directly into the vagina might be helpful.

Devices that use lasers or other forms of energy to 'rejuvenate' vaginal tissue are now being studied as well, although it's not yet clear how helpful they might be. It's important to discuss the possible risks and benefits of these treatments with your doctor before deciding if one is right for you.

Second Cancers After Breast Cancer

Breast cancer survivors can be affected by a number of health problems. But one major concern for many survivors is facing cancer again.

If this happens, it's most often the result of the breast cancer coming back after treatment. This is called a breast cancer **recurrence**. But some cancer survivors develop a new, unrelated cancer later on. This is called a **second cancer**.

- [What is the risk of getting a second cancer?](#)
- [Follow-up after breast cancer treatment](#)
- [Can I lower my risk of getting a second cancer?](#)

What is the risk of getting a second cancer?

Women who've had breast cancer can still get other cancers. Although most breast cancer survivors don't get cancer again, they are at higher risk for getting some types of cancer.

The most common second cancer in breast cancer survivors is **another breast cancer**. (This is different from the first cancer coming back.) The new cancer can develop in the opposite breast, or in the same breast for women who were treated with breast-conserving surgery (such as a lumpectomy).

Depending on which types of cancer treatment they received (and other factors), some breast cancer survivors might also be at higher-than-average risk for:

- Salivary gland cancer
- Esophagus cancer
- Stomach cancer
- Colon cancer
- Uterine cancer
- Ovarian cancer
- Thyroid cancer
- Soft tissue cancer (sarcoma)
- Melanoma of the skin
- Acute myeloid leukemia (AML)

Of course, breast cancer survivors can get other types of cancer as well.

The increased risk for these cancers can be due to a number of factors, including [genetic risk factors¹](#) and the use of some types of breast cancer treatments. For example:

- Women with inherited mutations in one of the *BRCA* genes have an increased risk of breast cancer, ovarian cancer, and some other cancers.
- [Radiation therapy²](#) to the chest as part of treatment seems to increase the risk for lung cancer (especially in women who smoke), sarcomas (cancers of connective tissues such as blood vessels and bones), and certain blood cancers, such as leukemia and myelodysplastic syndrome (MDS). Overall, though, the increase in risk is small, and the overall risk of these cancers is still low.

- Certain [chemotherapy](#)³ (chemo) drugs can increase the risk of developing leukemia and myelodysplastic syndrome (MDS) slightly.
- While [tamoxifen](#)⁴ can lower the chance of hormone receptor-positive breast cancer coming back (as well as the risk of getting a second breast cancer), it can increase the risk of uterine cancer (endometrial cancer and uterine sarcoma). Still, the overall risk of uterine cancer in most women taking tamoxifen is low, so the benefits of this drug in treating breast cancer are generally greater than the small increase in risk of a second cancer.

Follow-up after breast cancer treatment

If you have completed treatment for breast cancer, you should still see your doctor regularly, both to look for signs that the cancer might have come back and to look for any late effects from cancer treatment.

If you have not had both breasts removed, you still need regular [mammograms](#)⁵ to look for breast cancer (either a recurrence of the cancer or a new breast cancer). See [Follow-up Care After Breast Cancer Treatment](#) for more on the other types of tests you might need after treatment.

You should also follow the [American Cancer Society guidelines for the early detection of cancer](#),⁶ such as those for colorectal cancer and cervical cancer. Screening tests can often find these cancers early, when they are likely to be easier to treat. In some cases, the tests might even help prevent these cancers if pre-cancers are found and treated. For women who have had breast cancer, most experts do not recommend any additional testing to look for second cancers unless you have symptoms.

Let your doctor know about any new symptoms or problems, because they could be caused by the breast cancer coming back or by a new disease or second cancer. For example, abnormal menstrual bleeding, such as bleeding or spotting after menopause or between periods, can be a symptom of uterine cancer.

Can I lower my risk of getting a second cancer?

There's no sure way to prevent all cancers, but there are steps you can take to lower your risk and stay as healthy as possible. Getting the recommended early detection tests, as mentioned above, is one way to do this.

It's also important to [stay away from tobacco products](#)⁷. Smoking increases the risk of

many cancers, including some of the second cancers that are more likely after breast cancer.

To [help maintain good health⁸](#), breast cancer survivors should also follow the [ACS Guidelines on Diet and Physical Activity for Cancer Prevention⁹](#):

- Get to and stay at a healthy weight.
- Keep physically active and limit the time you spend sitting or lying down.
- Follow a healthy eating pattern that includes plenty of fruits, vegetables, and whole grains, and limits or avoids red and processed meats, sugary drinks, and highly processed foods.
- It's best not to drink [alcohol¹⁰](#). Women who drink should have no more than 1 drink per day.

These steps may also lower the risk of some other health problems.

See [Second Cancers in Adults¹¹](#) for more information about causes of second cancers.

Non-cancerous Breast Conditions

Benign (non-cancerous) breast conditions are very common, and most women have them. In fact, most breast changes are benign. Unlike [breast cancers](#), benign breast conditions are not life-threatening. But some are linked with a higher risk of getting breast cancer later on.

Some benign breast changes may cause signs or symptoms (such as breast lumps, pain, or nipple discharge), while others might be found during a [mammogram](#). In either case, sometimes they can be hard to tell apart from breast cancer, so other exams or tests might be needed to find out for sure.

Types of non-cancerous breast conditions

- Fibrosis and Simple Cysts
- Hyperplasia (Ductal or Lobular)
- Lobular Carcinoma in Situ (LCIS)
- Adenosis
- Fibroadenomas
- Phyllodes Tumors
- Intraductal Papillomas
- Fat Necrosis and Oil Cysts
- Mastitis
- Duct Ectasia
- Radial Scars and Other Non-cancerous Breast Conditions

Fibrocystic Changes in the Breast

Many breast lumps turn out to be non-cancerous (benign) changes in fibrous tissue (fibrosis) and/or cysts, which together are known as **fibrocystic changes**. These changes used to be called fibrocystic disease, but they are a normal finding in many women.

Fibrocystic changes are most common in women of child-bearing age, but they can affect women of any age.

- Fibrosis
- Cysts
- Diagnosis of fibrocystic changes
- How do fibrocystic changes affect your risk for breast cancer?
- Treatment of fibrocystic changes

Fibrosis

Fibrosis refers to an area of fibrous tissue, the same tissue that ligaments and scar tissue are made of. Areas of fibrosis can feel rubbery or firm to the touch.

Cysts

Cysts are fluid-filled, round or oval sacs within the breasts. They are often felt as a round, movable lump (or lumps), which might be tender to the touch. They are most common in women in their 30s or 40s, but they can occur in women of any age. Monthly hormone changes often cause cysts to get bigger and become painful and sometimes more noticeable just before the menstrual period.

Cysts begin when fluid starts to build up inside the breast glands. They start as **microcysts** (very small cysts), which are too small to feel unless they are part of a cluster (group) of microcysts. If fluid continues to build up, they can develop into **macrocysts** (large cysts). These can often be felt easily and can be as large as 1 or 2 inches across.

Diagnosis of fibrocystic changes

Most often, fibrocystic changes are diagnosed based on symptoms, such as breast lumps, swelling, and/or tenderness or pain. These symptoms tend to be worse just

before your menstrual period, and they may change (such as the lumps growing or shrinking) during different stages of your menstrual cycle. At times you may notice some nipple discharge.

If there is a concern about a lump possibly being cancer, a [breast ultrasound](#)¹ typically is done to see if the lump is solid or if it has fluid in it (that is, if it's a cyst). There are different types of cysts:

- A **simple cyst** is filled entirely with fluid. Simple cysts are not a cause for concern.
- A **complicated cyst** is similar to a simple cyst, but it has what looks like 'debris' floating in the fluid. Complicated cysts are very unlikely to be cancer, but in some cases a doctor might advise a follow-up exam or a procedure to remove the fluid with a thin, hollow needle, just to be sure.
- A **complex cystic and solid mass** has features such as a solid component or thick outer walls. These findings have a higher chance of being cancer, so a [biopsy](#)² is usually needed to find out for sure.

How do fibrocystic changes affect your risk for breast cancer?

Neither fibrosis nor simple cysts increase your risk of later developing breast cancer.

There is a small chance complicated cysts and complex cystic and solid masses might contain cancer or put you at higher risk of breast cancer later on, depending on what is found on a biopsy.

Treatment of fibrocystic changes

Fibrocystic changes in the breast are thought to be natural, so generally no treatment is needed unless they are causing discomfort.

Cysts that are painful can be drained using a thin, hollow needle, which might be done to confirm the diagnosis. Removing the fluid may reduce pressure and pain for some time. If removed, the fluid might come back later, but cysts may also go away over time. Surgery might be an option to remove cysts that continue to come back and cause symptoms.

Most women with fibrocystic changes and without bothersome symptoms do not need treatment, but the doctor might recommend watching the changes closely. If you have mild discomfort, you may get relief from well-fitted, supportive bras, applying heat, or

using over-the-counter pain relievers.

Some women report that their breast symptoms improve if they avoid caffeine and other stimulants found in coffee, tea, chocolate, and many soft drinks. Studies have not found a clear link between these stimulants and breast symptoms, but many women feel that avoiding these foods and drinks for a couple of months is worth trying.

Because breast swelling toward the end of the menstrual cycle is painful for some women, some doctors recommend over-the-counter pain relievers such as acetaminophen or ibuprofen, or other medicines. It's been suggested that some types of vitamin or herbal supplements might relieve symptoms, but so far none have been proven to be helpful, and some may have side effects if taken in large doses. Some doctors prescribe hormones, such as oral contraceptives (birth control pills), [tamoxifen](#)³, or androgens. But these are usually given only to women with severe symptoms because they also can have serious side effects.

If you have breast symptoms that aren't improving or are getting worse, it's important to see your doctor for further evaluation.

Hyperplasia of the Breast

Hyperplasia is an overgrowth of the cells that line the **lobules** (milk-producing glands) or **ducts** (small tubes) inside the breast. It is not cancer, but some types of hyperplasia are linked with a higher risk of developing breast cancer.

- [Diagnosis of hyperplasia](#)
- [How does hyperplasia affect your risk for breast cancer?](#)
- [Treatment of hyperplasia](#)
- [Reducing breast cancer risk or finding it early](#)

Diagnosis of hyperplasia

Hyperplasia can be described as either **usual** or **atypical**, based on how the cells look under a microscope.

- In **usual ductal hyperplasia**, there is an overgrowth of cells lining the ducts in the breast, but the cells look very close to normal.
- In atypical hyperplasia (or hyperplasia with atypia), the cells look more distorted and abnormal. This can be either **atypical ductal hyperplasia (ADH)** or **atypical lobular hyperplasia (ALH)**.

Hyperplasia doesn't usually cause a lump that can be felt, but it can sometimes cause changes that can be seen on a [mammogram](#)¹. It's diagnosed by doing a [biopsy](#)², during which a hollow needle or surgery is used to take out some of the abnormal breast tissue for testing.

How does hyperplasia affect your risk for breast cancer?

Hyperplasia can affect your risk for breast cancer, but how much depends on what type it is:

- **Usual ductal hyperplasia (also known as moderate or florid hyperplasia of the usual type, without atypia):** The risk of breast cancer is about 1½ to 2 times higher than that of a woman with no breast abnormalities.
- **Atypical hyperplasia (either ADH or ALH):** The risk of breast cancer is about 4 to 5 times higher than that of a woman with no breast abnormalities. More details about pathology reports showing atypical hyperplasia can be found in [Understanding Your Pathology Report: Atypical Hyperplasia](#)³.

Treatment of hyperplasia

Usual ductal hyperplasia is considered a normal finding in the breast and does not need to be treated.

If either **ADH** or **ALH** is found in a needle biopsy sample, surgery may be recommended to remove more breast tissue around it. This is to be sure that there is nothing more serious, such as cancer, nearby. If ADH or ALH is found after a surgical biopsy, typically no other treatment is needed.

Reducing breast cancer risk or finding it early

Both ADH and ALH are linked to a higher risk of breast cancer. Even though most women with ADH or ALH will not develop breast cancer, it's still important to talk with a health care provider about your risk and what you can do about it.

Options for women at higher risk of breast cancer from ADH or ALH may include:

- **Seeing a health care provider more often**(such as every 6 to 12 months) for a breast exam along with a yearly [mammogram⁴](#). Additional imaging with [breast MRIs⁵](#) may also be recommended, especially if you have other factors that raise your risk of breast cancer.
- **Making lifestyle changes to lower breast cancer risk.** To learn more, see [Can I Lower My Risk of Breast Cancer?⁶](#)
- **Taking medicine to help lower breast cancer risk.** For more on this, see [Deciding Whether to Use Medicine to Reduce Breast Cancer Risk⁷](#).

Lobular Carcinoma in Situ (LCIS)

Lobular carcinoma in situ (LCIS) is a type of breast change that is sometimes seen when a [breast biopsy](#)¹ is done. In LCIS, cells that look like cancer cells are growing in the lining of the milk-producing glands (lobules) of the breast, but they don't invade through the wall of the lobules.

- [Is LCIS cancer?](#)
- [Types of LCIS](#)
- [Diagnosis of LCIS](#)
- [How does LCIS affect breast cancer risk?](#)
- [Treatment for LCIS](#)
- [Reducing breast cancer risk or finding it early](#)

Is LCIS cancer?

LCIS is not considered cancer, and it typically does not spread beyond the lobule (that is, it doesn't become invasive breast cancer) if it isn't treated. But having LCIS does increase your risk of later developing an invasive breast cancer in either breast. (See "How does LCIS affect breast cancer risk?")

LCIS and another type of breast change ([atypical lobular hyperplasia, or ALH](#)) are types of **lobular neoplasia**. These are benign (non-cancerous) conditions, but they both increase your risk of breast cancer.

Types of LCIS

The different types of LCIS are:

- **Classic LCIS:** The cells lining the lobules of the breast are smaller and are about the same size.
- **Pleomorphic LCIS:** The cells lining the lobules of the breast are larger and look more abnormal.
- **Florid LCIS:** The cells lining the lobules have grown into a large enough group that they have formed a mass, typically with an area of dead cells in the middle (called **central necrosis**).

Diagnosis of LCIS

Classic LCIS usually doesn't cause a lump that can be felt or changes that can be seen

on a [mammogram](#)², although pleomorphic and florid LCIS are sometimes found this way. Most often, LCIS is found when a [breast biopsy](#)³ is done for another problem that's nearby. (During a biopsy, small pieces of breast tissue are removed and checked in the lab.)

You can learn more about pathology reports showing LCIS in [Understanding Your Pathology Report: Lobular Carcinoma In Situ](#)⁴.

How does LCIS affect breast cancer risk?

Women with LCIS have about a 7 to 12 times higher risk of developing invasive cancer in either breast. For this reason, doctors typically recommend that women with LCIS have regular breast cancer screening tests and follow-up visits with a health care provider for the rest of their lives.

Treatment for LCIS

Having LCIS does increase your risk of developing invasive breast cancer later on. But since LCIS is not a true cancer or pre-cancer, often no treatment is needed after the biopsy.

Sometimes if LCIS is found using a needle biopsy, the doctor might recommend that it be removed completely (with an [excisional biopsy](#)⁵ or some other type of [breast-conserving surgery](#)⁶) to help make sure that LCIS was the only abnormality there. This is especially true if the LCIS is described as **pleomorphic** or **florid**, in which case it might be more likely to grow quickly.

Even after an excisional biopsy, if **pleomorphic** or **florid LCIS** is found, some doctors might recommend another, more extensive surgery to make sure it has all been removed.

Reducing breast cancer risk or finding it early

Close follow-up is important because women with LCIS have the same increased risk of developing cancer in both breasts. Women should also talk to a health care provider about what they can do to help reduce their breast cancer risk. Options for women at high risk of breast cancer because of LCIS may include:

- **Seeing a health care provider more often** (such as every 6 to 12 months) for a breast exam along with the yearly mammogram. Additional imaging with [breast](#)

[MRI⁷](#) may also be recommended, especially if a woman has other factors that raise her risk of breast cancer.

- **Making lifestyle changes to lower breast cancer risk.** To learn more, see [Can I Lower My Risk of Breast Cancer?⁸](#)
- **Taking medicine to help lower the risk of breast cancer.** For more on this, see [Deciding Whether to Use Medicine to Reduce Breast Cancer Risk⁹.](#)
- **Surgery, called [bilateral prophylactic mastectomy¹⁰](#) (removal of both breasts), to reduce risk.** (This is more likely to be a reasonable option in women who also have other risk factors for breast cancer, such as a [BRCA gene mutation¹¹](#).) This may be followed later by [breast reconstruction¹²](#).

Adenosis of the Breast

Adenosis is a benign (non-cancerous) breast condition in which the lobules (milk-producing glands) are enlarged, and there are more glands than usual. Adenosis is often found in biopsy samples of women who have [fibrocystic changes](#) in their breasts.

There are many other names for this condition, including aggregate adenosis, tumoral adenosis, or adenosis tumor. Even though some of these terms contain the term tumor, adenosis is not breast cancer.

Sclerosing adenosis is a special type of adenosis in which the enlarged lobules are distorted by scar-like tissue. This type may cause breast pain.

- [Diagnosis of breast adenosis](#)
- [Treatment of adenosis](#)
- [How does adenosis affect your risk for breast cancer?](#)

Diagnosis of breast adenosis

If many enlarged lobules are close to one another, they may be large enough to be felt as a breast lump. In cases like this, a breast exam may not be enough to tell if the lump is adenosis or something else (such as breast cancer).

Calcifications (mineral deposits) can form in adenosis (including sclerosing adenosis), as well as in breast cancers. These can show up on [mammograms](#)¹, which can make it hard to tell these conditions apart.

Because of these uncertainties, a [breast biopsy](#)² is usually needed to know if the breast change is caused by adenosis or cancer. (In a biopsy, small pieces of breast tissue are removed and checked under a microscope.)

Treatment of adenosis

Adenosis doesn't usually need to be treated, unless it's causing bothersome symptoms.

How does adenosis affect your risk for breast cancer?

Most types of adenosis are not thought to increase breast cancer risk, although some studies have found that women with sclerosing adenosis have a slightly higher risk of breast cancer.

Fibroadenomas of the Breast

Fibroadenomas are common, benign (non-cancerous) breast tumors made up of both glandular tissue and stromal (connective) tissue.

Fibroadenomas are most common in women in their 20s and 30s, but they can be found in women of any age. They tend to shrink after a woman goes through menopause.

- [Diagnosis of fibroadenomas](#)
- [How do fibroadenomas affect your risk for breast cancer?](#)
- [Treatment of fibroadenomas](#)

Diagnosis of fibroadenomas

Some fibroadenomas are too small to be felt, but some can be up to several inches across. A woman can have one or many fibroadenomas.

Fibroadenomas can often feel like a marble within the breast. They tend to be round or oval and have clear-cut borders. You can move them under the skin, and they're usually firm or rubbery, but not tender. Some fibroadenomas are only found by an imaging test (such as a [mammogram](#)¹ or [ultrasound](#)²).

A [breast biopsy](#)³ (removing some breast tissue to check it in the lab) may be needed to know for sure if a breast mass is a fibroadenoma (or some other condition).

Most fibroadenomas look the same all over when seen under a microscope. These are called **simple fibroadenomas**. But some fibroadenomas have other changes, too, and are called **complex fibroadenomas**. (Complex fibroadenomas tend to be bigger and tend to occur in older patients.)

How do fibroadenomas affect your risk for breast cancer?

Simple fibroadenomas do not seem to increase breast cancer risk by much, if at all. Complex fibroadenomas seem to increase the risk slightly more than simple fibroadenomas.

Treatment of fibroadenomas

Most fibroadenomas don't need to be treated. But doctors might recommend removing them in some cases, especially if they keep growing or change the shape of the breast.

Sometimes fibroadenomas stop growing or even shrink on their own, without any treatment. As long as the doctor feels sure the masses are fibroadenomas and not breast cancer, they can often be left in place and watched to be sure they don't grow. This approach is useful for women with many fibroadenomas that aren't growing. In such cases, removing them might mean removing a lot of nearby normal breast

tissue, causing scarring and changes in the shape and texture of the breast.

It's important that women with fibroadenomas have regular breast exams or imaging tests to make sure the fibroadenomas are not growing.

Sometimes one or more new fibroadenomas can appear after one is removed. This usually means that another fibroadenoma has formed – it does not mean that the old one has come back.

Phyllodes Tumors of the Breast

Phyllodes tumors (or phylloides tumors) are rare breast tumors that start in the connective (stromal) tissue of the breast, not the ducts or glands (which is where most breast cancers start). Most phyllodes tumors are benign and only a small number are malignant (cancer).

Phyllodes tumors are often divided into 3 groups, based on how they look under a microscope:

- **Benign** (non-cancerous) tumors account for more than half of all phyllodes tumors. These tumors are the least likely to grow quickly or to spread.
 - **Borderline** tumors have features in between benign and malignant (cancerous) tumors.
 - **Malignant** (cancerous) tumors account for about 1 in 4 phyllodes tumors. These tend to grow the fastest and are the most likely to spread or to come back after treatment.
-
- [Who is most at risk for phyllodes tumors?](#)
 - [Diagnosis of phyllodes tumors](#)
 - [How do phyllodes tumors affect your risk for breast cancer?](#)
 - [Treatment of phyllodes tumors](#)

Who is most at risk for phyllodes tumors?

