GO2 FOR LUNG CANCER

PATIENT SUPPORT

Understanding Non-Small Cell Lung Cancer

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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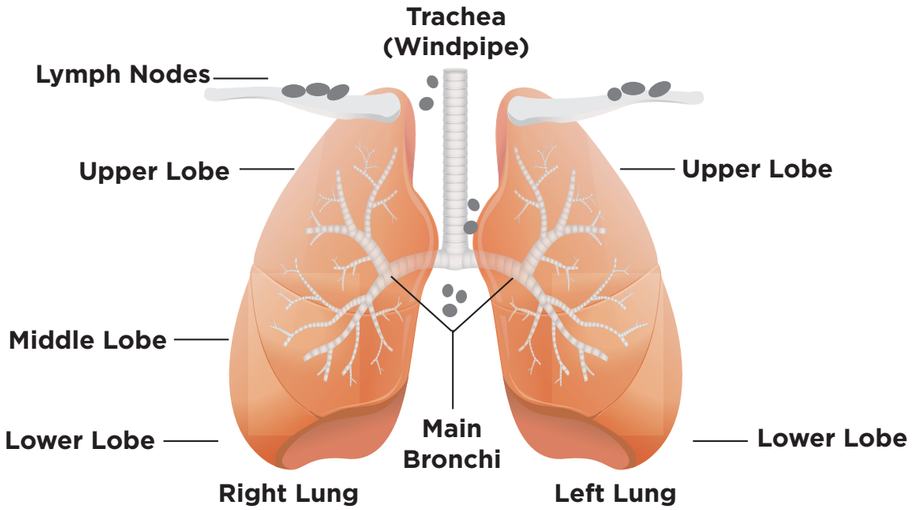
Understanding Non-Small Cell Lung Cancer was created to help you learn about your diagnosis, your treatment options, and other services that can help you.

Many have found the support of family, friends, and social or faith groups to be helpful in coping with lung cancer.

If you would also like to connect with other people affected by lung cancer, we can help. To learn more about support groups or other services GO2 for Lung Cancer offers, call us at 1-800-298-2436 or email support@go2.org.

The Lungs



Your lungs are 2 sponge-like organs in your chest. Your right lung has 3 sections, called lobes, and your left lung has 2 lobes. When you breathe, air enters through your mouth and nose and goes into your lungs through the trachea (windpipe).

The trachea (windpipe) divides into tubes called bronchi, which enter the lungs and divide into smaller branches called bronchioles. At the end of the bronchioles are tiny air sacs called alveoli.

Types of Non-Small Cell Lung Cancer

Cancer occurs when healthy cells in the body change and then grow and divide out of control. Lung cancer is cancer that begins in the lungs. It is one of the most common cancers in the United States.

The two main types of lung cancer are non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC).

There are 3 common sub-types of NSCLC:

- **Adenocarcinoma** is the most common sub-type of NSCLC. It begins in the tissue that lines the outside of the lungs.
- **Squamous cell carcinoma** is the 2nd 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 3rd most common sub-type of NSCLC. It often begins in the outer regions of the lungs.

Risk Factors for Non-Small Cell Lung Cancer

- **A history of smoking**
  Cigarettes contain chemicals that cause many types of cancer and other illnesses.

- **Being exposed to radon**
  Radon is a clear, odorless, tasteless, radioactive gas that occurs naturally in soil and rocks.

- **Family history**
  Having a family history of lung cancer can increase your risk of lung cancer.

- **Radiation therapy**
  Having radiation therapy can increase the risk of cancer in that part of the body.

- **Other types of lung illness**
  Emphysema, chronic obstructive pulmonary disease [COPD], or tuberculosis can occur with lung cancer.

- **Being exposed to certain chemicals**
  Arsenic, asbestos, beryllium, uranium, and Agent Orange are types of chemicals that can cause lung cancer.

- **Being exposed to secondhand smoke**
  This is also called passive smoking.

If you smoke, quitting is one of the most important lifestyle changes you can make to improve your health.

