

What is Acute Lymphoblastic (Lymphocytic) Leukemia?

Leukemia that begins in the lymphoid cells is called lymphoid, lymphoblastic or lymphocytic leukemia. Acute Lymphocytic Leukemia is called ALL. It is a cancer of the blood cells in which too many lymphoid cells (a type of white blood cell) are made by the bone marrow and organs of the lymph system. ALL is a type of cancer that grows quickly without treatment.

ALL can be tested and grouped into different categories or subtypes. For example, there are subtypes called B-cell ALL and T-Cell ALL. Tests on your blood, bone marrow and lymph nodes are used to classify ALL subtypes. Tests include:

- Immunophenotyping - a test that looks for specific proteins on the surface of the immature blast cells to help identify the subtype.
- Cytogenetic analysis - a test to look at the genetic material inside your cells (chromosomes) to help identify the subtype and in some cases plan your treatment.

Some of these tests may be done both during and after therapy to measure the effects of leukemia treatment. The tests will help your doctor to learn about:

- the drug combination needed for your treatment
- the length of time you need treatment

What are the symptoms of ALL?

The abnormal leukemia cells travel throughout the body in blood vessels just like all blood cells. Sometimes they become trapped by the lymph nodes, liver or spleen, which then become enlarged. People who have ALL usually feel sick. Common ALL symptoms include:

- Swollen lymph nodes (in neck or armpit), usually painless
- Fevers, night sweats
- Frequent infections
- Fatigue, feeling weak
- Pale skin
- Bleeding and bruising easily
- Swelling or discomfort in the abdomen (from enlarged liver or spleen)
- Weight loss for no clear reason
- Pain in bones or joints

If the brain is affected by ALL, you may have headaches, vomiting, confusion, or seizures.

Leukemia symptoms may be vague and can also be caused by other illnesses. Call your treatment team if you have any of these symptoms.

How is Acute Lymphocytic Leukemia diagnosed?

- Full Medical History by your doctor
- Full physical exam with attention paid to enlarged lymph glands (nodes), liver, and spleen
- Blood tests: Complete Blood Count (CBC) to check the number of white blood cells, red blood cells and platelets in your blood. Leukemia typically causes a very high number of white blood cells. Learn more about understanding your blood counts.
- Blood Cell Examination: a test on the blood cells where the blood cells are stained with a colored dye and looked at through a microscope. It is also called a blood smear.
- Biopsy: a test to remove a very small piece of tissue to look for cancer cells in your bone marrow. The tissue usually comes from the back of the hipbone. The test is done with numbing medicine to reduce the discomfort of the procedure. The tissue removed is looked at under the microscope by a pathologist (tissue doctor) to check for leukemia cells. Some of the cells are sent for genetic analysis to look for the special BCR-ABL gene, which affects about 30% of adults with ALL. A bone marrow aspiration and biopsy are usually done together in the office.
- Bone marrow aspiration: using a hollow needle to remove the liquid sample of bone marrow into a syringe
- Bone marrow biopsy: capturing the solid piece of the bone marrow that stays in the bone marrow needle after it is removed from the patient. This solid piece is placed in a jar.
- Cytogenetic Analysis: a test to look at the genetic material inside of cells, the chromosomes. Abnormal chromosomes may help to identify the type of leukemia.
- Spinal tap: a test using a long thin needle and numbing medicine to remove some of the fluid (called cerebrospinal fluid) which surrounds your spinal cord and brain. This is to check for leukemia cells in and around the spine and brain. Often, chemotherapy will be administered into the spinal canal after the fluid is removed.
- Chest x-ray: an x-ray picture of your heart and lungs and other internal organs in your chest. This is important to identify whether or not there are swollen lymph glands in your chest.

What is the Treatment for ALL?

There are several treatment options for people with ALL. The choice of treatment depends on different factors, including:

- your white blood cell count
- the type and sub-type of leukemia
- your age
- whether leukemia cells are present in your lymph glands and
- whether leukemia cells are found in the fluid around your brain.

ALL is a cancer that progresses quickly without treatment. Treatment should be started right away. The goal of treatment is to remove leukemia symptoms that are present and to destroy the leukemia forming cells. This is called remission. After this point is reached, more treatment may be given to prevent a return of leukemia symptoms. This is called a relapse. Leukemia treatment options include:

- Chemotherapy – drugs given with the goal to destroy leukemia cells. Chemotherapy may be given by mouth, into a vein (IV), or sometimes through a catheter in the chest that stays in place. Chemotherapy is usually given in intervals called cycles. Aggressive chemotherapy for ALL usually requires several months of chemotherapy, some of which is given in the hospital. Chemotherapy may also be given into the spinal canal to prevent leukemia from entering the spinal fluid that surrounds the brain.
- Targeted therapy – drugs that block the action of an abnormal protein in the body so that the leukemia cells are no longer stimulated to grow. These medications may be used if your leukemia is positive for the Philadelphia chromosome or the bcr-abl gene.
- Stem Cell Transplant – This treatment allows you to be treated with high doses of drugs, radiation, or both. The high doses destroy both the normal and abnormal cells in the bone marrow. Then, you receive healthy stem cells through a large vein. The healthy stem cells will most likely come from a family member, volunteer donor, or blood saved from an umbilical cord. This is called an allogeneic transplant. New blood cells grow from the newly transplanted stem cells, replacing the ones that were destroyed by the high dose leukemia treatment.

Clinical Trials

Clinical trials are research studies of new drugs, new combinations of drugs or already approved drugs being studied to treat patients in new/different ways. They may include new drug doses or new ways (schedules) to give the drugs. Clinical trials are run under strict guidelines. Their purpose is to help find out whether new cancer treatments are safe and effective or better than the standard (current) treatment. At Massachusetts General Hospital, there are several clinical trials open for the treatment of leukemia that use the latest in cancer treatments.

If you have any questions or would like to speak with one of our physicians, please call the Center for Leukemia at Massachusetts General Hospital at 617 724 1124. You can speak to a senior Leukemia physician 24 hours a day/ 7 days a week by calling Dr. Karen Ballen at 617-724-5700 beeper 31343.