Your Guide to the Breast Cancer Pathology Report

Developed for you by

BREASTCANCER.ORG

Breastcancer.org is a nonprofit organization dedicated to providing education and information on breast health and breast cancer.

The pathology report is used by your doctor to determine which treatments are right for you.

Your Guide to the Breast Cancer Pathology Report

A report is written each time tissue is removed from the body to check for cancer. These are called pathology reports. Each report has the results of the studies done on the removed tissue. The information in these reports will help you and your doctors decide on the best treatment for you.

Reading your pathology report can be scary and confusing. Different labs may use different words to describe the same thing. On page 34, you'll find an easy-to-understand word list. We hope we can help you make sense of this information so you can get the best care possible.

TABLE OF CONTENTS

WAIT FOR THE WHOLE PICTURE

Waiting for test results

When you have all of the test results, you and your doctor can make the right decisions for you. The analysis of the removed tissue can lead to several different reports. Some tests take longer than others. Not all tests are done by the same lab. Most information comes within 1 to 2 weeks after surgery, and you will usually have all the results within a few weeks. Your doctor can let you know when the results come in. If you don't hear from your doctor, call the office.

Get all the information you need

When you have all the test information you need, you and your doctor can make a final decision about your treatment. Don't focus too much on any one piece of information by itself. Try to look at the whole picture as you think about your options.

Different labs and hospitals may use different words to describe the same thing. If there are words in your pathology report that are not explained in this booklet, don't be afraid to ask your doctor what they mean.

For more information, go to:
www.breastcancer.org

EXPERT TIP: Marisa Weiss, M.D.,
breast cancer doctor

"The information in your pathology report often comes in bits and pieces. Just after surgery, the cancer cells are first looked at under the microscope. Results from additional studies that require special techniques may take longer. So you may have one, two, or three lab reports from one surgery. Together, the lab reports make up your pathology report. Try to keep all your reports in one place, so that when you go for your treatment evaluations, the doctors will have all the information they need."

Parts of your pathology report

Personal information. Make sure it's your correct name and date of operation at the top of the report.

Specimen. This section describes where the tissue samples came from. Tissue samples could be taken from the breast, from the lymph nodes under your arm (axilla), or both.

Clinical history. This is a short description of you and how the breast abnormality was found. It also describes the kind of surgery that was done.

Clinical diagnosis. This is the diagnosis the doctors were expecting before your tissue sample was tested.

Gross description. This section describes the pieces of tissue removed. It talks about the size, weight, and color of each piece.

Microscopic description. This section describes the way the cancer cells look under the microscope, their relationship to the normal surrounding tissue, and the size of the cancer.

Special tests or markers. This section reports the results of tests for proteins, genes, and cell growth rate.

Summary or final diagnosis. This section is the short description of all the important findings in all of the tissue examined.

For more information, go to:
www.breastcancer.org

READING YOUR PATHOLOGY REPORT

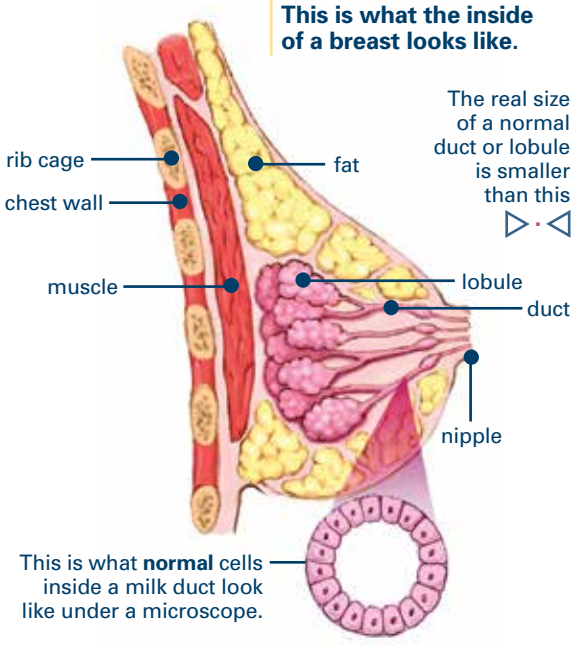
The pathology report answers questions about a breast abnormality

Breast tissue can develop abnormalities that are sometimes cancerous. Usually breast cancer begins either in the cells of the lobules, which are milk-producing glands, or the ducts, the passages that drain milk from the lobules to the nipple. Breast cancers have many characteristics that help determine the best treatment.

Is the breast abnormality a cancer?

A lump or spot in the breast can be made of normal cells or cancer cells. There can also be cells that fall somewhere between normal and cancerous ("atypical" cells).

Cancer cells are cells that grow in an uncontrolled way. They may stay in the place where they started to grow, or they may grow into the normal tissue around them. Cancer cells may also spread beyond the breast.



The abnormal lump or spot may be found using mammography or other testing methods. A procedure called a biopsy removes a piece of tissue from the lump or spot to find out if cancer cells are present.

The pathology report will tell you what kinds of cells are present.

Is the breast cancer invasive?

If breast cancer is found, it's important to know whether the cancer has spread outside the milk ducts or lobules of the breast where it started.

Non-invasive cancers stay within the milk ducts or milk lobules in the breast. They do not grow into or invade normal tissues within or beyond the breast. Non-invasive cancers are sometimes called in situ or pre-cancers.

If the cancer has grown into normal tissues, it is called **invasive**. Most breast cancers are invasive. Sometimes cancer cells spread to other parts of the body through the blood or lymph system. When cancer cells spread to other parts of the body, it is called metastatic breast cancer.

In some cases, a breast cancer may be both invasive and non-invasive.