Phyllodes tumors are most common in women in their 40s, but women of any age can have them. Women with [Li-Fraumeni syndrome¹](#) (a rare, inherited genetic condition) have an increased risk for phyllodes tumors.

Diagnosis of phyllodes tumors

Phyllodes tumors are usually felt as a firm, painless breast lump, but some may hurt. They tend to grow large fairly quickly, and they often stretch the skin.

Sometimes these tumors are seen first on an imaging test (like an [ultrasound²](#) or [mammogram³](#)), in which case they're often hard to tell apart from [fibroadenomas](#).

The diagnosis can often be made with a [core needle biopsy⁴](#), but sometimes the entire tumor needs to be removed (during an [excisional biopsy⁵](#)) to know for sure that it's a phyllodes tumor, and whether it's malignant or not.

How do phyllodes tumors affect your risk for breast cancer?

Having a benign phyllodes tumor does not affect your breast cancer risk. If you have a malignant phyllodes tumor, it does not affect your risk of getting other types of breast cancer. Still, you may be watched more closely and get regular imaging tests after treatment for a phyllodes tumor, because these tumors can sometimes come back after surgery.

Treatment of phyllodes tumors

Phyllodes tumors typically need to be removed completely with surgery.

If the tumor is found to be **benign**, an excisional biopsy might be all that is needed, as long as the tumor was removed completely.

If the tumor is **borderline or malignant**, a wider margin (area of normal tissue around the tumor) usually needs to be removed as well. This might be done with [breast-conserving surgery⁶](#) (lumpectomy or partial mastectomy), in which part of the breast is removed. Or the entire breast might be removed with a [mastectomy⁷](#), especially if a margin of normal breast tissue can't be taken out with breast-conserving surgery. [Radiation therapy⁸](#) might be given to the area after surgery, especially if it's not clear that all of the tumor was removed.

Malignant phyllodes tumors are different from the more common types of breast cancer.

They are less likely to respond to some of the treatments commonly used for breast cancer, such as the [hormone therapy](#)⁹ or [chemotherapy](#)¹⁰ drugs normally used for breast cancer. Phyllodes tumors that have spread to other parts of the body are often treated more like [sarcomas](#)¹¹ (soft-tissue cancers) than breast cancers.

Phyllodes tumors can sometimes come back in the same place. Because of this, close follow-up with frequent breast exams and imaging tests are usually recommended after treatment.

Intraductal Papillomas of the Breast

Intraductal papillomas are benign (non-cancerous), wart-like tumors that grow within the milk ducts of the breast. They are made up of gland tissue along with fibrous tissue and blood vessels (called fibrovascular tissue).

- [What are intraductal papillomas?](#)

- Diagnosis of breast papillomas
- How do intraductal papillomas affect your risk for breast cancer?
- Treatment of breast papillomas

What are intraductal papillomas?

Solitary papillomas (solitary intraductal papillomas) are single tumors that often grow in the large milk ducts near the nipple. They are a common cause of clear or bloody nipple discharge, especially when it comes from only one breast. They may be felt as a small lump behind or next to the nipple. Sometimes they can be painful.

Papillomas may also be found in small ducts in areas of the breast farther from the nipple. In this case, there are often several growths (**multiple papillomas**). These are less likely to cause nipple discharge.

In **papillomatosis**, there are very small areas of cell growth within the ducts, but they aren't as distinct as papillomas are.

Diagnosis of breast papillomas

Papillomas might cause symptoms such as clear or bloody nipple discharge (or a breast lump), or they might show up as an abnormal area on an imaging test (such as a [mammogram¹](#) or [breast ultrasound²](#)).

A ductogram (galactogram), in which dye is injected into the nipple duct where the discharge is likely coming from and then an x-ray is taken, may sometimes be helpful in finding papillomas.

If symptoms or an imaging test can pinpoint an area of concern, a [breast biopsy³](#) of the area can be done to confirm the diagnosis. In some cases, surgery (duct excision) may be done to look at the area more closely.

How do intraductal papillomas affect your risk for breast cancer?

Having a single (solitary) papilloma does not raise breast cancer risk unless it contains other breast changes, such as [atypical hyperplasia](#). However, having multiple papillomas increases breast cancer risk slightly.

Treatment of breast papillomas

Whether or not papillomas need to be treated depends on factors such as their size, if there is more than one, and if they're causing symptoms. Because papillomas can sometimes be linked with other, more serious breast findings, doctors may recommend [surgery⁴](#) to remove them and the part of the duct they're in.

Fat Necrosis and Oil Cysts in the Breast

Fat necrosis is a benign (non-cancerous) breast condition that can develop when an area of fatty breast tissue is injured. It can also develop after breast surgery or radiation treatment.

- [Stages of fat necrosis](#)
- [Diagnosis of fat necrosis and oil cysts](#)
- [How do fat necrosis and oil cysts affect breast cancer risk?](#)
- [Treatment of fat necrosis and oil cysts](#)

Stages of fat necrosis

There are different stages of fat necrosis. As the fat cells die, they release their contents, forming a sac-like collection of greasy fluid called an **oil cyst**. Over time, [calcifications¹](#) (small deposits of calcium) can form around the walls of the cyst, which can often be seen on [mammograms²](#). As the body continues to repair the damaged breast tissue, it's usually replaced by denser scar tissue.

Diagnosis of fat necrosis and oil cysts

Oil cysts and areas of fat necrosis can form a lump that can be felt, but it usually doesn't hurt. The skin around the lump might look thicker, red, or bruised. Sometimes these changes can be hard to tell apart from cancers on a breast exam or even a mammogram. If this is the case, a [breast biopsy³](#) (removing all or part of the lump to look at the tissue under the microscope) might be needed to find out if the lump

contains cancer cells.

Doctors can usually tell an oil cyst by the way it looks on a mammogram or [breast ultrasound⁴](#). But if it could be something else, some type of needle biopsy (a [fine needle aspiration⁵](#) or [core needle biopsy⁶](#)) might be done.

How do fat necrosis and oil cysts affect breast cancer risk?

These breast changes do not affect your risk for breast cancer.

Treatment of fat necrosis and oil cysts

As long as doctors are sure of the diagnosis, fat necrosis and oil cysts usually don't need to be treated. Sometimes fat necrosis goes away on its own. If a needle biopsy is done to remove the fluid in an oil cyst, it can also serve as treatment.

If the lump gets bigger or becomes bothersome, however, surgery may be done to remove it.

Mastitis

Mastitis is inflammation (swelling) in the breast, which is usually caused by an infection. It is most common when a woman is breastfeeding, but it can happen at other times as well.

A clogged milk duct that doesn't let milk fully drain from the breast, or breaks in the skin of the nipple can lead to infection. This causes the body's white blood cells to release substances to fight the infection, which can lead to swelling and increased blood flow. The infected part of the breast may become swollen, painful, red, and warm to the touch. Mastitis can also cause fever and a headache, or general flu-like symptoms.

- [Diagnosis of mastitis](#)
- [How does mastitis affect your risk of breast cancer?](#)
- [Treatment of mastitis](#)

Diagnosis of mastitis

Mastitis can often be diagnosed based on symptoms and the results of a breast exam. It usually affects only one breast.

How does mastitis affect your risk of breast cancer?

Having mastitis does not raise your risk of developing breast cancer.

Treatment of mastitis

Mastitis is typically treated with antibiotics, along with emptying the milk from the breast. In some cases, a breast abscess (a collection of pus) may form. Abscesses are treated by draining the pus, either by surgery or by aspiration (using a thin, hollow needle, often guided by [ultrasound¹](#)), and then antibiotics.

[Inflammatory breast cancer²](#) has symptoms that are a lot like mastitis and can be mistaken for an infection. If you've been diagnosed with mastitis and antibiotic treatment doesn't help within a week or so, you might need a skin [biopsy³](#) to be sure it's not cancer. Inflammatory breast cancer can spread quickly, so don't put off going back to the doctor if you still have symptoms after antibiotic treatment.

Duct Ectasia

Duct ectasia, also known as **mammary duct ectasia**, is a benign (non-cancerous) breast condition that occurs when a milk duct in the breast widens and its walls thicken. This can cause the duct to become blocked and lead to fluid build-up. It's more common in women who are getting close to menopause. But it can happen at other ages, too.

- [Diagnosis of duct ectasia](#)
- [How does duct ectasia affect your breast cancer risk?](#)
- [Treatment of duct ectasia](#)

Diagnosis of duct ectasia

Often, this condition causes no symptoms and is found when a [biopsy](#)¹ (removal of small pieces of breast tissue to be checked with a microscope) is done for another breast problem.

Less often, duct ectasia may cause a nipple discharge, which is often sticky and thick. The nipple and nearby breast tissue may be tender and red, and the nipple may be pulled inward. Sometimes scar tissue around the abnormal duct causes a hard lump that may be confused with cancer. A [mammogram](#)² and/or [breast ultrasound](#)³ may be done to learn more about the changed part of your breast.

How does duct ectasia affect your breast cancer risk?

Duct ectasia does not increase your risk for breast cancer.

Treatment of duct ectasia

Duct ectasia that is causing symptoms sometimes gets better without treatment. Warm compresses and antibiotics may be used in some cases. If the symptoms don't go away, the abnormal duct might need to be surgically removed.

Radial Scars and Some Other Non-cancerous Breast Conditions

These are some of the less common types of benign (non-cancerous) tumors and conditions that can be found in the breast.

- [Radial scars](#)
- [Other breast changes that are not cancer](#)

Radial scars

Radial scars are also called **complex sclerosing lesions**. They're most often found when a breast [biopsy](#)¹ is done for some other purpose. Sometimes radial scars show up as a distortion of the normal breast tissue on a mammogram.

Radial scars are not really scars, but they look like scars when seen with a microscope. They don't usually cause symptoms, but they are important because:

- If they are large enough, they may look like cancer on an imaging test such as a [mammogram](#)², or even on a biopsy.
- They seem to be linked to a slight increase in a woman's risk of developing breast cancer.

Doctors often recommend surgery to remove radial scars, but in some cases they can use imaging tests instead to watch for any concerning changes.

Other breast changes that are not cancer

Other types of benign masses and other changes can also be found in the breast. Many of these are described on other [Non-cancerous Breast Conditions](#) pages.

Some types of benign breast changes that are not covered on those pages are listed below. None of these conditions raise breast cancer risk, but they may need to be [biopsied](#)³ or removed to know what they are and to be sure they don't have any cancer cells in them.

- **Lipoma:** a fatty tumor that can appear almost anywhere in the body, including the breast. It is usually not painful.

- **Hamartoma:** a smooth, painless lump formed by the overgrowth of mature breast cells, which can be made up of fatty, fibrous, and/or gland tissues
- **Hemangioma:** a rare tumor made up of blood vessels
- **Hematoma:** a collection of blood within the breast caused by internal bleeding
- **Adenomyoepithelioma:** a very rare tumor formed by certain cells in the milk duct walls
- **Neurofibroma:** a tumor that's an overgrowth of nerve cells
- **Granular cell tumor:** a tumor that starts in early forms of Schwann cells, which normally surround and help insulate nerve cells. These tumors rarely start in the breast.

About Breast Cancer in Men

Get an overview of breast cancer in men and the latest key statistics in the US.

Overview and Types

If you have been diagnosed with breast cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Breast Cancer in Men?](#)

Research and Statistics

See the latest estimates for new cases of breast cancer in men and deaths in the US and what research is currently being done.

- [Key Statistics for Breast Cancer in Men](#)
 - [What's New in Research for Breast Cancer in Men?](#)
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What Is Breast Cancer in Men?

- [Male breast tissue](#)
- [Where breast cancer starts](#)
- [How breast cancer spreads](#)
- [Benign breast conditions](#)

- [**Types of Breast Cancer in Men**](#)

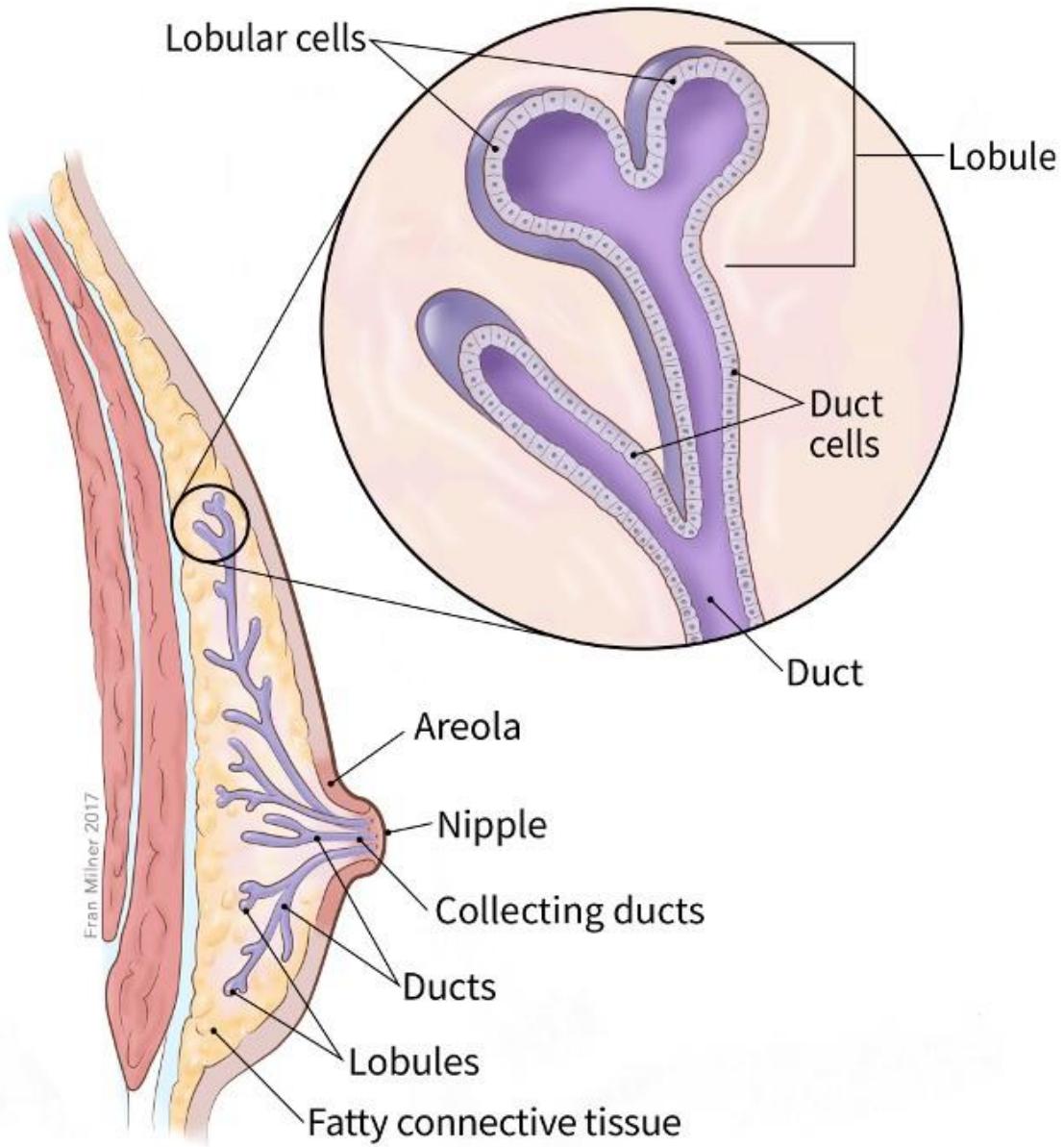
Breast cancer occurs mainly in women, but men can get it, too. Many people do not realize that men have breast tissue and that they can develop breast cancer. Cells in nearly any part of the body can become cancer and can spread to other areas.

Breast cancer starts when cells in the breast begin to grow out of control. These cells usually form a tumor that can often be seen on an x-ray or felt as a lump. The tumor is malignant (cancer) if the cells can grow into (invade) surrounding tissues or spread (metastasize) to distant areas of the body.

To learn more about how cancers start and spread, see [What Is Cancer?](#)¹

Male breast tissue

Until puberty (on average around age 9 or 10), young boys and girls have a small amount of breast tissue consisting of a few ducts located under the nipple and areola (area around the nipple). At puberty, a girl's ovaries make female hormones, causing breast ducts to grow and lobules to form at the ends of ducts. Even after puberty, boys and men normally have low levels of female hormones, and breast tissue doesn't grow much. Men's breast tissue has ducts, but only a few if any lobules.



Where breast cancer starts

Breast cancers can start from different parts of the breast. Most breast cancers begin in the ducts that carry milk to the nipple (ductal cancers). Some start in the glands that make breast milk (lobular cancers). Men have these ducts and glands, too, even though they aren't normally functional. There are also types of breast cancer that start in other types of breast cells, but these are less common.

A small number of cancers start in other tissues in the breast. These cancers are called [sarcomas²](#) and [lymphomas³](#) and are not really thought of as breast cancers.

Although many types of breast cancer can cause a lump in the breast, not all do. There are [other symptoms of breast cancer you should watch for⁴](#) and report to a health care provider.

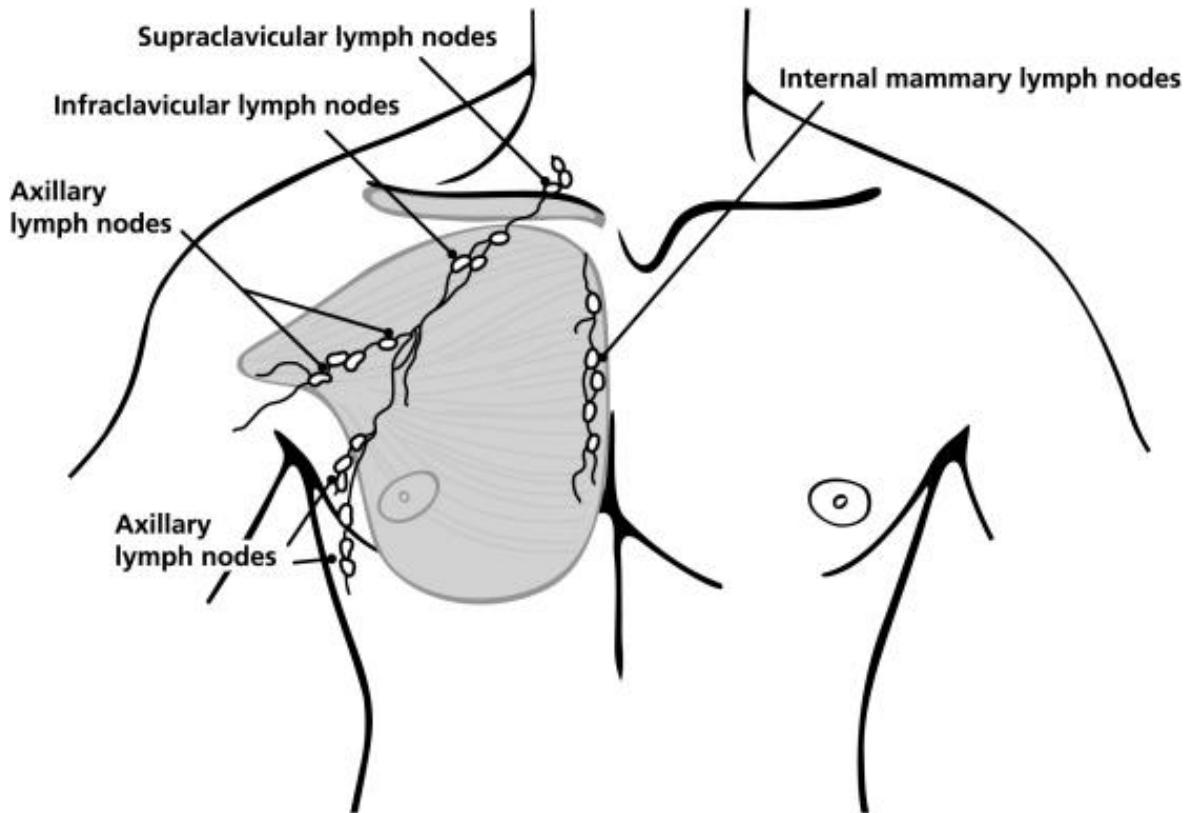
It's also important to understand that most breast lumps are benign and not cancer (malignant). Benign breast tumors are abnormal growths, but they do not spread outside of the breast and they are not life threatening. Any breast lump or change needs to be checked by a health care provider to determine whether it is benign or malignant (cancer) and whether it might impact your future cancer risk.

How breast cancer spreads

Breast cancer can spread when the cancer cells get into the blood or lymph system and are carried to other parts of the body.

The lymph system is a network of lymph (or lymphatic) vessels found throughout the body. The lymph vessels carry lymph fluid and connect lymph nodes. Lymph nodes are small, bean-shaped collections of immune system cells. Lymph vessels are like small veins, except that they carry a clear fluid called lymph (instead of blood) away from the breast. Lymph contains tissue fluid and waste products, as well as immune system cells. Breast cancer cells can enter lymph vessels and start to grow in lymph nodes. Most of the lymph vessels of the breast drain into:

- Lymph nodes under the arm (axillary nodes)
- Lymph nodes around the collar bone (supraclavicular [above the collar bone] and infraclavicular [below the collar bone] lymph nodes)
- Lymph nodes inside the chest near the breast bone (internal mammary lymph nodes)



If the cancer cells have spread to your lymph nodes, there is a higher chance that the cells could have also traveled through the lymph system and spread (metastasized) to other parts of your body. The more lymph nodes with breast cancer cells, the more likely it is that the cancer may be found in other organs. Because of this, finding cancer in one or more lymph nodes often affects your treatment plan. Usually, [surgery to remove one or more lymph nodes⁵](#) will be needed to know whether the cancer has spread.

