

National Cancer Institute

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What You Need  
To Know About™

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# Lung Cancer

U.S. DEPARTMENT OF  
HEALTH AND HUMAN SERVICES  
National Institutes of Health

## National Cancer Institute Services

This is only one of many free booklets for people with cancer.

You may want more information for yourself, your family, and your friends.

### Call NCI's Cancer Information Service

**1-800-4-CANCER (1-800-422-6237)**

### Visit NCI's website

**<http://www.cancer.gov>**

### Chat online

**LiveHelp**, NCI's instant messaging service

**<https://livehelp.cancer.gov>**

### E-mail

**[cancergovstaff@mail.nih.gov](mailto:cancergovstaff@mail.nih.gov)**

### Order publications

**<http://www.cancer.gov/publications>**

**1-800-4-CANCER (1-800-422-6237)**

### Get help with quitting smoking

**1-877-44U-QUIT (1-877-448-7848)**

## About This Booklet

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This National Cancer Institute (NCI) booklet is for you—someone who has just been diagnosed with lung **cancer**.

Words that may be new to you are shown in **bold**. See the **Words To Know** section on page 25 to learn what a new word means and how to pronounce it.

This booklet is about medical care for people with lung cancer. Learning about medical care for lung cancer can help you take an active part in making choices about your care.

You can read this booklet from front to back. Or, you can read only the sections you need right now.

This booklet has lists of questions that you may want to ask your doctor. Many people find it helpful to take a list of questions to a doctor visit. To help remember what your doctor says, you can take notes. You may also want to have a family member or friend go with you when you talk with the doctor—to take notes, ask questions, or just listen.

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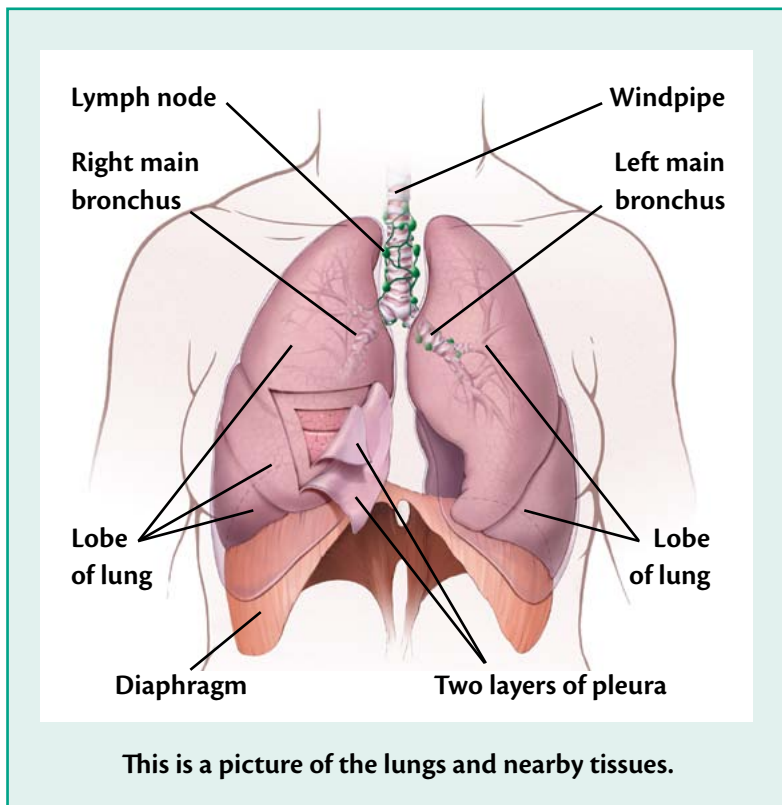
# The Lungs

Your lungs are a pair of large organs in your chest. They are part of your **respiratory system**.

Air enters your body through your nose or mouth. It passes through your windpipe (**trachea**) and through each **bronchus**, and goes into your lungs.

When you breathe in, your lungs expand with air. This is how your body gets **oxygen**.

When you breathe out, air goes out of your lungs. This is how your body gets rid of **carbon dioxide**.



Your right lung has three parts (**lobes**). Your left lung is smaller and has two lobes.

Inside the chest are two thin layers of tissue (the **pleura**). One layer covers the lungs and the other layer lines the inside of your chest.

## Cancer Cells

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Cancer begins in **cells**, the building blocks that make up all tissues and organs of the body, including the lungs.

Normal cells in the lungs and other parts of the body grow and divide to form new cells as they are needed. When normal cells grow old or get damaged, they die, and new cells take their place.

Sometimes, this process goes wrong. New cells form when the body doesn't need them, and old or damaged cells don't die as they should. The buildup of extra cells often forms a mass of tissue called a growth or **tumor**.

