
Treating Small Cell Lung Cancer

If you've been diagnosed with small cell lung cancer (SCLC), your cancer care team will discuss your treatment options with you. It's important to weigh the benefits of each treatment option against the possible risks and side effects.

How is small cell lung cancer treated?

Treatments for SCLC can include:

- [Chemotherapy for Small Cell Lung Cancer](#)
- [Immunotherapy for Small Cell Lung Cancer](#)
- [Radiation Therapy for Small Cell Lung Cancer](#)
- [Surgery for Small Cell Lung Cancer](#)
- [Palliative Procedures for Small Cell Lung Cancer](#)

Common treatment approaches

The treatment options for SCLC are based mainly on the stage (extent) of the cancer, but other factors, such as a person's overall health and lung function are also important. Sometimes, more than one of type of treatment is used. If you have SCLC, you will probably get chemotherapy if you are healthy enough. If you have limited stage disease, radiation therapy and – rarely – surgery may be options as well. People with extensive stage disease often receive chemotherapy with or without immunotherapy.

- [Treatment Choices for Small Cell Lung Cancer, by Stage](#)

Who treats small cell lung cancer?

You may have different types of doctors on your treatment team, depending on the

stage of your cancer and your treatment options. These doctors could include:

- A **medical oncologist**: a doctor who treats cancer with medicines such as chemotherapy and immunotherapy
- A **pulmonologist**: a doctor who specializes in medical treatment of diseases of the lungs
- A **radiation oncologist**: a doctor who treats cancer with radiation therapy
- A **thoracic surgeon**: a doctor who treats diseases in the lungs and chest with surgery

Many other specialists may be involved in your care as well, including nurse practitioners, nurses, psychologists, social workers, rehabilitation specialists, and other health professionals.

- [Health Professionals Who Are Part of a Cancer Care Team](#)

Making treatment decisions

It's important to discuss all of your treatment options as well as their possible side effects with your family and your treatment team to make the choice that best fits your needs. If there's anything you don't understand, ask to have it explained.

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

- [Questions to Ask About Lung Cancer](#)
- [Seeking a Second Opinion](#)

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.

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.

- [Clinical Trials](#)

Considering complementary, integrative, and alternative methods

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

Complementary and integrative methods are treatments that are used **along with** your regular medical care. **Alternative** treatments are used **instead of** standard medical treatment. Although some complementary and integrative methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

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.

- [Complementary and Integrative Medicine](#)

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and they can be 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, and more - to help you get through treatment. Call our Cancer Knowledge Hub at 1-800-227-2345 and speak with one of our caring, trained cancer helpline specialists. Or, if you prefer, you can use our chat feature on cancer.org to connect with one of our specialists.

- [Palliative Care](#)
- [Programs & Services](#)

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors as you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

People who have advanced cancer and who are expected to live less than 6 months may want to consider hospice care. Hospice care is designed to provide the best possible quality of life for people who are near the end of life. You and your family are encouraged to talk with your doctor or a member of your supportive care team about hospice care options, which include hospice care at home, a special hospice center, or other health care locations. Nursing care and special equipment can make staying at home a workable option for many families.

- [If Cancer Treatments Stop Working](#)
- [Hospice Care](#)

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 your cancer care team any questions you may have about your treatment options.

Chemotherapy for Small Cell Lung

Cancer

Chemotherapy (chemo) is treatment with anticancer drugs that may be injected into a vein or taken by mouth. These drugs travel through the bloodstream and reach most parts of the body.

- [When is chemotherapy used?](#)
- [Chemo drugs used to treat SCLC](#)
- [How is chemotherapy given?](#)
- [Possible side effects of chemotherapy for SCLC](#)
- [More information about chemotherapy](#)

When is chemotherapy used?

Chemo travels through the bloodstream and reach most parts of the body. It is typically part of the treatment for small cell lung cancer (SCLC). This is because SCLC has usually already spread by the time it is found , so treatments such as surgery alone or radiation therapy alone would not reach all areas of cancer.

- For people with **limited-stage SCLC**, chemo is often given with radiation therapy. This is known as **chemoradiation**.
- For people with **extensive-stage SCLC**, chemo with or without [immunotherapy](#) is usually the main treatment. Sometimes radiation therapy is given as well.

Some patients in poor health might not be able to tolerate intense doses of chemo or a combination of drugs. But older age by itself is not a reason to avoid chemo.

Chemo drugs used to treat SCLC

Generally, SCLC is first treated with combinations of chemo drugs. The combinations used most often are:

- **Cisplatin** and **etoposide**
- **Carboplatin** and **etoposide**

If the SCLC worsens or comes back after treatment with the above combination of chemo drugs, other chemo drugs may then be given. These drugs are usually given by themselves:

- **Topotecan (Hycamtin)**
- **Lurbinectedin (Zepzelca)**
- **Docetaxel (Taxotere)**
- **Paclitaxel (Taxol)**
- **Gemcitabine (Gemzar)**
- **Irinotecan (Camptosar)**
- **Temozolomide (Temodar)**
- **Vinorelbine (Navelbine)**

How is chemotherapy given?

