

Acute Lymphocytic Leukemia (ALL): Radiation Therapy



What is radiation therapy?

Radiation therapy uses high-energy X-rays to kill cancer cells or stop them from growing. A machine directs the beams of energy at the tumor. Radiation therapy is also called radiotherapy. Its goal is to kill cancer cells or shrink tumors.

When might radiation therapy be used for acute lymphocytic leukemia (ALL)?

Radiation therapy is sometimes used along with chemotherapy (chemo) to treat ALL. It might be used this way if:

- **You're having a stem cell transplant.** This is rarely done, but you may get radiation to your whole body to help kill your bone marrow cells and any leukemia cells. This is called total body irradiation (TBI). It's given along with chemotherapy. TBI may be used to help keep your body from rejecting the transplanted stem cells. It sends radiation in equal doses to all of your body.
- **You need radiation to help manage certain symptoms.** If chemo isn't working, radiation can stop the growth of leukemia cells in your bone marrow. Killing the cancer cells can help ease bone pain caused by the buildup of ALL cells.
- **There's a risk that ALL cells will invade your central nervous system (CNS).** The CNS is your brain and spinal cord. Radiation can be used to keep leukemia cells from getting into and growing in your CNS. This is called prophylactic or preventive radiation therapy. It can be part of all phases of ALL treatment.
- **ALL has spread to your CNS (brain and spine) or to another organ.** Radiation can be used as focused treatment on the leukemia cells in certain parts of your body. Chemo cannot easily reach all parts of your body, so they're sometimes hiding places for ALL cells. Radiation aimed at these areas can kill the cancer cells there. In rare cases, a tumor may grow and cause problems with how an organ works. Radiation can be used to shrink the tumor so the organ can work better.

Where is radiation therapy given?

You can get radiation as an outpatient or as an inpatient. Outpatient means you go in, get treated, and go home the same day. Inpatient means you stay overnight in the hospital. Treatment directed at just a small part of your body is often done as an outpatient. If you're getting ready for a stem cell transplant, radiation is done as an inpatient.

Getting ready for radiation therapy

A healthcare provider who specializes in treating cancer with radiation is called a radiation oncologist. This healthcare provider works with you to decide the kind of radiation you need and determines the dose and length of treatment needed.

A session called a simulation is done before you start radiation treatment. Imaging tests, like MRI or CT scans, are done to clearly outline the size and shape of the tumor. The radiation beams are controlled and formed to fit this shape and focus on the tumor. This helps limit damage to nearby healthy tissue.

Your treatment team also decides what position you'll need to be in for treatment. The radiation needs to be pointed at the exact same spot on your body each time. This spot is called your treatment field or port. A body mold might be made to help put you in the exact same position for each treatment. Your radiation port might be marked with tiny dot tattoos. Lasers on the machine can be lined up with the dots to be sure the radiation is aimed at the tumor.

If you're getting TBI as part of a stem cell transplant, your whole body will be treated. TBI may be done as one treatment, where you get the whole dose of radiation, or the dose may be divided up and given over a few days.

During a radiation treatment session

Treatment is a lot like getting an X-ray, but it takes longer, up to 15 or 30 minutes. TBI can take longer.

At the start of the treatment session, a radiation therapist helps you get into position and may use blocks or special shields to protect other parts of your body from exposure to radiation. The therapist then lines up lights on the machine with the marks on your skin so the radiation is directed to the right spot.

When you're ready, the therapist leaves the room and turns the machine on. You may hear whirring or clicking noises as the machine moves during radiation. This may sound like a vacuum cleaner. The machine won't touch you. During the session, you'll be able to talk to and hear the therapist over an intercom. You can't feel radiation, so the process will be painless. You will not be radioactive afterward.

During total body irradiation (TBI)

To get TBI as part of a stem cell transplant, you stand in a special machine or lie down on either your stomach or your back. Special shields may be used to protect certain organs from high-dose radiation. These include your lungs, heart, and kidneys. Sometimes the machine also helps protect these tissues by moving little metal shields where the beam comes out.

Possible side effects of radiation therapy

Radiation affects normal cells as well as leukemia cells. Because of this, you may have side effects from this treatment. The dose, frequency, and the treatment area are linked to what side effects you might have and how bad they are. Some people have few or no side effects.

If you do have side effects that are very significant, your healthcare provider may change the dose of your radiation or how often you get treatment. Or treatment may be stopped until your side effects clear up. Tell your healthcare provider about any side effects you have right away. It's important to treat them before they get worse.

Short-term side effects

These often start a few weeks into or even after treatment. Common side effects are:

- Loss of appetite
- Diarrhea, if your belly is treated
- Tiredness
- Hair loss at your treatment port
- Nausea and vomiting
- Mouth and throat sores, if your head and neck are treated
- Headaches, if your head is treated
- Skin irritation, including blistering and peeling at your radiation port
- Infection
- Low blood counts

The immediate side effects of TBI tend to be worse and can affect your whole body. They include a high risk for infection because of a decrease in your white blood cells, and damage to your skin and mucous membranes.

Long-term side effects

These may not show up until many years after treatment. They may include:

- Ongoing skin problems, such as redness
- Inflammation of the lungs (called interstitial pneumonitis)
- Decreased bone and soft tissue growth, which mostly affects children
- Slow intellectual development in children who get radiation to the brain as part of their treatment
- Hearing loss
- Clouding of the lenses of the eye (cataracts)
- Reduced ability to have children (decrease or loss of fertility)
- Growth of another kind of cancer (called a secondary cancer)
- Damage to the heart, lungs, or kidneys

Working with your healthcare providers

Talk with your healthcare providers about what side effects you should watch for. Also talk about what can be done to prevent or ease them. Know when you should call your healthcare team. Make sure you know what number to call with questions or problems, even after office hours and on holidays and weekends.

It may be helpful to keep a diary of your side effects. Write down any changes you notice, how bad they are, and when they happen. A written list can make it easier for you to remember your questions when you go to your next appointment. It can also make it easier for you to work with your treatment team to make a plan to manage side effects.

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