You may see these descriptions of the type of cancer cells in your report:

DCIS (Ductal Carcinoma In Situ). This is a cancer that is non-invasive. It stays inside the milk ducts.

NOTE: There are subtypes of DCIS. You'll find their names in the word list that begins on page 34 of this booklet.

LCIS (Lobular Carcinoma In Situ). This is a tumor that is an overgrowth of cells that stay inside the milk-making part of the breast (called lobules). LCIS is not a true cancer. It's a warning sign of an increased risk for developing an invasive cancer in the future in either breast.

IDC (Invasive Ductal Carcinoma). This is a cancer that begins in the milk duct but has grown into the surrounding normal tissue inside the breast. This is the most common kind of breast cancer.

ILC (Invasive Lobular Carcinoma). This is a cancer that starts inside the milk-making glands (called lobules), but grows into the surrounding normal tissue inside the breast.

NOTE: There are other, less common types of invasive breast cancer. You'll find their names in the word list beginning on page 34 of this booklet.

How different are the cancer cells from normal cells?

Grade is how different the cancer cells are from normal cells. Experts compare the appearance of the cancer cells to normal breast cells. Based on these comparisons, they give a grade to the cancer. **Grade is different from stage** (see page 28 for information about stage).

There are three cancer grades:

Grade 1 (low grade or well differentiated). Grade 1 cancer cells look a little bit different from normal cells. They are usually slow-growing.

Grade 2 (intermediate/moderate grade or moderately differentiated). Grade 2 cancer cells do not look like normal cells. They are growing a little faster than normal.

Grade 3 (high grade or poorly differentiated). Grade 3 cancer cells look very different from normal cells. They are fast-growing.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

The type of cancer I have is_____

_____.

The cancer is: (*check one*)

◯ **Grade 1** ◯ **Grade 2** ◯ **Grade 3**

How fast are the cancer cells growing?

Your pathology report may include information about the rate of cell growth—the proportion of cancer cells within the tumor that are growing and dividing to form new cancer cells. A higher percentage suggests a faster-growing, more aggressive cancer, rather than a slower, less aggressive cancer.

Tests that can measure the rate of cell growth include:

- **Ki-67.** Ki-67 is a protein in cells that increases as they prepare to divide into new cells. A staining process can measure the percentage of tumor cells that are positive for Ki-67. The more positive cells there are, the more quickly they are dividing and forming new cells.

  In breast cancer, a result of less than 10% is considered low, 10-20% is intermediate/borderline, and more than 20% is considered high.

  If you have an Oncotype DX test done on the cancer to estimate your recurrence risk, checking Ki-67 levels is included as part of the testing.

- **S-phase fraction.** The S-phase fraction number tells you what percentage of cells in the tissue sample are in the process of copying their genetic information (DNA). This S-phase, short for "synthesis phase," happens just before a cell divides into two new cells.

  In breast cancer, a result of less than 6% is considered low, 6-10% is intermediate/borderline, and more than 10% is considered high.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

The rate of cancer growth is: (*check one*)

◯ **Low** ◯ **Intermediate/borderline** ◯ **High**

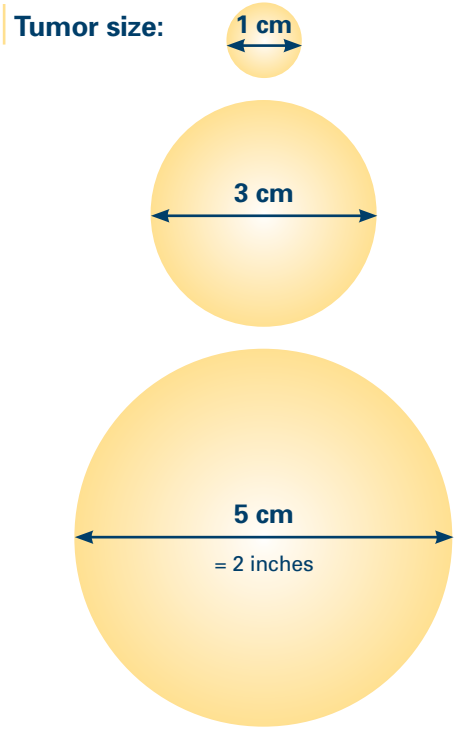
Test used: (*check one*)

◯ **Ki-67 test** ◯ **S-phase fraction test**

How big is the cancer?

Doctors measure cancers in **centimeters (cm)**. The size of the cancer is one of the factors that determines the stage and treatment of the breast cancer.

Size doesn't tell the whole story. All of the cancer's characteristics are important. A small cancer can be very fast-growing while a larger cancer may be slow-growing, or it could be the other way around.



Has the whole cancer been removed?

When surgery is done to remove the whole cancer, the surgeon tries to take out all of the cancer with an extra area, or **margin**, of normal tissue around it. This is to be sure that all of the cancer is removed.

The outer edge of the tissue removed is called the **margin of resection**. It is looked at very carefully to see if it is clear of cancer cells.

The pathologist also measures the distance between the cancer cells and the margin.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

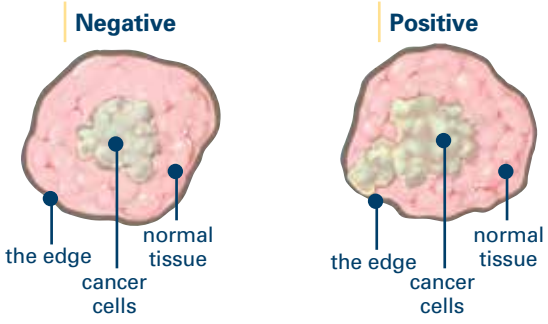
The size of the cancer is _____ centimeters.

