

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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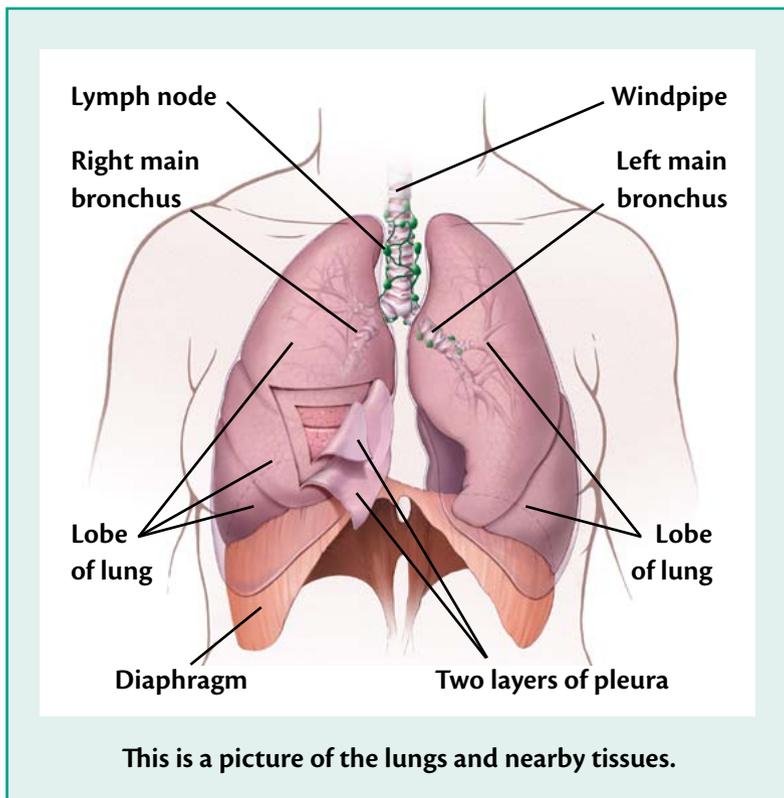
# The Lungs

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.

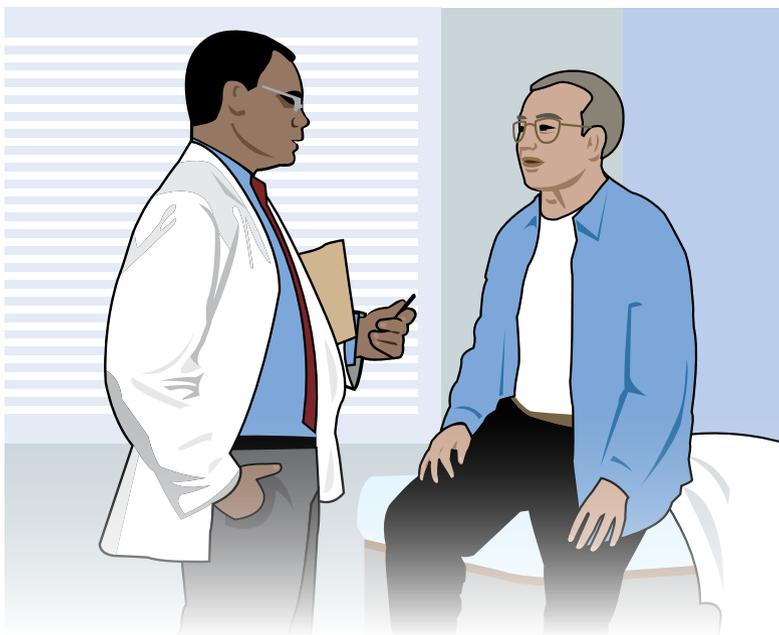
### Questions you may want to ask your doctor about treatment options

- 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.**

It may take some time and effort to gather your medical records and see another doctor. In most cases, it's not a problem to take several weeks to get a second opinion. The delay in starting treatment usually will not make treatment less effective. To make sure, you should discuss this delay with your doctor. Some people with lung cancer need treatment right away. For example, a doctor may advise a person with small cell lung cancer not to delay treatment more than a week or two.

