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## 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 Associated With Cancer Care<sup>1</sup>](#)

## **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<sup>2</sup>](#)
- [Seeking a Second Opinion<sup>3</sup>](#)

## **Thinking about taking part in a clinical trial**

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

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)<sup>4</sup>

## Considering complementary and alternative methods

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

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be 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 Alternative Medicine](#)<sup>5</sup>

## 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 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 National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Palliative Care](#)<sup>6</sup>

- [Find Support Programs and Services in Your Area](#)<sup>7</sup>

### **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 and 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.

- [If Cancer Treatments Stop Working](#)<sup>8</sup>

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

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## **Chemotherapy for Small Cell Lung Cancer**

Chemotherapy (chemo) is treatment with anti-cancer 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 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 other treatments such as surgery or radiation therapy 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](#)<sup>1</sup> 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.

## Chemotherapy used to treat SCLC

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

- Cisplatin and etoposide
- Carboplatin and etoposide
- Cisplatin and irinotecan
- Carboplatin and irinotecan

## How is chemotherapy given?

Chemo drugs for lung cancer are typically given into a vein (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 setting.

Often, slightly larger and sturdier IVs known as [central venous catheters](#)<sup>2</sup> (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 most common types are the port and the PICC line.

Doctors give chemo in cycles, with each 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. Topotecan, which can either be given into a vein (IV) or taken as pills, is the drug most often used, although others might also be tried.

SCLC that progresses or comes back can be hard to treat, so taking part in a [clinical trial](#)<sup>3</sup> of newer treatments might be a good option for some people.

## Possible side effects of chemotherapy for SCLC

Chemo drugs can cause [side effects](#)<sup>4</sup>. 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](#)<sup>5</sup>
- Diarrhea or constipation

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

- Increased chance of [infections](#)<sup>6</sup> (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)
- [Fatigue](#)<sup>7</sup> (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.

Some drugs can have specific side effects. For example:

- Drugs such as cisplatin and carboplatin can damage nerve endings. This is called [peripheral neuropathy](#)<sup>8</sup>. It can sometimes lead to symptoms (mainly in the hands and feet) such as pain, burning or tingling sensations, sensitivity to cold or heat, or 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 medical 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.

To learn more about chemo, see [Chemotherapy](#)<sup>9</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/lung-cancer/treating-small-cell/immunotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/immunotherapy.html)
2. <https://www.cancer.org/treatment/treatments-and-side-effects/central-venous-catheters.html>
3. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy/chemotherapy-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy/chemotherapy-side-effects.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections.html)
7. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html)

[effects/fatigue.html](#)

8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/peripheral-neuropathy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/peripheral-neuropathy.html)
9. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html)

## References

Araujo LH, Horn L, Merritt RE, Shilo K, Xu-Welliver M, Carbone DP. Ch. 69 - Cancer of the Lung: Non-small cell lung cancer and small cell lung cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

Hann CL, Wu A, Rekhman N, Rudin CM. Chapter 49: Small cell and Neuroendocrine Tumors of the Lung. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Cancer Institute. Physician Data Query (PDQ). Health Professional Version. Small Cell Lung Cancer Treatment. 2019. Accessed at <https://www.cancer.gov/types/lung/hp/small-cell-lung-treatment-pdq> on June 12, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Small Cell Lung Cancer. V.1.2019. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/sclc.pdf](https://www.nccn.org/professionals/physician_gls/pdf/sclc.pdf) on June 12, 2019.

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# Immunotherapy for Small Cell Lung Cancer

Immunotherapy is the use of medicines to stimulate a person's own immune system to



recognize and destroy cancer cells more effectively.

## 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 “checkpoints” or proteins on immune cells that need to be turned on (or off) to start an immune response. Cancer cells sometimes use checkpoints to avoid being attacked by the immune system. But drugs that target these checkpoints can be used to treat some people with small cell lung cancer (SCLC).

- **Nivolumab (Opdivo)** and **pembrolizumab (Keytruda)** target PD-1, a protein on T cells (a type of immune cell) that normally helps keep these cells from attacking other cells in the body. By blocking PD-1, these drugs boost the immune response against cancer cells. This can shrink some tumors or slow their growth. They are used to treat advanced SCLC in people whose cancer continues to grow after getting at least two previous treatments, including [chemotherapy](#)<sup>1</sup> with either cisplatin or carboplatin.
- **Atezolizumab (Tecentriq)** targets PD-L1, a protein related to PD-1 that is found on some tumor cells and immune cells. Blocking this protein can also help boost the immune response against cancer cells. This drug can be used as part of the first-line treatment for advanced SCLC, along with the chemo drugs carboplatin and etoposide, and then continued alone as maintenance therapy.

