



# Navigating **LUNG CANCER**

PATIENT EDUCATION GUIDE



**The Society  
of Thoracic  
Surgeons**

The CHEST Foundation, the charitable foundation of the American College of Chest Physicians, champions lung health by supporting clinical research, community service, and patient education. Through CHEST Foundation-supported programs, CHEST's 19,000+ members engage in advancing the lung health of millions of patients in local communities around the world. More than 95 cents of every dollar raised goes toward advancing the foundation's mission-based programming. Since its inception, the foundation has provided more than \$10 million in funding for clinical research and community service, with a reach that spans more than 60 countries.

Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 7,400 cardiothoracic surgeons, researchers, and allied health care professionals worldwide who are dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society's mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy.



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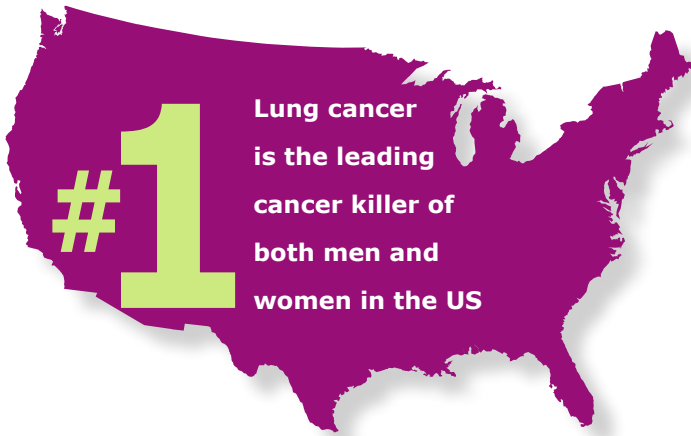
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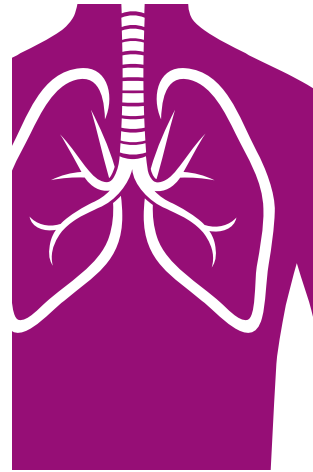
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## Key Facts About Lung Cancer



Lung cancer is the leading cancer killer of both men and women in the US



Lung cancer usually causes no symptoms until it becomes advanced. Screening CT scans now are available in the hope of diagnosing early stage disease in patients at risk for lung cancer.

Early diagnosis and treatment with surgery and/or new techniques of chemotherapy and radiation therapy may

# CURE

many patients with lung cancer



Lung cancer starts in the lung, but can spread to the lymph nodes and other parts of the body.

The lung cancer survival rate is more than

# 50%

when diagnosed at an early stage.

