

cancer.org | 1.800.227.2345

Understanding a Breast Cancer

- Breast Cancer Stages
- Breast Cancer Survival Rates

Questions to Ask About Your Breast Cancer

You can take an active role in your breast cancer care by learning about your cancer and its treatment and by asking questions. Get a list of key questions here.

• Questions to Ask Your Doctor About Breast Cancer

Connect with a breast cancer survivor

Reach To Recovery

The American Cancer Society Reach To Recovery® program connects people facing breast cancer – from diagnosis through survivorship – with trained volunteers who are breast cancer survivors. Our volunteers provide one-on-one support through our website and mobile app to help those facing breast cancer cope with diagnosis, treatment, side effects, and more.

Breast Cancer Grade

- What is a breast cancer's grade?
- Grading invasive breast cancer cells
- Grading ductal carcinoma in situ (DCIS)

Knowing a breast cancer's grade is important to understand how fast it's likely to grow and spread.

What is a breast cancer's grade?

Cancer cells are given a **grade** when they are removed from the breast and checked in the lab. The grade is based on how much the cancer cells look like normal cells. The grade is used to help predict your outcome (prognosis) and to help figure out what treatments might work best.

A **low grade number (grade 1)** usually means the cancer is slower-growing and less likely to spread.

A **high grade number (grade 3)** means a faster-growing cancer that's more likely to spread.

An intermediate grade number (grade 2) means the cancer is growing faster than a

Last Revised: November 8, 2021

Breast Cancer Ploidy and Cell Proliferation

- What is ploidy and what does it mean?
- What is cell proliferation?

Finding out more information about the \underline{DNA}^1 in the breast cancer cells can help predict how fast the cancer cells are dividing and growing.

What is ploidy and what does it mean?

The **ploidy** of cancer cells refers to the amount of DNA they contain.

- If there's a normal amount of DNA in the cells, they are said to be **diploid**. These cancers tend to grow and spread more slowly.
- If the amount of DNA is abnormal, then the cells are called **aneuploid**. These cancers tend to be more aggressive. They also tend to grow and spread faster.

Tests of ploidy may help figure out long-term outcomes, but they rarely change treatment and are considered optional. They are not usually recommended as part of a routine breast cancer work-up.

What is cell proliferation?

Cell proliferation is how quickly a cancer cell copies its DNA and divides into 2 cells. If the cancer cells are dividing more rapi6p8q, g /F2 1tp94 S182 gs ()Tj igs w a 5e amhtp0g-ter11-0 0 rg

of cells in a sample that are copying their DNA as it gets ready to divide into 2 new cells.

If the S-phase fraction or Ki-67 labeling index is high, it means that the cancer cells are dividing more rapidly.

Hyperlinks

1. www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html

References

Duffy MJ, Harbeck N, Nap M, Molina R, Nicolini A, Senkus E, Cardoso F. Clinical use of biomarkers in breast cancer: Updated guidelines from the European Group on Tumor Markers (EGTM). *Eur J Cancer*. 2017;75:284-298.

Harris L, Fritsche H, Mennel R, et al. American Society of Clinical Oncology 2007 update of recommendations for the use of tumor markers in breast cancer. *J Clin Oncol.* 2007;25(33):5287-5312. doi:10.1200/JCO.2007.14.2364.

Jagsi R, King TA, Lehman C, Morrow M, Harris JR, Burstein HJ. Chapter 79: Malignant Tumors of the Breast. In: DeVita VT, Lawrence TS, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Last Revised: November 8, 2021

Breast Cancer Hormone Receptor Status

- What are estrogen and progesterone receptors?
- Why is knowing hormone receptor status important?
- How are breast tumors tested for hormone receptors?

• What do the hormone receptor test results mean?

Breast cancer cells taken out during a <u>biopsy</u>¹ or <u>surgery</u>² will be tested to see if they have certain proteins that are estrogen or progesterone receptors. When the hormones estrogen and progesterone attach to these receptors, they stimulate the cancer to grow. Cancers are called **hormone receptor-positive** or **hormone receptor-negative** based on whether or not they have these receptors (proteins). Knowing the hormone receptor status is important in deciding treatment options. Ask your doctor about your hormone receptor status and what it means for you.

What are estrogen and progesterone receptors?

Receptors are proteins in or on cells that can attach to certain substances in the blood. Normal breast cells and some breast cancer cells have receptors that attach to the hormones estrogen and progesterone, and need these hormones for the cells to grow.

