



**The Leukemia &
Lymphoma Society**[®]
Fighting Blood Cancers

Facts 2006-2007

LEUKEMIA

LYMPHOMA

MYELOMA

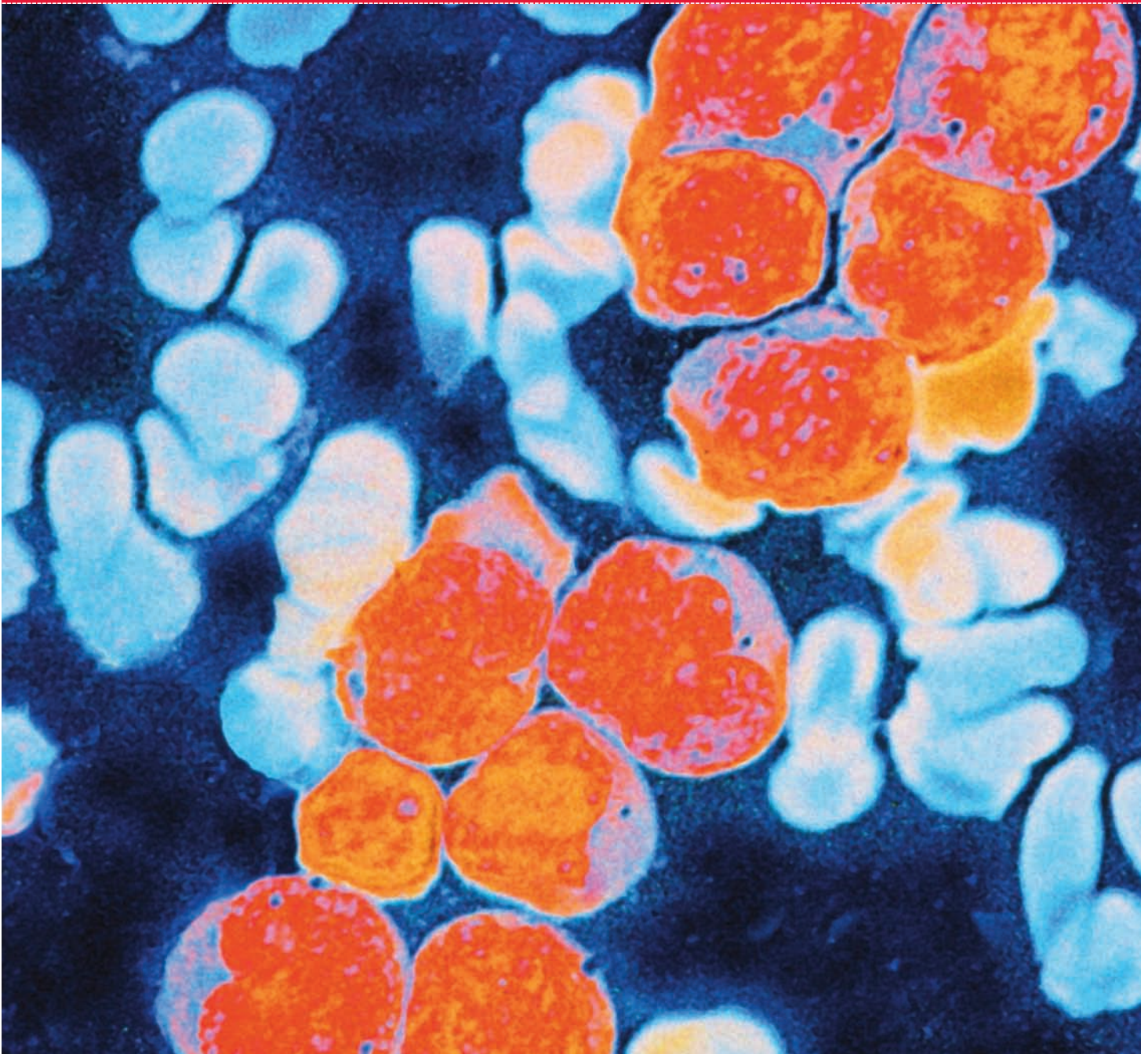


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LEUKEMIA

LYMPHOMA

MYELOMA

Cover Photo: Color-enhanced transmission electron micrograph of leukemia cells. Cover photo by James Cavallini/Photo Researchers, Inc.

Executive Summary

Facts 2006-2007, an annual publication, is a compilation of the most recent data on leukemia, lymphoma and myeloma. The data within *Facts 2006-2007* reflect the most recent statistics available from SEER, the National Cancer Institute's Surveillance, Epidemiology and End Results Program, Cancer Statistics Review 1975-2003 (see Notes, page 17). These data were published online by SEER, www.seer.cancer.gov, in May 2006. The next SEER Cancer Statistics Review is expected to be published online in April 2007.

Leukemia, lymphoma and myeloma are cancers that originate in the bone marrow or lymphatic tissues as the result of an acquired genetic injury to the DNA of a single cell, which becomes malignant and multiplies continuously. This abnormal accumulation interferes with the production of healthy blood cells.