Margins around a cancer are described in three ways:

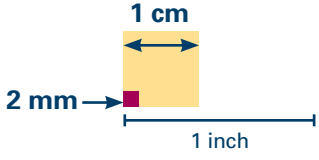
Negative. No cancer cells can be seen at the outer edge. Usually, no more surgery is needed.

Positive. Cancer cells come right out to the edge of the tissue. More surgery is usually needed to remove any remaining cancer cells.

Close. Cancer cells are close to the edge of the tissue, but not right at the edge. More surgery may be needed.



NOTE: What is called negative (or clean or clear) margins can be different from hospital to hospital. In some hospitals, doctors want at least 2 millimeters (mm) of normal tissue between the edge of the cancer and the outer edge of the tissue. In other places, just one healthy cell is called a negative margin.



Are there cancer cells in your lymph channels or blood vessels?

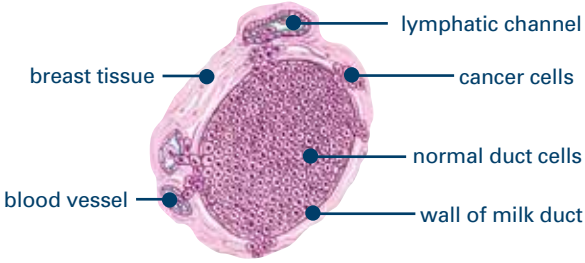
The breast has a network of lymph channels and blood vessels that drain fluid and blood from your breast tissue back into your body's circulation. These pathways remove used blood and waste products.

There is an increased risk of cancer coming back when cancer cells are found in the fluid channels of the breast. In these cases, your doctor may customize your treatment to reduce this risk.

If lymphatic or blood vessel (vascular) invasion is found, your pathology report will say **present**. If there is no invasion, the report will say **absent**.

NOTE: Lymphatic or vascular invasion is different from lymph node involvement.

This is a picture of cancer cells that have spread through the wall of the milk duct and into the nearby lymph channels.



MY REPORT SAYS:

The margins are: (*check one*)

◯ **Negative** ◯ **Positive** ◯ **Close**

Lymphatic or vascular invasion is: (*check one*)

◯ **Present** ◯ **Absent**

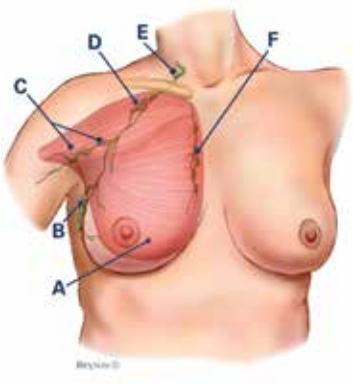
Are there cancer cells in your lymph nodes?

Your doctor will examine your lymph nodes to see if they contain cancer. Having cancer cells in the lymph nodes under your arm is associated with an increased risk of the cancer spreading.

Lymph nodes are filters along the lymph fluid channels. Lymph fluid leaves the breast and eventually goes back into the bloodstream. The lymph nodes try to catch and trap cancer cells before they reach other parts of the body.

When lymph nodes are free, or clear, of cancer, the test results are called negative. If lymph nodes have some cancer cells in them, they are called positive.

Lymph node areas adjacent to breast area



- **A** Pectoralis major muscle
- **B** Axillary lymph nodes: level I
- **C** Axillary lymph nodes: level II
- **D** Axillary lymph nodes: level III
- **E** Supraclavicular lymph nodes
- **F** Internal mammary lymph nodes

How many lymph nodes are involved?

The more lymph nodes that contain cancer cells, the more serious the cancer might be. So doctors use the number of involved lymph nodes to help make treatment decisions.

Doctors also look at the amount of cancer in the lymph nodes.

How much cancer is in each lymph node?

You may see these words describing how much cancer is in each lymph node:

Microscopic. Only a few cancer cells are in the node. A microscope is needed to find them.

Gross. There is a lot of cancer in the node. You can see or feel the cancer without a microscope.

Extracapsular extension. Cancer has spread outside the wall of the node.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

The lymph nodes are: (*check one*)

◯ **Positive** ◯ **Negative**

If positive:

The number of involved nodes is _____ .

Do the cancer cells have hormone receptors?

Hormone receptors are like ears on and in breast cells that listen to signals from hormones. These hormone signals tell breast cells that have the receptors to grow.

A cancer is called **ER-positive** if it has receptors for the hormone estrogen. It's called **PR-positive** if it has receptors for the hormone progesterone. Breast cells that do not have receptors are negative for these hormones.

Breast cancers that are ER-positive, PR-positive, or both tend to respond to hormonal therapy. Hormonal therapy is medicine that reduces the amount of estrogen in your body or that blocks estrogen from the receptors.

If the cancer has no hormone receptors, there are still treatments available.

Hormone receptors are proteins. Like all proteins, their production is controlled by genes. To learn more about tests for various genes, please see page 20.

You will see the results of your hormone receptor test written in one of these three ways:

1. **The number of cells that have receptors out of 100 cells tested.** You will see a number between 0% (none have receptors) and 100% (all have receptors).
2. **An Allred score between 0 and 8.** This scoring system is named for the doctor who developed it. The system looks at what percentage of cells test positive for hormone receptors, along with how well the receptors show up after staining (this is called "intensity"). This information is then combined to score the sample on a scale from 0 to 8. The higher the score, the more receptors were found and the easier they were to see in the sample.
3. **The word "positive" or "negative."**

NOTE: Even if your report just says "positive" or "negative," ask your doctor or lab to give you the number of cells (percentage) that have receptors. This is important because sometimes a low number may be called negative. But even cancers with low numbers of hormone receptors may respond to hormonal therapy. And a high positive number is important to know because it predicts a particularly good response to hormonal therapy.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

Hormone receptors are:

○ **ER-positive** ____**% (1%-100%)** | ○ **ER-negative**

or circle: **Allred score: 0 1 2 3 4 5 6 7 8**

○ **PR-positive** ____**% (1%-100%)** | ○ **PR-negative**

or circle: **Allred score: 0 1 2 3 4 5 6 7 8**

Does the cancer have genes that affect how the cancer might be treated?

