



[cancer.org](https://www.cancer.org) | 1.800.227.2345

# Treating Chronic Lymphocytic Leukemia

If you've been diagnosed with chronic lymphocytic leukemia (CLL), your cancer care team will discuss your treatment options with you. It's important that you think carefully about each of your choices, and to weigh the benefits of each treatment option against the possible risks and side effects.

## Main treatments

Because CLL often grows slowly, not everyone needs to be treated right away. When treatment is needed, the main treatments used are:

- [Chemotherapy for Chronic Lymphocytic Leukemia \(CLL\)](#)
- [Immunotherapy for Chronic Lymphocytic Leukemia \(CLL\)](#)
- [Targeted Therapy Drugs for Chronic Lymphocytic Leukemia](#)
- [Supportive or Palliative Care for Chronic Lymphocytic Leukemia](#)
- [Stem Cell Transplant for Chronic Lymphocytic Leukemia](#)

## Other treatments

Less often, the following treatments might be used to treat CLL:

- [Surgery for Chronic Lymphocytic Leukemia \(CLL\)](#)
- [Radiation Therapy for Chronic Lymphocytic Leukemia \(CLL\)](#)

## Common treatment approaches

It's important to take time and think about your options. Because CLL often grows





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.

- [If Cancer Treatments Stop Working](#)

*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 Chronic Lymphocytic Leukemia (CLL)

Chemotherapy (chemo) uses anti-cancer drugs that are taken by mouth or injected into a vein or muscle to kill or control cancer cells. These drugs enter the bloodstream and reach all parts of the body, so chemo can be useful for cancers that tend to spread throughout the body, like chronic lymphocytic leukemia (CLL).

- [When and how is chemo used to treat chronic lymphocytic leukemia \(CLL\)?](#)
- [Chemo drugs used for chronic lymphocytic leukemia \(CLL\)](#)
- [Possible side effects of chemo](#)
- [More information about chemotherapy](#)

## When and how is chemo used to treat chronic lymphocytic leukemia (CLL)?

In the past, when people with CLL needed to be treated, chemo was usually part of the main treatment (often along with an [immunotherapy](#) drug, known as **chemoimmunotherapy**, or CIT). But as newer, more effective [targeted drugs](#) have become available, chemo is now used less often.

Chemo might be used (often along with an immunotherapy drug) if:

- It's important to get a quick response to treatment
- A person can't be treated with targeted drugs for some reason
- Other drug treatments have already been tried and are no longer helpful

Chemo is also often an important part of the treatment for people getting a [stem cell transplant](#).

Doctors give chemo in cycles, with each treatment period followed by a rest period to allow the body time to recover. Chemo cycles generally last about 3 to 4 weeks. Because of the side effects it can cause (see below), chemo might not be recommended for people in poor health, but age by itself should not keep anyone from getting chemo.

## Chemo drugs used for chronic lymphocytic leukemia (CLL)

The chemo drugs most often used to treat CLL include:

- Fludarabine
- Cyclophosphamide
- Bendamustine
- Chlorambucil
- Corticosteroids, such as prednisone, methylprednisolone, or dexamethasone

Chemo drugs might be combined and/or used with immunotherapy drugs. Examples of common regimens include:

- Fludarabine, cyclophosphamide, and rituximab (FCR)
- Bendamustine and rituximab (BR)

## **Possible side effects of chemo**

Drugs known as **growth factors**, such as G-CSF (filgrastim), pegfilgrastim, and GM-CSF (sargramostim), might be given to increase white blood cell counts and help reduce the chance of infection (see [Infections in People With Cancer](#)<sup>1</sup>).

**Tumor lysis syndrome** is another possible side effect of certain types of chemo. It's most common in people who had large numbers of leukemia cells in their body before treatment. (This may be called **bulky disease**.) It most often happens with the first cycle of chemo. When the CLL cells are killed, they break open and release their contents into the bloodstream. This can overwhelm the kidneys, which can't get rid of all of these substances at once. This can lead to build up of excess amounts of certain minerals in the blood and even kidney failure. The excess minerals can cause heart and nervous system problems. These problems might be prevented by giving the person extra fluids and certain drugs, such as sodium bicarbonate, allopurinol, febuxostat, and rasburicase.