Highlights from the Report Include:

- An estimated 785,829 Americans are living with blood cancers.
- Every five minutes, someone is diagnosed; approximately 118,310 new cases are expected this year.
- Every 10 minutes, someone dies from a blood cancer – an estimated 53,920 deaths in 2006.
- In general, the likelihood of dying from leukemia, lymphoma and myeloma decreased from 1994 to 2003 (the last year data were available).

Leukemia:

- There are 208,080 people in the United States living with or in remission from leukemia.
- Thirty-one percent more males are living with leukemia than females.
- In 2006, 35,070 people will be diagnosed with leukemia.
- In 2006, 22,280 people will die of leukemia.
- Leukemia causes more deaths than any other cancer among children and young adults under the age of 20.

Lymphoma:

- There are 519,473 people living today with lymphoma; 133,819 have or are in remission from Hodgkin lymphoma; 385,654 have or are in remission from non-Hodgkin lymphoma (NHL).
- This year, 66,670 new cases of lymphoma will be diagnosed in the United States (7,800 cases of Hodgkin, 58,870 cases of non-Hodgkin).

- This year, 20,330 people will die of lymphoma (1,490 of Hodgkin, 18,840 of non-Hodgkin).
- Non-Hodgkin lymphoma is the sixth most common cancer in the United States, and its age-adjusted incidence rose 76 percent from 1975 to 2003.

Myeloma:

- There are 58,336 people living today with myeloma.
- This year, 16,570 people will be diagnosed with myeloma.
- This year, 11,310 people will die from myeloma.
- From 1975 to 2003, the incidence of myeloma has increased 8 percent, and mortality from the disease has increased 28 percent.
- Eighty-four percent of myeloma cases occur in people age 55 and over.
- Americans of African descent have nearly double the incidence rate of those of European descent.
- The incidence rate in men is 62 percent higher than in women.
- Survival from myeloma five years after diagnosis was only 33 percent in 1996-2002 (the most recent data), making it the most difficult blood cancer to treat successfully.
- Although newer treatments are expected to improve survival rates, even the most aggressive therapies rarely cure the disease.

Five-Year Relative Survival Rates 1960-63 vs. 1975-1977 vs. 1996-2002

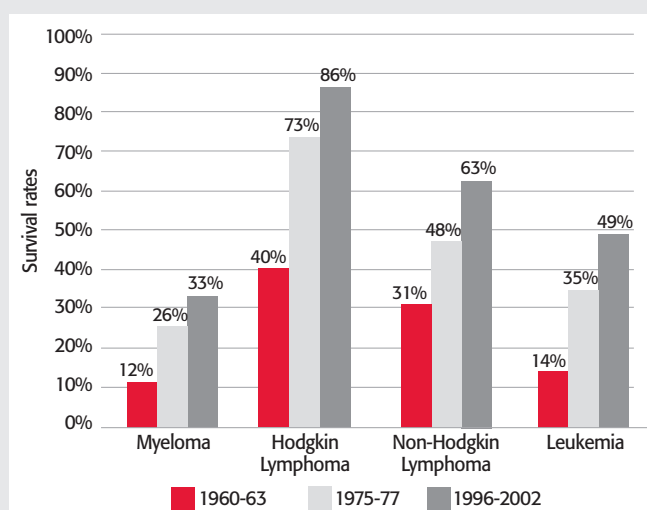


Figure 1: Sources: SEER (Surveillance, Epidemiology and End Results) Cancer Statistics Review, 1975-2003, National Cancer Institute, 2006.

About the Diseases

Leukemia, Hodgkin and non-Hodgkin lymphoma and myeloma are cancers that originate in the bone marrow or lymphatic tissues. They are considered to be related cancers because they involve the uncontrolled growth of cells with similar functions and origins. These diseases result from an acquired genetic injury to the DNA of a single cell, which becomes abnormal (malignant) and multiplies continuously. The accumulation of malignant cells interferes with the body's production of normal blood cells and can result in severe anemia, decreased ability to fight infections and a predisposition to bleeding.

New Cases

An estimated 118,310 people in the United States will be diagnosed with leukemia, lymphoma and myeloma in 2006. New cases of leukemia, Hodgkin and non-Hodgkin lymphoma and myeloma will account for nearly 8.5 percent of the 1,399,790 new cancer cases diagnosed in the United States this year.

Deaths

Leukemia, lymphoma and myeloma will cause the deaths of an estimated 53,920 people in the United States this year. These blood cancers will account for 9.5 percent of the deaths from cancer in 2006 based on the 564,830 total cancer-related deaths.

Every 10 minutes, another child or adult is expected to die from leukemia, lymphoma or myeloma. This statistic represents 148 people each day, or six people every hour. Leukemias are the leading fatal cancers in young men and women under age 20.

Survival

An estimated 785,829 Americans are living with leukemia, Hodgkin and non-Hodgkin lymphoma and myeloma.

Treatment

Chemotherapy and Radiotherapy: The use of chemotherapy (anti-cancer drugs), usually in combinations of two or more drugs, is largely responsible for the dramatic improvement in managing leukemia and lymphoma. Approximately 50 different drugs are now being used in the treatment of these diseases.

