**WHAT IS LEUKEMIA**

**What is leukemia?**

Leukemia is a cancer that starts in the blood-forming cells of the bone marrow. When one of these cells changes and becomes a leukemia cell, it no longer matures the way it should. Often, it divides to make new cells faster than normal. Leukemia cells also don't die when they should. They build up in the bone marrow and crowd out normal cells. At some point, leukemia cells leave the bone marrow and spill into the bloodstream, often causing the number of white blood cells (WBCs) in the blood to increase. Once in the blood, leukemia cells can spread to other organs, where they can keep other cells in the body from working properly.

Leukemia is different from other types of cancer that start in organs like the lungs, colon, or breast and then spread to the bone marrow. Cancers that start in another part of the body and then spread to the bone marrow are not leukemia.

Not all leukemias are the same. Knowing the specific type of leukemia helps doctors better predict each patient's prognosis (outlook) and plan the best treatment.

**Acute lymphoblastic leukemia** (ALL)

**Acute lymphocytic leukemia (ALL)** progresses rapidly, replacing healthy cells that produce functional lymphocytes with leukemia cells that can't mature properly. The leukemia cells are carried in the bloodstream to other organs and tissues, including the brain, liver, lymph nodes and testes, where they continue to grow and divide. The growing, dividing and spreading of these leukemia cells may result in a number of possible symptoms.

Acute lymphocytic leukemia (ALL), also called acute lymphoblastic leukemia and acute lymphoid leukemia, is a blood cancer that results when abnormal white blood cells (leukemia cells) accumulate in the bone marrow.

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ALL is typically associated with having more B lymphatic cells than T cells. B and T cells play active roles in preventing the body from infections and germs and destroying cells that have already become infected. B cells particularly help prevent germs from infecting the body while T cells destroy the infected cells.

ALL can occur at any age, but acute lymphocytic leukemia incidences occur most frequently in people under the age of 15 or over the age of 45. Although ALL makes up the largest percentage of leukemia diagnoses in children under the age of 15 (specifically between the ages of two to four), it is rare for adults to develop this disease.

Acute lymphoblastic leukaemia is the most common childhood cancer. It occurs when a bone marrow cell develops errors in its DNA.

Symptoms may include enlarged lymph nodes, bruising, fever, bone pain, bleeding from the gums and frequent infections.

Treatments may include chemotherapy or targeted drugs that specifically kill cancer cells.

**Acute lymphocytic leukemia symptoms**

ALL symptoms are often similar to those of the flu and can include the following:

Fever

Weakness

Fatigue

Headaches

Loss of appetite

Pale skin

Vomiting

Body aches

Other potential signs and symptoms of ALL may include:

Bleeding gums

Frequent infections

Nosebleeds

Easy bruising

Swollen lymph nodes around the neck, underarm, stomach or groin

Shortness of breath

Weight loss

**People may experience:**

**Pain areas:**in the bones

**Whole body:**fatigue, fever, loss of appetite, or night sweats

**Also common:**bleeding gums, easy bruising, infection, nosebleed, pallor, red spots on skin, shortness of breath, swollen lymph nodes, or weight loss

**Treatment depends on stage**

Treatments may include chemotherapy or targeted drugs that specifically kill cancer cells.

**Supportive care**

What are the survival rates for acute lymphoblastic leukemia? About 98% of children with ALL go into remission within weeks after starting treatment. About 90% of those children can be cured. Patients are considered cured after 10 years in remission Delivering fluids, medication or blood directly into a vein.

**Medications**

[**Chemotherapy**](https://www.google.com/search?sxsrf=ACYBGNS8Jy7EWiyJ3wPyvBiBblEc2h3McA:1579739422995&q=acute+lymphoblastic+leukemia+chemotherapy&stick=H4sIAAAAAAAAAOMQFeLUz9U3ME4rLC9S4gAxjQzN03cxMRosYtVMTC4tSVXIqcwtyMhPykksLslMVshJLc1Ozc1MVEjOSM3NL8lILUosqAQAUX0u-0cAAAA&sa=X&ved=2ahUKEwikiY35u5jnAhWS8XMBHWIVA1oQ0EB6BAgBEAg)

Kills cells that are growing or multiplying too quickly.

