Acute Lymphoblastic Leukemia (ALL)  Fact Sheet

Leukemia is a cancer that begins in the bone marrow (the soft inner part of some bones), but in most cases, moves into the blood. It can then spread to other parts of the body, such as organs and tissues. 1 Acute lymphoblastic leukemia (ALL), one of the four main types of leukemia, is a slow-growing blood cancer that starts in bone marrow cells called lymphocytes, or white blood cells. 2 Once these white blood cells are affected by leukemia, they do not go through their normal process of maturing. 2 The lymphocytes continue to reproduce and build up, invade the blood fairly quickly. 1 ALL is an aggressive type of leukemia; without treatment, most patients with acute leukemia would live only a few months. 2

Facts and Figures
• Worldwide, there was an estimated 351,000 new cases of leukemia overall and approximately 257,000 related deaths in 2008. 3
• Of the approximately 43,000 new cases of all kinds of leukemia diagnosed in the United States in 2010, 5,330 cases were diagnosed as ALL, of which about one out of three were in adults. 4
• Of the approximately 22,000 deaths from all kinds of leukemia diagnosed in the United States in 2010, ALL accounted for approximately 1,400. 2
• The five-year relative survival rate of ALL overall (including adults and children) is about 63 percent. 4
  • Survival rates in adults only are less favorable, with a five-year survival rate of less than 10 percent in this patient population. 5

Phases of ALL
• There is no standard staging system for adult ALL. The disease is classified as untreated, in remission, or recurrent. 6
  o Untreated ALL means the disease is newly diagnosed and has not been treated except to relieve symptoms, such as fever, bleeding, or pain. Characteristics of untreated ALL include an abnormal blood count, meaning more than 5 percent of the cells in the bone marrow are blasts (leukemia cells), and existing signs and symptoms of leukemia. 6
  o ALL in remission is typically defined as having no evidence of disease after treatment. 2
    ▪ In heavily pretreated patients, complete remission may be evidenced by just bone marrow measurement, with less than 5 percent of blast cells contained in the bone marrow. 2
  o Recurrent adult ALL is cancer that has returned after going into remission. The disease may recur in the blood, bone marrow, or in other parts of the body. 7

Diagnosis
• Patients with ALL often have several non-specific symptoms, including weight loss, fever, night sweats, fatigue, and loss of appetite. 5 Lab tests used to diagnose and classify ALL, including peripheral blood smear, Fluorescent in situ hybridization (FISH), immunochemistry, and polymerase chain reaction (PCR). 2
• The disease may be caught during a blood test, as most signs and symptoms of ALL result from a shortage of normal blood cells, such as red and white blood cells, as well as blood platelets. 2
• ALL may also be diagnosed due to an enlarged spleen or swelling in the abdomen. A CT or MRI scan may detected swollen or enlarged lymphnodes, where ALL may spread. 2

Treatment
• Treatment options for each patient are based on the leukemia subtype as well as certain prognostic features. Several types of treatment may be used in patients with ALL; the main treatment currently used is long-term chemotherapy and various combination chemotherapy regimens. 4
• Surgery and radiation may be used in special circumstances. 2
  o Surgery has a very limited role in the treatment of ALL. Because leukemia cells spread widely throughout the bone marrow and to many other organs, it is not possible to cure this type of cancer by surgery. 2
• More recently, new targeted therapy drugs that inhibit tyrosine kinases, such as imatinib and dasatinib, are being used to treat some types of Philadelphia chromosome positive (Ph+) ALL. 2
o About 25 to 30 percent of adult patients with ALL are Ph+, meaning that their blood contains an abnormal chromosome (a shortened chromosome 22 that results from a translocation with chromosome 9).  

o The CD22 antigen has also been shown to be expressed on the surface of more than 90 percent of leukemic blasts in a vast majority of B-cell ALL patients. Additionally, there is preclinical evidence that a CD22-targeted cytotoxic may provide antitumor activity against CD22 positive ALL.

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