

Pathology Report Patient Companion Guide

Breast Cancer - Understanding Your Pathology Report

Pathology Reports can be overwhelming. They contain scientific terms that are unfamiliar and might be a bit scary. This companion Patient Guide to Pathology Reports is designed to help patients understand what the various tests mean and how they help guide treatment planning.

Together with other diagnostic tools like medical images (eg. mammograms and ultrasounds), your cancer care team uses the results of pathology reports to design your treatment plan. A pathology report typically has several sections, including a description of where the tumour was found, what tests were performed and a “pathologic diagnosis” – the result of the tests the pathologist conducted. (A [Pathologist](#) is a medical doctor. They are specialists in examining body tissues and fluids for disease.)

A diagnosis is given after your tissue sample (or samples) has been examined and analyzed by the pathologist. Tests are performed individually on separate sections, or slices, of the tissue. Each test has a different procedure. Some can be done in a few hours and others might take a week (or more) to finish. Having the results of all of the tests is important to get a correct, complete diagnosis, and critical to determining the best treatment plan for you.



Provincial Health Services Authority

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Pathology reports are sent to share the results of a biopsy or after a tumour is removed during surgery. This section has a quick overview of some of the terms and what you might see in a pathology report after a biopsy or surgery. More details about the tests performed are covered in other sections.

Biopsy Pathology Report

A Biopsy Pathology Report summarizes the results of a biopsy – it tells you what type of cancer has been found. One of the most important parts of the biopsy report is whether your tumour is “**in situ**” (pre-cancer) or “**invasive**” (cancer), and where it was found – “**ductal**” or “**lobular**”. There may be a reference to the tumour ‘**grade**’, which describes how fast the biopsied cells may be growing. On invasive tumours, usually tests are also performed to determine the **status of hormone receptors**, so you may see either “positive” or “negative” in relation to a hormone status. (ER: estrogen receptor, PR: progesterone receptor, HER2: human epidermal growth factor receptor 2).

Surgical Pathology Report

A Surgical Pathology Report, which is more detailed and contains information about the entire tumour, is sent after surgery to remove the tumour(s). The **diagnosis** (type of cancer or pre-cancer), **stage**, grade, status of ‘**margins**’ around the tumour and the outcome of any **lymph node exams** are usually finalized in this report. Tumour ‘stage’, also known as ‘*staging of the tumour*’, is a system used to identify the size of a cancer and how far it has grown. (More details about stage are in the next section.) **Note:** Tumour *grade* (how closely the tested cells resemble normal cells) is NOT the same as tumour *stage* (how far it has spread). Oncologists rely on this more detailed surgical pathology report to determine the optimum treatment plan.

What's In Your Pathology Report

Let's first take a closer look at some of the key things in your Pathology Report. These are the terms you'll likely hear most often. Additional information about other items in the testing checklist used by pathologists follows in the next section.

Type of Cancer

Breast tumours are divided into different types based on two things: the type of cancer (which is based on where the tumour was found in the breast – ductal or lobular) and whether it is “in situ” (pre-cancer) or “invasive” (cancer). Breast cancers that start in the duct (how milk is carried to the nipple) are called **ductal** and those that start in the lobule (where the milk is produced) are called **lobular**.

- **Invasive** – this label is used to describe cancers that have spread outside the area where the tumour started. Other terms you may see or hear are “**regional**” or “**locally advanced**”, which means cancer cells are more spread out but still close to the original tumour. “**Distant**”, “**advanced**” or “**metastatic**” mean the cancer has spread to other parts of the body.
- **In situ** – In situ is also known as **non-invasive** or pre-cancer. It is the earliest form of breast cancer that has not spread outside of the milk ducts or lobule.



In Situ



Invasive

Grade

Grading a tumour helps your cancer team understand how fast the cancer may be growing and how likely it might be to spread elsewhere in your body. The grade assigned to your cancer is one of the information points your team will use to help plan your treatment.

Cancers are **'graded' between 1 and 3** based on what the cells look like under a microscope compared to normal cells. The closer a cancer cell looks to a normal cell, the lower the grade. Lower grade cancers look a lot like a healthy cell and usually grow slowly. Higher grade cancer cells, which grow more quickly, are more abnormal and look very different from normal cells. Pathologists and oncologists may also refer to the **'differentiation'** of a cancer cell. According to the [Canadian Cancer Society](#), "grading is a standardized way of measuring differentiation."

