Lung Cancer (Small Cell) Overview

The information that follows is an overview of this type of cancer. It is based on the more detailed information in our document *Lung Cancer (Small Cell).* This document and other information can be obtained by calling 1-800-227-2345 or visiting our website at www.cancer.org.

What is small cell lung cancer?

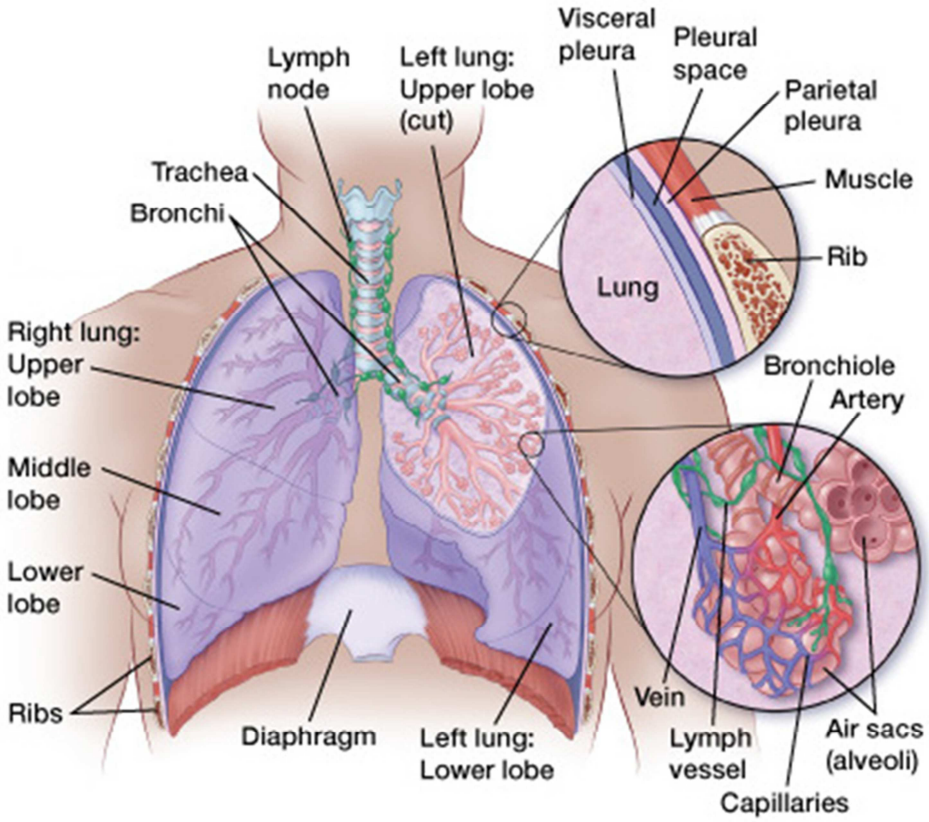
Note: *This document covers only the small-cell type of lung cancer. The treatment for small cell lung cancer is very different from the treatment for non-small cell lung cancer. Much of the information for one type will not apply to the other type. If you don't know which type of lung cancer you have, ask your doctor so you can be sure you are looking at the right information.*

Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other areas of the body. To learn more about how cancers start and spread, see *What Is Cancer?*

Lung cancer is a cancer starts in the lungs. To understand lung cancer, it helps to know something about the lungs and how they work.

The lungs

The lungs are 2 sponge-like organs found in the chest. Each lung is divided into sections called lobes. The right lung has 3 lobes, while the left lung has 2 lobes. The left lung is smaller because the heart takes up more room on that side of the body.



When you breathe in, air enters through your mouth and nose and goes into your lungs through the windpipe (*trachea*). The trachea divides into tubes called the *bronchi*, which enter the lungs and divide into smaller bronchi. These divide into even smaller branches called the *bronchioles*. At the end of the bronchioles are tiny air sacs known as *alveoli*.

Many tiny blood vessels run through the alveoli. They absorb oxygen from the air you breathe in and pass carbon dioxide from the body into the alveoli to be breathed out when you exhale. Taking in oxygen and getting rid of carbon dioxide are your lungs' main functions.

The thin lining around the lungs, called the *pleura*, helps to protect the lungs and allows them to move during breathing.

Below the lungs, a thin muscle called the *diaphragm* separates the chest from the belly (abdomen). When you breathe, the diaphragm moves up and down, forcing air in and out of the lungs.

Start and spread of lung cancer

Lung cancers are thought to start as areas of pre-cancer changes in the lung. These changes are not a mass or tumor. They can't be seen on an x-ray and they don't cause symptoms.

Over time, a pre-cancer may go on to become true cancer. The cells divide to make new cells and a tumor may form. In time, the tumor becomes large enough to show up on an x-ray.

At some point, lung cancer cells can break away and spread to other parts of the body in a process called *metastasis*. Lung cancer can be a life-threatening disease because it often spreads this way before it is found.

The lymph system

One of the ways lung cancer can spread is through the lymph system. Lymph vessels are like veins, but they carry lymph instead of blood. Lymph is a clear fluid that contains tissue waste and cells that fight infection.

Lung cancer cells can enter lymph vessels and begin to grow in lymph nodes (small collections of immune cells) around the bronchi and in the space between the lungs. Once lung cancer cells have reached the lymph nodes, they are more likely to have spread to other organs of the body. The extent (stage) of the cancer and decisions about treatment are based in part on whether or not the cancer has spread to the nearby lymph nodes. We talk about this more in the section "Staging for small cell lung cancer."

Types of lung cancer

There are 2 main types of lung cancer and they are treated very differently.

- Small cell lung cancer (SCLC) – this is the less common type. It tends to grow and spread quickly, and it has almost always spread to distant parts of the body before it is found. It is also called oat cell carcinoma and small cell undifferentiated carcinoma.
- Non-small cell lung cancer (NSCLC) – this is the most common type.