Chemo drugs for lung cancer are typically given into a vein (intravenous [IV]), either as an injection over a few minutes or as an infusion over a longer period of time. This can be done in a doctor's office, chemotherapy clinic, or in a hospital.

Often, slightly larger and sturdier IVs known as [central venous catheters](#)¹ (CVCs), central venous access devices (CVADs), or central lines are needed to give chemo. They are used to put medicines, blood products, nutrients, or fluids right into your blood. They can also be used to take out blood for testing.

Many different kinds of CVCs are available. The 2 most common types are the port and the PICC (peripherally inserted central catheter) line. A port is a small quarter-sized device that is placed under the skin in your upper chest. A small tube connects the port to a large vein that goes into the heart, called the superior vena cava. A PICC line is a small tube that is placed in the upper arm; that tube threads through the vein until it reaches the superior vena cava.

Doctors give chemo in cycles. Each cycle includes the period of treatment followed by a rest period to give you time to recover from the effects of the drugs. Cycles are most often 3 or 4 weeks long, and initial treatment is typically 4 to 6 cycles. The schedule varies depending on the drugs used. For example, some drugs are given only on the first day of the chemo cycle. Others are given for a few days in a row, or once a week. Then, at the end of the cycle, the chemo schedule repeats to start the next cycle.

For advanced cancers, the initial chemo combination is often given for 4 to 6 cycles, sometimes in combination with an immunotherapy drug. Beyond this, doctors might also recommend extending treatment with a single immunotherapy drug, for people who have had a good response to their initial chemotherapy or have had no worsening of their cancer.

If the cancer progresses (gets worse) during treatment or returns after treatment is finished, other chemo drugs may be tried. The choice of drugs depends to some extent on how soon the cancer begins to grow again. (The longer it takes for the cancer to return, the more likely it is to respond to further treatment.)

- If cancer returns more than 6 months after treatment, it might respond again to the same chemo drugs that were given the first time.
- If the cancer comes back sooner, or if it keeps growing during treatment, further treatment with the same drugs isn't likely to be helpful. If further chemo is given, most doctors prefer treatment with a single, different drug to help limit side effects. SCLC that progresses or comes back can be hard to treat, so taking part in a [clinical trial](#)² of newer treatments might be a good option for some people.

Possible side effects of chemotherapy for SCLC

Chemo drugs can cause [side effects](#)³. These depend on the type and dose of drugs given and how long they are taken. Some common side effects of chemo include:

- Hair loss
- Mouth sores
- Loss of appetite or weight changes
- [Nausea and vomiting](#)⁴
- Diarrhea or constipation

Chemo can also affect the blood-forming cells of the bone marrow, which can lead to:

- Increased chance of [infections](#)⁵ (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)
- [Fatigue](#)⁶ ((tiredness, from low red blood cell counts)

These side effects usually go away after treatment, but there are also often ways to lessen them. For example:

- Drugs can be given to help prevent or reduce nausea and vomiting.
- Drugs can be used to help prevent or treat low blood cell counts (especially low white blood cell counts)..

Some drugs can have specific side effects. For example:

- Drugs such as cisplatin and carboplatin can damage nerve endings. This is called peripheral neuropathy. It can sometimes lead to symptoms (mainly in the hands and feet), such as numbness or tingling sensations, burning or pain, sensitivity to cold or heat, or muscle weakness. In most people, this goes away or gets better after treatment is stopped, but it may last a long time in some people.
- Cisplatin can also cause kidney damage. To help prevent this, doctors give lots of IV fluids before and after each dose of the drug is given.

Be sure to report any side effects you notice during chemo to your cancer care team so that they can be treated promptly. In some cases, the doses of the chemo drugs may need to be reduced or treatment may need to be delayed or stopped to prevent the effects from getting worse.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see [Chemotherapy](#)⁷.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)⁸.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/tubes-lines-ports-catheters.html
2. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
3. www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy/chemotherapy-side-effects.html
4. www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting.html
5. www.cancer.org/cancer/managing-cancer/side-effects/infections.html
6. www.cancer.org/cancer/managing-cancer/side-effects/fatigue-weakness-sleep.html

7. www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html
8. www.cancer.org/cancer/managing-cancer/side-effects.html

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Immunotherapy for Small Cell Lung Cancer

Immunotherapy is the use of medicines to help a person's own immune system to recognize and destroy cancer cells more effectively.