Pathologists grade a cancer cell using a scoring system. In your pathology report, you may see this referred to as the **'Nottingham Histologic Score'**. It's described in more detail in the next section.

Stage

Staging is how much cancer is in your body and where it might have spread. **Breast cancer stages range from 0 to 4**. Staging takes into account the size of the tumour, where in the breast it was found, if the cancer has spread beyond where it was first discovered and where in the body the cancer may have spread. The stage of a cancer is used by your care team to help plan treatment and is an important prognosis tool (the likely outcome).

Pathologists in British Columbia use the **TNM staging system**. It is the most common staging system in Canada and around the world.

- T = Tumour. T is based on the size of the tumour, generally a number between 1 and 4. A higher number means a larger tumour. (The entire tumour must be removed in order to determine a T number. Pathology reports for needle biopsies do not have T numbers because the entire tumour has not been removed.)
- N = Lymph Nodes. A number after N indicates how many lymph nodes were found to have cancer in them. This can be further broken down into sub-stages with an "a", "b" or "c" to further classify the number of lymph nodes where cancer was found. N0 (zero) means no cancer was found in the tested lymph nodes. N1a would indicate that metastases (malignant growths) were found in 1 to 3 axillary lymph nodes. (There is more detail on lymph node testing and tumour size in the next section.)
- M = Metastasis. M0 (zero) means the cancer has not spread anywhere else in the body. M1 means that cancer has spread.

A detailed description of the stages of breast cancer can be found at the [Canadian Cancer Society](#).

You may see a small “c” or “p” in front of the TNM in your report. The “**c**” means **clinical stage**. It is what your clinical team suspects about the lump in your breast before a biopsy is performed. It is the “working theory” based on what they see from mammograms, ultrasounds and physical examinations. The “**p**” means **pathologic stage**. This is what the pathologist found as a result of the tests performed on a biopsy tissue sample or a tumour sample that was surgically removed.

Hormone Receptor Status

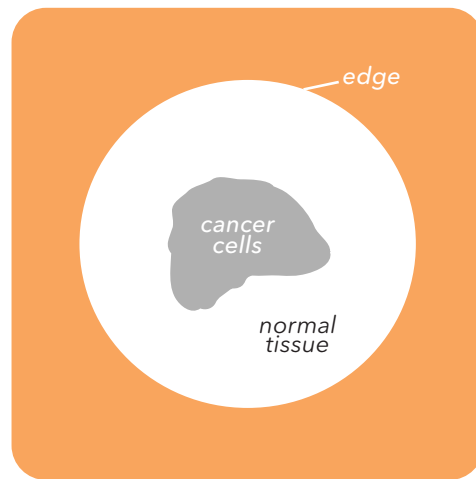
Breast cancer cells sometimes have **estrogen receptors (ER)** or **progesterone receptors (PR)** that use these hormones to stimulate their growth. A test is done to see if the tumour has these hormone receptors. Sometimes, a positive hormone test may be reported as an **‘Allred score’** (which ranges from 0 to 8). This score indicates how many of the cancer cells contain the hormone receptor and how well the receptors are seen under the microscope (also called ‘staining intensity’). A high Allred score (7-8 out of 8) means there are many cancer cells staining with high/strong intensity, while a low Allred score (3-4 out of 8) means there are only a few cancer cells with faint/weak staining intensity. Your tumour can be ER positive and PR negative. Or ER and PR positive. This is sometimes called double positive. If a tumour is both ER negative and PR negative, that is often referred to as double negative, and when the companion HER2 test is also negative, this is called “triple negative”. If hormone receptors are positive, hormone treatment therapies to block those receptors may be an option your care team considers.

