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About Breast Cancer

Breast Cancer Basics

Get an overview of what breast cancer is and how it forms.

- [What Is Breast Cancer?](#)
- [How Does Breast Cancer Start?](#)

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](#)

Research and Statistics

Find the latest statistics about breast cancer, and advances in research.

- [How Common Is Breast Cancer?](#)
 - [What's New in Breast Cancer Research?](#)
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What Is Breast Cancer?

Breast cancer is a type of cancer that starts in the breast. Cancer starts when cells begin to grow out of control. (To learn more about how cancers start and spread, see [What Is Cancer?](#)¹)

Breast cancer cells usually form a tumor that can often be seen on an x-ray or felt as a lump. Breast cancer occurs almost entirely in women, but [men can get breast cancer](#)², too.

It's important to understand that most breast lumps are benign and not cancer (malignant). Non-cancerous 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 determine if it is benign or malignant (cancer) and if it might affect your future cancer risk. See [Non-cancerous Breast Conditions](#)³ to learn more.

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)
- There are also other types of breast cancer that are less common like phyllodes tumor and angiosarcoma
- A small number of cancers start in other tissues in the breast. These cancers are called [sarcomas](#)⁴ and [lymphomas](#)⁵ 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. See [Breast Cancer Signs and Symptoms](#)⁶ to learn what you should watch for and report to a health care provider. Many breast cancers are also found on screening mammograms, which can detect cancers at an earlier stage, often before they can be felt, and before symptoms develop.

Types of breast cancer

There are many different types of breast cancer and common ones include ductal

carcinoma in situ (DCIS) and invasive carcinoma. Others, like phyllodes tumors and angiosarcoma are less common.

Once a biopsy is done, breast cancer cells are tested for proteins called estrogen receptors, progesterone receptors and HER2. The tumor cells are also closely looked at in the lab to find out what grade it is. The specific proteins found and the tumor grade can help decide treatment options.

To learn more about specific types of breast cancer and tests done on the breast cancer cells, see [Understanding a Breast Cancer Diagnosis](#)⁷.

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 that connects lymph nodes (small bean-shaped collections of immune system cells). The clear fluid inside the lymph vessels, called lymph, 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 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 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. 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, you will need surgery to remove one or more lymph nodes to know whether the cancer has spread.

Still, not all women with cancer cells in their lymph nodes develop metastases, and some women with no cancer cells in their lymph nodes develop metastases later.

Hyperlinks

1. www.cancer.org/cancer/cancer-basics/what-is-cancer.html
2. www.cancer.org/cancer/breast-cancer-in-men.html
3. www.cancer.org/cancer/breast-cancer/non-cancerous-breast-conditions.html
4. www.cancer.org/cancer/soft-tissue-sarcoma.html
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6. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-cancer-signs-and-symptoms.html
7. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis.html

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How Does Breast Cancer Start?

Changes or mutations in DNA can cause normal breast cells to become cancer. Certain DNA changes are passed on from parents (inherited) and can greatly increase your [risk for breast cancer](#)¹. Other 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. Hormones seem to play a role in many cases of breast cancer, but just how this happens is not fully understood.

Inherited versus acquired DNA mutations

Normal breast cells become cancer because of changes (mutations) in DNA. DNA is the chemical in our cells that makes up our [genes](#)². Genes have the instructions for how our cells function.

Some DNA mutations are *inherited* or passed to you from your parents. This means the mutations are in all your cells when you are born. Some mutations can greatly increase the risk of certain cancers. They cause many of the cancers that run in some families and often cause cancer when people are younger.

But most DNA 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.

Mutated DNA can lead to mutated genes. Some genes control when our cells grow, divide into new cells, and die. Changes in these genes can cause the cells to lose normal control and are linked to cancer.

Proto-oncogenes

Proto-oncogenes are genes that help cells grow normally. When a proto-oncogene mutates (changes) or there are too many copies of it, it becomes a "bad" gene that can stay turned on or activated when it's not supposed to be. When this happens, the cell grows out of control and makes more cells that grow out of control. This can lead to cancer. This bad gene is called an [oncogene](#)³.

Think of a cell as a car. For the car to work properly, there need to be ways to control how fast it goes. A proto-oncogene normally functions in a way that's much like a gas pedal. It helps control how and when the cell grows and divides. An oncogene is like a gas pedal that's stuck down, which causes the cell to divide out of control.

