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 cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide into new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out, damaged, or dying cells.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of this out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells keep on growing and form new cancer cells. These cancer cells can grow into (invade) other tissues, something that normal cells cannot do. Being able to grow out of control and invade other tissues are what makes a cell a cancer cell.

In most cases the cancer cells form a tumor. But some cancers, like leukemia, rarely form tumors. Instead, these cancer cells are in the blood and bone marrow.

When cancer cells get into the bloodstream or lymph vessels, they can travel to other parts of the body. There they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis* (muh-**tas**-tuh-sis).

No matter where a cancer may spread, it is always named (and treated) based on the place where it started. For instance, breast cancer that has spread to the liver is still breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is still prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their own kind of cancer.

Not all tumors are cancerous. Tumors that aren't cancer are called *benign* (be-**nine**). Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into other tissues. Because of this, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

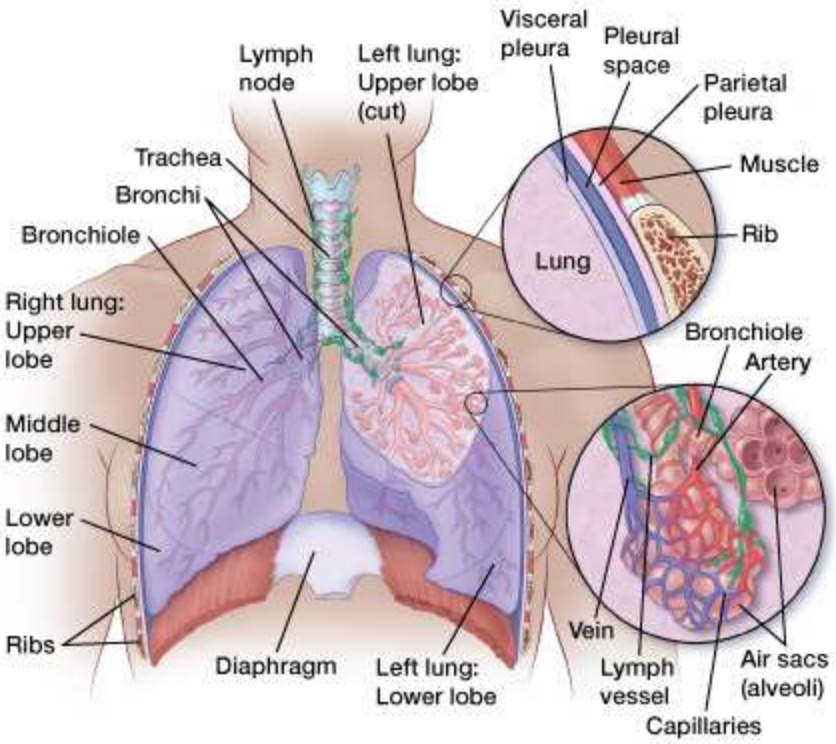
What is small cell lung cancer?

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.*

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. The right lung has 3 sections, called lobes. 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 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

Most lung cancer starts in the cells lining the lung airways.

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, these changes in the cells may go on to become true cancer. The cancer makes chemicals that cause new blood vessels to form nearby. These new blood vessels feed the cancer cells and allow a tumor to 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)
- Non-small cell lung cancer (NSCLC)

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

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

Small cell lung cancer (SCLC)

About 10% to15% of all lung cancers are the small cell type. Other names for SCLC are *oat cell carcinoma* and *small cell undifferentiated carcinoma*.

This cancer often starts in the bronchi near the center of the chest. It tends to grow and spread quickly, and it has almost always spread to distant parts of the body before it is found.

Non-small cell lung cancer

About 85% to 90% of lung cancers are non-small cell lung cancer (NSCLC). There are different types of NSCLC, but they are grouped together because the approach to treatment and prognosis (outlook) are similar.

Other types of lung cancer

Along with the 2 main types of lung cancer, other tumors can also be found in the lungs. Some of these are not cancer and others are. Carcinoid tumors, for instance, are usually slow-growing and cured by surgery. For more information, see our document *Lung Carcinoid Tumor*.

Keep in mind that cancer that starts in other organs (such as the breast, pancreas, kidney, or skin) can sometimes spread (metastasize) to the lungs, but these 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.