Breast cancer cells may have one, both, or none of these receptors.

- ER-positive: Breast cancers that have estrogen receptors are called ER-positive (or ER+) cancers.
- **PR-positive**: Breast cancers with progesterone receptors are called PR-positive (or **PR+**) cancers.
- Hormone receptor-positive: If the cancer cell has one or both of the receptors above, the term hormone-receptive positive (also called hormone-positive or HR+) breast cancer may be used.
- Hormone receptor-negative: If the cancer cell does not have the estrogen or the progesterone receptor, it's called hormone-receptor negative (also called hormone-negative or HR-).

Keeping the hormones estrogen and progesterone from attaching to the receptors can help keep the cancer from growing and spreading. There are <u>drugs that can be used to do this³</u>.

Why is knowing hormone receptor status important?

Knowing the hormone receptor status of your cancer helps doctors decide how to treat it. If your cancer has one or both of these hormone receptors, hormone therapy drugs can be used to either lower estrogen levels or stop estrogen from acting on breast cancer cells. This kind of treatment is helpful for hormone receptor-positive breast cancers, but it doesn't work on tumors that are hormone receptor-negative (both ERand PR-negative).

All invasive breast cancers should be tested for both of these hormone receptors either on the biopsy sample or when the tumor is removed with surgery. About 3 of 4 breast cancers have at least one of these receptors. This percentage is higher in older women than in younger women. DCIS should also be checked for hormone receptors.

How are breast tumors tested for hormone receptors?

A test called an **immunohistochemistry (IHC) test** is used most often to find out if cancer cells have estrogen and progesterone receptors. The test results will help guide you and your cancer care team in making the best treatment decisions.

What do the hormone receptor test results mean?

Test results will give you your hormone receptor status. It will say a tumor is hormone receptor-positive if at least 1% of the cells tested have estrogen and/or progesterone receptors. Otherwise, the test will say the tumor is hormone receptor-negative.

Hormone receptor-positive (or hormone-positive) breast cancer cells have either estrogen (ER) or progesterone (PR) receptors or both. These breast cancers can be treated with hormone therapy drugs that lower estrogen levels or block estrogen receptors. Hormone receptor-positive cancers tend to grow more slowly than those that are hormone receptor-negative. Women with hormone receptor-positive cancers tend to have a better outlook in the short-term, but these cancers can sometimes come back many years after treatment.

Hormone receptor-negative (or hormone-negative) breast cancers have no estrogen or progesterone receptors. Treatment with hormone therapy drugs is not helpful for these cancers. These cancers tend to grow faster than hormone receptor-positive cancers. If they come back after treatment, it's often in the first few years. Hormone receptor-negative cancers are more common in women who have not yet gone through menopause.

Triple-negative breast cancer cells don't have estrogen or progesterone receptors and also don't make any or too much of the protein called <u>HER2</u>. These cancers tend to be more common in women younger than 40 years of age, who are Black, or who have a mutation in the *BRCA1* gene. Triple-negative breast cancers grow and spread faster than most other types of breast cancer. Because the cancer cells don't have hormone

https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf on August 31, 2021.

Hammond MEH. Hormone receptors in breast cancer: Clinical utility and guideline recommendations to improve test accuracy. In Vora SR, ed. *UpToDate*. Waltham, Mass.: UpToDate, 2021. https://www.uptodate.com. Last updated August 16, 2021. Accessed August 31, 2021.

Pritchard KI. Adjuvant endocrine therapy for postmenopausal women with hormone receptor-positive breast cancer. In Vora SR, ed. *UpToDate*. Waltham, Mass.: UpToDate, 2021. https://www.uptodate.com. Last updated August 13, 2021. Accessed August 31, 2021.

Rimawi MF and Osborne CK. Chapter 43: Adjuvant Systemic Therapy: Endocrine Therapy. In: Harris JR, Lippman ME, Morrow M, Osborne CK, eds. *Diseases of the Breast*. 5th ed. Philadelphia: Wolters Kluwer Health; 2014.

Stearns V and Davidson NE. Chapter 45: Adjuvant Chemo Endocrine Therapy. In: Harris JR, Lippman ME, Morrow M, Osborne CK, eds. *Diseases of the Breast*. 5th ed. Philadelphia: Wolters Kluwer Health; 2014.

Last Revised: November 8, 2021

Breast Cancer HER2 Status

- What is HER2 and what does it mean?
- How are breast tumors tested for HER2?

and drugs that target HER2 are not helpful in treating these cancers. See <u>Triple-negative Breast Cancer⁵</u> to learn more.