Tumors in the lung can be **benign** (not cancer) or **malignant** (cancer):

### ■ **Benign tumors:**

- Are rarely a threat to life
- Don't invade the tissues around them
- Don't spread to other parts of the body
- Usually don't need to be removed

### ■ **Malignant tumors (lung cancer):**

- May be a threat to life
- Can invade nearby organs and tissues

- Can spread to other parts of the body
- Often can be removed but may grow back

Lung cancer cells can spread by breaking away from a lung tumor. They can travel through **blood vessels** or **lymph vessels** to reach other parts of the body. After spreading, cancer cells may attach to other tissues and grow to form new tumors that may damage those tissues.

When lung cancer spreads from its original place to another part of the body, the new tumor has the same kind of abnormal cells and the same name as the primary (original) tumor. For example, if lung cancer spreads to the bones, the cancer cells in the bones are actually lung cancer cells. The disease is **metastatic** lung cancer, not bone cancer. For that reason, it is treated as lung cancer, not bone cancer.

## Types of Lung Cancer

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In 2012, more than 226,000 Americans will be diagnosed with lung cancer.

The most common types are named for how the lung cancer cells look under a microscope:

- **Small cell:** The cells of **small cell lung cancer** look small under a microscope. About 1 of every 8 people with lung cancer has small cell lung cancer.
- **Non-small cell:** The cells of **non-small cell lung cancer** are larger than the cells of small cell lung cancer. Most (about 7 of every 8) people diagnosed with lung cancer have non-small cell lung cancer. It doesn't grow and spread as fast as small cell lung cancer, and it's treated differently.

Because most people who get lung cancer were smokers, you may feel like doctors and other people assume that you are or were a smoker (even if you aren't or weren't).

Whether or not you were a smoker, it's important for you to protect your body now from smoke. Avoid secondhand smoke from smokers near you.

If you smoke, talk with an expert about quitting. It's never too late to quit. Quitting can help cancer treatments work better. It may also reduce the chance of getting another cancer.

To get help with quitting smoking...

- Go online to [Smokefree.gov](http://Smokefree.gov).
- Call NCI's Smoking Quitline at **1-877-44U-QUIT (1-877-448-7848)**.
- Sign up for the free mobile service **SmokefreeTXT** to get tips and encouragement to quit. To sign up, text the word QUIT to IQUIT (47848) from your mobile phone. Or, go to <http://smokefree.gov/smokefreetxt/Signup.aspx>.

## Staging Tests

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After you learn that you have lung cancer, you may need staging tests to help with decisions about treatment. Staging tests can show the stage (extent) of lung cancer, such as whether cancer cells have spread to other parts of the body.

When lung cancer spreads, cancer cells are often found in nearby **lymph nodes**. Lung cancer cells can spread from the



lung to almost any other part of the body, such as the brain, bones, other lung, liver, or **adrenal gland**.

Staging tests may include...

- **CT scan:** An **x-ray** machine linked to a computer takes a series of detailed pictures of your chest, abdomen, brain, or other parts of your body. You'll receive **contrast material** by injection into a blood vessel in your arm or hand. For a **CT scan** of the abdomen, you may receive contrast material by mouth also. The contrast material makes abnormal areas easier to see. The pictures from a CT scan can show the lung tumor's size. The pictures can also show cancer that has spread to your liver, adrenal glands, brain, or other organs.
- **PET scan:** Your doctor may use a **PET scan** to get a better view of the tumor in the lung or to find cancer that has spread. You'll receive an injection of a small amount of radioactive sugar. A machine makes computerized pictures of the sugar being used by cells in the body. Because cancer cells use sugar faster than normal cells, areas with cancer cells look brighter on the pictures.
- **MRI:** A strong magnet linked to a computer is used to make detailed pictures of your head or spine. An **MRI** can show whether cancer has spread to these areas. Sometimes contrast material is used to make abnormal areas show up more clearly on the picture.
- **Bone scan:** A small amount of a **radioactive** substance will be injected into a blood vessel. The radioactive substance travels through your bloodstream and collects in the bones. A machine called a scanner detects and measures the radiation. The scanner makes pictures of your bones. Because higher amounts of the radioactive

substance collect in areas where cancer is present, the pictures can show cancer that has spread to the bones.

Other tests may be needed. For example, your doctor may remove samples of lymph nodes or other tissues to see whether lung cancer has spread.

### Questions you may want to ask your doctor about tests

- What type of lung cancer do I have?
- Has the cancer spread from the lung? If so, to where?
- May I have a copy of test results?

## Stages

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The stage of lung cancer depends mainly on...