Genes contain the recipes for the various proteins a cell needs to stay healthy and function normally. Some genes and the proteins they make can influence how a breast cancer behaves and how it might respond to a specific treatment. Cancer cells from a tissue sample can be tested to see which genes are normal and which are abnormal. The proteins they make can also be tested.

If the genetic recipe contains a mistake, the report will say **"genetic mutation"** or **"genetic abnormality."** An example is one of the inherited breast cancer gene abnormalities, called BRCA1 or BRCA2. Testing for BRCA1 and BRCA2 is not part of the standard pathology workup. (Please see page 25 for more information on these abnormalities.)

If the genetic recipe repeats the same instruction over and over again, the report will say **"gene amplification."** Genetic amplification happens when a genetic recipe's repeated instruction causes the gene to make too many copies of itself.

If the genetic recipe mistake (abnormality) or repeated instruction (amplification) calls for too much protein to be made, the report will say that there is **overexpression** of that protein.

HER2 status. Your pathology report usually includes the cancer's HER2 status. The HER2 gene is responsible for making HER2 proteins. These proteins are receptors on breast cells. Under normal circumstances, HER2 receptors help control how a breast cell grows, divides, and repairs itself. But in about 25% of breast cancers, the HER2 gene can become abnormal and make too many copies of itself (amplification of the HER2 gene). Amplified HER2 genes command breast cells to make too many receptors (overexpression of the HER2 protein). When this happens, the overexpressed HER2 receptors shout at (rather than talk to) the breast cells to grow and divide in an uncontrolled way. This can lead to the development of breast cancer.

Breast cancers that have amplified HER2 genes or that overexpress the HER2 protein are described in the pathology report as being HER2-positive. HER2-positive breast cancers tend to grow faster and are more likely to spread and come back when compared with HER2-negative breast cancers. But HER2-positive breast cancers can respond to targeted treatments that are designed to work against HER2-positive cancer cells.

For more information, go to:
www.breastcancer.org

There are four tests for HER2:

1. **IHC test (ImmunoHistoChemistry):**
   - The IHC test shows whether there is too much HER2-receptor protein in the cancer cells.
   - The results of the IHC test can be 0 (negative), 1+ (also negative), 2+ (borderline), or 3+ (positive; the HER2 protein is overexpressed).
2. **FISH test (Fluorescence In Situ Hybridization):**
   - The FISH test shows whether there are too many copies of the HER2 gene in the cancer cells.
   - The results of the FISH test can be positive (extra HER2 gene copies—amplified) or negative (normal number of HER2 gene copies—not amplified).
3. **SPoT-Light HER2 CISH test (Subtraction Probe Technology Chromogenic In Situ Hybridization):**
   - The SPoT-Light test shows whether there are too many copies of the HER2 gene in the cancer cells.
   - The results of the SPoT-Light test can be positive (extra copies—amplified) or negative (normal number of copies—not amplified).
4. **Inform HER2 Dual ISH test (In Situ Hybridization):**
   - The Inform HER2 Dual ISH test shows whether there are too many copies of the HER2 gene in the cancer cells.
   - The results of the Inform HER2 Dual ISH test can be positive (extra copies—amplified) or negative (normal number of copies—not amplified).

Find out which test for HER2 you had. This is important. Only cancers that test IHC 3+, FISH positive, SPoT-Light HER2 CISH positive, or Inform HER2 Dual ISH positive respond to therapy that works against HER2-positive breast cancers. An IHC 2+ test result is called borderline.

Research has shown that some HER2 status test results may be wrong. This is probably because different labs have different classification rules. Each pathologist also may use slightly different criteria. This usually happens when test results are borderline (IHC 2+). If you have a 2+ result, you can and should ask to also have the tissue tested with the FISH test. If your results are negative, you may want to ask your doctor if another HER2 test makes sense for you.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

HER2 status is: (*check one*)

◯ **Positive** ◯ **Negative** ◯ **Borderline**

Test used: (*check one*) ◯ **IHC** ◯ **FISH**

◯ **SPoT-Light HER2 CISH** ◯ **Inform HER2 Dual ISH**

EGFR status. The EGFR gene, much like the HER2 gene, can be overexpressed in some breast cancer cells and influence how the cancer cells behave. Your pathology report may also contain information about EGFR overexpression.

Genomic assays. Unlike individual gene testing, such as testing for HER2, genomic assays analyze the activity of a group of normal and abnormal genes that can increase the risk of breast cancer coming back after treatment. This analysis can help decide if a person is likely to benefit from chemotherapy to reduce the risk of the cancer coming back. A number of genomic assays for breast cancer are currently available, including Oncotype DX, MammaPrint, and Mammostrat.

If the breast cancer is early-stage and hormone-receptor-positive, you and your doctor may decide that a genomic assay is appropriate for your situation. The results of your genomic assay are reported separately from your pathology report. The test results will indicate the likelihood of the cancer coming back based on the overall pattern of gene activity found in the breast cancer cells. Your doctor can use this information to help decide whether chemotherapy to reduce the risk of breast cancer coming back makes sense in your overall treatment plan.

The Oncotype DX test also is used to estimate recurrence risk of DCIS and/or the risk of a new invasive cancer developing in the same breast, and how likely a person is to benefit from radiation therapy after DCIS surgery.