Even if you have lung cancer, quitting or cutting back on how much you smoke can help improve how your response to treatment. If you want to quit, tell a member of your healthcare team. They want to help you.

Your Healthcare Team

Your healthcare team will include many people who have specialized skills in a certain area of lung cancer care. This is vital because they each have great knowledge and can talk as a team about your care and treatment plans. Cancer treatments can affect the whole body, and each member of your team should know what the other team members are doing.

Here are some of the healthcare team members that may work with you.

Medical oncologist: A cancer doctor who uses medicine (such as chemotherapy) to treat cancer.

Chemotherapy nurse: A nurse who specializes in providing chemotherapy and can help manage side effects.

Oncology social worker or counselor: A highly trained healthcare team member who provides support and helps people find resources to meet their needs.

Palliative care specialist: A doctor, nurse, or other healthcare team member who provides relief from symptoms, pain, and stress of an illness like cancer.

Pathologist: A doctor who studies tissue from a biopsy to diagnose diseases.

Patient advocacy group: Groups like GO2 for Lung Cancer that provide education, support, and referral services at no cost.

Patient navigator: A nurse, social worker, or trained person who assists patients and loved ones on their path through the healthcare system.

Pulmonary rehabilitation specialist: A specialist who works to improve breathing and other effects of lung cancer to improve function.

Pulmonologist: A doctor who specializes in lung problems.

Radiation oncologist: A cancer doctor who uses radiation (high-energy beams) to treat cancer.

Thoracic surgeon: A doctor who specializes in surgery of the chest.

Diagnosing NSCLC

Scans

During the diagnosis process, you will have different types of scans. These tests give your healthcare team more information about the size and location of the suspected area of cancer. The area may be called a tumor, spot, lesion, nodule, or mass. These scans are used to help make treatment choices and are sometimes used along with some biopsy methods. Each scan has its own purpose.

CT (computed tomography) or "CAT" scan can show tumors that may not be seen on a chest X-ray.

LDCT (low-dose computed tomography) is used as a screening tool for people who are at high risk to see if they have lung cancer.

PET (positron emission tomography) scan shows how a tumor is using glucose (also known as sugar). Since tumors use more glucose than other tissue, they appear as "hot spots" (bright areas) on the image. A PET scan is often used to see if cancer has spread to other parts of the body. It's not used to see if cancer has spread to the brain.

MRI (magnetic resonance imaging) creates detailed pictures of the body that are often used to see if cancer has spread to other parts of the body, including the brain.

Biopsy Methods

During a biopsy, tissue is removed from the body for testing. The tissue is looked at closely under a microscope and is used to diagnose cancer and provide needed information to plan for the next steps in your care.

There are several types of biopsy methods that can be used based on your needs.

Needle biopsy: A needle is used to draw out fluid or tissue for testing. It is sometimes done with the help of a CT scan or MRI to guide the needle to the exact spot needed. There are two types of needle biopsies:

- **Fine Needle Aspiration (FNA):** Tissue or fluid is removed using a thin hollow needle. FNA can be done through the skin or during a bronchoscopy.
- **Core Needle Biopsy:** Tissue is removed using a wider needle. More tissue can be removed than with FNA.

Thoracentesis: Fluid is removed from the space around the lungs using a hollow needle inserted into the chest.

Bronchoscopy: A thin, lighted tube (bronchoscope) is passed down the throat through the mouth or nose and into the center area of the lungs. A sample of a tumor can be removed for testing.

