

# Breast Cancer

## About 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

Breast cancer occurs almost entirely in women, but rarely to men too.

Cancer starts when cells begin to grow out of control.

**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 Conditions](#) 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.

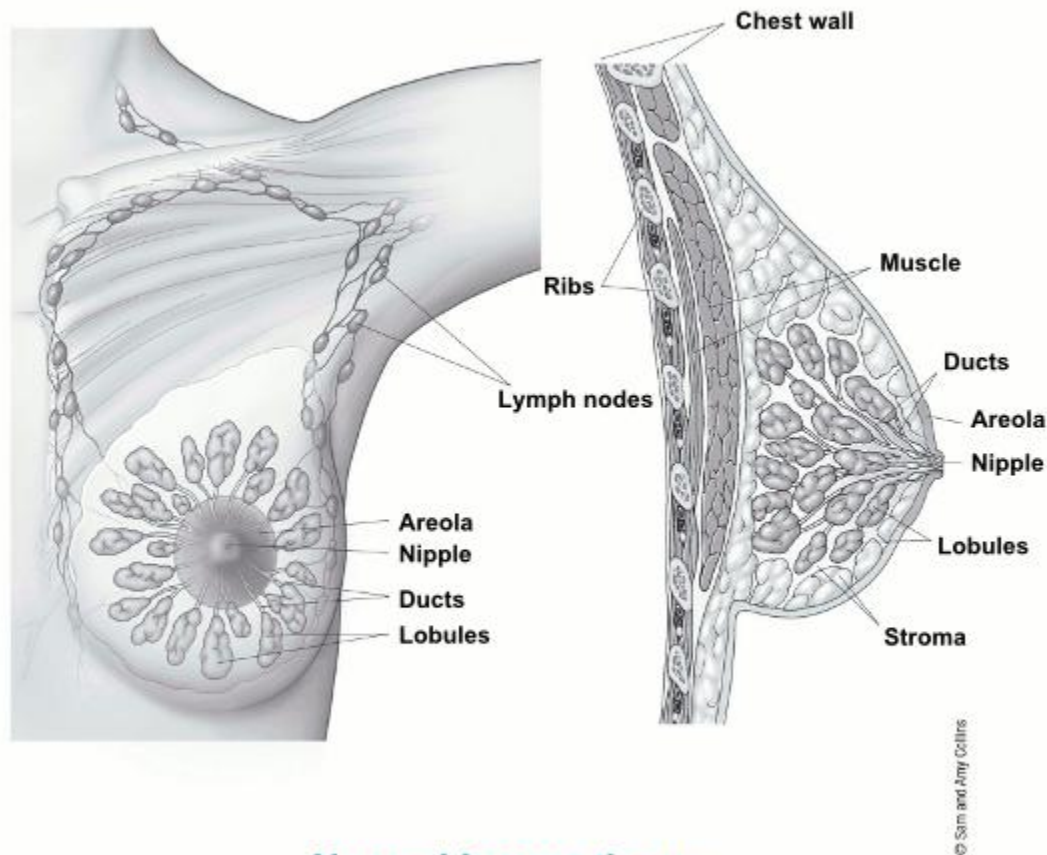
The breast has different parts:

- **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 tumor](#) 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 [sarcomas](#) and [lymphomas](#) and are not really thought of as breast cancers.

