What Is Acute Lymphoblastic Leukemia? What to Know About This Blood Cancer

If you have this type of blood and bone marrow cancer, it's important to start treatment right away.

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Any time someone is diagnosed with "acute" *anything*, you know it's something that requires attention—pronto. That's certainly true with certain cancers.

If it's acute lymphoblastic leukemia (ALL), you need to act swiftly because, without treatment, this blood cancer progresses rapidly, says the Leukemia and Lymphoma Society (LLS).

Here's what to know about this type of cancer, including common treatment options.

What is acute lymphoblastic leukemia?

Leukemia is an umbrella term for a wide variety of blood cancers. As you might have guessed from the name, ALL (also called acute lymphocytic leukemia) is an acute type of leukemia, as opposed to a chronic one, says Moffitt Cancer Center. This means it tends to be aggressive and therefore requires prompt treatment.

ALL impacts the lymphocytes, a type of white blood cell. In healthy people, these cells are made in the bone marrow where they start as immature cells called lymphoblasts; then turn into lymphocytes and then travel through the bloodstream fighting off germs, says the American Society for Clinical Oncology (ASCO). In people who have ALL, however, these cells never develop properly and instead remain as lymphoblasts.

Also problematic: An overproduction of these immature lymphocytes (aka lymphoblasts) means there isn't enough room in the bone marrow for other types

of white blood cells, ASCO explains. Red blood cells (which carry oxygen) and platelets (crucial for blood clotting) also get crowded out.

These disruptions to normal cell production can lead to an array of problems, including anemia, infections, and abnormal bruising or bleeding.

As a blood cancer, ALL can spread fairly easily to other parts of the body, including the lymph nodes, liver, spleen, and brain, says the American Cancer Society (ACS). Unlike other cancers that start as a solid mass (tumor), "we call leukemias liquid tumors because they're in the blood and can spread all over the place," says Jeffrey Schriber, MD, director of Hematologic Malignancies at Cancer Treatment Centers of America in Phoenix.

This spread often happens before a patient is even diagnosed, but that doesn't mean the prognosis is always grim. ALL is the most common type of cancer in children and teens, says ACS, but 98% of children who are diagnosed with it go into remission within just a few weeks of starting treatment. About 90% of those kids will be cured, says St. Jude Children's Research Hospital.

The numbers are somewhat different for adults who develop ALL. ACS says about 80-90% of adult ALL patients will reach remission; unfortunately, about half will ultimately relapse.

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What are the risk factors for ALL?

ALL is relatively rare. You have about a 1 in 1,000 chance of chance of getting it in your lifetime, ACS reports. For comparison, Susan G. Komen says the lifetime risk of breast cancer for women in 1 in 8.

Anyone can develop ALL, but some people are at higher risk than others. Children and adults over age 50 are the most apt to develop it, according to ACS.

Genetic disorders including Down syndrome and Bloom syndrome increase the risk, as does exposure to radiation and some chemicals like benzene, the University of Michigan's Rogel Cancer Center points out.

Most of the time, an inherited mutation is not to blame for the development of ALL, says LLS. However, according to ACS, you can acquire mutations anytime during your life as your cells divide and replicate. Many ALL patients have an acquired mutation called the Philadelphia chromosome, which is a type of translocation (when DNA from one chromosome breaks off and attaches to a different chromosome).

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What are the symptoms of ALL?

Symptoms of ALL tie back to the fact that the disease interferes with the normal production of the blood cells your body needs to function properly, explains UPMC Hillman Cancer Center. Leukemia patients, including those with ALL, overproduce immature/abnormal white blood cells, which ends up interfering with the production of healthy white blood cells as well as red blood cells and platelets.

"It's like using 90% of your phone for music," says Dr. Schriber. "You run out of memory."

Lack of healthy white blood cells can lead to unexplained fevers or frequent infections, says LLS. Lack of red blood cells may make you unusually exhausted, pale, and dizzy. And too few platelets means you might get black and blue very easily or find that it takes longer for your blood to clot if you get a cut or scrape.

ALL might also cause bone or joint pain, night sweats, pain or fullness below the ribs, or painful breathing, says LLS.

How is ALL diagnosed?

Since symptoms are not terribly specific, the first step in diagnosing any leukemia is blood work. People with ALL often have an ususually high number of white cells (though these are not healthy/protective ones) and red blood cell and platelet count tend to be low, LLS explains.

If blood tests suggest that any kind of leukemia is a possibility, the next step is usually a bone marrow aspiration and biopsy, per LLS. A doctor will use a thin needle to remove a liquid marrow sample and a small amount of bone marrow, probably from your hip bone. These samples can then be analyzed along with blood samples in a lab to determine whether you have leukemia and, if so, if it's ALL or another type.

If you do have ALL, your doctor should then tell you which subtype you have. LLS describes two main subtypes: B-cell lymphoblastic leukemia/lymphoma and T-cell lymphoblastic leukemia. The B-cell type impacts B-cell lymphocytes, which are the white blood cells that clean up after T-cells attack a virus or bacteria. Most people with ALL have the B-cell type.

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How is ALL treated?

With blood cancer, there's no solid tumor to surgically remove like there would be with breast cancer or lung cancer. That's why the standard first-line treatment is usually chemotherapy.

Chemo kills cancer cells and stops them from replicating. ALL patients generally require three phases of chemo, per the University of Rochester Medical Center. The first, called induction, is designed to kill leukemia cells in the blood and bone marrow and get blood cell counts back to normal. The next, called consolidation/intensification, aims to get rid of any remaining cancer cells and prevent a relapse. The third, called maintenance, usually contains a lower dose of chemo but takes a couple of years to complete.

Some ALL patients may be candidates for radiation or targeted therapy. Radiation uses high doses of X-rays or other particles to kill off cancer, ASCO explains. Targeted therapy is medication, usually taken orally, that targets a specific part of the cancer cells and mostly spares healthy tissue, notes ACS. About a quarter of adult ALL patients have an abnormal chromosome called the Philadelphia chromosome, which makes them excellent candidates for targeted therapy drugs

like like imatinib (Gleevec), that, when combined with chemo, are often very effective, says the National Center Institute.

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