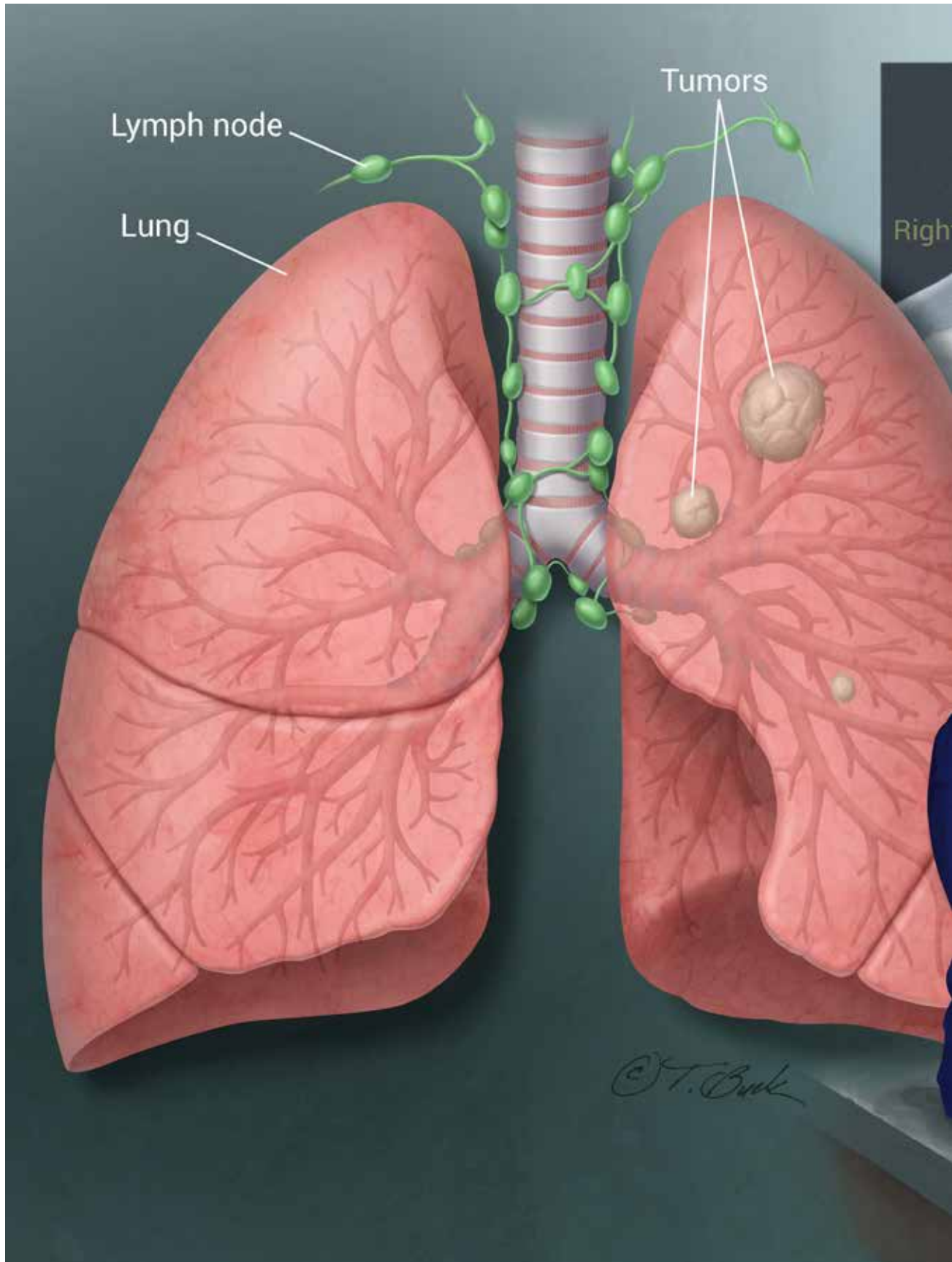
## Learn About Lung Cancer

Lung cancer is the second most common cancer among men and women. It is when abnormal lung cells grow out of control. Lung cancer is difficult to diagnose in early stages. It is important to see a *pulmonologist* – a doctor who is specially trained to diagnose and treat lung diseases and conditions – as soon as you suspect a problem. After a lung cancer diagnosis, your pulmonologist (lung doctor) will assemble a team of specialists. This provides you with a full range of the latest treatments. Your medical team could include your:

- primary care physician
- pulmonologist
- oncologist
- radiologist
- pathologist
- thoracic surgeon

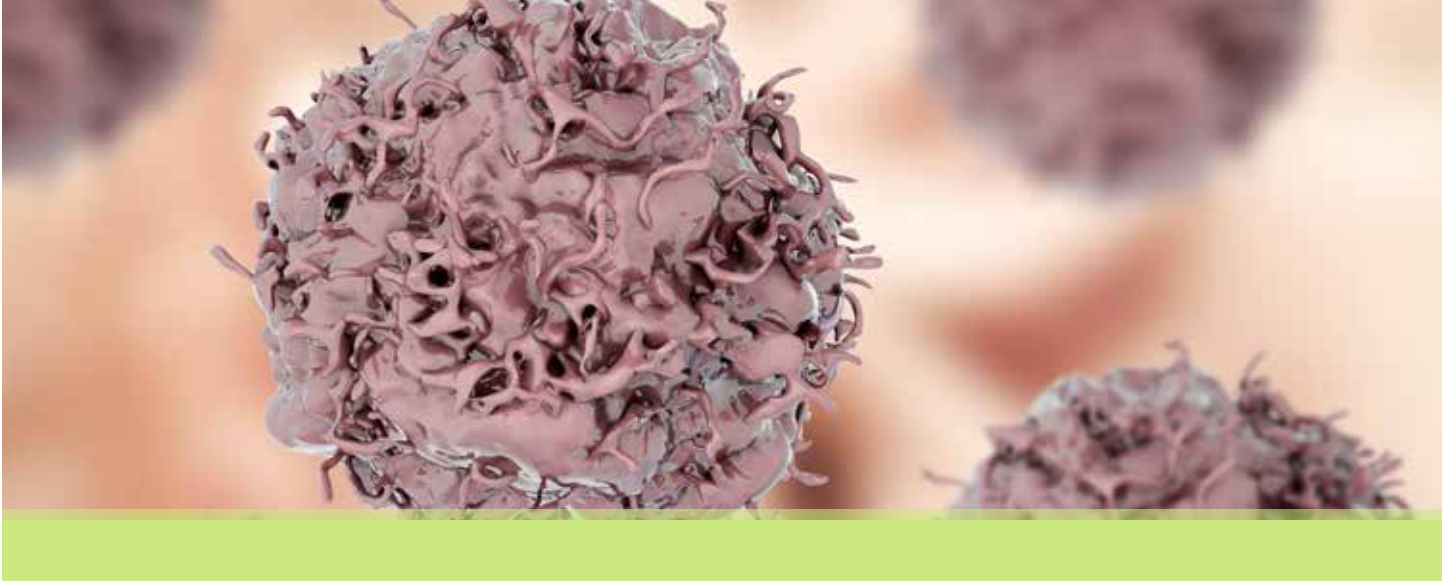
Together, these medical experts can determine the best treatment for your specific type of lung cancer.







## Lung Cancer Types



There are two types of lung cancer:

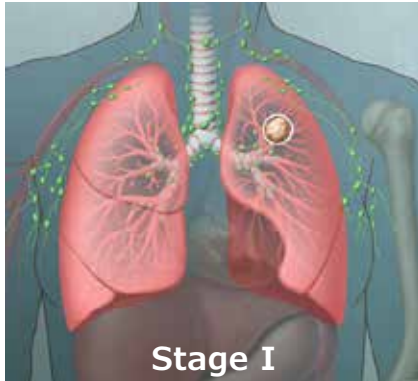
**Non-small Cell Lung Cancer (NSCLC)** represents 80% to 90% of all lung cancer cases each year. These lung cancers include:

- *adenocarcinoma*, the most common
- *squamous cell carcinoma*, about 25% of NSCLC
- *large cell carcinoma*, about 10% of NSCLC

**Small Cell Lung Cancer (SCLC)** represents 10% to 20% of all lung cancer cases each year. SCLC tumors tend to grow more quickly than NSCLC tumors. They may initially be more responsive to chemotherapy.