- [Immune checkpoint inhibitors](#)
- [Bispecific T-cell engager \(BiTE\)](#)
- [More information about immunotherapy](#)

Immune checkpoint inhibitors

An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses “checkpoint” proteins on immune cells, which act like switches that need to be turned on (or off) to start an immune response. Cancer cells sometimes use these checkpoints to avoid being attacked by the immune system.

Drugs that target these checkpoints (called **checkpoint inhibitors**) can be used to treat some people with small cell lung cancer (SCLC).

PD-L1 inhibitors

Atezolizumab (Tecentriq) and **durvalumab (Imfinzi)** target PD-L1, a checkpoint protein found on some tumor cells and immune cells. Blocking this protein can help boost the immune response against cancer cells.

These drugs can be used as part of the first treatment for advanced SCLC, along with etoposide and a platinum [chemo drug](#) (like carboplatin or cisplatin). Either drug can then be continued alone as maintenance therapy after the chemo is done.

Durvalumab can be given for treatment of early stage SCLC, after chemo (ie. cisplatin and etoposide) with radiation has been given.

These drugs are given as an intravenous (IV) infusion, typically every 2, 3, or 4 weeks. Atezolizumab can also be given (as **Tecentriq Hybreza**) as an injection under the skin (subcutaneously) over several minutes, typically once every 3 weeks.

Possible side effects of checkpoint inhibitors

Side effects of these drugs can include:

- Fatigue
- Cough
- Nausea
- Skin rash
- Loss of appetite
- Constipation
- Joint pain
- Diarrhea

Other, **more serious side effects** occur less often:

Infusion reactions: Some people might have an infusion reaction while getting these drugs. This is like an allergic reaction, and can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It's important to tell your doctor or nurse right away if you have any of these symptoms while getting these drugs.

Autoimmune reactions: These drugs remove one of the safeguards on the body's immune system. Sometimes the immune system responds by attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It's very important to report any new side effects to someone on your cancer care team as soon as possible. If serious side effects do occur, treatment may need to be stopped and you might be given high doses of corticosteroids to suppress your immune system.

Bispecific T-cell engager (BiTE)

Tarlatamab (Imdelltra) is a type of immunotherapy known as a bispecific T-cell engager (BiTE). Once it's injected into the body, one part of the drug attaches to immune cells called *T cells*, while another part attaches to the DLL3 protein on SCLC cells. This brings the two together, which helps the immune system attack the cancer cells.

Tarlatamab can be used to treat advanced ([extensive-stage¹](#)) SCLC that is no longer being helped by [chemo](#) that included a platinum drug (such as cisplatin or carboplatin).

This drug is given as an IV infusion, typically once a week at first, and then once every 2 weeks. Because of the risk of serious side effects such as cytokine release syndrome

(CRS) and nervous system problems (see below), your doctor will want to watch you closely in a healthcare setting for about 24 hours after the first 2 infusions, and for at least several hours after later treatments.

Possible side effects of tarlatamab

Common side effects of tarlatamab include:

- Fever
- Feeling very tired
- Nausea
- Loss of appetite
- A bad or metallic taste in your mouth
- Muscle or bone pain
- Constipation
- Abnormal blood test results

Tarlatamab can also cause **more serious side effects**:

Cytokine release syndrome (CRS): This is a serious side effect that can occur when T cells in the body release chemicals (cytokines) that ramp up the immune system. This happens most often within the first day after the infusion, and it can be life-threatening. Symptoms can include:

- Fever and chills
- Severe nausea and vomiting
- Trouble breathing
- Feeling very tired
- Fast heartbeat
- Feeling dizzy, lightheaded, or confused
- Headache
- Problems with balance and movement, such as trouble walking

Your health care team will watch you closely for possible signs of CRS, especially during and after the first few infusions. Be sure to contact your health care team right away if you have any symptoms that might be from CRS.

Nervous system problems: This drug can affect the nervous system, which could lead to serious or even life-threatening side effects that can occur days to weeks after

treatment. Symptoms can include:

- Headaches
- Weakness, numbness, or tingling in the hands or feet
- Feeling dizzy or confused
- Trouble speaking or understanding things
- Memory loss
- Trouble sleeping
- Fainting
- Tremors
- Seizures

Serious infections: Some people might get a serious infection while getting this drug. Tell your cancer care team right away if you have a fever, cough, chest pain, shortness of breath, sore throat, rash, or pain when urinating.

Low blood cell counts: This drug might lower your blood cell counts, which can increase your risk of infections or bleeding and may make you feel tired or short of breath. Your doctor will check your blood cell counts regularly during your treatment.

Liver problems: This drug can affect your liver, which might show up on lab tests. It might also cause symptoms such as feeling tired, loss of appetite, pain in the upper right part of your belly, dark colored urine, or yellowing of your skin or the white parts of your eyes (jaundice).