How many people get lung cancer?

The American Cancer Society's estimates for lung cancer (both small cell and non-small cell) in the United States for 2014 are:

- About 224,210 new cases of lung cancer (both small cell and non-small cell)
- About 159,260 deaths from lung cancer

Lung cancer (both small cell and non-small cell) is the second most common cancer in both men and women (not counting skin cancer), and it is by far the leading cause of cancer death for both men and women. More people die of lung cancer than of colon, breast, and prostate cancers combined. Lung cancer occurs mainly in older people. It is fairly rare in people under the age of 45.

The average lifetime chance that a man will develop lung cancer is about 1 in 13. For a woman it is about 1 in 16. These numbers include both smokers and non-smokers. For smokers the risk is much higher, while for non-smokers the risk is lower.

Survival statistics based on the stage (extent) of the cancer are covered in the section, "Survival rates for small cell lung cancer."

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.

Tobacco smoke

Smoking is by far the leading risk factor for lung cancer. Tobacco smoke causes at least 8 out of 10 deaths from lung cancer. This number is probably even higher for small cell lung cancer. It is very rare for someone who has never smoked to have small cell lung cancer. The longer a person has been smoking and the more packs per day smoked, the greater the risk.

Cigar and pipe smoking are almost as likely to cause lung cancer as is cigarette smoking. And smoking low tar or "light" cigarettes increases lung cancer risk as much as regular cigarettes. There is concern that menthol cigarettes may increase the risk even more since the menthol allows smokers to inhale more deeply.

Stopping smoking at any age may lower your risk of lung cancer. For help quitting, see our *Guide to Quitting Smoking* or call us at 1-800-227-2345.

Secondhand smoke: People who don't smoke but who breathe the smoke of others may also be at a higher risk for lung cancer. Non-smokers who live with a smoker, for instance, have about a 20% to 30% greater risk of developing lung cancer. Non-smokers exposed to tobacco smoke in the workplace are also more likely to get lung cancer. Secondhand smoke is thought to cause more than 3,000 deaths from lung cancer each year.

Radon

Radon is a radioactive gas made by the normal breakdown of uranium in soil and rocks. Uranium is found at higher levels in the soil in some parts of the United States. Radon can't be seen, tasted, or smelled. It can build up indoors and create a possible risk for cancer. The lung cancer risk from radon is much lower than that from tobacco smoke. But the risk is much higher in people who smoke than in those who don't.

State and local offices of the EPA (Environmental Protection Agency) can give you information on how to test for radon in the home. To learn more, see our document *Radon*.

Asbestos

Asbestos exposure is another risk factor for lung cancer. People who work with asbestos have a higher risk of getting lung cancer. If they also smoke, the risk is greatly increased. Both smokers and non-smokers exposed to asbestos also have a greater risk of getting a type of cancer called *mesothelioma*, which starts in the lining of the lungs. This type of cancer is discussed in our document *Malignant Mesothelioma*.

Although asbestos was used for many years, the government has now nearly stopped its use in the workplace and in home products. It is still present in many buildings, but it is not thought to be harmful as long as it is not released into the air. To learn more, see our document, *Asbestos*.

Other cancer-causing things in the workplace

Other things in some workplaces that can increase lung cancer risk include:

- Radioactive ores, such as uranium
- Inhaled chemicals or minerals like arsenic, beryllium, cadmium, silica, vinyl chloride, nickel compounds, chromium compounds, coal products, mustard gas, and chloromethyl ethers
- Diesel exhaust

The government and industry have taken major steps in recent years to help protect workers. But the dangers are still there. If you work around any of these, you should be very careful to limit how much you are exposed.

Air pollution

In cities, air pollution (such as from heavy traffic) may slightly increase the risk of lung cancer. But the risk is still far less than that caused by smoking. Worldwide, about 5% of all deaths from lung cancer may be due to outdoor air pollution.

Radiation treatment to the lungs

People who have had radiation to the chest to treat other cancers are at higher risk for lung cancer, especially if they smoke. Women who have radiation to the breast after a lumpectomy for breast cancer do not appear to have a higher risk of lung cancer.

Arsenic in drinking water

High levels of arsenic in drinking water, such as is seen in parts of Southeast Asia and South America, may increase the risk of lung cancer. The effect is even greater for smokers. This is less of a problem in the United States.