## More information about chemotherapy

Rai KR, Stilgenbauer S. Selection of initial therapy for symptomatic or advanced chronic lymphocytic leukemia/small lymphocytic lymphoma. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/selection-of-initial-therapy-for-symptomatic-or-advanced-chronic-lymphocytic-leukemia-small-lymphocytic-lymphoma> on June 10, 2024.

Rai KR, Stilgenbauer S. Treatment of relapsed or refractory chronic lymphocytic leukemia. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/treatment-of-relapsed-or-refractory-chronic-lymphocytic-leukemia> on June 10, 2024.

Last Revised: July 1, 2024

## Immunotherapy for Chronic Lymphocytic Leukemia (CLL)

Immunotherapy is treatment that either boosts a person's own immune system or uses lab-made versions of the normal parts of the immune system to kill cancer cells or slow their growth. Some types of immunotherapy can be used to treat chronic lymphocytic leukemia (CLL).

- [Monoclonal antibodies](#)
- [Chimeric antigen receptor \(CAR\) T-cell therapy](#)
- [More information about Immunotherapy](#)

### Monoclonal antibodies

Monoclonal antibodies are lab-made versions of immune system proteins (antibodies). Once inside your body, they attach to a specific target (often a protein on the surface of cancer cells). These drugs can help your immune system react to and destroy the cancer cells. Some monoclonal antibodies also fight cancer in other ways.

A monoclonal antibody might be given along with a [targeted drug](#) or with [chemotherapy \(chemo\)](#) as part of the treatment for CLL.







**Alemtuzumab** is a monoclonal antibody that targets the CD52 antigen, which is found on the surface of CLL cells and many T lymphocytes. It can be used mainly if CLL is no longer responding to standard treatments, but it can also be used earlier in the disease. It may be especially useful for people who have CLL with a chromosome 17 deletion,

**Lisocabtagene maraleucel (Breyanzi, also known as liso-cel)** can be used to treat adults with CLL that is still growing or that has returned, typically after treatment with at least 2 types of [targeted drugs](#) has already been tried.

### **Side effects of CAR T-cell therapy**

Because CAR T-cell therapy can have serious side effects, it is only given in medical centers that have special training with this treatment.

These treatments can sometimes cause

- [reactions.html](#)
3. [www.cancer.org/cancer/managing-cancer/side-effects/infections.html](http://www.cancer.org/cancer/managing-cancer/side-effects/infections.html)
  4. [www.cancer.org/cancer/managing-cancer/side-effects/infusion-immune-reactions.html](http://www.cancer.org/cancer/managing-cancer/side-effects/infusion-immune-reactions.html)
  5. [www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/monoclonal-antibodies.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/monoclonal-antibodies.html)
  6. [www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/car-t-cell1.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/car-t-cell1.html)
  7. [www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html)
  8. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

National Cancer Institute. Chronic Lymphocytic Leukemia Treatment (PDQ®)—Health Professional Version. 2024. Accessed at <https://www.cancer.gov/types/leukemia/hp/cll-treatment-pdq> on June 10, 2024.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®):—Health

# Targeted Therapy Drugs for Chronic Lymphocytic Leukemia

Targeted therapies are drugs that specifically focus on some of the changes inside cancer cells that help them grow. Unlike standard chemotherapy drugs, which work by attacking rapidly growing cells in general (including cancer cells), these drugs target one or more specific proteins on or in chronic lymphocytic leukemia (CLL) cells. When treatment is needed for CLL, a targeted drug is often part of the first line of treatment.

- [Bruton's tyrosine kinase \(BTK\) inhibitors](#)
- [BCL-2 inhibitors](#)
- [PI3K inhibitors](#)
- [More information about targeted therapy](#)

## Bruton's tyrosine kinase (BTK) inhibitors

BTK is a protein that normally helps some CLL cells to grow and survive. Drugs that target this protein, known as **BTK inhibitors**, can be helpful in treating CLL.

