

ABOUT BREAST CANCER

What is breast cancer?



Breast cancer occurs when breast tissue cells start to grow out of control. When this happens the cells usually form a tumor. Tumors are often seen on an x-ray or felt as a lump. It's important to get any lump in the breast checked by a doctor or other health care professional, but most breast lumps are not cancer.¹

Breast cancer affects women most of the time, but men can get it too. In the U.S., breast cancer is the most common type of cancer among women, and the second leading cause of cancer death after lung cancer.²

What are the different types of breast cancer?



There are many types of breast cancer. The most common types are called carcinomas.^{1,3,4}



Ductal carcinoma begins in the ducts that carry milk to the nipple. If cancer cells have grown outside of the ducts into other parts of the breast tissue, it's called **invasive ductal carcinoma**. When cancer cells are only in the lining of the ducts and have not spread to other breast tissue, it's called **ductal carcinoma *in situ***. However, ductal carcinoma *in situ* can become invasive breast cancer.



Lobular carcinoma begins in the glands that make breast milk. **Invasive lobular carcinoma** is when the cancer cells have spread to breast tissue that's close by. This type of cancer is more often found in both breasts than are other types of breast cancer.

What is a risk factor?^{4,5}



A risk factor is something that increases a person's chances of getting a disease. But having a risk factor for breast cancer doesn't mean you will get it. Most women have some risk factors but most don't get breast cancer. And some women will get breast cancer without having any risk factors.

What are the risk factors for breast cancer?



Being a woman and getting older are the main risk factors for breast cancer. Most breast cancer occurs in women 50 years of age or older. Other risk factors are:^{4,5}

- A personal history of breast cancer or a history of certain breast diseases that aren't cancer
- A family history of breast cancer – having a mother, sister, or daughter who has had breast cancer
- Having dense breasts – breasts with more connective tissue than fatty tissue
- Inheriting certain gene mutations (changes) such as BRCA1 or BRCA2. These increase your risk of breast and ovarian cancer
- A woman's reproductive history – starting your period at an early age, giving birth for the first time at an older age, and starting menopause at a later age exposes a woman to estrogen longer and may raise breast cancer risk
- Taking hormone therapy for symptoms of menopause
- Having radiation therapy to the breast or chest area before age 30
- Using alcohol
- Being obese



Breast Cancer Screening



Breast cancer that's found early, when it's small and has not spread, can be easier to treat. The best way to find cancer early is through regular screening mammograms. The American Cancer Society (ACS) makes different screening recommendations for women at average risk of breast cancer and for those at high risk of breast cancer. Talk with your doctor about a screening schedule that's right for you based on your risk factors, values, and preferences.

Women at average risk of breast cancer⁶



Women **without** the following risk factors are considered to be at **average risk** of getting breast cancer:

- A personal history of breast cancer
- A strong family history of breast cancer
- A gene mutation known to increase a woman's risk of breast cancer
- Chest radiation therapy before age 30

Screening Guidelines for women at average risk

- **Between ages 40 and 44:** These women have the option to start getting a mammogram every year.
- **Between ages 45 to 54:** These women should get a mammogram every year.
- **Aged 55 and older:** These women can decide between getting a mammogram each year or every other year. Screening should continue as long as they're in good health and are expected to live at least 10 more years.

Note: Clinical breast exams are not recommended as a part of breast cancer screening for women of any age at average risk.⁶

For women at high risk of breast cancer⁶



Women **with** the following risk factors are considered to be at **high risk** of getting breast cancer:

- A 20% to 25% or higher lifetime risk of breast cancer based on a risk assessment
- Testing that shows a BRCA1 or BRCA2 gene mutation
- A first-degree relative (parent, brother, sister, or child) with a BRCA1 or BRCA2 gene mutation, and have not had genetic testing themselves
- Radiation therapy to the chest between the ages of 10 and 30
- Certain syndromes (Li-Fraumeni, Cowden, or Bannayan-Riley-Ruvalcaba) or having a first-degree relative with one of these syndromes