Tumor suppression genes

[Tumor suppressor genes](#)⁴ are normal genes that slow down cell division (cell growth),

repair DNA mistakes, or tell cells when to die (a process known as *apoptosis* or *programmed cell death*). When tumor suppressor genes don't work properly, cells can grow out of control, make more cells that grow out of control, and cells don't die when they should, which can lead to cancer.

A tumor suppressor gene is like the brake pedal on a car. It normally keeps the cell from dividing too quickly, just as a brake keeps a car from going too fast. When something goes wrong with the gene, such as a mutation, the “brakes” don’t work and cell division can get out of control.

Inherited gene changes

Certain inherited DNA mutations (changes) can dramatically 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](#)⁵ can identify some women who have inherited mutations in the BRCA1 or BRCA2 tumor suppressor genes (or less commonly in other 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 recommendations](#)⁶ to help find cancer at an earlier, more treatable stage. Since these mutations in BRCA1 and BRCA2 genes are also 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. And 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 DNA mutations related to breast cancer take place in breast cells during a woman's life rather than having been inherited. These acquired mutations of oncogenes and/or tumor suppressor genes may result from other factors, like radiation or cancer-causing chemicals. But 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.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/risk-and-prevention.html
2. www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer/what-are-genes.html
3. www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer/oncogenes-tumor-suppressor-genes.html
4. www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer/oncogenes-tumor-suppressor-genes.html
5. www.cancer.org/cancer/cancer-causes/genetics.html
6. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/american-cancer-society-recommendations-for-the-early-detection-of-breast-cancer.html

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Types of Breast Cancer

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

The type of breast cancer is determined by the specific cells in the breast that are affected. 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 (milk-producing glands).

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 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 affect 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 that accounts for about 15% of all breast cancers. It is a difficult cancer to treat.

Inflammatory breast cancer

Inflammatory breast cancer is an uncommon type of invasive breast cancer. It accounts for about 1% to 5% of all breast cancers.

Less common types of breast cancer

There are other types of breast cancers that affect 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 starts in the breast ducts and spreads to the skin of the nipple and then to the areola (the dark circle around the nipple). It is rare, accounting for only about 1-3% of all cases of breast cancer.

Phyllodes tumor¹

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).

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.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/non-cancerous-breast-conditions/phyllodes-tumors-of-the-breast.html

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Ductal Carcinoma In Situ (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.

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.

See [Treatment for Ductal Carcinoma in Situ \(DCIS\)](#)¹ to learn more.

Hyperlinks

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Invasive Breast Cancer (IDC/ILC)

Breast cancers that have spread into surrounding breast tissue are known as *invasive breast cancer*.

Most breast cancers are invasive, but there are different types of invasive breast cancer. The two most common are **invasive ductal carcinoma** and **invasive lobular carcinoma**.

Inflammatory breast cancer and **triple negative breast cancer** are also types of 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 milk-producing glands (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, about 1 in 5 women with ILC might have cancer in both breasts.

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 seen when they are viewed under the microscope, 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 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.

See [Treating Breast Cancer](#)¹ for details on different types of treatment, as well as common treatment approaches based on the stage or other factors.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/treatment.html

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Triple-negative Breast Cancer

Triple-negative breast cancer (TNBC) accounts for about 10-15% of all breast cancers. The term *triple-negative breast cancer* refers to the fact that the cancer cells don't have [estrogen or progesterone receptors](#)¹ and also don't make too much of the protein called [HER2](#)². (The cells test "negative" on all 3 tests.) These cancers tend to be more common in women younger than age 40, who are African American, or who have a BRCA1 mutation.

Triple-negative breast cancer differs from other types of invasive breast cancer in that they grow and spread faster, have limited treatment options, and a worse prognosis (outcome).

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 features. If the cells do not have estrogen or progesterone receptors, and also do not make too much of the HER2 protein, the cancer is considered to be triple-negative breast cancer.

Survival rates for triple-negative breast cancer

Triple-negative breast cancer (TNBC) is considered an aggressive cancer because it grows 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. The outlook is generally not as good as it is 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 he or she is 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 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](#)⁵ (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

Based on women diagnosed with triple-negative breast cancer between 2010 and 2016.