Triple-positive breast tumors are HER2-positive, ER-positive, and PR-positive. These cancers are treated with hormone drugs as well as drugs that target HER2.

Hyperlinks

- 1. <u>www.cancer.org/cancer/types/breast-cancer/treatment/targeted-therapy-for-breast-cancer.html</u>
- 2. www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests.html
- 3. <u>www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-</u> <u>tests/understanding-your-pathology-report/breast-pathology/breast-cancer-</u> <u>pathology.html</u>
- 4. <u>www.cancer.org/cancer/types/breast-cancer/treatment/targeted-therapy-for-breast-cancer.html</u>
- 5. <u>www.cancer.org/cancer/types/breast-cancer/about/types-of-breast-cancer/triple-negative.html</u>

References

Henry NL, Shah PD, Haider I, Freer PE, Jagsi R, Sabel MS. Chapter 88: Cancer of the Breast. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

Jagsi R, King TA, Lehman C, Morrow M, Harris JR, Burstein HJ. Chapter 79: Malignant Tumors of the Breast. In: DeVita VT, Lawrence TS, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Comprehensive Cancer Network (NCCN). Practice Guidelines in Oncology: Breast Cancer. Version 7.2021 – August 23, 2021. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf on August 31, 2021.

Yamauchi H and Bleiweiss IJ. HER2 and predicting response to therapy in breast cancer. In Vora SR, ed. *UpToDate*. Waltham, Mass.: UpToDate, 2021. https://www.uptodate.com. Last updated May 19, 2021. Accessed August 31, 2021.

Wolff AC, Hammond MEH, Allison KH, Harvey BE, Mangu PB, Bartlett JMS et al.

Human Epidermal Growth Factor Receptor 2 Testing in Breast Cancer: American Society of Clinical Oncology/College of American Pathologists Clinical Practice Guideline Focused Update. *J Clin Oncol.* 2018;36(20):2105-2122.

Last Revised: August 25, 2022

Breast Cancer Gene Expression Tests

- What do the test results mean?
- Testing options

Gene expression tests are a form of <u>personalized medicine</u>¹ - a way to learn more about your cancer and tailor your treatment.

These tests are done on breast cancer cells after surgery or biopsy to look at the patterns of a number of different genes. This process or test is sometimes called **gene expression profiling**.

What do the test results mean?

The patterns found can help predict if certain early-stage breast cancers are likely to come back after initial treatment.

Some gene expression testing/profiling can help predict which women will most likely benefit from <u>chemotherapy</u>² after breast surgery (adjuvant chemotherapy.) <u>Hormone</u> <u>therapy</u>³ is a standard treatment for hormone receptor-positive breast cancers, but it's not always clear when to use chemotherapy. These tests can help guide that decision. Still, these tests cannot tell any one woman for certain if her cancer will come back with or without chemotherapy.

These tests continue to be studied in large <u>clinical trials</u>⁴ to better understand how and when to best use them. In the meantime, ask your doctor if these tests might be useful for you.

Testing options

The **Oncotype DX, MammaPrint, and Prosigna** are examples of tests that look at different sets of breast cancer genes to see if chemotherapy is needed to help reduce the risk of cancer coming back (recurrence). More tests are in development. The type of test that's used will depend on your situation. Keep in mind that these tests are used for early-stage cancers, and testing isn't needed in all cases. For example, if breast cancer is advanced, it might be clear that chemotherapy is needed, even without gene expression testing.

Oncotype DX

The Oncotype DX test is used for stage I, II or IIIa

For women age 50 or younger that have cancer in the lymph nodes:

- A low score (0-25) means a lower risk of recurrence, but women in this group might have a benefit from adding chemotherapy to hormone therapy. Another option might be <u>ovarian suppression along with tamoxifen or an aromatase</u> inhibitor⁶.
- A high score (26-100) means a higher risk of recurrence. Women in this group are more likely to benefit from the addition of chemotherapy to hormone therapy to help lower the chance of the cancer coming back.

MammaPrint

The MammaPrint test can be used to help determine how likely breast cancers are to recur in a distant part of the body after treatment. It can be used for any type of invasive breast cancer that's 5cm (about 2 inches) or smaller and has spread to no more than 3 lymph nodes. This test can be done regardless of a woman's age or the cancer's hormone or HER2 status.