(If the cancer has features of both types, it is called mixed *small cell/non-small cell cancer*. This is not common.)

Along with the 2 main types of lung cancer, other kinds of cancer can start in the lungs. Sometimes tumors that aren't cancer can start in the lungs, as well. Cancers that start in other places also often spread to the lungs.

Keep in mind that cancer that starts in other organs (such as the breast, pancreas, kidney, or skin) and spread (metastasize) to the lungs, are **not** lung cancers. For instance, cancer

that starts in the breast and spreads to the lungs is still breast cancer, not lung cancer. Treatment for these cancers that have spread to the lungs depends on where the cancer started.

The information here only covers small cell lung cancer. Non-small cell lung cancer is covered in our document *Lung Cancer (Non-Small Cell)*.

What are the risk factors for small cell lung cancer?

A risk factor is anything that affects a person's chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But having a risk factor, or even several risk factors, does not mean that you will get the disease. And some people who get the disease may have few or no known risk factors. Even if a person with lung cancer has a risk factor, it is often very hard to know how much it may have contributed to the cancer.

Several risk factors can make you more likely to get lung cancer.

- Smoking tobacco – including cigarettes, cigars, and pipes
- Secondhand smoke (breathing in the smoke of others)
- Radon
- Asbestos
- Air pollution
- Radiation therapy to treat cancers in the chest
- Arsenic in drinking water
- Certain workplace exposures
- Having had lung cancer before
- Having a family member with lung cancer

For more information about these factors and how they increase the risk of lung cancer, see the section about risk factors in our more detailed document *Lung Cancer (Small Cell)*.

Can small cell lung cancer be prevented?

Some people who get lung cancer do not have any clear risk factors. Although we know how to prevent most lung cancers, at this time we don't know how to prevent all of them.

The best way to reduce your risk of lung cancer is not to smoke. You should also avoid breathing in other people's smoke.

If you smoke, stopping can help lower your risk of getting lung cancer. If you stop smoking before a cancer starts, your damaged lungs gradually repair themselves. No matter what your age or how long you've smoked, quitting may lower your risk of lung cancer and help you live longer. If you would like help quitting smoking, see our *Guide to Quitting Smoking* or call us at 1-800-227-2345.

Radon is also a cause of lung cancer. You can lower your exposure by having your home tested and treated, if needed. For more information, see our document *Radon*.

Protecting yourself from cancer-causing chemicals at work and elsewhere can also be helpful. When people work where these chemicals are common, exposure should be kept as low as possible.

A good diet with lots of fruits and vegetables may also help reduce your risk of lung cancer.

Can small cell lung cancer be found early?

It is often hard to find lung cancer early. Most people with early lung cancer do not have any symptoms, so only a small number of lung cancers are found at an early stage. When lung cancer is found early, it is often because of tests that were being done for something else.

Screening for lung cancer

Screening is the use of tests or exams to find a disease like cancer in people who don't have any symptoms of that disease. Doctors have looked for many years for a test that could find lung cancer early and help patients live longer.

In recent years, a large clinical trial, known as the National Lung Screening Trial (NLST), found that in some people at high risk of lung cancer (due to their age and history of smoking), a screening test known as a low-dose CT (LDCT) scan could lower the chance of dying from lung cancer (although most of the lung cancers that were found early were the non-small cell type).

Still, screening with LDCT scans also has some downsides. One drawback is that this test also finds a lot of things that turn out not to be cancer but that still need to be tested to be

sure. LDCTs also expose people to a small amount of radiation with each test. These factors, and others, need to be taken into account by people and their doctors who are thinking about whether screening with LDCT scans is right for them.

Based on the results of the NLST, the American Cancer Society has developed screening guidelines for lung cancer. People who are at higher risk for lung cancer, such as current or former smokers, might want to discuss these guidelines with their doctor to see if screening might be right for them.

For more details about the American Cancer Society's lung cancer screening guidelines, see our document *Lung Cancer Prevention and Early Detection*.

Signs and symptoms of small cell lung cancer

Most lung cancers do not cause symptoms until they have spread, but you should report any of the following problems to your doctor right away. Often these problems are caused by something other than cancer, but if lung cancer is found, getting treatment right away might mean it would work better. The most common symptoms of lung cancer are:

- A cough that does not go away or gets worse
- Chest pain, often made worse by deep breathing, coughing, or laughing
- Hoarseness
- Weight loss and loss of appetite
- Coughing up bloody or rust-colored sputum (spit or phlegm)
- Shortness of breath
- Feeling weak or tired
- Infections such as bronchitis and pneumonia that don't go away or keep coming back
- New onset of wheezing

When lung cancer spreads to other parts of the body, it may cause:

- Bone pain (like pain in the back or hips)
- Weakness or numbness of the arms or legs
- Headache, dizziness, balance problems, or seizure
- Yellow coloring of the skin and eyes (jaundice)

- Lumps near the surface of the body, caused by cancer spreading to the skin or to lymph nodes in the neck or above the collarbone

Some lung cancers can cause a group of symptoms called *syndromes*.

Horner syndrome

Cancers of the top part of the lungs (sometimes called *Pancoast tumors*) can damage a nerve that passes from the upper chest into your neck. This can cause severe shoulder pain. Sometimes these tumors also cause a group of symptoms called *Horner syndrome*:

- Drooping or weakness of one eyelid
- Having a smaller pupil (dark part in the center of the eye) in the same eye
- Reduced or absent sweating on the same side of the face

Conditions other than lung cancer can also cause Horner syndrome.