Genetic testing that is not a part of your pathology report

Inherited cases of breast cancer are likely associated with abnormal genes. Two of the most common are abnormal versions of BRCA1 (BReast CAncer gene 1) and BRCA2 (BReast CAncer gene 2). According to the National Cancer Institute, women with an abnormal BRCA1 or BRCA2 gene have about a 60% risk of being diagnosed with breast cancer during their lifetimes (compared to about 12% for women overall). Their risk of ovarian cancer is also increased. Abnormal BRCA1 or BRCA2 genes are found in 5% to 10% of all breast cancer cases in the United States.

Changes in other genes are also associated with breast cancer, though they are less common and don't seem to increase risk as much as abnormal BRCA1 and BRCA2 genes. Although abnormal BRCA1 and BRCA2 genes are considered rare, the following genes are considered rarer and haven't been studied as much as the BRCA genes:

- **ATM gene.** Inheriting one abnormal ATM gene has been linked to an increased rate of breast cancer in some families because the abnormal gene stops the cells from repairing damaged DNA.

For more information, go to:
www.breastcancer.org

- **p53 gene.** Inheriting an abnormal p53 gene (also called the TP53 gene) causes Li-Fraumeni syndrome, a disorder that causes people to develop soft tissue cancers at a young age.
- **CHEK2 gene.** Li-Fraumeni syndrome also can be caused by an abnormal CHEK2 gene; even when it doesn't cause Li-Fraumeni syndrome, an abnormal CHEK2 gene can double breast cancer risk.
- **PTEN gene.** An abnormal PTEN gene causes Cowden syndrome, a rare disorder that causes a higher risk of both benign and cancerous breast tumors, as well as growths in the digestive tract, thyroid, uterus, and ovaries.
- **CDH1 gene.** Women with an abnormal CDH1 gene have a higher risk of invasive lobular breast cancer.

Finding out whether you have an inherited abnormal gene requires special tests, and the results are separate from the results in your pathology report. If your doctor is concerned that you and your immediate relatives may have inherited abnormal BRCA1 or BRCA2 gene, he or she may recommend that you and other family members be tested. BRCA1 and BRCA2 tests are done using a blood or saliva sample, not a tissue sample. Your doctor or genetic counselor also may order testing for an abnormal ATM, p53, CHEK2, PTEN, or CDH1 gene if it's determined from your personal or family history that these tests are needed.

For more information, go to:
www.breastcancer.org

What stage is the breast cancer?

Cancer stage is based on the size of the cancer, whether the cancer is invasive or non-invasive, whether lymph nodes are involved, and whether the cancer has spread to other places beyond the breast. Many of the cancer traits you reviewed in this booklet are not included in staging.

The purpose of the staging system is to help organize the different factors and some of the personality features of the cancer into categories in order to:

- best understand your prognosis (the most likely outcome of the disease)
- guide treatment decisions (together with other parts of your pathology report)
- provide a common way to describe the breast cancer so that results of your treatment can be compared and understood

Stage 0

Stage 0 is used to describe non-invasive breast cancers, such as ductal carcinoma in situ (DCIS). In stage 0, there is no evidence of cancer cells or non-cancerous abnormal cells breaking out of the part of the breast in which they started, or getting through to or invading neighboring normal tissue.

Stage I

Stage I is divided into subcategories known as IA and IB.

Stage IA describes invasive breast cancer (cancer cells are breaking through to or invading normal surrounding breast tissue) in which:

- the tumor measures up to 2 centimeters AND
- the cancer has not spread outside the breast; no lymph nodes are involved

Stage IB describes invasive breast cancer in which:

- there is no tumor in the breast; instead, small groups of cancer cells—larger than 0.2 millimeter but not larger than 2 millimeters—are found in the lymph nodes OR
- there is a tumor in the breast that is no larger than 2 centimeters, and there are small groups of cancer cells—larger than 0.2 millimeter but not larger than 2 millimeters—in the lymph nodes

Microscopic invasion is also possible in stage I breast cancer. In microscopic invasion, the cancer cells have only just begun to invade the tissue outside the lining of the duct or lobule. To qualify as microscopic invasion, the cells that have begun to invade the tissue cannot measure more than 1 millimeter.

For more information, go to:
www.breastcancer.org

Stage II

Stage II is divided into subcategories known as IIA and IIB.

Stage IIA describes invasive breast cancer in which:

- no tumor can be found in the breast, but cancer (larger than 2 millimeters) is found in 1 to 3 axillary lymph nodes (the lymph nodes under the arm) or in the lymph nodes near the breastbone (found during a sentinel node biopsy) OR
- the tumor measures 2 centimeters or smaller and has spread to the axillary lymph nodes OR
- the tumor is larger than 2 centimeters but not larger than 5 centimeters and has not spread to the axillary lymph nodes

Stage IIB describes invasive breast cancer in which:

- the tumor is larger than 2 centimeters but no larger than 5 centimeters; small groups of breast cancer cells—larger than 0.2 millimeter but not larger than 2 millimeters—are found in the lymph nodes OR
- the tumor is larger than 2 centimeters but no larger than 5 centimeters; cancer has spread to 1 to 3 axillary lymph nodes or to lymph nodes near the breastbone that were found during a sentinel node biopsy OR
- the tumor is larger than 5 centimeters but has not spread to the axillary lymph nodes

Stage III

Stage III is divided into subcategories known as IIIA, IIIB, and IIIC.