HER2 Status

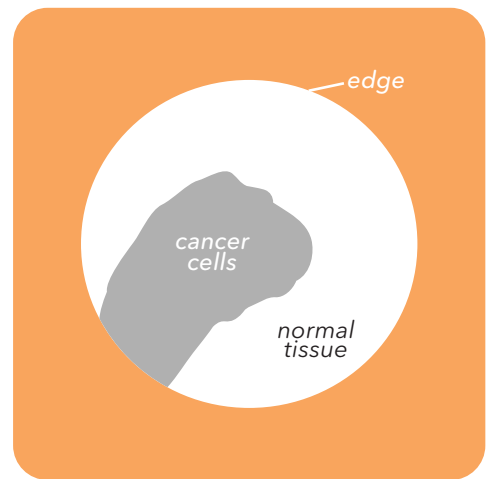
HER2 stands for **human epidermal growth factor receptor 2**. This test is often done at the same time as the Hormone Receptor Status (ER and PR) test. HER2 is a gene that controls a protein found on the surface of cells. Too much HER2 can make tumours grow. This test finds out how much HER2 a tumour is making. The HER2 score (tested in the same way as ER and PR) is reported on a scale from 0 to 3+. A negative score (0 to 1+) or a positive score (3+) will not undergo additional testing. When the score is 2+ (an ‘equivocal’ score), an additional confirmatory test will usually be performed (this test is called FISH, which stands for fluorescence in situ hybridization).

Margins

The surgical pathology report contains information about the “margins” around a tumour. Margins are the edges of non-cancerous tissue that surround a tumour when it is removed. Surgeons aim for a “clear margin”, meaning no tumour cells in the tissue surrounding the removed tumour, to make sure all of the cancer was removed. Your surgical pathology report may state that the tumour is “**clear from the margins**” or may report the distance to the margins.



Clear Margin



Positive

These are the most common terms used in discussions about your cancer. The next section covers a bit more detail about the testing checklist pathologists use to build a pathology report.



The Standardized Cancer Protocol Synoptic Test Checklist

In British Columbia, pathologists across the province generally use a protocol (an “official procedure”) called “pathology synoptic reporting”. This ensures that all pathologists use the exact same checklist for describing cancers, with standardized labels and processes. This helps deliver consistent pathology report content no matter where your pathology testing was done or who did the tests. The [College of American Pathologists Cancer Protocols](#) are the default standard synoptic reports used in most of North America, including British Columbia.

Here are some of the items from the “synoptic checklist” you may see in your report. A full list of Breast Cancer tests in the checklist can be found on the [College of American Pathologists website](#) – Breast is the first group in the list of protocols. It’s broken out into **DCIS-Breast** and **Invasive Breast** – if you want to know more about the checklist used for your pathology report, be sure to click on the correct one based on the type of cancer listed in your diagnosis. Please note that these checklists are very detailed and contain complex scientific terms – they can be scary to read. The checklist also contains a detailed description of how the test was performed.

Procedure

This section is a general summary, including how the tumour was removed (the type of surgery you chose to have).

Types of procedures described include:

- **Excisions** - removal of the tumour and breast tissue while conserving the breast. Excisions are sometimes called ‘**partial mastectomies**’ or ‘**lumpectomies**’.
- **Total Mastectomy** - removal of all breast tissue, generally (but not always) including the nipple and areola.

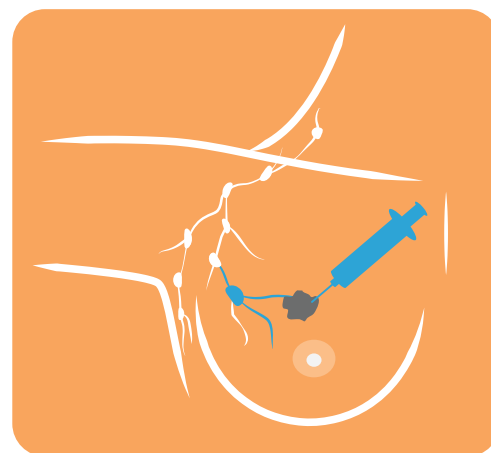
Lymph Node Sampling & Reporting

[Lymph nodes](#) are small, bean-shaped organs that are part of your lymphatic system, which carries fluids around the body. They are typically tested for patients whose biopsy pathology report found an invasive carcinoma. The test is performed to see if the cancer has spread to the blood or lymph system. Lymph node status is one of the factors that helps to determine the stage of a cancer – how far has it spread. Typical lymph node tests include (but are not limited to):

- **Sentinel Node Biopsy** – the cluster of lymph nodes that are the first (or sentinel) group of nodes that drain fluid away from the area in the breast where a tumour is located. This ‘sentinel’ group is identified through the use of radioactive tracers and/or dye (sometimes both are used). Generally involves the removal of less than 5 lymph nodes.
- **Axillary Lymph Node Dissection** – removed as a block of lymph nodes with axillary tissue, which is generally located in the underarm area.