### Ibrutinib (Imbruvica)

Ibrutinib can be used in the initial treatment of CLL. It has also been shown to help when CLL is hard to treat, for instance, if the CLL cells have a chromosome 17 deletion (del17p) or if the CLL has [come back](#)<sup>1</sup> after other treatments. This drug is a pill taken daily.

**Side effects of ibrutinib** can include diarrhea, nausea, constipation, fatigue, shortness of breath, swelling of the feet and hands, body aches, and rash. Low red blood cell counts (anemia), and low levels of certain white blood cells (neutropenia) and platelets (thrombocytopenia) are also common side effects. Some people treated with this drug get serious infections. Other side effects are also possible, so ask your doctor what you might expect.

### Acalabrutinib (Calquence)

Acalabrutinib can be used in the initial treatment of CLL, or after other treatments have been tried. It might be used alone or along with other drugs. This drug is a capsule taken by mouth, typically twice a day.



BCL-2 is a protein in CLL cells that helps them live longer than they should. Drugs that target this protein, known as **BCL-2 inhibitors**, can be helpful in treating CLL.

### **Venetoclax (Venclexta)**

Venetoclax can be used alone or along with a [monoclonal antibody](#), such as rituximab or obinutuzumab. It's taken as a pill, typically once a day.

### **Side effects of venetoclax**



counts (thrombocytopenia), are also common.

Less often, **more serious side effects** can occur, such as liver damage, severe diarrhea, lung inflammation (pneumonitis), serious allergic reactions, severe skin problems, and holes (perforations) in the intestines.

Old (dormant) **infections** (like hepatitis) may become active again when someone is taking this drug. You may be given preventive (prophylactic) medicines to help keep this from happening. Your cancer care team will also watch you closely for signs of infection.

### **Duvelisib (Copiktra)**

Duvelisib blocks two kinase proteins called PI3K-delta and PI3K-gamma. It's been shown to help treat CLL after other treatments have been tried. It's a pill, typically taken twice a day.

Common **side effects** include diarrhea, fever, fatigue, nausea, cough, pneumonia, belly pain, joint/muscle pain and rash. Low blood counts, including red blood cells (anemia) and certain white blood cells (neutropenia) are also common.

Less often, **more serious side effects** can occur, such as liver damage, severe diarrhea, lung inflammation (pneumonitis), serious allergic reactions, severe skin problems.

**More information about targeted therapy 2 t/muscle pain and rash. Low bo1 gs (a**

---

National Cancer Institute. Chronic Lymphocytic Leukemia Treatment (PDQ®)—Health Professional Version. 2024. Accessed at <https://www.cancer.gov/types/leukemia/hp/ctl-treatment-pdq> on June 10, 2024.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®): Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma, Version 3.2024. Accessed at <https://www.nccn.org> on June 10, 2024.

Rai KR, Stilgenbauer S. Selection of initial therapy for symptomatic or advanced chronic lymphocytic leukemia/small lymphocytic lymphoma. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/selection-of-initial-therapy-for-symptomatic-or-advanced-chronic-lymphocytic-leukemia-small-lymphocytic-lymphoma> on June 10, 2024.

Rai KR, Stilgenbauer S. Treatment of relapsed or refractory chronic lymphocytic leukemia. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/treatment-of-relapsed-or-refractory-chronic-lymphocytic-leukemia> on June 10, 2024.

Last Revised: July 1, 2024

## Surgery for Chronic Lymphocytic Leukemia (CLL)

Surgery has a very limited role in treating chronic lymphocytic leukemia (CLL). Because CLL cells tend to spread widely throughout the bone marrow and to many organs, surgery can't cure this type of cancer. Surgery is rarely needed even to diagnose CLL, which can often be done with blood tests. But there are some situations where surgery might be done.