More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy²](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects³](#).

Hyperlinks

1. www.cancer.org/cancer/types/lung-cancer/detection-diagnosis-staging/staging-sclc.html

2. www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html
3. www.cancer.org/cancer/managing-cancer/side-effects.html

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Radiation Therapy for Small Cell Lung Cancer

Radiation therapy uses high-energy rays (or particles) to kill cancer cells.

- [When is radiation therapy used?](#)
- [Types of radiation therapy](#)
- [Possible side effects of radiation therapy for SCLC](#)
- [More information about radiation therapy](#)

When is radiation therapy used?

Depending on the [stage](#)¹ of small cell lung cancer (SCLC) and other factors, radiation therapy might be used:

- To treat the tumor and lymph nodes in the chest. In limited-stage SCLC, it might be used at the same time as [chemotherapy](#) (chemo). Giving chemo and radiation together is called **concurrent chemoradiation**.
- After chemo is finished. This is sometimes done for patients with extensive stage disease, or it can be used for people with limited stage disease who cannot tolerate getting chemotherapy and radiation at the same time.
- To help lower the chances of cancer spreading to the brain. This is called **prophylactic cranial irradiation (PCI)**. This is usually given to people with limited stage SCLC, but it can also help some people with extensive stage SCLC.
- To shrink tumors to relieve (palliate) symptoms of lung cancer such as pain, bleeding, trouble swallowing, cough, shortness of breath, and problems caused by spread to other organs such as the brain or bone.

Types of radiation therapy

The type of radiation therapy most often used to treat SCLC is called [external beam radiation therapy \(EBRT\)](#)². A machine outside the body focuses radiation at the cancer.

Treatment is much like getting an x-ray, but the radiation dose is stronger. The procedure itself is painless, and each treatment lasts only a few minutes. Most often, radiation treatments as part of the initial treatment for SCLC is given once or twice daily,

5 days a week, for 3 to 7 weeks. Radiation to relieve symptoms and prophylactic cranial radiation (PCI) is given for shorter periods of time, typically less than 3 weeks.

Newer EBRT techniques have been shown to help doctors treat lung cancers more accurately while lessening the radiation exposure to nearby healthy tissues. These include:

- **Three-dimensional conformal radiation therapy (3D-CRT)** uses special computers to precisely map the location of the tumor(s). Radiation beams are shaped and aimed at the tumor(s) from several directions, which makes it less likely to damage normal tissues.
- **Intensity modulated radiation therapy (IMRT)** is an advanced form of 3D therapy. The beams can be shaped and aimed at the tumor from several angles, and the strength of the beams can be adjusted to limit the dose reaching nearby normal tissues. This technique is used most often if tumors are near important structures such as the spinal cord. A variation of IMRT is called **volumetric modulated arc therapy (VMAT)**. A machine delivers radiation quickly as it rotates once around the body. This allows each treatment to be given over just a few minutes.
- **Four-dimensional conformal radiation therapy (4DCT)** shows where the tumor is in relation to other structures during each part of the breathing cycle, as opposed to just giving a “snapshot” of a point in time, like a standard CT does. 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 determine if a person might be eligible for surgery.
- **Stereotactic body radiation therapy (SBRT)**, also known as **stereotactic ablative radiotherapy (SABR)**, is most often used to treat early-stage SCLC when surgery isn’t an option due to a person’s health or in people who don’t want surgery. It might also be considered for tumors that have limited spread to other parts of the body, such as the brain or adrenal glands.

Instead of giving a small dose of radiation each day for several weeks, SBRT uses very focused beams of high-dose radiation given in fewer (usually 1 to 5) treatments. Several beams are aimed at the tumor from different angles. To target the radiation precisely, you are put in a specially designed body frame for each treatment. This reduces the movement of the lung tumor during breathing.

- **Stereotactic radiosurgery (SRS)** isn’t really surgery, but a type of stereotactic radiation therapy that is given in only 1 session. It can sometimes be used instead

of or along with surgery for single spots tumor.

Possible side effects of radiation therapy for SCLC

If you are going to get radiation therapy, it's important to ask your doctor beforehand about the possible side effects so that you know what to expect. Common side effects depend on where the radiation therapy is aimed and can include:

- Skin changes in the area being treated, which can range from mild redness to blistering and peeling
- Hair loss (in the area where the radiation enters the body)
- Fatigue (tiredness)
- Nausea and vomiting
- Loss of appetite and weight loss

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 may be worse.

Radiation therapy to the chest may damage your lungs, which might cause a cough, problems breathing, and shortness of breath. These usually improve after treatment is over, although sometimes they may not go away completely.