Lymph Nodes



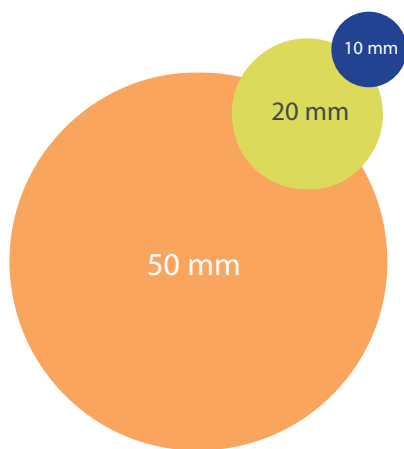
Tumour injected with tracer or dye to locate Sentinel Node (in blue)

(Please note: this guide provides a high level summary of lymph node testing. If you want to know more about lymph node classification status and types of lymph node biopsies, there are more resources at the [Canadian Cancer Society](#) or the [Canadian Breast Cancer Foundation](#).)

If lymph nodes were tested, you may see the finding reported as positive or negative. Positive means that cancer cells were found in a lymph node. Depending on the number of nodes removed, your report may contain something like 0/3 (no cancer cells found in any of the 3 lymph nodes examined) or 2/3 (2 of the 3 lymph nodes examined had cancer cells). The status of lymph nodes with cancer cells is assigned a “classification” based on the number and/or size of abnormal cells seen under the microscope. Pathologists use a combination of letters and numbers to indicate the type of metastases found. You may see something like pN1mi where p = pathologic, N = node, 1 = the number of metastases found and mi = the size of metastases (in this case if ‘1mi’ is stated, it refers to only a very small metastasis, i.e. a ‘micro’ metastasis).

Tumour Size

The size of a tumour is one of the factors that determines the stage of a cancer. Tumours are measured in millimetres. Pathologists use diagnostic images (like ultrasounds), microscopic evaluation and visual examination of the removed tumour to determine an accurate size. The tumour size is indicated using a number from 1 to 4, so you may see something like T2 on your pathology report. This means your tumour is between 20 and 50 mm.



Actual size
(when printed at 100% on letter sized paper)

Tis	Tumour "in situ"
T1	Tumour less than 20 mm
T1mi	Tumour less than 1 mm
T1a	Tumour between 1 mm & 5 mm
T1b	Tumour between 6 mm & 10 mm
T1c	Tumour between 10 mm & 20 mm
T2	Tumour between 20 mm & 50 mm
T3	Tumour over 50 mm
T4	Tumours of any size that have spread to the chest wall

Here is an example of a TNM report:

pT2N1aM0 is a pathologic diagnosis (p) of a tumour that is more than 20 mm but less than 50 mm (T2) with 1 lymph node (N) that has cancer and no metastasis (M). This result is an example of an "early stage" breast cancer – Stage 1 or 2. "Locally advanced" breast cancers are tumours larger than 50 mm and more than three lymph nodes. They are generally a Stage 3 cancer. All metastatic breast cancers (cancers that have spread beyond the breast and nearby lymph nodes) are classified as Stage 4. In situ breast cancer (pre-cancer) – where the cancer cells are only in the ducts or the lobule and have not spread into the breast tissue – is Stage 0.

Histologic Grade (Nottingham Histologic Score)

Pathologists use the Nottingham Histologic Score to help classify the aggressiveness of a tumour. They look at three things: **nuclear grade** refers to the nucleus of the cancer cell and how much it looks like a normal cell, **mitotic rate** indicates how fast the cancers cells are multiplying, and **tubule formation** reflects how many of the cancer cells form small tube-like structures.

The results of the three tests are combined to produce an overall grade. Generally, lower scores are better.