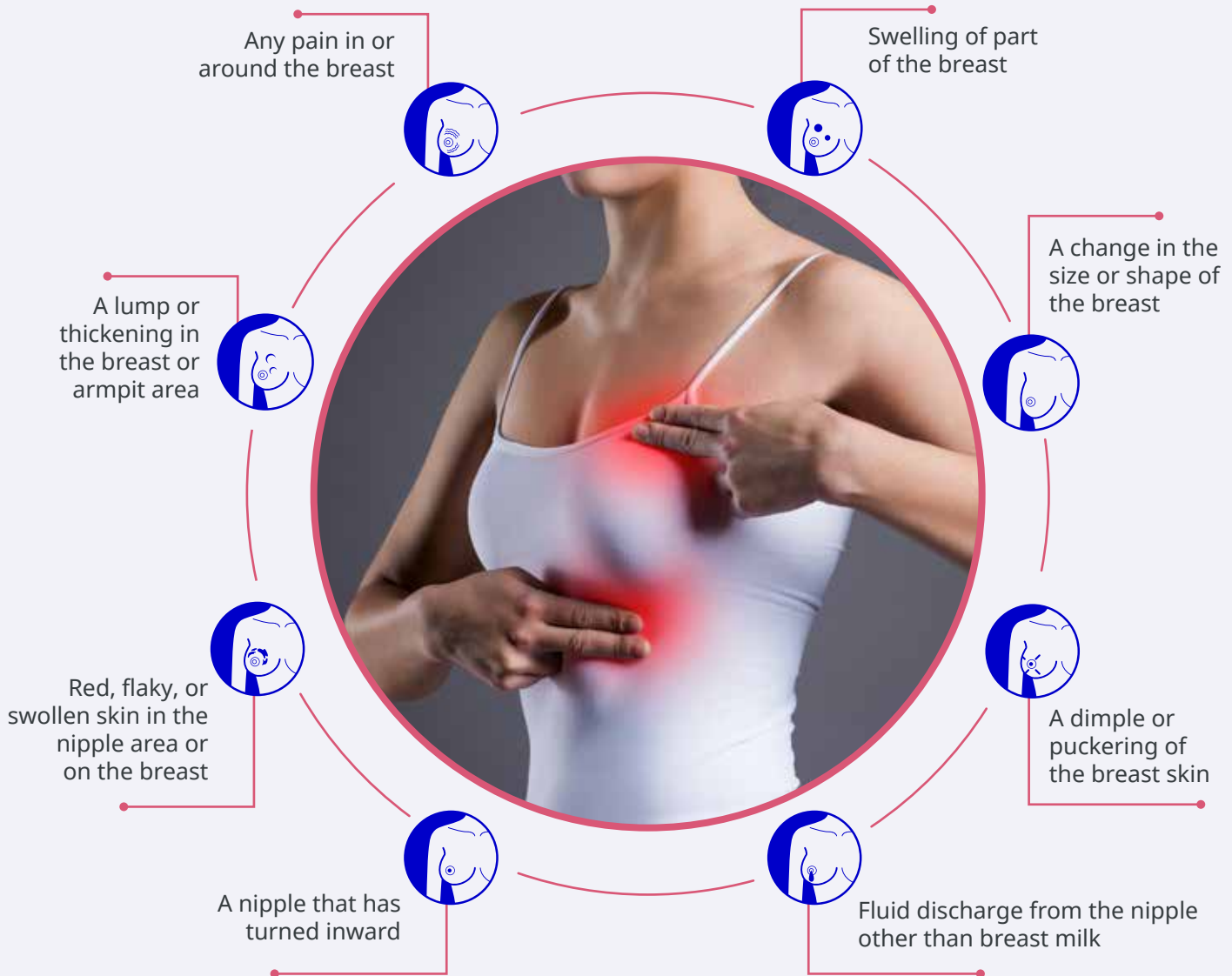
Screening Guidelines for women at high risk

- **At age 30:** Most women at high risk of breast cancer should start getting a mammogram and breast MRI every year, continuing as long as they are in good health. The decision to start should take into account the woman's personal circumstances and preferences.

What are the signs and symptoms of breast cancer?



Some women don't have any symptoms. And not all women have the same symptoms. The signs and symptoms listed here may be caused by breast cancer or another medical condition. If you notice any of these signs or other changes in your breasts, let your doctor know.^{4,7}



How is breast cancer detected and diagnosed?



These are the tests and procedures that may be used to help diagnose breast cancer:^{4,8}



Physical exam and health history. An exam of your body to check your general health and to look for signs of breast disease. During the exam, you may also be asked about your health habits, and past illnesses and treatments you've had.



Diagnostic mammogram. Mammograms are x-rays of the breasts which are used to get pictures of breast tissue. Diagnostic mammograms are more detailed and may be used if a problem is found on a screening mammogram.



Ultrasound exam. This procedure uses sound waves (ultrasound) that bounce off breast tissue to form pictures, called sonograms.



MRI (magnetic resonance imaging). An MRI is a body scan that uses a magnet, radio waves, and a computer to make detailed pictures of both breasts.



Breast biopsy. If a lump in the breast is found, a biopsy may be done. A biopsy is when fluid or tissue is removed and viewed under a microscope to check for signs of cancer.

If cancer is found, other tests are done to learn more about it. This will also help you and your doctor make decisions about your treatment. The results of some tests used to diagnose breast cancer are also used to stage the disease. Other tests you may need include: ⁴



Sentinel lymph node biopsy – A type of biopsy that examines the first lymph nodes where the cancer is likely to spread.



