Chronic lymphocytic leukemia (CLL), a malignant disorder of the lymphocytes, is one of the most common forms of leukemia in the United States. An estimated 15,490 new cases of CLL were diagnosed in the United States in 2009, and about 4,390 people died from CLL (Jemal et al., 2009). The incidence of CLL increases with age, and men are more likely to develop the disorder. The disease also is slightly more prevalent in Caucasians than in African Americans (Redaelli, Laskin, Stephens, Botteman, & Pashos, 2004).

Diagnosis of CLL is based on clinical examination and specific tests on the peripheral blood and bone marrow. Flow cytometry is helpful in diagnosing CLL and ruling out other lymphoproliferative disorders. Signs and symptoms of CLL usually develop slowly, with many patients being asymptomatic during the early stages of the disease. Common symptoms include fatigue, shortness of breath, swollen lymph nodes, repeated infections, and unintended weight loss.

In general, patients with CLL do not require treatment until they develop symptoms or experience disease progression (Hallek et al., 2008). Approved treatments include purine analogs (such as fludarabine), bendamustine, alkylating agents (such as chlorambucil or cyclophosphamide), or various combinations (Catovsky et al., 2007; Eichhorst et al., 2006; Flinn et al., 2007; Rai et al., 2000). The anti-CD20 monoclonal antibody rituximab appears to improve outcomes when added to fludarabine-based chemotherapy.