Personal and family history of lung cancer

If you have had lung cancer, you have a higher risk of getting another lung cancer. Brothers, sisters, and children of people who have had lung cancer may have a slightly higher risk themselves, especially if the family got cancer at a younger age. It is not clear how much of this might be due to shared genes among family members and how much might be from shared household exposures (such as tobacco smoke or radon).

Certain vitamins

Two large studies have found that smokers who took beta carotene supplements actually had an *increased* risk of lung cancer. The results of these studies suggest that smokers should not take beta carotene supplements.

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 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.

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?

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 to look for any spots on the lungs. If the x-ray is normal, you most likely do not have lung cancer. 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 the type of PET most often used in small cell lung cancer patients.

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.

Other tests used to find lung cancer and its spread

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.

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 in the place and size of the cut (incision) needed.

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.

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 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.

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 now rarely done for small cell lung cancer. 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.

Lab tests of biopsy samples and other tests

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, so it is very important to find out where the cancer started so the right treatment can be given.

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.

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.

There are 2 types of staging:

- The *clinical stage* is based on the results of the physical exam, biopsies, and imaging tests (CT scan, chest x-ray, PET scan, etc.).
- If you have surgery, your doctor can also determine a *pathologic stage*, which is based on the same factors as the clinical stage, plus what is found during the surgery.

The clinical and pathologic stages may be different in some cases. During surgery the doctor may find cancer in a place that did not show up on imaging tests. That could mean a more advanced pathologic stage. Because most patients with lung cancer do not have surgery, the clinical stage is most often used when describing the 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 radiation. 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 treatments such as surgery and radiation therapy to try to cure the cancer (limited stage) from those for whom chemotherapy 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 Roman numerals from 0 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)*.

Survival rates for small cell lung cancer

Some people with cancer may want to know the survival rates for their type of cancer. Others may not find the numbers helpful, or may even not want to know them. If you do not want to know them, stop reading here and skip to the next section.

Survival rates are a way for doctors and patients to get a general idea of the outlook for people with a certain type and stage of cancer. The 5-year survival rate refers to the percentage of patients who live *at least* 5 years after their cancer is found. Of course, many people live much longer than 5 years. Five-year *relative* survival rates compare the number of people who are still alive 5 years after their cancer was found to the survival of others the same age who don't have cancer. This is a better way to see the impact that cancer can have on survival.

The numbers below are 5-year relative survival rates from the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) database. They are based on people with small cell lung cancer treated between 1988 and 2001. Improvements in treatment since then mean that the survival rates for people with these cancers may now be higher.

Stage	**5-year relative survival rate**
I	31%
II	19%
III	8%
IV	2%

While these numbers provide an overall picture, keep in mind that every person's situation is unique and the statistics can't predict exactly what will happen in your case. Talk with your cancer care team if you have questions about your own chances of a cure, or how long you might survive your cancer. They know your situation best.

How is small cell lung cancer treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the 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.

Choosing a treatment plan

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

- Surgery
- Radiation therapy
- Chemotherapy

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.

You may have different types of doctors on your treatment team, depending on the stage of your cancer and your treatment options. Many other experts may be involved in your care as well (nurses, respiratory therapists, social workers, etc.)

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. Age alone should not keep you from having treatment. Older people can be helped by treatment as much as younger people as long as their general health is good.

If time allows, it is often a good idea to get a second opinion. This can give you more information and help you feel more confident about the treatment plan you choose.

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 for lung surgery.

Different operations can be used to treat SCLC.

- Pneumonectomy: the entire lung is removed.
- Lobectomy: an entire section (lobe) of the lung is removed.
- Segmentectomy or wedge resection: part of a lobe is removed.
- Sleeve resection: a section of a large airway is removed and the lung is reattached.

Lobectomy is often the preferred operation for SCLC if it can be done. 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.

Video-assisted thoracic surgery (VATS): This is a new kind of surgery for some people with early stage lung cancer. A tiny video camera is put through a small cut (incision) in the chest to help the surgeon see the tumor. One or 2 other small cuts are made in the skin, and long instruments are passed though these to remove the tumor. Since only small cuts are needed, there is a shorter hospital stay and less pain after surgery. This approach is most often used for small tumors near the outside of the lung. The cure rate seems to be the same as for standard surgery. The doctor who does this surgery should have experience because it takes a great deal of skill.