Your esophagus, which is in the middle of your chest, may be exposed to radiation, which could cause a sore throat and trouble swallowing during or shortly after treatment. This might make it hard to eat anything other than soft foods or liquids for a while. This also often improves after treatment is finished.

Radiation therapy to large areas of the brain can sometimes cause memory loss, fatigue, headaches, or trouble thinking. Usually these symptoms are minor compared with those caused by cancer that has spread to the brain, but they can affect your quality of life.

More information about radiation therapy

To learn more about how radiation is used to treat cancer, see [Radiation Therapy](#)³.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)⁴.

Hyperlinks

1. www.cancer.org/cancer/types/lung-cancer/detection-diagnosis-staging/staging-sclc.html
2. www.cancer.org/cancer/managing-cancer/treatment-types/radiation/external-beam-radiation-therapy.html
3. www.cancer.org/cancer/managing-cancer/treatment-types/radiation.html
4. www.cancer.org/cancer/managing-cancer/side-effects.html

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Surgery for Small Cell Lung Cancer

Surgery is rarely used as part of the main treatment for small cell lung cancer (SCLC), as the cancer has usually already spread by the time it is found.

In fewer than 1 out of 20 people with SCLC, the cancer is found as only a single lung tumor, with no spread to lymph nodes or other organs. Surgery may be an option for these early-stage cancers, usually followed by additional treatment ([chemotherapy](#) and/or [immunotherapy](#)).

- [Tests before lung surgery](#)
- [Types of lung surgery](#)
- [Ways to do lung surgery](#)
- [Intraoperative imaging](#)
- [Possible risks and side effects of lung surgery](#)
- [After surgery](#)
- [More information about Surgery](#)

Tests before lung surgery

If your doctor thinks the lung cancer can be treated with surgery you might need more tests, such as:

- Pulmonary function tests (PFTs) to see if you would have enough healthy lung tissue left after surgery.
- EKG (recording of your heart's electrical activity) and an echocardiogram (ultrasound of your heart) to check the function of your heart
- Blood work or other studies to be sure you're healthy enough for surgery.

Your doctor will want to check if the cancer has already spread to the lymph nodes between the lungs. This is often done before surgery with mediastinoscopy or another technique.

To learn more about these tests, see [Tests for Lung Cancer](#)¹.

Types of lung surgery

There are different types of lung resection, including:

- **Pneumonectomy:** This surgery removes an entire lung. This might be needed if the tumor is close to the center of the chest.
- **Lobectomy:** The lungs are made up of 5 lobes (3 in the right lung and 2 in the left). In this surgery, the entire lobe containing the tumor(s) is removed. If it can be done, this is often the preferred type of operation for SCLC.
- **Segmentectomy or wedge resection:** In these operations, only the part of the lobe with the tumor is removed. This approach might be used if a person doesn't have enough normal lung function to withstand removing the whole lobe.
- **Sleeve resection:** This operation may be used to treat some cancers in large airways in the lungs. If you think of the large airway with a tumor as similar to the sleeve of a shirt with a stain a few inches above the wrist, the sleeve resection would be like cutting across the sleeve (airway) above and below the stain (tumor) and then sewing the cuff back onto the shortened sleeve. A surgeon may be able to do this operation instead of a pneumonectomy to preserve more lung function.

The type of operation your doctor recommends depends on the size and location of the tumor and on how well your lungs are functioning. Doctors often prefer to do a more extensive operation (for example, a lobectomy instead of a segmentectomy) if a person's lungs are healthy enough, as it may provide a better chance to cure the cancer.

Ways to do lung surgery

There are primarily 2 ways to do lung surgery: open lung surgery (thoracotomy) or minimally invasive surgery. Minimally invasive surgery includes mainly 2 types: video-assisted thoracoscopic surgery (VATS) and robotic-assisted thoracoscopic surgery (RATS). With any of these surgeries, the goal could be to diagnose (to get more tissue for diagnosis), stage (to look at nearby lymph nodes for possible spread of cancer), and/or treat lung cancer (to remove all known cancer in the lung). They all require general anesthesia, where you are in a deep sleep.

Open lung surgery (Thoracotomy)

In a thoracotomy, the surgeon makes a large cut between the ribs. Where the cut is depends on which part of the lung needs to be removed. In general, the surgeon will spread the ribs to see the lung and nearby organs inside.

Video-assisted thoracic surgery (VATS)

Video-assisted thoracoscopic surgery (VATS) uses smaller incisions and typically has a shorter hospital stay and fewer complications than a thoracotomy. The cure rate after this surgery seems to be the same as with surgery done with a larger incision. But it's important that the surgeon doing this procedure is experienced, because it requires a great deal of skill.

Robotic-assisted thoracic surgery (RATS)

In this approach, the thoracoscopy is done using a robotic system. The surgeon sits at a control panel in the operating room and moves robotic arms to operate through several small incisions in the patient's chest.