- [Surgery to help diagnose chronic lymphocytic leukemia \(CLL\)](#)
- [Splenectomy](#)
- [More information about Surgery](#)

## Surgery to help diagnose chronic lymphocytic leukemia (CLL)

Sometimes minor surgery is needed to remove a lymph node (biopsy) or a tumor somewhere else in the body to help diagnose or stage CLL. To learn more, see [Tests for Chronic Lymphocytic Leukemia \(CLL\)](#)<sup>1</sup>.

## Splenectomy

In some people with CLL, the spleen might become enlarged. This is known as **splenomegaly**. One of the spleen's normal functions is to remove worn-out blood cells from the bloodstream. If the spleen gets too large, it can become too active and remove too many blood cells, leading to low levels of red blood cells and platelets. The spleen might also grow so large that it presses on nearby organs and causes problems.

An enlarged spleen can often be treated with medicines (such as corticosteroids) or with radiation. But in some people, the spleen may need to be removed in an operation called a **splenectomy**. This isn't expected to cure the CLL, but it can help improve some of the symptoms and improve blood cell counts, which can lower the need for [blood product transfusions](#)<sup>2</sup>.

Most people have no problem living without a spleen, but they're at higher risk for certain bacterial infections. Doctors recommend that people get certain vaccines before their spleen is removed. If your spleen has been removed, be sure to report any signs of infection to your health care team right away.

## More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)<sup>3</sup>.

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

## Hyperlinks

1. [www.cancer.org/cancer/types/chronic-lymphocytic-leukemia/detection-diagnosis-](http://www.cancer.org/cancer/types/chronic-lymphocytic-leukemia/detection-diagnosis-)

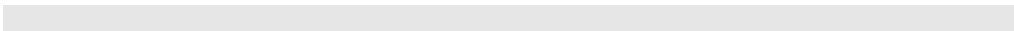
[staging/how-diagnosed.html](#)

2. [www.cancer.org/cancer/managing-cancer/treatment-types/blood-transfusion-and-donation.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/blood-transfusion-and-donation.html)

[www.cancer.org/cancer/managing-cancer/treatment-types/surgery](http://www.cancer.org/cancer/managing-cancer/treatment-types/surgery)

---

## **Radiation Therapy for Chronic Lymphocytic Leukemia (CLL)**



aimed. They can include:

- Skin changes in the treated area, which can vary from mild redness to what looks and feels like a burn
- Fatigue (feeling very tired)
- Low blood cell counts, increasing the risk of infection and bleeding (if radiation is given to the whole body)
- Nausea and vomiting (more common with radiation to the belly)
- Diarrhea (more common with radiation to the belly)

Ask your treatment team what side effects you should look out for and what you can do about them.

### **More information about radiation therapy**

lymphocytic leukemia/small lymphocytic lymphoma. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/selection-of-initial-therapy-for-symptomatic-or-advanced-chronic-lymphocytic-leukemia-small-lymphocytic-lymphoma> on June 13, 2024.

Rai KR, Stilgenbauer S. Treatment of relapsed or refractory chronic lymphocytic leukemia. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/treatment-of-relapsed-or-refractory-chronic-lymphocytic-leukemia> on June 13, 2024.

Last Revised: July 1, 2024

## Supportive or Palliative Care for Chronic Lymphocytic Leukemia

Supportive care for chronic lymphocytic leukemia (CLL) is aimed at helping with symptoms or other problems related to the leukemia and its treatment, as opposed to treating the CLL itself. For instance, some people with CLL have infections or low blood cell counts.

- [Treatments to help prevent infections](#)
- [Treatments for low blood counts](#)
- [Treating very high white blood cell counts \(leukapheresis\)](#)
- [More information about palliative care](#)

Although treating the CLL directly (with [targeted drugs](#), [chemotherapy](#), and/or [immunotherapy](#)) may help with some of the problems related to CLL over time, other treatments may be needed in the meantime.

### Treatments to help prevent infections

People with CLL often have weakened immune systems. This can be from the CLL itself, as well as from some of the medicines used to treat it. Because of this, people with CLL are at higher risk for infections, which can sometimes be serious.

## Antibiotic and antiviral medicines

Some medicines used to treat CLL, including some chemo drugs can raise your risk of certain infections such as cytomegalovirus (CMV) and pneumonia caused by *Pneumocystis jiroveci*.