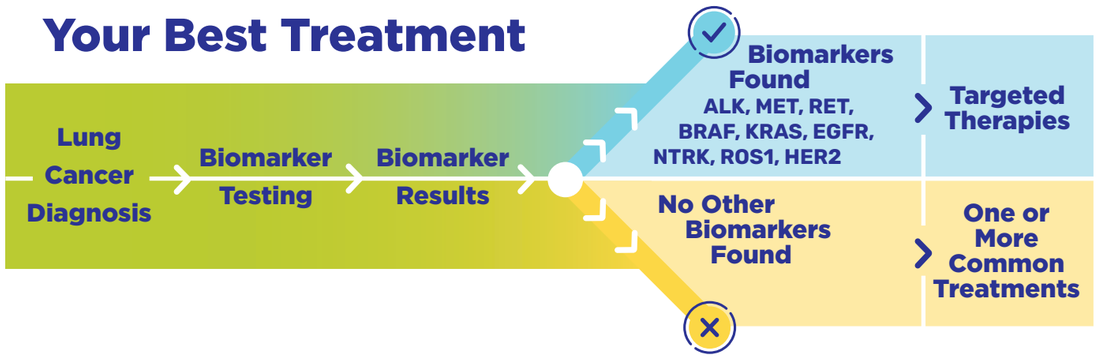
- **Endobronchial Ultrasound (EBUS):** Uses a bronchoscope and ultrasound (high-frequency sound waves) and allows for a better view of the center of the chest to see if the cancer has spread.

Surgical biopsy: Tissue is removed during surgery.

Liquid biopsy: Blood or other fluid is removed for biomarker testing to help with planning treatment.

Biomarkers

Biomarkers are changes or mutations inside cancer cells that make them different from healthy cells. They are what drives cancer cells to grow and spread. It's important to know what biomarkers you have to find your best treatment options. 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).



Biomarker Testing

When a pathologist confirms any stage of NSCLC, biomarker testing should be done. The same tissue from your biopsy sample can be used to look for biomarkers or a liquid (blood) sample can be used.

Comprehensive biomarker testing is best because it looks for all known biomarkers at the same time instead of only one or a few. This will ensure you know all your possible treatment choices.

Biomarker Results

Not all lung cancers are treated the same way. Your stage and biomarker testing results for NSCLC will direct your healthcare team to the best treatment options for you. If your test results show a certain biomarker is present, there may be an approved targeted therapy to treat the cancer.

If you're not sure if you've had biomarker testing, ask your healthcare team.
If you have not had testing, ask why not.
If you have been tested, talk with your healthcare team to make sure you understand the results of your tests.

If lung cancer spreads or goes away and then comes back, it can have different biomarkers. New biomarker testing can offer new treatment choices for you. If you have questions or would like to have help understanding your biomarker results, please contact our HelpLine at 1-800-298-2436 or email support@go2.org.

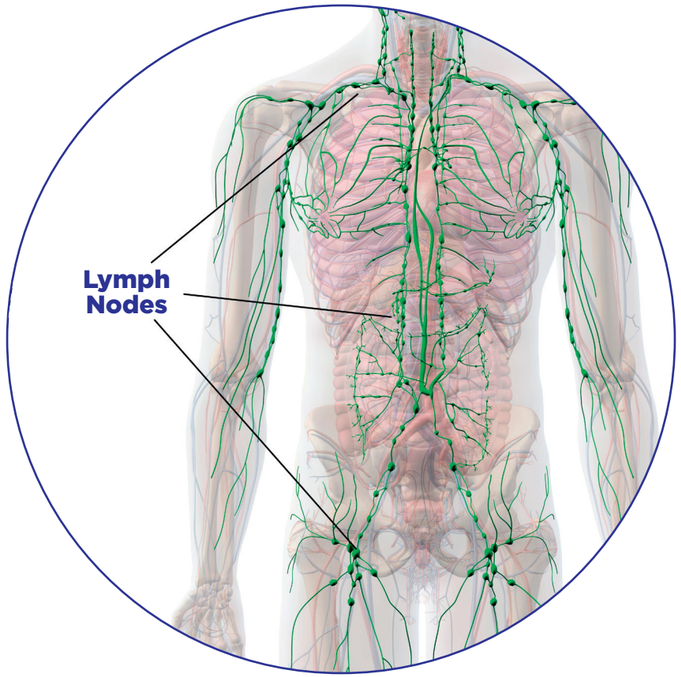
Lymphatic System

The lymphatic system includes organs, vessels, and nodes that are found all over your body. It collects extra fluid and returns it to the blood to fight infection.