Chest x-ray – A type of x-ray that creates a picture of the organs and bones inside the chest.



Bone scan – A procedure that checks if there are any cancer cells inside the bone.



CT scan or CAT scan (computed tomography) – A procedure that creates a series of detailed pictures of areas inside the body, taken from different angles. Dye may also be used to help organs show up more clearly. The dye can be swallowed or injected into a vein (blood vessel).



PET scan (positron emission tomography scan) – A procedure that's used to find malignant (cancerous) tumor cells in the body.



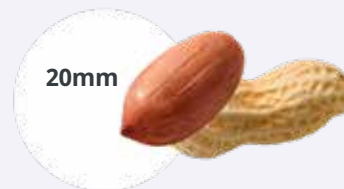


If you've been diagnosed with breast cancer, your doctor will try to find out if it has spread inside the breast or to other parts of your body. This process is called staging. In breast cancer, staging is determined using:⁴

- The TNM system
- The tumor grading system
- Biomarker testing

The TNM system is used to describe the size of the primary (main) tumor and the spread of cancer to nearby lymph nodes or other parts of the body.⁴

- **T is for Tumor.** This looks at the size and location of the main tumor. The size of a tumor is usually measured in millimeters (mm) where, for example, 5 mm is about the size of a pencil eraser and 20 mm is about the size of a peanut.
- **L is for Lymph node.** This looks at the size and location of any lymph nodes. Lymph nodes are removed with surgery and examined under a microscope for signs the cancer has spread.
- **M is for Metastasis.** Metastasis is the spread of cancer to other parts of the body. When breast cancer spreads to other parts of the body – most often the bones, liver, lungs, or brain – it's called metastatic breast cancer.



Millimeters (mm)
10mm
0 1 2
Centimeters (cm)



The tumor grading system is used to describe how quickly the cancer is likely to grow or spread. Low-grade cancer cells look more like normal cells and tend to grow and spread more slowly than high-grade cancer cells.⁴

Biomarker status testing is done to determine whether the breast cancer cells have certain receptors (biomarkers) that attach to the hormones estrogen and progesterone. While these hormones are needed for healthy breast cells, they can also cause some cancer cells to grow and divide. To check for these biomarkers, samples of tissue are removed during a biopsy or surgery. The samples are then tested to see if the breast cancer cells have estrogen or progesterone receptors.

Breast cancer biomarker testing includes:⁴

- **Estrogen receptor (ER).** If the breast cancer cells have estrogen receptors, the cancer is ER positive (ER+). If they don't have estrogen receptors, the cancer is called ER negative (ER-).
- **Progesterone receptor (PR).** Breast cancer cells that have progesterone receptors are PR positive (PR+). If they don't have progesterone receptors, the cancer is PR negative (PR-).
- **Human epidermal growth factor type 2 receptor (HER2).** If breast cancer cells have more than normal amounts of HER2 receptors on their surface, the cancer is HER2 positive (HER2+). If the breast cancer cells have a normal amount of HER2 receptors on their surface, the cancer is HER2 negative (HER2-). HER2+ breast cancer tends to grow and divide faster than HER2-.

Breast cancer may also be described as triple positive or triple negative.⁴

- **Triple positive** = Breast cancer cells that are ER+, PR+, and HER2+.
- **Triple negative** = Breast cancer cells that are ER-, PR-, and HER2-.



Below are the general features of each breast cancer stage. As a rule, lower numbers mean the cancer has spread less, and higher numbers mean it has spread more. The lower subcategories within each stage also mean a lower stage. For example, stage A is lower than stages B or C. Your doctor will also consider the tumor grade and results from biomarker testing when determining stage. If you have any questions about the staging of your cancer, let your doctor know.⁹

Stage 0

This stage is non-invasive cancer, such as ductal carcinoma in situ (DCIS). In stage 0, there are no signs of cancer cells or abnormal non-cancer cells breaking out from the part of the breast where they started. There are also no signs of cancer cells invading normal tissue.⁹

Stage I

This is invasive breast cancer, meaning cancer cells are breaking through from where the cancer started. They are also invading normal breast tissue. Stage I is divided into subcategories IA and IB.⁹

IA: The tumor is up to 2 centimeters (cm) in size and hasn't spread outside the breast (no lymph nodes are involved).