Possible side effects of surgery

Problems after surgery depend on how much surgery was done and a person's health beforehand. Serious problems can include bleeding, infection, and pneumonia. While it is rare, in some cases people may not survive the surgery, so it is very important to talk with your doctors to be sure you are a good candidate for surgery.

Surgery for lung cancer is a major operation, and recovering from the operation typically takes weeks to months. The surgery site will hurt for some time after surgery, which might limit your activity. People whose lungs are in good shape (other than the cancer) can often return to normal activities after some time if a lobe or even an entire lung is removed. But if they also have problems like emphysema or chronic bronchitis, which are common in heavy smokers, they may have long-term shortness of breath.

Surgery and other methods to relieve problems

In some cases, surgery or other treatments may be used to help with the symptoms of the cancer (rather than trying to remove all of the cancer).

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.

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:

- It can be used along with chemotherapy (in limited stage disease) to treat the tumor and lymph nodes in the chest.
- In limited stage SCLC, it is used on the brain to try to prevent the spread of cancer there.
- 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. Standard radiation is used less often than in the past. Newer methods such as 3D-CRT and IMRT allow doctors to be more precise in treating SCLC while reducing radiation to nearby healthy tissues.

Possible side effects of radiation treatment

- Sunburn-like skin problems
- Hair loss (in the place where the radiation enters the body)
- Tiredness (fatigue)

- Nausea and vomiting
- Loss of appetite and weight loss

Radiation can affect the blood-forming cells in the bone marrow. This can cause low blood cell counts, which can lead to:

- Increased chance of infections (from having too few white bloods)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (from having too few red blood cells)

Radiation to the chest can damage your lungs, which might cause a cough, problems breathing, and shortness of breath. If your esophagus, which is in the middle of your chest, is exposed to radiation, it could cause a sore throat and trouble swallowing during treatment. This may make it hard to eat anything other than soft foods or liquids for a while.

Most of these side effects go away after treatment, but some can last a long time. When chemotherapy is given with radiation, the side effects are often worse.

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, please see the “Radiation Therapy” section of our website or our document *Understanding Radiation Therapy: A Guide for Patients and Families*.

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.

To learn more about chemo please see the “Chemotherapy” section of our website, or our document *Understanding Chemotherapy: A Guide for Patients and Families*.

Clinical trials for small cell lung cancer

You may have had to make a lot of decisions since you’ve been told you have cancer. One of the most important decisions you will make is deciding which treatment is best for you. You may have heard about clinical trials being done for your type of cancer. Or maybe someone on your health care team has mentioned a clinical trial to you.

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They 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. Sometimes they might be the only way to get access to some newer treatments. They are also the

only way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

If you would like to take part in a clinical trial, you should start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service for a list of clinical trials that meet your medical needs. You can reach this service at 1-800-303-5691 or on our website at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials website at www.cancer.gov/clinicaltrials.

There are requirements you must meet to take part in any clinical trial. If you do qualify for a clinical trial, it is up to you whether or not to enter (enroll in) it.

You can get a lot more information on clinical trials in our document *Clinical Trials: What You Need to Know*. You can read it on our website or call us at 1-800-227-2345 and have it sent to you.

Complementary and alternative therapies for small cell lung cancer

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that your doctor hasn't mentioned. Everyone from friends and family to Internet groups and websites may offer ideas for what might help you. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

What are complementary and alternative therapies?

It can be confusing because not everyone uses these terms the same way, and they are used to refer to many different methods. We use *complementary* to refer to treatments that are used *along with* your regular medical care. *Alternative* treatments are used *instead of* a doctor's medical treatment.

Complementary methods: Most complementary treatment methods are not offered as cures for cancer. Mainly, they are used to help you feel better. Some examples of methods that are used along with regular treatment are meditation to reduce stress, acupuncture to help relieve pain, or peppermint tea to relieve nausea. Some complementary methods are known to help, while others have not been tested. Some have been proven not to be helpful, and a few might even be harmful.

Alternative treatments: Alternative treatments may be offered as cancer cures. These treatments have not been proven safe and effective in clinical trials. Some of these methods may be harmful, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment.