Patients with leukemia, myeloma and lymphoma are

Estimated New Cases (%) of Blood Cancers in 2006

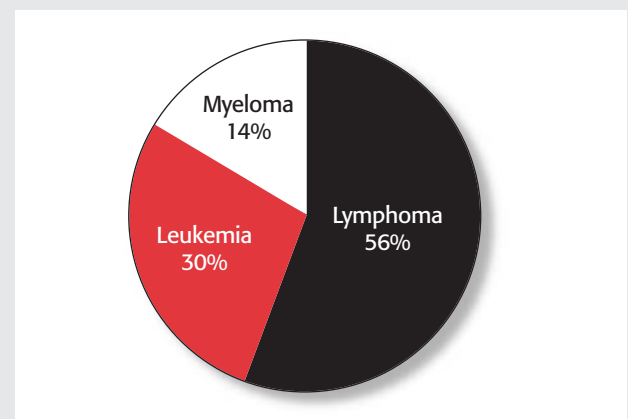


Figure 2: Source: *Cancer Facts and Figures, 2006*, American Cancer Society.

usually treated with chemotherapy. Patients with acute lymphocytic leukemia (ALL), with some types of Hodgkin lymphoma, with large localized areas of non-Hodgkin lymphoma or with special complications that are amenable to radiation therapy may receive both primary chemotherapy and ancillary radiation therapy.

Blood and Marrow Stem Cell Transplantation:

Stem cell transplantation from marrow was introduced approximately 35 years ago and is now standard therapy for selected patients with leukemia, lymphoma and myeloma. There are two major types of stem cell transplants: syngeneic and allogeneic. Syngeneic transplant describes the use of an identical twin as donor. An allogeneic transplant uses blood or marrow stem cells from a normal donor, usually a brother or sister with the same tissue type. If a sibling is not available, a search of the National Marrow Donor Program registry of tissue-typed volunteers could be made for a matched unrelated donor.

Stem cells also circulate in large numbers in fetal blood and can be recovered from umbilical cord and placental blood after childbirth. The harvesting, freezing and storing of cord blood has provided another source of stem cells for transplantation, especially for children. The numbers of stem cells in cord blood are often insufficient for the needs of larger adult patients. However, studies suggest that two matched cord donors

may result in a higher success rate in larger adults. Cord blood stem cell transplantation provides an additional donor pool and the opportunity for greater ethnic diversity in the blood supply because of collection efforts in hospitals where children of underrepresented ethnic backgrounds are born.

In special instances, especially in young children, slightly mismatched cord stem cell donors may be used quite successfully, and research is being conducted to improve so-called “haploidentical” transplant, for which a parent rather than a sibling could be the donor. Such an approach would greatly lessen the proportion of children without a donor.

Autologous transplantation uses the patient’s own marrow stem cells and is technically not transplantation since another person is not the donor. The technique is important. The blood or marrow stem cells are collected while the patient is in remission, and the harvested cells may be treated with chemotherapy agents or monoclonal antibodies to decrease the presence of contaminating tumor cells before being returned to the patient. The stem cells are frozen and later thawed and infused into the patient if intensive chemotherapy and/or radiotherapy is required for subsequent treatment.

The technique of harvesting stem cells from blood and cord blood has made transplantation available for more patients. Blood and cord blood transplants differ from marrow transplants principally in the source of the cells collected for transplant. Stem cells not only reside in the marrow but also circulate in the blood. Because blood, as well as marrow, is a source of stem cells for transplantation, these cells can be harvested from the blood of a donor, frozen and stored and later transplanted to the patient. To ensure there will be enough blood stem cells for successful transplantation, donors of blood stem cells require special treatment to mobilize sufficient stem cells from marrow into their blood before cells are harvested.

“Non-ablative” allogeneic stem cell transplantation is the term applied to a technique of allogeneic transplant that uses lower doses of chemotherapy and/or radiotherapy to prepare the recipient to receive the donor’s stem cells. This still experimental approach greatly lessens the early toxicity of transplantation and has extended the age at which recipients with leukemia,

lymphoma or myeloma can have an allogeneic transplant. It has been made possible by more effective immunosuppressive drugs that are capable of preventing rejection of the donor’s cells without full intensity treatment of the patient’s immune system. Over time the donor’s cells take hold and the patient’s leukemia, lymphoma or myeloma is attacked and suppressed by donor lymphocytes that form from the donor stem cells. This “graft versus leukemia or lymphoma effect” can suppress (cure) the malignancy and is a prolonged (indefinite) form of immunotherapy. In standard stem cell transplantation, ablation of the recipient’s blood-cell-forming and immune cells was the price that had to be paid to eradicate the leukemia, lymphoma or myeloma and permit the donor’s cells to be accepted by the temporarily immunodeficient recipient. “Ablation” referred to wiping-out the recipient’s cancer, marrow and immune system. In non-ablative transplantation, the recipient’s blood cell and immune system are preserved, making the procedure more tolerable.

New Approaches to Treatment

Several areas of research have resulted in new approaches to the treatment of leukemia, lymphoma and myeloma.