Still, not all men with cancer cells in their lymph nodes develop metastases to other areas, and some men can have no cancer cells in their lymph nodes and later develop metastases.

Benign breast conditions

Men can also have some benign (not cancerous) breast disorders.

Gynecomastia

Gynecomastia is the most common male breast disorder. It is not a tumor but rather an increase in the amount of a man's breast tissue. Usually, men have too little breast tissue to be felt or noticed. Gynecomastia can appear as a button-like or disk-like growth under the nipple and areola (the dark circle around the nipple), which can be felt and sometimes seen. Some men have more severe gynecomastia and they may appear to have small breasts. Although gynecomastia is much more common than breast cancer in men, both can be felt as a growth under the nipple, which is why it's important to have any such lumps checked by your doctor.

Gynecomastia is common among teenage boys because the balance of hormones in the body changes during adolescence. It is also common in older men due to changes in their hormone balance.

In rare cases, gynecomastia occurs because tumors or diseases of certain endocrine (hormone-producing) glands cause a man's body to make more estrogen (the main female hormone). Men's glands normally make some estrogen, but not enough to cause breast growth. Diseases of the liver, which is an important organ in male and female hormone metabolism, can change a man's hormone balance and lead to gynecomastia. Obesity (being extremely overweight) can also cause higher levels of estrogen in men.

Some medicines can cause gynecomastia. These include some drugs used to treat ulcers and heartburn, high blood pressure, heart failure, and psychiatric conditions. Men with gynecomastia should ask their doctors if any medicines they are taking might be causing this condition.

Klinefelter syndrome, a rare genetic condition, can lead to gynecomastia as well as increase a man's risk of developing breast cancer. This condition is discussed further in [Risk Factors for Breast Cancer in Men⁶](#).

Benign breast tumors

There are many types of benign breast tumors (abnormal lumps or masses of tissue), such as papillomas and fibroadenomas. Benign tumors do not spread outside the breast and are not life threatening. Benign breast tumors are common in women but are very rare in men.

Types of Breast Cancer in Men

The most common types of breast cancer are ductal carcinoma in situ, invasive ductal carcinoma, and invasive lobular carcinoma.

Most breast cancers are **carcinomas**. In fact, breast cancers are often a type of carcinoma called **adenocarcinoma**, which starts in cells that make glands (glandular tissue). Breast adenocarcinomas start in the ducts (the milk ducts) or the lobules (milk-producing glands).

There are other, less common, types of breast cancers, too, such as **sarcomas**, phyllodes, Paget's disease and angiosarcomas which start in the cells of the muscle, fat, or connective tissue.

Sometimes a single breast tumor can be a combination of different types. And in some very rare types of breast cancer, the cancer cells may not form a lump or tumor at all.

When a biopsy is done to find out the specific type of breast cancer, the pathologist also will say if the cancer has spread into the surrounding tissues. The name of the breast cancer type will change depending on the extent of the cancer.

- **In situ** breast cancers have not spread.
- **Invasive** or **infiltrating** cancers have spread (invaded) into the surrounding breast tissue.

These general kinds of breast cancer can be further described with the terms outlined above.

Ductal carcinoma in situ

Ductal carcinoma in situ (DCIS; also known as intraductal carcinoma) is considered non-invasive or pre-invasive breast cancer. In DCIS (also known as intraductal carcinoma), cells that lined the ducts have changed to look like cancer cells. The difference between DCIS and invasive cancer is that the cells have not spread (invaded) through the walls of the ducts into the surrounding tissue of the breast (or spread outside the breast). DCIS is considered a pre-cancer because some cases can go on to become invasive cancers. Right now, though, there is no good way to know for certain which cases will go on to become invasive cancers and which ones won't. DCIS accounts for about 1 in 10 cases of breast cancer in men. It is almost always curable with surgery.⁷

Lobular carcinoma in situ

Lobular carcinoma in situ (LCIS)⁸ may also be called lobular neoplasia. In LCIS, cells that look like cancer cells are growing in the lobules of the milk-producing glands of the breast, but they haven't grown through the wall of the lobules. LCIS is not a true pre-

invasive cancer because it does not turn into an invasive cancer if left untreated, but it is linked to an increased risk of invasive cancer in both breasts. LCIS is rarely, if ever seen in men.

Infiltrating (or invasive) ductal carcinoma

This is the most common type of breast cancer. [Invasive \(or infiltrating\) ductal carcinoma⁹](#) (IDC) starts in a milk duct of the breast, breaks through the wall of the duct, and grows into the fatty tissue of the breast. Once it breaks through the wall of the duct, it has the potential to spread to other parts of the body. Invasive (or infiltrating) ductal carcinoma (IDC) starts in a milk duct of the breast, breaks through the wall of the duct, and grows into the fatty tissue of the breast. At this point, it may be able to spread (metastasize) to other parts of the body through the lymphatic system and bloodstream. At least 8 out of 10 male breast cancers are IDCs (alone or mixed with other types of invasive or in situ breast cancer). Because the male breast is much smaller than the female breast, all male breast cancers start relatively close to the nipple, so they are more likely to spread to the nipple. This is different from Paget disease as described below.

Infiltrating (or invasive) lobular carcinoma

[Invasive lobular carcinoma¹⁰](#) (ILC) starts in the milk-producing glands (lobules). Like IDC, it can spread to other parts of the breast and body. ILC is very rare in men, accounting for only about 2% of male breast cancers. This is because men do not usually have much lobular (glandular) breast tissue.

Paget disease of the nipple

[This type of breast cancer¹¹](#) starts in the breast ducts and spreads to the nipple. It may also spread to the areola (the dark circle around the nipple). The skin of the nipple usually appears crusted, scaly, and red, with areas of itching, oozing, burning, or bleeding. There may also be an underlying lump in the breast.

Paget disease may be associated with DCIS or with infiltrating ductal carcinoma. It is rare and accounts for about 1-3% of female breast cancers and a higher percentage (5%) of male breast cancers.

Inflammatory breast cancer

Inflammatory breast cancer is an aggressive, but rare type of breast cancer. It makes the breast swollen, red, warm and tender rather than forming a lump. It can be mistaken

for an infection of the breast. This is very rare in men. See [Inflammatory Breast Cancer¹²](#) for more information.

Special types of invasive breast carcinoma

There are some special types of breast cancer that are sub-types of invasive carcinoma. They are much less common than the breast cancers named above.

Some of these may have a better or worse prognosis than standard infiltrating ductal carcinoma.

- Adenoid cystic (or adenocystic) carcinoma
- Low-grade adenosquamous carcinoma (this is a type of metaplastic carcinoma)
- Medullary carcinoma
- Mucinous (or colloid) carcinoma
- Papillary carcinoma
- Tubular carcinoma
- Metaplastic carcinoma (including spindle cell and squamous, except low grade adenosquamous carcinoma)
- Micropapillary carcinoma
- Mixed carcinoma (has features of both invasive ductal and lobular)

In general, these sub-types are still treated like standard infiltrating carcinoma.

Key Statistics for Breast Cancer in Men

- [How common is breast cancer in men?](#)

How common is breast cancer in men?

The American Cancer Society estimates for breast cancer in men in the United States for 2024 are:

- About 2,790 new cases of invasive breast cancer will be diagnosed
- About 530 men will die from breast cancer

Breast cancer is about 100 times less common among White men than among White women. It is about 70 times less common among Black men than Black women. As in Black women, Black men with breast cancer tend to have a worse prognosis (outlook).

For men, the average lifetime risk of getting breast cancer is about 1 in 726. But each man's risk might be higher or lower than this, based on whether he has [risk factors for breast cancer](#)¹.

Visit the [American Cancer Society's Cancer Statistics Center](#)² for more key statistics.

What's New in Research for Breast Cancer in Men?

- [Causes of breast cancer and breast cancer prevention](#)
- [New laboratory tests](#)
- [Treatment](#)

Breast cancer in men is rare and is often treated like breast cancer in women, but research is showing that there are some differences. More research is needed.

Research into the causes, prevention, and treatment of breast cancer is under way in many medical centers throughout the world. However, most breast cancer clinical trials and research are done in women. See [What's New In Breast Cancer Research? \(in women\)](#)¹ for more information on advances in breast cancer treatment.

Causes of breast cancer and breast cancer prevention

Studies continue to uncover lifestyle factors and habits that alter breast cancer risk. Ongoing studies are looking at the effect of exercise, weight gain or loss, and diet on breast cancer risk. Research is also looking to see if being overweight or obese as a teenager increases breast cancer risk in men as it does for breast cancer in women.

Research has identified several genetic variations associated with breast cancer risk. It

shows that these genetic variations affect breast cancer risk in different ways for men and women. This suggests differences in the biology of breast cancer in men and women. More research is being done on this. Scientists are also exploring how common gene variations may affect breast cancer risk. Each gene variant has only a modest effect on risk (10% to 20%), but when taken together they may possibly have a large impact.

New laboratory tests

Circulating tumor cells/tumor DNA

Researchers have found that in many breast cancers, cells may break away from the tumor and enter the blood. These circulating tumor cells (CTCs) and the DNA from these cancer cells (circulating tumor DNA [ctDNA]) can be detected with sensitive lab tests. It is thought that these “liquid biopsies” may help monitor patients while they are getting treatment. This might also be an easy way to collect tumor cells to test for new drugs or sensitivities to currently available drugs before actually giving them. Although these tests are available for general use, and the research is promising, more studies are needed.

Treatment

Radiation therapy

Men with breast cancer tend to be diagnosed with larger tumors and often have mastectomies. But it's not clear whether these men should have radiation therapy after surgery, as well. Most doctors follow the same guidelines set for women with breast cancer who have mastectomies, but it is not clear if these recommendations should be the same for men. More studies are needed to define the role of radiation after mastectomy in men with breast cancer.

Immunotherapy

Recent studies in a few types of cancer have shown a promising new way to get immune cells called **T cells (a type of white blood cell)** to fight cancer by changing them in the lab so they can find and destroy cancer cells. Research for this type of treatment in breast cancer is being investigated.

Breast Cancer in Men Causes, Risk Factors, and Prevention

Learn about the risk factors for breast cancer in men and what you might be able to do to help lower your risk.

Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Learn more about the risk factors for male breast cancer.

- [Risk Factors for Breast Cancer in Men](#)
- [What Causes Breast Cancer in Men?](#)

Prevention

There is no way to completely prevent cancer. But there are things you can do that might lower your risk. Learn more.

- [Can Breast Cancer in Men Be Prevented?](#)
-

Risk Factors for Breast Cancer in Men

- [Aging](#)
- [Family history of breast cancer](#)

- Inherited gene mutations
- Klinefelter syndrome
- Radiation exposure
- Alcohol
- Liver disease
- Estrogen treatment
- Obesity
- Testicular conditions

A risk factor is anything that affects your chance of getting a disease, such as breast cancer.

But having a risk factor, or even many, does not mean that you are sure to get the disease. Some men with one or more breast cancer risk factors never develop the disease, while most men with breast cancer have no apparent risk factors.

We don't yet completely understand the causes of breast cancer in men, but researchers have found several factors that may increase the risk of getting it. As with female breast cancer, many of these factors are related to your body's sex hormone levels.

Aging

Aging is an important risk factor for the development of breast cancer in men. The risk of breast cancer goes up as a man ages. On average, men with breast cancer are about 72 years old when they are diagnosed.

Family history of breast cancer

Breast cancer risk is increased if other members of the family (blood relatives) have had breast cancer. About 1 out of 5 men with breast cancer have a close relative, male or female, with the disease.

Inherited gene mutations

Men with a mutation (defect) in the *BRCA2* gene have an increased risk of breast cancer, with a lifetime risk of about 6 in 100. *BRCA1* mutations can also cause breast cancer in men, but the risk is lower, about 1 in 100.

Although mutations in these genes most often are found in members of families with many cases of breast and/or [ovarian cancer](#)¹, they have also been found in men with breast cancer who did not have a strong family history.

Mutations in *CHEK2*, *PTEN* and *PALB2* genes might also be responsible for some breast cancers in men.

Klinefelter syndrome

Klinefelter syndrome is a congenital (present at birth) condition that affects about 1 in 1,000 men. Normally the cells in men's bodies have a single X chromosome along with a Y chromosome, while women's cells have two X chromosomes. Men with Klinefelter syndrome have cells with a Y chromosome plus at least two X chromosomes (but sometimes more).

Men with Klinefelter syndrome also have small testicles and are often infertile because they are unable to produce functioning sperm cells. Compared with other men, they have lower levels of androgens (male hormones) and more estrogens (female hormones). For this reason, they often develop [gynecomastia](#)² (benign male breast growth).

Men with Klinefelter syndrome are more likely to get breast cancer than other men. Having this condition can increase the risk anywhere between 20 - 60 times the risk of a man in the general population.

Radiation exposure

A man whose chest area has been treated with [radiation](#)³ (such as for the treatment of a cancer in the chest, like [lymphoma](#)⁴) has an increased risk of developing breast cancer.

Alcohol

[Heavy drinking](#)⁵ (of alcoholic beverages) increases the risk of breast cancer in men. This may be because of its effects on the liver (see next paragraph).

Liver disease

The liver plays an important role in balancing the levels of sex hormones. In cases of severe liver disease, such as cirrhosis, the liver is not working well and the hormone

levels are uneven, causing lower levels of androgens and higher levels of estrogen. Men with liver disease can also have a higher chance of developing benign male breast growth (gynecomastia) and also have an higher risk of developing breast cancer.

Estrogen treatment

Estrogen-related drugs were once used in hormonal therapy for men with [prostate cancer](#)⁶. This treatment may slightly increase breast cancer risk.

There is concern that transgender/transsexual individuals who take high doses of estrogen as part of gender-affirming hormonal treatment could also have a higher breast cancer risk. Still, research on breast cancer risk in transgender individuals is quite new, so it isn't clear what their breast cancer risk may be.

Obesity

Studies have shown that women's breast cancer risk is increased by [obesity](#)⁷ (being extremely overweight) after menopause. Obesity is also a risk factor for male breast cancer as well. The reason is that fat cells in the body convert male hormones (androgens) into female hormones (estrogens). This means that obese men have higher levels of estrogens in their body.

Testicular conditions

Certain conditions, such as having an undescended testicle, having mumps as an adult, or having one or both testicles surgically removed (orchiectomy) may increase male breast cancer risk.

What Causes Breast Cancer in Men?

- Hormone levels
- Gene changes (mutations)

Although [certain risk factors](#) may increase a man's chances of developing breast cancer, the cause of most breast cancers in men is unknown.

Hormone levels

Breast cells normally grow and divide in response to female hormones such as estrogen. The more cells divide, the more chances there are for mistakes to be made when they are copying their DNA. These DNA changes can eventually lead to cancer (see below).

Factors that unbalance the levels of female and male hormones in the body can therefore have an effect on breast cancer risk. Many of these were described in [Risk Factors for Breast Cancer in Men](#).

Gene changes (mutations)

Researchers are making great progress in understanding how certain changes in DNA can cause normal cells to become cancerous. DNA is the chemical in our cells that makes up our *genes*, the instructions for how our cells function. We usually look like our parents because they are the source of our DNA. However, DNA affects more than how we look.

Some [genes](#)¹ contain instructions for controlling when our cells grow, divide, and die. Certain genes that speed up cell division are called *oncogenes*. Others that slow down cell division or cause cells to die at the appropriate time are called *tumor suppressor genes*. Cancers can be caused by DNA mutations (defects) that turn on oncogenes or

turn off tumor suppressor genes.

Acquired gene mutations

Most DNA mutations related to male breast cancer occur during life rather than having been inherited from a parent before birth. It's not clear what causes most of these mutations. Radiation to the breast area is a factor in a small number of cases. Some acquired mutations of oncogenes and/or tumor suppressor genes may be the result of cancer-causing chemicals in our environment or diet, but so far studies have not identified any chemicals that are responsible for these mutations in male breast cancers.

Inherited gene mutations

Certain inherited DNA changes can cause a high risk of developing certain cancers and are responsible for cancers that run in some families.

Some breast cancers are linked to inherited mutations of the *BRCA1* or *BRCA2* tumor suppressor genes. Normally, these genes make proteins that help cells recognize and/or repair DNA damage and prevent them from growing abnormally. But if a person has inherited a mutated gene from either parent, the chances of developing breast cancer are higher.

Men with inherited mutations in the *BRCA1* and *BRCA2* genes have a higher lifetime risk for breast cancer, and possibly some other cancers such as prostate and pancreatic cancer. There are also other hereditary cancer syndromes that can be associated with male breast cancer.

All men who have been diagnosed with breast cancer should consider [genetic testing²](#) because they can be at risk for other cancers, such as prostate and pancreas cancer. Having one of these inherited gene changes might also affect their family members' chances of getting certain cancers.

Can Breast Cancer in Men Be Prevented?

Since the cause of most breast cancers is not known, there is no known way to prevent

them. But there are some things a man can do to lower his risk of breast cancer.

Get to and stay at a healthy weight: Both increased body weight and weight gain as an adult are linked with a higher risk of breast cancer in women. And since being [overweight or obese](#)¹ is linked with an increased risk for several cancers, the American Cancer Society recommends you stay at a healthy weight throughout your life and avoid excess weight gain by balancing your food intake with physical activity.

Avoid or limit alcohol: [Alcohol](#)² use increases the risk of breast cancer in women. Even low levels of alcohol intake have been linked with an increase in risk. Alcohol use is linked with several cancers and is the third most important preventable risk factor for cancer. [It is best not to drink alcohol. For men who do drink, they should have no more than 2 alcoholic drinks a day.](#)³

Be physically active: Many studies have shown that moderate to vigorous [physical activity](#)⁴ is linked with lower breast cancer risk in women, as well as many other types of cancer. The American Cancer Society recommends that adults get at least 150 to 300 minutes of moderate intensity or 75 to 150 minutes of vigorous intensity activity each week (or a combination of these), preferably spread throughout the week. Getting to or going over the upper limit of 300 minutes is ideal.

For now, the best strategies for reducing the number of deaths caused by this disease are early detection and prompt treatment. [Early detection](#)⁵ has been a problem for men, who may not notice breast lumps or see their doctor only when the lumps have gotten large. In general, men are diagnosed with breast cancers at more advanced stages than are women.

To read more about other ways to reduce your cancer risk in general, such as keeping physically active and following a healthy eating pattern, see the [American Cancer Society guideline for diet and physical activity for cancer prevention](#)⁶.

Breast Cancer in Men Early Detection, Diagnosis, and Staging

Know the signs and symptoms of breast cancer in men. Find out how breast cancer in men is tested for, diagnosed, and staged.

Detection and Diagnosis

Catching cancer early often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that is not always the case.

- [Can Breast Cancer in Men Be Found Early?](#)
- [Signs and Symptoms of Breast Cancer in Men](#)
- [Tests to Help Diagnose Breast Cancer in Men](#)

Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and anticipated response to treatment.

- [Lab Tests to Help Classify Breast Cancer in Men](#)
- [Tests to Look for Breast Cancer Spread in Men](#)
- [Breast Cancer Stages in Men](#)
- [Breast Cancer Survival Rates in Men](#)

Can Breast Cancer in Men Be Found Early?

- Differences in early detection of breast cancers in men and women
- For men who are or may be at high risk

Finding breast cancer early improves the chances that male breast cancer can be treated successfully. However, because breast cancer is so uncommon in men, there is unlikely to be any benefit in screening men in the general population for breast cancer with mammograms or other tests.

Differences in early detection of breast cancers in men and women

There are many similarities between breast cancer in men and women, but there are some important differences that affect finding it early.

Breast size

The most obvious difference between the male and female breast is size. Because men have very little breast tissue, it is easier for men and their health care professionals to feel small masses (tumors). On the other hand, because men have so little breast tissue, cancers do not need to grow very far to reach the nipple, the skin covering the breast, or the muscles underneath the breast. So even though breast cancers in men tend to be slightly smaller than in women when they are first found, more often have already spread to nearby tissues or lymph nodes. The extent of spread is one of the most important factors in the prognosis (outcome) of a breast cancer.

Lack of awareness

Another difference is that breast cancer is common among women and rare among men. Women tend to be aware of this disease and its possible warning signs, but many men do not think that they can get it at all. Some men ignore breast lumps or think they are caused by an infection or some other reason, and don't get medical treatment until the mass has had a chance to grow. Some men are embarrassed when they find a breast lump and worry that someone might question their masculinity. This could also delay diagnosis and reduce a man's chances for successful treatment.

For men who are or may be at high risk

Careful breast exams might be useful for screening men with a strong family history of breast cancer and/or with *BRCA* mutations found by genetic testing. Screening men for breast cancer has not been studied to know if it is helpful, and mammography (x-rays of the breast) and ultrasound is usually only done if a lump is found. Men who are at [high risk for breast cancer¹](#) should discuss how to manage their risk with their doctor.

Genetic counseling and testing

If you have a strong family history of breast cancer (in men or women), ovarian cancer, pancreatic cancer, and/or prostate cancer that might be caused by a *BRCA* mutation, and/or if someone else in your family is known to have a *BRCA* mutation, you might want to consider genetic testing to determine if you have inherited a mutated *BRCA* gene. If the test detects a mutated *BRCA* gene, you and your health care team can watch carefully for early signs of cancer. Other cancers including prostate cancer, pancreatic cancer, and testicular cancer have been linked to *BRCA* mutations. .