Like blood vessels, lymph vessels help move lymph fluid throughout the body. Lymph fluid contains white blood cells, which help to fight infection.

Lymph nodes are small, oval-shaped organs within the lymphatic system. The nodes trap and collect things that could be harmful so your white blood cells can attack them. Lymph nodes are found all over the body, but major groups can be found behind the knee and elbow joints and in the groin, armpits, neck, and chest. A large group that drains lymph fluid from the lungs is found in the center of the chest.

Cancer cells can break off from the main tumor and travel to other parts of the body through the lymphatic system. Some of these cells become trapped within a lymph node and start to grow. If cancer is in the lymph nodes, your healthcare team will use this information to help stage cancer.



Stages of NSCLC

Information about the size of the primary (first) tumor, the number of lymph nodes with cancer cells, and how far the cancer has spread is used to stage NSCLC. Staging cancer means it is given a number, or a number and a letter that describes it. You may have heard of cancer staging numbers 0, I, II, III, IV or 0, 1, 2, 3, 4. In this type of staging, a higher number means the cancer is more advanced. The boxes below show how NSCLC cancer is defined at each stage.

NSCLC Stage 0 = Abnormal cells are found in the lining of the airways that may become cancer.

NSCLC Stage 1 = Cancer is found early and is in one lung and has not spread to lymph nodes. Stage 1 is divided into **stages 1A and 1B** based on the size of the tumor and how far it has spread inside one lung.

NSCLC Stage 2 = Cancer is found early but has spread inside or just outside of one lung and may have spread to nearby lymph nodes on the same side of the body. Stage 2 is divided into stages **2A and 2B** based on the size of the tumor and whether it has spread to nearby lymph nodes and certain lung structures.

NSCLC Stage 3 = Cancer is in one lung and has spread to the chest and to lymph nodes further away from the lungs. Stage 3 is divided into stages **3A, 3B, and 3C** based on the size and number of tumors, the location of the lymph nodes found to have cancer, and exactly where the cancer has spread in the chest area.

NSCLC Stage 4 = Cancer is advanced and has spread to the lining or fluid around the heart or lungs or has spread to distant parts of the body. Stage 4 is divided into **stages 4A and 4B** based on the number of tumors and exactly where the cancer has spread.

Your healthcare team may also use the **TNM system** to stage lung cancer. This staging system was developed by the American Joint Committee on Cancer (AJCC) and the International Union Against Cancer (IUAC).

T = Tumor This describes the size of the tumor, where it is located, and whether it has spread.

N = Lymph Node This describes whether cancer has spread to the lymph nodes in and around the lungs.

M = Metastasis This describes whether cancer has spread to areas outside the lymph nodes.

NSCLC Treatment Options

NSCLC Treatment Options by Disease Stage

	Stage 1A	Stage 1B	Stage 2A Stage 2B	Stage 3A Stage 3B Stage 3C	Stage 4A Stage 4B
Surgery	✓	✓	✓	✓	Rare
Radiation Therapy	✓	✓	✓	✓	✓
Immunotherapy		✓	✓	✓	✓
Chemotherapy		✓	✓	✓	✓
Targeted Therapy		✓	✓	✓	✓
Palliative Care	✓	✓	✓	✓	✓
Clinical Trials			✓	✓	✓

Treatment depends on:

- The stage of the cancer
- If certain biomarkers are present
- How well your lungs are working
- Other health problems
- If you can complete daily tasks like eating, bathing, and dressing on your own

Surgery

There are a few types of lung cancer surgeries. Each one is named based on the amount of lung tissue that is being removed. The goal of lung cancer surgery is to remove the tumor with the smallest amount of lung tissue possible.

- **Wedge Resection:** A small wedge-shaped piece of the lung is removed.
- **Segmental Resection or Segmentectomy:** A piece of the lung is removed that is larger than a wedge resection but smaller than a lobectomy.
- **Lobectomy:** An entire lobe of the lung is removed.
- **Pneumonectomy:** The entire lung is removed.