Superior vena cava syndrome

The superior vena cava (SVC) is a large vein that carries blood from the head and arms back to the heart. It passes next to the upper part of the right lung and the lymph nodes inside the chest. Tumors in this area may push on the SVC, which can cause the blood to back up in the veins. This can cause swelling in the face, neck, arms, and upper chest (sometimes with a bluish-red skin color). It can also cause headaches, dizziness, and a change in consciousness if it affects the brain. While SVC syndrome can come on slowly over time, in some cases it can become life-threatening, and needs to be treated right away.

Paraneoplastic syndromes

Some lung cancers can make hormone-like substances that enter the bloodstream and cause problems with other tissues and organs, even though the cancer has not spread to those tissues or organs. These problems are called *paraneoplastic syndromes*. Sometimes these syndromes can be the first symptoms of lung cancer. Because the symptoms affect other organs, patients and their doctors may suspect at first that something other than lung cancer is causing them. Some examples include:

SIADH: In this condition, the body retains too much water. Symptoms can include fatigue, loss of appetite, muscle weakness or cramps, nausea, vomiting, restlessness, and confusion. Without treatment, severe cases may lead to seizures and coma.

Cushing syndrome: This syndrome can lead to symptoms such as weight gain, easy bruising, weakness, drowsiness, and fluid retention. Cushing syndrome can also cause

high blood pressure and high blood sugar levels, or even diabetes. This syndrome can be caused by things other than cancer.

Lambert-Eaton syndrome: In this nervous system condition, muscles around the hips become weak. One of the first signs may be trouble getting up from a sitting position. Later, muscles around the shoulder may become weak.

Most of the symptoms listed here are more likely to be caused by something other than lung cancer. Still, if you have any of these problems, you should see a doctor right away.

How is small cell lung cancer diagnosed?

If you have symptoms of lung cancer, you should go to your doctor. After asking questions about your health and doing a physical exam, your doctor might want to do some of the following tests if he or she thinks you might have lung cancer:

Imaging tests

There are a number of different tests that can make pictures of the inside of your body. These can be used to find lung cancer, to see if it has spread, to find out whether treatment is working, or to spot a cancer that has come back after treatment.

Chest x-ray

A plain x-ray of your chest is often the first test your doctor will do if you are having lung problems. If anything does not look normal, the doctor may order more tests.

CT scan (computed tomography)

A CT (or CAT) scan is a special kind of x-ray test that can show a detailed picture of a slice of your body.

A CT scan is more likely to show a lung tumor than a routine chest x-ray. It can also give the doctor exact information about the size, shape, and place of a tumor, or help find swollen lymph nodes that might contain cancer. CT scans are also used to find tumors in other organs that might be the spread of lung cancer.

A CT scan can also be used to guide a biopsy needle right into a place that might have cancer. For this, you stay on the CT scanning table while the doctor moves a biopsy needle through the skin and toward the mass. Once the doctor can see that the needle is within the mass, a piece of it is removed and looked at under a microscope.

MRI scan (magnetic resonance imaging)

Like CT scans, MRI scans give detailed pictures of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. MRI scans are useful in looking for the spread of lung cancer to the brain or spinal cord.

MRI scans take longer than x-rays − often up to an hour. Also, you have to be placed inside a tube-like machine, which upsets some people. Newer, open MRI machines can sometimes help with this if needed.

PET scan (positron emission tomography)

For a PET scan, a form of radioactive sugar is injected into the blood. Cancer cells in the body take in large amounts of the sugar. A special camera can then spot the radioactivity.

If you appear to have early stage lung cancer, this test can help show if the cancer has spread to nearby lymph nodes or other areas, which can help determine if surgery may be an option for you. This test can also help tell whether an abnormal area on a chest x-ray or CT scan might be cancer.

Some machines combine a CT and a PET scan to even better pinpoint tumors. This is called a PET/CT and is the type of PET most often used for patients with lung cancer.

Bone scan

A bone scan can help show if a cancer has spread to the bones. For this test, a small amount of radioactive substance is put into your vein. The amount used is very low. This substance builds up in areas of bone that may not be normal because of cancer. These will be seen on the bone scan as “hot spots.” While these areas may suggest the spread of cancer, other problems can also cause hot spots.

Bone scans are done mainly when there is reason to think the cancer may have spread to the bones (because of symptoms such as bone pain) and other test results aren’t clear. PET scans can usually show the spread of cancer to bones, so bone scans aren’t usually needed if a PET scan has already been done.

Tests used to diagnose lung cancer

The actual diagnosis of small cell lung cancer is made by looking at lung cells under a microscope. The cells can be taken from lung secretions (sputum or phlegm), removed from the lung (known as a *biopsy*), or found in fluid removed from the area around the lung. The choice of which tests to use depends on the situation.

Sputum cytology

In this test, a sample of mucus you cough up from the lungs (called *sputum* or *phlegm*) is looked at under a microscope to see if cancer cells are present. This test is more likely to help find cancers that start in the big airways of the lung.

Needle biopsy

For this test, a long, hollow needle is used to remove a sample of cells from the area that may be cancer. If the area is in the outer part of the lungs, the biopsy needle can be inserted through the skin on the chest wall. An imaging test (like a CT scan) is used to guide the needle to the right spot. The sample is looked at in the lab to see if there are cancer cells in it.

A needle biopsy may also be done during a bronchoscopy (see below) to take samples of lymph nodes between the lungs.

Bronchoscopy

A lighted, flexible tube (called a bronchoscope) is passed through the mouth or nose and into the larger airways of the lungs. The mouth and throat are sprayed first with a numbing medicine. You may also be given medicine through an intravenous (IV) line to make you feel relaxed. This test can help see tumors, or it can be used to take samples of tissue or fluids to see if cancer cells are present.

Thoracentesis

If fluid has built up around the lungs, this test can be done to check whether it is caused by cancer or by some other medical problem, such as heart failure or an infection. First, the skin is numbed and then a hollow needle is placed between the ribs to drain the fluid. The fluid is checked for cancer cells.