## How Lung Cancer Affects the Body



Different types of lung cancer often behave differently in the body. Treatment is based on the *type* of cancer and the *stage* of cancer. The stage is the extent of cancer. Is it in one area of the lung, or has it spread? Staging lung cancer is critically important. Treatments can vary depending on the stage.

Lung cancer's projected outcome, the *prognosis*, is also impacted by the stage. Lower stages, where the cancer is more localized, have a better outcome than advanced stages.

By understanding where the lung cancer is, and how and where it spreads, the medical team can create a specialized treatment plan based on the type and stage.

The stages of NSCLC are:

**Stage I:** The cancer is in one part of one lung. It hasn't spread.

**Stage II:** The cancer is in one lung and nearby lymph nodes within that lung, called the *hilar*.

**Stage III:** The cancer is in one lung and the lymph nodes between the two lungs in the middle of the chest.

**Stage IIIA:** Describes lung cancer that has spread to lymph nodes on the same side of the chest as the cancer. It could also be cancer that has directly invaded adjacent structures like the chest wall, esophagus, or heart.

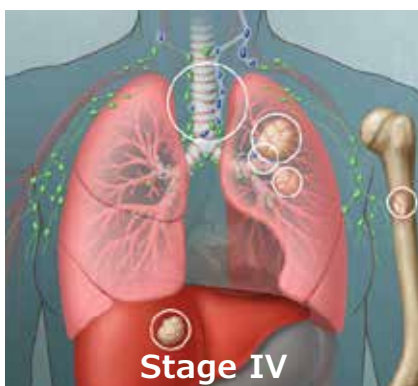
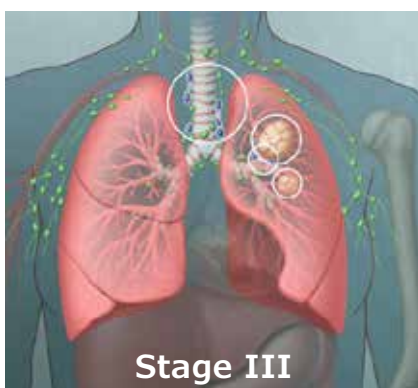
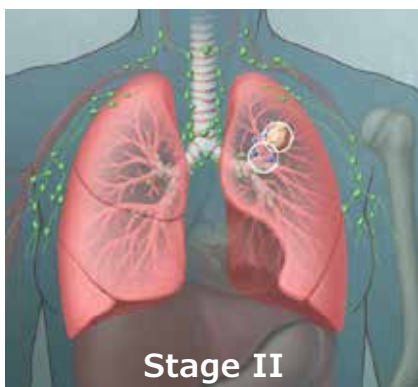
**Stage IIIB:** Means that the cancer has spread from the lungs to the lymph nodes on the opposite side of the chest or above the collarbone.

**Stage IV:** The cancer has spread to the space around the lungs (the pleura), the other lung, or to another part of the body, such as the brain, bones, liver or adrenal glands. The term "*metastasis*" is used in Stage IV cancer. This is when the cancer has spread beyond its original site in the lung to other, more distant parts of the body.

SCLC has two stages:

**Limited Stage:** The cancer is found in just one part of a lung and nearby lymph nodes.

**Extensive Stage:** The cancer has spread to other parts of the chest or body. It is likely that SCLC will soon have a four-stage system. This system better predicts outcomes.



## How Serious Is Lung Cancer?

# #1

Lung cancer is the leading cancer killer in both men and women in the United States

**155,870**  
**EACH YEAR**

Deaths from lung cancer in the United States

**432**  
**EACH DAY**

More **MEN** die of lung cancer than of prostate and colon cancers combined



**1 in 14**

The risk that a man will get lung cancer during his lifetime

More **WOMEN** die of lung cancer than of breast, ovarian, and uterine cancers combined



**1 in 17**

The risk that a woman will get lung cancer during her lifetime

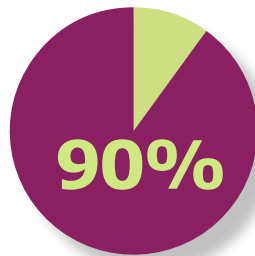
ABOUT

**14%**

of all new cancers in the United States each year are lung cancer

That equals

**225,500**  
**CASES**



of lung cancer cases occur in people ages

**50 and older**



of all lung cancer cases in the United States are not related to smoking

While men are being diagnosed less with lung cancer, the rates are increasing in women. This is due to a change in the pattern of cigarette smoking in the last 30 years.

While tremendous progress is being made in lung cancer diagnosis and treatment, it is still a very serious disease. It has the lowest 5-year survival

rate among all common cancers because by the time it is found, it has spread. The survival rate is more than 50% when:

- it's detected at an early stage
- it's in only one area of the lung

Early screening is critically important. A cure is possible with early diagnosis and treatment with surgery.

Screening is recommended for current or former smokers. The more you smoke(ed) (more cigarettes, more years), the greater your risk.

Speak with your doctor about new treatments that may work for you. In 2016, the FDA approved seven new lung cancer treatments, and there are many more being developed.

## Symptoms of Lung Cancer

Early lung cancer usually does not cause noticeable symptoms. Many times, it is discovered later. Even then, there are good treatment options.

Sometimes lung cancer appears on a chest radiograph, a CT or CAT scan, or a test that's done for something else, like a lung infection. Lung doctors are key in the prompt diagnosis, staging, and treatment of lung cancer.