SEER Stage	5-year Relative Survival Rate
Localized	91%
Regional	65%
Distant	12%
All stages combined	77%

Understanding the numbers

- **Women now being diagnosed with triple negative 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 four to 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](#)⁶, 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 drugs work.

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. It might also be given after surgery to reduce the chances of the cancer coming back. Radiation might also be an option depending on certain features of the tumor.

Because hormone therapy and HER2 drugs are not choices for women with triple negative breast cancer, chemotherapy is often used. In cases where the cancer has spread to other parts of the body (stage IV) chemotherapy and other treatments that can be considered include PARP inhibitors, platinum chemotherapy, or immunotherapy.

For details, see [Treatment of Triple-negative Breast Cancer](#)⁷.

Hyperlinks

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Inflammatory Breast Cancer

Inflammatory breast cancer (IBC) is rare and accounts for only 1% to 5% of all breast cancers. Although it is often a type of invasive ductal carcinoma, it differs from other types of breast cancer in its symptoms, outlook, and treatment. IBC has symptoms of inflammation like swelling and redness, but infection or injury do not cause IBC or the symptoms. IBC symptoms are caused by cancer cells blocking lymph vessels in the skin causing the breast to look "inflamed."

Symptoms include **breast swelling, purple or red color of the skin, and dimpling or thickening of the skin of the breast** so that it may look and feel **like an orange peel**. Often, you might not feel a lump, even if it is there. If you have any of these symptoms, it does not mean that you have IBC, but you should see a doctor right away.

How is inflammatory breast cancer different from other types of breast cancer?

Inflammatory breast cancer differs (IBC) from other types of breast cancer in several 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).
- African American women appear to develop IBC more often than white women.
- IBC is more common among women who are overweight or obese.
- IBC also tends to be more aggressive—it grows and spreads much more quickly—than more common types of breast cancer.

- IBC is always 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 every 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) causes a number of signs and symptoms, most of which develop quickly (within 3-6 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

Tenderness, redness, warmth, and itching are also common symptoms of a breast infection or inflammation, such as mastitis 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.

This 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. 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.

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.

If you have any of these symptoms, it does not mean that you have IBC, but you should

see a doctor right away. If treatment with antibiotics is started, you'll need to let your doctor know if it doesn't help, especially if the symptoms get worse or the affected area gets larger. Ask to see a specialist (like a breast surgeon) or you might want to get a second opinion if you're concerned.

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:

- [Mammogram](#)¹
- [Breast ultrasound](#)²
- [Breast MRI \(magnetic resonance imaging\) scan](#)³

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

Biopsy

Breast cancer is diagnosed by a [biopsy](#)⁴, taking out a small piece of the breast tissue and looking at it in the lab. 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 [grade](#)⁵.

They will also be tested for certain proteins that help decide which treatments will be helpful. Women whose breast cancer cells have [hormone receptors](#)⁶ are likely to benefit from treatment with hormone therapy drugs.

Cancer cells that make too much of a [protein called HER2](#)⁷ or too many copies of the gene for that protein may be treated by certain drugs that target HER2.

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 areas it is **stage IV**.

For more information, read about [breast cancer staging](#)⁸.

Survival rates for inflammatory breast cancer

Inflammatory breast cancer (IBC) is considered an aggressive cancer because it grows 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. The outlook is generally not as good as it is 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 he or she is 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 70%, it means that women who have that cancer are, on average, about 70% 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 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](#)⁹ (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 inflammatory breast cancer

(Based on women diagnosed with inflammatory breast cancer between 2009 and 2016.)

SEER Stage	5-year Relative Survival Rate
Regional	56%
Distant	19%
All SEER Stages	41%

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 four to 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](#)¹⁰, and other factors can also affect your outlook.

*SEER = Surveillance, Epidemiology, and End Results

Treating inflammatory breast cancer

Inflammatory breast cancer (IBC) that has not spread outside the breast or nearby lymph nodes is stage III. In most cases, treatment is chemotherapy first to try to shrink the tumor, followed by surgery to remove the cancer. Radiation is given after surgery, and, in some cases, more treatment may be given after radiation. 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 with drugs that targets HER2.