Samples from biopsies or other tests are sent to a lab. There, a doctor looks at the samples under a microscope to find out if they contain cancer and if so, what type of cancer it is. Special tests may be needed to help classify the cancer. Cancers from other organs can spread to the lungs. It’s very important to find out where the cancer started, because treatment is different for different types of cancer.

The results of these tests are described in a pathology report, which is usually available within about a week. If you have any questions about your pathology results or any tests, talk to your doctor. For more information on understanding your pathology report, see the “Lung Pathology” section of our website.

Tests used to look for cancer spread

Endobronchial ultrasound

Ultrasound is a test that uses sound waves to make pictures of parts of your body. For endobronchial ultrasound, a bronchoscope is fitted with an ultrasound device at its tip and is passed down into the windpipe to look at nearby lymph nodes and other structures in the chest. This is done with numbing medicine and light sedation. If swollen lymph nodes are seen on the ultrasound, a hollow needle can be passed through the bronchoscope and guided into the area to take biopsy samples. The samples are then looked at under a microscope to see if there are cancer cells.

This test may be used if the doctor is thinking about surgery as a part of treatment, which is not often the case for small cell lung cancer.

Endoscopic esophageal ultrasound

This test is much like an endobronchial ultrasound, except an endoscope (a lighted, flexible tube) is passed down the throat and into the esophagus (the swallowing tube that connects the throat to the stomach). The esophagus lies just behind the windpipe. This test is done with numbing medicine and drugs to help you relax (called *light sedation*).

Ultrasound images taken from inside the esophagus can help find large lymph nodes inside the chest that might contain lung cancer. If swollen lymph nodes are seen on the ultrasound, a hollow needle can be passed through the endoscope to get biopsy samples of them. The samples are then looked at under a microscope to see if they contain cancer cells.

This test may be used if the doctor is thinking about surgery as a part of treatment, which is not often the case for small cell lung cancer.

Mediastinoscopy and mediastinotomy

Both of these tests may be done so the doctor can look at and take samples of the structures in the area between the lungs (called the *mediastinum*). They are done in an operating room while you are in a deep sleep (under general anesthesia). The main difference between them is that a mediastinotomy involves a slightly larger cut (incision), a little lower down on the chest.

These tests might be done if the doctor is considering surgery as a part of treatment, which is not often the case for small cell lung cancer.

Thoracoscopy

This test can be done to find out if cancer has spread to the spaces between the lungs and the chest wall, or to the linings of these spaces. It can also be used to sample tumors on the outer parts of the lungs. It is done in an operating room while you are in a deep sleep (under general anesthesia). The doctor makes a small cut in the skin on the side of the chest and uses a thin, lighted tube connected to a video camera and screen to look at the space between the lungs and the chest wall. Samples of tumor or lymph nodes can be removed and sent to the lab to look for cancer.

Bone marrow aspiration and biopsy

These tests are done to look for spread of the cancer into the bone marrow, but they are rarely needed. The two tests are usually done at the same time. For these tests you lie on your side or on your belly. The skin over the back of your hip is cleaned. After the area is numbed, a thin, hollow needle is inserted into the hip bone to suck out (aspirate) a small amount of fluid from the marrow. A larger needle is then used to remove a small piece of the hip bone and some marrow. Even with the numbing medicine, most people still have some brief pain when the samples are removed. The samples are then checked for cancer cells.

Other tests

Blood tests

Blood tests are not used to find lung cancer, but they are done to get a sense of a person’s overall health. A complete blood count (CBC) shows whether your blood has normal numbers of different blood cell types. This test will be done often if you are treated with chemotherapy because these drugs can affect the blood-forming cells of the bone marrow. Other blood tests can spot problems in different organs like the kidneys, liver, and bones.

Pulmonary function tests

Pulmonary function tests (PFTs) show how well your lungs are working. There are different types of PFTs but they all basically involve having you breathe in and out through a tube that is connected to different machines. These tests are only needed if surgery might be an option in treating the cancer. Since surgery is rarely used to treat small cell lung cancer, these tests are not often done for patients known to have small cell lung cancer.

Staging for small cell lung cancer

The stage of a cancer describes how far it has spread. This is very important because your treatment and your outlook (prognosis) depend largely on the stage of the cancer. The exams and tests described in the section “How is small cell lung cancer found?” are also used to stage lung cancer.

Small cell lung cancer staging systems

A staging system is a standard way for doctors to describe how large a cancer is and how far it has spread. There are 2 staging systems that can be used to describe the spread of small cell lung cancer (SCLC).

Limited vs. extensive stage

For treatment purposes, a 2-stage system is most often used. This system divides SCLC into *limited stage* or *extensive stage*.

Limited stage usually means that the cancer is only in one lung and perhaps in lymph nodes on the same side of the chest. The cancer is most often confined to an area that is small enough to be treated with one radiation “port.” Only about 1 out of 3 people have limited stage SCLC when it is first found.

Extensive stage means the cancer has spread widely throughout a lung, to the other lung, to lymph nodes on the other side of the chest, or to distant organs. Many doctors also call cancer that has spread to the fluid around the lung extensive stage. About 2 out of 3 people with SCLC have extensive disease when their cancer is first found.

SCLC is staged in this way because it helps to separate people who may be helped by more aggressive treatments such as chemotherapy combined with radiation therapy to try to cure the cancer (limited stage) from those for whom chemotherapy alone is likely to be a better option (extensive stage).