RATS is similar to VATS in terms of less pain, less blood loss, and shorter recovery time.

For the surgeon, the robotic system may provide more maneuverability and more precision when moving the instruments than standard VATS. Still, the most important factor in the success of either type of thoracoscopic surgery is the surgeon's experience and skill.

Intraoperative imaging

Along with the results of imaging tests (such as CT scans) done before surgery, surgeons also rely on what they can see and feel during the operation to help determine which parts of the lung need to be removed. However, some lung tumors might not be easily seen or felt, so in some situations it's possible that a tumor (or parts of tumor) might be missed.

Your surgeon might use a special **intraoperative imaging** system during the surgery to help find tumors that aren't easily seen or felt. For this approach, a fluorescent drug called **pafolacianine (Cytalux)** is injected into your blood within 24 hours before your surgery. The drug travels through your body and attaches to a specific protein found on lung cancer cells. Once in the operating room, the imaging system gives off near-infrared light that causes the drug to light up, which can help the surgeon see which areas of the lung need to be removed.

The most common side effects after getting pafolacianine are belly pain, heartburn, itching, chest pain, nausea, vomiting, and flushing. Your doctor will probably ask you to avoid any supplements that have folic acid in them for a few days before the procedure because they might affect how well this drug works.

Possible risks and side effects of lung surgery

Surgery for lung cancer is a major operation and can have serious side effects, which is why surgery isn't a good idea for everyone. While all surgeries carry some risks, they depend to some degree on the extent of the surgery and a person's overall health.

Possible complications during and soon after surgery can include reactions to anesthesia, excess bleeding, blood clots in the legs or lungs, wound infections, and pneumonia. While it is rare, in some cases people might not survive the surgery.

Recovering from lung cancer surgery typically takes weeks to months. When the surgery is done through a thoracotomy, the surgeon must spread the ribs to get to the lung, so the area near the incision may hurt for some time after surgery. Your activity might be limited for at least a month or two.

If your lungs are in good condition (other than the presence of the cancer) you can usually return to normal activities after some time if a lobe or even an entire lung has been removed. If you also have another lung disease such as emphysema or chronic bronchitis (which are common among people who have smoked for a long time), you might become short of breath with activity after surgery.

After surgery

When you wake up from surgery, you will have a tube (or tubes) coming out of your chest and attached to a special container to allow excess fluid and air to drain out. The tube(s) will be removed once the fluid drainage and air leak slow down enough. Generally, you will spend about 1 to 7 days in the hospital depending on the type of surgery.

More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)².

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)³.

Hyperlinks

1. www.cancer.org/cancer/types/lung-cancer/detection-diagnosis-staging/how-diagnosed.html
2. www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html
3. www.cancer.org/cancer/managing-cancer/side-effects.html

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Palliative Procedures for Small Cell

Lung Cancer

Palliative care (sometimes called **supportive care**) is meant to relieve symptoms and improve a person's quality of life.

- [Options for palliative support](#)
- [Treating fluid buildup in the area around the lung](#)
- [Treating fluid buildup around the heart](#)
- [Treating an airway blocked by a tumor](#)
- [More information about palliative care](#)

Options for palliative support

People with small cell lung cancer (SCLC) often benefit from procedures to help with problems caused by the cancer. For example, people with advanced lung cancer can be short of breath. This can be caused by many things, including fluid around the lung or an airway that is blocked by a tumor. Although treating the cancer with [chemotherapy](#) or other drugs may help with this over time, other treatments may be needed as well.

Treating fluid buildup in the area around the lung

Sometimes fluid can build up in the chest outside the lungs. This is called a **pleural effusion**. It can press on the lungs and cause trouble breathing.

Thoracentesis

Thoracentesis is a procedure to remove the fluid. The doctor will numb an area in the lower back, and then place a hollow needle into the space between the ribs to drain the fluid around the lung. An ultrasound may be used to guide the needle into the fluid.

Pleurodesis

Pleurodesis is a procedure to remove the fluid and keep it from coming back. The main types are:

Chemical pleurodesis: A small cut is made in the skin of the chest wall, and a hollow tube (called a **chest tube**) is placed into the chest to remove the fluid. Then a substance is put into the chest through the tube that causes the linings of the lung (visceral pleura) and chest wall (parietal pleura) to stick together, sealing the space and

limiting further fluid buildup. A number of substances can be used for this, such as talc, the antibiotic doxycycline, or a chemotherapy drug like bleomycin.

Surgical pleurodesis: Talc is blown into the space around the lungs during an operation. This is done through a small incision using [thoracoscopy](#)¹

Catheter placement

One end of the catheter (a thin, flexible tube) is placed in the chest through a small cut in the skin, and the other end is left outside the body. Once in place, the outside catheter can be attached to a special bottle to allow the fluid to drain out on a regular basis.