[**Blood transfusion**](https://www.google.com/search?sxsrf=ACYBGNS8Jy7EWiyJ3wPyvBiBblEc2h3McA:1579739422995&q=acute+lymphoblastic+leukemia+blood+transfusion&stick=H4sIAAAAAAAAAOMQFeLUz9U3ME4rLC9S4gAxc80NC3YxMRosYtVLTC4tSVXIqcwtyMhPykksLslMVshJLc1Ozc1MVEjKyc9PUSgpSswrTistzszPAwDFQgMiTAAAAA&sa=X&ved=2ahUKEwikiY35u5jnAhWS8XMBHWIVA1oQ0EB6BAgBEAk)

Blood components that are added to replace deficiencies within the bloodstream.

[**Steroid**](https://www.google.com/search?sxsrf=ACYBGNS8Jy7EWiyJ3wPyvBiBblEc2h3McA:1579739422995&q=acute+lymphoblastic+leukemia+steroid&stick=H4sIAAAAAAAAAOMQFeLUz9U3ME4rLC9SAjMNDctN83YxMRosYlVJTC4tSVXIqcwtyMhPykksLslMVshJLc1Ozc1MVCguSS3Kz0wBAJo3RQFDAAAA&sa=X&ved=2ahUKEwikiY35u5jnAhWS8XMBHWIVA1oQ0EB6BAgBEAo)

Modifies or simulates hormone effects, often to reduce inflammation or for tissue growth and repair.

**Medical procedure**

**Allotransplantation**

Transfer of living organs or tissue from one part of the body to another or from one individual to another. Examples include organ transplants and bone grafts.

**Acute lymphocytic leukemia treatment options**

Treatment for ALL may include chemotherapy, chemotherapy with stem cell transplant, radiation therapy and/or immunotherapy. Your integrated team of leukemia experts will answer your questions and recommend treatment options based on your unique diagnosis and needs.

A common chemotherapy treatment for ALL begins with induction chemotherapy, in which a combination of drugs is used to destroy as many leukemia cells as possible and bring blood counts to normal. This is followed by consolidation chemotherapy, to destroy any remaining leukemia cells that cannot be seen in the blood or bone marrow.

Patients with ALL may also receive maintenance chemotherapy. This less intensive course of chemotherapy is used to reduce the risk of the disease recurring after treatment has finished.

**Acute Myeloblastic leukaemia (AML)**

**Acute myeloid leukemia (AML)**, also known as acute myelogenous leukemia, acute myeloblastic leukemia, acute granulocytic leukemia or acute nonlymphocytic leukemia, is a fast-growing form of cancer of the blood and bone marrow.

AML is the most common type of acute leukemia. It occurs when the bone marrow begins to make blasts, cells that have not yet completely matured. These blasts normally develop into white blood cells. However, in AML, these cells do not develop and are unable to ward off infections.

In AML, the bone marrow may also make abnormal red blood cells and platelets. The number of these abnormal cells increases rapidly, and the abnormal (leukemia) cells begin to crowd out the normal white blood cells, red blood cells and platelets that the body needs.

One of the main things that differentiates AML from the other main forms of leukemia is that it has eight different subtypes, which are based on the cell that the leukemia developed from. The types of acute myelogenous leukemia include:

Myeloblastic (M0) - on special analysis

Myeloblastic (M1) - without maturation

Myeloblastic (M2) - with maturation

Promyeloctic (M3)

Myelomonocytic (M4)

Monocytic (M5)

Erythroleukemia (M6)

Megakaryocytic (M7)

**Acute myeloid leukemia** (**AML**) is a cancer of the **myeloid** line of blood cells, characterized by the rapid growth of abnormal cells that build up in the bone marrow and blood and interfere with normal blood cells. ... As an **acute leukemia**, **AML** progresses rapidly and is typically fatal within weeks or months if left untreated.

AML progresses rapidly, with myeloid cells interfering with the production of normal white blood cells, red blood cells and platelets.