When lung cancer surgery is needed, sometimes lymph nodes around the tumor also need to be removed to look for cancer cells. This is called lymph node dissection or lymphadenectomy.

Radiation Therapy

Radiation therapy is a treatment that uses high-energy beams to kill or shrink cancer. It can be used to manage pain, shrink a tumor, or slow down the growth of cancer. It can be used before, after, or along with other cancer treatments. Radiation therapy is also used to treat cancer that has spread to the brain.

There are a few types of radiation therapy, and each works in its own way. Ask your healthcare team to discuss the types of radiation therapy that may be options for you.

The side effects of radiation therapy depend on the area of the body that gets the radiation and may include:

- Tiredness (fatigue)
- Loss of appetite
- Inflammation of the esophagus (esophagitis)
- Inflammation of the lung (pneumonitis)

Chemotherapy

Chemotherapy (chemo) is a treatment that kills cancer's fast-growing and dividing cells. Your chemo treatments may include one drug or more than one drug. It is given in cycles followed by a rest period to allow your body time to recover.

Common NSCLC drugs are:	
Brand Name	**Generic Name**
Abraxane	nab-paclitaxel
Alimta	pemetrexed disodium
Gemzar	gemcitabine hydrochloride
Navelbine	vinorelbine
Paraplat, Paraplatin	carboplatin
Platinol, Platinol AQ	cisplatin
Taxotere	docetaxel
Toposar, VePesid	etoposide

Common side effects of chemo may include:

- Hair loss
- Nausea and vomiting
- Loss of appetite
- Constipation or diarrhea
- Shortness of breath
- Tiredness (fatigue)
- Numbness or tingling in the hands or feet (neuropathy)
- Low platelets
- Low red/white blood cell count (anemia)

Targeted Therapy

Targeted therapies are drugs that stop cancer by attacking a specific "target" inside cancer cells. These targets are called biomarkers and they are what drive cancer cells to grow and spread. If your biomarker test results show that you have a biomarker with an approved targeted therapy, you will likely be treated with a targeted therapy drug. Some targeted therapies come in the form of a pill, while others are given through an IV (a small tube inserted in a vein).

Common NSCLC targeted therapy drugs are:

Biomarker	Brand Name	Generic Name
EGFR	Gilotrif	afatinib
	Iressa	gefitinib
	Tagrisso	osimertinib
	Tarceva	erlotinib
	Tarceva with Cyramza	erlotinib with ramucirumab
	Vizimpro	dacomitinib

Biomarker	Brand Name	Generic Name
EGFR-Exon 20	Rybrevant	amivantamab-vmjw

Biomarker	Brand Name	Generic Name
ALK	Alecensa	alectinib
	Alunbrig	brigatinib
	Lorbrena	lorlatinib
	Xalkori	crizotinib
	Zykadia	ceritinib

Biomarker	Brand Name	Generic Name
ROS1	Rozlytrek	entrectinib
	Xalkori	crizotinib

Biomarker	Brand Name	Generic Name
BRAF	Mekinist with Tafinlar	trametinib with dabrafenib
	Braftovi with Mektovi	encorafenib with binimetinib

Biomarker	Brand Name	Generic Name
RET	Gavreto	pralsetinib
	Retevmo	selpercatinib

Targeted Therapy (continued)

Biomarker	Brand Name	Generic Name
MET	Tabrecta	capmatinib
	Tepmetko	tepotinib

Biomarker	Brand Name	Generic Name
NTRK	Rozlytrek	entrectinib
	Vitrakvi	larotrectinib

Biomarker	Brand Name	Generic Name
KRAS	Lumakras	sotorasib

Biomarker	Brand Name	Generic Name
HER2	Enhertu	trastuzumab deruxtecan

	Brand Name	Generic Name
Other Targeted Therapy Drugs	Avastin	bevacizumab
	Mvasi	bevacizumab-awwb (Other generics are also available)

Note: Cyramza can also be used with chemotherapy to treat lung cancer that doesn't have an identified biomarker.