Treating fluid buildup around the heart

Lung cancer can sometimes spread to the area around the heart. This can lead to fluid buildup inside the sac around the heart (called a **pericardial effusion**), which can press on the heart and affect how well it works.

Pericardiocentesis

Pericardiocentesis is a procedure that drains the fluid with a needle placed into the space around the heart. This is usually done using an echocardiogram (an ultrasound of the heart) to guide the needle.

Creating a pericardial window

During surgery, a piece of the sac around the heart (the pericardium) is removed to allow the fluid to drain into the chest or belly. This opening is called a **pericardial window** and helps to keep the fluid from building up again.

Treating an airway blocked by a tumor

Cancer can sometimes grow into an airway in the lung, blocking it and causing problems such as pneumonia or shortness of breath. Sometimes this is treated with [radiation therapy](#), but other techniques can also be used.

Photodynamic therapy (PDT)

[Photodynamic therapy](#)² is sometimes used to help open up airways blocked by tumors

to help people breathe better.

For this technique, a light-activated drug called porfimer sodium (Photofrin) is injected into a vein. This drug collects more in cancer cells than in normal cells. After a couple of days (to give the drug time to build up in the cancer cells), a bronchoscope is passed down the throat and into the lung. This can be done using either local anesthesia (numbing the throat) and sedation, or with general anesthesia (which puts you in a deep sleep). A special laser light on the end of the bronchoscope is aimed at the tumor, which activates the drug and kills the cells. The dead cells are then removed a few days later during a bronchoscopy. This process can be repeated if needed.

PDT can cause swelling in the airway for a few days, which could lead to some shortness of breath, as well as coughing up blood or thick mucus. Some of this drug also collects in normal cells in the body, such as skin and eye cells. This can make you very sensitive to sunlight or strong indoor lights. Too much exposure can cause serious skin reactions (like a severe sunburn), so doctors recommend staying out of any strong light for several weeks after the injection.

Laser therapy

Lasers can sometimes be used to help open up airways blocked by tumors to help people breathe better.

The laser is on the end of a bronchoscope, which is passed down the throat and next to the tumor. The doctor then aims the laser beam at the tumor to burn it away. This treatment can usually be repeated, if needed. You are usually asleep (under general anesthesia) for this type of treatment.

Stent placement

If a lung tumor has grown into an airway and is causing problems, sometimes a bronchoscope is used to put a hard silicone or metal tube called a **stent** in the airway to help keep it open. This is often done after other treatments such as PDT or laser therapy.

More information about palliative care

To learn more about how palliative care can be used to help control or reduce symptoms caused by cancer, see [Palliative Care](#)³.

To learn about some of the side effects of cancer or treatment and how to manage

them, see [Managing Cancer-related Side Effects](#)⁴.

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/thoracoscopy.html
2. www.cancer.org/cancer/managing-cancer/treatment-types/radiation/photodynamic-therapy.html
3. www.cancer.org/cancer/managing-cancer/palliative-care.html
4. www.cancer.org/cancer/managing-cancer/side-effects.html

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Treatment Choices for Small Cell Lung Cancer, by Stage

Small cell lung cancer (SCLC) is usually [staged](#)¹ as either limited or extensive. For treatment of limited-stage SCLC, a combination of chemotherapy and radiation is usually given. For treatment of extensive-stage SCLC, a combination of chemotherapy and immunotherapy is usually given.

- [Treating limited-stage SCLC](#)

- [Treating extensive-stage SCLC](#)
- [SCLC that progresses or recurs after treatment](#)

Treating limited-stage SCLC

If you only have one small tumor in your lung and there is no evidence of cancer in lymph nodes or elsewhere, your doctors might recommend [surgery](#) to remove the tumor and the nearby lymph nodes.

Very few patients with SCLC are treated this way. This is only an option if you are in fairly good health and can withstand having part of a lung removed.

Before the operation, the lymph nodes in your chest will be checked for cancer with [mediastinoscopy or other tests](#)², because surgery is unlikely to be a good option if the cancer has spread there.

Surgery is generally followed by [chemotherapy](#). If cancer is found in the lymph nodes that were removed, radiation therapy to the chest is also usually recommended. The radiation is often given at the same time as the chemo. Although this increases the [side effects of treatment](#)³, it appears to be more effective than giving one treatment after the other. If you already have severe lung disease (in addition to your cancer) or other serious health problems, you might not be given radiation therapy.