Symptoms include fatigue, fever, recurrent infections and bruising of the body easily.

Treatments include chemotherapy, other drug therapy and stem-cell transplants.

Auer rods (or Auer bodies) are large, crystalline cytoplasmic inclusion bodies sometimes observed in myeloid blast cells during acute myeloid leukemia, acute promyelocytic leukemia, and high-grade myelodysplastic syndromes and myeloproliferative disorders. Composed of fused lysosomes and rich in lysosomal enzymes, Auer rods are azurophilic and can resemble needles, commas, diamonds, rectangles, corkscrews, or rarely granules

**Requires a medical diagnosis**

Symptoms include fatigue, fever, recurrent infections and bruising of the body easily.

**People may experience:**

**Whole body:**fatigue, fever, or loss of appetite

**Also common:**bleeding, bruising, infection, pallor, red spots on skin, or shortness of breath

**Treatment depends on stage**

Treatments include chemotherapy, other drug therapy and stem-cell transplants.

**Medications**

[**Chemotherapy**](https://www.google.com/search?sxsrf=ACYBGNQre32eCl0NopbXBmWdoxRU3ahh_Q:1579739873929&q=acute+myeloid+leukemia+chemotherapy&stick=H4sIAAAAAAAAAOMQFeLUz9U3SKowzjNX4gAxjQzN03cxMRosYlVOTC4tSVXIrUzNyc9MUchJLc1Ozc1MVEjOSM3NL8lILUosqAQArOu800EAAAA&sa=X&ved=2ahUKEwi1oojQvZjnAhUB4HMBHSrGBzgQ0EB6BAgBEAU)

Kills cells that are growing or multiplying too quickly.

[**Blood transfusion**](https://www.google.com/search?sxsrf=ACYBGNQre32eCl0NopbXBmWdoxRU3ahh_Q:1579739873929&q=acute+myeloid+leukemia+blood+transfusion&stick=H4sIAAAAAAAAAOMQFeLUz9U3SKowzjNX4gAxc80NC3YxMRosYtVITC4tSVXIrUzNyc9MUchJLc1Ozc1MVEjKyc9PUSgpSswrTistzszPAwDzHDEmRgAAAA&sa=X&ved=2ahUKEwi1oojQvZjnAhUB4HMBHSrGBzgQ0EB6BAgBEAY)

Blood components that are added to replace deficiencies within the bloodstream.

**Medical procedure**

[**Allogeneic hematopoietic stem cell transplantation**](https://www.google.com/search?sxsrf=ACYBGNQre32eCl0NopbXBmWdoxRU3ahh_Q:1579739873929&q=acute+myeloid+leukemia+allogeneic+hematopoietic+stem+cell+transplantation&stick=H4sIAAAAAAAAABXHywnCUBAFUBSE6FJwP9hAAk-wBssYn1cdMp-QTEDbsYxUp-7OaQ77bWttd30VPx93f576e9GyrFfdZ3PhOifI3tCQGynmHiZMrBoPOKTSE8YZQwjytylhVKFKObJPg7Inp4R_AX_er8ppAAAA&sa=X&ved=2ahUKEwi1oojQvZjnAhUB4HMBHSrGBzgQ0EB6BAgBEAk)

Delivering stem cells from a healthy donor to a recipient.

**Chronic Acute Myeloblastic Leukemia (CAML)**

**Chronic lymphocytic leukemia (CLL)** is a typically slow-growing cancer that begins in lymphocytes in the bone marrow and extends into the blood. It may also spread to lymph nodes and organs such as the liver and spleen. CLL develops when too many abnormal lymphocytes grow, crowding out normal blood cells and making it difficult for the body to fight infection.

