GO2 FOR LUNG CANCER

PATIENT SUPPORT

Understanding Lung Biopsy and Pathology Results

go2.org

GO2 Patient Support

For Everyone Impacted by Lung Cancer

We put people living with and at risk for lung cancer at the center of everything we do. From finding care to staying informed and building your resources, we are your community. As your friends, your guides, your advocates, your support system, **GO2 is your go-to.**

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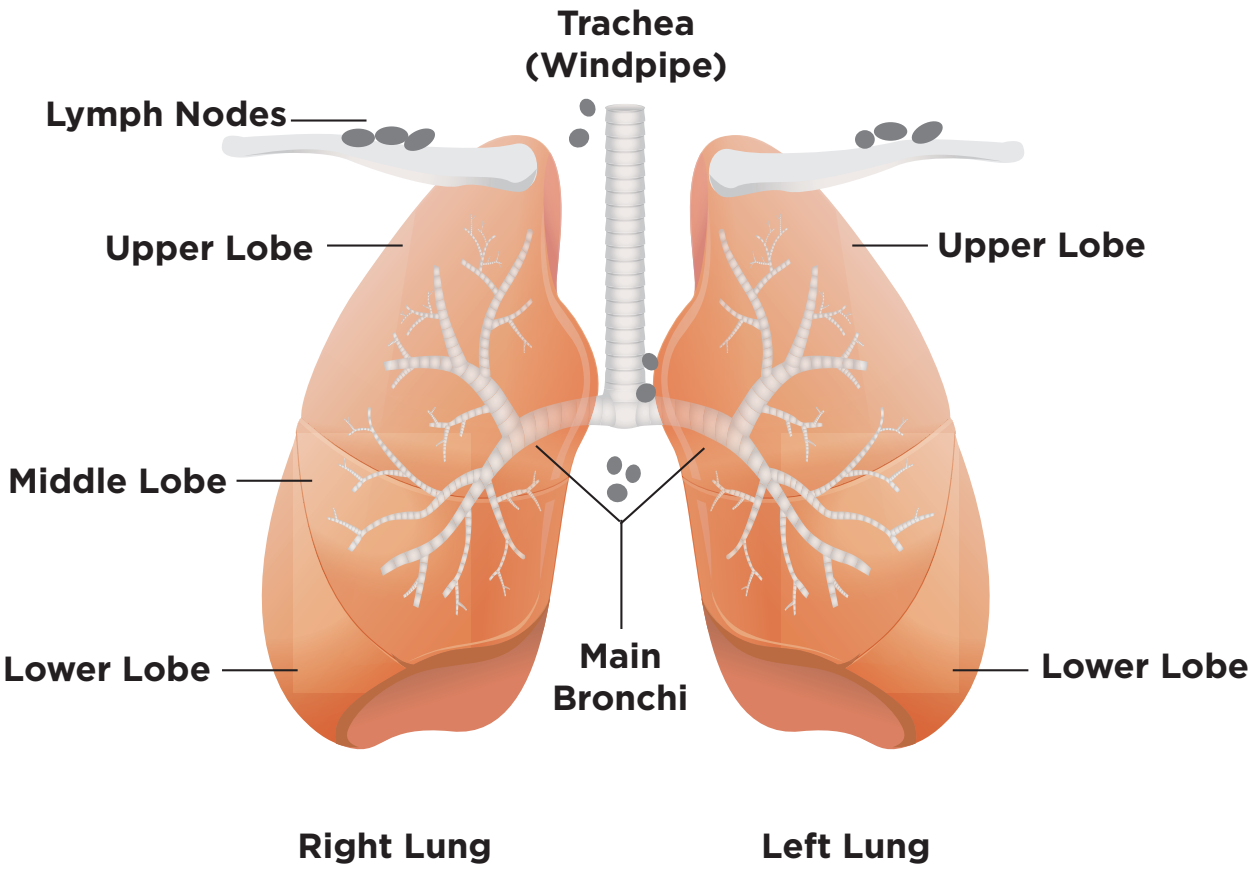
This booklet was created to help you learn about lung cancer biopsies and your pathology report. Understanding this information can help you discuss your results with your healthcare team and loved ones.

Many have found the support of family, friends, and social or faith groups to be helpful in coping with lung cancer. If you would like to connect with other people living with lung cancer and learn more about support groups or GO2's Phone Buddy program, call our HelpLine at 1-800-298-2436 or email support@go2.org.