Stage IIIA describes invasive breast cancer in which either:

- no tumor is found in the breast or the tumor may be any size; cancer is found in 4 to 9 axillary lymph nodes or in the lymph nodes near the breastbone (found during imaging tests or a physical exam) OR
- the tumor is larger than 5 centimeters; small groups of breast cancer cells (larger than 0.2 millimeter but not larger than 2 millimeters) are found in the lymph nodes OR
- the tumor is larger than 5 centimeters; cancer has spread to 1 to 3 axillary lymph nodes or to the lymph nodes near the breastbone (found during a sentinel lymph node biopsy)

Stage IIIB describes invasive breast cancer in which:

- the tumor may be any size and has spread to the chest wall and/or skin of the breast and caused swelling or an ulcer AND
- may have spread to up to 9 axillary lymph nodes OR
- may have spread to lymph nodes near the breastbone

Stage III *(continued)*

Inflammatory breast cancer is considered at least stage IIIB. Typical features of inflammatory breast cancer include the following:

- a substantial portion of the breast skin is reddened
- the breast feels warm and may be swollen
- cancer cells have spread to the lymph nodes and may be found in the skin

Stage IIIC describes invasive breast cancer in which:

- the cancer has spread to 10 or more axillary lymph nodes OR
- the cancer has spread to lymph nodes above or below the collarbone OR
- the cancer has spread to axillary lymph nodes or to lymph nodes near the breastbone

Stage IV

Stage IV describes invasive breast cancer in which:

- the cancer has spread beyond the breast and nearby lymph nodes to other organs of the body, such as the lungs, distant lymph nodes or skin, bones, liver, or brain

The words used to describe stage IV breast cancer are "advanced" and "metastatic." Cancer may be stage IV at first diagnosis, or it can be a recurrence of a previous breast cancer that has spread to other parts of the body.

For more information, go to:
www.breastcancer.org

MY REPORT SAYS:

The cancer is stage: (*check one*)

◯ **Stage 0** ◯ **Stage IA** ◯ **Stage IB**
◯ **Stage IIA** ◯ **Stage IIB** ◯ **Stage IIIA**
◯ **Stage IIIB** ◯ **Stage IIIC** ◯ **Stage IV**

WORD LIST

Abnormal cells: Cells that do not look or act like the healthy cells of the body.

Aggressive cancer cells: Cells that are fast-growing and have a tendency to spread beyond the area where they started.

Atypical ductal hyperplasia: Abnormal cells that have accumulated in a breast duct. The cells have increased in number and fill almost the entire duct. The cells can keep changing until they become DCIS. Atypical ductal hyperplasia can increase the risk of a future breast cancer.

Atypical lobular hyperplasia: Abnormal cells that have accumulated in a breast lobule. The cells have increased in number and fill almost the entire lobule. It's possible for the cells to keep changing until they become LCIS. Atypical lobular hyperplasia can increase the risk of a future breast cancer.

Axillary lymph nodes: Lymph nodes under your arms.

Basal-like breast cancer: Basal-like is one of the four main molecular subtypes of breast cancer. Basal-like breast cancer is hormone-receptor-negative and HER2-negative. Also called triple-negative breast cancer.

Benign: Not cancerous or precancerous.

Biopsy: An operation to remove tissue to check whether it's cancer or not.

BRCA1: An abnormal gene, known as BReast CAncer gene 1, associated with a higher risk of developing breast cancer.

BRCA2: An abnormal gene, known as BReast CAncer gene 2, associated with a higher risk of developing breast cancer.

Clean margins: Removed breast tissue around the tumor in which the outer edge is free of cancer cells. Also called "negative margins."

Close margins: Removed breast tissue around the tumor in which cancer cells come near the outer edge.

Colloid (mucinous) carcinoma of the breast: A rare type of invasive breast cancer that contains small pools of mucous material.

Comedo DCIS: A type of non-invasive cancer that tends to grow quickly. Comedo refers to areas of dead cancer cells that build up inside the tumor—a sign that the cancer cells are growing so quickly that some of the cells are not getting enough nourishment.

Comedonecrosis: Clumps of dead cancer cells, often seen in high-grade DCIS. The cells are so crowded that some of them do not get enough nourishment and die.

Cribriform carcinoma of the breast: A less common type of invasive breast cancer that invades the connective tissues of the breast and features holes between the cancer cells (like the holes in Swiss cheese).

Cribriform DCIS: A type of non-invasive breast cancer that usually grows slowly. Cribriform DCIS features gaps between cancer cells in the affected ducts (like the pattern of holes in Swiss cheese).

Ductal Carcinoma In Situ (DCIS): An uncontrolled growth of breast cells within the milk duct without invasion into the normal surrounding breast tissue.

EGFR gene: A gene that controls how quickly cells divide. Also called HER1.

EGFR-negative: A breast cancer with a normal number of the EGFR gene.

EGRF-positive: A breast cancer with too many copies of the EGFR gene.

ER-negative: A cancer that does not have estrogen receptors.

ER-positive: A cancer that has estrogen receptors.

Estrogen: The major female sex hormone. Estrogen can cause some cancers to grow.

Extracapsular extension: When cancer has spread outside the wall of a lymph node.

Fibrocystic changes: Benign changes in the breast, such as large amounts of rubbery, firm ("fibrous") tissue or fluid-filled cysts.

FISH (Fluorescence In Situ Hybridization) test: A test for multiple genes, including the HER2 gene.

Gene: The code material for a cell to make a single protein. Proteins perform different functions for the cell including growth and repair.

Genomic assay: A test that analyzes the activity of a group of genes.

Grade: How different the cancer cells look from normal cells as well as how quickly the cells are growing.

Gross lymph node involvement: A situation in which many cancer cells are found in a lymph node.

HER2 (Human Epidermal growth factor Receptor 2): A gene that helps control the growth and repair of cells.