You might be given an antiviral drug like acyclovir or valacyclovir to help lower your risk of CMV infection. To help prevent Pneumocystis pneumonia, a sulfa antibiotic is often given (such as trimethoprim with sulfamethoxazole). Other treatments are available for people who are allergic to sulfa drugs.

Some drugs used to treat CLL can also cause dormant viruses to become active. For instance, if you already carry the hepatitis B virus (HBV) or CMV, CLL treatment may allow them to grow and cause problems. Blood tests will be done to watch virus levels. You might be given drugs to help keep these viruses under control.

Antibiotics, antiviral, and antifungal drugs are also used to treat infections. Often, active infections require higher doses or different drugs from those used to prevent infections.

## Intravenous immunoglobulin (IVIG)

Some people with CLL don't make enough antibodies (immunoglobulins) to fight infections. This can lead to repeated lung and/or sinus infections. Antibody levels can be checked with a blood test, and if they're low, antibodies from donors might be given into a vein (IV) to raise the levels and help prevent infections. These donated antibodies are called **intravenous immunoglobulin (IVIG)**.

Most people with CLL don't usually need IVIG . If it is (such as in people who are getting a lot of infections), it's often given about once a month at first, and then less often over time. IVIG can also be given as needed based on blood tests of antibody levels.

## Vaccines

Vaccines to help prevent certain infections are often an important part of the care for people with CLL. But there might be times when vaccines might not be recommended, such as when you're being treated with medicines that weaken your immune system (which could make vaccines less effective). If you have CLL, it's best to speak to your health care provider before getting any vaccine.

Some examples of vaccines usually recommended for people with CLL include yearly flu (influenza) shots, COVID-19 vaccines, the pneumococcal vaccine (to help prevent



pneumonia), and the recombinant zoster vaccine (to help prevent shingles).

It's important for people with weak immune systems to avoid vaccines that contain live viruses. These vaccines can sometimes cause serious infections in people with weak immune systems.

For more information on vaccines, see [Vaccinations and Flu Shots for People with Cancer](#)<sup>1</sup>.

## Treatments for low blood counts

CLL or its treatment can cause low blood cell counts, especially red blood cells and platelets, which normally help the blood clot.

Having a **low red blood count (anemia)** can make you feel tired, lightheaded, or short of breath. Anemia can have different causes. If anemia is causing symptoms, it can be treated with [red blood cell transfusions](#)<sup>2</sup>. These are often given in an outpatient clinic.

Having a **low platelet count** can lead to serious bleeding. Platelet transfusions can help prevent this.

In some people with CLL, low red blood and platelet counts can also be caused by the cells being destroyed by abnormal antibodies.

When antibodies cause low numbers of platelets, it's called **immune thrombocytopenia (ITP)**. Before diagnosing this, the bone marrow is often checked to make sure that something else isn't causing the low platelet counts. In ITP, giving platelet transfusions doesn't usually help increase the platelet counts, because the antibodies just destroy the new platelets, too. This can be treated with drugs that affect the immune system, like corticosteroids, IVIG, and the antibody drug rituximab. Another option is to [remove the spleen](#), since after the antibodies stick to the platelets, they're actually destroyed in the spleen.

When antibodies cause low red blood cell counts, it's called **autoimmune hemolytic anemia (AIHA)**. This also can be treated with drugs that affect the immune system, like corticosteroids, IVIG, and rituximab. [Removing the spleen](#) is another option. Sometimes AIHA can develop while you're getting certain drugs, so stopping the drug may be helpful.

## Treating very high white blood cell counts (leukapheresis)

Although it's rare, some people with CLL have very high numbers of leukemia cells in their blood when they're first diagnosed, which causes problems with their blood circulation. This is called **leukostasis**, and it needs to be treated right away.

Sometimes treating CLL with medicines such as targeted drugs, chemotherapy, and/or immunotherapy might not lower the number of leukemia cells right away. Because of this, a procedure called **leukapheresis** may be used first. In this treatment, your blood is passed through a special machine that takes out the white blood cells (including leukemia cells) and returns the rest of the blood back into your bloodstream.