**Cancer starts when cells in the body start to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other parts of the body. To learn more about how cancers start and spread,**

**Chronic myeloid leukemia (CML) is also known as chronic myelogenous leukemia. It's a type of cancer that starts in certain blood-forming cells of the bone marrow.**

**In CML, a genetic change takes place in an early (immature) version of myeloid cells -- the cells that make red blood cells, platelets, and most types of white blood cells (except lymphocytes). This change forms an abnormal gene called BCR-ABL, which turns the cell into a CML cell. The leukemia cells grow and divide, building up in the bone marrow and spilling over into the blood. In time, the cells can also settle in other parts of the body, including the spleen. CML is a fairly slow growing leukemia, but it can change into a fast-growing acute leukemia that's hard to treat.**

**CML occurs mostly in adults, but very rarely it occurs in children, too. In general, their treatment is the same as for adults.**

**CHRONIC ACUTE LYMPHOBLASTIC LEUKEMIA (CALL)**

**Chronic myeloid leukemia (CML)**, also known as chronic myelogenous leukemia, begins in the blood-forming cells of the bone marrow and then, over time, spreads to the blood. Eventually, the disease spreads to other areas of the body.

B-cell chronic lymphocytic leukaemia (CLL) develops from a type of white blood cell called B cells. It progresses slowly, usually affecting older adults.

CLL may not cause any symptoms for years. When symptoms do occur, they may include swollen lymph nodes, fatigue and easy bruising.

Treatment isn't always initially necessary, but may include chemotherapy. Stem-cell transplant is used in rare cases for aggressive types.

**REQUIRES A MEDICAL DIAGNOSIS**

CLL may not cause any symptoms for years. When symptoms do occur, they may include swollen lymph nodes, fatigue and easy bruising.

**Chronic lymphocytic leukemia symptoms**

CLL is a slow-growing disease and many signs of CLL are vague. The symptoms of CLL tend to develop over time. For many people, CLL symptoms may at first seem to be some kind of non-specific change in overall health. There may be an increased sense of fatigue or weakness. Some people may experience flu-like symptoms, like night sweats or enlarged lymph nodes. Many people are diagnosed with CLL because of a blood test for an unrelated condition.

Some of the conditions that may arise as CLL slowly develops and spreads may include:

Anemia: Red blood transports oxygen throughout the body. Low levels of red blood cells may reduce the blood’s overall oxygen carrying capacity. This condition can be evaluated by a complete blood count (CBC) test. Symptoms of anemia may include weakness, fatigue, lack of energy and shortness of breath.

Leukopenia: Lymphocytic leukemias affect the white blood cells responsible for producing antibodies and warding off disease. A decrease in the functional lymphocytes may diminish the body's immune system. Symptoms of leukopenia may include reduced immunity, more frequent infections and fevers.

Thrombocytopenia: Blood platelets are the particles in the blood that aid with clotting. A CBC test may reveal a low blood platelet count in patients who have CLL. Symptoms of thrombocytopenia may include easy bruising, bleeding or nose bleeds, and bleeding gums.

Swollen lymph nodes: In some cases, the leukemia may spread to the lymph nodes. The clusters of lymph nodes in the neck, armpits or groin may become noticeably swollen from the accumulation of excessive amounts of cancerous lymphocytes.

Enlarged liver or spleen: The excess lymphocytes may build up in the liver or spleen. An enlarged liver or spleen may cause a feeling of fullness after eating a small meal, loss of appetite or swelling in the abdomen.

**SYMPTOMS**

**Can have no symptoms, but people may experience:**

**Common symptoms:**swollen lymph nodes or fatigue

**TREATMENT DEPENDS ON STAGE**

Treatment isn't always initially necessary, but may include chemotherapy. Stem-cell transplant is used in rare cases for aggressive types.

**Medications**

[**Chemotherapy**](https://www.google.com/search?sxsrf=ACYBGNTB88qM3X785cYmy12fyZ-Xpxkfuw:1579782046376&q=chronic+lymphocytic+leukemia+chemotherapy&stick=H4sIAAAAAAAAAOMQFeLUz9U3MEpKN89V4gAzDc3TdzExGixi1UzOKMrPy0xWyKnMLcjIT64sAbFTS7NTczMTFZIzUnPzSzJSixILKgFUt9_DRwAAAA&sa=X&ved=2ahUKEwiPzbjd2pnnAhVk4HMBHRxLDFQQ0EB6BAgBEAU)

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Blood components that are added to replace deficiencies within the bloodstream.