Symptoms of lung cancer can affect the whole body. Persistent cough and shortness of breath are the most common. Other common symptoms and complications include:

- coughing up blood
- chest, shoulder, or back pain
- voice changes, especially hoarseness
- repeated lung infections (such as pneumonia or bronchitis)
- difficulty swallowing

Sometimes, lung cancer spreads beyond the lungs to other parts of the body. Symptoms that may be seen when lung cancer has spread include:

- weakness
- fatigue
- unexplained weight loss
- bone or joint pain
- unexplained broken bones
- headaches
- blood clots or bleeding
- unsteady movement or seizures
- memory loss
- neck or face swelling

Any persistent, unusual, or unexplained symptom should be checked out by a doctor. Everyone coughs sometimes, but a cough that persists – especially with other signs, such as blood in the mucus or unexplained pain – should always be checked out. Like all cancers, lung cancer is best treated when caught early.

Many symptoms are non-specific. They can be the result of other medical problems not related to lung cancer. People with COPD can have a chronic cough and repeated infections. See your doctor for an accurate diagnosis if you have any symptoms.

## Causes of Lung Cancer



Smoking is still the number one cause of lung cancer. In fact, smoking is the cause of many other cancers, including:

- esophageal
- larynx
- mouth
- throat
- kidney
- bladder
- liver
- pancreatic
- stomach
- cervical
- colon
- rectal
- acute myeloid leukemia

The American Cancer Society estimates that 80% to 85% of all lung cancer cases in the United States are linked to smoking. This includes people who have quit smoking.

Any kind of smoking seems to increase the risk of lung cancer. Smoking cigarettes, cigars, and pipes have all been linked to lung cancer. Smoking marijuana may also increase the risk, especially in young people. Exposure to secondhand smoke increases the risk. It is estimated that secondhand smoke causes more than 3,000 lung cancer deaths each year among nonsmoking adults.

No one knows for sure the impact of smoking e-cigarettes (vaping) on lung health. E-cigarettes contain nicotine. Like tobacco cigarettes, they can lead to nicotine addiction. Some claim that inhaling e-cigarettes may be safer than tobacco smoking. Some think it may help smokers quit. There are no data to support these claims. Others believe that e-cigarettes may lead more young people to start smoking tobacco. More research is needed.

Researchers are learning that certain genetic mutations are linked to lung cancer. Mutations are genes that work differently than their “normal” versions. People who have those genes may be more likely to get lung cancer. Having one of these genes may be why some nonsmokers get lung cancer.

Other harmful substances can also cause lung cancer. Radon is a naturally occurring odorless, tasteless, invisible radioactive gas. People exposed to high radon levels are more likely to get lung cancer. In fact, radon exposure is a leading cause of lung cancer in nonsmokers. Radon levels can be high in underground mines. They are also high in tightly sealed, poorly ventilated homes, generally those with basements.

Exposure to asbestos, a mineral-based substance once used in insulation and building construction, can cause lung cancer, especially in smokers. Air pollution has also been linked to lung cancer.



## Risks

Smoking is the single greatest risk factor for lung cancer. Regular exposure to secondhand smoke also increases the risk. The risk seems to be dose-dependent. In other words, the more you smoke (more cigarettes, more years), the greater your risk. Research shows that quitting smoking at any time of your life decreases your risk.

Other risk factors are the same as the causes for lung cancer:

**A history of cancer in another part of the body.** People with a history of head and neck cancer or esophageal cancer, both associated with tobacco use, are at higher risk. People who have had breast, colon, or prostate cancer, are at increased risk.

**Age.** Lung cancer risk increases with age. Only about 10% of cases occur in people younger than 50.

**Family history.** If one of your parents, brother, or sister has had lung cancer, your risk may increase.

**Prior radiation therapy.** Radiation is an important cancer treatment. Radiation to the chest area, especially for treatment of another cancer, seems to increase the risk.

**Exposure to radon, asbestos, and/or industrial chemicals.** Radon, asbestos, arsenic, beryllium, and uranium have all been linked to lung cancer. Anyone who has worked with them may have an increased risk.

**Other lung disease.** Chronic obstructive pulmonary disease (COPD), interstitial lung disease, and tuberculosis (TB) may increase lung cancer risk. Scarring of the lungs from other diseases may set the stage for lung cancer.

Having more than one risk factor also increases your odds of developing lung cancer. A smoker with asbestos exposure has about four times the risk of developing lung cancer as a smoker without it. It's 80 times the risk compared with someone who neither smoked nor was exposed to asbestos.

## Complications



Symptoms of lung cancer can affect the entire body. Other common symptoms include:

- collapsed lung
- chest pain
- coughing up blood
- unexplained weight loss
- blocked airways
- repeated lung infections
- fluid buildup around the lungs or heart

Many symptoms may cause fatigue and discomfort. Your doctor can help you manage problems that may arise.

## When to See Your Doctor

If you are at increased risk for lung cancer, ask your doctor about screening with a low dose chest CT Scan. Your doctor can help you weigh the risks and benefits. Chest CT scans don't find all lung cancers. Sometimes they raise false alarms. If screening shows something suspicious, your doctor may to repeat the scan right away or in several months. This will show if abnormalities have disappeared or changed.

## Preparing for Your First Appointment



Whether you're going to see a primary care physician or cancer specialist, prepare for your visit. Consider bringing a friend or loved one. They may remember details of the visit that you forget or misunderstand. Some record their appointments with a cell phone or audio recorder. Take notes during your visit. Bring questions about any diagnosis or treatment information that may be confusing.