Delays or interruptions in your medical treatments may give the cancer more time to grow and make it less likely that treatment will help.

Finding out more

It is easy to see why people with cancer think about alternative methods. You want to do all you can to fight the cancer, and the idea of a treatment with few or no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or they may no longer be working. But the truth is that most of these alternative methods have not been tested and proven to work in treating cancer.

As you think about your options, here are 3 important steps you can take:

- Look for “red flags” that suggest fraud. Does the method promise to cure all or most cancers? Are you told not to have regular medical treatments? Is the treatment a “secret” that requires you to visit certain providers or travel to another country?
- Talk to your doctor or nurse about any method you are thinking of using.
- Contact us at 1-800-227-2345 to learn more about complementary and alternative methods in general and to find out about the specific methods you are looking at. You can also find out more about them in the “Complementary and Alternative Medicine” section of our website.

The choice is yours

Decisions about how to treat or manage your cancer are always yours to make. If you want to use a non-standard treatment, learn all you can about the method and talk to your doctor about it. With good information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

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?

Add your own questions below:

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 the 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, please 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

As mentioned in the section, “Can small cell lung cancer be found early?” a large study called the National Lung Screening Trial (NLST) recently found that low-dose CT scanning in people at high risk of lung cancer (due to smoking history) lowered the risk of death from lung cancer. This finding has led to the development of screening guidelines for lung cancer.

Another 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

Real-time tumor imaging

Researchers are looking to use new imaging techniques, such as four-dimensional computed tomography (4DCT), to help improve treatment. In this technique, the CT machine scans the chest constantly for about 30 seconds. It shows how the tumor moves as a person breathes, as opposed to just giving a ‘snapshot’ of a point in time, like a standard CT does.

4DCT can be used to show exactly where the tumor is during each part of the breathing cycle, which can help doctors aim radiation at the tumor more precisely. This technique might also be used to help show if a tumor is attached to or invading important structures in the chest, which could help doctors figure out if it can be removed with surgery.

Chemotherapy

Many 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*. New drugs that slow or stop angiogenesis are being studied as lung cancer treatments. Some are already used for other cancer types. For instance, a drug called bevacizumab (Avastin) has been shown to help patients with some types of non-small cell lung cancer. In early studies, it has helped stop some small cell lung cancers from growing for a time, but so far it hasn't been shown to help patients live longer. Other drugs that affect blood vessel growth are also being tested for use against SCLC.

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

From your American Cancer Society

The following information may also be helpful to you. These materials may be ordered from our toll-free number.

Small Cell Lung Cancer Detailed Guide (also in Spanish)

Living with cancer

After Diagnosis: A Guide for Patients and Families (also in Spanish)

Caring for the Patient With Cancer at Home: A Guide for Patients and Families (also in Spanish)

Guide to Controlling Cancer Pain (also in Spanish)

Distress in People With Cancer

Living With Uncertainty: The Fear of Cancer Recurrence

When Your Cancer Comes Back: Cancer Recurrence

Advanced Cancer

Understanding cancer treatments

Understanding Cancer Surgery: A Guide for Patients and Families (also in Spanish)

Understanding Chemotherapy: A Guide for Patients and Families (also in Spanish)

Understanding Radiation Therapy: A Guide for Patients and Families (also in Spanish)

Lasers in Cancer Treatment

Cancer treatment side effects

Nausea and Vomiting

Anemia in People With Cancer

Fatigue in People With Cancer

Peripheral Neuropathy Caused by Chemotherapy

Family and caregiver concerns

Talking With Friends and Relatives About Your Cancer (also in Spanish)

What It Takes to Be a Caregiver

Helping Children When a Family Member Has Cancer: Dealing With Diagnosis (also in Spanish)

Work, insurance, and finances

Health Insurance and Financial Assistance for the Cancer Patient

Returning to Work After Cancer Treatment

Working During Cancer Treatment

Carcinogens and lung cancer

Asbestos

Diesel Exhaust

Radon

Questions About Smoking, Tobacco, and Health (also in Spanish)

Guide to Quitting Smoking (also in Spanish)

When treatment isn't working

Nearing the End of Life

Hospice Care

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order.

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.*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at **1-800-227-2345** or visit www.cancer.org.

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Last Revised: 2/11/2014

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