Two intravenous (IV) lines are needed for this treatment the blood is removed through one IV, and then returned to your body through the other IV. Sometimes, a single large catheter is put in near the neck or under the collar bone instead of using IV lines in the arms. This type of catheter is called a [central venous catheter \(CVC\)](#)<sup>3</sup> or **central line** and has both IVs built into it.

Leukapheresis works quickly to get the number of leukemia cells down. The effect is only for a short time, but it may help until other treatments have a chance to work.

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

To learn about some of the side effects of cancer or treatment and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>5</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects/infections/vaccination-during-cancer-treatment.html](http://www.cancer.org/cancer/managing-cancer/side-effects/infections/vaccination-during-cancer-treatment.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/blood-transfusion-and-donation.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/blood-transfusion-and-donation.html)
3. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/tubes-lines-ports-catheters.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/tubes-lines-ports-catheters.html)
4. [www.cancer.org/cancer/managing-cancer/palliative-care.html](http://www.cancer.org/cancer/managing-cancer/palliative-care.html)
5. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

Centers for Disease Control and Prevention (CDC). There Are Vaccines You Need as an Adult. 2021. Accessed at <https://www.cdc.gov/vaccines/adults/index.html> on June 14, 2024.

---

## **Stem Cell Transplant for Chronic Lymphocytic Leukemia**



## Allogeneic SCT

In an **allogeneic transplant**, the stem cells come from someone else (a donor). To lower the chance of serious health problems, the donor needs to match the patient in terms of tissue type. Often, a close relative, like a brother or sister is a good match. Less often, a matched unrelated donor may be found.

This type of transplant can cause severe or even life-threatening complications and side effects, so it's often not a good option in people who are older or have other health problems.

**Non-myeloablative transplant (mini-transplant):** For people who are older or who have other health issues and can't tolerate a standard allogeneic transplant that uses high doses of chemo, a non-myeloablative transplant (also known as a mini-transplant or reduced-intensity transplant) might still be an option. For this type of transplant, a person gets lower doses of chemo and radiation that don't completely destroy the cells in their bone marrow. They then get the allogeneic (donor) stem cells. These cells enter the body and establish a new immune system, which sees the leukemia cells as foreign and attacks them (a **graft-versus-leukemia** effect).

This is the most common type of SCT used to treat CLL.

## Autologous SCT

For an **autologous transplant**, the person's own stem cells are collected from their blood or bone marrow before treatment. They are frozen and stored while the person gets treatment (high-dose chemotherapy and/or radiation). In the lab, a process called purging may be used to try to remove any leukemia cells in the samples. The stem cells are then put back (reinfused) into the patient's blood after treatment. One problem with this type of SCT is that there might be remaining leukemia cells that might be given back to the person along with the stem cells.

This type of SCT is rarely used to treat CLL.

## More information about stem cell transplant

[G 7Tooeduti learsyd oblemnag 0 0 m,2 49m 1 7htol1.73-rg21ls](#)

---

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects/infections.html](http://www.cancer.org/cancer/managing-cancer/side-effects/infections.html)
2. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
3. [www.cancer.org/cancer/managing-cancer/treatment-types/stem-cell-transplant.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/stem-cell-transplant.html)
4. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

National Cancer Institute. Chronic Lymphocytic Leukemia Treatment (PDQ®)—Health Professional Version. 2024. Accessed at <https://www.cancer.gov/types/leukemia/hp/cll-treatment-pdq> on June 14, 2024.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®): Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma, Version 3.2024. Accessed at <https://www.nccn.org> on June 14, 2024.

Negrin RS, Rai KR. Hematopoietic cell transplantation in chronic lymphocytic leukemia. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/hematopoietic-cell-transplantation-in-chronic-lymphocytic-leukemia> on June 14, 2024.

Rai KR, Stilgenbauer S. Treatment of relapsed or refractory chronic lymphocytic leukemia. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/treatment-of-relapsed-or-refractory-chronic-lymphocytic-leukemia> on June 14, 2024.