Your pulmonologist is just one part of the team approach to lung cancer care. These specialists are also important:

**Family practitioners and internists** are doctors who have completed a residency in family medicine or internal medicine. They often find your cancer first. They work together with specialists and subspecialists to coordinate your care.

**Pulmonologists** (also called *pulmonary specialists*) are doctors who specialize in diagnosing and treating lung diseases. They treat breathing problems caused by cancer or its treatment.

**Pathologists** are doctors who specialize in identifying diseases. They use a microscope to look at tissue samples taken during a biopsy. The pathologist will diagnose the type of cancer and how advanced it is. You may never meet your pathologist. He or she will consult with other doctors on your team.

**Thoracic surgeons (chest surgeons)** are doctors who specialize in surgery on the lungs and other organs inside the chest. A thoracic surgeon treats cancers of the lung, esophagus, and chest wall. Some have special training in surgical oncology.



**Oncologists** are doctors who specialize in treating cancer. There are three main types:

- **Medical oncologists** treat cancer by using medicines, such as chemotherapy or targeted therapy. Your medical oncologist may refer you to other specialists.
- **Radiation oncologists** use X-rays and other types of radiation therapy.
- **Surgical oncologists** use surgery to diagnose and treat cancer. They can do biopsies and remove tumors. A thoracic surgical oncologist specializes in surgeries on lung tumors and other tumors found inside the chest.

**Diagnostic or interventional radiologists** are doctors who specialize in diagnosing disease with imaging tests. These tests include X-ray, MRI, CT scan, PET scan, and ultrasound. Interventional radiologists use imaging tests to guide them in biopsies. A diagnostic radiologist may specialize in radiation oncology, diagnosing cancerous growths specifically. Having a radiologist with lung cancer experience can improve the accuracy of your diagnosis.

Your medical team may have some or all of these health care professionals:

**Oncology nurses** specialize in treating and caring for people with cancer. They are often a major point of contact for patients and their families.

**Patient navigators** are trained, culturally sensitive health care workers. They provide support and guidance throughout the cancer care process. They help people “navigate” through the maze of:

- doctors’ offices
- clinics
- hospitals
- outpatient centers
- insurance and payment systems
- patient-support organizations, and
- other parts of the health care system

**Respiratory therapists** evaluate and treat people with breathing problems or other lung disorders.

**Social workers** talk with people and their families about emotional or physical needs. They also help them find support.

**Registered dieticians** use diet and nutrition to keep the body healthy. They help improve nutritional health.

Your medical team will want to know as much as possible about your:

- symptoms
- overall health
- medical history

Before your appointment, gather:

**Information about your symptoms.**

What symptoms are you having? When did they start? Have they changed? Have you noticed new ones? Does anything relieve your symptoms? Does anything make them worse?

**Information about smoking.** A complete description of smoking habits is very important. Did you ever smoke? If so, when did you start? How many packs of cigarettes did you typically smoke in a day/week? How long did you smoke? If you quit, when?

**Work history.** A complete description of your jobs is also important, even if the job was years ago. People with work exposure to asbestos or other harmful substances may develop lung cancer long after the job ends.

**Complete list of your medications, supplements, and vitamins.** Include all prescription and over-the-counter medications and supplements. These include herbal and natural remedies. If possible, bring the bottles and containers with you. That way your doctor can see exactly what you’re taking.

**Your medical history.** Have you had cancer? What kind? What treatment did you undergo? Your doctor will want to know about any lung and breathing problems. If you have medical records at another doctor’s office, have copies sent to your lung doctor.

**Medical records.** Bring all your medical records, especially any copies of old chest X-rays. Comparing current and old films tells the doctor about the likelihood of lung cancer. These records help your doctor determine which tests are needed. If suspicious tissue has been there for several years without changing, it is probably not lung cancer.

**Family medical history.** Has anyone in your family been diagnosed with lung cancer? Does anyone in your family have a history of lung or breathing problems?

**Questions.** Write down your questions. You won’t forget to ask them during your appointment.

## Diagnosing Lung Cancer



Your health-care team has to address three main issues:

1. What type of lung cancer is it? (the diagnosis)
2. Where is it located? (the stage)
3. What do we do about it? (the treatment plan)

It's important to answer the first two questions as quickly as possible. Activities to find the answers must be done correctly. This may take a little longer. The best treatment plan for you depends on accuracy in the diagnosis and staging of your cancer.

Your health-care team will ask you lots of questions about your health. They will take a full medical history. They will also perform a thorough physical exam. Tests will be ordered to assess what's causing your symptoms. If the tests suggest cancer, additional tests will be done. Test results help your medical team get an accurate diagnosis and stage. Only then can they develop your treatment plan.

Tests used to look for and learn more about an abnormality on a screening include:



**Chest X-rays.** A chest X-ray is painless. Doctors look at your lungs and airways. Chest X-rays can show spots (nodules) or other abnormal areas. There’s no way to tell from an X-ray whether any are cancerous. If your chest X-ray looks suspicious, more tests will be required..



**CT scans.** A CT scan (sometimes called a “CAT scan”) uses X-rays to create cross-sectional pictures. They provide more detailed pictures of the size and location of abnormalities found on a chest X-ray.



**Positive-emission tomography (PET scan).** In this test, a radioactive sugar is injected. It provides data about whether something seen on a CT scan is metabolically active (changing or growing). PET scans can tell if a tumor is spreading from the primary site to other parts of the body.