These drugs are given as an intravenous (IV) infusion, typically every 2, 3 or 4 weeks.

### Possible side effects of immunotherapy for SCLC

Side effects of these drugs can include [fatigue](#)<sup>2</sup>, cough, [nausea](#)<sup>3</sup>, [skin rash](#),<sup>4</sup> [decreased appetite](#)<sup>5</sup>, [constipation](#)<sup>6</sup>, [joint pain](#)<sup>7</sup>, and [diarrhea](#)<sup>8</sup>.

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 health 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.

To learn more about this type of treatment, see [Cancer Immunotherapy](#).<sup>9</sup>

## Hyperlinks

1. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/skin-problems.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/skin-problems.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/eating-problems/poor-appetite.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/eating-problems/poor-appetite.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/constipation.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/constipation.html)
7. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html)
8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/diarrhea.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/diarrhea.html)
9. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html)

## References

Antonia SJ, López-Martin JA, Bendell J, Ott PA, Taylor M, Eder JP, et al. Nivolumab alone and nivolumab plus ipilimumab in recurrent small-cell lung cancer (CheckMate 032): a multicentre, open-label, phase 1/2 trial. *Lancet Oncol*. 2016 Jul;17(7):883-895.

Araujo LH, Horn L, Merritt RE, Shilo K, Xu-Welliver M, Carbone DP. Ch. 69 - Cancer of the Lung: Non-small cell lung cancer and small cell lung cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*.

6th ed. Philadelphia, Pa: Elsevier; 2020.

Chung HC, Lopez-Martin JA, Kao SC, Miller WH, Ros W, Gao Bo et al. Phase 2 study of pembrolizumab in advanced small-cell lung cancer (SCLC): KEYNOTE-158. *J Clin Oncol* 36, no. 15\_suppl (May 20 2018) 8506-8506.

Hann CL, Wu A, Rekhtman N, Rudin CM. Chapter 49: Small cell and Neuroendocrine Tumors of the Lung. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Horn L, Mansfield AS, Szczsna A, Havel L, Krzakowski M, Hochmair MJ et al. First-Line Atezolizumab plus Chemotherapy in Extensive-Stage Small-Cell Lung Cancer. *N Engl J Med*. 2018 Dec 6;379(23):2220-2229.

National Cancer Institute. Physician Data Query (PDQ). Health Professional Version. Small Cell Lung Cancer Treatment. 2019. Accessed at <https://www.cancer.gov/types/lung/hp/small-cell-lung-treatment-pdq> on June 12, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Small Cell Lung Cancer. V.1.2019. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/sclc.pdf](https://www.nccn.org/professionals/physician_gls/pdf/sclc.pdf) on June 12, 2019.

Ott PA, Elez E, Hiret S, Kim DW, Morosky A, Saraf S et al. Pembrolizumab in Patients With Extensive-Stage Small-Cell Lung Cancer: Results From the Phase Ib KEYNOTE-028 Study. *J Clin Oncol*. 2017 Dec 1;35(34):3823-3829.

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## Radiation Therapy for Small Cell Lung

# Cancer

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

Depending on the [stage](#)<sup>1</sup> of small cell lung cancer (SCLC) and other factors, radiation therapy is 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](#)<sup>2</sup> (chemo). Giving chemo and radiation together is called **concurrent chemoradiation**. The radiation may be started with the first or second cycle of chemo.
- 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**. This is used most often to treat 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 \(EBRT\)](#)<sup>3</sup>. 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 are 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 techniques 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.
- **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 one session. It can sometimes be used instead of or along with surgery for single tumors that have spread to the brain. In one version of this treatment, a machine focuses about 200 beams of radiation on the tumor from different angles over a few minutes to hours. A rigid frame keeps your head in the same position. In another version, a linear accelerator (a machine that creates radiation) that is controlled by a computer moves around your head to deliver radiation to the tumor from many different angles. These treatments can be repeated if needed.

## 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](#)<sup>4</sup> 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](#)<sup>5</sup> (tiredness)
- [Nausea and vomiting](#)<sup>6</sup>
- 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.

For more information, see [Radiation Therapy](#)<sup>7</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/staging-sclc.html](http://www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/staging-sclc.html)
2. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation/external-beam-radiation-therapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation/external-beam-radiation-therapy.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html)
7. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html)

## References

Araujo LH, Horn L, Merritt RE, Shilo K, Xu-Welliver M, Carbone DP. Ch. 69 - Cancer of the Lung: Non-small cell lung cancer and small cell lung cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

Hann CL, Wu A, Rekhtman N, Rudin CM. Chapter 49: Small cell and Neuroendocrine Tumors of the Lung. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Cancer Institute. Physician Data Query (PDQ). Health Professional Version. Small Cell Lung Cancer Treatment. 2019. Accessed at <https://www.cancer.gov/types/lung/hp/small-cell-lung-treatment-pdq> on June 12, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Small Cell Lung Cancer. V.1.2019. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/sclc.pdf](https://www.nccn.org/professionals/physician_gls/pdf/sclc.pdf) on June 12, 2019.