Last Revised: July 1, 2024

---

# Typical Treatment of Chronic Lymphocytic Leukemia

Treatment options for chronic lymphocytic leukemia (CLL) can vary, based on things like if the leukemia is causing symptoms or other problems, if the leukemia cells have certain gene or chromosome changes, and a person's age and overall health.

- [Initial treatment of CLL](#)
- [Second-line or later treatments for CLL](#)
- [Treating complications of CLL](#)

Many people live a long time with CLL, but in general it is very hard to cure, and treating it right away, especially if it isn't causing problems, hasn't been shown to help people live longer. Because of this, and because treatment can cause [side effects](#),<sup>1</sup> doctors often advise waiting until the leukemia is progressing or causing bothersome symptoms before starting treatment.

If treatment is needed, some important factors to take into account include the person's age and overall health, and [prognostic factors](#)<sup>2</sup> such as the leukemia cells having a deletion in chromosome 17 or a *TP53* gene mutation, or an unmutated version of the *IGHV* gene.

## Initial treatment of CLL

If CLL needs to be treated, there are many options for first-line treatment, including [targeted drugs](#), [chemotherapy](#), [immunotherapy](#), and different combinations of these.

- Chlorambucil and obinutuzumab

Other drugs or combinations of drugs may also be used.

### **Radiation or surgery**

If the only problem is an enlarged spleen or swollen lymph nodes in one part of the body, localized treatment with low-dose [radiation therapy](#) may be an option.

[Splenectomy](#) (surgery to remove the spleen) is another option if the enlarged spleen is causing symptoms.

### **Stem cell transplant**

It's not common, but some people who have very high-risk CLL (based on [prognostic factors](#)<sup>4</sup>) may be referred for a [stem cell transplant \(SCT\)](#) early in treatment.

### **Second-line or later treatments for CLL**

If the first treatment for CLL is no longer working, or if the leukemia [comes back](#)<sup>5</sup>, another type of treatment often helps. The options are generally the same as with the first treatment (targeted drugs, immunotherapy, and possibly chemotherapy), although they will depend on what the first treatment was and how well it worked, as well as other factors such as a person's overall health.

If the response to the initial treatment lasted a long time (usually at least a few years), the same treatment might be used again. If the initial response wasn't long-lasting, using the same treatment isn't as likely to be helpful.

Many of the same drugs and combinations listed above (as well as others) may be options as second-line treatments. Targeted therapy drugs and monoclonal antibodies are commonly used, alone or in combination. Chemo drugs might also be an option for some people.

Other types of treatments might be options as well. For example, some people who've already had treatment might benefit from a type of immunotherapy known as [CAR T-cell therapy](#).

At some point, a [stem cell transplant](#) may be an option for some people, especially if they have a type of CLL that's harder to treat, such as if the cells have a chromosome 17 deletion or a *TP53* gene mutation.



[Clinical trials](#)<sup>6</sup> of newer treatments might also be a good option at some point, especially if many treatments have been tried.

## Treating complications of CLL

People with CLL are at risk for a number of complications, including low blood counts, infections, and an increased risk of some more aggressive types of cancer. Treating the CLL itself might help with some of these. But sometimes other types of treatments might be needed as well.

### Low blood cell counts and infections

CLL can sometimes cause serious problems with low blood counts and infections. These are discussed in [Supportive or Palliative Care for Chronic Lymphocytic Leukemia](#).

### Leukapheresis for very high white blood cell counts

Although it's rare, some people with CLL have very high numbers of leukemia cells in their blood when they're first diagnosed, which causes problems with their blood circulation. This is called **leukostasis**, and it needs to be treated right away. Sometimes a procedure called **leukapheresis** might be used to remove the white blood cells, although this isn't used very often.

To learn more, see [Supportive or Palliative Care for Chronic Lymphocytic Leukemia](#).