The TNM staging system

A more formal system to describe the growth and spread of lung cancer is the American Joint Committee on Cancer (AJCC) TNM staging system. It is based on 3 key pieces of information:

- The size of the main tumor and whether it has grown into nearby areas
- Whether the cancer has reached nearby lymph nodes
- Whether the cancer has spread to other parts of the body

Stages are described using the number zero and Roman numerals from I to IV (0 to 4). Some stages are further divided into A and B. As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV (4), means a more advanced cancer.

This system is used more often for non-small cell lung cancer. It is used less often for small cell lung cancer, mainly because treatment options don't vary much between these detailed stages.

For more details the staging of lung cancer, see "How is small cell lung cancer staged?" in our document *Lung Cancer (Small Cell)*.

How is small cell lung cancer treated?

Choosing a treatment plan

If you have small cell lung cancer, your treatment choices might include:

- Chemotherapy
- Radiation therapy
- Surgery

Palliative treatments are also sometimes helpful.

The main treatment will most likely be chemotherapy (chemo), either alone or with radiation. Very rarely, surgery might be done if it is limited stage cancer.

After the cancer is found and staged, your doctors will talk to you about treatment choices. Be sure to discuss all of your treatment options as well as their possible side effects with your doctors so you can decide which option is best for you. (See the section "What are some questions I can ask my doctor about small cell lung cancer?")

Important things to think about include the stage and type of cancer, your overall health, the likely side effects of the treatment, and the chance of curing the cancer, helping you live longer, or relieving symptoms.

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service at 1-800-303-5691 for a list of studies that meet your medical needs, or see Clinical Trials to learn more.

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be dangerous.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision. See Complementary and Alternative Medicine to learn more.

Help getting through cancer treatment

Your cancer care team will be your first source of information and support, but there are other resources for help when you need it. Hospital- or clinic-based support services are an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, support groups, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists on call 24 hours a day, every day.

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

Chemotherapy for small cell lung cancer

Chemotherapy (chemo) is treatment with drugs given into a vein or taken by mouth. These drugs enter the bloodstream and go throughout the body. This treatment is useful for cancer that has spread to organs beyond the lung. Chemo is usually the main treatment for small cell lung cancer (SCLC).

Doctors give chemo in cycles, with each round of treatment followed by a rest period to allow the body time to recover. Chemo cycles often last about 3 to 4 weeks, and the first round of treatments is most often 4 to 6 cycles. Most often, chemo for SCLC combines 2 drugs. Chemo is not often used for patients in poor health, but older age by itself doesn’t mean you can’t get chemo.

Possible side effects

Chemo drugs kill cancer cells but they also damage some normal cells, causing side effects. These side effects depend on the type of drugs used, the amount given, and the length of treatment. Common short-term side effects can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea or constipation
- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Feeling tired all the time (from having too few red blood cells)

Some chemo drugs can have other side effects. For instance, some drugs can damage nerves. This can cause numbness or tingling in the fingers and toes, and sometimes the arms and legs may feel weak. For more information, see our document *Peripheral Neuropathy Caused by Chemotherapy*.

Most side effects go away when treatment is over, but some can last a long time. Be sure to tell your doctor or nurse if you have any side effects, as there are often ways to help. In some cases, the doses of the chemo drugs may need to be lowered or treatment may need to be delayed or stopped to prevent the side effects from getting worse.

For more information about the chemo used to treat small cell lung cancer, see our document *Lung Cancer (Small Cell).*

To learn more about chemo in general please see the "Chemotherapy" section of our website, or our document *A Guide to Chemotherapy*.

Radiation treatment for small cell lung cancer

Radiation therapy is treatment with high-energy rays (like x-rays) to kill cancer cells or shrink tumors. The radiation comes from outside the body (external radiation). In small cell lung cancer (SCLC) it can be used in different ways:

- Radiation to the chest can be used along with chemotherapy to treat limited stage disease. Less often, it is used after chemotherapy is done.
- Radiation to the brain can be done to try to prevent problems from cancer that may have spread there but is too small to be seen on imaging tests. This is most often used if you have limited stage disease.
- Radiation can also be used to relieve symptoms such as pain, bleeding, trouble swallowing, or problems caused by the cancer spreading to the brain.

Treatment is much like getting an x-ray, but the radiation is more intense. The procedure itself is painless. Each treatment lasts only a few minutes, although the setup time – getting you into place for treatment – takes longer. Most often, radiation treatments are given once or twice a day, 5 days a week for several weeks. Radiation to relieve symptoms or to prevent spread to the brain is given for shorter periods of time.

Possible side effects of radiation treatment

Side effects of radiation depend on where the radiation is aimed. Some common side effects of radiation to treat lung cancer are:

- Skin problems ranging from redness to blistering and peeling
- Hair loss (in the place where the radiation enters the body)
- Tiredness (fatigue)
- Nausea and vomiting
- Pain with swallowing and weight loss

These often go away after treatment. When chemotherapy is given with radiation, side effects such as nausea and tiredness are often worse.

Radiation can affect the blood-forming cells in the bone marrow, leading to low blood cell counts. Problems with low blood counts are more common if chemotherapy is given with radiation. These problems can lead to holding the treatment for a time.

Radiation to the chest can cause long-term damage to the lungs and cause a cough and trouble breathing.

Side effects of radiation therapy to the brain usually become most serious 1 or 2 years after treatment. These could include memory loss, headaches, trouble with thinking, and less sexual desire. These side effects, though, are usually minor compared to those caused by lung cancer tumors that have spread to the brain.

For more information about how radiation therapy can be used to treat small cell lung cancer, see our document *Lung Cancer (Small Cell).*

For more information about radiation therapy in general, please see the "Radiation Therapy" section of our website or our document *Understanding Radiation Therapy: A Guide for Patients and Families*.

Surgery for small cell lung cancer

Surgery is rarely used as the main treatment in small cell lung cancer (SCLC). In fewer than 1 out of 20 cases, the cancer is found as only one tumor, with no spread to lymph nodes or other organs. In these cases, surgery might be helpful. If used, it is usually followed by treatment with chemo and maybe radiation.