For most people with limited-stage SCLC, surgery is not an option because the tumor is too large, it's in a place that can't be removed easily, or it has spread to nearby lymph nodes or other lobes in the same lung. If you are in good health, the standard treatment is chemo plus [radiation](#) to the chest given at the same time (called **concurrent chemoradiation**). The chemo drugs used are usually etoposide plus either cisplatin or carboplatin.

Concurrent chemoradiation can help people with limited-stage SCLC live longer and give them a better chance at a cure than giving one treatment (or one treatment at a time). The downside is that this combination has more side effects than either chemo or radiation alone.

People who aren't healthy enough for chemoradiation are usually treated with chemo by itself. This may be followed by radiation to the chest.

After giving concurrent chemoradiation to people with limited-stage SCLC and if the lung cancer has not worsened at that point, they may benefit from treatment with **durvalumab (Imfinzi)**. Durvalumab is a type of [immunotherapy](#) drug.

If no measures are taken to prevent it, about half of people with SCLC will have cancer spread to their brain. If your cancer has responded well to initial treatment, you may be given radiation therapy to the head (**prophylactic cranial irradiation**, or PCI) to try to prevent this. The radiation is usually given in lower doses than what is used if the cancer had already spread to brain, but some patients may still have side effects.

In most people with limited-stage SCLC, tumors treated with chemo (with or without radiation) will shrink significantly. In many, the tumor will shrink to the point where it can no longer be seen on imaging tests. Unfortunately, for most people, the cancer will return at some point.

Because these cancers are hard to cure, [clinical trials](#)⁴ of newer treatments may be a good option for some people. If you think you might want to take part in a clinical trial, talk to your doctor.

Treating extensive-stage SCLC

Extensive-stage SCLC has spread too far for surgery or radiation therapy to be useful as the initial treatment. If you have extensive SCLC and are in fairly good health, [chemotherapy](#) (chemo), possibly along with an [immunotherapy](#) drug, is typically the first treatment. This can often shrink the cancer, treat your symptoms, and help you live longer.

The most common combination of chemo drugs is etoposide, plus either cisplatin or carboplatin. The immunotherapy drugs **atezolizumab (Tecentriq)** or **durvalumab (Imfinzi)** can be used along with etoposide and a platinum drug (cisplatin or carboplatin) for initial treatment and can then be continued alone as maintenance therapy. The cancer will shrink significantly with treatment in most people, and in some, the cancer might no longer be seen on imaging tests. This combination of PD-L1 immunotherapy with chemotherapy also seems to help some people with SCLC live longer. Unfortunately, the cancer often returns at some point in almost all people with extensive-stage SCLC.

If cancer growth in the lungs is causing symptoms, such as shortness of breath or bleeding, radiation therapy or other types of treatment, such as laser surgery, can sometimes be helpful. Radiation therapy can also be used to relieve symptoms if the cancer has spread to the bones, brain, or spinal cord.

If your overall health is poor, you might not be able to withstand the side effects of standard doses of chemo. If this is the case, your doctor may treat you with lower doses of chemo or [palliative/supportive care](#) alone. This would include treatment of any [pain](#)⁵,

breathing problems, or other symptoms you might have.

Because these cancers are hard to treat, [clinical trials](#)⁶ of newer chemo drugs and combinations, as well as other new treatments, could be a good option for some people. If you think you might be interested in taking part in a clinical trial, talk to your doctor.

SCLC that progresses or recurs after treatment

If the cancer continues to grow during treatment or [comes back](#)⁷, any further treatment will depend on the location and extent of the cancer, what treatments you've had, and on your health and desire for further treatment. It's always important to understand the goal of any further treatment before it starts. You should understand if it's to try to cure the cancer, to slow its growth, or to help relieve symptoms. It is also important to understand the benefits and risks.

If a cancer continues to grow during the initial chemotherapy treatment or if a cancer starts to grow after chemo has been stopped for less than 6 months, another type of chemo, such as topotecan may be tried, although it may be less likely to help. In these cases, if you are healthy enough, clinical trials are usually recommended.

For cancers that come back after initial treatment is finished, the choice of chemo drugs depends on how long the cancer was in remission. (See [Chemotherapy for Small Cell Lung Cancer](#).)

Another option for people who have already received chemo might be the [immunotherapy](#) drug **tarlatamab (Imdelltra)**.

For more on dealing with a recurrence, see [Coping With Cancer Recurrence](#)⁸.

Hyperlinks

1. www.cancer.org/cancer/types/lung-cancer/detection-diagnosis-staging/staging-sclc.html
2. www.cancer.org/cancer/types/lung-cancer/detection-diagnosis-staging/how-diagnosed.html
3. www.cancer.org/cancer/managing-cancer/side-effects.html
4. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-

[trials.html](#)

5. www.cancer.org/cancer/managing-cancer/side-effects/pain.html
6. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
7. www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html
8. www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence/coping-with-cancer-recurrence.html

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