

Understanding Your Pathology Report

A pathology report is a medical report that describes a tissue sample taken from a patient, written by a pathologist. It provides the definitive cancer diagnosis and is used for staging and planning treatment. It usually includes a gross description, a microscopic description, and a final diagnosis.

The simple version

A pathology report is a medical report that describes a tissue sample taken from your body. It is sometimes called a surgical pathology report. A pathologist writes it. A pathologist is a doctor with special training in identifying diseases by studying cells and tissues under a microscope.

The report starts with identifying information, such as your name, birthdate, and the date of the biopsy. It says where in the body the sample came from and how it was taken. Most reports then have three main parts. One is a gross description, which is how the sample looks to the naked eye. One is a microscopic description, which is how the cells look under the microscope. The third is a final diagnosis. Some reports also add a comments section from the pathologist.

The pathology report gives the definitive cancer diagnosis. It is also used for staging, which describes the extent of cancer in the body and whether it has spread. And it helps your team plan treatment.

Your pathology report is the document that confirms a cancer diagnosis and describes exactly what was found.

How tissue is obtained

The pathologist examines cells or tissue from a biopsy, from surgery, or from body fluids. A biopsy sample can be taken in several ways, such as:

- taking a tissue sample from the surface of the skin
- putting a needle through the skin to draw out tissue or fluid
- passing a thin, lighted tube called an endoscope through the mouth, anus, urethra, or a small cut, to look inside the body and remove a sample

Surgery may also be used to remove part or all of a tumor. Some or all of the removed tumor is then examined. When the whole tumor comes out, the surgeon usually takes a rim of normal tissue around it as well. That rim is the margin. The pathologist checks it for tumor cells. For some cancers, especially breast cancer and melanoma, the surgeon may also remove nearby

lymph nodes. These are the sentinel lymph nodes. The pathologist then checks whether they contain cancer cells.

A pathologist may also examine cells in body fluids. These include urine, cerebrospinal fluid (the fluid around the brain and spinal cord), sputum (mucus coughed up from the lungs), and others.

How the tissue is examined

The pathologist needs very thin slices of tissue to study under a microscope. These slices are called sections. First the lab has to process the sample to make it solid.

The most common approach is to chemically "fix" the sample, usually with a chemical called formalin. Fixing holds the cells steady. The tissue is then set into a permanent paraffin wax block. The block is cut into very thin sections. Those sections go onto slides and are stained with dyes. The dyes bring out parts of the cell and structures in the tissue. This is known as histologic (tissue) examination. Preparing these fixed sections normally takes several days. The pathologist typically sends the report within 10 days after the biopsy or surgery.

Frozen sectioning is another approach. It is used when an immediate answer is needed. During surgery, for example, it gives the surgeon a rapid diagnosis while the patient is still in the operating room. A frozen section can be examined in about 15 to 20 minutes. But fixed (permanent) sections preserve more detail, so they are used more often to make a diagnosis.

The gross description

The gross description includes the color, weight, and size of a tissue sample as seen by the naked eye. It may also give the shape of the sample and any abnormalities that can be seen. It names the body site the tissue came from. It also says how many samples were taken, and whether any lymph nodes were removed and how many.

The microscopic description

The microscopic description covers how the cells look after staining and under the microscope. The most common stain is hematoxylin and eosin, or H&E. This part may list the type and number of cells seen. It may say how abnormal the cells look, which is the tumor grade. It may also note other features of the cells.

This section also says whether abnormal cells were found in the margins or in lymph nodes:

- **Margins** are described as negative (or "clean") when no cancer cells are found at the edge of the removed tissue. That suggests all the cancer has been removed. A margin is positive (or "involved") when cancer cells are found at the edge. That suggests some cancer has not been removed.
- **Lymph nodes** are called positive if they have cancer cells and negative if they do not.

Some report phrases are worth decoding. These explainers cover positive lymph node, high-grade, low-grade, pathologic complete response, suspicious for malignancy, cannot exclude malignancy, metaplasia, hyperplasia, and equivocal result.

The microscopic description may also carry results of extra tests. Some measure properties of the cells. Others look for genetic or molecular changes.

The diagnosis

The diagnosis section is the pathologist's summary of all the findings. It pulls together the visual exam, the microscopic exam, and relevant clinical information. This is where the cancer type is named. It also gives the tumor grade, the lymph node status, the margin status, and the stage.

Molecular and biomarker results

Certain molecular tests, sometimes called biomarker tests, are done as part of the initial pathology analysis. This happens for all cases of a given cancer type. For example, a report for suspected breast cancer will include testing for estrogen and progesterone receptors and for the protein HER2/neu. These results help identify the best treatments for an individual patient.

A liquid biopsy is another way to look at molecular features. It tests a sample of blood or other fluid for pieces of tumor DNA. Some of these results may arrive in separate reports linked to the pathology report.

Your portal may show blood-based or molecular monitoring language. Related explainers cover circulating tumor DNA, tumor-informed ctDNA, minimal residual disease, molecular residual disease, Signatera, and Guardant360. Newer molecular reports may also mention PTEN loss, an ESR1 mutation, a TP53 mutation, BCR-ABL, a FISH test, or flow cytometry.

Getting your report and a second opinion

The doctor in charge of your treatment will tell you about the findings in the pathology report. They can help you understand what it means for your situation. You can also ask to discuss your report with the pathologist. One thing to expect: results often appear in the patient portal at the same time the doctor receives them. So you may see your report before your doctor has reviewed it.

The diagnosis of most cancers is straightforward. Even so, you or your doctor may want a second opinion from another pathologist. To arrange one, you will need to obtain the slides and/or paraffin block from the pathologist or hospital that examined the sample. Many institutions provide second opinions, including NCI-designated cancer centers. Contact the facility in advance about availability, cost, and shipping.

Your doctor is your guide to the report — and getting a second opinion is always an option if you want one.

More report codes and categories to decode

Some reports use standardized category systems. These explainers translate Bethesda thyroid biopsy categories, Bethesda Pap test wording, Grade Group in prostate cancer, MRD, RECIST, and Lugano criteria.

Source: National Cancer Institute (cancer.gov/about-cancer/diagnosis-staging/diagnosis/pathology-reports-fact-sheet)

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