Because breast cancer in men can be caused by *BRCA* mutations, men with breast cancer should also consider [genetic testing²](#).

If you are thinking about having genetic testing, it is strongly recommended that you talk first to a professional qualified to explain and interpret these tests, such as a genetic counselor or a nurse or doctor with special training. It is very important to understand what genetic testing can and can't tell you, and to carefully weigh the benefits and risks of testing before having it done. Test results are not always clear cut, and even if they are, it's not always clear what should be done about them. There may be other concerns as well, such as what the results might mean for other family members.

Signs and Symptoms of Breast Cancer in Men

Possible symptoms of breast cancer to watch for include:

- A lump or swelling, which is often (but not always) painless
- Skin dimpling or puckering
- Nipple retraction (turning inward)
- Redness or scaling of the nipple or breast skin
- Discharge from the nipple

Sometimes a breast cancer can spread to lymph nodes under the arm or around the collar bone and cause a lump or swelling there, even before the original tumor in the breast is large enough to be felt.

These changes aren't always caused by cancer, but if you notice any breast changes, you should see a health care professional as soon as possible.

Tests to Help Diagnose Breast Cancer in Men

- Medical history and physical exam
- Imaging tests for breast cancer in men

Medical history and physical exam

If there is a chance you have breast cancer, your doctor will want to get a complete personal and family medical history. This may give some clues about the cause of any symptoms you are having and if you might be at increased risk for breast cancer.

A complete breast exam will be done to find any lumps or suspicious areas and to feel their texture, size, and relationship to the skin and muscle. The doctor may also examine the rest of your body to look for any evidence of possible spread, such as enlarged lymph nodes (especially under the arm).

Imaging tests for breast cancer in men

If you have signs or symptoms that could mean breast cancer or another breast disease, your doctor might recommend one or more of the following imaging tests.

Diagnostic mammogram

A [mammogram](#)¹ is a low dose x-ray exam of the breast that allows doctors called radiologists to look for changes in breast tissue. It is called a *diagnostic* mammogram when it is done because problems are present.

A mammogram uses a machine designed to look only at breast tissue. The breast is pressed between 2 plates to flatten and spread the tissue. The compression only lasts a

few seconds and may be uncomfortable briefly, but it is necessary to get a better picture. In some cases, special images known as *cone or spot views with magnification* are taken to make a small area of abnormal breast tissue easier to evaluate.

The results of this test might suggest that a biopsy is needed to tell if the abnormal area is cancer. Mammography is often more accurate in men than women, since men do not have dense breasts or other common breast changes that might interfere with the test.

Breast ultrasound

Breast ultrasound² is often used to examine some types of breast changes.

Breast ultrasound uses sound waves to make a computer picture of the inside of the breast. A gel is put on the skin of the breast, and a wand-like instrument called a **transducer** is moved over the skin. The transducer sends out sound waves and picks up the echoes as they bounce off body tissues. The echoes are made into a picture on a computer screen. You might feel some pressure as the transducer is moved across the breast, but it should not be painful.

This test does not expose you to radiation.

Breast ultrasound is often used to look at breast changes that are found during a mammogram or physical exam. It is useful because it can often tell the difference between fluid-filled cysts³ (which are unlikely to be cancer) and solid masses (which might need further testing to be sure they're not cancer).

In someone with a breast tumor, ultrasound can also be used to check if the lymph nodes under the arm are enlarged. If they are, ultrasound can be used to guide a needle to take a sample (a biopsy) to look for cancer cells there and in the breast tissue.

Breast Biopsy

When other tests show that you might have breast cancer, you will probably need to have a biopsy.⁴ Needing a breast biopsy doesn't necessarily mean you have cancer. Most biopsy results are not cancer, but a biopsy is the only way to find out. During a biopsy, a doctor will remove cells from the suspicious area so they can be looked at in the lab to see if cancer cells are present. It typically takes at least a few days for you to find out the results.

If your doctor thinks you don't need a biopsy, but you still feel there's something wrong with your breast, follow your instincts. Don't be afraid to talk to your doctor about this or

go to another doctor for a second opinion. A biopsy is the only sure way to diagnose breast cancer.

There are different types of breast biopsies. The type you have depends on your situation.

Fine needle aspiration biopsy (FNA)⁵: This type of biopsy is often used to look for cancer spread in the nearby lymph nodes. The doctor uses a very thin, hollow needle attached to a syringe to withdraw (aspirate) a small amount of tissue or fluid from a suspicious area. A local anesthetic (numbing medicine) may or may not be used. The biopsy sample is then checked to see if there are cancer cells in it.

If the area to be biopsied can be felt, the needle can be guided into it while the doctor is feeling it. If the lump can't be felt easily, the doctor might watch the needle on an ultrasound screen as it moves into the area. This is called an **ultrasound-guided biopsy**.

An FNA biopsy is the easiest type of biopsy to have, but it can sometimes miss a cancer if the needle does not go into the cancer cells.

If the results of the FNA biopsy do not give a clear diagnosis, or your doctor still has concerns, you might need to have a second biopsy or a different type of biopsy.

Core needle biopsy (CNB)⁶: This is the most common type of biopsy used to make a breast cancer diagnosis. The doctor uses a wide, hollow needle to take out pieces of breast tissue from a suspicious area. The needle used in this technique is larger than that used for FNA and allows the doctor to remove larger cylinders (cores) of tissue. Several cylinders are often removed. The biopsy is done with local numbing medicine and with the doctor either feeling the abnormal area or using an imaging test (like ultrasound or MRI) to find the spot to biopsy.

In addition to the standard CNB, there are two other types of CNBs:

- Stereotactic core needle biopsy⁷
- Vacuum-assisted core biopsy⁸

If the results of the CNB do not give a clear diagnosis, or your doctor still has concerns, you might need to have a second biopsy or a different type of biopsy.

Surgical (open) biopsy: Most breast cancer can be diagnosed with a needle biopsy. Rarely, surgery is needed to remove all or part of the lump for testing. Most often, the

surgeon removes the entire mass or abnormal area, as well as a surrounding margin of normal-appearing breast tissue.

There are 2 types of surgical biopsies:

- An **incisional biopsy** removes only part of the suspicious area, enough to make a diagnosis.
- An **excisional biopsy** removes the entire tumor or abnormal area, with or without trying to take out an edge of normal breast tissue (depending on the reason for the biopsy).

Lymph node biopsy: The doctor may also need to biopsy the lymph nodes under the arm to check them for cancer spread. This might be done at the same time as biopsy of the breast tumor, or during surgery to remove the breast tumor. This is done by needle biopsy, or with a [sentinel lymph node biopsy and/or an axillary lymph node dissection⁹](#).

Lab Tests to Help Classify Breast Cancer in Men

- [Breast cancer type](#)
- [Breast cancer grade](#)
- [Tests to classify breast cancers](#)
- [Other lab tests](#)

Breast cancer is classified in different ways, based on the results of lab tests after biopsy or surgery. Breast cancer is given a type, based on the type of cells it started from; a grade, based on how the cells look and how quickly they grow; and other classifications based on the results of tests for different hormone receptors or genes or proteins in the cancer cells.

Breast cancer type

The tissue removed during the biopsy (or during surgery) is first looked at in the lab to see if cancer is present and whether it is a carcinoma or some other type of cancer (like a sarcoma). If there is enough tissue, the pathologist may be able to determine if the cancer is *in situ* (not invasive) or invasive. The biopsy is also used to determine the cancer's [type¹](#), such as invasive ductal carcinoma or invasive lobular carcinoma.

Breast cancer grade

Cancer cells are given a **grade** when they are removed from the breast and checked in the lab. The grade is based on how much the cancer cells look like normal breast cells.

For invasive cancers, a lower grade number (1) usually means the cancer is slower-growing, and less likely to spread. A higher number (3) means a faster-growing cancer that's more likely to spread. The grade is used to help predict your outcome (prognosis) and help figure out what treatments might work best. Sometimes words such as "well differentiated," "moderately differentiated," and "poorly differentiated" are used to describe the grade instead of numbers:

- **Grade 1 or well differentiated:** The cells are slower-growing, and look more like normal breast tissue.
- **Grade 2 or moderately differentiated:** The cells are growing at a speed of and look like cells somewhere between grades 1 and 3.

- **Grade 3 or poorly differentiated:** The cancer cells look very different from normal cells and will probably grow and spread faster.

Our information about [pathology reports](#)² can help you understand details about your breast cancer.

Ductal carcinoma in situ (DCIS) is also graded, but the grade is based only on how abnormal the cancer cells look. Areas of **necrosis** (dead or dying cancer cells) are also noted. If there is necrosis, it means the tumor is growing quickly. See [Understanding Your Pathology Report: Ductal Carcinoma In Situ](#)³ for more on how DCIS is described.

Tests to classify breast cancers

Estrogen receptor (ER) and progesterone receptor (PR) status

Receptors are proteins in or on cells that can attach to certain substances in the blood. Normal breast cells and some breast cancer cells have receptors (proteins) that attach to the hormones estrogen and progesterone, and the cells depend on these hormones to grow. Cancers are called *hormone receptor-positive* or *hormone receptor-negative* based on if they have these receptors. Knowing the [hormone receptor status](#)⁴ is important in deciding treatment options. Keeping these receptors from attaching to the hormones can help keep the cancer from growing and spreading. There are [drugs that can be used to do this](#)⁵.

Breast cancer cells may have one, both, or neither of these receptors:

- **ER-positive (ER+)** breast cancers have estrogen receptors.
- **PR-positive (PR+)** breast cancers have progesterone receptors.

HER2 status

In a small number of breast cancers in men, the cells have too much of a growth-promoting protein called [HER2](#)⁶ (also known as HER2/neu). Tumors with increased levels of HER2 are referred to as *HER2-positive*. Cancer cells become HER2-positive by having too many copies of the *HER2* gene (known as *gene amplification*). Cancer cells with greater than normal amounts of the HER2/neu protein tend to grow and spread more aggressively than other breast cancers.

All newly-diagnosed breast cancers should be tested for HER2 because the outlook for people with HER2-positive cancers is improved if drugs that target the HER2 protein, such as trastuzumab (Herceptin) and lapatinib (Tykerb) are used as part of treatment. See [Targeted Therapy for Breast Cancer in Men](#)⁷ for more information on drugs that target this protein.

The biopsy or surgery sample is usually [tested](#)⁸ in 1 of 2 ways:

- **Immunohistochemistry (IHC):** In this test, special antibodies that identify the HER2/neu protein are applied to the sample, which cause it to change color if abnormally high levels are present. The test results are reported as 0, 1+, 2+, or 3+.
- **Fluorescent in situ hybridization (FISH):** This test uses fluorescent pieces of DNA that specifically stick to copies of the HER2/neu gene in cells, which can then be counted under a special microscope.

Many breast cancer specialists think the FISH test gives more accurate results than IHC, but it is more expensive and takes longer to get the results. Often the IHC test is used first.

- If the results are 0, the cancer is considered **HER2-negative**. These cancers do not respond to treatment with drugs that target HER2.
- If the IHC result is 1+, the cancer is considered **HER2-negative**. These cancers do not usually respond to treatment with drugs that target HER2, but new research shows that certain HER2 drugs might help in some cases (see below).
- When the result is 2+, the HER2 status of the tumor is not clear and is called **“equivocal.”** The tumor is then tested with FISH to clarify the result. Some institutions also use FISH to confirm HER2 status that is 3+ by IHC and some perform only FISH.
- If the test comes back 3+, the cancer is **HER2-positive**. These cancers are usually treated with drugs that target HER2.

Classifying breast cancer based on hormone receptors and HER2 status

Doctors often divide invasive breast cancers into groups based on the presence of hormone receptors (ER and PR) and whether or not the cancer has too much HER2.

Hormone receptor-positive: If the breast cancer cells contain either estrogen or progesterone receptors, they can be called hormone receptor-positive (or just hormone-

positive). Breast cancers in men that are hormone receptor-positive can be treated with hormone therapy drugs that lower estrogen levels, block estrogen receptors, or affect androgen (male hormone) levels (see [Hormone Therapy for Breast Cancer in Men⁹](#)). This includes cancers that are ER-negative but PR-positive. Hormone receptor-positive cancers tend to grow more slowly than those that are hormone receptor-negative (and don't have either estrogen or progesterone receptors). Patients with these cancers tend to have a better outlook in the short-term, but cancers that are hormone receptor-positive can sometimes come back many years after treatment. About 9 out of 10 male breast cancers are hormone receptor-positive.

Hormone receptor-negative: If the breast cancer cells don't have either estrogen or progesterone receptors, they are said to be hormone receptor-negative (or just hormone-negative). Treatment with hormone therapy drugs is not helpful for these cancers. These cancers tend to grow more quickly than hormone receptor-positive cancers. If they return after treatment, it is more often in the first few years.

HER2 positive: Cancers that have too much HER2 protein or gene are called HER2 positive. These cancers can be treated with [drugs that target HER2¹⁰](#).

HER2 negative: Cancers that don't have excess HER2 are called HER2 negative. These cancers do not respond to treatment with drugs that target HER2.

HER2 low: Some breast cancers that have an IHC result of 1+ or an IHC result of 2+ along with a negative FISH test might be called HER2-low cancers. These breast cancers are still being studied but appear to benefit from [certain HER2 targeted drugs¹¹](#).

Triple-negative: If the breast cancer cells don't have estrogen or progesterone receptors and don't have too much HER2, they are called triple-negative (HER2 negative, ER negative, and PR negative). Triple-negative breast cancers tend to grow and spread more quickly than most other types of breast cancer. Because the tumor cells don't have hormone receptors, hormone therapy is not helpful in treating these cancers. Because they don't have too much HER2, drugs that target HER2 aren't helpful, either. [Chemotherapy¹²](#) can still be useful, though.

Triple-positive: This term is used to describe cancers that are ER-positive, PR-positive, and have too much HER2. These cancers can be treated with hormone drugs as well as drugs that target HER2.

Other lab tests

Tests of ploidy and cell proliferation rate

Finding out more information about the DNA in the breast cancer cells can help predict how fast the cancer cells are dividing and growing.

The **ploidy** of cancer cells refers to how much DNA they contain.

- If there's a normal amount of DNA in the cells, they are said to be *diploid*. These cancers tend to grow and spread more slowly.
- If the amount is abnormal, then the cells are described as *aneuploid*. These cancers tend to be more aggressive and grow and spread faster.)

Tests of ploidy may help determine prognosis (outcome), but they rarely change treatment and are considered optional. They are not usually recommended as part of a routine breast cancer work-up.

Cell proliferation is how quickly a cancer cell copies its DNA and divides into 2 cells. If the cancer cells are dividing more rapidly, it means the cancer is faster growing or more aggressive. DNA is copied when the cell is getting ready to divide into 2 new cells. The *S-phase fraction* is the percentage of cells in a sample that are copying their DNA. The rate of cancer cell division can also be estimated by a Ki-67 test. If the S-phase fraction or Ki-67 test is high, it means that the cancer cells are dividing more rapidly, which can indicate a more aggressive cancer.

Molecular tests for gene changes

In some cases, doctors may test for specific gene changes in the breast cancer cells that could mean certain [targeted drugs¹³](#) or [immunotherapy drugs¹⁴](#) might help treat the cancer.

These molecular tests (also known as *genomic tests* or *biomarker tests*) can be done on cancer cells from a biopsy or surgery for breast cancer, or on a blood sample.

Some changes that might be tested for include:

- ***BRCA1 and BRCA2 gene mutations***
- ***PIK3CA, AKT1, and PTEN gene mutations***
- ***ESR1 gene mutations***
- ***Microsatellite instability (MSI) and defects in mismatch repair genes (dMMR)***
- ***Tumor mutational burden (TMB)***
- ***NTRK fusion gene changes***

Gene expression tests

Tests that look at the patterns of certain genes (sometimes referred to as *gene expression profiling*) can help predict if some early-stage (stage 1 or 2) breast cancer are likely to come back after initial treatment. Doctors can use this information to know who will most likely benefit from [chemotherapy¹⁵](#) after [breast surgery¹⁶](#).

Oncotype DX and **MammaPrint** are examples of tests that look at different sets of breast cancer genes. There are more tests in development. Tests like these are part of what's being called "personalized medicine" – learning more about your cancer to specifically tailor your treatment.

More information is needed to decide how useful this test is for breast cancer in men. But there is enough data that this test can help men with early stage breast cancer make decisions about chemotherapy after surgery. Ask your doctor if these tests might be appropriate.

Tests to Look for Breast Cancer Spread in Men

- Chest x-ray
- Computed tomography (CT) scan
- Magnetic resonance imaging (MRI) scan
- Ultrasound
- Bone scan
- Positron emission tomography (PET) scan

If you have been diagnosed with breast cancer, you might need more tests if your doctor thinks the cancer might have spread based on your symptoms, the results of your physical exam, or the size of your tumor. Your doctor will talk with you about which (if any) of these tests you will need.

Chest x-ray

This test may be done to see if the breast cancer has spread to the lungs.

Computed tomography (CT) scan

A [CT scan](#)¹ uses x-rays taken from different angles, which are combined by a computer to make detailed pictures of the organs. This test is most often used to look at the chest and/or belly (abdomen) to see if breast cancer has spread to other organs. It can also be used to guide a biopsy needle into an area of concern.

Magnetic resonance imaging (MRI) scan

A [MRI scan](#)² makes detailed pictures using radio waves and strong magnets instead of x-rays. This test can be helpful in looking at your brain and spinal cord. MRIs can be more uncomfortable than CT scans because they take longer and you often need to lie in a narrow tube while the test is done.

Ultrasound

For an [ultrasound](#)³, a wand that gives off sound waves is moved over the skin to take pictures of the inside of the body. A gel is often put on your skin first. This test can be used to diagnose breast cancer but it can also be used to look for cancer that has spread to other parts of the body.

Abdominal ultrasound can be used to look for tumors in the liver or other abdominal organs.

Bone scan

A [bone scan](#)⁴ can help show if a cancer has metastasized (spread) to the bones. It can show all of the bones in the body at the same time and can find small areas of cancer spread not seen on plain x-rays.

Bone changes show up as "hot spots" on your skeleton. They attract the radioactivity. These areas may suggest metastatic cancer, but arthritis or other bone diseases can also cause the same pattern. To distinguish between these conditions, your cancer care team may use other imaging tests such as simple x-rays or CT, MRI or PET scans to get a better look at the abnormal areas or they may even take biopsy samples of the bone.

Positron emission tomography (PET) scan

For this test, a form of radioactive sugar is put into a vein and travels throughout the body. Cancer cells absorb high amounts of this sugar. A special camera then takes pictures that show the areas where the sugar collected throughout the body.

A [PET scan](#)⁵is useful when your doctor thinks the cancer may have spread but doesn't know where. The picture is not as finely detailed as a CT or MRI scan, but it can provide helpful information about your whole body. Some machines can perform both a PET and CT scan at the same time (PET/CT scan). The radiologist can compare areas of higher radioactivity on the PET with the appearance of that area on the CT.

This test can be useful in looking for cancer that has spread to distant organs, but it is not as helpful in looking for small deposits of cancer cells in the lymph nodes under the arm (axillary lymph nodes).

Breast Cancer Stages in Men

- [How is the stage determined?](#)
- [Details of the TNM staging system](#)
- [Examples using the new staging system](#)

After someone is diagnosed with breast cancer, doctors will try to figure out if it has spread, and if so, how far. This process is called **staging**. The stage of a cancer describes how much cancer is in the body. It helps determine how serious the cancer is and how best to treat it. Doctors also use a cancer's stage when talking about survival statistics.

The staging system used for breast cancer in men is the same as the one used for breast cancer in women.

The earliest stage breast cancers are stage 0 (carcinoma in situ). It then ranges from stage I (1) through IV (4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV, means cancer has spread more. And within a stage, an earlier letter means a lower stage.

How is the stage determined?

The staging system most often used for breast cancer is the American Joint Committee on Cancer (AJCC) TNM system, which is based on 7 key pieces of information:

- The extent (size) of the tumor (**T**): How large is the cancer? Has it grown into nearby areas?
- The spread to nearby lymph nodes (**N**): Has the cancer spread to nearby lymph nodes? If so, how many?
- The spread (**metastasis**) to distant sites (**M**): Has the cancer spread to distant organs such as the lungs or liver?
- Estrogen Receptor (**ER**) status: Does the cancer have the protein called an estrogen receptor?
- Progesterone Receptor (**PR**) status: Does the cancer have the protein called a progesterone receptor?
- HER2/neu (**HER2**) status: Does the cancer make too much of a protein called HER2?
- Grade of the cancer (**G**): How much do the cancer cells look like normal cells?

[Oncotype Dx® Recurrence Score](#) results may also be considered in the stage in certain circumstances.

The most recent AJCC system, effective January 2018, has both clinical and pathologic staging systems for breast cancer. The **pathologic stage** (also called the **surgical stage**) is determined by examining tissue removed during an operation. Sometimes, if surgery is not possible right away or at all, the cancer will be given a **clinical stage** instead. This is based on the results of a physical exam, biopsy, and imaging tests. The clinical stage is used to help plan treatment. Sometimes, though, the cancer has spread further than the clinical stage estimates, and may not predict the patient's outlook as accurately as a pathologic stage.