- **The size of the lung tumor**
- **How deeply the tumor has invaded nearby tissue, such as the chest wall**
- **Whether lung cancer cells have spread to lymph nodes or other parts of the body**

## Stages of Non-small Cell Lung Cancer

Doctors describe the stages of non-small cell lung cancer using the Roman numerals I, II, III, and IV. Stage I is **early-stage cancer**, and Stage IV is **advanced cancer** that has spread to other parts of the body, such as the bones.

You can find pictures of the stages and other information on NCI's website at <http://www.cancer.gov/cancertopics/types/lung>.

### Occult Stage Lung Tumor

Tumor cells are found in **sputum**, but CT scans and other imaging tests don't show a lung tumor.

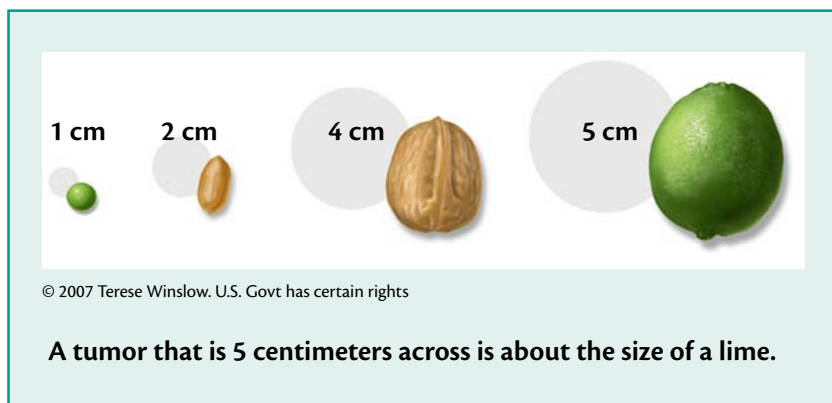
### Stage 0 Lung Tumor

Abnormal cells are found only in the innermost lining of the lung. The tumor has not grown through this lining. A Stage 0 tumor is also called **carcinoma in situ**. It is not an **invasive cancer**.

### Stage I Lung Cancer

The lung tumor is an invasive cancer. It has grown through the innermost lining of the lung into deeper lung tissue. The tumor is surrounded by normal tissue, and it doesn't invade nearby tissues, such as the chest wall.

The tumor is no more than 5 centimeters (about 2 inches) across. Cancer cells are not found in nearby lymph nodes.



## Stage II Lung Cancer

The lung tumor is smaller than 7 centimeters across, and cancer cells are found in nearby lymph nodes.

Or, cancer cells are not found in nearby lymph nodes. The lung tumor is more than 5 centimeters across, or it invades nearby tissues, such as the chest wall, **diaphragm**, pleura, main bronchus, or tissue that surrounds the heart. More than one malignant tumor may be found within the same lobe of the lung.

## Stage III Lung Cancer

The tumor may be any size. More than one malignant tumor may be found within the lung.

Cancer cells may be found in lymph nodes on either side of the chest or the neck. The tumor may have invaded nearby organs, such as the heart, **esophagus**, or trachea.

## Stage IV Lung Cancer

Malignant tumors are found in both lungs. Or, the lung cancer has spread to other parts of the body, such as the brain, bones, liver, or adrenal glands. Or, cancer cells are found in fluid between the two layers of pleura. (See page 1 for picture of pleura.)

## Stages of Small Cell Lung Cancer

Most doctors describe the stages of small cell lung cancer with two stages:

- **Limited stage:** Cancer is found only on one side of the chest.

- **Extensive stage:** Cancer is found in the lung and also in tissues on the other side of the chest. Or, lung cancer is found in distant organs, such as the brain, or in fluid between the two layers of pleura. (See page 1 for picture of pleura.)

Instead of limited and extensive stage, some doctors describe the stages of small cell lung cancer using the Roman numerals I, II, III, and IV (see **Stages of Non-small Cell Lung Cancer**).

## Treatment

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People with lung cancer have many treatment options. Treatment options include...

- **Surgery**
- **Radiation therapy**
- **Chemotherapy**
- **Targeted therapy**

The treatment that's right for you depends mainly on the type and stage of lung cancer. You may receive more than one type of treatment.

At any stage of lung cancer, care is available to control pain and manage breathing problems, to relieve the **side effects** of treatment, and to ease emotional concerns. You can get information about coping with symptoms and side effects on NCI's website at <http://www.cancer.gov/cancertopics/coping>.

Also, you can get information about coping from NCI's Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)**. Or, chat using NCI's instant messaging service, **LiveHelp (<https://livehelp.cancer.gov>)**.

## Doctors Who Treat Lung Cancer

Your health care team will include specialists. There are many ways to find doctors who treat lung cancer:

- Your doctor may be able to refer you to specialists.
- You can ask a local or state medical society, or a nearby hospital or medical school for names of specialists.