**Bronchoscopy.** A bronchoscope is a thin, flexible tube that contains a tiny video camera. The tube is passed through your nose or mouth. It goes down through your windpipe (trachea) into your lungs. This allows the doctor, usually a pulmonologist or thoracic surgeon, to see inside your air passages. They can take small tissue samples (biopsies) and fluid samples. Samples are sent to a lab and checked for cancer.



**Navigational Bronchoscopy.** A kind of bronchoscopy that uses a GPS like system to locate and biopsy lung nodules that are beyond the reach of conventional bronchoscopy with safety and accuracy.



**Endobronchial Ultrasound.** This test is sometimes used during bronchoscopy. It not only diagnoses lung cancer, but can also see if it has spread to the lymph nodes (staging). The bronchoscope has a sound-wave probe on the end. Doctors can locate and see masses and lymph nodes next to the airway, but not within the lung. Doctors then use needles to sample the mass and/or lymph nodes to check for cancer. Endobronchial ultrasound is not offered at all hospitals and medical centers.



**Needle Biopsies.** If a CT scan shows a suspicious mass or nodule or possible tumor, radiologists can use a CT scan to biopsy the abnormality. Samples can be taken through small or large needles in order to provide sufficient material for diagnosis.



**Surgical lung biopsy.** Depending on the location of the suspected abnormality or tumor, surgery is sometimes best for getting a good tissue sample.



**Ultra sound Guided Thoracentesis.** This test may be done if there is an abnormal fluid collection between the chest wall and the lung, an area known as the pleura. (pleural effusion also describes fluid collection from the pleura.) In this test, the fluid is found in real time with an ultrasound machine. The location is marked and the skin on the chest is thoroughly numbed. A needle is inserted into the space around the lung. Fluid is removed. It is sent to the lab to check for cancer.



**Medical thoracoscopy.** This test may be done to biopsy the inside layer of the chest. This is called the *pleura*. It is when thoracentesis does not provide a diagnosis. It is done under monitored anesthesia and ultrasound guidance. A small camera is inserted into the chest cavity. The pleura is inspected and biopsied. The test is safe and accurate. Patients may go home the same day. It may also relieve, the symptoms of fluid through a modality of techniques at the same time.



**Biomarker testing.** Tumor tissue from a biopsy can be tested for certain features of cancer cells, or biomarkers. This gives specific information about the tumor. Biomarker testing gives doctors more information about *your* lung cancer. Personalized information is important. All lung cancers are not the same. Biomarker testing helps your doctor decide which treatment is best for you.

These tests not only identify the lung cancer, but also help determine the stage. This helps your health-care team plan your treatment.

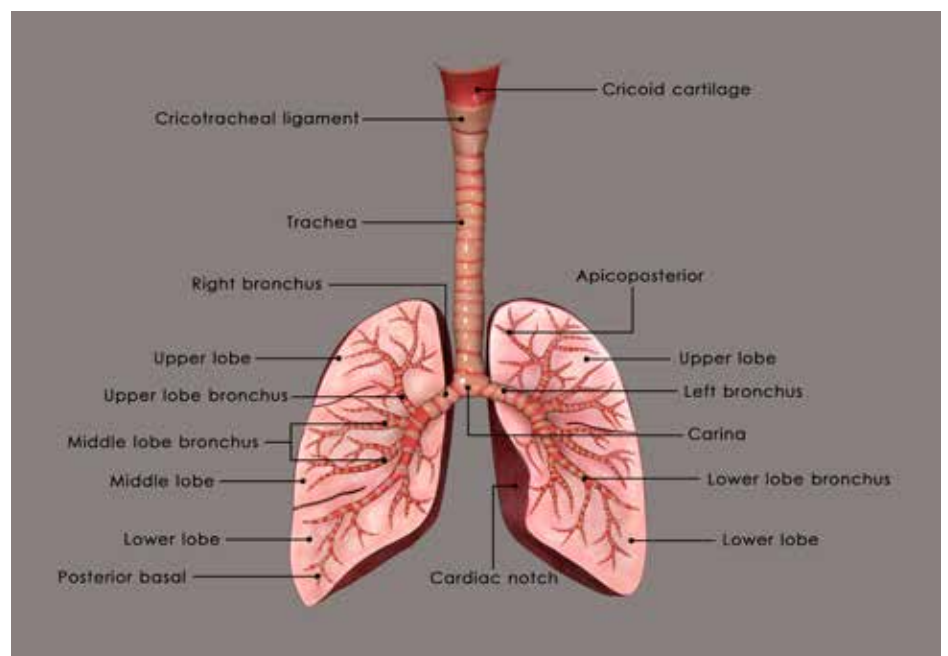
## Lung Cancer Treatments



Lung cancer treatment depends on:

- the type of lung cancer
- the stage
- whether it contains any specific features (biomarkers)

Biomarkers indicate which treatment might work best. Your health-care team will also consider your overall health and wishes when planning your treatment.





Some of the most common treatments for lung cancer include:

**Surgery.** Surgery is the initial treatment of choice. Each lung is divided into sections, or lobes. The right lung has three lobes: the upper, middle, and lower. The left lung has just two lobes: the upper and lower. Surgery may be able to remove the cancer. In these cases, surgery has the highest cure rate. Depending on the location and stage of the lung cancer, surgeons may remove:

- part of a lobe (*sublobar resection*)
- an entire lobe (*lobectomy*)
- an entire lung (*pneumonectomy*). A person can survive with just one lung.



**Chemotherapy.** Chemotherapy uses medications to kill cancer cells. Most chemotherapy drugs are given directly into the veins through an intravenous (IV) line. Some are pills (oral chemotherapy). In advanced NSCLC, chemotherapy can be used alone or with other cancer treatments.