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced. Once a person's T, N, and M categories, as well as ER, PR, HER2 status and grade of the cancer have been determined, this information is combined in a process called **stage grouping** to assign an overall stage. For more information see [Cancer Staging](#).¹ Detailed explanations of the TNM categories are seen below. The addition of information about ER, PR, and HER2 status along with grade has made stage grouping complex, so, it is best to ask your doctor about your specific stage and what it means.

Details of the TNM staging system

T categories for breast cancer

T followed by a number from 0 to 4 describes the main (primary) tumor's size and if it has spread to the skin or to the chest wall under the breast. Higher T numbers mean a larger tumor and/or wider spread to tissues near the breast.

TX: Primary tumor cannot be assessed.

T0: No evidence of primary tumor.

Tis: Carcinoma in situ (DCIS, or Paget disease of the nipple with no associated tumor mass)

T1(includes T1a, T1b, and T1c): Tumor is 2 cm (3/4 of an inch) or less across.

T2: Tumor is more than 2 cm but not more than 5 cm (2 inches) across.

T3: Tumor is more than 5 cm across.

T4 (includes T4a, T4b, T4c, and T4d): Tumor of any size growing into the chest wall or skin. This includes inflammatory breast cancer.

N categories for breast cancer

N followed by a number from 0 to 3 indicates whether the cancer has spread to lymph nodes near the breast and, if so, how many lymph nodes are involved.

Lymph node staging for breast cancer is based on how the nodes look under the microscope, and has changed as technology has improved. Newer methods have made it possible to find smaller and smaller collections of cancer cells, but experts haven't been sure how much these tiny deposits of cancer cells affect outlook.

It's not yet clear how much cancer in the lymph node is needed to see a change in outlook or treatment. This is still being studied, but for now, a deposit of cancer cells must contain at least 200 cells or be at least 0.2 mm across (less than 1/100 of an inch) for it to change the N stage. An area of cancer spread that is smaller than 0.2 mm (or fewer than 200 cells) doesn't change the stage, but is recorded with abbreviations (i+ or mol+) that indicate the type of special test used to find the spread.

If the area of cancer spread is at least 0.2 mm (or 200 cells), but still not larger than 2 mm, it is called a **micrometastasis** (one mm is about the size of the width of a grain of rice). Micrometastases are counted only if there aren't any larger areas of cancer spread. Areas of cancer spread larger than 2 mm are known to affect outlook and do change the N stage. These larger areas are sometimes called **macrometastases**, but are more often just called metastases.

NX: Nearby lymph nodes cannot be assessed (for example, if they were removed previously).

N0: Cancer has not spread to nearby lymph nodes.

N0(i+): The area of cancer spread contains less than 200 cells and is smaller than 0.2 mm. The abbreviation "i+" means that a small number of cancer cells (called isolated tumor cells) were seen in routine stains or when a special type of staining technique, called immunohistochemistry, was used.

N0(mol+): Cancer cells cannot be seen in underarm lymph nodes (even using special stains), but traces of cancer cells were detected using a technique called *RT-PCR*. RT-PCR is a molecular test that can find very small numbers of cancer cells. (This test is

not often used to find breast cancer cells in lymph nodes because the results do not influence treatment decisions.)

N1: Cancer has spread to 1 to 3 axillary (underarm) lymph node(s), and/or tiny amounts of cancer are found in internal mammary lymph nodes (those near the breast bone) on sentinel lymph node biopsy.

N1mi: Micrometastases (tiny areas of cancer spread) in the lymph nodes under the arm. The areas of cancer spread in the lymph nodes are at least 0.2mm across, but not larger than 2mm.

N1a: Cancer has spread to 1 to 3 lymph nodes under the arm with at least one area of cancer spread greater than 2 mm across.

N1b: Cancer has spread to internal mammary lymph nodes on the same side as the cancer, but this spread could only be found on sentinel lymph node biopsy (it did not cause the lymph nodes to become enlarged).

N1c: Both N1a and N1b apply.

N2: Cancer has spread to 4 to 9 lymph nodes under the arm, or cancer has enlarged the internal mammary lymph nodes

N2a: Cancer has spread to 4 to 9 lymph nodes under the arm, with at least one area of cancer spread larger than 2 mm.

N2b: Cancer has spread to one or more internal mammary lymph nodes, causing them to become enlarged.

N3: Any of the following:

N3a: either:

Cancer has spread to 10 or more axillary lymph nodes, with at least one area of cancer spread greater than 2 mm,

OR

Cancer has spread to the lymph nodes under the collarbone (infraclavicular nodes), with at least one area of cancer spread greater than 2 mm.

N3b: either:

Cancer is found in at least one axillary lymph node (with at least one area of cancer spread greater than 2 mm) and has enlarged the internal mammary lymph nodes,

OR

Cancer has spread to 4 or more axillary lymph nodes (with at least one area of cancer spread greater than 2 mm), and tiny amounts of cancer are found in internal mammary lymph nodes on sentinel lymph node biopsy.

N3c: Cancer has spread to the lymph nodes above the collarbone (supraclavicular nodes) with at least one area of cancer spread greater than 2 mm.

M categories for breast cancer

M followed by a 0 or 1 indicates whether the cancer has spread to distant organs -- for example, the lungs, liver, or bones.

M0: No distant spread is found on x-rays (or other imaging tests) or by physical exam.

cM0(i+): Small numbers of cancer cells are found in blood or bone marrow (found only by special tests), or tiny areas of cancer spread (no larger than 0.2 mm) are found in lymph nodes away from the underarm, collarbone, or internal mammary areas.

M1: Cancer has spread to distant organs (most often to the bones, lungs, brain, or liver).

Examples using the new staging system

Example #1

If the cancer size is between 2 and 5 cm (T2) but it has not spread to the nearby lymph nodes (N0) or to distant organs (M0) **AND** is:

- Grade 3
- HER2 negative
- ER positive
- PR positive

The cancer stage is IB.

Example #2

If the cancer is larger than 5 cm (T3) and has spread to 4 to 9 lymph nodes under the arm or to any internal mammary lymph nodes (N2) but not to distant organs (M0) **AND** is:

- Grade 2
- HER2 positive
- ER positive
- PR positive

The cancer stage is IB.

Example #3

If the cancer is larger than 5 cm (T3) and has spread to 4 to 9 lymph nodes under the arm or to any internal mammary lymph nodes (N2) but not to distant organs (M0) **AND** is:

- Grade 2
- HER2 negative
- ER negative
- PR negative

The cancer stage is IIIB.

Breast Cancer Survival Rates in Men

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Ask your doctor how these numbers might apply to you, as they are familiar with your situation.

What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type and stage of cancer to people in the overall population. For example, if the **5-year relative survival rate** for a specific stage of breast cancer in men is 80%, it means that men who have that cancer are, on average, about 80% as likely as men who don't have that cancer to live for at least 5 years after being diagnosed.

Where do these numbers come from?

The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results (SEER) database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for breast cancer in men in the

United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the breast.
- **Regional:** The cancer has spread outside the breast to nearby structures or lymph nodes.
- **Distant:** The cancer has spread to distant parts of the body, such as the lungs or brain.

5-year relative survival rates for breast cancer in men

These numbers are based on men diagnosed with cancer of the breast between 2012 and 2018.

SEER stage	5-year relative survival rate
Localized	95%
Regional	84%
Distant	20%
All SEER stages combined	83%

Understanding the numbers

- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread. But other factors, such as your age and overall health, whether the cancer cells have certain [gene or protein changes](#), and how well the cancer responds to treatment, can also affect your outlook.
- **Men now being diagnosed with breast cancer may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on men who were diagnosed and treated at least 5 years earlier.

Treating Breast Cancer in Men

If you've been diagnosed with breast cancer, your cancer care team will discuss your treatment options with you. It's important that you think carefully about each of your choices. Weigh the benefits of each treatment option against the possible risks and side effects.

Local treatments

Some treatments are called *local therapies*, meaning they treat the tumor without affecting the rest of the body. These treatments are more likely to be useful for earlier stage (less advanced) cancers, although they might also be used in some other situations. Types of local therapy used for breast cancer include:

- [Surgery for Breast Cancer in Men](#)
- [Radiation Therapy for Breast Cancer in Men](#)

Systemic treatments

Breast cancer can also be treated using drugs, which can be given by mouth or directly into the bloodstream. These are called *systemic therapies* because they can reach cancer cells almost anywhere in the body. Depending on the type of breast cancer, several different types of drugs might be used, including:

- [Chemotherapy for Breast Cancer in Men](#)
- [Hormone Therapy for Breast Cancer in Men](#)
- [Targeted Drug Therapy for Breast Cancer in Men](#)
- [Immunotherapy for Breast Cancer in Men](#)

Common treatment approaches

Most of the information about treating male breast cancer comes from doctors' experience with treating female breast cancer. Because so few men have breast cancer, it is hard for doctors to study the treatment of male breast cancer patients separately in clinical trials.

- [Treatment of Breast Cancer in Men, by Stage](#)

Adjuvant therapy

Patients who have no detectable cancer after surgery are often given **treatment to help keep the cancer from coming back**. This is known as *adjuvant therapy*. Even in the early stages of breast cancer, cancer cells may break away from the main breast tumor and begin to spread. These cells can't be felt on a physical exam or seen on x-rays or other imaging tests, and they cause no symptoms. But they can become new tumors in nearby tissues and other organs (and bones). The goal of adjuvant therapy is to kill these hidden cells. Systemic therapy and radiation can both be used as adjuvant therapy.

Not every patient needs adjuvant therapy. Whether or not you are likely to benefit depends on the stage and characteristics of your cancer and what type of surgery you had. Generally, if the tumor is larger or the cancer has spread to lymph nodes, it is more likely to have spread through the bloodstream, and you are more likely to benefit. But other features may determine if you should consider adjuvant therapy.

Neoadjuvant therapy

Some patients are given **treatment before surgery to shrink the tumor** in the hope it will allow a less extensive operation to be done. This often involves the same treatments used for adjuvant therapy, only giving them (or starting them) before surgery and not after. This is called *neoadjuvant therapy*.

Neoadjuvant therapy also lowers the chance of the cancer coming back later, so many patients who get neoadjuvant therapy will not need adjuvant therapy, or will not need as much.

Who treats breast cancer?

Doctors on your cancer treatment team might include:

- **A breast surgeon or surgical oncologist:** a doctor who uses surgery to treat breast cancer

- A **radiation oncologist**: a doctor who uses radiation to treat cancer
- A **medical oncologist**: a doctor who uses chemotherapy and other medicines to treat cancer

Many other specialists might be part of your treatment team as well, including physician assistants, nurse practitioners, nurses, psychologists, social workers, nutritionists, genetic counselors, and other health professionals.

- [Health Professionals Associated with Cancer Care](#)

Making treatment decisions

It's important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. It's also very important to ask questions if there's anything you're not sure about.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- [Questions to Ask Your Doctor About Breast Cancer in Men](#)
- [Seeking a Second Opinion](#)

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't

mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Integrative Medicine](#)

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and can be an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Palliative Care](#)
- [Programs & Services](#)

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the

cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors and you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.

Surgery for Breast Cancer in Men

- [Surgery to remove breast cancer](#)
- [Surgery to remove nearby lymph nodes](#)
- [Chronic pain after breast surgery](#)
- [More information about Surgery](#)

Most men with breast cancer have some type of surgery as part of their treatment. There are different types of breast surgery, and it may be done for different reasons, depending on the situation. For example, surgery may be done to:

- Remove as much of the cancer as possible (breast-conserving surgery or mastectomy)
- Find out whether the cancer has spread to the lymph nodes under the arm (sentinel lymph node biopsy or axillary lymph node dissection)
- Relieve symptoms of advanced cancer

Your doctor may recommend a certain operation based on your breast cancer features and your medical history, or you may have a choice about which type to have. It's important to know your options so you can talk about them with your doctor and make the choice that is right for you.

Surgery to remove breast cancer

There are two main types of surgery to remove breast cancer:

Mastectomy

In this surgery, the entire breast is removed, including all of the breast tissue and sometimes other nearby tissues. Most men with breast cancer will undergo a mastectomy since men have a small amount of breast tissue. There are several types of mastectomies:

- In a **simple or total mastectomy**, the surgeon removes the entire breast, including the nipple, but does not remove underarm lymph nodes or muscle tissue from beneath the breast.
- In a **modified radical mastectomy**, the surgeon extends the incision to remove the entire breast and lymph nodes under the arm as well.
- If the tumor is large and growing into the chest muscles, the surgeon must do a **radical mastectomy**, a more extensive operation removing the entire breast, axillary lymph nodes, and the chest wall muscles under the breast. This is only needed if the cancer has grown into the pectoral muscles under the breast.

Breast-conserving surgery (BCS)

This surgery might also be called a **lumpectomy, quadrantectomy, partial mastectomy, or segmental mastectomy**. For this surgery, only the part of the breast containing the cancer is removed. The goal is to remove the cancer as well as some surrounding normal tissue. How much of the breast is removed depends on the size and location of the tumor and other factors.

BCS is commonly used to treat women with breast cancer. It is used much less often in men because most male breast cancers are located behind the nipple and many times have grown into the nipple, so they require more extensive surgery such as a mastectomy. If BCS is done, it is typically followed by [radiation therapy](#).

Possible side effects of breast surgery

Aside from post-surgical pain, temporary swelling, and a change in the appearance of the breast, possible side effects of surgery include bleeding and infection at the surgical site, *hematoma* (buildup of blood in the wound), and *seroma* (buildup of clear fluid in the wound).

Surgery to remove nearby lymph nodes

To find out if the breast cancer has spread to axillary (underarm) lymph nodes, one or more of these lymph nodes may be removed and looked at in the lab. This is an important part of figuring out the [stage¹](#) (extent) of the cancer.

Lymph nodes may be removed either as part of the surgery to remove the breast cancer or as a separate operation.

Two types of surgery can be used to remove the lymph nodes:

- **Sentinel lymph node biopsy (SLNB):** A procedure in which the surgeon removes only the lymph node(s) under the arm to which the cancer would likely spread first. Removing only one or a few lymph nodes lowers the risk of side effects from the surgery.
- **Axillary lymph node dissection (ALND):** A procedure in which the surgeon removes many lymph nodes from under the arm. ALND is not done as often as it was in the past, but it might still be the best way to look at the lymph nodes in some situations.

Either of these procedures can usually be done at the same time as mastectomy or lumpectomy, but they might also be done in a second operation.

For a **sentinel lymph node biopsy**, the surgeon finds and removes the *sentinel node* (or *nodes*) — the first lymph node(s) into which a tumor drains, and the one(s) most likely to contain cancer cells if they have started to spread.

To do this, the surgeon injects a substance into the area around the tumor, into the skin over the tumor, or into the tissues just under the areola (the colored area around the nipple). This can be done with either:

- A radioactive substance and/or a blue dye, OR
- A liquid containing iron oxide particles

Lymph vessels will carry these substances into the sentinel node(s) over the next few hours. The sentinel nodes can then be found by:

- Using a special machine to detect either radioactivity or iron oxide particles
- Looking for nodes that have turned blue (or brown, if iron oxide particles were injected)

The doctor then makes an incision (cut) in the skin over the area in the armpit and removes the nodes. These nodes (often 2 or 3) are then looked at in the lab.

The lymph nodes can sometimes be checked for cancer during surgery. If cancer is found in the sentinel lymph node, the surgeon may go on to do a full ALND. If no cancer cells are seen in the lymph node at the time of the surgery, or if the sentinel node is not checked during surgery, the lymph node(s) will be examined more closely over the next several days. If cancer is found in the lymph node, the surgeon may recommend a full ALND at a later time.

If there are no cancer cells in the sentinel node(s), it's very unlikely that the cancer has spread to other lymph nodes, so no further lymph node surgery is needed. This lets you avoid some of the potential side effects of a full ALND.

A SLNB might not always be the best option for checking the lymph nodes. If an underarm lymph node looks or feels large or abnormal by touch or by a test like ultrasound, it may be checked by [fine needle aspiration \(FNA\)](#)². If cancer is found, a full ALND is typically recommended, so a SLNB is not needed.

SLNB is a complex technique that requires a great deal of skill. It should only be done by a surgical team experienced with this technique. If you are thinking about having this type of biopsy, ask your health care team if this is something they do regularly.

Possible side effects of lymph node surgery

As with other operations, pain, swelling, bleeding, and infection are possible.

Lymphedema: A possible long-term effect of removing axillary lymph nodes is lymphedema (swelling) of the arm. This occurs because any excess fluid in the arms normally travels back into the bloodstream through the lymphatic system. Removing the lymph nodes sometimes blocks the drainage from the arm, causing this fluid to build up.

This side effect has not been well studied in men. In women the risk of lymphedema is

thought to be in the range of 20-30% after an ALND, and it is less common after a SLNB. Lymphedema seems to be more common if radiation is given after surgery. Sometimes this starts soon after surgery, but it can take a long time to develop. For some people, the swelling lasts for only a few weeks and then goes away. Other times, the swelling lasts a long time. If your arm is swollen, tight, or painful after lymph node surgery, be sure to tell someone on your cancer care team right away. For more information about ways to prevent or manage lymphedema after breast surgery, see [Lymphedema³](#).

Limited arm and shoulder movement: You may also have limited movement in your arm and shoulder after surgery. This is more common after an ALND than a SLNB. Your doctor may give you exercises to ensure that you do not have permanent problems with movement (a frozen shoulder).

Some patients notice a rope-like structure that begins under the arm and can extend down toward the elbow. This, sometimes called *axillary web syndrome* or *lymphatic cording*. It is more common after an ALND than SLNB. Symptoms might not appear for weeks or even months after surgery. It can cause pain and limit movement of the arm and shoulder. This often goes away without treatment, although some people seem to find physical therapy helpful.

Numbness: Numbness of the skin of the upper, inner arm is another common side effect because the nerve that controls sensation here travels through the lymph node area.

Chronic pain after breast surgery

Some patients have problems with nerve (neuropathic) pain in the chest wall, armpit, and/or arm after surgery that doesn't go away over time. This is called post-mastectomy pain syndrome (PMPS) because it was first described in women who had mastectomies, but it occurs after breast-conserving therapy, as well.

PMPS is thought to be linked to damage done to the nerves in the armpit and chest during surgery. But the causes are not known. Between 20% and 30% of women develop symptoms of PMPS after surgery. It isn't clear how common this is in men after breast cancer surgery. It seems to be more common in younger patients, those who had a full ALND (not just a SLNB), and those who were treated with radiation after surgery. Because ALNDs are done less often now, PMPS is less common than it once was.

Symptoms of PMPS include:

- Pain and tingling in the chest wall, armpit, and/or arm
- Pain in the shoulder or surgical scar
- Numbness
- Burning or shooting pain
- A "pins and needles" sensation
- Severe itching

Most patients with PMPS say that their symptoms are not severe, but PMPS can cause you to not use your arm the way you should, and over time you could lose the ability to use it normally. Tell your doctor if you are having pain or other symptoms of PMPS. Nerve pain requires different treatment from other types of pain. See [Cancer Pain⁴](#) for more information.

More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery⁵](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects⁶](#).

Radiation Therapy for Breast Cancer in Men

- [When might radiation therapy be used?](#)
- [When will I get radiation therapy?](#)
- [Preparing for external beam radiation therapy](#)
- [Possible side effects of radiation therapy](#)

- [More information about radiation therapy](#)

Some men with breast cancer will need radiation, often in addition to other treatments. The recommendations for radiation therapy in men with breast cancer is largely taken from those for female breast cancer because not enough studies have been done in men. The need for radiation depends on what type of surgery you had or whether your cancer has spread to the lymph nodes or somewhere else in your body. Tumors that are large or involve the skin might also need radiation. You could have just one type of radiation, or a combination of different types.

Radiation therapy is treatment with high-energy rays (such as x-rays) or particles that destroy cancer cells. The most common type of radiation therapy for men with breast cancer is called *external beam radiation*. A machine focuses the radiation on the area affected by the cancer.

When might radiation therapy be used?

Not all men with breast cancer need radiation therapy, but it may be used in several situations:

- After [breast-conserving surgery](#) (BCS), to help lower the chance that the cancer will come back in the remaining breast tissue or nearby lymph nodes. Radiation is needed less often for men with breast cancer than it is for women, mainly because breast-conserving surgery (BCS) isn't done as much.
- After a [mastectomy](#), especially if the cancer is larger than 5 cm (about 2 inches), attached to the skin, or if cancer is found in the lymph nodes.
- If cancer has spread to other parts of the body, such as the bones or brain.

Which areas need radiation depends on whether you had a mastectomy or breast-conserving surgery (BCS) and whether or not the cancer has reached nearby lymph nodes.

- If you had a mastectomy and no lymph nodes had cancer, radiation is focused on the chest wall, the mastectomy scar, and anywhere drains had been placed after surgery.
- If you had BCS, you will most likely have radiation to the entire breast (called whole breast radiation), and an extra boost of radiation to the area in the breast where the cancer was removed (called the tumor bed) to help prevent it from coming back in that area. The boost is often given after the treatments to the whole breast have

ended. It uses the same machine, with lower amounts of radiation, but the beams are aimed at the tumor bed.

- If cancer was found in the lymph nodes under the arm (axillary lymph nodes), this area may be given radiation, as well. In some cases, the area treated might also include the nodes above the collarbone (supraclavicular lymph nodes) and the nodes beneath the breast bone in the center of the chest (internal mammary lymph nodes).

When will I get radiation therapy?