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



**Normal breast tissue**

### How breast cancer spreads

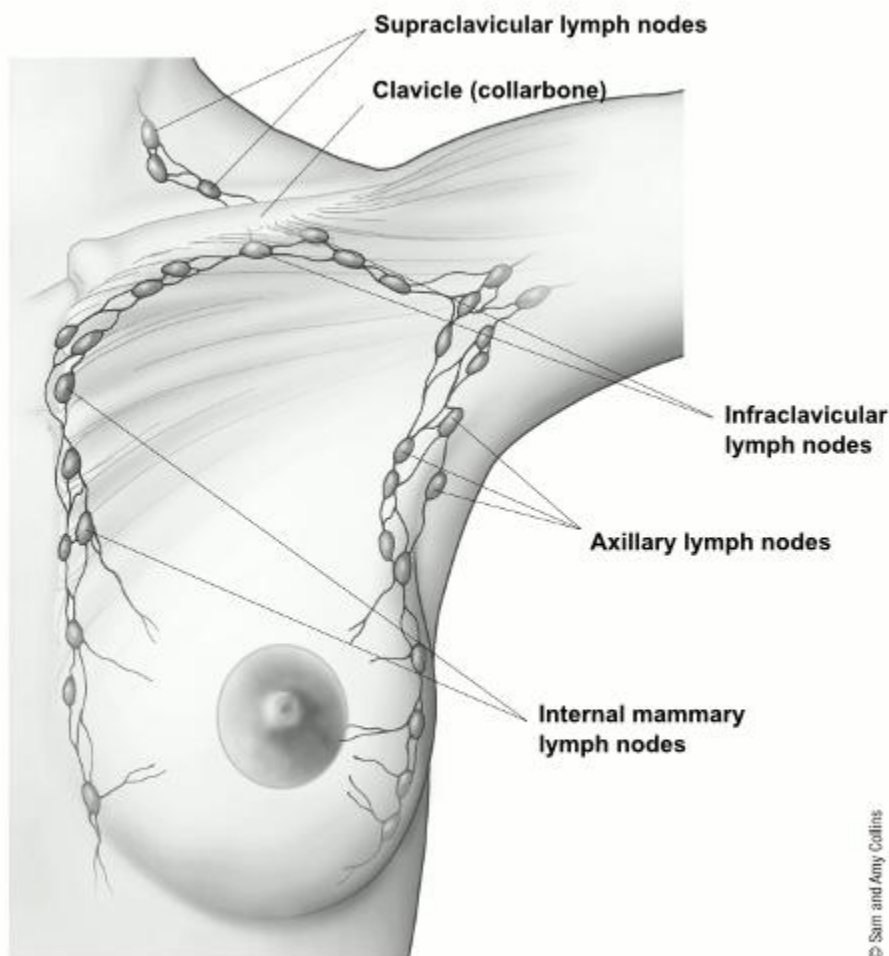
Breast cancer can spread when the cancer cells get into the blood or lymph system and then are carried to other parts of the body.

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.



**Lymph nodes in relation to the breast**

## 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

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.

### Lifestyle Related 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

[Drinking alcohol](#) 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 day.](#)

## Having excess body weight (overweight or obesity)

[Having excess body weight \(overweight or obesity\)](#) 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 have excess body weight 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 have excess body weight (overweight or obesity) **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:

- Having excess body weight after menopause is more strongly linked with an increased risk of [hormone receptor-positive breast cancer](#).
- Some research suggests that having excess body weight before menopause might increase your risk of the less common [triple-negative breast cancer](#).

[The American Cancer Society recommends](#) 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 recommends](#) 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 cancer](#) and osteoporosis, but this must be weighed against the possible harms, especially since there are other ways to prevent and treat osteoporosis, and [screening](#) 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 Risk](#).

## **Risk Factors we can't change**

### **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 mammograms](#).

### **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 \(ADH\)](#)
- [Atypical lobular hyperplasia \(ALH\)](#)

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](#), 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](#).

## **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](#) 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](#).

## **Hormones**

Hormones also seem to play a role in many cases of breast cancer, but just how this happens is not fully understood.

## 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 test](#). 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

[Genes](#) 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 recommendations](#) 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.