IB:

- There is no tumor in the breast, but small groups of cancer cells between 0.2 and 2 millimeters (mm) in size are present in the lymph nodes

OR

- There is a tumor in the breast no larger than 2 cm in size and there are small groups of cancer cells between 0.2 and 2 mm in size in the lymph nodes

Stage II

This stage of invasive breast cancer is divided into subcategories IIA and IIB.⁹

In general, in stage **IIA**:

- There is no tumor in the breast, but cancer larger than 2 mm in size is found in 1 to 3 lymph nodes under the arm (**axillary lymph nodes**) or in lymph nodes near the breastbone

OR

- The tumor is 2 cm in size or smaller and has spread to axillary lymph nodes

OR

- The tumor is between 2 and 5 cm in size and hasn't spread to axillary lymph nodes

In general, in stage **IIB**:

- The tumor is between 2 and 5 cm in size and small groups of cancer cells between 0.2 mm and 2 mm in size are found in the lymph nodes

OR

- The tumor is between 2 and 5 cm in size and has spread to 1 to 3 axillary lymph nodes or to lymph nodes near the breastbone

OR

- The tumor is larger than 5 cm in size and hasn't spread to any axillary lymph nodes





Stage III

This stage of invasive breast cancer is divided into subcategories IIIA, IIIB, and IIIC:⁹

In general, in stage **IIIA**:

- There is no tumor in the breast, or the tumor may be any size. Cancer cells are found in 4 to 9 axillary lymph nodes or in lymph nodes near the breastbone

OR

- The tumor is larger than 5 cm in size and small groups of cancer cells between 0.2 mm and 2 mm in size are found in the lymph nodes

OR

- The tumor is larger than 5 cm in size and cancer has spread to 1 to 3 axillary lymph nodes or to lymph nodes near the breastbone

In general, in stage **IIIB**:

- The tumor may be any size, and it has spread to the chest wall and/or the skin of the breast causing swelling or an ulcer

AND

- It may have spread to up to 9 axillary lymph nodes or may have spread to lymph nodes near the breastbone
- Inflammatory breast cancer – breasts that are red and swollen, and cancer has spread to lymph nodes and may be found in the skin is considered at least stage IIIB

In general, in stage **IIIC**:

- There is no tumor in the breast or if there is one, it's any size and may have spread to the chest wall or skin of the breast

AND

- Cancer has spread to 10 or more axillary lymph nodes

OR

- Cancer has spread to lymph nodes above or below the collarbone

OR

- Cancer has spread to axillary lymph nodes or to lymph nodes near the breastbone

Stage IV

This stage is invasive breast cancer that has spread beyond the breast and lymph nodes to other parts of the body such as the lungs, skin, bones, liver, or brain. Stage IV is also described as advanced or metastatic cancer.⁹

Relative Survival Rates by Breast Cancer Stage^{10,11}



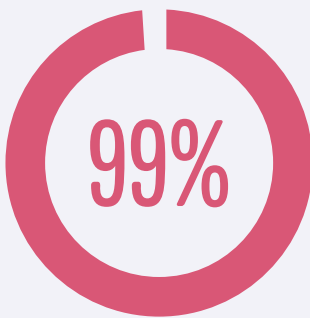
A relative survival rate compares women with the same type and stage of breast cancer to women in the overall population. The statistics are based on large groups of people, so they can't be used to predict what will happen to any individual woman that gets breast cancer. The reason is that no two women are exactly alike, and treatment and responses to treatment can vary widely.

These statistics are from a database maintained by the National Cancer Institute (NCI). It tracks 5-year relative survival rates for breast cancer in the U.S. based on

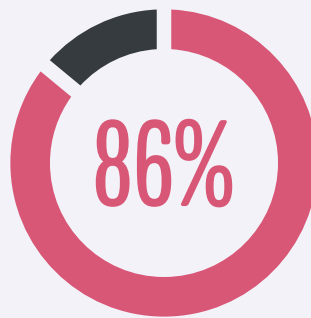
how far the cancer has spread. The database doesn't group cancers by the TNM stages (stage 0, stage I, stage II, etc.). Instead, it groups cancers into stages as follows:

- **Localized:** No sign the cancer has spread outside of the breast
- **Regional:** Cancer has spread outside the breast to nearby structures or lymph nodes
- **Distant:** The cancer has spread to distant parts of the body such as the lungs or liver

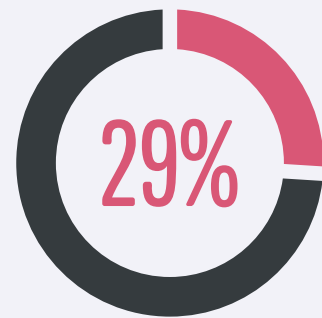
Breast Cancer: 5-Year Relative Survival



Localized



Regional



Distant

SEER 18, 2011-2017, All Races, Females by SEER Summary Stage 2000

What do these percentages mean?



For example, the 5-year relative survival rate for localized breast cancer is 99%. This means women who have localized breast cancer are, on average, about 99% as likely as women who don't have that cancer to live for at least 5 years after being diagnosed.

Once your breast cancer stage and other factors have been determined, it will help you and your doctor:



Figure out your prognosis (chance of recovery)



Make decisions about a treatment plan that's best for you



Determine if certain clinical trials may be an option for you

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