- A score of 3 to 5 is a low grade, or **Grade 1**
- Scores of 6 or 7 are considered intermediate grade, or **Grade 2**
- A score or 8 or 9 is considered high, or **Grade 3**

A grade 1 cancer is considered to be '**well-differentiated**' and tends to grow and spread at a slower rate than grade 3 cancers, which are considered '**poorly differentiated**' or '**undifferentiated**'.

Pathologic Stage Classification

This is what is generally referred to as the stage of your cancer. Stage indicates how far the cancer has progressed. See the notes above about stage.

Pathologic Diagnosis

This is the summary of all of the tests completed within the Synoptic Test Checklist. You may see this at the beginning or at the end of the pathology report. This is the diagnosis.

This covers the major parts of a pathology report. You can find more detail about pathology reports at the [College of American Pathologists Cancer Protocols](#) and about pathologists at the [My Pathology website](#).

References

- College of American Pathologists Cancer Protocols:
www.cap.org/web/home/protocols-and-guidelines/cancer-reporting-tools/cancer-protocol-templates
- Canadian Cancer Society – Breast Cancer Staging:
www.cancer.ca/en/cancer-information/cancer-type/breast/staging/?region=bc
- Canadian Cancer Society – Breast Cancer Grading:
www.cancer.ca/en/cancer-information/cancer-101/what-is-cancer/grading/?region=bc
- Canadian Cancer Society – diagram of the breast & lymph nodes:
www.cancer.ca/en/cancer-information/cancer-type/breast/breast-cancer/the-breasts/?region=bc
- Canadian Breast Cancer Foundation – Staging and Grading:
www.bcbf.org/bc/AboutBreastCancerMain/Diagnosis/Pages/StagingGrading.aspx
- National Cancer Institute – Lymph Nodes:
www.cancer.gov/publications/dictionaries/cancer-terms/def/lymph-node
- My Pathologist – Diagnosing Disease:
www.mypathologist.ca/pathology-in-action/
- Canadian Association of Pathologists:
www.cap-acp.org

Tools and Support

BC Cancer has many tools and support options for patients and families. Please see the website at www.bccancer.bc.ca. For contact information, visit www.bccancer.bc.ca/contact

Feedback

We welcome your help in making this Pathology Report Companion Guide better. Please share your feedback and suggestions!
Phone: 604-877-6000 ext. 674619 Email: patientexp@bccancer.bc.ca

Glossary

- Advanced** – cancer has spread to other parts of the body from its original source
- Biopsy** – tests performed on bodily tissues or fluids
- Differentiation, differentiated** – used in grading to classify how closely cancer cells in a tissue sample resemble normal tissue
- Distant** – cancer has spread to other parts of the body from its original source
- Ductal** – located in the breast milk ducts
- Excision** – a surgical term describing the removal of a tumour; sometimes called partial mastectomy or lumpectomy
- Grade** – a classification system that helps identify how fast cancer cells are growing and are likely to spread elsewhere in the body
- HER2** – human epidermal growth factor receptor 2, a gene that is sometimes found on the surface of cells that can make cancer grow faster
- Hormone receptor status** – a test done to determine if estrogen receptors (ER) or progesterone receptors (PR) are present in a tumour
- In situ** – an early stage tumour that has not spread beyond the site where it formed
- Invasive** – a tumour that has spread beyond the site where it formed – note that invasive does not mean metastatic
- Lobular** – located in breast lobules
- Locally advanced** – cancer cells have spread out from the source, but are still close to the original tumour
- Lumpectomy** – a partial mastectomy, also called breast conserving surgery
- Lymph nodes** – small, bean-shaped organs that move lymphatic fluids throughout the body
- Margins** – edges of non-cancerous tissue that surround a tumour when it is removed
- Mastectomy** – surgical removal of a breast
- Metastatic** – cancer has spread to other parts of the body from its original source
- Regional** – cancer cells have spread out from the source, but still are close to the original tumour
- Sentinel node biopsy** – a biopsy technique that uses a radioactive isotope “tracer” or special blue dye (sometimes both) to identify the first lymph nodes that drain lymphatic fluid from the area of the breast where the cancer was found. The first node that turns blue is the ‘sentinel’ lymph node.
- Stage** – a classification system used to describe how much cancer is in your body and where it might have spread
- TNM** – a system used to classify tumours: T = tumour, N = lymph nodes, M = metastasis