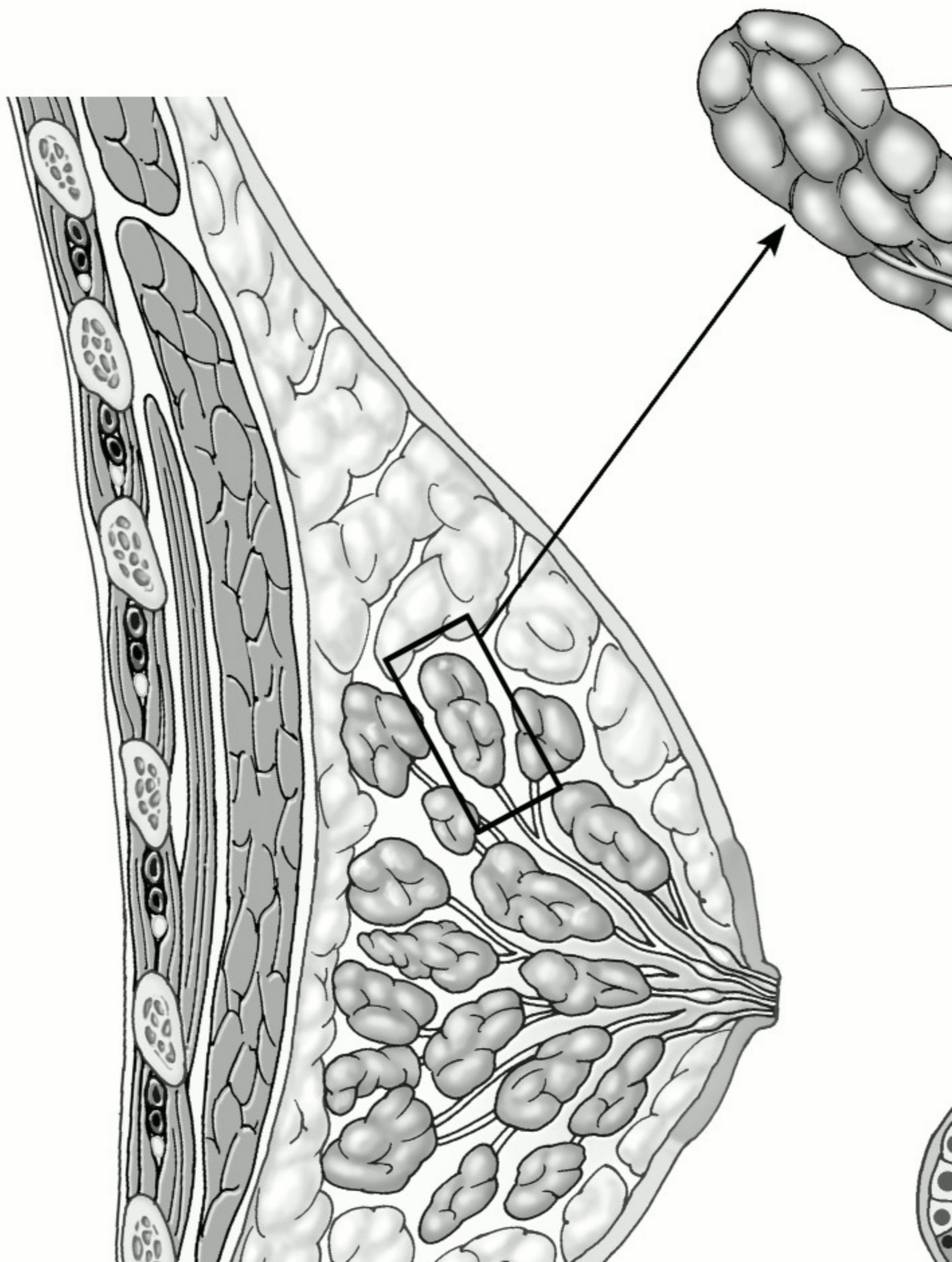
### **Types of Breast cancer**

#### **1) 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**.

**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. Radiation is usually given after BCS. Tamoxifen or an aromatase inhibitor after surgery might also be an option if the DCIS is hormone-receptor positive.

## 2) 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)

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.

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

### **Special types of invasive breast cancers**

#### **I. 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 receptors](#) (ER or PR) and also don't have too much of the [HER2](#) protein. (The cells test "negative" on all 3 tests.)

### **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](#) 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](#), 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 have 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 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 triple-negative breast cancer

These numbers are based on women diagnosed with TNBC between 2015 and 2021.

SEER Stage	5-year Relative Survival Rate
Localized	92%
Regional	67%
Distant	15%
All stages combined	78%

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 grade](#), 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 HER2-targeted 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.

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

## II. 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?

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:

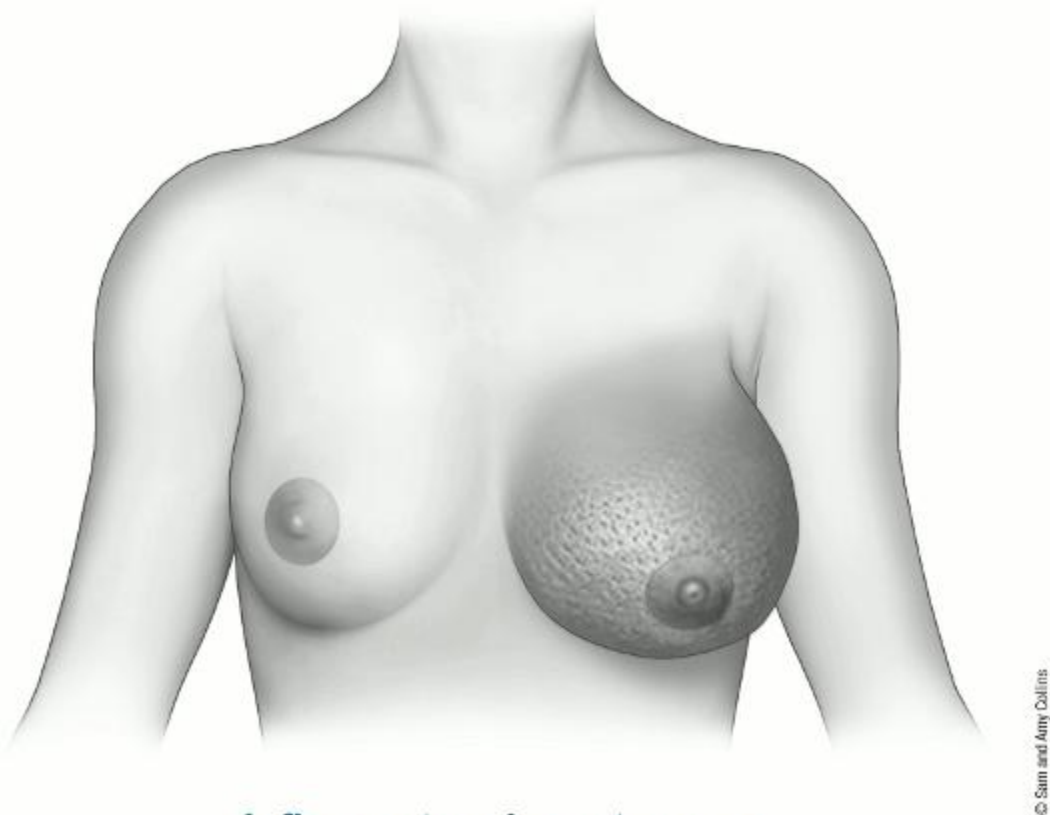
- IBC doesn't look like a typical breast cancer. It often does not cause a breast lump, and it might not show up on a mammogram. This makes it harder to diagnose.
- IBC tends to occur in younger women (younger than 40 years of age).
- Black women appear to develop IBC more often than White women.
- IBC is more common among women who have excess body weight (overweight or obesity).
- 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



### **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 [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.

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:

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

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 [biopsy](#), taking out a small piece of the breast tissue and looking at it in the lab. This might mean a [punch biopsy](#) 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 [grade](#).

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

Cancer cells that make too much of a [protein called HER2](#) 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 proteins](#) 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 staging](#).

## 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.**

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 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 inflammatory breast cancer

These numbers are based on women diagnosed with IBC between 2015 and 2021.

(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	53%
Distant	22%
All SEER Stages	40%

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 grade](#), 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 Cancer](#).

## **Breast Cancer detection and prevention**

### **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 gaining excess body weight 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

[Alcohol](#) 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 menopause](#) 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 [DCIS](#) or [LCIS](#)), 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 as having 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](#) at a younger age
- Possibly adding another screening test, such as [breast MRI](#)

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 Prevention](#).

### **Breast Cancer early detection and Tests**

#### 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**

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 also be soft, round, tender, or even painful.

### **Other symptoms of breast cancer**

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.)

### **Other causes of breast changes**

Benign breast conditions

Many of these symptoms can also be caused by [benign \(non-cancerous\) breast conditions](#). The signs and symptoms of these conditions may include lumps, pain, or discharge from your nipples. Some benign conditions might show up on a mammogram.

Lifetime breast changes

Your breasts may feel different during your period. A pregnancy can also cause changes in your breasts. As you get close to menopause, you may notice lumps or other differences in your breasts. Hormones, like birth control or hormone replacement therapy, can cause breasts to become more dense. Radiologists have a harder time seeing cancer on [mammograms of dense breasts](#).

### **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](#)

X-ray of the breast. Detects early-stage tumors even before a lump is felt

**Example:**

A tiny microcalcification pattern is seen → may indicate early cancer (DCIS).

- [Breast Ultrasound](#)

Sound waves to view inside the breast. Helps distinguish **solid lumps vs fluid-filled cysts**

**Example:**

A lump seen in a mammogram → ultrasound determines it is a benign cyst.

- [Breast MRI](#)

Uses magnetic fields. Very detailed images. Used for high-risk patients or unclear mammogram results

**Example:**

A woman with BRCA gene mutation undergoes MRI every year for safety.

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