The Lungs



Knowing the parts of your lungs and the basics of how they work can help you better understand what happens during a lung biopsy. This knowledge can also make it easier to talk through any questions or concerns with your healthcare team.

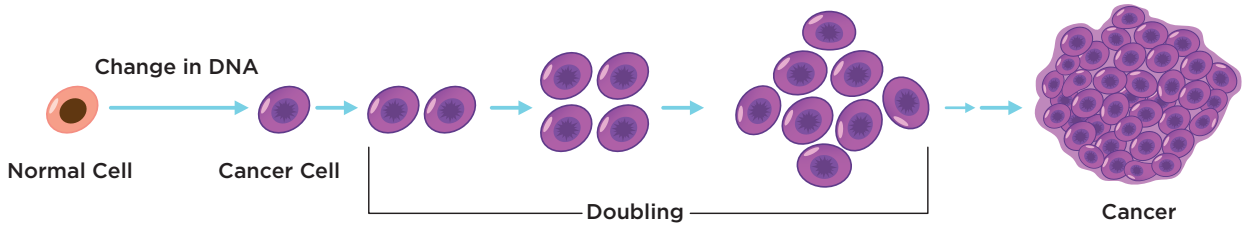
Your lungs are 2 sponge-like organs in your chest. The right lung has 3 sections, and the left lung has 2 sections. These sections are called lobes. When you breathe in, air comes in through your mouth and nose and travels to your lungs through the trachea (windpipe). The trachea divides into tubes called the bronchi, which enter the lungs and divide into smaller branches called bronchioles. At the end of the bronchioles are tiny air sacs known as alveoli. When the air you breathe travels down into these air sacs, oxygen crosses into the bloodstream and is carried through the rest of your body.

What Is Lung Cancer?

Lung cancer occurs when damaged cells inside the lung begin to grow out of control.

Cells are the basic building blocks of your body. Healthy cells grow, mature, and are replaced by other healthy cells. Each cell has a map that controls how it grows and functions. This map is your DNA (deoxyribonucleic acid). Sometimes when your body makes new cells, mistakes happen, and the DNA is damaged. When cells with damaged DNA divide or double, they make more damaged cells. Sometimes these damaged cells stick together and form tumors. The kind of cancer a person has is based on where the damaged cells begin to grow. If the damaged cells start to grow in the lung, it is called lung cancer.

Process of cancer cell development



What Is a Biopsy?

A biopsy is a type of test that takes a sample of tissue or fluid from your body and studies it to confirm whether cancer is present. If cancer is found, a biopsy can show the type of cancer as well as important details that guide the next steps in testing or treatment. For most types and stages of lung cancer, the sample of biopsy tissue or fluid will also be used to look for biomarkers or proteins that respond well to certain types of treatment.

Having a biopsy doesn't mean you'll be diagnosed with lung cancer. Many biopsies confirm cancer is not present and allow you and your healthcare team to move forward with other testing or treatments, as needed.

Biopsy Methods

There are a few ways a lung biopsy may be done. Common biopsy methods include:

- **Fine needle aspiration (FNA)** and **core biopsy** use a needle to remove cells from the tumor or area where cancer may be located. A core biopsy can collect a larger sample than FNA.
- **Thoracentesis** places a thin needle through the skin and into the chest to remove fluid that may have gathered outside of the lungs.
- **Bronchoscopy** uses a flexible tube with a small camera, called a bronchoscope, that is passed through the nose or mouth and into the large tubes of the lungs, so a tissue sample can be taken.
- **Endoscopic esophageal ultrasound** uses a thin flexible tube that is passed through the mouth and into the esophagus (food pipe). This can show nearby lymph nodes and a tissue sample can be taken.
- **Mediastinoscopy** uses a tube with a camera, called a mediastinoscope, that is passed through a small incision (opening) in the middle of the chest to see around the outside of the lungs and take a tissue sample of lymph nodes.
- **Video-assisted thoracoscopic surgery (VATS)** uses a tube with a camera on the end, called a thoracoscope, that is passed through a small incision (opening) in the chest that allows your doctor to look at the surface of the lung and the chest wall.
- **Thoracotomy** is like VATS, except a larger incision (opening) in the chest is performed to be able to see the lung. Healing time is longer, and sometimes a 3–5 day hospital stay is needed.

Questions for your healthcare team:

- What are my biopsy options?
- Which option do you recommend and why?
- What are the risks and benefits?
- How should I prepare?
- How will I be kept comfortable during the procedure?
- How long will the procedure take?
- How long will it take to get the results?
- What will happen after the biopsy?