The test looks at 70 different genes to determine if the cancer is at low risk or high risk of coming back (recurring) in the next 10 years. The test results come back as either "low risk" or "high risk." This test is also being studied as a way to determine whether certain women might benefit from chemotherapy.

Prosigna

The Prosigna test can be used to predict the risk of recurrence in the next 10 years in women who have gone through menopause (postmenopausal) and whose invasive breast cancers are hormone receptor-positive and HER2-negative. It can be used to test early-stage cancers that have not spread to the lymph nodes, or early-stage cancers with no more than 3 positive lymph nodes.

The test looks at 50 genes and classifies the results as low, intermediate, or high risk.

Breast Cancer Index

The Breast Cancer Index test is done on your tumor sample from when you are first diagnosed. It can be used to predict the risk of recurrence in the 5 to 10 years after diagnosis in women whose invasive breast cancers are hormone receptor-positive and

have not spread to nearby lymph nodes or have not spread to more than 3 lymph nodes. It can also help predict who might benefit from hormone therapy for longer than 5 years.

The test looks at 11 genes and classifies the results as low or high risk.

Hyperlinks

- 1. <u>www.cancer.org/cancer/managing-cancer/treatment-types/precision-medicine.html</u>
- 2. <u>www.cancer.org/cancer/types/breast-cancer/treatment/chemotherapy-for-breast-cancer.html</u>
- 3. <u>www.cancer.org/cancer/types/breast-cancer/treatment/hormone-therapy-for-breast-cancer.html</u>
- 4. <u>www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-</u> <u>trials.html</u>
- 5. <u>www.cancer.org/cancer/types/breast-cancer/about/types-of-breast-cancer/dcis.html</u>
- 6. <u>www.cancer.org/cancer/types/breast-cancer/treatment/hormone-therapy-for-breast-cancer.html</u>

References

Cardoso F, van't Veer LJ, Bogaerts J, Slaets L, Viale G, Delaloge S et al. 70-Gene Signature as an Aid to Treatment Decisions in Early-Stage Breast Cancer. *N Engl J Med*. 2016;375(8):717-29.

Foukakis T, and Bergh J, and Hurvitz SA. Deciding when to use adjuvant chemotherapy for hormone receptor-positive, HER2-negative breast cancer. In Vora SR, ed. *UpToDate*. Waltham, Mass.: UpToDate, 2021. https://www.uptodate.com. Last updated August 17, 2021. Accessed September 14, 2021.

Gnant M, Filipits M, Dubsky P, et al. Predicting risk for late metastasis: The PAM50 risk of recurrence (ROR) score after 5 years of endocrine therapy in postmenopausal women with HR+ early breast cancer: A study on 1,478 patients for the ABCSG-8 trial. *Ann Oncol.* 2013; 24(Suppl 3): iii29-iii37.

Harris LN, Ismaila N, McShane LM, et al. Use of Biomarkers to Guide Decisions on Adjuvant Systemic Therapy for Women With Early-Stage Invasive Breast Cancer: American Society of Clinical Oncology Clinical Practice Guideline. *J Clin Oncol.* 2016;34(10):1134–1150.

Knauer M, Mook S, Rutgers EJ, Bender RA, Hauptmann M, van de Vijver MJ et al. The predictive value of the 70-gene signature for adjuvant chemotherapy in early breast cancer. *Breast Cancer Res Treat.* 2010 Apr;120(3):655-61.

Krop I, Ismaila N, Andre F, et al. Use of Biomarkers to Guide Decisions on Adjuvant Systemic Therapy for Women With Early-Stage Invasive Breast Cancer: American Society of Clinical Oncology Clinical Practice Guideline Focused Update. *J Clin Oncol.* 2017;35(24):2838–2847.

National Comprehensive Cancer Network (NCCN). Practice Guidelines in Oncology: Breast Cancer. Version 8.2021. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf on Sept. 14, 2021.

Paik, S. Development and Clinical Utility of a 21-Gene Recurrence Score Prognostic Assay in Patients with Early Breast Cancer Treated with Tamoxifen. *The Oncologist*. 2007;12(6): 631-635.

Sparano JA, Gray RJ, Makower DF, Pritchard KI, Albain DF, Hayes DF, et al. Adjuvant chemotherapy guided by a 21-gene expression assay in breast cancer. *N Engl J Med*. 2018;379(2):111-121.