## Surgery

Surgery may be an option for people with early-stage lung cancer.

The surgeon usually removes only the part of the lung that contains cancer. Most people who have surgery for lung cancer will have the lobe of the lung that contains the cancer removed. This is a **lobectomy**. In some cases, the surgeon will remove the tumor along with less tissue than an entire lobe, or the surgeon will remove the entire lung. The surgeon also removes nearby lymph nodes.

After lung surgery, air and fluid will collect in the chest. A chest tube that was inserted during surgery will allow the fluid to drain. Also, a nurse or respiratory therapist will teach you coughing and breathing exercises. You'll need to do these exercises several times a day. The chest tube will be removed a few days after surgery.

The time it takes to heal after surgery is different for everyone. Your hospital stay may be a week or longer. It may be several weeks before you return to normal activities.

Medicine can help control your pain after surgery. Before surgery, you should discuss the plan for pain relief with your doctor or nurse. After surgery, your doctor can adjust the plan if you need more pain relief.

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

- What kind of surgery do you suggest for me?
- How will I feel after surgery?
- If I have pain, how can we control it?
- How long will I be in the hospital?
- Will I have any lasting side effects?
- When can I get back to my normal activities?

## Radiation Therapy

Radiation therapy is an option for people with any stage of lung cancer:

- People with early lung cancer may choose radiation therapy instead of surgery.
- After surgery, radiation therapy can be used to destroy any cancer cells that may remain in the chest.
- In advanced lung cancer, radiation therapy may be used with chemotherapy.
- Radiation therapy can be used to help shrink a tumor that is blocking the airway.

- Radiation therapy can be used to help relieve pain from lung cancer that has spread to the bones or other tissues.
- Radiation therapy is often used to treat lung cancer that has spread to the brain.

The radiation comes from a large machine. The machine aims high-energy rays at your body to kill cancer cells. The treatment affects cells only in the area being treated, such as the chest area.

You'll go to a hospital or clinic for treatment. Treatments are usually 5 days a week for about 6 weeks. Each treatment session usually lasts less than 20 minutes.

Although radiation therapy is painless, it may cause other side effects. The side effects depend mainly on how much radiation is given and the part of your body that is treated. Ask your health care team to describe the side effects that you might expect during or after radiation therapy.

Radiation therapy aimed at the chest may cause a sore throat, cough, or shortness of breath. When you try to swallow, you may feel a lump in your throat or burning in your chest or throat. Your health care team can suggest ways to manage these problems. The problems usually go away when treatment ends.

It's common for the skin in the chest area to become red and dry and to get darker. Sometimes the skin may feel tender or itchy. Check with your doctor before using lotion or cream on your chest. After treatment is over, the skin will heal.

You're likely to become tired during radiation therapy, especially in the later weeks of treatment. Although getting

enough rest is important, most people say they feel better when they exercise every day. Try to go for a short walk, do gentle stretches, or do yoga.

The NCI booklet *Radiation Therapy and You* has helpful ideas for coping with radiation therapy side effects.

### **Questions you may want to ask your doctor about radiation therapy**

- When will treatment start? When will it end? How often will I have treatments?
- How will I feel during treatment? Will I be able to drive myself to and from treatment?
- What can I do to take care of myself before, during, and after treatment?
- How will we know the treatment is working?
- What side effects should I expect? What should I tell you about?
- Are there any lasting effects?

## Chemotherapy

Chemotherapy may be used alone, with radiation therapy, or after surgery.

Chemotherapy uses drugs to kill cancer cells. The drugs for lung cancer are usually given directly into a vein (**intravenous**) through a thin needle.

You'll probably receive chemotherapy in a clinic or at the doctor's office. People rarely need to stay in the hospital during treatment.