Development of New Drugs: In the past decade, several important new drugs and new uses for existing drugs have greatly improved cure rates or remission duration for some patients with leukemia. Imatinib mesylate (Gleevec®) is now the drug of choice in newly diagnosed patients with chronic myelogenous leukemia (CML). It works by blocking the oncogene-encoded protein product that instigates the transformation to a leukemic cell. The protein is an enzyme in the family of tyrosine kinases. Gleevec offers several dramatic advantages to patients: oral administration, decreased side effects, few severe adverse effects on normal tissues and a very high response rate. The effectiveness and tolerance of older patients and the projections from the first five years of clinical trials in newly diagnosed patients suggest that the drug will prolong the duration of hematological remission and life when compared to former therapy. Although a minority of patients have developed resistance to the drug, two second-generation agents, dasatinib and nilotinib, are entering clinical use that can overcome this resistance in some cases.

Gleevec is not only a very important new agent in the treatment of CML, but it can also induce remissions in some cases of acute leukemia, chronic eosinophilic leukemia (formerly hypereosinophilic syndrome), occasional cases of chronic myelomonocytic leukemia (CMML) and in systemic mastocytosis because they have a genetic abnormality that results in an abnormal tyrosine kinase that is blocked by imatinib (mutant ABL, PDGFR or KIT).

Revlimid®, a thalidomide derivative, has been approved by the U.S. Food and Drug Administration (FDA) for the treatment of a specific type of myelodysplastic syndrome (MDS) that results from an alteration in chromosome 5. Some patients with moderately severe, symptomatic anemia have improvement in hemoglobin levels with this agent. In patients with anemia, principally, but without this specific chromosome 5 abnormality, perhaps 20 percent of cases also derive benefit. Patients with more severe forms of MDS are very unlikely to respond to the agent, however. Azacitidine (Vidaza®), approved by the FDA for all types of MDS, kills unhealthy bone marrow cells and helps the bone marrow function more normally in MDS patients, reducing the need for transfusions in some MDS patients.

The remission rate and duration of remission of acute promyelocytic leukemia (APL) has been improved significantly with the introduction of all-trans retinoic acid in combination with chemotherapy. Arsenic trioxide also adds to the drugs available to treat this subtype of acute leukemia. Early studies indicate the combination of arsenic trioxide and all-trans retinoic acid may be a further advance in the initiation of therapy.

The treatment of hairy cell leukemia, a less common type of chronic lymphocytic leukemia (CLL), has improved dramatically with the introduction of two very useful agents: pentostatin and cladribine, notably the latter. Hairy cell leukemia was very resistant to treatment; however, cladribine has been very effective in producing a large proportion of very long-term remissions of the disease after only one week of therapy.

In May 2006, thalidomide (Thalomid®), in combination with dexamethasone, was approved by the FDA for newly diagnosed myeloma. Two additional drugs being studied in clinical trials have shown responses in a subset of patients with myeloma: the proteasome inhibitor bortezomib (Velcade®) and the immune modulator (Revlimid). Velcade

is approved by the FDA for treating people with myeloma who have had at least one prior therapy. Clinical trial results have shown a significant survival advantage for myeloma patients (who had received one to three prior therapies) treated with Revlimid plus dexamethasone versus dexamethasone alone.

Immunotherapy: This is a treatment that uses immune cells or antibodies to fight the disease; suppresses the progression of leukemia, lymphoma and myeloma; and enhances the specificity of treatment to minimize toxic effects on normal tissues. Three types of immunotherapy are being explored: antibody treatment, vaccine development and immune cell administration.

Monoclonal antibodies are laboratory-produced proteins that can be infused into an appropriate patient. Some antibodies can be made to interact with a cell antigen and, in so doing, decrease the viability of the tumor cell, leading to its death. These antibodies are sometimes called “naked” antibodies, in contrast to antibodies that carry a radioactive agent or a toxin to kill the tumor cell.

Monoclonal antibodies have added to the arsenal of agents that can be used for the treatment of patients with lymphoma and leukemia. It is hoped that they can be added to chemotherapy without producing many toxic side effects.

Rituximab (Rituxan®) is an antibody directed at the target CD20 antigen on B cell lymphoma cells. Cell surface antigens have been given a cluster designation (CD) followed by a number, thus rituximab is an anti-CD20 antibody. Rituximab has become an important agent to treat CD20-positive lymphocytic malignancies. Indeed, although initially used in indolent lymphomas, such as follicular lymphoma, it has now become an important fifth drug in the R-CHOP – rituximab-cyclophosphamide, doxorubicin (Adriamycin®), vincristine (Oncovin®), and prednisone – therapy of diffuse large B-cell lymphoma, the most prevalent lymphoma subtype. Campath®-1H is a monoclonal antibody directed against the antigen CD52 found on T and B lymphocytes. It is especially active against the lymphocytes in CLL.

Another antibody that has been approved for use by the FDA to treat certain patients with acute

myelogenous leukemia (AML) is linked to a chemical toxin called calicheamicin. This drug, with the trade name Mylotarg®, is approved for older patients with AML who relapse after initial treatment.

Monoclonal antibodies can also be linked to a radioactive isotope to target and kill specific cancer cells. These antibodies are injected into the patient in the hope that the antibodies will latch on to the antigen on the cancer cells and destroy the cells. These are called conjugated monoclonal antibodies. They deliver the toxic substance directly to the cancer cells. Examples of this treatment are the drugs Zevalin® and Bexxar®. These drugs have been approved to treat relapsed B-cell non-Hodgkin lymphoma.