If you will need external radiation therapy after surgery, it is usually not started until your surgery site has healed, which is often a month or longer. If you are getting chemotherapy as well, radiation treatments are usually delayed until chemotherapy is complete.

Breast radiation is most often given 5 days a week (Monday thru Friday) for about 6 to 7 weeks.

Preparing for external beam radiation therapy

Before your treatment starts, the radiation team will carefully figure out the correct angles for aiming the radiation beams and the proper dose of radiation. They will make some ink marks or small tattoos on your skin to focus the radiation on the right area. Check with your health care team whether the marks they use will be permanent.

External radiation therapy is much like getting an x-ray, but the radiation is stronger. The procedure itself is painless. Each treatment lasts only a few minutes, but the setup time—getting you into place for treatment—usually takes longer.

Possible side effects of radiation therapy

The main short-term side effects of external beam radiation therapy to the breast are:

- Swelling in the breast or chest wall
- Skin changes in the treated area similar to a sunburn (redness, skin peeling, darkening of the skin)
- Fatigue

Your health care team may advise you to avoid exposing the treated skin to the sun because it could make the skin changes worse. Most skin changes get better within a few months. Changes to the breast tissue usually go away in 6 to 12 months, but it can take longer.

External beam radiation therapy can also cause side effects later on:

- Radiation to the breast or chest wall can sometimes damage some of the nerves to the arm. This is called **brachial plexopathy** and can lead to numbness, pain, and weakness in the shoulder, arm, and hand.
- Radiation to the underarm lymph nodes can cause lymphedema, a type of pain and swelling in the arm or chest.
- In rare cases, radiation therapy may weaken the ribs, which could lead to a fracture.
- In the past, parts of the lungs and heart were more likely to get some radiation, which could lead to long-term damage of these organs. Modern radiation therapy equipment allows doctors to better focus the radiation beams, so these problems are rare today.
- A very rare complication of radiation to the breast or chest wall is the development of another cancer called an angiosarcoma.

More information about radiation therapy

To learn more about how radiation is used to treat cancer, see [Radiation Therapy¹](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects²](#).

Chemotherapy for Breast Cancer in Men

- When is chemotherapy used?
- Which chemotherapy drugs are used for breast cancer?
- How is chemotherapy given?
- Possible side effects of chemotherapy

- [More information about chemotherapy](#)

Chemotherapy (chemo) is treatment with cancer-killing drugs that may be given intravenously (injected into your vein) or by mouth. The drugs travel through the bloodstream to reach cancer cells in most parts of the body. Occasionally, chemo might be given directly into the spinal fluid which surrounds the brain and spinal cord.

When is chemotherapy used?

Not all men with breast cancer will need chemo, but there are several situations in which chemo might be recommended:

- **After surgery (adjuvant chemotherapy):** When treatment is given to patients who have no evidence of cancer after [surgery](#), it is called *adjuvant therapy*. Adjuvant chemo is used to try to kill any cancer cells that might have been left behind or have spread but can't be seen, even on [imaging tests¹](#). If these cells were allowed to grow, they could form new tumors in other places in the body. Adjuvant chemo can lower the risk of breast cancer coming back. [Radiation](#) and [hormone therapy](#) can also be used as adjuvant treatments.
- **Before surgery (neoadjuvant chemotherapy):** *Neoadjuvant therapy* is like adjuvant therapy, except you get the treatments (or at least start them) before surgery instead of after. Neoadjuvant chemo can be used to try to shrink the tumor so it can be removed with less extensive surgery. Because of this, neoadjuvant chemo is often used to treat cancers that are too big to be removed by surgery at the time of diagnosis (called *locally advanced cancers*). Also, by giving chemo before the tumor is removed, doctors can better see how the cancer responds to it. If the first set of chemo drugs doesn't shrink the tumor, your doctor will know that other drugs are needed. It should also kill any cancer cells that have spread but can't be seen. Just like adjuvant chemo, neoadjuvant chemo can lower the risk of breast cancer coming back. In terms of survival and the chances of cancer coming back, there is no difference between getting chemo before or after surgery.
- **For advanced breast cancer:** Chemo can also be used as the main treatment for men whose cancer has either already spread beyond the breast and underarm area when it is diagnosed, or if it spreads after initial treatments. The length of treatment depends on how well the chemo is working and how well you tolerate treatment.

Sometimes it's not clear if chemotherapy will be helpful. There are tests available, such as Oncotype DX and MammaPrint, that can help determine which men will most likely

benefit from chemo after breast surgery. See [How is Breast Cancer in Men Classified?](#)² for more information.

Which chemotherapy drugs are used for breast cancer?

In most cases (especially as adjuvant or neoadjuvant treatment), chemo is most effective when combinations of drugs are used. Today, doctors use many different combinations, and it's not clear that any single combination is clearly the best.

The most common drugs used for adjuvant and neoadjuvant chemo include:

- Anthracyclines, such as doxorubicin (Adriamycin) and epirubicin (Ellence)
- Taxanes, such as paclitaxel (Taxol) and docetaxel (Taxotere)
- 5-fluorouracil (5-FU)
- Cyclophosphamide (Cytoxan)
- Carboplatin (Paraplatin)

Most often, combinations of 2 or 3 of these drugs are used.

Chemo drugs useful in treating breast cancer that has spread include:

- Taxanes, such as paclitaxel (Taxol), docetaxel (Taxotere), and albumin-bound paclitaxel (Abraxane)
- Anthracyclines (Doxorubicin, pegylated liposomal doxorubicin, and Epirubicin)
- Platinum agents (cisplatin, carboplatin)
- Vinorelbine (Navelbine)
- Capecitabine (Xeloda)
- Gemcitabine (Gemzar)
- Ixabepilone (Ixempra) Albumin-bound paclitaxel (nab-paclitaxel or Abraxane)
- Eribulin (Halaven)

Although drug combinations are often used to treat early breast cancer, advanced breast cancer more often is treated with single chemo drugs. Still, some combinations, such as paclitaxel plus carboplatin, are commonly used to treat advanced breast cancer.

For cancers that are [HER2-positive](#)³ one or more drugs that target HER2 may be used with chemo. See [Targeted Therapy for Breast Cancer in Men](#) for more information about these drugs.

How is chemotherapy given?

Chemo drugs for breast cancer are typically given into a vein (IV), either as an injection over a few minutes or as an infusion over a longer period of time. This can be done in a doctor's office, chemotherapy clinic, or in a hospital.

Often, a slightly larger and sturdier IV is required in the vein system to administer chemo. They are known as [central venous catheters⁴](#) (CVCs), central venous access devices (CVADs), or central lines. They are used to put medicines, blood products, nutrients, or fluids right into your blood. They can also be used to take out blood for testing.

Many different kinds of CVCs are available. The 2 most common types are the port and the PICC line. For breast cancer patients, the central line is typically placed on the opposite side of the breast that had surgery.

Doctors give chemo in cycles, with each period of treatment followed by a rest period. Chemo begins on the first day of each cycle, but the schedule varies depending on the drugs used. For example, with some drugs, the chemo is given only on the first day of the cycle. With others, it is given every day for 14 days, or weekly for 2 weeks. Then, at the end of the cycle, the schedule of chemo repeats to start the next cycle.

Cycles are most often 2 or 3 weeks long, but they vary according to the specific drug or combination of drugs. Some drugs are given more often. Adjuvant and neoadjuvant chemo is often given for a total of 3 to 6 months, depending on what drugs are used. Treatment is often longer for advanced breast cancer, and is based on how well it is working and what side effects you have.

Dose-dense chemotherapy: Doctors have found that giving the cycles of certain chemo agents closer together can lower the chance that the cancer will come back and improve survival in some patients. This usually means giving the same chemo that is normally given, but giving it every 2 weeks instead of every 3 weeks. A drug (growth factor) to help boost the white blood cell count is given after the chemo to make sure the white blood cell count returns to normal in time for the next cycle. This approach can be used for both adjuvant and neoadjuvant chemo. It can lead to more problems with low blood counts, though, so it isn't for everyone.

Possible side effects of chemotherapy

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow, the lining of

the mouth and intestines, and the hair follicles, also divide quickly. These cells are likely to be affected by chemo too, which can lead to side effects. Some men have many side effects while other men may have few.

The side effects of chemotherapy depend on the type of drugs, the amount taken, and the length of treatment. Some of the most common possible side effects include:

- Hair loss
- Mouth sores
- Loss of appetite (or increased appetite)
- Nausea and vomiting
- Low blood cell counts

Chemo can affect the blood-forming cells of the bone marrow, which can lead to:

- Increased chance of infections (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)
- Fatigue (from low red blood cell counts or other reasons)

These side effects are usually short-term and go away after treatment is finished. Let your cancer care team know if you have any side effects, because there are often ways to lessen them. For example, drugs can be given to help prevent or reduce nausea and vomiting.

Several other side effects are also possible. Some of these are only seen with certain chemotherapy drugs. Ask your cancer care team about the possible side effects of the specific drugs you are getting.

Nerve damage (neuropathy): Many drugs used to treat breast cancer, including the taxanes (docetaxel and paclitaxel), platinum agents (carboplatin, cisplatin), vinorelbine, erubulin, and ixabepilone, can damage nerves outside the brain and spinal cord. This can sometimes lead to symptoms (mainly in the hands and feet) such as numbness, pain, burning or tingling sensations, sensitivity to cold or heat, or weakness. In most cases this goes away once treatment is stopped, but it might last a long time in some men.

Heart damage: Doxorubicin, epirubicin, and some other drugs may cause permanent heart damage (called *cardiomyopathy*). The risk is highest if the drug is used for a long time or in high doses. Most doctors check your heart function with a test like a MUGA or echocardiogram(an ultrasound of the heart) before starting one of these drugs. They

also carefully control the doses and watch for symptoms of heart problems, and may repeat the heart test to monitor heart function during treatment. If the heart function begins to worsen, treatment with these drugs will be temporarily or permanently stopped. Still, in some people, signs of damage might not appear until months or years after treatment stops. Damage from these drugs happens more often if other drugs that can cause heart damage (such as those that target HER2) are used also, so doctors are more cautious when these drugs are used together.

Hand-foot syndrome: Certain chemo drugs, such as capecitabine and liposomal doxorubicin, can irritate the palms of the hands and the soles of the feet. This is called *hand-foot syndrome*. Early symptoms include numbness, tingling, and redness. If it gets worse, the hands and feet can become swollen, uncomfortable, or even painful. The skin may blister and peel. There is no specific treatment, although some creams or steroids given before chemo may help. These symptoms gradually get better when the drug is stopped or the dose is lowered. The best way to prevent severe hand-foot syndrome is to tell your doctor when early symptoms come up, so that the drug dose can be changed or other medications can be given .

Chemo brain: There is very little research on chemo brain in men, but many women who are treated for breast cancer report a slight decrease in mental functioning. There may be some long-lasting problems with concentration and memory. Although many women have linked this to chemo, it also has been seen in women who did not get chemo as a part of their treatment. Also, most women do function well after chemotherapy. In studies of chemo brain as a side effect of treatment, the symptoms most often go away within a few years. Even though most research was done in women, there's no reason to expect any differences in men being treated for breast cancer.

Increased risk of leukemia: Very rarely, certain chemo drugs can cause diseases of the bone marrow such as [myelodysplastic syndrome⁵](#) or even [acute myeloid leukemia⁶](#), a cancer of white blood cells. When this happens it is usually within 10 years of treatment. For most men though, chemo's benefits of helping to prevent breast cancer from coming back or extending life are likely to far exceed the risk of this serious but rare complication.

Feeling unwell or tired: Many people do not feel as healthy after chemotherapy as they did before. There is often a residual feeling of body pain or achiness and a mild loss of physical functioning. These may be very subtle changes that happen slowly over time.

Fatigue is often another common (but often overlooked) problem for those who have had chemo. This may last up to several years. It can often be helped, so it is important

to let your doctor or nurse know about it. Exercise, naps, and conserving energy may be recommended. If there are problems with sleep, these can be treated. Sometimes there is depression, which may be helped by counseling and/or medicines.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see [Chemotherapy⁷](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects⁸](#).

Hormone Therapy for Breast Cancer in Men

- [What types of drugs are used in hormone therapy?](#)
- [Orchiectomy \(castration\)](#)
- [Possible side effects of hormone therapy](#)
- [More information about hormone therapy](#)

Hormone therapy (sometimes called endocrine therapy) is a way to treat cancer by using hormones or drugs or other treatments that affect hormones. Hormone therapy is a form of systemic therapy, meaning it can reach nearly all parts of the body.

Hormone therapy can be used after surgery (adjuvant therapy) to help lower the risk of cancer coming back, or before surgery (neoadjuvant treatment). It can also be used to treat cancer that has spread, or cancer that has come back after treatment (recurred).

Some breast cancers grow in response to the hormones estrogen or progesterone. Estrogen and progesterone are usually thought of as female hormones, but men have them in their bodies, too, just at lower levels.

About 9 of 10 breast cancers in men are hormone receptor-positive, meaning they are estrogen receptor (ER)-positive, progesterone receptor (PR)-positive, or both. This makes them more likely to respond to hormone treatments. Hormone therapy does not help people whose tumors are both ER- and PR-negative.

What types of drugs are used in hormone therapy?

Several approaches to blocking the effects of estrogen or lowering estrogen levels are

used to treat breast cancer in women. Although many of these may work in men as well, they often haven't been studied well, if at all.

Tamoxifen and toremifene

These drugs are known as **selective estrogen receptor modulators (SERMs)**. They block estrogen receptors on breast cancer cells, which can help keep the cells from growing. Both of these drugs are taken daily as pills.

Tamoxifen is the best studied hormone drug for breast cancer in men and is most often used first. If tamoxifen doesn't work (or stops working), other hormone drugs may be tried, but this is largely based on how well they work in women with breast cancer.

Large studies of women with early-stage, hormone receptor-positive cancers have shown that taking tamoxifen after surgery for 5 years reduces the chances of the cancer coming back by about half. Taking it for 10 years may help even more. Studies in men with breast cancer have been smaller, but they have also found that taking tamoxifen after surgery for early-stage breast cancer can lower the chance of the cancer coming back and improve survival.

Tamoxifen can also be used to treat metastatic breast cancer.

Toremifene (Fareston) works like tamoxifen, but it's not used as often and is only approved to treat metastatic breast cancer. It is not likely to work if tamoxifen has already been used and has stopped working.

The most common **side effects** of tamoxifen and toremifene are:

- Hot flashes
- Sexual problems
- Fatigue

Some men with cancer spread to the bones may have a **tumor flare** with pain and swelling in the muscles and bones. This usually goes away quickly, but rarely a man may also develop a high calcium level in the blood that is hard to control. If this happens, the treatment may need to be stopped for a time.

Rare, but more serious side effects are also possible:

- **Blood clots** are another uncommon, but serious side effect. They usually form in the legs (called **deep vein thrombosis** or DVT), but sometimes a piece of clot may break off and end up blocking an artery in the lungs (**pulmonary embolism** or PE). Call your doctor or nurse right away if you develop pain, redness, or swelling in your lower leg (calf), shortness of breath, or chest pain, because these can be

symptoms of a DVT or PE.

- Rarely, tamoxifen has been associated with **strokes** in post-menopausal women. The risk in men is not clear. Tell your doctor if you have a sudden severe headache, confusion, or trouble speaking or moving.

Tamoxifen may also increase the risk of **heart attacks** in some people, although this link is not clear.

Selective estrogen receptor degraders (SERDs)

Like SERMs, these drugs attach to estrogen receptors. But SERDs bind to the receptors more tightly and cause them to be broken down (degraded).

Fulvestrant (Faslodex) is used to treat metastatic breast cancer, most often after other hormone drugs (like tamoxifen and often an aromatase inhibitor) have stopped working. It is given by injection into the buttocks every 2 weeks for a month, then monthly.

Elacestrant (Orserdu) can be used to treat advanced, ER-positive, HER2-negative breast cancer when the cancer cells have an *ESR1* gene mutation, and the cancer has grown after at least one other type of hormone therapy. This drug is taken daily as pills.

The most common side effects of these drugs are **hot flashes, nausea, muscle or joint pain, headache, and pain at the injection site**. Elacestrant can also increase cholesterol and fat levels in the blood.

Aromatase inhibitors

This group of drugs includes **anastrozole (Arimidex), letrozole (Femara), and exemestane (Aromasin)**. These drugs stop estrogen production by blocking an enzyme (aromatase) in fat tissue that converts male hormones from the adrenal glands into estrogen.

Aromatase inhibitors are taken daily as pills. They have been very effective in treating breast cancer in women, but they have not been well-studied in men. Still, some doctors use them to treat advanced breast cancer in men, often combined with a **luteinizing hormone-releasing hormone (LHRH) analog** to turn off hormone production by the testicles (discussed below). These drugs are generally used if tamoxifen stops working.

The main side effects are **thinning of the bones** and **pain in muscles and joints**.

Luteinizing hormone-releasing hormone (LHRH) analogs and anti-androgens

In men, **LHRH analogs** such as leuprolide (Lupron) and goserelin (Zoladex) affect the pituitary gland, which regulates testosterone production in the testicles. These drugs cause the pituitary gland to turn off production of testosterone by the testicles, leading to lower testosterone levels. They are given as shots either monthly or every few months. These drugs may be used by themselves, or combined with aromatase inhibitors or anti-androgens to treat advanced breast cancer in men.

Anti-androgens such as flutamide and bicalutamide work by blocking the effect of male hormones on breast cancer cells. These drugs are taken daily as pills.

Megestrol

Megestrol(Megace) is a progesterone-like drug. It is unclear how it stops cancer cells from growing, but it appears to compete for hormone receptor sites in the cells. This is an older drug that is usually reserved for men who are no longer responding to other forms of hormone therapy. Megestrol may **increase the risk for blood clots** and **frequently causes weight gain** by increasing appetite.

Orchiectomy (castration)

Surgical removal of the testicles (orchiectomy) is another way to regulate hormones that might affect breast cancer growth. Removing the testicles greatly lowers the levels of testosterone and other androgens (male hormones). Most male breast cancers have androgen receptors that may cause the cells to grow. Androgens can also be converted into estrogens in the body.

Orchiectomy shrinks most male breast cancers, and it may help make other treatments like tamoxifen more likely to work.

This was once a common treatment for breast cancer in men, but it is now used less often because medicines such as LHRH analogs can now be used to lower androgen levels.

Possible side effects of hormone therapy

Although some of these drugs have unique side effects (see descriptions above), in general they can cause **loss of sexual desire, trouble getting erections, weight gain, hot flashes, and mood swings**. Be sure to discuss any such side effects with

your cancer care team because there may be ways to treat them.

More information about hormone therapy

To learn more about how hormone therapy is used to treat cancer, see [Hormone Therapy¹](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects²](#).

Targeted Drug Therapy for Breast Cancer in Men

- Targeted therapy for HER2-positive breast cancer
- Targeted therapy for hormone receptor-positive breast cancer
- Targeted therapy for men with BRCA mutations
- Targeted therapy for triple-negative breast cancer
- More information about targeted therapy

As researchers have learned more about changes in cancer cells that cause them to grow out of control, they've developed new types of drugs that target some of these cell changes. These targeted drugs work differently from **chemotherapy** (chemo) drugs.

Targeted drugs sometimes work even when chemo drugs do not. Some targeted drugs can help other types of treatment work better. Targeted drugs also tend to have different side effects than chemo.

Several targeted drugs have been approved for use in treating breast cancer, although using these drugs in men is often based largely on how well they work in women.

Targeted therapy for HER2-positive breast cancer

In some men with breast cancer, the cancer cells have too much of a growth-promoting protein known as HER2 (or HER2/neu) on their surface. These cancers, known as *HER2-positive breast cancers*, tend to grow and spread more aggressively.

Different types of drugs have been developed that target the HER2 protein.

Monoclonal antibodies

Monoclonal antibodies are man-made versions of immune system proteins (antibodies) that are designed to attach to a specific target. In this case, they attach to the HER2 protein on cancer cells, which can help stop the cells from growing.

Trastuzumab (Herceptin, other brand names¹): Trastuzumab can be used to treat both early-stage and advanced breast cancer. This drug is often given with chemo, but it might also be used alone (especially if chemo alone has already been tried). When started before (neoadjuvant) or after (adjuvant) surgery to treat early breast cancer, this drug is usually given for 6 months to a year. For advanced breast cancer, treatment is often given for as long as the drug is helpful. This drug is given into a vein (IV).

Another form of trastuzumab, called **trastuzumab and hyaluronidase injection (Herceptin Hylecta)**, is also available. It is given as a subcutaneous (under the skin)

shot over a few minutes.

Pertuzumab (Perjeta): This monoclonal antibody can be given with trastuzumab and chemo, either before or after surgery to treat early-stage breast cancer, or to treat advanced breast cancer. This drug is given into a vein (IV).

For people getting both of these monoclonal antibodies as part of their treatment, a combination of **trastuzumab, pertuzumab, and hyaluronidase (Phesgo)** is also available as a single injection. It is given as a subcutaneous (under the skin) shot over several minutes.

Margetuximab (Margenza): This monoclonal antibody can be used along with chemo to treat advanced breast cancer, typically after at least 2 other drugs that target HER2 have been tried. This drug is given into a vein (IV).

Antibody-drug conjugates

An antibody-drug conjugate (ADC) is a monoclonal antibody linked to a chemotherapy drug. In this case, the anti-HER2 antibody acts like a homing signal by attaching to the HER2 protein on cancer cells, bringing the chemo directly to them.