HER2-enriched: HER2-enriched is one of the four main molecular subtypes of breast cancer. HER2-enriched breast cancer is hormone-receptor-negative and HER2-positive.

HER2 gene amplification: A situation that arises when a HER2 gene doesn't work correctly and makes too many copies of itself.

HER2-negative: A breast cancer with a normal number of HER2 genes and protein receptors.

HER2-positive: A breast cancer with HER2 gene amplification or HER2 protein overexpression. HER2-positive breast cancers tend to grow faster and are more likely to spread and come back compared to HER2-negative breast cancers.

HER2 protein overexpression: When the HER2 gene makes too many copies of itself, and those extra HER2 genes tell breast cells to make too many HER2 receptors.

HER2 receptors: Proteins made by the HER2 gene that receive signals that stimulate cells to grow and multiply.

Hormone receptors: Proteins on and in cells that respond to signals from hormones.

IHC (ImmunoHistoChemistry) test: A test used to measure proteins, including the HER2 protein.

In situ: A cancer within the part of the breast where it started, such as in the ducts, without signs of spread.

Infiltrating: A cancer that has spread beyond the place where it started. Also called "invasive."

Inflammatory Breast Cancer (IBC): A rare and aggressive form of breast cancer that starts with reddening, swelling, and warmth of the breast, with symptoms worsening within days or hours. IBC is considered at least stage IIIB.

Inform HER2 Dual ISH test: A test used to figure out whether breast cancer cells are HER2-positive.

Invasive: A cancer that has spread beyond the place where it started. Also called "infiltrating."

Invasive Ductal Carcinoma (IDC): A cancer that started in the milk duct but has grown into the normal breast tissue around it.

Invasive Lobular Carcinoma (ILC): A cancer that started in the milk lobules and has grown into the normal breast tissue around it.

Ki-67 test: A test that shows how fast cancer is growing.

Lobular Carcinoma In Situ (LCIS): Cells that are not normal but stay inside the milk-making parts of the breast (lobules). LCIS isn't a true cancer, but a warning sign of an increased risk for developing an invasive cancer in the future in either breast.

Local recurrence: A breast cancer that comes back in the breast area where it was originally diagnosed.

Locoregional recurrence: A breast cancer that comes back in the lymph nodes in the armpit or collarbone area near where the cancer was originally diagnosed. Sometimes referred to as "regional" recurrence.

Luminal A breast cancer: Luminal A breast cancer is one of the four main molecular subtypes of breast cancer. Luminal A breast cancer is hormone-receptor-positive (either estrogen- and/or progesterone-positive) and HER2-negative.

Luminal B breast cancer: Luminal B breast cancer is one of the four main molecular subtypes of breast cancer. Luminal B breast cancer is hormone-receptor-positive (either estrogen- and/or progesterone-receptor-positive) and HER2-positive.

Lymph channels: Vessels that drain clear, cell-cleansing fluid ("lymph") away from tissues.

Lymph nodes: Filters along the lymph fluid channels; they can catch and trap cancer cells before they reach other parts of the body.

Lymph system: A network of vessels and nodes that creates and drains clear, cell-cleansing fluid ("lymph") from the body. The lymph system is an important part of the body's immune system.

Lymphatic invasion: When cancer cells are found in the lymph channels.

MammaPrint: A test that analyzes 70 genes from an early-stage breast cancer tissue sample to find out whether breast cancer has a low or high risk of coming back within 10 years after diagnosis.

Mammostrat: A test that measures the levels of five genes in early-stage, hormone-receptor-positive breast cancer cells. A risk index score is then calculated; the higher the score, the more likely the cancer is to come back (recur).

Margin: The layer of healthy breast tissue around the cancer that was removed during surgery.

Medullary carcinoma of the breast: A rare type of invasive cancer that usually presents with a soft, fleshy tumor that resembles a part of the brain called the medulla. Medullary carcinoma of the breast is usually hormone-receptor-negative and HER2-negative.

Menopause: The time when a woman completely stops getting her period (menstruating).

Metastatic: Breast cancer that has spread to other parts of the body, such as the bones or brain.

Microscopic invasion: A situation in which cancer cells have just started to invade the tissue outside the lining of a duct or lobule.

Microscopic lymph node involvement: When only a small number of cancer cells are found in a lymph node.

Milk ducts: Tiny tubes in the breast that carry milk from the lobules to the nipple.

Milk lobules: Milk-making glands in the breast.

Moderately differentiated: Cancer cells that don't look like normal cells. They grow a little faster than normal. Also called "grade 2."

Mucinous (colloid) carcinoma of the breast: A rare type of invasive cancer that contains small pools of mucous material.

Negative margins: Removed breast tissue around the tumor in which the outer edge is free of cancer cells. Also called "clean margins."

Non-invasive: A cancer that stays inside the part of the breast where it started.

Oncotype DX: A test that provides information on how likely the breast cancer is to return and whether you are likely to benefit from chemotherapy. Oncotype DX can also determine whether someone with DCIS can benefit from radiation therapy.

Papillary carcinoma of the breast: A rare type of invasive breast cancer that is made up of small, finger-like projections.

Papillary DCIS: A type of non-invasive breast cancer that does not spread and tends to grow slowly. Papillary DCIS features cancer cells arranged in a finger-like pattern within the ducts.

Pathologist: A doctor who looks at tissue under a microscope to see if it's normal or affected by disease.

Pathology report: The written results of each test done on tissue after it has been removed from the body during biopsy, lumpectomy, or mastectomy.

Perimenopause: The 1- to 3-year period of hormonal flux before periods stop completely.

Poorly differentiated: Cancer cells that look very different from normal cells. They are fast-growing. Also called "grade 3."