In patients with CML who have relapsed after stem cell transplantation, the infusion of donor lymphocytes can re-induce remission. Patients with myeloma have also had remission re-induced by donor lymphocytes. This type of treatment is being studied intensively to learn more about the basis for this immune cell effect and to expand it for use in other situations.

Vaccines: Vaccines are now used to treat certain types of lymphoma. Studies of vaccines used in patients with follicular or indolent lymphoma demonstrated an immune response. Researchers are working on vaccines that could prevent cancer from recurring. The hope is that the immune system of the patient will inhibit the growth of cancer cells.

Many cancer vaccines under development are intended to induce antigen-specific antitumor immune responses. This means that the vaccine induces an immune response against the cancer cells present in the patient. Vaccines have been developed and are in clinical trials for types of acute and chronic leukemia, lymphoma and myeloma. The goal is to extend the duration of remission achieved by remission induction therapy of various types.

Some vaccines contain antigens or parts of antigens purified from cancer cells obtained from the patient or from the same type of cancer cells of another patient. DNA vaccines that contain the DNA that encodes the specific antigen are being tested. In some approaches, cells are isolated in the laboratory and start making antibodies after insertion of the cancer antigen. In each

case, the basis for the vaccine is to make the cancer cells susceptible to immune attack by heightening the recognition of markers on the cancer cells.

Paradoxically, some vaccines are made from leukemic cells treated in test tubes to convert them to potent antigen-presenting cells.

Reversal of Multidrug Resistance: The malignant cells of patients have mechanisms that may allow them to escape the damaging effects of chemotherapy agents. These cells are, or become, less responsive to therapy. Approaches to reversing multidrug resistance are under study. The goal of several new agents being studied is to decrease resistance to an important chemotherapy drug used in leukemia. These agents are currently being tested in patients with AML and myeloma in the hope that they may decrease drug resistance and increase the rate of a prolonged response to therapy.

Gene Therapy: One approach to this type of treatment is to use “antisense” agents that block the encoding instructions of an oncogene so that it cannot direct the formation of the corresponding oncoprotein that causes the cell to transform into a malignant cell. These agents can act on the gene (DNA) or on RNA to prevent the formation of the gene product or protein (oncoprotein) that is the direct cause of transforming the cell into a malignant type.

In another approach, drugs are designed to interfere with the oncoprotein and prevent its effect on the cell. In studies of CML, gene therapy researchers are trying to modify an oncogene (BCR-ABL) that produces a protein that stimulates malignant cell growth. An alternative strategy called molecular targeted drug development targets the oncoprotein. Two new and potentially important approaches include a) the application of RNA interference; b) a modality that uses molecules of RNA to silence complementary (DNA) genes; and aptamer treatment, a technique that prepares small molecules in the laboratory that have the ability to inactivate proteins that cause disease. If the gene in the former case is an oncogene or the protein in the latter case is an oncoprotein, new forms of cancer therapy may be developed.

Leukemia

Leukemia is a malignant disease (cancer) of the bone marrow and blood. It is characterized by the uncontrolled accumulation of blood cells. Leukemia is divided into four categories: myelogenous or lymphocytic, each of which can be acute or chronic. The terms myelogenous or lymphocytic denote the cell type involved. Thus, the four major types of leukemia are:

Acute Lymphocytic Leukemia	Chronic Lymphocytic Leukemia
Acute Myelogenous Leukemia	Chronic Myelogenous Leukemia

Table 1: The Four Major Types of Leukemia

Living with Leukemia

An estimated 208,080 people in the United States are living with leukemia.

Acute leukemia is a rapidly progressing disease that results in the accumulation of immature, functionless cells in the marrow and blood. The marrow often no longer produces enough normal platelets, red blood cells and white blood cells. Anemia, a deficiency of red cells, develops in virtually all leukemia patients. The lack of normal white cells impairs the body's ability to fight infections. A shortage of platelets results in bruising and easy bleeding.

Chronic leukemia progresses more slowly and allows greater numbers of more mature, functional cells to be made.

Approximate U.S. Prevalence of the Four Major Leukemias as of January 1, 2003

Type	Prevalence*
Chronic lymphocytic leukemia	90,858
Chronic myelogenous leukemia	20,455
Acute lymphocytic leukemia	47,775
Acute myelogenous leukemia	25,687

Table 2: Source: SEER (Surveillance, Epidemiology, and End Results) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.
*Prevalence estimates are expressed here as the number of people living in which first involved tumor for each cancer site was diagnosed during the previous 28 years.

New Cases

An estimated 35,070 new cases of leukemia will be diagnosed in the United States this year. Acute leukemias account for 9 percent more of the cases than chronic leukemias.

- Most cases of leukemia occur in older adults; more than half of all cases occur after age 64. Leukemia is expected to strike more than nine times as many adults as children in 2006. (About 31,628 adults compared with 3,442 children, ages 0-19.)
- The most common types of leukemia in adults are acute myelogenous leukemia (AML) and chronic lymphocytic leukemia (CLL).
- About 32 percent of cancers in children ages 0-14 years are leukemia.
- Most cases of chronic myelogenous leukemia (CML) occur in adults. Only 2.8 percent of leukemias in children ages 0-19 are CML.
- The most common form of leukemia in children is acute lymphocytic leukemia (ALL). Nearly 61 percent (about 2,388) of the new cases of this disease will occur among children in 2006.

