

## Chronic Lymphocytic Leukemia (CLL)

Chronic lymphocytic leukemia (CLL) is the most common adult leukemia in the United States. Most patients are older than 60 years of age and there is a 2 to 1 male predominance. CLL is a B cell neoplasm and lymph nodes are diffusely effaced by an infiltrate of small lymphocytes which can also be seen on a peripheral smear. Some of these cells often come disrupted in the process of making smears and produce smudge cells that are characteristic of CLL. The bone marrow is almost always involved. Unlike most other lymphoid malignancies, chromosomal translocations are relatively rare. Patients are often asymptomatic at diagnosis and when symptoms do appear, they are typically nonspecific and include easy fatigability and weight loss. Some patients can present with lymphadenopathy and hepatosplenomegaly. Hypogammaglobulinemia is also common and contributes to disruption of normal immune function. CLL is also associated with warm autoimmune hemolytic anemia, which is often caused by the attachment of IgG antibodies to red blood cells. Richter's transformation occurs if a CLL patient develops a new-onset large-cell lymphoma.



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### Signs and Symptoms

#### Age > 60 Years

[Old grandpa and grandma](#)

CLL is most commonly diagnosed in patients who are older than 60 years of age.

#### B Cell Neoplasm

[Basketball Neanderthal-growth](#)

CLL is a neoplasm with overproduction of small, mature-appearing lymphocytes that can be seen in circulation on a blood smear. These cells will stain positive for CD5, CD20, and CD23.

#### Smudge Cells

[Smudge Cell glasses](#)

The peripheral blood typically contains large numbers of small round lymphocytes with minimal cytoplasm. Some of these cells often come disrupted in the process of making smears and produce "smudge cells" that are characteristic of CLL.

#### Often Asymptomatic

[Thumbs-up](#)

Patients are often asymptomatic at diagnosis and when symptoms do appear, they are typically nonspecific and include easy fatigability and weight loss.

#### Cold IgM Autoimmune Hemolytic Anemia

[Cold-ice \(IgM\) Mountain-goblin with Hemolysing-RBCs from Anemone](#)

CLL is associated with cold agglutinin disease, which is an autoimmune disease characterized by the presence of high concentrations of circulating antibodies, IgM, directed against red blood cells. This manifests as a form of autoimmune hemolytic anemia, specifically one in which antibodies only bind red blood cells at low body temperatures, typically 28-31°C. This is particularly common in individuals greater than 50 years old.

#### Warm IgG Autoimmune Hemolytic Anemia

[Warm-fire \(IgG\) Gold-Goblin Hemolysing-RBCs from Anemia-Anemone](#)

CLL is commonly associated with warm autoimmune hemolytic anemia, which is often caused by the attachment of IgG antibodies to red blood cells.

## Richter's Transformation

### Richter Scale

Richter's transformation is seen when a patient with pre-existing CLL develops a new large-cell lymphoma, thought to be a progression of their underlying disease. It should be suspected when a CLL patient develops new lymphadenopathy, new systemic symptoms, or increasing levels of lactate dehydrogenase on labs. A biopsy should be done on the new lesions and will typically show diffuse large B cell lymphoma.