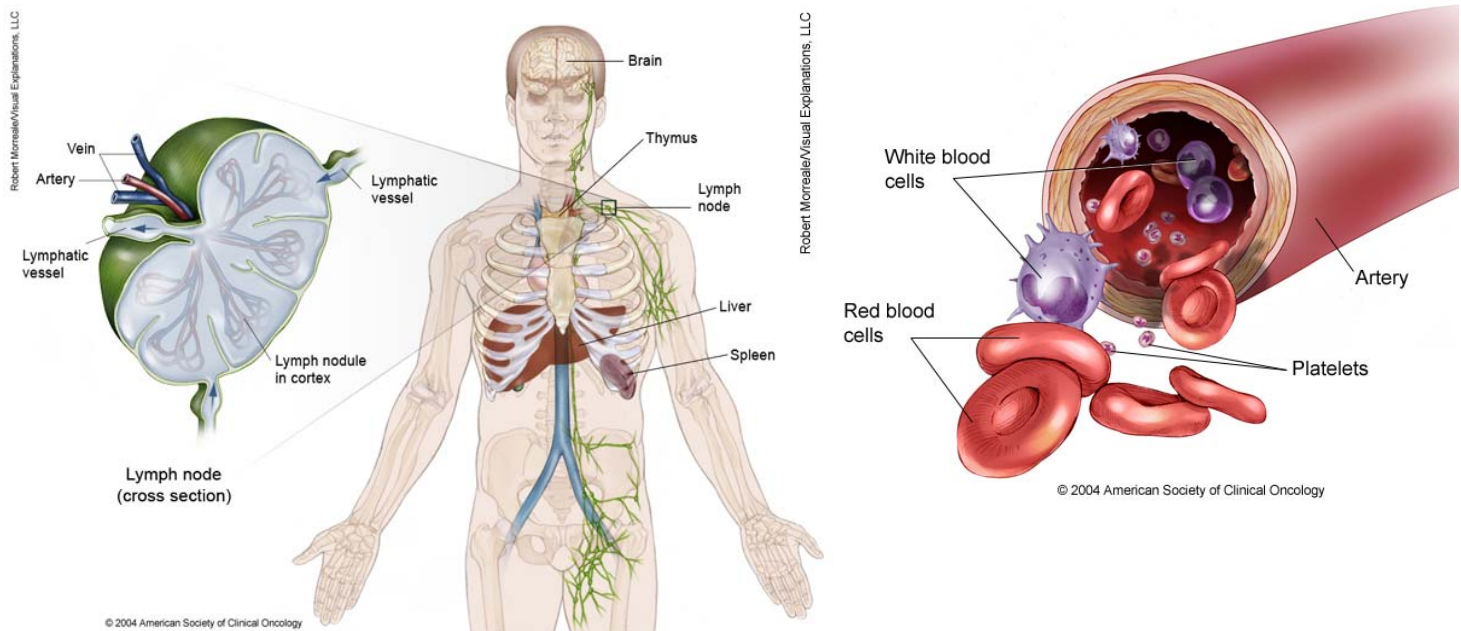


CHRONIC LYMPHOCYTIC LEUKEMIA

Chronic lymphocytic leukemia (CLL) is a type of cancer of the white blood cells called lymphocytes. Lymphocytes are normally found in the blood, lymph nodes, bone marrow (the spongy, red tissue in the inner part of the large bones), spleen, and in a clear fluid called lymph that flows through small vessels in the body and collects in lymph nodes. Patients with CLL have mature lymphocytes that grow abnormally and group together in the circulating blood, bone marrow, spleen, and lymph nodes. The abnormal cells eventually crowd healthy blood-forming cells, leading to fewer red blood cells (which deliver oxygen to the body), neutrophils (a type of white blood cell needed to fight infection), and platelets (which prevent bleeding). CLL often grows and progresses slowly. It may take years for symptoms to appear or for treatment to be needed.

T cells and B cells are two specific types of lymphocytes that cause CLL. T cells normally help to fight infections by activating other cells in the immune system. B cells produce antibodies in the immune system. The T-cell type of CLL is less common (about 1% of all CLL cases) and progresses more rapidly than the B-cell type of the disease (more than 95% of all CLL cases).



RISK FACTORS include:

Family history: Approximately 20% of patients with CLL have a relative with CLL or some other lymph-related cancer. The National Cancer Institute has established a registry of such families to learn more about the patterns in families for these cancers.

Age: CLL is most common in adults over the age of 50 years.

Gender: CLL occurs more frequently in men.

Ethnicity: B-cell CLL is more common in people of Russian and European descent, and virtually never occurs in people from Asian countries.