Total Estimated Number of New Leukemia Cases in the United States for 2006

Type	Individuals	Male	Female
Acute lymphocytic leukemia	3,930	2,150	1,780
Chronic lymphocytic leukemia	10,020	6,280	3,740
Acute myelogenous leukemia	11,930	6,350	5,580
Chronic myelogenous leukemia	4,500	2,550	1,950
Other, unclassified forms of leukemia	4,690	2,670	2,020
Total	35,070	20,000	15,070

Table 3: Source: *Cancer Facts and Figures 2006*, American Cancer Society, 2006.

Estimated Proportion of New Cases (%) in 2006 for Each Type of Leukemia Including Adults and Children

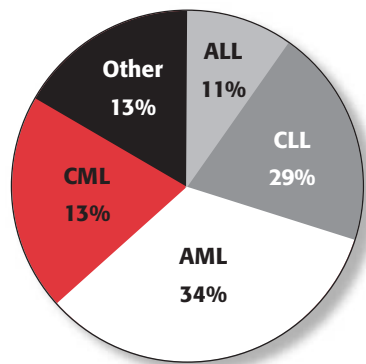


Figure 3: Source: *Cancer Facts and Figures 2006*, American Cancer Society, 2006.

Incidence by Gender

Incidence rates* for all types of leukemia are higher among males than among females. In 2006, males are expected to account for 57 percent of the new cases of leukemia.

**Note: Incidence rates are the number of new cases in a given year not counting the pre-existing cases. The incidence rates are usually presented as a specific number per 100,000 population.*

Incidence by Race and Ethnicity

Incidence rates for all types of cancer are 5 percent higher among Americans of African descent than among those of European descent. The incidence rate for all cancers among African-Americans, from 2000-2003, was 504.4 per 100,000 population, averaging about 174,816 cases per year. However, leukemia rates are higher in Americans of European descent than among those of African descent.

Leukemia is one of the top 15 most frequently occurring cancers in minority groups. Leukemia incidence is highest among whites and lowest among American Indians/Alaskan natives.

Leukemia rates are substantially higher for white and Hispanic children than for black children.

Hispanic children of all races under the age of 20 have the highest rates of leukemia.

Incidence by Age Group

Incidence rates by age differ for each of the leukemias. The leukemias represented 26 percent of all cancers occurring among children younger than 20 years from 2000-2003. In the 17 SEER areas of the United States, there were 2,847 children under the age of 20 diagnosed with leukemia from 2001-2003, including 2,130 with ALL. From these data, it is estimated that in 2006, 3,442 children will be diagnosed with leukemia throughout the United States. About 2,388 new cases of childhood ALL are expected to occur in 2006.

The most common form of leukemia among children under 19 years of age is ALL. The incidence of ALL among 1- to 4-year-old children is more than nine times greater than the rate for young adults ages 20-24.

There is optimism within centers that specialize in the treatment of children because survival statistics have dramatically improved over the past 30 years. Most children under 15 with ALL are cured.

CLL incidence increases dramatically among people who are age 50 and above, and AML incidence increases dramatically in people who are 60 and above. CML incidence increases dramatically among people who are age 60 and above. These cancers are most prevalent in the seventh, eighth and ninth decades of life.

Age-Specific Incidence Rates for Acute Myelogenous Leukemia (All Races), 2000-2003