The side effects depend mainly on which drugs are given and how much. Chemotherapy kills fast-growing cancer cells, but the drugs can also harm normal cells that divide rapidly:

- **Blood cells:** When drugs lower the levels of healthy blood cells, you're more likely to get infections, bruise or bleed easily, and feel very weak and tired. Your health care team will check for low levels of blood cells. If your levels are low, your health care team may stop the chemotherapy for a while or reduce the dose of the drug. There are also medicines that can help your body make new blood cells.
- **Cells in hair roots:** Chemotherapy may cause hair loss. If you lose your hair, it will grow back after treatment, but the color and texture may be changed.
- **Cells that line the digestive tract:** Chemotherapy can cause a poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores. Your health care team can give you medicines and suggest other ways to help with these problems.

Other possible side effects include hearing loss, joint pain, and tingling or numbness in your hands and feet.

When radiation therapy and chemotherapy are given at the same time, the side effects may be worse.

Your health care team can suggest ways to control many of these problems. Most go away when treatment ends.

The NCI booklet *Chemotherapy and You* has helpful ideas for coping with chemotherapy side effects.

## Targeted Therapy

People with non-small cell lung cancer that has spread may receive a type of treatment called targeted therapy. Several kinds of targeted therapy are used for non-small cell lung cancer. One kind is used only if a lab test on the cancer tissue shows a certain gene change. Targeted therapies can block the growth and spread of lung cancer cells.

Depending on the kind of drug used, targeted therapies for lung cancer are given intravenously or by mouth. The drug enters the bloodstream and can affect cancer cells all over the body.

During treatment, your health care team will watch you for side effects. You may get a skin rash, diarrhea, or mouth sores, or you may feel very tired. Other possible side effects include shortness of breath, belly pain, high blood pressure, vomiting, and swollen feet and hands. The side effects usually go away after treatment ends.

You may want to read the NCI fact sheet *Targeted Cancer Therapies*.

## **Questions you may want to ask your doctor about chemotherapy or targeted therapy**

- Which drug or drugs do you suggest for me? What will they do?
- What are the possible side effects? What can we do about them?
- When will treatment start? When will it end? How often will I have treatments?
- How will we know the treatment is working?
- Will there be lasting side effects?

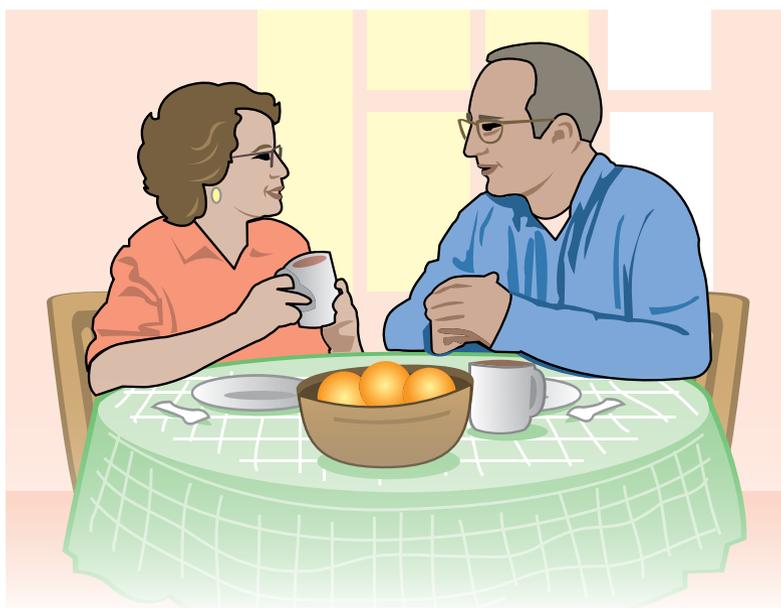
## Nutrition

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Eating well is important before, during, and after cancer treatment. You need the right amount of calories to maintain a good weight. You also need enough protein to keep up your strength. Eating well may help you feel better and have more energy.

Sometimes, especially during or soon after treatment, you may not feel like eating. You may be uncomfortable or tired. You may find that foods don't taste as good as they used to. In addition, poor appetite, nausea, vomiting, mouth blisters, and other side effects of treatment can make it hard for you to eat.

