



# Understanding Your Breast Cancer Pathology Report

A Guide for  
Breast Cancer  
Patients

guide



Being diagnosed with breast cancer is a life-changing event. There are many different emotional reactions to deal with and an enormous amount of information to learn. A call to the Y-ME National Breast Cancer Hotline can help with both.

Newly diagnosed women and men, their families and friends, need information that will educate them about breast cancer, possible treatments and prognosis. The pathology report can be a major source of this information. Unfortunately, the pathology report is sometimes written in terms that only pathologists and other medical professionals can understand. The pathology report is a collection of information that describes a patient's breast cancer. Not all tests described in this brochure will be done on an individual tissue sample. This is not wrong. You will note, with careful reading, that some tests give similar information and therefore all tests are not needed. Do not become concerned about any one finding on your pathology report. Most reports contain positive information and some that might be considered negative. It is the whole report that is most important. Specific questions about your pathology report should be directed to your doctor or pathologist.

We have put together this brochure in an effort to make this important document clearly understood by all. Because pathology reports sometimes follow different forms, we have tried to describe the terms that may be used on the report in a general way.

## Purpose of the Pathology Report

The purpose of a pathology report is to provide your health care team with information about a surgical specimen or tissue sample. The information is then used to determine the exact nature of the specimen (non-cancerous vs. cancerous) and the characteristics of the tissue sample. If the tissue sample is cancerous, the description of its characteristics will give you and your physician(s) information about size, local extent of the tumor, staging, prognosis and possible treatment options.

## Sections of the Pathology Report

### **Demographics**

This section contains identification information. Your name, doctor(s) name(s), medical record number and other identifying information may be included.

### **Gross Description**

In this section, you will find the description of the specimen or tissue sample based on what the naked eye can see. Included here will be the size and weight of the specimen and other visual observations made by the pathologist. Information about how the sample was handled — how it was sectioned and what materials were used — in preparation for the microscopic examination is also included.

### **Microscopic Description**

This part of the report points out the features of the tumor or tissue sample seen under a microscope. These features will lead to the specific diagnosis and will be discussed later.

### **Prognostic Report**

Results of the specific tests performed on the specimen are stated in this section.

### **Summary and Diagnosis**

This section should contain all of the important data from various tests performed on the specimen leading to a diagnosis. The most helpful part of this section is a list of characteristics and the findings related to the specific specimen.

# Information Found in the Report

## Anatomic site

For example: “breast, right, mastectomy” or “right breast upper outer quadrant lumpectomy.”

## Size

In general, the smaller the tumor the better the prognosis is. The larger a tumor grows, the greater the chance it may have spread to other areas of the body. Reported in centimeters (one inch = 2.54 centimeters).

## Invasive vs. Noninvasive

Invasive breast cancer is cancer that has broken through the wall (basement membrane) of either a duct or a lobule. (Breast tissue is made up of lobules that produce milk and ducts that carry the milk to the nipple). The most common form of breast cancer is invasive ductal carcinoma, a cancer that begins in a duct and spreads outside the duct. Noninvasive breast cancer is referred to as *in situ* because it remains in the duct or the lobule. It is considered Stage 0.

*Intraductal  
Carcinoma  
In Situ*



*Invasive  
Ductal  
Cancer*



## Histopathologic Grade

This measure is often reported using some version of the Bloom Richardson or the Scarff-Bloom-Richardson scale. It is based on a combined score for nuclear grade, mitotic rate, and histologic grade or architectural differentiation. Each characteristic is given a score of 1 to 3, resulting in a total score ranging from 3 to 9.

- Nuclear Grade

Nuclear grade is assessed on a scale of 1-3.

A Grade 1 (low) indicates small nuclei with little variation in size and shape. A Grade 3 (high)

indicates larger nuclei with marked variation in size and shape. Grade 2 (intermediate) nuclei show features between 1 and 3. The higher the grade is, the more aggressive the tumor.



Normal → Abnormal  
Nuclear Grading

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- **Mitotic Rate**  
This rate indicates the number of malignant cells that are actively dividing. The mitotic rate is reported with numbers from 1 to 3. The higher the score is, the more aggressive the tumor cells.
  - **Cellular Differentiation**  
This measure is based on how closely the specimen resembles normal breast tissue. This measure refers to tubular formation of the cells. A grade of 1 indicates a well-differentiated tissue with many tubules, Grade 2 moderately differentiated, and Grade 3 poorly differentiated tissue with few or no tubules.

### **Surgical Margins**

When a specimen is received from surgery, the edges or borders are marked with ink. Later, when cross sections of the specimen are viewed under the microscope, the pathologist can report whether the tumor goes right up to the inked border (positive) or whether the margin is “clear” or negative. Positive margins sometimes indicate the need for another surgical procedure in an attempt to remove any remaining cancer cells and achieve “clear margins.”