**You and your doctor will develop a treatment plan.**

- NCI's Cancer Information Service can give you information about treatment centers near you. Call **1-800-4-CANCER (1-800-422-6237)**. Or, chat using **LiveHelp (<https://livehelp.cancer.gov>)**, NCI's instant messaging service.
- Other sources can be found in the NCI fact sheet *How To Find a Doctor or Treatment Facility If You Have Cancer*.

Your health care team may include the following specialists:

- **Chest surgeon:** A chest surgeon (**thoracic surgeon**) specializes in **surgery** on the lungs and other organs inside the chest. You may wish to find an expert in lung cancer surgery.
- **Thoracic surgical oncologist:** A **thoracic surgical oncologist** is a surgeon who specializes in surgeries on lung tumors and other tumors found inside the chest.
- **Medical oncologist:** A **medical oncologist** is a doctor who specializes in treating cancer with drugs, such as **chemotherapy** and **targeted therapy**.
- **Radiation oncologist:** A **radiation oncologist** is a doctor who specializes in treating cancer with **radiation therapy**.

Your health care team may also include an **oncology nurse**, a **social worker**, and a **registered dietitian**. If you have trouble breathing, your doctor may refer you to a **pulmonologist** (lung specialist) or a **respiratory therapist**.

Your health care team can describe your treatment options, the expected results of each option, and the possible side effects. Because cancer treatments often damage healthy cells and tissues, side effects are common. These side effects depend on many factors, including the type of treatment.

Side effects may not be the same for everyone, and they may even change from one treatment session to the next.

You and your health care team can work together to develop a treatment plan.

Lung cancer is hard to control with current treatments. For that reason, many doctors encourage people with this disease to consider taking part in a research study (**clinical trial**) of new treatment methods. Research studies are an important option for people with any stage of lung cancer. See the **Cancer Treatment Research** section on page 24.

### Questions you may want to ask your doctor about treatment options

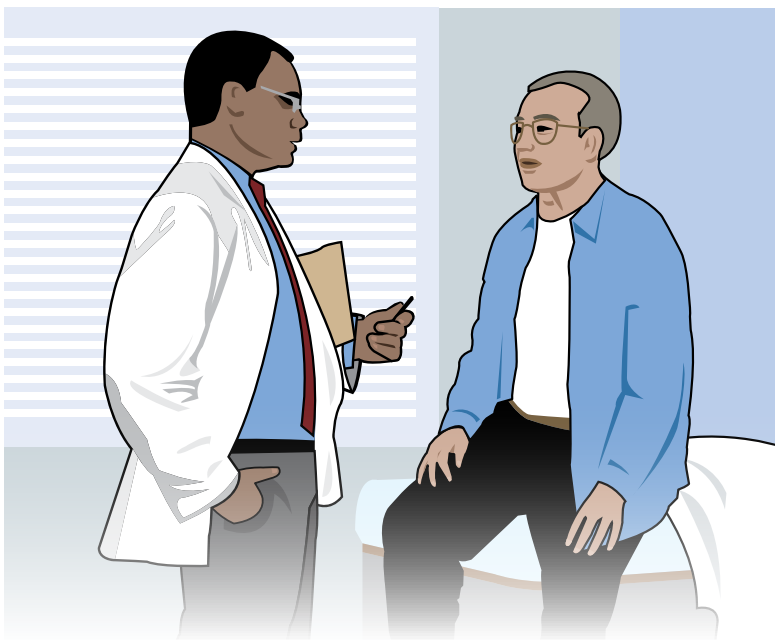
- What are my treatment options? Which do you recommend for me? Why?
- What are the expected benefits of each kind of treatment?
- What are the risks and possible side effects of each treatment? How can side effects be managed?
- What can I do to prepare for treatment?
- Will I need to stay in the hospital? If so, for how long?
- What is the treatment likely to cost? Will my insurance cover it?
- How will treatment affect my normal activities?
- Would a treatment research study be right for me?



## Second Opinion

Before starting treatment, you might want a second opinion about your diagnosis and treatment options. Some people worry that the doctor will be offended if they ask for a second opinion. Usually the opposite is true. Most doctors welcome a second opinion. And many health insurance companies will pay for a second opinion if you or your doctor requests it. Some insurance companies actually require a second opinion.

If you get a second opinion, the second doctor may agree with your first doctor's diagnosis and treatment recommendation. Or, the second doctor may suggest another approach. Either way, you have more information and perhaps a greater sense of control. You can feel more confident about the decisions you make, knowing that you've looked at all of your options.



**You may want to get a second opinion before starting treatment.**

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