### Other cancers

One of the most serious complications of CLL is a change (transformation) in the leukemia to a high-grade or aggressive type of \_\_\_\_\_

\_\_\_\_\_



4. [www.cancer.org/cancer/types/chronic-lymphocytic-leukemia/detection-diagnosis-staging/staging.html](http://www.cancer.org/cancer/types/chronic-lymphocytic-leukemia/detection-diagnosis-staging/staging.html)
5. [www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html](http://www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html)
6. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
7. [www.cancer.org/cancer/types/non-hodgkin-lymphoma.html](http://www.cancer.org/cancer/types/non-hodgkin-lymphoma.html)
8. [www.cancer.org/cancer/types/hodgkin-lymphoma.html](http://www.cancer.org/cancer/types/hodgkin-lymphoma.html)
9. [www.cancer.org/cancer/types/acute-lymphocytic-leukemia.html](http://www.cancer.org/cancer/types/acute-lymphocytic-leukemia.html)
10. [www.cancer.org/cancer/types/acute-myeloid-leukemia.html](http://www.cancer.org/cancer/types/acute-myeloid-leukemia.html)

Last Revised: July 1, 2024

---

## Treating Hairy Cell Leukemia (HCL)

Hairy cell leukemia (HCL) tends to grow slowly. People with HCL who aren't having symptoms often don't need to be treated right away, but they do need to be watched carefully. Doctor visits are done every few months to check for signs the HCL is growing and to see if it's causing any problems (like low blood counts, fatigue, or an enlarged spleen). Some people with HCL live for many years without having symptoms or needing treatment.

- [When does hairy cell leukemia \(HCL\) need to be treated?](#)
- [Which treatments are used for hairy cell leukemia \(HCL\)?](#)
- [Treatment of other problems caused by hairy cell leukemia \(HCL\)](#)

### When does hairy cell leukemia (HCL) need to be treated?

Treatment may be advised for people with HCL if they have low blood cell counts, recurrent infections, an enlarged spleen or lymph nodes, or other bothersome symptoms.

progressing, and help people live longer.

## Which treatments are used for hairy cell leukemia (HCL)?

The first treatment for HCL is most often [chemotherapy \(chemo\)](#)<sup>1</sup>, with either cladribine (2-CdA) or pentostatin. Sometimes the [monoclonal antibody](#) rituximab is given after the chemo.

Most often HCL responds well to these drugs, and the responses often last for many years.

If the leukemia comes back at some point, it can often be treated with the same drug again, especially if the HCL stayed in remission for a long time (typically at least 2 years). If one chemo drug doesn't work, another can be tried.

In rare cases where HCL doesn't respond to chemo, or if the response to treatment doesn't last for long, other types of medicines might be tried. For example, targeted drugs known as **BRAF inhibitors**, such as vemurafenib (sometimes with rituximab) or dabrafenib (plus trametinib) might be options. [BTK inhibitors](#) might also be an option, as might rituximab alone or [peginterferon-alfa](#)<sup>2</sup>, a type of immunotherapy.

If a person is uncomfortable because of an enlarged spleen, [surgery](#) to remove the spleen (splenectomy) can often help relieve pain.

## Treatment of other problems caused by hairy cell leukemia (HCL)

Like chronic lymphocytic leukemia (CLL), HCL can cause low blood counts and infections. Treatment of these problems is discussed in [Supportive or Palliative Care for Chronic Lymphocytic Leukemia](#).

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/cytokines.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/cytokines.html)

## References

National Cancer Institute. Hairy Cell Leukemia Treatment (PDQ®)—Health Professional Version. 2024. Accessed at <https://www.cancer.gov/types/leukemia/hp/hairy-cell-treatment-pdq> on June 20, 2024.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®): Hairy Cell Leukemia. Version 2.2024. Accessed at <https://www.nccn.org> on June 20, 2024.

Tallman MS. Treatment of hairy cell leukemia. UpToDate. 2024. Accessed at <https://www.uptodate.com/contents/treatment-of-hairy-cell-leukemia> on June 20, 2024.

Last Revised: July 1, 2024

### Written by

The American Cancer Society medical and editorial content team  
(<https://www.cancer.org/cancer/acs-medical-content-and-news-staff.html>)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as editors and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**