### **Lymph Node Status**

Our bodies have a network of lymph nodes and lymph vessels that carry and remove fluid, similar to the way blood vessels circulate blood to all parts of the body. The lymph fluid has white blood cells, which help fight infection. With invasive breast cancer, tumor cells may spread through the lymph vessels. Therefore, during surgery for invasive breast cancer, the doctor usually removes some of the lymph nodes and vessels from the underarm (axilla) to see if the cancer has spread. If cancer cells are found in any of the lymph nodes, it is reported as positive. The report will indicate how many lymph nodes were removed and how many are positive (e.g., 0/11 is no positive nodes out of 11; 3/15 is three positive nodes out of 15 removed). In general, negative lymph node status is better than positive and a lower number of positive nodes is better than a higher number. The lymphatic drainage system from the breast to the underarm is not random. It follows pathways that can be mapped by injecting blue dye, a radioactive material or both around the site of the tumor. The first lymph node, or first several lymph nodes, that show dye or radioactivity are called the sentinel nodes. On average, two sentinel nodes are identified, removed

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and analyzed, although the range varies from one to five. This newer procedure is called sentinel node mapping (SNM). Not everyone is a candidate for SNM, and its potential benefit is still being studied. At this time, the finding of a positive sentinel lymph node is usually followed by a standard axillary lymph node dissection, or removal of more nodes.

### **Hormone Receptor Status**

There are some breast cancer cells that have a high proportion of hormone (estrogen and/or progesterone) receptors in the nucleus. These cells are sensitive to hormones that can promote cell growth. If your cancer cells have a high proportion of estrogen (ER) or progesterone (PR) receptors, the report will say you are ER positive or PR positive. If your cells have a lower number of receptors, your report will say you are ER or PR negative. This is one of the most important pieces of information on the pathology report. Being ER/PR positive means you might benefit from hormonal therapy. Hormone therapy is actually therapy with an oral drug, usually tamoxifen or aromatase inhibitors, which blocks hormone receptors in the cancer cell.

### **HER2 Status**

The HER2 (HER2/neu, c-erb-2 or erb-2) gene produces a protein that acts as a receptor on the surface of the cell. This receptor is sensitive to a growth factor, a signal to the cell to grow. If the cancer cells have more receptors than normal, they are receiving more messages to grow and divide. There are two ways to measure HER2 status. One is an immunohistochemistry (IHC) test, which measures the overexpression of the protein (number of receptors on the surface of the cancer cell) and is reported using the numbers 0 to +3. Scores of 0 and +1 are HER2 negative and +2 and +3 are HER2 positive. The other method of testing is fluorescent in situ hybridization (FISH), which measures the amplification of the HER2 gene (the number of copies of the HER2 gene present in a cancer cell). The results of this test are reported as positive or negative. HER2 positive status is associated with tumors that are fast growing and aggressive. Only 25% to 30% of women with breast cancer are HER2 positive.

### **Lymphovascular Invasion**

This is the penetration of cancerous cells (often seen as small clusters under the microscope) into the interior of blood vessels and/or lymph channels. Lymphovascular invasion may indicate a more aggressive tumor.

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## The Ki-67 proliferation index

The Ki-67, a cell proliferation associated nuclear antigen, is found in cells in nearly all stages of the cell cycle and is therefore a direct indicator of the growth fraction.

The Ki-67 status is reported as a percentage of invasive carcinoma cells exhibiting positive nuclear staining: less than 10%—favorable prognosis, more than 20%—unfavorable diagnosis, 10-20%—borderline category.

The Ki-67 growth fraction is significantly related to the grade in most tumors, being highest in Grade 3 invasive carcinomas. Estrogen and progesterone receptor negative tumors tend to have a high Ki-67 positive fraction and this index could be used to add adjuvant chemotherapy in both receptor negative and positive patients. The Ki-67 reactivity does not correlate well with the stage of the tumor as reflected in size, lymph node status or distant metastasis.

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## Staging

Staging is the assessment of how far a patient's breast cancer has progressed and determines treatment decisions and prognosis. Knowing the patient's stage helps the doctor decide what kind of treatment would be best for the patient.

Staging is done using the TNM system. T is Tumor size, N is lymph Node status (cancer cells found in the lymph nodes is called positive status) and M is Metastasis (the tumor has spread to other parts of the body). In general, the lower the stage the better the prognosis. Below is an abbreviated table to help you understand the relationship of these three factors.

STAGE	SIZE OF TUMOR	LYMPH NODE STATUS	METASTASIS
0	DCIS	Negative	None
I	<2 cm	Negative	None
II	0-2 cm	Positive	None
	2-5 cm	Positive or Negative	
III	0-5 cm	Positive (fixed)	None
	>5 cm with skin or chest wall involvement	Positive or Negative (fixed or moveable)	
IV	Any size	Any status	Yes

# mission

The mission of Y-ME National Breast Cancer Organization is to ensure, through information, empowerment and peer support, that no one faces breast cancer alone.



212 West Van Buren Street, Suite 1000  
Chicago, IL 60607-3908

24-hour Y-ME National Breast Cancer Hotline  
800-221-2141 (English)\*  
800-986-9505 (Spanish)

\* Interpreters available in 150 languages

[www.yme.org](http://www.yme.org)

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