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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 patients, 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](#)<sup>1</sup>).

If your doctor thinks the lung cancer can be treated with surgery:

- Pulmonary function tests will be done to see if you would still have enough healthy lung tissue left after surgery

- Tests will be done to check the function of your heart and other organs 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 techniques described in [Tests for Lung Cancer<sup>2</sup>](#).

## Types of lung surgery

Different operations can be used to treat SCLC. In any of these operations, nearby lymph nodes are also removed to look for possible spread of the cancer. These operations require general anesthesia (where you are in a deep sleep) and are usually done through a large surgical incision between the ribs in the side of the chest or the back (called a **thoracotomy**).

- **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.

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 5 to 7 days in the hospital after the surgery.

## Possible risks and side effects of lung surgery

Surgery for lung cancer is a major operation and can have serious [side effects](#)<sup>3</sup>, 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 long-time smokers), you might become short of breath with activity after surgery.

For more general information about surgery, see [Cancer Surgery](#)<sup>4</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
2. [www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/how-diagnosed.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html)

## References

Araujo LH, Horn L, Merritt RE, Shilo K, Xu-Welliver M, Carbone DP. Ch. 69 - Cancer of the Lung: Non-small cell lung cancer and small cell lung cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*.

6th ed. Philadelphia, Pa: Elsevier; 2020.

Hann CL, Wu A, Rekhman N, Rudin CM. Chapter 49: Small cell and Neuroendocrine Tumors of the Lung. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Cancer Institute. Physician Data Query (PDQ). Health Professional Version. Small Cell Lung Cancer Treatment. 2019. Accessed at <https://www.cancer.gov/types/lung/hp/small-cell-lung-treatment-pdq> on June 12, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Small Cell Lung Cancer. V.1.2019. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/sclc.pdf](https://www.nccn.org/professionals/physician_gls/pdf/sclc.pdf) on June 12, 2019.

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## Palliative Procedures for Small Cell Lung Cancer

Palliative, or supportive, care is meant to relieve symptoms and improve a person's quality of life.

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](#)<sup>1</sup> or other drugs may help with this over time, other treatments may be needed as well.

### 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](#)<sup>2</sup>, but other techniques can also be used.

## Photodynamic therapy (PDT)

[Photodynamic therapy](#)<sup>3</sup> 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.

## 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 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](#)<sup>4</sup>

### **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.

### Hyperlinks

1. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
2. [www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation/photodynamic-therapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation/photodynamic-therapy.html)
4. [www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/thoracoscopy.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/thoracoscopy.html)

### References

Araujo LH, Horn L, Merritt RE, Shilo K, Xu-Welliver M, Carbone DP. Ch. 69 - Cancer of the Lung: Non-small cell lung cancer and small cell lung cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

National Cancer Institute. Physician Data Query (PDQ). Health Professional Version. Small Cell Lung Cancer Treatment. 2019. Accessed at <https://www.cancer.gov/types/lung/hp/small-cell-lung-treatment-pdq> on June 11, 2019.

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# Treatment Choices for Small Cell Lung Cancer, by Stage

For practical reasons, small cell lung cancer (SCLC) is usually [staged](#)<sup>1</sup> as either limited or extensive. In most cases, SCLC has already spread by the time it is found, so [chemotherapy](#)<sup>2</sup> (chemo) is usually part of treatment.

If you smoke, one of the most important things you can do to be ready for treatment is to [quit](#)<sup>3</sup>. Studies have shown that patients who stop smoking after a diagnosis of lung cancer tend to have better outcomes than those who don't.

## Treating limited stage SCLC

### Stage I cancers

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](#)<sup>4</sup> 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 all or part of a lung removed.

Before the operation, the lymph nodes in your chest will be checked for cancer with [mediastinoscopy or other tests](#)<sup>5</sup>, because surgery is unlikely to be a good option if the cancer has spread there.

Surgery is generally followed by [chemotherapy](#)<sup>6</sup>. 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](#)<sup>7</sup>, 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.

In about half of people with SCLC, the cancer will eventually spread to the brain if no preventive measures are taken. For this reason, you may be given [radiation therapy](#)<sup>8</sup> to the head (called **prophylactic cranial irradiation**, or PCI) to try to prevent this. The radiation is usually given in low doses. Still, some patients may have side effects.