Sparano JA, Gray RJ, Ravdin PM, Makower DF, Pritchard KI, Albain KS et al. Clinical and Genomic Risk to Guide the Use of Adjuvant Therapy for Breast Cancer. *N Engl J Med*. 2019;380(25):2395-2405.

Wallden B, Storhoff J, Nielsen T, et al. Development and verification of the PAM50based Prosigna breast cancer gene signature assay. *BMC Med Genomics*. 2015;8:54.

Last Revised: November 8, 2021

Other Breast Cancer Gene, Protein, and

In some cases, doctors may test for specific gene changes in the breast cancer cells that could mean certain <u>targeted drugs</u>⁴ or immunotherapy drugs might help treat the cancer.

These molecular tests (also known as

- Tumor mutational burden (TMB): TMB is a measure of the number of gene mutations (changes) inside the cancer cells. Breast cancer cells that have many gene mutations (a high TMB) might be more likely to be recognized as abnormal and attacked by the body's immune system. If your breast cancer tissue is tested and found to have a high TMB (TMB-H), treatment with pembrolizumab (Keytruda) might be an option.
- *NTRK* gene changes: Some breast cancer cells might have changes in one of the *NTRK* genes. These gene changes can sometimes lead to cancer growth. Larotrectinib (Vitrakvi) and entrectinib (Rozlytrek) are drugs that target the proteins made by the abnormal *NTRK* genes and might be options for people with advanced breast cancer.

Blood tests

Blood tests are not used to diagnose breast cancer, but they can help to get a sense of a person's overall health. For example, they can be used to help determine if a person is healthy enough to have surgery or certain types of chemotherapy.

A **complete blood count (CBC)** looks at whether your blood has normal numbers of different types of blood cells. For example, it can show if you are anemic (have a low number of red blood cells), if you could have trouble with bleeding (due to a low number of blood platelets), or if you are at increased risk for infections (because of a low number of white blood cells). This test could be repeated regularly during treatment, as many cancer drugs can affect blood-forming cells of the bone marrow.

Blood chemistry tests can help find if some of your organs, such as the liver or kidneys are not working as well. For example, if cancer has spread to the bones, it might cause higher than normal levels of calcium and alkaline phosphatase. If breast cancer spreads to the liver, it can sometimes cause high levels of liver function tests, such as aspartate aminotransferase (AST) or alanine aminotransferase (ALT). Breast cancer does not spread to the kidneys, but if your bloodwork shows your kidneys are not working well, certain chemo drugs, like cisplatin, might not be used.

Breast cancer cells sometimes make substances called **tumor markers** that can be found in the blood. For breast cancer that has spread to other organs, tumor markers that might be checked include carcinoembryonic antigen (CEA), cancer antigen 15-3 (CA 15-3), and cancer antigen 27-29 (CA 27-29). Blood tests for these tumor markers are not used by themselves to diagnose or follow breast cancer.

Hyperlinks

- 1. <u>www.cancer.org/cancer/types/breast-cancer/screening-tests-and-early-detection/breast-biopsy.html</u>
- 2. www.cancer.org/cancer/managing-cancer/treatment-types/precision-medicine.html
- 3. www.cancer.org/cancer/types/breast-cancer/treatment/immunotherapy.html
- 4. <u>www.cancer.org/cancer/types/breast-cancer/treatment/targeted-therapy-for-breast-cancer.html</u>
- 5. <u>www.cancer.org/cancer/types/breast-cancer/risk-and-prevention/genetic-testing.html</u>
- 6. <u>www.cancer.org/cancer/types/breast-cancer/treatment/hormone-therapy-for-breast-cancer.html</u>

References

Burstein HJ, Somerfield MR, Barton DL, et al. Endocrine Treatment and Targeted Therapy for Hormone Receptor-Positive, Human Epidermal Growth Factor Receptor 2-Negative Metastatic Breast Cancer: ASCO Guideline Update [published online ahead of print, 2021 Jul 29]. *J Clin Oncol.* 2021;JCO2101392. doi:10.1200/JCO.21.01392.

National Comprehensive Cancer Network (NCCN). Practice Guidelines in Oncology: Breast Cancer. Version 8.2021 – September 13, 2021. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf on September 14, 2021.

Van Poznak C, Somerfield MR, Bast RC, et al. Use of Biomarkers to Guide Decisions on Systemic Therapy for Women With Metastatic Breast Cancer: American Society of Clinical Oncology Clinical Practice Guideline. *J Clin Oncol.* 2015;33(24):2695-2704. doi:10.1200/JCO.2015.61.1459.