Ado-trastuzumab emtansine (Kadcyla or TDM-1): This antibody-drug conjugate is used by itself to treat early-stage breast cancer after surgery (when chemo and trastuzumab were given before surgery, and there was cancer still present at the time of surgery), or to treat advanced breast cancer in men who have already been treated with trastuzumab and chemo. This drug is given in a vein (IV).

Fam-trastuzumab deruxtecan (Enhertu): This antibody-drug conjugate can be used by itself to treat breast cancer that can't be removed with surgery or that has spread (metastasized) to another part of the body, typically after at least 2 other anti-HER2 targeted drugs have been tried. This drug is given in a vein (IV).

Fam-trastuzumab deruxtecan can also be used to treat [HER2-low²](#) breast cancers that can't be removed with surgery or that has spread to another part of the body, typically after chemotherapy has been tried or if the cancer recurs within 6 months of finishing adjuvant chemotherapy.

Kinase inhibitors

HER2 is a type of protein known as a *kinase*. Kinases are proteins in cells that normally relay signals (such as telling the cell to grow). Drugs that block kinases are called

kinase inhibitors.

Lapatinib (Tykerb): This drug is a pill taken daily. Lapatinib is used to treat advanced breast cancer, typically along with the chemo drug capecitabine or with certain hormone therapy drugs.

Neratinib (Nerlynx): This kinase inhibitor is a pill taken daily. Neratinib is used to treat early-stage breast cancer after completing one year of trastuzumab, and it is usually given for one year. It can also be given along with the chemo drug capecitabine to treat people with metastatic disease, typically after at least 2 other anti-HER2 targeted drugs have been tried.

Tucatinib (Tukysa): This kinase inhibitor is taken as pills, typically twice a day. Tucatinib is used to treat advanced breast cancer, after at least one other anti-HER2 targeted drug has been tried. It is typically given along with trastuzumab and the chemo drug capecitabine.

Side effects of HER2 targeted drugs

The side effects of HER2 targeted drugs are often mild, but some can be serious. Discuss what you can expect with your doctor.

The monoclonal antibodies and antibody-drug conjugates can sometimes cause **heart damage** during or after treatment. This can lead to **congestive heart failure**. For most (but not all) people, this effect lasts a short time and gets better when the drug is stopped. The risk of heart problems is higher when these drugs are given with certain chemo drugs that also can cause heart damage, such as doxorubicin (Adriamycin) and epirubicin (Ellence). Because these drugs can cause heart damage, doctors often check your heart function (with an echocardiogram or a MUGA scan) before treatment, and regularly while you are taking the drug. Let your doctor know if you develop symptoms such as **shortness of breath, leg swelling, and severe fatigue**.

Lapatinib, neratinib, tucatinib, and the combination of pertuzumab with trastuzumab can cause **severe diarrhea**, so it's very important to let your health care team know about any changes in bowel habits as soon as they happen.

Lapatinib and tucatinib can also cause **hand-foot syndrome**, in which the hands and feet become sore and red, and may blister and peel.

Lapatinib, neratinib, and tucatinib can cause **liver problems**. Your doctor will do blood tests to check your liver function during treatment. Let your health care team know right away if you have possible signs or symptoms of liver problems, such as itchy skin,

yellowing of the skin or the white parts of your eyes, dark urine, or pain in the right upper belly area.

Fam-trastuzumab deruxtecan (Enhertu) can cause **serious lung disease** in some people. In some cases this might even be life threatening. It's very important to let your doctor or nurse know right away if you're having symptoms such as coughing, wheezing, trouble breathing, or fever.

Targeted therapy for hormone receptor-positive breast cancer

In about 9 out of 10 men with breast cancer, the breast cancer cells have proteins (receptors) on the outside that can attach to hormones, like estrogen or progesterone, to help them grow. These are called **hormone receptor-positive (HR-positive) breast cancers**. Sometimes they are called estrogen receptor-positive (ER-positive) or progesterone receptor-positive (PR-positive) breast cancers. These cancers are commonly treated with [hormone therapy](#). Certain targeted therapy drugs can make hormone therapy even more effective, although these targeted drugs might also add to the side effects.

CDK4/6 inhibitors

Palbociclib (Ibrance), ribociclib (Kisqali), and abemaciclib (Verzenio) are drugs that block proteins in the cell called cyclin-dependent kinases (CDKs), particularly CDK4 and CDK6. Blocking these proteins in hormone receptor-positive breast cancer cells helps stop the cells from dividing. This can slow cancer growth.

These drugs can be used to treat men with hormone receptor-positive, HER2-negative breast cancer. There are different ways to use these drugs:

- For men with early-stage breast cancer that has spread to the lymph nodes and has a high chance of coming back after surgery, abemaciclib can be given as adjuvant treatment along with tamoxifen or an AI. It is typically given for 2 years.
- Any of these drugs can be given along with an aromatase inhibitor (AI) or fulvestrant to treat advanced breast cancer.
- Abemaciclib can also be used by itself in men with advanced breast cancer who have previously been treated with hormone therapy and chemotherapy.

These drugs are taken as pills, typically once or twice a day.

The most common **side effects of CDK4/6 inhibitors** are low blood cell counts and

fatigue. Nausea and vomiting, mouth sores, hair loss, diarrhea, and headache are less common side effects. Very low white blood cell counts can increase the risk of serious infection. A rare but possible life-threatening side effect is inflammation of the lungs, also called interstitial lung disease or pneumonitis.

PI3K inhibitor

Alpelisib (Piqray) is a targeted drug known as a *PI3K inhibitor*. It blocks a form of the PI3K protein in cancer cells, which can help stop them from growing.

This drug can be used along with the hormone drug fulvestrant to treat both men and postmenopausal women with advanced hormone receptor-positive, HER2-negative breast cancer with a PIK3CA gene mutation that has grown during or after treatment with an aromatase inhibitor. (The *PIK3CA* gene is the gene that tells the cell to make the PI3K protein.) Your doctor will test your blood or tumor for this mutation before starting treatment with this drug.

This drug is taken as a pill, typically once a day.

Side effects of alpelisib can include high blood sugar levels, signs of kidney, liver, or pancreatic problems, diarrhea, rash, low blood counts, nausea and vomiting, fatigue, decreased appetite, mouth sores, weight loss, low calcium levels, blood clotting problems, and hair loss. Very severe skin reactions, such as rashes with peeling and blistering, are possible and should be reported to a doctor. People with a history of severe skin reactions should tell their doctor before taking alpelisib.

AKT inhibitor

Capivasertib (Truqap) blocks forms of the AKT protein, which is part of a signaling pathway inside cells (including cancer cells) that can help them grow. Other proteins in this pathway include the PI3K and PTEN proteins.

This drug can be used along with the hormone drug fulvestrant to treat advanced hormone receptor-positive, HER2-negative breast cancer, if the cancer cells have changes in any of the *PIK3CA*, *AKT1*, or *PTEN* genes, and if the cancer has grown during or after treatment with hormone therapy. Your doctor will test your blood or tumor for these mutations before starting treatment with this drug.

This drug is taken as pills, typically twice a day for 4 days, followed by 3 days off each week.

Side effects of capivasertib can include:

- High blood sugar levels: Your cancer care team will check your blood sugar levels before and during your treatment.
- Diarrhea (which may be severe): Tell your cancer team right away if start to have loose stool or diarrhea.
- Skin rash or other skin reactions: Very severe skin reactions, such as rashes with peeling and blistering, are possible and should be reported to a doctor.

Other possible side effects can include nausea, vomiting, mouth sores, skin rash, and changes in certain blood tests.

mTOR inhibitor

Everolimus (Afinitor) is a targeted drug known as an *mTOR inhibitor*. It blocks mTOR, a protein in cells that normally helps them grow and divide. Everolimus may also stop tumors from developing new blood vessels, which can help limit their growth. When used for treating breast cancer, this drug seems to help hormone therapy drugs work better.

This drug is approved to treat advanced hormone receptor-positive, HER2-negative, breast cancer in women who have gone through menopause. It is meant to be used with exemestane (Aromasin) in these women if their cancers have grown while they were being treated with either letrozole or anastrozole (or if the cancer started growing shortly after treatment with these drugs was stopped).

Everolimus is also being studied for use for earlier stage breast cancer and combined with other treatments. Although most of the people with breast cancer in studies of everolimus are women, some studies have included men.

Everolimus is taken as a pill, typically once a day.

Common **side effects of everolimus** include mouth sores, diarrhea, nausea, fatigue, feeling weak or tired, low blood counts, shortness of breath, and cough. Everolimus can also increase blood lipids (cholesterol and triglycerides) and blood sugars, so your doctor will check your blood work periodically while you are on this drug. It can also increase your risk of serious infections, so your doctor will watch you closely for infection while you are on treatment.

Antibody-drug conjugate

An antibody-drug conjugate (ADC) is a monoclonal antibody joined to a chemotherapy drug. The antibody acts like a homing signal by attaching to a specific protein on cancer cells, bringing the chemo directly to them.

Sacituzumab govitecan (Trodelvy): In the case of this ADC, the monoclonal antibody part attaches to the Trop-2 protein on breast cancer cells and brings the chemo directly to them. (Some breast cancer cells have too much Trop-2, which helps them grow and spread quickly.)

This ADC can be used to treat advanced hormone receptor-positive, HER2-negative breast cancer, in people who have already received hormone therapy and at least 2 chemo regimens.

This drug is given into a vein (IV) weekly for 2 weeks, followed by one week off, then restarted.

Some common **side effects** of this drug include nausea, vomiting, diarrhea, constipation, feeling tired, rash, loss of appetite, hair loss, low red blood cell counts, and belly pain. Serious side effects can include very low white blood cell counts (with an increased risk of infection), severe diarrhea, and infusion reactions (similar to an allergic reaction) when the drug is infused. Medicines are normally given before each treatment to lower the chances of vomiting and infusion reactions.

Targeted therapy for men with *BRCA* mutations

Olaparib (Lynparza) and **talazoparib (Talzenna)** are drugs known as *PARP inhibitors*. PARP proteins normally help repair damaged DNA inside cells. The *BRCA* genes (*BRCA1* and *BRCA2*) also help repair DNA (in a slightly different way), but mutations in one of those genes can stop this from happening. PARP inhibitors work by blocking the PARP proteins. Because tumor cells with a mutated *BRCA* gene already have trouble repairing damaged DNA, blocking the PARP proteins often leads to the death of these cells.

Olaparib and talazoparib can be used to treat metastatic, HER2-negative breast cancer in patients with a *BRCA* mutation who have already gotten **chemotherapy** (and **hormone therapy** if the cancer is hormone receptor-positive).

Only a portion of men with breast cancer have a *mutated BRCA gene that they are born with*³, and which is in all the cells of the body (as opposed to the gene change being acquired and found only in the cancer cells). If you are not known to have a *BRCA* mutation, your doctor will test your blood to be sure you have one before

starting treatment with one of these drugs.

These drugs come in pills that are taken once or twice a day.

Side effects can include nausea, vomiting, diarrhea, fatigue, loss of appetite, taste changes, low red blood cell counts (anemia), low platelet counts, low white blood cell counts, belly pain, and muscle and joint pain. Rarely, some people treated with a PARP inhibitor have developed a blood cancer, such as [myelodysplastic syndrome⁴](#) or [acute myeloid leukemia \(AML\)⁵](#).

Targeted therapy for triple-negative breast cancer

In triple-negative breast cancer (TNBC), the cancer cells don't have estrogen or progesterone receptors, and they make very little or none of the HER2 protein.

Antibody-drug conjugate

An antibody-drug conjugate (ADC) is a monoclonal antibody joined to a chemotherapy drug. The antibody acts like a homing signal by attaching to a specific protein on cancer cells, bringing the chemo directly to them.

Sacituzumab govitecan (Trodelvy): In the case of this ADC, the monoclonal antibody part attaches to the Trop-2 protein on breast cancer cells and brings the chemo directly to them. (Some breast cancer cells have too much Trop-2, which helps them grow and spread quickly.)

This antibody-drug conjugate can be used by itself to treat advanced TNBC, after at least 2 other chemo regimens have been tried. This drug is given in a vein (IV) weekly for 2 weeks, followed by one week off, then restarted.

Some common **side effects** of this drug include nausea, vomiting, diarrhea, constipation, feeling tired, rash, loss of appetite, hair loss, low red blood cell counts, and belly pain. Serious side effects can include very low white blood cell counts (with an increased risk of infection), severe diarrhea, and infusion reactions (similar to an allergic reaction) when the drug is infused. Medicines are normally given before each treatment to lower the chances of vomiting and infusion reactions.

More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy⁶](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects⁷](#).

Immunotherapy for Breast Cancer in Men

- [Immune checkpoint inhibitors](#)
- [More information about immunotherapy](#)

Immunotherapy is the use of medicines to stimulate a person's own immune system to recognize and destroy cancer cells more effectively. Immunotherapy can be used to treat some types of breast cancer.

Immune checkpoint inhibitors

An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses "checkpoints," which are proteins on immune cells that need to be turned on (or off) to start an immune response. Breast cancer cells sometimes use these checkpoints to avoid being attacked by the immune system. Drugs that target these checkpoint proteins help to restore the immune response against breast cancer cells.

PD-1 inhibitor

Pembrolizumab (Keytruda) for breast cancer

Pembrolizumab (Keytruda) is a drug that targets PD-1, a protein on immune system cells called *T cells* that normally help keep these cells from attacking other cells in the body. By blocking PD-1, these drugs boost the immune response against breast cancer cells. This can often shrink tumors.

It can be used with chemotherapy to treat [triple-negative breast cancer¹](#) (that makes the

PD-L1 protein) that:

- has come back (recurred) locally but can't be removed by surgery and hasn't been treated with chemotherapy this time OR
- has spread to other parts of the body and has not been treated with chemotherapy this time.

This drug is given as an intravenous (IV) infusion, typically every 3 or 6 weeks.

Possible side effects of immune checkpoint inhibitors

Side effects of these drugs can include fatigue, cough, nausea, skin rash, poor appetite, constipation, and diarrhea.

Other, more serious side effects occur less often.

Infusion reactions: Some people might have an infusion reaction while getting these drugs. This is like an allergic reaction, and can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It's important to tell your doctor or nurse right away if you have any of these symptoms while getting these drugs.

Autoimmune reactions: These drugs remove one of the safeguards on the body's immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It's very important to report any new side effects to your health care team quickly. If serious side effects do occur, treatment may need to be stopped and you may get high doses of corticosteroids to suppress your immune system.

More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy²](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects³](#).

Treatment of Breast Cancer in Men, by Stage

- Stage 0 (ductal carcinoma in situ)
- Stage I
- Stage II
- Stage III

- Stage IV (metastatic)
- Recurrent cancer

This information is based on AJCC Staging systems prior to 2018 which were primarily based on tumor size and lymph node status. Since the updated staging system for breast cancer now also includes the ER, PR and HER2 status, the stages may be higher or lower than previous staging systems. Whether or not treatment strategies will change with this new staging system are yet to be determined. You should discuss your stage and treatment options with your physician.

Because there have been few [clinical trials](#)¹ on treatment of male breast cancer, most doctors base their treatment recommendations on their experience with the disease and on the results of studies of breast cancer in women. With some minor variations, breast cancer in men is treated the same way as breast cancer in women.

The [stage \(extent\) of your breast cancer](#)² is an important factor in making decisions about your treatment options. In general, the more the breast cancer has spread, the more treatment you will likely need. But [other factors](#)³ can also be important, such as:

- If the cancer cells contain hormone receptors (that is, if the cancer is ER-positive or PR-positive)
- If the cancer cells have large amounts of the HER2 protein (that is, if the cancer is HER2-positive)
- Your overall health and personal preferences
- How fast the cancer is growing (measured by grade or other measures)

Talk with your doctor about how these factors can affect your treatment options.

Stage 0 (ductal carcinoma in situ)

Stage 0 cancer means that the cancer is limited to the inside of the milk duct and is a non-invasive cancer. Stage 0 breast tumors include ductal carcinoma in situ (DCIS).

It is treated with [surgery](#) to remove the cancer. Most often in males, a mastectomy is done. If breast-conserving surgery is done, it is followed by [radiation therapy](#) to the remaining breast tissue.

Sometimes DCIS can contain an area of invasive cancer. The chance that an area of DCIS contains invasive cancer goes up with tumor size and how fast the cancer is growing. If there is concern of invasive cancer, the lymph nodes under the arm may be

checked for spread, most often with a sentinel lymph node biopsy. If cancer cells are found in the sentinel lymph node, it means the tumor must contain some invasive cancer, and the man will be treated based on his invasive cancer stage.

Stage I

These cancers are still relatively small and either have not spread to the lymph nodes (N0) or there is a tiny area of cancer spread in the sentinel lymph node (N1mi).

The main treatment for stage I breast cancer is to remove it with [surgery](#). This is usually done by mastectomy, but breast-conserving surgery (BCS) might occasionally be an option. If breast-conserving surgery is done, it is usually followed by [radiation therapy](#).

The lymph nodes under the arm will be checked for cancer spread, either with an axillary lymph node dissection (ALND) or sentinel node biopsy (SLNB). If the sentinel lymph node contains cancer, a full ALND may be needed, depending on the size of the cancer in the lymph node as well as what other treatment is planned.

[Hormone therapy](#), [chemotherapy](#) (chemo) and/or [targeted therapy](#) may be recommended as adjuvant (after surgery) therapy, based on the tumor size and results of lab tests. Hormone therapy with tamoxifen is usually recommended for hormone receptor-positive tumors. Adjuvant chemo is commonly used for tumors larger than 1 cm (about 1/2 inch) across and some smaller tumors that may be more likely to spread (based on features such as grade or a high growth rate). Men with HER2-positive tumors may also receive targeted therapy with trastuzumab (Herceptin).

Stage II

These cancers tend to be larger than stage I cancers and/or have spread to a few nearby lymph nodes.

Systemic (drug) therapy is often recommended for men with stage II breast cancer. Some systemic therapies are given before [surgery](#) (neoadjuvant therapy), and others are given after surgery (adjuvant therapy). Neoadjuvant treatments may be an option for men with large tumors, because they can shrink the tumor before surgery, possibly enough to make breast-conserving surgery (BCS) an option. The lymph nodes under the arm will be checked for cancer spread, either with an axillary lymph node dissection (ALND) or sentinel lymph node biopsy. If the sentinel lymph node contains cancer, a full ALND may be needed, depending on the size of the cancer in the lymph node as well as what other treatment is planned.

Radiation therapy may be given after surgery if the tumor is large or if it is found to have spread to several lymph nodes. Radiation therapy lowers the risk of the cancer coming back (recurrence).

The drugs used will depend on the man's age and the tumor's hormone-receptor status and HER2 status. They may include:

Chemotherapy: Chemo can be given before or after surgery.

HER2 targeted drugs: If the cancer is HER2-positive, HER2 targeted drugs are started along with chemo. Both trastuzumab (Herceptin) and pertuzumab (Perjeta) may be used as a part of neoadjuvant treatment. Then trastuzumab is continued after surgery for a total of one year of treatment.

Hormone therapy: If the cancer is hormone receptor-positive, hormone therapy with tamoxifen is typically used for 5 years after surgery.

Stage III

This stage includes more advanced tumors (large or growing into nearby skin or muscle) and cancers with spread to many nearby lymph nodes.

Most often, these cancers are treated with **chemo** before **surgery** (neoadjuvant chemo). For HER2-positive tumors, the **targeted drug** trastuzumab is given as well, sometimes along with pertuzumab. This is usually followed by a mastectomy. Most men with this stage need a full axillary lymph node dissection (ALND). Often, radiation therapy is recommended after surgery. Adjuvant **hormone therapy** with tamoxifen is given for at least 5 years if the tumor is hormone receptor-positive. Men with HER2-positive cancers will probably also receive trastuzumab to complete one year of treatment. Adjuvant hormone therapy can typically be taken at the same time as trastuzumab.

Another option for stage III cancers is to treat with surgery first. This usually means a mastectomy with an ALND. Surgery is usually followed by adjuvant chemo. Trastuzumab is given with chemo if the tumor is HER2 positive, and then it is continued to complete one year of treatment. Radiation is recommended after surgery and chemo. Adjuvant hormone therapy is given to men with hormone receptor-positive breast cancers for at least 5 years.

Stage IV (metastatic)

Stage IV cancers have spread beyond the breast and nearby lymph nodes to other

parts of the body. Breast cancer most commonly spreads to the bones, liver, and lungs. As the cancer progresses, it may spread to the brain, but it can affect any organ and tissue.

Systemic (drug) therapy is the main treatment for stage IV breast cancer in men. Depending on many factors, this may be [hormone therapy](#), [chemo](#), [targeted therapy](#), [immunotherapy](#), or some combination of these treatments.

[Radiation therapy](#) and/or [surgery](#) may also be used in certain situations, such as:

- When the breast tumor is causing an open wound in the breast (or chest)
- To treat a small number of metastases in a certain area, such as the brain
- To help prevent bone fractures
- When an area of cancer spread is pressing on the spinal cord
- To treat a blood vessel blockage in the liver
- To relieve pain or other symptoms

If your doctor recommends such local treatments, it is important that you understand their goal, whether it is to try to cure the cancer or to prevent or treat symptoms.

In some cases, regional chemo (where drugs are delivered directly into a certain area, such as the fluid around the brain or into the liver) may be useful as well.