For details, see [Treatment of Inflammatory Breast Cancer](#)¹¹.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/mammograms.html
2. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-ultrasound.html
3. www.cancer.org/treatment/understanding-your-diagnosis/tests/mri-for-cancer.html
4. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-biopsy.html
5. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-grades.html
6. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-hormone-receptor-status.html
7. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-her2-status.html
8. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/stages-of-breast-cancer.html
9. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/stages-of-breast-cancer.html
10. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-grades.html
11. www.cancer.org/cancer/breast-cancer/treatment/treatment-of-inflammatory-breast-cancer.html

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Last Revised: January 12, 2021

Angiosarcoma of the Breast

Angiosarcoma is rare cancer that starts in the cells that line blood vessels or lymph vessels. Many times it's 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

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. (Lymphedema 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 mammogram](#)¹
- [Breast ultrasound](#)²

- [Breast MRI \(magnetic resonance imaging\) scan](#)³

Angiosarcoma is diagnosed by a [biopsy](#)⁴, removing a small piece of the breast tissue and looking at it 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 [surgery](#)⁵ to remove the breast (mastectomy). The axillary lymph nodes are typically not removed. For more information on sarcomas, see [Soft Tissue Sarcoma](#)⁶.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/mammograms.html
2. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-ultrasound.html
3. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-mri-scans.html
4. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-biopsy.html
5. www.cancer.org/cancer/breast-cancer/treatment/surgery-for-breast-cancer.html
6. www.cancer.org/cancer/soft-tissue-sarcoma.html

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Last Revised: September 20, 2019

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). 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 \(invasive breast cancer\)](#).

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.

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 mammogram](#)¹
- [Breast ultrasound](#)²
- [Breast MRI \(magnetic resonance imaging\) scan](#)³

Paget disease of the breast is diagnosed by a [biopsy](#)⁴, removing a small piece of the breast tissue and looking at it in the lab. In some cases, the entire nipple may be removed. Only a biopsy can tell for sure that it is cancer.

Treating Paget disease of the breast

Paget disease can be treated by removing the entire breast ([mastectomy](#)⁵) or [breast-conserving surgery](#)⁶ (BCS) followed by whole-breast [radiation therapy](#)⁷. 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, the outlook (prognosis) is excellent.

If the cancer has spread (is invasive), the outlook is not as good, and the cancer will be [staged](#)⁸ and treated like any other [invasive ductal carcinoma](#)⁹.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/mammograms.html
2. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-ultrasound.html
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Last Revised: September 20, 2019

How Common Is Breast Cancer?

Breast cancer is the most common cancer in American women, except for skin cancers. 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.

Current year estimates for breast cancer

The American Cancer Society's estimates for breast cancer in the United States for 2021 are:

- About 281,550 new cases of invasive breast cancer will be diagnosed in women.
- About 49,290 new cases of [ductal carcinoma in situ \(DCIS\)](#) will be diagnosed.
- About 43,600 women will die from breast cancer.

Trends in breast cancer incidence

In recent years, incidence rates have increased by 0.5% per year.

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 a woman will die from breast cancer is about 1 in 39 (about 2.6%).

Since 2007, breast cancer death rates have been steady in women younger than 50, but have continued to decrease in older women. From 2013 to 2018, the death rate went down by 1% per year.

These decreases are believed to be the result of finding breast cancer earlier through screening and increased awareness, as well as better treatments.

Breast cancer survivors

At this time there are more than 3.8 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 Cancer](#)¹.

Visit the [American Cancer Society's Cancer Statistics Center](#)² for more key statistics.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-survival-rates.html
2. cancerstatisticscenter.cancer.org/#/

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Last Revised: May 7, 2021

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.

Breast cancer causes

Studies continue to uncover lifestyle factors and habits, as well as inherited genes, that affect breast cancer risk. Here are a few examples:

- Several studies are looking at the effect of exercise, weight gain or loss, and diet on risk.
- Studies on the best use of genetic testing for breast cancer mutations continue.
- Scientists are exploring how common gene variations (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, but when taken together 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.

Reducing breast cancer risk

Researchers continue to look for medicines that might help lower breast cancer risk,

especially women who are at high risk.