Chemotherapy with radiation therapy is the treatment of choice for SCLC that is limited to a defined area of the chest. A defined area can be safely targeted with radiation.

Chemotherapy is usually given without radiation for patients with more extensive SCLC. If chemotherapy is delivered through veins, your doctor may suggest a “port.” A port is a special access line into a major vein in the upper part of the chest or arm. It is placed before chemotherapy begins.

Ports are non-invasive. They are placed by interventional radiologists or surgeons. Ports, or other types of long-term access to veins, are commonly used for chemotherapy. This is because treatment often lasts many weeks or months. A port means that patients aren’t stuck with needles at every treatment.

Sometimes, chemotherapy is given before surgery (called *neoadjuvant*). In some people with larger tumors, where surgery is the best first step, chemotherapy is given after surgery (or *adjuvant*).

Chemotherapy with radiation is commonly used to treat patients with Stage IIIA and IIIB lung cancer. Chemotherapy is usually given alone in Stage IV.



**Radiation Therapy.** Radiation therapy uses high-energy X-rays or other forms of radiation to kill cancer cells. It can be delivered in several different ways. In most cases, the patient lies on a special treatment table. A machine delivers invisible radioactive beams through the skin to the cancer.

Radiation can harm healthy tissue. The radiation oncology team will carefully measure and mark the spot to get radiation. During treatment, the beams will be aimed at that precise spot. Each treatment takes only a few minutes.

Radiation therapy for lung cancer is usually given several days each week for several weeks. The schedule is planned specifically for each patient. It depends on the type, size, and location of the cancer. Your health-care team will create a radiation therapy plan that:

- eliminates as much cancer as possible
- minimizes side effects
- limits of radiation exposure to normal tissues outside the cancer



**Stereotactic body radiation therapy (SBRT).** SBRT radiation therapy focuses and intensifies each dose of radiation. It causes less damage to the healthy tissue near the tumor. Throughout the treatment, the strength and direction of the radiation are constantly adjusted. This targets any changes in the tumor (such as it getting smaller) and spares healthy tissue. SBRT delivers several doses, usually three to five treatments (one per day).



**Immunotherapy** This is a new therapy in NSCLC using drugs that make the immune system stronger. This helps your body fight its cancer. This treatment is used with stage IV cancer. Immunotherapy is a type of biological therapy. It enhances the body's immune response and stop lung cancers from escaping the immune system. It doesn't target cancer cells directly. Instead it trains your immune system to recognize cancer cells, and selectively target and kill them.

Immunotherapies can do this in two ways:

- by enabling the immune system to mount or maintain a response,
- or by suppressing factors that prevent the immune response.

There are many different types of immunotherapy. Three main types are currently being studied in people with NSCLC:

- immune checkpoint inhibitors
- therapeutic cancer vaccines
- adoptive T-Cell transfer

Immune checkpoint inhibitors have made the most progress. The first FDA-approved immunotherapy drugs for lung cancer are in this group. Immunotherapy is also being studied in SCLC.

There are three FDA-approved immunotherapy drugs for metastatic NSCLC.

- Nivolumab (Opdivo®)
- Pembrolizumab (Keytruda®)
- Atezolizumab (Tecentriq®)

The choice of immunotherapy drug depends on:

- the line of therapy
- the presence or absence of an EGFR/ALK/ROS1 alteration
- the proportion of cancer cells that stain positive for the PD-L1 protein





**Targeted therapies.** Targeted cancer therapy uses drugs to attack cancer cells. It is used for some kinds of lung cancers. Researchers have learned more about the changes in cells that cause cancer. Drugs have been developed that directly target some of these changes. These drugs target specific parts of cells. They target signals that proteins send to cells that cause them to grow and divide uncontrollably.

Targeted cancer therapies are also called:

- *precision medicines*
- *molecularly targeted drugs*
- *molecularly targeted therapies*

Learn more about:

- the cell changes or mutations that they target
- whether and how to get your tumor tested for mutations
- whether targeted therapy is a good option for you
- what targeted therapy options are available

Drugs that have already been studied and FDA-approved belong to a class called *tyrosine kinase inhibitors* (TKIs). Tyrosine kinases are specific enzymes. These enzymes may signal cancer cells to grow. TKIs are targeted therapies that block these signals. By blocking these signals, they keep the cancer from getting bigger and spreading. TKIs are named for the enzyme they block. The first TKIs with FDA approval are:

- EGFR inhibitors (Tarceva, Iressa, Gilotrif, Tagrisso)
- ALK inhibitors (Xalkori, Zykadia)
- ROS1 inhibitor (Xalkori)



**Other Treatments.** Other lung cancer treatments are:

- *Radiofrequency ablation* uses heat to kill cancer cells. It delivers heat through a thin, needle-like probe into the skin near the cancer.
- *Photodynamic therapy* (PDT) delivers a special light through a bronchoscope to cancer cells inside the breathing tubes.
- *Laser beams* through bronchoscopy, kill cancer cells in order to open blocked airways.
- *Cryotherapy* uses extreme cold to kill cancer cells. A thin, needle-like probe is inserted through a bronchoscope or into the chest wall, delivering treatment directly to the tumor.

Your health-care team will discuss these options and whether they are right for your type of cancer.

## Side Effects



Lung cancer treatments have side effects. Not everyone has side effects. Over the past decade or so, progress has been made in chemotherapy that is less toxic. Many people have mild side effects. Some have severe side effects. Common side effects include:

- fatigue
- nausea
- vomiting
- loss of appetite
- weakness
- hair loss
- mouth sores
- sores at the site of radiation treatment
- decreased immunity (resistance to other illness or disease)
- memory problems
- pain and discomfort
- diarrhea or constipation
- skin rashes

Side effects will depend on what treatments you receive and how your body responds.