Your Pathology Report

After a biopsy, a pathologist will study your liquid or tissue samples and provide the results in a detailed report. This is called a pathology report.

How long does it take to get the results of a biopsy?

If your biopsy is done during surgery and a tumor is removed, the biopsy results could be known right away. In other cases, results can take anywhere from a few days to more than a week.

What do positive and negative biopsy results mean?

A positive or negative test result means something is present or found (positive) or it's not present or not found (negative).

A positive biopsy means cancer was found, while a negative one means no cancer was found.

Should I have a pathology second opinion?

Your treatment options will be based on the type of lung cancer you have, so it is important to have as much information as possible. You may want to think about getting a second opinion if:

- The biopsy result is inconclusive (can't be sure if there is cancer or not).
- Cancer is confirmed, but the place in the body where it started is not known.
- The type or subtype of cancer is not known.

What is included in a pathology report?

The information in your pathology report will be unique to you but will likely include these sections:

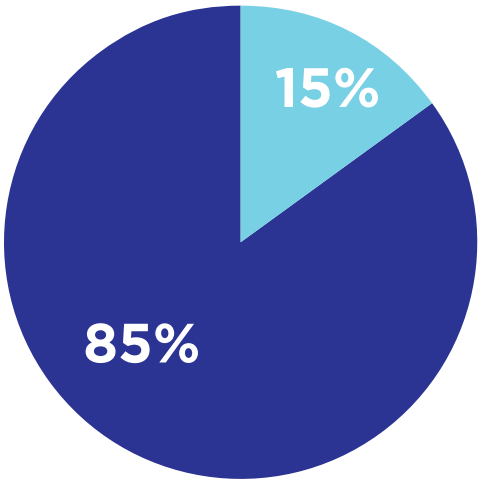
Section Name	Information included:
Identification	Your name, date of birth, patient ID number, and pathology number. Each biopsy test has its own number.
Sample or Specimen Details	Who performed the biopsy, the method used, where in the body the tissue or fluid came from, and information from past biopsies or cancer diagnoses.
Diagnosis or Clinical Diagnosis	Whether cancer was found and the type of cancer.
Gross Description	How the sample looked without a microscope; may describe the size, weight, shape, color; where in the body the sample came from; how many samples were taken; and whether lymph nodes were removed.
Microscopic Findings	How the sample looked under the microscope; may describe whether a stain was used; the type, size, and number of cells; the tumor grade; and margins (whether cancer cells were found in the edges of the sample). Other special tests may also be described.
Other (Ancillary) Test Findings	Results of other tests; may include biomarker (molecular) test results.
Summary or Overview	Describes the full results.

Pathology reports can be hard to understand. If you have questions about your biopsy and/or pathology report, ask a member of your healthcare team, call our free HelpLine at 1-800-298-2436, or email us at support@go2.org.

What are the most common types of lung cancer?

If lung cancer is found, the type of lung cancer will be included in the report. There are 2 main types of lung cancer:

- **Non-small cell lung cancer (NSCLC)** is the most common type of lung cancer. It has 3 common sub-types:
  - **Adenocarcinoma** is the most common subtype of NSCLC. It begins in the tissue that lines the outside of the lungs.
  - **Squamous cell carcinoma** is the second most common sub-type of NSCLC. It begins inside the lungs in the thin, flat cells that line the breathing tubes.
  - **Large cell carcinoma** is the next most common sub-type of NSCLC. It often begins in the outer regions of the lungs.
- **Small cell lung cancer (SCLC)** is less common than NSCLC and is named for the small, oval-shaped cancer cells seen under a microscope. This type of lung cancer is most often diagnosed when it is in its later stages and tends to spread quickly. SCLC sub-types are currently being studied.



For every 100 people diagnosed with lung cancer, about 85 will have NSCLC and 15 will have SCLC.

- Small Cell Lung Cancer
- Non-Small Cell Lung Cancer

If you've been diagnosed with NSCLC, SCLC, or a type of lung cancer that is not mentioned here and would like more information, call our free HelpLine 1-800-298-2436 or email us at support@go2.org.

Biomarker Testing for Non-Small Cell Lung Cancer

If you have been diagnosed with NSCLC, ask for comprehensive biomarker testing. This type of testing looks for many biomarkers at the same time rather than just a few. This is important because your test results guide your healthcare team to the best treatment for you, which may include targeted therapy.

Biomarkers are changes or mutations inside cancer cells that make them different from healthy cells. Biomarkers are what drive cancer cells to grow and spread.