### Other limited stage cancers

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](#)<sup>9</sup> plus [radiation](#)<sup>10</sup> 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.

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](#)<sup>11</sup>.

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](#)<sup>12</sup> 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](#)<sup>13</sup> (chemo), possibly along with an [immunotherapy](#)<sup>14</sup> 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 drug atezolizumab (Tecentriq) can be used along with etoposide and 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. Unfortunately, the cancer will still return at some point in almost all people with extensive stage SCLC.

If the cancer responds well to the initial treatment, [radiation](#)<sup>15</sup> to the chest may be given. This can help people with extensive stage SCLC live longer. Radiation to the brain (prophylactic cranial irradiation, or PCI) may also be considered to help prevent cancer progression in the brain.

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](#)<sup>16</sup> or [palliative/supportive care](#)<sup>17</sup> alone. This would include treatment of any [pain](#)<sup>18</sup>, breathing problems, or other symptoms you might have.

Because these cancers are hard to treat, [clinical trials](#)<sup>19</sup> 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](#)<sup>20</sup>, 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. 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](#)<sup>21</sup>). Another option for people whose cancer continues to grow after two or more lines of treatment (including chemo with either carboplatin or cisplatin) are the [immunotherapy](#)<sup>22</sup> drugs nivolumab (Opdivo) or pembrolizumab (Keytruda).

For more on dealing with a recurrence, see [Coping With Cancer Recurrence](#)<sup>23</sup>.

*The treatment information in this document is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of*



*your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.*

## Hyperlinks

1. [www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/staging-sclc.html](http://www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/staging-sclc.html)
2. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
3. [www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html](http://www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html)
4. [www.cancer.org/cancer/lung-cancer/treating-small-cell/surgery.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/surgery.html)
5. [www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/how-diagnosed.html)
6. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
7. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
8. [www.cancer.org/cancer/lung-cancer/treating-non-small-cell/radiation-therapy.html](http://www.cancer.org/cancer/lung-cancer/treating-non-small-cell/radiation-therapy.html)
9. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
10. [www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html)
11. [www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html)
12. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
13. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
14. [www.cancer.org/cancer/lung-cancer/treating-small-cell/immunotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/immunotherapy.html)
15. [www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/radiation-therapy.html)
16. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
17. [www.cancer.org/cancer/lung-cancer/treating-small-cell/palliative.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/palliative.html)
18. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html)
19. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
20. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html)
21. [www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/chemotherapy.html)
22. [www.cancer.org/cancer/lung-cancer/treating-small-cell/immunotherapy.html](http://www.cancer.org/cancer/lung-cancer/treating-small-cell/immunotherapy.html)
23. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/coping-with-cancer-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/coping-with-cancer-recurrence.html)

## References

Araujo LH, Horn L, Merritt RE, Shilo K, Xu-Welliver M, Carbone DP. Ch. 69 - Cancer of

the Lung: Non-small cell lung cancer and small cell lung cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

Hann CL, Wu A, Rekhman N, Rudin CM. Chapter 49: Small cell and Neuroendocrine Tumors of the Lung. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Cancer Institute. Physician Data Query (PDQ). Health Professional Version. Small Cell Lung Cancer Treatment. 2019. Accessed at <https://www.cancer.gov/types/lung/hp/small-cell-lung-treatment-pdq> on June 12, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Small Cell Lung Cancer. V.1.2019. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/sclc.pdf](https://www.nccn.org/professionals/physician_gls/pdf/sclc.pdf) on June 12, 2019.

Parsons A, Daley A, Begh R, Aveyard P. Influence of smoking cessation after diagnosis of early stage lung cancer on prognosis: Systematic review of observational studies with meta-analysis. *BMJ*. 2010;340:b5569.

Price T, Nichols F. Surgical management of small cell lung cancer. In: Pass HI, Carbone DP, Johnson DH, Minna JD, Scagliotti GV, Turrisi AT, eds. *Principles and Practice of Lung Cancer*. 4th ed. Philadelphia, Pa: Lippincott Williams & Wilkins. 2010:521–529.

US Department of Health and Human Services. The Health Consequences of Smoking – 50 Years of Progress. A Report of the Surgeon General. 2014. Accessed at [www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf](http://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf) on June 12, 2019.

Videtic GM, Stitt LW, Dar AR, et al. Continued cigarette smoking by patients receiving concurrent chemoradiotherapy for limited-stage small-cell lung cancer is associated with decreased survival. *J Clin Oncol*. 2003;21:1544-1559.

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