Your doctor, a registered dietitian, or another health care provider can suggest ways to help you meet your nutrition needs. Also, the NCI booklet *Eating Hints* has many useful recipes and lists of foods that can help with side effects.



**Eating well may help you feel better.**

## Follow-up Care

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You'll need regular checkups (such as every 6 months) after treatment for lung cancer. Checkups help ensure that any changes in your health are noted and treated if needed. If you have any health problems between checkups, contact your doctor.

Lung cancer may come back after treatment. Your doctor will check for the return of cancer. It may return in the chest or it may return in another part of the body, such as the bones.

Checkups also help detect health problems that can result from cancer treatment.

Checkups may include a physical exam, blood tests, or CT scans.

You may find it helpful to read the NCI booklet *Facing Forward: Life After Cancer Treatment*. You may also want to read the NCI fact sheet *Follow-up Care After Cancer Treatment*.

## Sources of Support

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Learning that you have lung cancer can change your life and the lives of those close to you. These changes can be hard to handle. It's normal for you, your family, and your friends to need help coping with the feelings that a diagnosis of cancer can bring.

Concerns about treatments and managing side effects, hospital stays, and medical bills are common. You may also worry about caring for your family, keeping your job, or continuing daily activities.

Here's where you can go for support:

- Doctors, nurses, and other members of your health care team can answer questions about treatment, working, or other activities.
- Social workers, counselors, or members of the clergy can be helpful if you want to talk about your feelings or concerns. Often, social workers can suggest resources for financial aid, transportation, home care, or emotional support.
- Support groups can also help. In these groups, people with lung cancer or their family members meet with other patients or their families to share what they have learned about coping with the disease and the effects of treatment. Groups may offer support in person, over the telephone, or on the Internet. You may want to talk with a member of your health care team about finding a support group.
- NCI's Cancer Information Service can help you locate programs, services, and NCI publications. Call **1-800-4-CANCER (1-800-422-6237)**. Or, chat using **LiveHelp (<https://livehelp.cancer.gov>)**, NCI's instant messaging service.

For tips on coping, you may want to read the NCI booklet *Taking Time: Support for People With Cancer*.

## Cancer Treatment Research

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Cancer research has led to advances that have helped people live longer, and doctors continue to search for new and better ways to treat lung cancer. All over the world, doctors are conducting many types of cancer treatment research studies (clinical trials).

NCI sponsors many studies with people who have lung cancer, such as studies of surgery, radiation therapy, chemotherapy, targeted therapy, and their combination.

Even if the people taking part in a clinical trial don't benefit directly from the treatment under study, they may still make an important contribution by helping doctors learn more about lung cancer and how to control it. Although clinical trials may pose some risks, researchers do all they can to protect their patients.

If you're interested in being part of a clinical trial, talk with your doctor. You may want to read the NCI booklet *Taking Part in Cancer Treatment Research Studies*. It describes how treatment studies are carried out and explains their possible benefits and risks.

NCI's website has a section on clinical trials at <http://www.cancer.gov/clinicaltrials>. It has general information about clinical trials as well as detailed information about specific ongoing studies of lung cancer.

NCI's Cancer Information Service can answer your questions and provide information about clinical trials. Contact CIS at **1-800-4-CANCER (1-800-422-6237)** or at **LiveHelp (<https://livehelp.cancer.gov>)**.

## Words To Know

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Definitions of thousands of terms are on NCI's website in NCI's Dictionary of Cancer Terms. You can access it at <http://www.cancer.gov/dictionary>.

**Adrenal gland** (uh-DREE-nul): A small gland that makes steroid hormones, adrenaline, and noradrenaline. These hormones help control heart rate, blood pressure, and other important body functions. There are two adrenal glands, one on top of each kidney.

**Advanced cancer:** Cancer that has spread to other places in the body and usually cannot be cured or controlled with treatment.

**Benign** (beh-NINE): Not cancer. Benign tumors may grow larger but do not spread to other parts of the body.

**Blood vessel:** A tube through which the blood circulates in the body. Blood vessels include a network of arteries, arterioles, capillaries, venules, and veins.