If surgery might be an option, your doctor will order tests to make sure the lung cancer hasn't spread and to find out if you are healthy enough to have a big operation and to have all or part of a lung removed. Many people with lung cancer aren't healthy enough for surgery.

Operations used to treat lung cancer involve removing a lung or part of a lung. If the entire lung is removed, it is called a *pneumonectomy*. Operations to remove part of a lung include *lobectomy*, *segmentectomy*, *wedge resection*, and *sleeve resection*.

Some doctors now treat some early stage lung cancers near the outside of the lung with a procedure called video-assisted thoracic surgery (VATS). Instead of making a big incision, surgery is done through small holes (incisions) in the skin under the guidance of a tiny camera on the end of a tube that is placed into the chest through a small hole to let the surgeon see the tumor. The doctor who does this surgery should have experience because it takes a great deal of skill.

With any of these operations, lymph nodes are also removed to look for possible spread of the cancer.

With any of these surgeries you will be in a deep sleep (under general anesthesia) and will usually have a cut (surgical incision) between the ribs in the side of the chest. You will most likely need to spend about a week in the hospital after the surgery. There will be some pain because the surgeon has to cut through the ribs to get to the lungs.

Possible side effects of surgery

Problems after surgery depend on how much surgery was done and a person's health beforehand. Everyone has pain after surgery. Serious problems can include bleeding, infection, pneumonia, and breathing problems. While it is rare, in some cases people may not survive the surgery.

Recovering from surgery to treat lung cancer can take weeks to months. Whether or not you can return to normal activities some time after surgery depends on how healthy you (and your lungs) were before surgery.

More information about surgery for small cell lung cancer can be found in our document *Lung Cancer (Small Cell).*

Palliative treatments for small cell lung cancer

In some cases, treatments may be used to help with the symptoms of the cancer (rather than trying to cure the cancer). These are sometimes called palliative treatments.

For instance, a bronchoscope with a laser on the end can be used to open an airway blockage that may be causing pneumonia or shortness of breath. Sometimes, a metal or plastic tube called a *stent* may be placed in the airway using a bronchoscope to help keep it open. Other methods like radiation may also be used.

Sometimes fluid collects in the chest and makes it hard to breathe. This fluid can be removed through a small tube placed in the chest. After the fluid is drained out, either talc or some type of drug is placed into the chest to help seal the space and prevent future fluid build-up.

More information about these procedures can be found in our document *Lung Cancer (Small Cell).*

What are some questions I can ask my doctor about small cell lung cancer?

As you cope with cancer and cancer treatment, we encourage you to have honest, open talks with your doctor. Feel free to ask any question that's on your mind, no matter how

small it might seem. Here are some questions you might want to ask. Take them with you to your next doctor visit. Be sure to add your own questions as you think of them. Nurses, social workers, and other members of the treatment team may also be able to answer many of your questions.

- Would you please write down the exact type of lung cancer I have?
- May I have a copy of my pathology report?
- Where exactly is the cancer? Has it spread beyond the place where it started?
- What is the stage of my cancer? What does that mean in my case?
- Are there other tests that need to be done before we can decide on treatment?
- Are there other doctors I need to see?
- How much experience do you have treating this type of cancer?
- What treatment choices do I have?
- What do you suggest and why?
- What is the goal of this treatment?
- How long will treatment last? What will it involve? Where will it be done?
- How quickly do we need to decide on treatment?
- What are my chances of long-term survival?
- What risks or side effects are there to the treatment you suggest? How long are they likely to last?
- Will I lose my hair? If so, what can I do about it?
- What should I do to get ready for treatment?
- What are the chances of the cancer coming back after treatment? What would we do if that happens?
- What will we do if the treatment doesn’t work or if the cancer comes back?
- What type of follow-up will I need after treatment?

Be sure to write down any questions you have that are not on this list.

Moving on after treatment for small cell lung cancer

For some people with lung cancer, treatment may remove or destroy the cancer. While it can feel good to be done with treatment, it can also be stressful. You may find that you now worry about the cancer coming back. This is a very common concern among those who have had cancer. (When cancer comes back, it is called a *recurrence*.)

It may take a while before your recovery begins to feel real and your fears are somewhat relieved. You can learn more about what to look for and how to learn to live with the chance of cancer coming back in *Living With Uncertainty: The Fear of Cancer Recurrence*.

But for other people, the lung cancer may never go away completely. You may keep on getting treatments with chemo, radiation, or other treatments to help keep the cancer in check. Learning to live with cancer as a kind of chronic disease can be hard and very stressful. Our document *When Cancer Doesn't Go Away*, talks more about this.

Follow-up care

During and after treatment, your doctors will still want to watch you closely. It is very important to keep all follow-up appointments. During these visits, your doctors will ask about symptoms, do physical exams, and may order blood tests, CT scans, or other tests.

In people who show no signs of cancer, many doctors recommend follow-up visits about every 3 months for the first couple of years after treatment, about every 6 months for the next several years, then at least yearly after 5 years. Some doctors may advise different follow-up schedules.

Follow-up is needed to check for signs that the cancer that has come back or spread, as well as possible side effects of certain treatments. This is the time for you to ask your health care team any questions you might have and discuss any of your concerns.

Almost any cancer treatment can have side effects. Some may last for a few weeks or months, but others can last the rest of your life. Please tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

If your cancer comes back, treatment will depend on the location of the cancer and what treatments you've had before. Should your cancer come back, our document *When Your Cancer Comes Back: Cancer Recurrence* can give you information on how to manage and cope with this phase of your treatment.