Remember that side effects can be eased with medication before you even start treatment. It's common to give anti-nausea medication to lung cancer patients before chemotherapy. This helps with vomiting. Ask your doctors about the possible side effects. Ask what you can do to help manage them. Report **ANY** side effects to your doctors throughout your treatment. They can't help you feel better if they don't know what you are experiencing.

## Living With Lung Cancer



There's no magic cure for lung cancer. You can do things at home to increase your comfort and improve your overall health.

**If you smoke, quit.** It's not easy to stop smoking. Your healthcare team can prescribe medication. They can refer you to local classes and support groups. Quitting smoking will keep you healthier.



**Get plenty of rest.** It reduces stress, increases feelings of wellbeing, and may strengthen your immune system (the body's natural ability to fight disease). Many find cancer treatment exhausting. You may feel wiped out after chemotherapy or radiation. Listen to your body. Rest when you feel tired. It's okay to be active when you feel good. Healing takes time and energy.



**Keep active and exercise.** You may not feel like doing it, but exercise is helpful. Studies now show that it can help reduce lung cancer symptoms and side effects. It can also improve quality of life. Talk to your doctor to find a safe program for you. Try to do be active every day – even if it is a long walk.



**Eat a healthy diet.** It's not easy to eat well. It's hard to eat at all if cancer treatment affects your appetite and sense of taste. Getting enough calories and nutrients supports healing. Tell your health-care team if eating becomes a challenge.

Your physician may prescribe medication. Some medications can stimulate appetite. Others relieve mouth sores or soothe nausea. Your doctor may also recommend nutritional supplements. Many cancer centers have nutritionists on staff. A nutritionist can help with an eating plan that meets your needs.



**Get emotional, spiritual, and psychological support.** Few things hit harder than a cancer diagnosis. You may feel stunned, angry, upset, sad, frightened, or overwhelmed. Sometimes, you may feel all of these emotions at once. This is completely normal.

Anxiety and depression may begin to negatively affect your work or relationships. That might be time for professional help. Talk about your feelings with your health-care team. Your doctor can assess you for clinical depression. If appropriate, he or she can prescribe medication and/or refer you to a professional counselor or mental health professional. Some patients find a spiritual or religious advisor helpful.

Don't forget that a diagnosis of lung cancer can be stressful for the entire family. Your family members may feel as overwhelmed as you do. Support groups can help both patients and families. Talking to others who have had or are living with lung cancer can help.

Many patient advocate groups offer support and survivorship services. LUNgevity offers online and peer-to-peer support. It includes a toll-free helpline and PhoneBuddy program.

The Lung Cancer Alliance maintains a list of online and in-person support groups across the country. CancerCare also has lists of support groups. They offer online phone counseling with social workers who specialize in cancer care.

Many hospitals and health-care organizations host lung cancer support groups. Ask your health-care team what support options near you.



## If the Worst Happens



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**Living with cancer is hard.**

**Be kind to yourself, accept offers of help, and try to stay positive.**

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It isn't easy to talk about death. Most people with cancer, feel better when they do. Ask your healthcare team to describe different outcomes and options. Take time to think about what you want if your cancer continues to worsen even with treatment. It's a good idea to talk about options with family and close friends and your health-care team if your cancer continues. It's important for people with a serious illness, to find and ask someone to be a health-care agent, or "proxy." If you can't speak for yourself, this person has the legal responsibility to explain your wishes about health care. Your doctor, hospital, or a lawyer can help you find a health proxy.

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## Resources

Use these resources to get reliable information about lung cancer:

American Cancer Society | <https://www.cancer.org/cancer/lung-cancer.html>

Bonnie J. Addario Lung Cancer Foundation | [www.lungcancerfoundation.org](http://www.lungcancerfoundation.org)

Lung Cancer Alliance | [www.lungcanceralliance.org](http://www.lungcanceralliance.org)

LUNGevity Foundation | [www.LUNGevity.org](http://www.LUNGevity.org)

National Cancer Institute at the National Institutes of Health | <https://www.cancer.gov/types/lung>

## Support

There are many places to get support dealing with lung cancer. There are local and online groups that can help you find answers to your questions and provide assistance. Your health-care provider will likely know the support groups in your local area. Other online resources are:

American Cancer Society  
[cancer.org](http://cancer.org)

American Lung Association Lung Cancer Support Groups  
<https://www.inspire.com/groups/american-lung-association-lung-cancer-survivors/>

The Better Breathers Clubs and American Lung Association  
<http://www.lung.org/support-and-community/>

Bonnie J. Addario Lung Cancer Foundation  
<http://www.lungcancerfoundation.org/>

LUNGevity Foundation  
<https://www.lungevity.org/>

National Cancer Institute at the National Institutes of Health  
<https://www.cancer.gov/types/lung>



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[chestfoundation.org/lungcancer](http://chestfoundation.org/lungcancer)

Other patient education guides available from the CHEST Foundation in print and on our website:  
[chestfoundation.org/patienteducation](http://chestfoundation.org/patienteducation)



**The Society  
of Thoracic  
Surgeons**

[ctsurgerypatients.org](http://ctsurgerypatients.org)

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Some drugs and medical devices presented in this publication may have US Food and Drug Administration (FDA) clearance for limited use in restricted research settings. It is the responsibility of the health-care provider to ascertain the FDA status of each drug or device planned for use in his or her clinical practice.