**Bronchus** (BRON-kus): A large airway that leads from the trachea (windpipe) to a lung. The plural of bronchus is bronchi.

**Cancer:** A term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems. Also called malignancy.

**Carbon dioxide** (KAR-bun dy-OK-side): A colorless, odorless gas. It is a waste product made by the body. Carbon dioxide travels in the blood from the body's tissues to the lungs. Breathing out clears carbon dioxide from the lungs.

**Carcinoma in situ** (KAR-sih-NOH-muh in SY-too): A group of abnormal cells that remain in the place where they first formed. They have not spread. These abnormal cells may become cancer and spread into nearby normal tissue. Also called stage 0 disease.

**Cell:** The individual unit that makes up the tissues of the body. All living things are made up of one or more cells.

**Chemotherapy** (KEE-moh-THAYR-uh-pee): Treatment with drugs that kill cancer cells.

**Clinical trial:** A type of research study that tests how well new medical approaches work in people. These studies test new methods of screening, prevention, diagnosis, or treatment of a disease. Also called clinical study.

**Contrast material:** A dye or other substance that helps show abnormal areas inside the body. It is given by injection into a vein, by enema, or by mouth. Contrast material may be used with x-rays, CT scans, MRI, or other imaging tests.

**CT scan:** A series of detailed pictures of areas inside the body taken from different angles. The pictures are created by a computer linked to an x-ray machine. Also called CAT scan, computed tomography scan, computerized axial tomography scan, and computerized tomography.

**Diaphragm** (DY-uh-fram): The thin muscle below the lungs and heart that separates the chest from the abdomen.

**Early-stage cancer:** A term used to describe cancer that is early in its growth, and may not have spread to other parts of the body. What is called early stage may differ between cancer types.

**Esophagus** (ee-SAH-fuh-gus): The muscular tube through which food passes from the throat to the stomach.

**Intravenous** (IN-truh-VEE-nus): Into or within a vein. Intravenous usually refers to a way of giving a drug or other substance through a needle or tube inserted into a vein. Also called IV.

**Invasive cancer** (in-VAY-siv): Cancer that has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues. Also called infiltrating cancer.

**Lobe:** A portion of an organ, such as the liver, lung, breast, thyroid, or brain.

**Lobectomy** (loh-BEK-toh-mee): Surgery to remove a whole lobe (section) of an organ (such as the lungs, liver, brain, or thyroid gland).

**Lymph node** (limf): A rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Lymph nodes filter lymph (lymphatic fluid), and they store lymphocytes (white blood cells). They are located along lymphatic vessels. Also called lymph gland.

**Lymph vessel** (limf): A thin tube that carries lymph (lymphatic fluid) and white blood cells through the lymphatic system. Also called lymphatic vessel.

**Malignant** (muh-LIG-nunt): Cancerous. Malignant tumors can invade and destroy nearby tissue and spread to other parts of the body.

**Medical oncologist** (MEH-dih-kul on-KAH-loh-jist): A doctor who specializes in diagnosing and treating cancer using chemotherapy, targeted therapy, hormonal therapy, and biological therapy. A medical oncologist often is the main health care provider for someone who has cancer. A medical oncologist also gives supportive care and may coordinate treatment given by other specialists.

**Metastatic** (meh-tuh-STA-tik): Having to do with metastasis, which is the spread of cancer from one part of the body to another.

**MRI:** A procedure in which radio waves and a powerful magnet linked to a computer are used to create detailed pictures of areas inside the body. These pictures can show the difference between normal and diseased tissue. MRI makes better images of organs and soft tissue than other scanning techniques, such as computed tomography (CT) or x-ray. MRI is especially useful for imaging

the brain, the spine, the soft tissue of joints, and the inside of bones. Also called magnetic resonance imaging.