Last Revised: November 28, 2023

Imaging Tests to Look for Breast Cancer Spread

- Chest x-ray
- Computed tomography (CT) scan
- Magnetic resonance imaging (MRI) scan
- Ultrasound
- Positron emission tomography (PET) scan
- Bone scan

If you have been diagnosed with breast cancer, you might need more imaging tests. Your doctor will talk with you about which of these tests you may need.

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Imaging tests might be done for a number of reasons including:

- To look at suspicious areas that might be cancer
- To learn how far cancer might have spread
- To help determine if treatment is working
- To look for possible signs of cancer coming back after treatment

Chest x-ray

A <u>chest x-ray¹</u> may be done to see if the cancer has spread to your lungs.

Computed tomography (CT) scan

A CT scan²n posb/GSo loemg /GS0 rga sliceGS986 gspartGS98ictures o 0 min0stg /of these te02 220

check for cancer.

Magnetic resonance imaging (MRI) scan

Like CT scans, <u>MRI scans</u>³ show detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. This test can be used to look at the breasts or other parts of the body, such as the brain or spinal cord to look for possible cancer spread.

Ultrasound

<u>Ultrasound</u>⁴ (ultrasonography) uses sound waves to create an image on a video screen. A small microphone-like instrument called a transducer that gives off sound waves is moved over the skin surface and picks up the echoes as they bounce off tissues. A computer turns these echoes into an image on the screen. An ultrasound can be done over a breast or in the underarm area, or even the liver.

Positron emission tomography (PET) scan

For a <u>PET scan⁵</u>, a slightly radioactive form of sugar (known as FDG) is injected into the blood and collects mainly in cancer cells.

PET/CT scan: Often a PET scan is combined with a CT scan using a special machine that can do both at the same time. This lets the doctor compare areas of higher radioactivity on the PET scan with a more detailed picture on the CT scan.

Bone scan

A <u>bone scan</u>⁶ can help show if the cancer has spread to your bones. A small amount of low-level radioactive material is injected into the blood and collects mainly in abnormal areas of bone. It can show all of the bones of your body at the same time and can find small areas of cancer spread not seen on plain x-ray.

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/imaging-radiology-

tests-for-cancer.html

- 2. <u>www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ct-scan-for-</u> <u>cancer.html</u>
- 3. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/mri-for-cancer.html
- 4. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ultrasound-forcancer.html
- 5. <u>www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/nuclear-medicine-scans-for-cancer.html</u>
- 6. <u>www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/nuclear-medicine-scans-for-cancer.html</u>

References

Joe BN. Clinical features, diagnosis, and staging of newly diagnosed breast cancer. In Vora SR, ed. *UpToDate*. Waltham, Mass.: UpToDate, 2021. https://www.uptodate.com. Last updated May 12, 2021. Accessed August 31, 2021.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology. Breast Cancer. Version 7.2021. Accessed at www.nccn.org/professionals/physician_gls/pdf/breast.pdf on August 31, 2021.

Niravath P, Osborne CK. Chapter 31: Evaluation of Patients for Metastasis Prior to Primary Therapy. In: Harris JR, Lippman ME, Morrow M, Osborne CK, eds. *Diseases of the Breast.* 5th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2014.

Last Revised: November 8, 2021

Breast Cancer Stages

- How is the stage determined?
- Details of the TNM staging system
- Examples using the full staging system

progesterone receptor?

- HER2 status: Does the cancer make too much of a protein called HER2?
- Grade of the cancer (G): How much do the cancer cells look like normal cells?

In addition, Oncotype Dx® Recurrence Score results may also be considered in the stage in certain situations.

Once all of these factors have been determined, this information is combined in a process called **stage grouping** to assign an overall stage. For more information see <u>Cancer Staging</u>².

Details about the first three factors (the TNM categories) are below. However, the addition of information about ER, PR, and HER2 status along with grade has made stage grouping for breast cancer more complex than for other cancers. Because of this, it is best to ask your doctor about your specific stage and what it means.

Details of the TNM staging system

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced. The categories below use the pathologic (surgical) definitions.

T categories for breast cancer

T followed by a number from 0 to 4 describes the main (primary) tumor's size and if it has spread to the skin or to the chest wall under the breast. Higher T numbers mean a larger tumor and/or wider spread to tissues near the breast.

TX: Primary tumor cannot be assessed.

T0: No evidence of primary tumor.