Positive margins: A situation in which cancer cells come up to the outer edge of the breast tissue that was removed during surgery. This suggests that more cancer cells were left behind in the body.

PR-negative: A cancer that does not have progesterone receptors.

PR-positive: A cancer that has progesterone receptors.

Pre-cancerous: An overgrowth of abnormal cells that shows no signs of invasion. Pre-cancerous cells are a warning sign of possibly developing cancer in the future.

Progesterone: A female sex hormone. Progesterone can cause some cancers to grow.

Prognosis: The most likely outcome of a disease.

Recurrence: When a cancer comes back.

Regional recurrence: A breast cancer that comes back in the lymph nodes in the armpit or collarbone area near where the cancer was originally diagnosed. Sometimes referred to as "locoregional" recurrence.

S-phase fraction test: A test that shows how fast a cancer is growing.

Sclerosing adenosis: A benign breast condition in which enlarged lobules form breast lumps.

Sentinel lymph node: The first lymph node or nodes to which cancer cells are likely to spread from a tumor.

Solid DCIS: A type of non-invasive breast cancer; it tends to grow slowly. Solid DCIS cancer cells completely fill the affected breast ducts.

SPoT-Light HER2 CISH test: A test used to count the number of copies of the HER2 gene.

Staging: A system doctors use to classify a breast cancer according to how advanced it is.

Triple-negative breast cancer: Breast cancer that tests negative for estrogen receptors, progesterone receptors, and HER2. Triple-negative breast cancer tends to be more aggressive than other types of breast cancer.

Tubular carcinoma of the breast: A rare type of invasive breast cancer that is made up of tube-shaped cells and tends to grow slowly.

Vascular invasion: When cancer cells are found in the blood vessels.

Well differentiated: Cancer cells that look a little bit different from normal cells. They are usually slow-growing. Also called "grade 1."

For more information, go to:
www.breastcancer.org

KEY QUESTIONS

With your doctor's help, it's important that you understand the answers to the questions below:

1. Is this breast cancer invasive, non-invasive, or both invasive and non-invasive?
2. Is this a slow-growing or a fast-growing breast cancer?
3. Are the margins negative, close, or positive?
4. Are there any cancer cells present in lymph channels or blood vessels?
5. What do the hormone receptor tests show? Can I take a medicine that lowers or blocks the effects of estrogen?
6. Which of these HER2 tests was performed on the tissue?
   - IHC (ImmunoHistoChemistry) test
   - FISH (Fluorescence In Situ Hybridization) test
   - SPoT-Light HER2 CISH (Subtraction Probe Technology Chromogenic In Situ Hybridization) test
   - Inform HER2 Dual ISH (Inform Dual In Situ Hybridization) test
7. Is the HER2 test positive, negative, or borderline?
8. Are any lymph nodes involved with this cancer? If so, how many?
9. What other lab tests were done on the cancer tissue? What did they show?
10. Is any further surgery recommended based on these results?
11. Which treatments are most likely to work for this specific cancer?

PATHOLOGY REPORT CHECKLIST

This checklist can help you keep the important results from all your pathology reports together in one place. With your doctor's help, fill in the answers below. Then take this booklet with you when you visit your other doctors, so they have the information they need.

My pathology reports show the following cancer features:

1. **Invasive or non-invasive:**
   ◯ invasive ◯ non-invasive
   ◯ both invasive and non-invasive
2. **Size:** _____ centimeters (cm)
3. **Grade:** ◯ grade 1 ◯ grade 2 ◯ grade 3
4. **Lymphatic or vascular involvement:**
   ◯ present ◯ absent
5. **Margins of resection:**
   ◯ negative ◯ close ◯ positive
6. **Hormone receptors:**
   estrogen receptors:
   ◯ positive _____% (0%-100%) ◯ negative
   or circle: Allred score 0 1 2 3 4 5 6 7 8
   progesterone receptors:
   ◯ positive _____% (0%-100%) ◯ negative
   or circle: Allred score 0 1 2 3 4 5 6 7 8
7. **HER2 status based on one or more of these tests: IHC (ImmunoHistoChemistry) test:**
   ◯ positive ◯ negative ◯ borderline
   FISH (Fluorescence In Situ Hybridization) test:
   ◯ positive (amplified) ◯ negative (not amplified)
   SPoT-Light HER2 CISH (Subtraction Probe Technology Chromogenic In Situ Hybridization) test:
   ◯ positive (amplified) ◯ negative (not amplified)
   Inform HER2 Dual ISH (Inform Dual In Situ Hybridization) test:
   ◯ positive (amplified) ◯ negative (not amplified)
8. **Lymph node status:**
   ◯ positive (cancer found in lymph node[s])
   number of lymph nodes involved: _____
   ◯ negative (no cancer in lymph nodes)
9. **Oncotype DX, MammaPrint, or Mammostrat test results:** Recurrence score: _____
   10-year recurrence risk: _____

NOTES

For more information, go to:
www.breastcancer.org

BREASTCANCER.ORG

KNOWLEDGE. CLARITY. CONFIDENCE.

Breastcancer.org is the number one online resource for breast cancer information and support, providing over 8,000 pages of expert-reviewed information on all aspects of breast cancer—from diagnosis through treatment and beyond. Breastcancer.org also hosts a vibrant peer support community with over 150,000 registered members.

Breastcancer.org reaches millions of people around the world. Our mission is to help people affected by breast cancer make sense of complex medical and personal information so they can make the best decisions for their lives. Our goal is to empower everyone to face breast cancer with knowledge, clarity, and confidence.

Visit us online **at www.breastcancer.org.**

This booklet was made possible by an unrestricted educational grant from Genentech, A Member of the Roche Group

HER/100614/0005(2)

v5.6.15