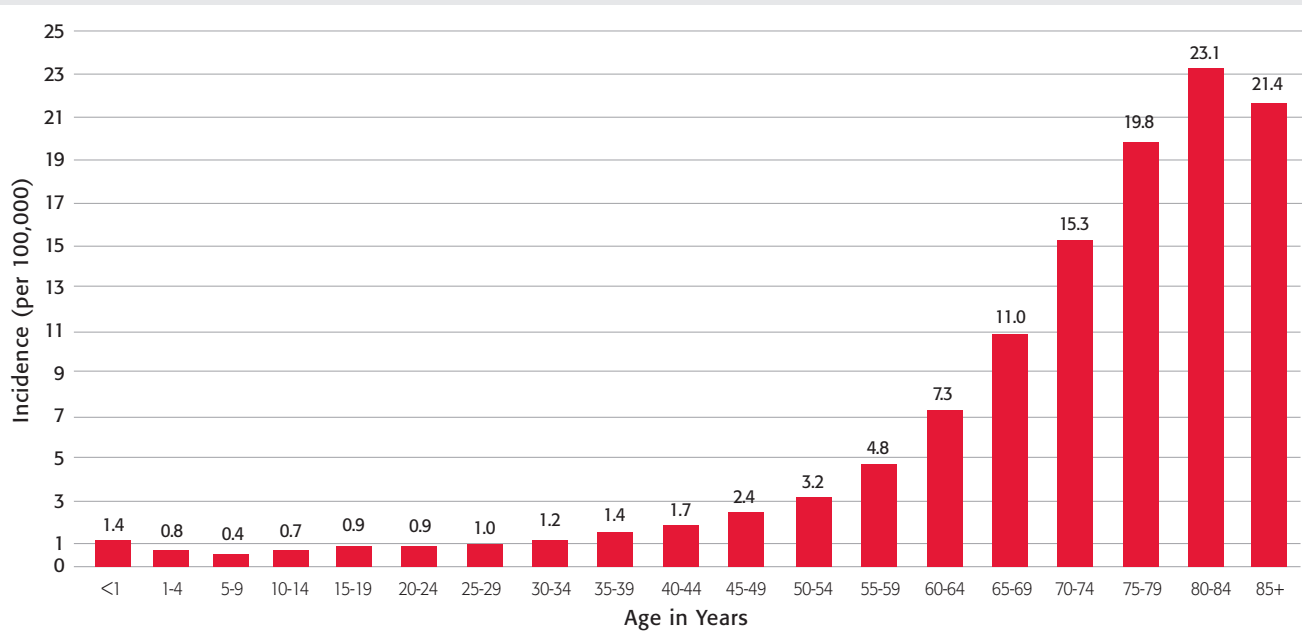


Figure 4: Sources: SEER (Surveillance, Epidemiology and End Results) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.

Signs and Symptoms of Leukemia

Signs of acute leukemia may include:

- Easy bruising or bleeding (because of platelet deficiency)
- Paleness or easy fatigue (because of anemia)
- Recurrent minor infections or poor healing of minor cuts (because of inadequate white cell count)

These signs are not specific to leukemia and may be caused by other disorders. They do warrant medical evaluation. The diagnosis of leukemia requires specific blood tests, including the examination of the cells in blood or marrow. A proportion of people with chronic leukemia may not have major symptoms and are diagnosed during a medical examination.

Possible Causes of Leukemia

Anyone can get leukemia. Leukemia strikes all ages and both sexes. The cause of leukemia is not known. Although chronic exposure to benzene in the workplace and exposure to extraordinary doses of irradiation can be causes of the disease, neither explains most cases.

Treatment of Leukemia

The aim of treatment is to bring about a complete remission. Complete remission means that there is no evidence of the disease and the patient returns to good health with normal blood and marrow cells. Relapse indicates a return of the cancer cells and the return of other signs and symptoms of the disease. For acute leukemia, a complete remission (no evidence of disease in the blood or marrow) that lasts five years after treatment often indicates cure. Treatment centers report increasing numbers of patients with leukemia who are in complete remission at least five years after diagnosis of their disease.

Five-Year Relative Survival Rates for All Ages, All Types Leukemia, 1975-2002

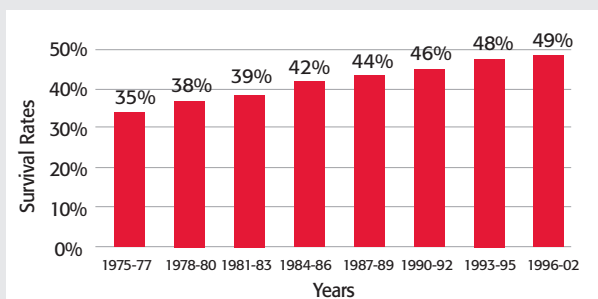


Figure 5: Sources: SEER (Surveillance, Epidemiology and End Results) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.

Survival

Relative survival compares the survival rate of a person diagnosed with a disease with that of a person without the disease. The relative five-year survival rate has more than tripled in the past 46 years for patients with leukemia. In 1960-63, when compared to a person without leukemia, a patient had a 14 percent chance of living five years. By 1975-77, the five year relative survival rate had jumped to 35 percent, and in 1996-2002, the overall relative survival rate was nearly 49 percent. The relative survival rates differ by age of the patient at diagnosis, gender, race and type of leukemia.

During 1996-2002, the five-year relative survival rates overall were:

- Acute lymphocytic leukemia: 65.2 percent overall; 90.5 percent for children under 5
- Chronic lymphocytic leukemia: 74.2 percent
- Acute myelogenous leukemia: 20.4 percent overall; 53.1 percent for children under 15
- Chronic myelogenous leukemia: 42.3 percent

Five-Year Relative Survival Rates for Acute Lymphocytic Leukemia, in Children Under 15 Years, 1964-2002

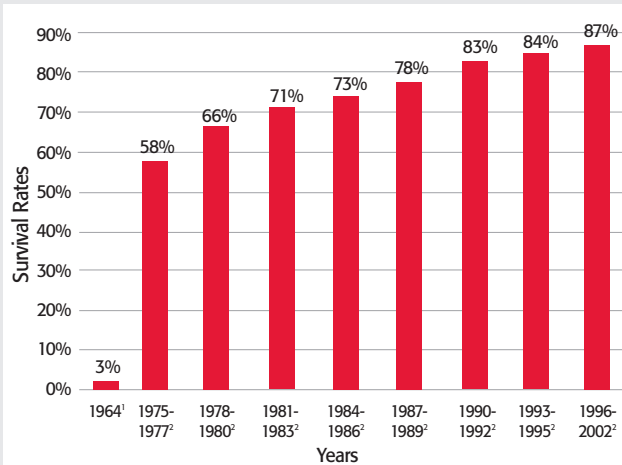


Figure 6: The graph shows childhood ALL five-year relative survival rates have improved significantly over the past nearly 40 years.
Sources: 1. Zuelzer WW. Implications of long-term survivals in acute stem cell leukemia of childhood treated with composite cyclic therapy. *Blood* 1964; 24: 477-94. 2. *Surveillance, Epidemiology and End Results (SEER) Program*, Cancer Statistics Review, 1975-2003, National Cancer Institute, 2006.