Treatment to relieve symptoms depends on where the cancer has spread. For example, pain from bone metastases may be treated with external beam radiation therapy and/or bisphosphonates or denosumab (Xgeva). For more information, see [Bone Metastases⁴](#).

Advanced [triple-negative breast cancer⁵](#) (TNBC) that makes the PD-L1 protein may be treated first with the immunotherapy drug atezolizumab along with albumin-bound paclitaxel (Abraxane). Another option might be treatment with the immunotherapy drug pembrolizumab (Keytruda) along with chemotherapy. The PD-L1 protein is found in about 1 out of 5 TNBCs.

Advanced cancer that progresses during treatment

Treatment for advanced breast cancer can often shrink or slow the growth of the cancer (sometimes for many years), but after a time it may stop working. Further treatment at this point depends on several factors, including previous treatments, where the cancer is located, and a man's age, general health, and desire to continue getting treatment.

Progression while on hormone therapy: For hormone receptor-positive cancers that

were being treated with hormone therapy, switching to another type of [hormone therapy](#) is sometimes helpful. Another option might be a hormone drug along with a [targeted therapy drug](#). If this isn't helpful, [chemo](#) is usually the next step.

Progression while on chemotherapy: For cancers that are no longer responding to one chemo regimen, trying another may be helpful. Many different drugs and combinations can be used to treat breast cancer. However, each time a cancer progresses during treatment it becomes less likely that further treatment will have an effect.

For breast cancers that are considered [HER2-low](#)⁶ and have spread to distant sites after trying chemotherapy, the antibody-drug conjugate fam-trastuzumab deruxtecan (Enhertu) might be an option.

For advanced hormone receptor-positive, HER2-negative breast cancer or for [triple-negative breast cancer](#)⁷ in which at least 2 other chemo treatments have been tried, the [antibody-drug conjugate](#) sacituzumab govitecan (Trodelvy) might be an option.

Progression while getting HER2 drugs: HER2-positive cancers that no longer respond to trastuzumab may respond to [other drugs that target the HER2 protein](#) (sometimes along with [chemo](#) or [hormone therapy](#) drugs). Some options might include:

- Pertuzumab (Perjeta) with chemo and trastuzumab
- Ado-trastuzumab emtansine (Kadcyla)
- Fam-trastuzumab deruxtecan (Enhertu)
- Margetuximab (Margenza) with chemo
- Lapatinib (Tykerb) and the chemo drug capecitabine
- Lapatinib and an aromatase inhibitor (for hormone receptor-positive cancers)
- Neratinib (Nerlynx) and the chemo drug capecitabine (this combination can be helpful for cancers that have spread to the brain)
- Tucatinib (Tukysa), trastuzumab, and the chemo drug capecitabine (this combination can be helpful for cancers that have spread to the brain)

Because current treatments are very unlikely to cure advanced breast cancer, if you are in otherwise good health, you may want to think about taking part in a [clinical trial](#)⁸ testing newer treatments. You can also read about living with later-stage cancer in [Advanced Cancer, Metastatic Cancer, and Bone Metastasis](#)⁹.

Recurrent cancer

For some men, breast cancer may come back after treatment – sometimes years later. This is called a *recurrence*. **Recurrence can be local (in the same breast or in the surgery scar), regional (in nearby lymph nodes), or in a distant area.** If cancer is found in the opposite breast but nowhere else in the body, it is not a recurrence—it's a new cancer that requires its own treatment.

Treating local recurrence: This includes cancer coming back in the breast or in the chest wall (near the mastectomy scar). If a patient has a local recurrence and no evidence of distant metastases, it might still be cured. Treatment depends on what other treatments have been given already. The treatment for local recurrence may be additional surgery followed by radiation therapy. If the area has already been treated with radiation, it might not be possible to give more radiation to the area without damaging nearby tissues.

Hormone therapy, chemo, trastuzumab, or some combination of these may be used after surgery and/or radiation therapy.

For people with [triple-negative breast cancer¹⁰](#) that has come back locally, cannot be removed with surgery, and makes the PD-L1 protein, immunotherapy with the drug pembrolizumab along with chemotherapy might be an option. If at least 2 other drug regimens have already been tried, the [antibody-drug conjugate](#) sacituzumab govitecan (Trodelvy) might be an option as well.

Treating regional recurrence: When breast cancer comes back in nearby lymph nodes (such as those under the arm or around the collar bone), it is treated by removing those lymph nodes. This may be followed by radiation treatments aimed at the area.

Systemic treatment (such as hormone therapy, chemo, targeted therapy, or some combination of these) may be used after surgery and/or radiation therapy.

Treating distant recurrence: Men who have a recurrence in places such as the bones, lungs, brain, etc., are often treated the same way as those found to have stage IV breast cancer with spread to these organs when they were first diagnosed (see above). The only difference is that treatment may be affected by the previous treatments a man has had.

Recurrent breast cancer can sometimes be hard to treat. If you are in otherwise good health, you may want to think about taking part in a [clinical trial¹¹](#) testing a newer treatment.

If your cancer comes back, see [Understanding Recurrence¹²](#) for more general information on how to manage and cope with this phase of your treatment.

You can also read about treatments for metastatic cancer in [Advanced Cancer, Metastatic Cancer, and Bone Metastasis¹³](#).

Questions to Ask Your Doctor About Breast Cancer in Men

- [When you're told you have breast cancer](#)
- [When deciding on a treatment plan](#)
- [If you need surgery](#)
- [During treatment](#)
- [After treatment](#)

It's important to be able to have frank, open discussions with your cancer care team. They want to answer all of your questions, so that you can make informed treatment and life decisions.

Here are some questions that you can use to help better understand your cancer and your treatment options. Don't be afraid to take notes and tell the doctors or nurses when you don't understand what they're saying. You might want to bring another person with you when you see your doctor and have them take notes to help you remember what was said.

Not all of these questions will apply to you, but they should help get you started. Be sure to write down some questions of your own. For instance, you might want more information about recovery times or you may want to ask about nearby or online support groups where you can talk with other men going through similar situations. You may also want to ask if you qualify for any [clinical trials¹](#).

Keep in mind that doctors aren't the only ones who can give you information. Other health care professionals, such as nurses and social workers, can answer some of your questions. To find out more about speaking with your health care team, see [The Doctor-Patient Relationship²](#).

When you're told you have breast cancer

- Exactly what type of breast cancer do I have?
- How big is the cancer? Where exactly is it?
- Has the cancer spread to my lymph nodes or other organs?
- What's the stage of the cancer? What does that mean?
- Will I need any other tests before we can decide on treatment?
- Do I need to see any other doctors or health professionals?
- What is the hormone receptor status of my cancer? What does this mean?
- What is the HER2 status of my cancer? What does this mean?
- How do these factors affect my treatment options and long-term outlook (prognosis)?
- What are my chances of survival, based on my cancer as you see it?
- Should I think about genetic testing? What would the pros and cons of testing be?
- How do I get a copy of my pathology report?
- If I'm concerned about the costs and insurance coverage for my diagnosis and treatment, who can help me?

When deciding on a treatment plan

- What treatments are appropriate for me? What do you recommend? Why?
- How long will treatment last? What will it involve? Where will it be done?
- What risks or side effects should I expect?
- Should I think about taking part in a clinical trial?
- What should I do to get ready for treatment?
- How much experience do you have treating this type of cancer?
- Should I get a [second opinion³](#)? How do I do that?
- What would the goal of the treatment be?
- How soon do I need to start treatment?
- How will treatment affect my daily activities? Can I still work fulltime?
- Will I lose my hair? If so, what can I do about it?
- What are the chances the cancer will come back (recur) after this treatment?

- What would we do if the treatment doesn't work or if the cancer comes back?
- What if I have transportation problems getting to and from treatment?

If you need surgery

- Is breast-conserving surgery (lumpectomy) an option for me? Why or why not?
- What are the pros and cons of breast-conserving surgery versus mastectomy?
- How many surgeries like mine have you done?
- Will you have to take out lymph nodes? If so, would you advise a sentinel lymph node biopsy? Why or why not?
- What side effects might lymph node removal cause?
- How long will I be in the hospital?
- Will I have stitches or staples at the surgery site? Will there be a drain (tube) coming out of the site?
- How do I care for the surgery site? Will I need someone to help me?
- What will the scar look like?
- Do I need to stop taking any medications or supplements before surgery?
- When should I call your office if I'm having side effects?

During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions may apply to you, but asking the ones that do may be helpful.

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Will I need to change what I eat during treatment?
- Are there any limits on what I can do?
- Can I exercise during treatment? If so, what kind of exercise should I do, and how often?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed?
- Will I need special tests, such as imaging scans or blood tests? How often?

After treatment

- What are the chances my cancer might come back? What will we do if that happens?
- What type of follow-up will I need after treatment?
- Will I need a special diet after treatment?
- Are there any limits on what I can do?
- Am I at risk for lymphedema?
- What can I do to reduce my risk for lymphedema?
- What should I do if I notice swelling in my arm?
- What other symptoms should I watch for? What kind of exercise should I do now?
- What type of follow-up will I need after treatment?
- How often will I need to have follow-up exams, blood tests, or imaging tests?
- How will we know if the cancer has come back? What should I watch for?

After Male Breast Cancer Treatment

Get information about life as a cancer survivor, next steps, and what you can do to help.

Living as a Cancer Survivor

For many people, completing cancer treatment often raises questions about next steps as a survivor.

- [What Happens After Treatment for Breast Cancer in Men?](#)

Cancer Concerns After Treatment

Treatment may remove or destroy the cancer, but it is very common to have questions about cancer coming back or treatment no longer working.

- [Second Cancers After Male Breast Cancer](#)
-

What Happens After Treatment for Breast Cancer in Men?

- [Follow-up care](#)
- [Can I lower my risk of breast cancer progressing or coming back?](#)
- [If the cancer comes back](#)
- [Second cancers after treatment](#)

- [Getting emotional support](#)

For many men with breast cancer, treatment can remove or destroy the cancer. The end of treatment can be both stressful and exciting. You may be relieved to finish treatment, but it's hard not to worry about cancer coming back. This is very common if you've had cancer.

For other people, the cancer may never go away completely. Some people may get regular treatments with chemotherapy, radiation therapy, or other therapies to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful.

Follow-up care

Even after you have completed breast cancer treatment, your doctors will want to watch you closely. It's very important to go to all of your follow-up appointments. During these visits, your doctors will ask if you are having any problems. They may do exams and lab tests or imaging tests to look for signs of cancer or treatment side effects.

Almost any cancer treatment can have [side effects¹](#). Some might only last for a few days or weeks, but others might last a long time. Some side effects might not even show up until years after you have finished treatment. Visits with your doctor are a good time for you to ask questions and talk about any changes or problems you notice or concerns you have. However, if you have additional concerns about your cancer, you do not have to wait until your next scheduled visit. You can call your doctor immediately.

Typical follow-up schedules

Doctor visits: At first, your follow-up doctor visits will probably be scheduled for every few months. The longer you have been free of cancer, the less often the appointments are needed. After 5 years, they are typically done about once a year.

Mammograms: Routine screening mammograms, even after a breast cancer diagnosis in a man, is not common, and it is unclear how helpful they are.

Bone density tests: If you are taking an aromatase inhibitor or a luteinizing hormone-releasing hormone (LHRH) analog, you may be at increased risk for osteoporosis (thinning of the bones). Your doctor may want to monitor your bone health and may consider testing your bone density.

Other tests: Other tests such as blood tumor marker studies, blood tests of liver function, bone scans, and chest x-rays are not a standard part of follow-up. Getting these tests doesn't help someone treated with breast cancer live longer. They will be done (as indicated) if you have symptoms or physical exam findings that suggest that the cancer has recurred. These and other tests may be done as part of evaluating new treatments by [clinical trials](#)².

If symptoms, exams, or tests suggest cancer may have recurred, imaging tests such as a chest x-ray, CT scan, PET scan, MRI scan, bone scan, and/or a biopsy may be done. Your doctor may also measure levels of blood tumor markers such as CA15-3, CEA, or CA27-29. The blood levels of these substances go up in some men if their cancer has spread. They are not elevated in everyone with recurrence, so these tests aren't always helpful. However, if your levels are elevated, they may help your doctor monitor the results of treatment.

Men who have had breast cancer can also still get other types of cancer. Talk to your doctor about genetic testing to see if you have a hereditary cancer syndrome that might put you at a very high risk for other cancers. Male breast cancer survivors also have a normal risk for other types of cancers. Because of this, it's important to follow the [American Cancer Society guidelines for the early detection of cancer](#)³, such as those for colorectal cancer and prostate. To learn more about the risks of second cancers and what you can do about them, see [Second Cancers After Male Breast Cancer](#).

Ask your doctor for a survivorship care plan

Talk with your doctor about developing a survivorship care plan for you. This plan might include:

- A suggested schedule for follow-up exams and tests
- A schedule for other tests you might need in the future, such as early detection (screening) tests for other types of cancer, or tests to look for long-term health effects from your cancer or its treatment
- A list of possible late- or long-term side effects from your treatment, including what to watch for and when you should contact your doctor
- Diet and physical activity suggestions

- Reminders to keep your appointments with your primary care provider (PCP), who will monitor your general health care

Keeping health insurance and copies of your medical records

Even after treatment, it's very important to keep health insurance. Tests and doctor visits cost a lot, and even though no one wants to think about their cancer coming back, this could happen.

At some point after your cancer treatment, you might find yourself seeing a new doctor who doesn't know about your medical history. It's important to keep copies of your medical records to give your new doctor the details of your diagnosis and treatment. Learn more in [Keeping Copies of Important Medical Records⁴](#).

Can I lower my risk of breast cancer progressing or coming back?

If you have (or have had) breast cancer, you probably want to know if there are things you can do (aside from your treatment) that might lower your risk of the cancer growing or coming back, such as getting or staying active, eating a certain type of diet, or taking nutritional supplements.

Research has found that some things that might be helpful, but nearly all of the studies on this topic have been done in women with breast cancer, since breast cancer in men is rare.

Still, doing what you can to stay as healthy as possible is more important than ever after breast cancer treatment. [Controlling your weight, staying active, and eating right⁵](#) may help you lower your risk of your breast cancer coming back, as well as help protect you from other health problems.

Getting to a healthy weight

If you have had breast cancer, getting to and staying at a healthy weight might help lower your risk of the cancer coming back. A lot of research suggests that being overweight or obese (very overweight) raises this risk. It has also been linked with a higher risk of getting [lymphedema⁶](#), as well as a higher risk of dying from breast cancer.

However, there is less research to show whether losing weight during or after treatment can actually lower the risk of breast cancer coming back. This is complicated by the fact that many people gain weight (without trying) during breast cancer treatment, which itself might increase risk.

Of course, for men who are overweight, getting to a healthy weight can also have other health benefits. Getting to a healthy weight might also lower your risk of getting some

other cancers, as well as some other chronic diseases.

Because of the possible health benefits of losing weight, many health care providers now encourage men who are overweight to get to and stay at a healthy weight. Still, it's important to discuss this with your doctor before trying to lose weight, especially if you are still getting treatment or have just finished it. Your health care team can help you create a plan to lose weight safely.

Being physically active

Among female breast cancer survivors, studies have found a consistent link between physical activity and a lower risk of breast cancer coming back and of dying from breast cancer, as well as of dying from any cause. This has not been well studied in men, but it may still apply. Physical activity has also been linked to improvements in quality of life, physical functioning, and fewer [fatigue⁷](#) symptoms.

It's not clear exactly how much activity might be needed, but more seems to be better. More vigorous activity may also be more helpful than less vigorous activity. But further studies are needed to help clarify this.

In the past, breast cancer survivors with **lymphedema** were often advised to avoid certain arm exercises and vigorous activities. But studies have found that such physical activity is safe when done properly. In fact, it might actually lower the risk of lymphedema, or improve lymphedema for someone who already has it.

As with other types of lifestyle changes, it's important to talk with your treatment team before starting a new physical activity program. This will likely include meeting with a physical therapist as well. Your team can help you plan a program that can be both safe and effective for you.

Eating a healthy diet

Most research on possible links between diet and the risk of breast cancer coming back has looked at broad dietary patterns, rather than specific foods. In general, it's not clear if eating any specific type of diet can help lower your risk of breast cancer coming back.

Studies have found that female breast cancer survivors who eat diets high in vegetables, fruits, whole grains, chicken, and fish tend to live longer than those who eat diets that have more refined sugars, fats, red meats (such as beef, pork, and lamb), and processed meats (such as bacon, sausage, luncheon meats, and hot dogs). But it's not clear if this is due to effects on breast cancer or possibly to other health benefits of

eating a healthy diet.

Many people have questions about whether **soy products** are safe to eat after a diagnosis of breast cancer. Soy foods are rich sources of compounds called *isoflavones* that can have estrogen-like properties in the body. Some studies in women have suggested that soy food intake might lower the risk of breast cancer coming back, although more research is needed to confirm this. While eating soy foods doesn't seem to pose a risk, the evidence regarding the effects of taking soy or isoflavone supplements, which often contain much higher levels of these compounds, is not as clear.

While the links between specific types of diets and breast cancer coming back are not certain, there are clearly health benefits to eating well. For example, diets that are rich in plant sources are often an important part of getting to and staying at a healthy weight. Eating a healthy diet can also help lower your risk for some other health problems, such as heart disease and diabetes.

Dietary supplements

Some people want to know if there are any dietary or nutritional supplements they can take to help lower their risk. So far, no dietary supplements (including vitamins, minerals, and herbal products) have been shown to clearly help lower the risk of breast cancer progressing or coming back, in men or women. This doesn't mean that none will help, but it's important to know that none have been proven to do so.

Dietary supplements are not regulated like medicines in the United States – they do not have to be proven effective (or even safe) before being sold, although there are limits on what they're allowed to claim they can do. If you're thinking about taking any type of nutritional supplement, talk to your health care team. They can help you decide which ones you can use safely while avoiding those that might be harmful.

Alcohol

It's clear that alcohol – even as little as a few drinks a week – increases the risk of *getting* breast cancer, at least among women. But whether alcohol affects the risk of breast cancer *coming back* is not as clear. Drinking alcohol can raise the levels of estrogen in the body, which in theory could increase the risk of breast cancer coming back. But there is no strong evidence from studies to support this.

Although there is no specific research in men with breast cancer and alcohol, [alcohol use⁸](#) has been linked with several other types of cancer. It is best not to drink alcohol,

but men who do drink should have no more than 2 drinks a day.

Because this issue is complex, it's important to discuss it with your health care team, taking into account your risk of breast cancer coming back (or getting a new cancer) and your risk of other health issues linked to alcohol use.

If the cancer comes back

If cancer does return, your treatment options will depend on where it comes back, what treatments you've had before, and your current health and preferences. For more information on how recurrent cancer is treated, see [Treatment of Breast Cancer in Men, by Stage⁹](#).

Second cancers after treatment

Men who have had breast cancer can also still get other types of cancer. Men with breast cancer should be offered genetic testing to see if they have a hereditary cancer syndrome and could be at a very high risk for other cancers. They also have a normal risk for other types of cancers. Learn more in [Second Cancers After Male Breast Cancer](#).

Getting emotional support

Some amount of feeling depressed, anxious, or worried is normal when breast cancer is a part of your life. Some people are affected more than others. But everyone can benefit from help and support from other people, whether friends and family, religious groups, support groups, professional counselors, or others. Learn more in [Life After Cancer¹⁰](#).

Second Cancers After Male Breast Cancer

- [Follow-up care for men after breast cancer treatment](#)

Breast cancer survivors can be affected by a number of health problems, but often a major concern is facing cancer again. Cancer that comes back after treatment is called a *recurrence*. But some cancer survivors develop a new, unrelated cancer later. This is called a *second cancer*.

Men who have had breast cancer can get any type of second cancer, but they have a higher increased risk for certain types of cancer, including:

- A second breast cancer (this is different than the first cancer coming back)
- [Small intestine cancer¹](#)
- [Rectal cancer²](#)
- [Pancreas cancer³](#)
- [Prostate cancer⁴](#)
- [Basal and squamous cell skin cancer⁵](#)
- [Myeloid leukemia⁶](#)

For some second cancers, shared genetic risk factors may play a role. For example, men with mutations in the *BRCA2* gene have an increased risk of prostate and pancreas cancer as well as breast cancer. All men with breast cancer meet guidelines for genetic testing and should discuss this with their doctor or see a genetic counselor.

Follow-up care for men after breast cancer treatment

After completing treatment for breast cancer, you should still see your doctor regularly to look for signs the cancer has come back or spread. Experts do not recommend any specific tests to look for second cancers in patients without symptoms. Let your doctor know about any new symptoms or problems, because they could be caused by the cancer coming back or by a new disease or second cancer.

Survivors of breast cancer should follow the [American Cancer Society guidelines for the early detection of cancer⁷](#) and [stay away from tobacco products⁸](#). Smoking increases the risk of many cancers.

To help [maintain good health⁹](#), survivors should also:

- Get to and stay at a healthy weight
- Keep physically active and limit the time you spend sitting or lying down
- Follow a healthy eating pattern that includes plenty of fruits, vegetables, and whole grains, and limits or avoids red and processed meats, sugary drinks, and highly

processed foods

- It's best not to drink [alcohol¹⁰](#). If you do drink, men should have no more than 2 drinks per day

These steps may also lower the risk of some cancers.

See [Second Cancers in Adults¹¹](#) for more information about causes of second cancers.