Common side effects of targeted therapy vary based on the type of drug and may include:

- Rash
- Diarrhea
- Vision problems
- Tiredness
- Nausea
- Heart and lung problems

Immunotherapy

An important part of the immune system is its ability to see the difference between normal cells in the body and those it sees as “foreign” — like cancer cells. To do this, it uses “checkpoints” on certain immune cells, called T-cells. These checkpoints need to be turned on to start an immune response. However, cancer cells can find ways to use these checkpoints to avoid being attacked by the immune system.

A type of immunotherapy called “checkpoint inhibitors” fixes this problem and keeps the immune system active. It works on a certain protein located on the surface of your T-cells or on cancer cells. Examples of these proteins are PD-1, PD-L1, and CTLA-4.

There are many immunotherapies approved to treat NSCLC. Your healthcare team can discuss which type of immunotherapy is best for you based on the stage of cancer and the timing of other treatments you may need.

Common immunotherapies used to treat NSCLC include:

Immunotherapy drugs that block the PD-1 protein on the immune cell	
Brand Name	**Generic Name**
Keytruda	pembrolizumab
Libtayo	cemiplimab-rwlc
Opdivo	nivolumab
Jemperli	dostarlimab

Immunotherapy drugs that block the PD-L1 protein on the cancer cell	
Brand Name	**Generic Name**
Imfinzi	durvalumab
Tecentriq	atezolizumab

Immunotherapy drugs that block the CTLA-4 protein on the immune cell	
Brand Name	**Generic Name**
Imjudo	tremelimumab
Yervoy	ipilimumab

Common side effects of immunotherapy:

Side effects from immunotherapy are often caused by the increased activity of the immune system.

- Tiredness (fatigue)
- Flu-like symptoms
- Rashes
- Diarrhea
- Shortness of breath
- Inflammation within the lungs, liver, kidneys, or hormone-producing glands such as thyroid or pituitary

Clinical Trials

Before a new drug is approved for use, it has to pass through a strict testing process called a clinical trial. A clinical trial is a type of research that is done to study new cancer treatments to learn how well they work and how safe they are. The purpose is to know whether the new treatment is better than the current treatments.

Clinical trials are very important because they are the only way new and better treatments can be found. Learning about clinical trials early is important so you have plenty of time to decide whether one is right for you. Any time you're facing a treatment decision, you can ask about clinical trials that might be right for you.

GO2's LungMATCH Program

Treatment & clinical trial navigation assistance

Our trained and compassionate team offers specialized treatment and trial navigation to guide you along your treatment journey.

With information about your stage, type of lung cancer, and past and present treatments, we can help you understand the clinical trial process and find trials that fit your needs.

Having clinical trial options to discuss with your healthcare team can help you decide if joining a trial is right for you.

Palliative Care

Palliative care is a service that can help you find ways to prevent or ease symptoms and side effects from cancer or cancer treatment.

Palliative care may be able to help with the following problems:

- Constipation
- Diarrhea
- Difficulty breathing
- Tiredness (fatigue)
- Loss of appetite
- Mood changes related to treatment
- Nausea
- Pain
- Sleep problems
- Weight loss

Who provides palliative care?
It is provided by a member of the healthcare team that has special training or knowledge in how to increase the quality of life for people with cancer. Palliative care teams may include nurses, dieticians, social workers, chaplains, and therapists.

Where is palliative care provided?
Palliative care options depend on the location and your needs. Sometimes palliative care is offered in the hospital, outpatient office, long-term care facility, or in your home.

What palliative care is not:

- Palliative care is not a treatment to cure or reduce cancer.
- Palliative care is not hospice. Hospice is a service that is only for people who are no longer getting cancer treatments and are thought to have less than 6 months of life.

Finding palliative care
If you would like to find palliative care, ask your healthcare team to locate this service near you.

Notes

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

Confronting Lung Cancer Starts Here

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