Biomarkers are named after the exact changes that occurred inside the cancer cell. Since these names can be complex and very long, they are called by their symbols (letters that stand for their longer names).

Common NSCLC biomarkers include:

ALK, BRAF, EGFR, HER2, KRAS, MET, NTRK, RET, ROS1

Biomarker testing uses your biopsy tissue or a blood sample (liquid biopsy) and looks for mutations or changes in cancer cells. Biomarker testing may also be called molecular testing, assays, or profiles.

Comprehensive biomarker testing looks for many biomarkers at the same time. This will make sure you know all your treatment choices. Standard biomarker testing looks for one or a limited set of biomarkers and does not provide a complete picture.

Liquid biopsy is a newer way to do biomarker testing and uses blood or other fluid rather than tissue. Ask a member of your healthcare team if a liquid biopsy to look for biomarkers is right for you.

If you've been diagnosed with SCLC, you may have biomarker testing if you are in a clinical trial or if your healthcare team thinks it would be helpful based on your health information. Researchers are studying SCLC biomarkers and are running clinical trials to find new treatments.

Pathology Report Glossary

Angiolymphatic (angioinvasion or angiolymphatic invasion): Cancer has spread to the lymph vessels or blood vessels.

Antibody: Protein made by the immune system when foreign substances are found in the body.

Atypia: Not normal.

Atypical adenomatous hyperplasia in situ: Pre-cancerous lesion (or spot).

Benign: Not cancer.

Carcinoma: Cancer that begins in tissues that line or cover organs in the body.

Cell density: The number of cells in a sample.

Cell structure: The number, size, and shape of the cells and how they look.

Cytology: The study of a single cell or small group of cells.

Differentiation: How close the cancer cells look to normal cells. Well-differentiated means the cells look closer to normal cells; poorly differentiated means they look less like normal cells.

Dysplasia: The presence of abnormal (atypical) cells.

Excision: Surgery to remove.

Granulomas: Inflammation in tissue, usually due to infection.

High-grade tumor: Cancer cells look very different than normal cells and tend to grow and spread faster.

Histology: Structure of the cells under the microscope.

Hyperplasia: Increased cell production in normal tissue or an organ, which can be a sign of changes that happen before cancer develops.

Inconclusive: The presence of cancer is not known.

Invasion/invasive (infiltrating): Cancer has spread beyond the layer of tissue in which it started and is growing into surrounding areas of tissue.

In situ: Abnormal cells are found only in the place where they first formed and have not spread.

Low-grade tumor: Cancer cells look a lot like normal cells and tend to grow and spread slower.

Lymphovascular invasion: Spread of cancer to the blood vessels and/or lymphatic system.

Malignant: Cancer is present.

Metastasis: The process of the spread of cancer to other parts of the body.

Minimally invasive surgery: Uses a series of small incisions to allow insertion of a video camera and small instruments for removing cancerous tissue.

Mucinous: Filled with mucus-like material (see also non-mucinous).

Necrosis: Cell death from injury, toxins, or infections.

Negative or clean margins: No cancer cells are found at the edges of the tissue, suggesting that all of the cancer has been removed.

Neoplasm: Abnormal cell growth that can be benign (not cancer) or malignant (cancer).

Non-mucinous: Immunochemistry marker that gives information about how aggressive cancer is and may help predict response to certain treatments.

Parenchymal cells: Make up the functioning tissue of a gland or organ.

Pleomorphic: Able to change shape or form.

Pleura: Lining that surrounds the lungs.

Pleural cavity: Space between the lining of the lungs.

Positive or involved margins: Cancer cells are found at the edge of the tissue, suggesting that all of the cancer has not been removed.

Spread: A description of the cancer, if it has spread and how far (see invasion).

Squamous dysplasia, in situ: Precancerous lesion (or spot) that may lead to squamous cell carcinoma.

Stains: Used to color tissue to help pathologists better see and examine cells.

Stromal cells: Make up the connective tissue of a gland or organ.

Tissue block: Section of tissue removed by biopsy or surgery.

Tumor or surgical margin: Describes either the outer edge of the nodule or tumor or the outer edges of a section of tissue after surgery.

Vascular: Includes blood vessels, arteries, veins, and capillaries.

For more information about lung cancer, current treatments, support options, and/or referrals to other resources, please visit go2.org, call our HelpLine at 1-800-298-2436, or email support@go2.org.

Confronting Lung Cancer Starts Here

support@go2.org
1-800-298-2436

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