- Estrogen blocking drugs are typically used to help treat breast cancer, but some might also help prevent it. Tamoxifen and raloxifene have been used for many years to prevent breast cancer. More recent studies with another class of drugs called aromatase inhibitors (exemestane and anastrozole) have shown that these drugs are also very effective in preventing breast cancer
- Other clinical trials are looking at non-hormonal drugs for breast cancer reduction. Drugs of interest include drugs for diabetes like metformin, drugs used to treat blood or bone marrow disorders, like ruxolitinib, and bexarotene, a drug that treats a specific type of T-cell lymphoma.

This type of research takes many years. It might be some time before meaningful results on any of these compounds are available.

New lab tests

Liquid biopsies

Circulating tumor cells (CTCs) and circulating tumor DNA (ctDNA)

Circulating tumor cells (CTCs) are cancer cells that break away from the tumor and move into the bloodstream. Circulating tumor DNA (ctDNA) is DNA that is released into the bloodstream when cancer cells die. Researchers are investigating tests that measure the amount of CTCs and ctDNA in the blood of women with breast cancer. Identifying and testing the CTCs and ctDNA in the blood is sometimes referred to as a “liquid biopsy.” This type of biopsy may offer an easier and less expensive way to test the tumor than a traditional needle biopsy, which comes with risks such as bleeding and infection.

Some studies have shown that in women with metastatic (Stage 4) breast cancer, a high level of CTCs might predict a poorer outcome compared to women with a lower level.

Although more studies are needed before liquid biopsies could replace the traditional needle biopsy, some potential uses include:

- Looking for new gene changes (mutations) in the tumor cells that might mean the cancer has become resistant to specific treatments (like aromatase inhibitors)

- Determining if a certain drug will work on a tumor before trying it
- Helping decide if a woman's cancer is responding to a certain treatment by noticing a decline in CTC level
- Predicting if the breast cancer will recur (come back) in women with early stage breast cancer

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 Tests.](#)¹

Breast cancer treatment

Chemotherapy

It is known that [chemotherapy](#)² can be helpful for many breast cancer patients. But predicting who will benefit the most or the least is still being studied. Sometimes there are significant side effects (long- and short-term) from chemotherapy, so having tests that can determine who really needs chemo would be useful. Many studies are being done to evaluate different tests that can more accurately tell which patients would benefit from chemo and which patients could avoid it.

Triple-negative breast cancer

Since triple-negative breast cancers (TNBC) cannot be treated with hormone therapy or targeted therapy such as HER2 drugs, the treatment options are limited to chemotherapy. And although TNBC tends to respond well to initial chemotherapy, it tends to come back (recur) more frequently than other breast cancers.

In 2019, the immunotherapy drug Atezolizumab (Tecentriq), was approved along with the chemotherapy drug nab-paclitaxel (Abraxane) for use in women with advanced triple negative breast cancer that makes the PD-L1 protein. Other potential targets for new breast cancer drugs have been identified in recent years. Drugs based on these targets, such as kinase inhibitors, are now being studied to treat triple-negative breast cancers, either by themselves, or in combination with chemotherapy. One example is the AKT inhibitor ipatasertib, which, when used with paclitaxel, shows promising results in treating women with TNBC as the first treatment. Another AKT inhibitor, capivasertib, is also showing encouraging results when given with paclitaxel.

Androgen receptor inhibitors

Breast cancer cells are routinely tested for estrogen and progesterone receptors to help determine treatment options. About 60% of breast cancer cells also have receptors for androgens (male hormones). Initial studies in women with breast cancer show some response when using the antiandrogen bicalutamide, to treat TNBC that has the androgen receptor. Bicalutamide is a drug that has been used to treat prostate cancer for many years. More studies in breast cancer are ongoing.

Supportive care

There are trials looking at different medicines to try and improve memory and [brain symptoms after chemotherapy](#)³. Other studies are evaluating if certain cardiac drugs, known as beta-blockers, can prevent the heart damage sometimes caused by common breast cancer drugs such as doxorubicin and trastuzumab.

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 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 Trials](#)⁴ to learn more.

Hyperlinks

1. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/experimental-breast-imaging.html
2. www.cancer.org/cancer/breast-cancer/treatment/chemotherapy-for-breast-cancer.html
3. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/changes-in-mood-or-thinking/chemo-brain.html
4. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html

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Written by

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(www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

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