Tis: Carcinoma in situ (DCIS, or Paget disease of the breast with no associated tumor mass)

T1 (includes T1a, T1b, and T1c): Tumor is 2 cm (3/4 of an inch) or less across.

T2: Tumor is more than 2 cm but not more than 5 cm (2 inches) across.

T3: Tumor is more than 5 cm across.

T4 (includes T4a, T4b, T4c, and T4d): Tumor of any size growing into the chest wall or skin. This includes inflammatory breast cancer.

N categories for breast cancer

found in internal mammary lymph nodes (those near the breast bone) on sentinel lymph node biopsy.

N1mi: Micrometastases (tiny areas of cancer spread) in the lymph nodes under the arm. The areas of cancer spread in the lymph nodes are at least 0.2mm across, but not larger than 2mm.

N1a: Cancer has spread to 1 to 3 lymph nodes under the arm with at least one area of cancer spread greater than 2 mm across.

N1b: Cancer has spread to internal mammary lymph nodes on the same side as the cancer, but this spread could only be found on sentinel lymph node biopsy (it did not cause the lymph nodes to become enlarged).

N1c: Both N1a and N1b apply.

N2: Cancer has spread to 4 to 9 lymph nodes under the arm, or cancer has enlarged the internal mammary lymph nodes

N2a: Cancer has spread to 4 to 9 lymph nodes under the arm, with at least one area of cancer spread larger than 2 mm.

N2b: Cancer has spread to one or more internal mammary lymph nodes, causing them to become enlarged.

N3: Any of the following:

N3a: either:

Cancer has spread to 10 or more axillary lymph nodes, with at least one area of cancer spread greater than 2 mm,

OR

Cancer has spread to the lymph nodes under the collarbone (infraclavicular nodes), with at least one area of cancer spread greater than 2 mm.

N3b: either:

Cancer is found in at least one axillary lymph node (with at least one area of cancer spread greater than 2 mm) and has enlarged the internal mammary lymph nodes,

OR

Cancer has spread to 4 or more axillary lymph nodes (with at least one area of cancer spread greater than 2 mm), and to the internal mammary lymph nodes on sentinel lymph node biopsy.

N3c: Cancer has spread to the lymph nodes above the collarbone (supraclavicular nodes) on the same side of the cancer with at least one area of cancer spread greater than 2 mm.

M categories for breast cancer

M followed by a 0 or 1 indicates whether the cancer has spread to distant organs -- for example, the lungs, liver, or bones.

MO: No distant spread is found on x-rays (or other imaging tests) or by physical 0 :i+)cmS130, or b\

- HER2 negative
- ER positive
- PR positive

The cancer stage is IB.

Example #2

If the cancer is larger than 5 cm (T3) and has spread to 4 to 9 lymph nodes under the arm or to any internal mammary lymph nodes (N2) but not to distant organs (M0) **AND** is:

- Grade 2
- HER2 positive
- ER positive
- PR positive

The cancer stage is IB.

Example #3

If the cancer is larger than 5 cm (T3) and has spread to 4 to 9 lymph nodes under the arm or to any internal mammary lymph nodes (N2) but not to distant organs (M0) **AND** is:

Grade 2
HER2 positive

- 1. <u>www.cancer.org/cancer/types/breast-cancer/treatment.html</u>
- 2. www.cancer.org/cancer/diagnosis-staging/staging.html

References

American Joint Committee on Cancer. Breast. In: AJCC Cancer Staging Manual. 8th ed. New York, NY: Springer; 2017:589.

National Comprehensive Cancer Network (NCCN). Practice Guidelines in Oncology: Breast Cancer. Version 8.2021. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf on September 15, 2021.

Paik, S. Development and Clinical Utility of a 21-Gene Recurrence Score Prognostic Assay in Patients with Early Breast Cancer Treated with Tamoxifen. *The Oncologist*. 2007;12(6): 631-635.

Last Revised: November 8, 2021

Survival Rates for Breast Cancer

Understanding the numbers

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

What is a 5-year relative survival rate?

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

Where do these numbers come from?

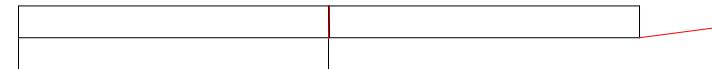
The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results (SEER) database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

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

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

5-year relative survival rates for breast cancer

These numbers are based on women diagnosed with breast cancer between 2013 and 2019.



situ (DCIS).

