

# Acute Lymphocytic Leukemia (ALL): Chemotherapy



## What is chemotherapy?

Chemotherapy (chemo) uses strong medicines to kill cancer cells. The medicines kill cells that grow quickly, like cancer cells. Some normal cells also grow quickly. Because of this, chemo can harm those cells. This causes side effects.

## When might chemotherapy be used for ALL?

Chemo is the main treatment for nearly all people with acute lymphocytic leukemia (ALL).

If the first treatment with chemo doesn't work, your healthcare provider may advise another kind of chemo. This might be given in high doses as part of a stem cell transplant. It depends on a variety of factors, such as your age, overall health, and if the first treatment worked at all.

## How is chemotherapy given for ALL?

You will meet with a hematologist/oncologist before chemo treatment starts. This healthcare provider specializes in treating blood cancers like leukemia. The provider will talk with you about your treatment options and what you might expect.

Chemo for ALL is often given in phases. This gives the medicines a better chance of working well. The total treatment can take up to 3 years. The treatment phases of ALL include:

- **Remission induction or induction therapy.** The goal of this phase is to quickly kill as many leukemia cells as possible. Strong medicines are used, and you're in the hospital for this phase. You may be there for up to 6 weeks. Induction usually puts the leukemia into remission. Remission means no ALL cells can be found in your body.
- **Consolidation (intensification) therapy.** The goal of this phase is to kill any remaining leukemia cells and keep you in remission. High doses of chemo are given in cycles over 4 to 6 months.
- **Maintenance therapy.** The goal of this phase is to keep the leukemia in remission over a long period of time. This phase lasts about 2 years. Many times the chemo is pills you can take at home.

Chemo in the first 2 phases can be intense. You may need to spend a lot of time in the hospital. Tests will be done to be sure treatment is working.

## What is intrathecal chemotherapy?

Intrathecal chemotherapy is used for many people with ALL. For this treatment, chemo is put right into your cerebrospinal fluid (CSF). This is the fluid that surrounds your brain and spinal cord. The chemo is given through a lumbar puncture. This means it's put in your CSF by putting a needle between the bones of the lower part of your spine. A lumbar puncture can cause some pain.

This treatment is often used to treat ALL in your CSF or to keep it from spreading to your spine or brain. It's often started during the induction phase and may be done throughout your treatment. Most of the time the chemo medicines methotrexate and cytarabine are used.

If you need long-term CSF treatment, minor surgery can be done to put a small, soft plastic dome just under your scalp. The dome is called an Ommaya reservoir. It's connected to a thin tube that ends in your brain. A needle can be put into the dome to take out CSF for testing and to put chemo right into your CSF. It can also be used to check for signs of infection. When you no longer need it, the Ommaya reservoir is taken out.

## Treatment in the remission induction phase

This first phase of treatment is often started very soon after finding out you have ALL. You'll likely get a combination of at least 3 chemo medicines. They are used together to make it more likely that the treatment will work. Which medicines you get and how long you receive them depends on many factors. These include your age, overall health, the subtype of ALL (gene changes in the ALL cells), and how well the leukemia responds to treatment.

The medicines most often used in this phase include:

- Vincristine
- Dexamethasone or prednisone
- Doxorubicin or daunorubicin
- Cyclophosphamide
- L-asparaginase or peg-asparaginase
- Cytarabine
- Methotrexate
- Etoposide

You may also need blood transfusions during this time if your blood cell counts get too low. Your healthcare team will watch you closely for side effects. Side effects are more likely if you get high doses of chemo.

People whose leukemia cells have the Philadelphia chromosome will likely also get a targeted therapy medicine along with chemo. Examples of this kind of medicine are imatinib and ponatinib. Targeted therapy medicine is taken daily as pills.

A few weeks after treatment, a bone marrow biopsy and aspiration will be done. This is to look for remaining leukemia cells. If there are still leukemia cells in your bone marrow, you may have a second course of chemo. This is done to try to put the leukemia into remission.

## **Treatment in the consolidation (intensification) phase**

Once your leukemia is in remission, the next phase of treatment is consolidation. This is an intense course of chemotherapy given in cycles. The cycles include a treatment time and a rest or recovery time. Consolidation is done to try to kill any remaining cancer cells.

This phase includes many of the same medicines used in the induction phase. Some people may have a stem cell transplant during this phase of treatment. Intrathecal chemotherapy may also still be given. If your leukemia cells have the Philadelphia chromosome, you'll get targeted therapy in this phase.

## **Treatment in the maintenance phase**

This long phase of treatment is needed for most types of ALL. It's done because there still may be traces of leukemia cells in your body. The most common medicines used in this phase of treatment are methotrexate and mercaptopurine. If your leukemia cells contain the Philadelphia chromosome, you'll also get targeted therapy in this phase.

You don't have to be in the hospital to get maintenance treatment. Many of the medicines used are pills you can take at home. There also tend to be fewer treatment side effects.

## **What are common side effects of chemotherapy?**

Chemo medicines attack and kill cells that divide quickly, including cancer cells. These medicines can also affect normal cells that grow quickly. These include hair, cells that line your mouth and throat, and bone marrow cells where your new blood cells are made. High doses of chemo are used for ALL. This can sometimes lead to serious side effects. Chemo side effects are different for everyone. Most go away over time after treatment ends.

The most common short-term side effects of chemotherapy for ALL include:

- Nausea and vomiting
- Loss of appetite
- Easy bruising or bleeding, from low levels of platelets in the blood
- Tiredness, from having low levels of red blood cells
- Infections, from low levels of white blood cells
- Hair loss
- Headaches
- Loss of sexual desire
- Mouth sores
- Pain when swallowing
- Diarrhea
- Skin and nail changes
- Pain, numbness, or tingling in the hands or feet (neuropathy)

Some side effects may not go away after treatment. For instance, some medicines may damage the heart or other organs, or they may affect your ability to have children (fertility). Neuropathy may last months or years in certain cases. Healthcare providers try to limit this damage by doing tests to closely watch the way your body responds to chemo. Some chemo medicines may raise your risk of having other types of cancer later on. These risks need to be weighed against the benefits these medicines provide in treating your ALL. Be sure to tell your healthcare team about all the side effects you experience. There may be ways to manage the side effects or prevent them from getting worse.

## Working with your healthcare provider

It's important to know which medicines you're taking. Write down the names of all the medicines you're taking. Ask your healthcare team what each one is for, how they work, and what side effects you might have.

Talk with your healthcare providers about what signs to look for and when to call them. Make sure you know what number to call with problems or questions, even on evenings, holidays, and weekends.

It may be helpful to keep a diary of your side effects. Write down physical, emotional changes, as well as changes in the way you think. A written list will make it easier for you to remember your questions when you go to your appointments. It will also make it easier for you to work with your medical team to make a plan to manage your side effects.

© 2000-2027 The StayWell Company, LLC. All rights reserved. This information is not intended as a substitute for professional medical care. Always follow your healthcare professional's instructions  
This information is not intended as a substitute for professional medical care. Always follow your Healthcare professional's instructions. Copyright Krames LLC.