Keep your health insurance and copies of your medical records

At some point after your cancer is found and treated, you may find yourself in the office of a new doctor. It is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy and always keep copies for yourself:

- A copy of your pathology report from any biopsy or surgery
- If you had surgery, a copy of your operative report
- If you stayed in the hospital, a copy of the discharge summary that the doctor wrote when you were sent home
- If you had radiation treatment, a copy of the treatment summary
- If you had chemo, a list of your drugs, drug doses, and when you took them
- Copies of your x-rays, CT scans, and other imaging tests (these can often be stored digitally on a DVD, etc.)

It is also important to keep health insurance. While you hope your cancer won't come back, it could happen. If it does, you don't want to have to worry about paying for treatment.

Lifestyle changes after treatment for small cell lung cancer

Having cancer and dealing with treatment can take a lot of time and energy, but it can also be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term.

Make healthier choices

For many people, a diagnosis of cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on alcohol, or give up tobacco. Even things like keeping your stress level under control may help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you smoke, one of the best things you can do to improve your chances for treatment success is to quit. Studies have shown that patients

who stop smoking after a finding of lung cancer have better outcomes than those who don't. Quitting can help improve lung function and have a host of other health benefits as well. If you are thinking about quitting smoking and need help, call us at 1-800-227-2345.

Eating better

Eating right is hard for many people, but it can be even harder to do during and after cancer treatment. If treatment caused weight changes or eating or taste problems, do the best you can and keep in mind that these problems usually get better over time. You may find it helps to eat small portions every 2 to 3 hours until you feel better. You may also want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to deal with these treatment side effects.

One of the best things you can do after treatment is put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for some other types of cancer, as well as having many other health benefits. Get more information in our document *Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions*.

Rest, fatigue, and exercise

Feeling tired (fatigue) is a very common problem during and after cancer treatment. This is not a normal type of tiredness but a bone-weary exhaustion that often doesn’t get better with rest. For some people, fatigue lasts a long time after treatment and can keep them from staying active. But exercise can actually help reduce fatigue and the sense of depression that sometimes comes with feeling so tired.

If you are very tired, though, you will need to balance activity with rest. It is OK to rest when you need to. To learn more about fatigue, please see our documents (For more information on fatigue and other side effects, see the “Physical Side Effects” section of our website or “Additional resources for small cell lung cancer” to get a list of available information.)

If you were very ill or weren’t able to do much during treatment, it is normal that your fitness, staying power, and muscle strength declined. You need to find an exercise plan that fits your own needs. Talk with your health care team before starting. Get their input on your exercise plans. Then try to get an exercise buddy so that you’re not doing it alone.

Exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- It makes your muscles stronger.

- It reduces fatigue.
- It can help lower anxiety and depression.
- It helps you feel better about yourself.

And long term, we know that getting regular physical activity plays a role in helping to lower the risk of some cancers, as well as having other health benefits.

Can I lower my risk of the cancer growing or coming back?

Most people want to know whether there are lifestyle changes they can make to reduce their risk of the cancer growing or coming back. Unfortunately, for most cancers there is isn't much solid evidence to guide people. This doesn't mean that nothing will help – it's just that for the most part this isn't something that has been well studied. Most studies have looked at lifestyle changes as ways to prevent cancer in the first place, not slowing it down or keeping it from coming back.

But there are some things people can do that might help them live longer or reduce the risk of lung cancer coming back.

Quitting smoking: If you smoke, quitting is important. Quitting has been shown to help people with lung cancer live longer, even when the cancer has spread. It also lowers the chance of getting another lung cancer, which is especially important for people with early stage lung cancer. Of course, quitting smoking may have other health benefits as well, like lowering the risk of some other cancers. If you need help quitting, talk to your doctor or call the American Cancer Society at 1-800-227-2345.

Diet and nutrition: Possible links between diet and lung cancer growing or coming back are much less clear. Because of the lack of data in this area, it's important to talk with your health care team before making any major changes to your diet (including taking any supplements) to try to improve your outlook.

How might having small cell lung cancer affect your emotional health?

During and after treatment, you may be surprised by the flood of emotions you go through. This happens to a lot of people.

You may find yourself thinking about death and dying. Or maybe you're more aware of the effect of your cancer on your family, friends, and career. Money may be a concern as the medical bills pile up. Unexpected issues may also cause concern – for instance, if you are getting better and need fewer doctor visits, you might see your health care team less often. This can be hard for some people.

This is a good time to look for emotional and social support. You need people you can turn to. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or private counselors.

The cancer journey can feel very lonely. You don't need to go it alone. Your friends and family may feel shut out if you decide not include them. Let them in – and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you. You can also read our document *Distress in People with Cancer* or see the "Emotional Side Effects" section of our website for more information.

If treatment for small cell lung cancer stops working

When a person has had many different treatments and the cancer has not been cured, over time the cancer tends to resist all treatment. At this time you may have to weigh the possible benefits of a new treatment against the downsides, like treatment side effects and clinic visits.

This is likely to be the hardest time in your battle with cancer – when you have tried everything within reason and it's just not working anymore. Your doctor may offer you new treatment, but you will need to talk about whether the treatment is likely to improve your health or change your outlook for survival.

If you want to keep on getting treatment for as long as you can, you need to think about the odds of treatment having any benefit and how this compares to the possible risks and side effects. In many cases, your doctor can tell you how likely it is the cancer will respond to treatment you are thinking about. For instance, the doctor may say that more treatment might have about a 1 in 100 chance of working. Some people are still tempted to try this. But it is important to have realistic expectations if you do choose this plan.

No matter what you decide to do, it is important for you to feel as good as possible. Make sure you are asking for and getting treatment for pain, nausea, or any other problems you may have. This type of treatment is called *palliative* treatment. It helps relieve symptoms but is not meant to cure the cancer.