Understanding the numbers

- Women now being diagnosed with breast cancer may have a better outlook than these numbers show. Treatments improve over time, and these numbers are based on women who were diagnosed and treated at least five years earlier.
- These numbers apply only to the stage of the cancer when it is first diagnosed. They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- These numbers don't take everything into account. Survival rates are grouped based on how far the cancer has spread, but your age, overall health, how well the cancer responds to treatment, tumor grade, the presence of hormone receptors on the cancer cells, HER2 status, and other factors can also affect your outlook.
- Survival rates for women with triple-negative breast cancer are different than those above. See <u>Triple-negative Breast Cancer</u>¹.
- Survival rates for women with inflammatory breast cancer are different than those above. See<u>Inflammatory Breast Cancer</u>².

Hyperlinks

- 1. <u>www.cancer.org/cancer/types/breast-cancer/about/types-of-breast-cancer/triple-negative.html</u>
- 2. <u>www.cancer.org/cancer/types/breast-cancer/about/types-of-breast-cancer/inflammatory-breast-cancer.html</u>

References

American Cancer Society. *Cancer Facts & Figures 2024*. Atlanta: American Cancer Society; 2024.

Young JL Jr, Roffers SD, Ries LAG, Fritz AG, Hurlbut AA (eds). *SEER Summary Staging Manual - 2000: Codes and Coding Instructions*, National Cancer Institute, NIH Pub. No. 01-4969, Bethesda, MD, 2001.

Last Revised: January 17, 2024

Questions to Ask Your Doctor About Breast Cancer

- · When you're told you have breast cancer
- When deciding on a treatment plan
- If you need surgery
- During treatment
- After treatment

It's important to be able to have frank, open discussions with your cancer care team. They want to answer all of your questions so that you can make informed treatment and life decisions.

Here are some questions that you can use to help better understand your cancer and your treatment options. Don't be afraid to take notes and tell the doctors or nurses when you don't understand what they're saying. You might want to bring another person with you when you see your doctor and have them take notes to help you remember what was said.

Not all of these questions will apply to you, but they should help get you started. Be sure to write down some questions of your own. For instance, you might want more

What is the hormone receptor status

- What would we do if the treatment doesn't work or if the cancer comes back?
- What if I have transportation problems getting to and from treatment?

If you need surgery

- Is <u>breast-conserving surgery</u>⁹ (lumpectomy) an option for me? Why or why not?
- What are the positive and negative sides of breast-conserving surgery versus mastectomy?
- How many surgeries like mine have you done?
- Will you have to take out lymph nodes? If so, would you advise a sentinel lymph node biopsy? Why or why not?
- What side effects might lymph node removal cause?
- How long will I be in the hospital?
- Will I have stitches or staples at the surgery site? Will there be a drain (tube) coming out of the site?
- How do I care for the surgery site? Will I need someone to help me?
- What will my breasts look and feel like after my surgery? Will I have normal feeling in them?
- What will the scar look like?
- Is <u>breast reconstruction surgery</u>¹⁰ an option if I want it? What would it mean in my case?
- Can I have reconstruction at the same time as the surgery to remove the cancer? What are the reasons for and against having it done right away or waiting until later?
- What types of reconstruction might be options for me?
- Could you recommend a plastic surgeon I could speak to about reconstruction options?
- Will I need a breast form (prosthesis), and if so, where can I get one?
- Do I need to stop taking any medications or supplements before surgery?
- When should I call your office if I'm having side effects or concerns?

During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions may apply to you, but asking the ones that do may be helpful.

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Will I need to change what I eat during treatment?
- Are there any limits on what I can do?
- Can I exercise during treatment? If so, what kind of exercise should I do, and how often?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed?
- Will I need special tests, such as imaging scans or blood tests during treatment? If so, how often?

After treatment

- Will I need a special diet after treatment?
- Are there any limits on what I can do?
- Am I at risk for <u>lymphedema¹¹?</u>
- What can I do to reduce my risk for lymphedema?
- What should I do if I notice swelling in my arm?
- What other symptoms should I watch for? What kind of exercise should I do now?
- What type of follow-up will I need after treatment?
- How often will I need to have follow-up exams, blood tests, or imaging tests?
- How will we know if the cancer has come back? What should I watch for?
- What will my options be if the cancer comes back?

Hyperlinks

- 1. <u>www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-</u> <u>trials.html</u>
- 2. <u>www.cancer.org/cancer/managing-cancer/finding-care/the-doctor-patient-</u> relationship.html

insurance.html