STAGES

Stage 0: patient has high levels of lymphocytes without other symptoms

Stage I: patient has high levels of lymphocytes and swollen lymph nodes

Stage II: patient has high levels of lymphocytes, an enlarged liver or spleen; and usually, swollen lymph nodes

Stage III: patient has high levels of lymphocytes and anemia; and usually, swollen lymph nodes and an enlarged liver or spleen

Stage IV: patient has high levels of lymphocytes and low levels of platelets; and usually, swollen lymph nodes, an enlarged liver or spleen, and anemia.

SYMPTOMS TO REPORT include:

- *Swelling of lymph nodes in the neck, under the arms, or in the groin.
- *Discomfort or fullness in the upper left part of the abdomen
- *Fatigue (extreme tiredness)
- *Fever and infection
- *Abnormal bleeding
- *Weight loss

Other conditions may cause the same symptoms. Any of these symptoms that do not go away should be reported to a health care provider.

The stage may change in an individual patient over time. Patients vary in how quickly the disease changes. Patients with CLL have a poorly regulated immune system. Their bodies sometimes make abnormal antibodies, called autoantibodies, against their own red blood cells and/or platelets. This results in anemia (low levels of red blood cells) or a low platelet count. This process can occur at any time during the course of the disease and is not necessarily related to the severity of CLL.

DIAGNOSING AND STAGING

The following tests and procedures may be used to diagnose CLL and determine the stage of the disease. Staging is a way of describing cancer by where it is located, if or where it has spread, and if it is affecting the functions of other organs in the body.

Physical exam of entire body, including health habits and past illnesses and treatments

Blood tests of a complete blood count (CBC) to measure the counts of white and red blood cells

Bone marrow biopsy is the removal of a small piece of bone, bone marrow, and blood through a needle inserted into the hipbone or breastbone. The cells will be examined by a pathologist for signs of cancer and changes.

Flow cytometry and cytochemistry are laboratory tests that confirm whether the abnormal lymphocyte counts are a result of CLL or a reaction to infection or other problem. CLL cells have markers with distinctive patterns called an immunophenotype on their surface. Both tests can be done from a blood sample. These tests also measure the markers on the CLL cell surfaces to help predict how rapidly a patient's clinical course will progress.

Cytogenetic or fluorescence in situ hybridization (FISH) analysis is a test to examine blood or bone marrow cells for changes in the chromosomes to predict the progress of a patient's clinical course.

Computed tomography (CT) scans of the chest, abdomen and pelvis produce images of the inside of the body and can detect whether lymph nodes and organs are affected by the leukemia.

TREATMENT OPTIONS

Treatment of CLL depends on the stage, patient's risk status, and overall health. Many patients may not require treatment right away because CLL often progresses slowly. Some patients may never require treatment at all. None of the standard therapies are capable of eliminating all of the CLL even though the available treatments can be highly effective and keep the CLL under control for many years. Patients are almost never cured of their disease with treatment.

Watch and wait is appropriate for many patients with early-stage CLL. These patients will often remain without symptoms for years, or even decades, and will not need any treatment. Blood counts will be monitored and physical examinations will be performed during this watch-and-wait approach (also called active surveillance).

Some patients require treatment soon after the diagnosis is made because of symptoms and/or the presence of large amounts of CLL in the blood, lymph nodes, or spleen. Treatment is recommended for patients who develop symptoms and/or worsening blood counts. These might include increasing fatigue, night sweats, enlarging lymph nodes, frequent infections or falling red blood cell or platelet counts.

Types of treatment for CLL

Chemotherapy uses drugs taken by mouth, injections through a vein or muscle, or placed directly into the spinal column or in an organ to stop the growth of cancer cells. The way that chemotherapy is given depends on the type and stage of CLL being treated. Chemotherapy can be one or a combination of drugs.

Biologic therapy is a treatment that uses the patient's immune system to fight cancer. Substances made by the body or in a laboratory are used to boost, direct, or restore the body's natural defenses against cancer.

High-dose chemotherapy with stem cell transplant is a method of giving chemotherapy and replacing blood-forming cells that are abnormal or destroyed by the cancer treatment. Stem cells are immature blood cells that are removed from the blood or bone marrow of the patient or donor and then frozen or stored. The stem cells are thawed and given back to the patient through an infusion after the high-dose chemotherapy. The reinfused stem cells grow into and restore the body's blood cells.

Donor lymphocyte infusion (DLI) is an infusion treatment after stem cell transplant. It uses just the lymphocytes, a type of white blood cell, from a donor to attack the patient's CLL cells.

Radiation therapy uses high-energy x-rays to kill cancer cells. External radiation therapy uses a machine outside of the body to send radiation toward the cancer. This is not usually used in CLL patients, but is occasionally used to treat swollen lymph nodes or large spleens that are causing symptoms.