You can learn more about the changes that occur when treatment stops working, and about planning ahead for yourself and your family, in our documents *Nearing the End of Life* and *Advance Directives*.

At some point you may want to think about hospice care. This is special care that treats the person rather than the disease; it focuses on quality rather than length of life. Most of the time it is given at home. You should know that having hospice care doesn't mean you can't have treatment for the problems caused by your cancer or other health issues. It just means that the purpose of your care is to help you live life as fully as possible and to feel as well as you can. You can learn more about this in our document *Hospice Care*.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends – times that are filled with joy and meaning. Pausing at this time in your cancer treatment gives you a chance to focus on the most important things in your life. Now is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do. Though the cancer may be beyond your control, there are still choices you can make.

What's new in small cell lung cancer research?

Research on small cell lung cancer (SCLC) is going on now in many medical centers throughout the world.

Prevention

Prevention offers the greatest promise at this time for fighting lung cancer.

Tobacco

Smoking still accounts for at least 8 out of 10 lung cancer deaths. This percentage is likely even higher for small cell lung cancers. Studies are going on to look at how best to help people quit smoking through counseling, nicotine replacement, and other medicines. Other studies are looking at ways to convince young people not to start smoking. Researchers are also looking at differences in genes that may make some people much more likely to get lung cancer if they smoke or are exposed to someone else's smoke.

Environmental causes

Researchers also continue to look into some of the other causes of lung cancer, such as exposure to radon and diesel exhaust. Finding new ways to limit these exposures could potentially save many more lives.

Diet, nutrition, and medicines

Researchers are looking for ways to use vitamins or medicines to prevent lung cancer in people at high risk, but so far these have not proved to help. Many researchers think that simply following the American Cancer Society nutrition recommendations (such as staying at a healthy weight and eating a diet rich in fruits and vegetables each day) may be the best approach.

Finding lung cancer

One approach uses new ways to try to find cancer cells in sputum (spit) samples. Researchers have found some changes that often affect the DNA of lung cancer cells. New tests might be able to spot these changes and find lung cancer at an earlier stage.

Fluorescence bronchoscopy (also known as *autofluorescence bronchoscopy*) is a method that may help doctors find some lung cancers earlier, when they could be easier to treat. For this test, the doctor puts a bronchoscope through the mouth or nose and into the lungs. The end of the bronchoscope has a special light on it. The light causes abnormal areas in the airways to show up in a different color than healthy parts of the airway. Some cancer centers now use this to look for early lung cancers, especially when no tumors are seen with normal bronchoscopy.

An imaging test called *virtual bronchoscopy* uses CT scans to create detailed 3-D pictures of the airways in the lung. The images can be looked at as if the doctor were actually using a bronchoscope. There are benefits and drawbacks to this approach. But it may be a useful tool in some cases, such as in people who might be too sick to get a standard bronchoscopy. This test will likely be used more often as the technology improves.

Treatment

Chemotherapy

Clinical trials are being done to see if newer combinations of chemo drugs are safer and more effective. This is especially important in patients who are older and have other health problems. Doctors are also searching for better ways to combine chemo with radiation and other treatments.

Some new chemo drugs have shown promise in early studies and are now being tested in larger clinical trials.

Targeted drugs

Researchers are learning more about the inner workings of lung cancer cells that control their growth and spread. This is being used to develop new targeted drugs. These drugs work in a different way from standard chemo drugs. They might work in some cases when standard chemo drugs don’t, and they often have different (and less severe) side effects. Many of these are being tested in clinical trials to see if they can help people with lung cancer live longer or relieve their symptoms.

Drugs to keep new blood vessels from growing (anti-angiogenesis drugs): For cancers to grow, new blood vessels must develop to nourish the cancer cells within tumors. This

process is called *angiogenesis*. Drugs that slow or stop angiogenesis are being studied as lung cancer treatments.

Immune treatments

Researchers are hoping to develop drugs that can help the body's immune system fight the cancer.

Ipilimumab (Yervoy): This drug targets a protein in the body that normally suppresses the immune response. Blocking this protein might help the immune system attack cancer cells. The drug is already used to treat melanoma, and it is now being studied in other cancers, including SCLC.

Vaccines: Vaccines that boost the body's immune system to better kill lung cancer cells are being tested in clinical trials. Unlike vaccines against infections like measles or mumps, these vaccines are designed to help treat, not prevent, lung cancer. These types of treatments seem to have fewer side effects, so they might be useful in people who can't have other treatments. At this time, vaccines are only being used in clinical trials.

More information about small cell lung cancer

We have a lot more information that you might find helpful. Explore www.cancer.org or call our National Cancer Information Center toll-free number, 1-800-227-2345. We're here to help you any time, day or night.

National organizations and websites*

Along with the American Cancer Society, other sources of information and support include:

American Lung Association
Toll-free number: 1-800-586-4872 (1-800-LUNGUSA)
Website: www.lungusa.org

> Offers information on lung cancer and coping with breathing problems, side effects, and physical activity

Lungcancer.org
Toll-free number: 1-800-813-4673 (1-800-813-HOPE)
Website: www.lungcancer.org

Provides information, support, and other assistance to people with lung cancer. Also offers phone counseling and telephone support groups for people with lung cancer, with online support for caregivers

Lung Cancer Alliance
Toll-free number: 1-800-298-2436 (United States only)
Website: www.lungcanceralliance.org

Offers lung cancer treatment information, including a lung cancer information line, as well as a phone buddy program, referrals to support groups, and more

National Cancer Institute
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
Website: www.cancer.gov

Provides information on all types of cancer, living with cancer, support information for families of people with cancer, research, and more

** Inclusion on this list does not imply endorsement by the American Cancer Society.*

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For additional assistance please contact your American Cancer Society
1-800-227-2345 or www.cancer.org