**Non-small cell lung cancer:** A group of lung cancers that are named for the kinds of cells found in the cancer and how the cells look under a microscope. The three main types of non-small cell lung cancer are squamous cell carcinoma, large cell carcinoma, and adenocarcinoma. Non-small cell lung cancer is the most common kind of lung cancer.

**Oncology nurse** (on-KAH-loh-jee): A nurse who specializes in treating and caring for people who have cancer.

**Oxygen** (OK-sih-jen): A colorless, odorless gas. It is needed for animal and plant life. Oxygen that is breathed in enters the blood from the lungs and travels to the tissues.

**PET scan:** A procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed, computerized pictures of areas inside the body where the glucose is used. Because cancer cells often use more glucose than normal cells, the pictures can be used to find cancer cells in the body. Also called positron emission tomography scan.

**Pleura** (PLOOR-uh): A thin layer of tissue that covers the lungs and lines the interior wall of the chest cavity. It protects and cushions the lungs. This tissue secretes a small amount of fluid that acts as a lubricant, allowing the lungs to move smoothly in the chest cavity while breathing.

**Pulmonologist** (PUL-muh-NAH-loh-jist): A doctor who specializes in treating diseases of the lungs. Also called pulmonary specialist.

**Radiation oncologist** (RAY-dee-AY-shun on-KAH-loh-jist): A doctor who specializes in using radiation to treat cancer.

**Radiation therapy** (RAY-dee-AY-shun THAYR-uh-pee): The use of high-energy radiation from x-rays, gamma rays, neutrons,

protons, and other sources to kill cancer cells and shrink tumors. Also called irradiation and radiotherapy.

**Radioactive** (RAY-dee-oh-AK-tiv): Giving off radiation.

**Registered dietitian** (dy-eh-TIH-shun): A health professional with special training in the use of diet and nutrition to keep the body healthy. A registered dietitian may help the medical team improve the nutritional health of a patient.

**Respiratory system** (RES-pih-ruh-TOR-ee SIS-tem): The organs that are involved in breathing. These include the nose, throat, larynx, trachea, bronchi, and lungs. Also called respiratory tract.

**Respiratory therapist** (RES-pih-ruh-TOR-ee THAYR-uh-pist): A health professional trained to evaluate and treat people who have breathing problems or other lung disorders.

**Side effect:** A problem that occurs when treatment affects healthy tissues or organs. Some common side effects of cancer treatment are fatigue, pain, nausea, vomiting, decreased blood cell counts, hair loss, and mouth sores.

**Small cell lung cancer:** An aggressive (fast-growing) cancer that forms in tissues of the lung and can spread to other parts of the body. The cancer cells look small and oval-shaped when looked at under a microscope.

**Social worker:** A professional trained to talk with people and their families about emotional or physical needs, and to find them support services.

**Sputum** (SPYOO-tum): Mucus and other matter brought up from the lungs by coughing.

**Surgery** (SER-juh-ree): A procedure to remove or repair a part of the body or to find out whether disease is present. An operation.

**Targeted therapy** (TAR-geh-ted THAYR-uh-pee): A type of treatment that uses drugs or other substances, such as monoclonal antibodies, to identify and attack specific cancer cells.

**Thoracic surgeon** (thor-A-sik SER-jun): A surgeon who specializes in operating on organs inside the chest, including the heart and lungs.

**Thoracic surgical oncologist** (thor-A-sik SER-jih-kul on-KAH-loh-jist): A surgeon who specializes in operating on tumors found inside the chest.

**Trachea** (TRAY-kee-uh): The airway that leads from the larynx (voice box) to the bronchi (large airways that lead to the lungs). Also called windpipe.

**Tumor** (TOO-mer): An abnormal mass of tissue that results when cells divide more than they should or do not die when they should. Tumors may be benign (not cancer), or malignant (cancer). Also called neoplasm.

**X-ray**: A type of high-energy radiation. In low doses, x-rays are used to diagnose diseases by making pictures of the inside of the body. In high doses, x-rays are used to treat cancer.

## For the Latest Information About Lung Cancer

Visit NCI's website at <http://www.cancer.gov/cancertopics/types/lung>

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