Deaths

It is anticipated that approximately 22,280 deaths in the United States will be attributed to leukemia in 2006: 12,470 males and 9,810 females.

There will be an estimated 4,660 deaths from CLL and 1,490 deaths from ALL. There will be an estimated 9,040 deaths from AML and 600 deaths from CML.

Unclassified forms of leukemia will account for 6,490 additional deaths.

The estimated numbers of deaths attributed to leukemia in the United States are about 27 percent higher for males than for females. In 2006, deaths from leukemia are expected to be distributed in the following numbers:

Estimated Deaths (All Age Groups) from All Types of Leukemia in 2006

Type	Overall	Male	Female
Acute lymphocytic leukemia	1,490	900	590
Chronic lymphocytic leukemia	4,660	2,590	2,070
Acute myelogenous leukemia	9,040	5,090	3,950
Chronic myelogenous leukemia	600	300	300
Other, unclassified forms of leukemia	6,490	3,590	2,900
Total	22,280	12,470	9,810

Table 4: Source: *Cancer Facts and Figures 2006*, American Cancer Society.

Leukemia is the fifth most common cause of cancer deaths for men and the seventh most common cause of cancer deaths for women. The leukemia death rate for children 0–14 years of age in the United States has declined 61 percent over the past three decades. Despite this decline, leukemia causes more deaths than any other cancer among children and young adults under age 20.

In 2003 (the latest year for which data are available), 688 children under the age of 20 died from leukemia.

Lymphoma

Lymphoma is a general term for a group of cancers that originates in the lymphatic system. Lymphoma results when a lymphocyte (a type of white blood cell) undergoes a malignant change and begins to multiply, eventually crowding out healthy cells and creating tumors that enlarge the lymph nodes or other sites in the body. Fifty-six percent of the blood cancers diagnosed are lymphomas.

Hodgkin Lymphoma

Hodgkin lymphoma is a specialized form of lymphoma and will represent about 11.7 percent of all lymphomas diagnosed in 2006. Hodgkin lymphoma has characteristics that distinguish it from all other cancers of the lymphatic system, including the presence of an abnormal cell called the Reed-Sternberg cell (a large, malignant cell found in Hodgkin lymphoma tissues); incidence rates higher in adolescents and young adults than adults in their middle years; and five-year relative survival rates of 86 percent.

Non-Hodgkin Lymphoma

Non-Hodgkin lymphoma represents a diverse group of cancers with the distinctions between types based on the characteristics of the cancerous cells. The groups are often classified as indolent or aggressive, or low, intermediate and high grade. Each histologic grouping is diagnosed and treated differently, and each has prognostic factors that categorize it as more or less favorable. It is the sixth most common cause of cancer deaths in males and in females.

Living with Lymphoma

In the United States in 2006, there are 133,819 people living with Hodgkin lymphoma (active disease or in remission) and 385,654 people living with non-Hodgkin lymphoma for a total of 519,473 members of the U.S. population who are living with lymphoma.

New Cases

About 66,670 Americans will be diagnosed with lymphoma in 2006 (7,800 cases of Hodgkin lymphoma and 58,870 cases of non-Hodgkin lymphoma). The incidence of Hodgkin lymphoma is consistently lower than that of non-Hodgkin lymphoma.

Non-Hodgkin lymphoma is the sixth most common cancer in males and the fifth most common cancer in females in the United States. The age-adjusted incidence of non-Hodgkin lymphoma rose by 76 percent from 1975-79 to 2002-2003, an average annual percentage increase of 2.6 percent.

New Cases of Lymphoma by Gender, 2006

Type	Male	Female	Total
Hodgkin Lymphoma	4,190	3,610	7,800
Non-Hodgkin Lymphoma	30,680	28,190	58,870
Total	34,870	31,800	66,670

Table 5: Source: *Cancer Facts and Figures 2006*, American Cancer Society, 2006.

Age-specific incidence rates of non-Hodgkin lymphoma are 2.9/100,000 at ages 20-24 for males and 1.9/100,000 for females. By ages 60-64, they are 51.2/100,000 for males and 38.4/100,000 for females. Twelve percent of all cases of Hodgkin lymphoma diagnosed in 2006 will be in children under 20 years of age, while fewer than 2 percent of all cases of non-Hodgkin lymphoma will be diagnosed in children this year.

The reasons for the development of non-Hodgkin lymphoma are not certain. Immune suppression plays a role in some patients. Persons infected with the human immunodeficiency virus (HIV) have a much higher risk of developing lymphoma. The Epstein-Barr virus causes Burkitt lymphoma in Africa. The bacterium *Helicobacter pylori* is associated with the development of lymphoma in the stomach wall. These risk factors explain only a small proportion of cases.

Incidence by Gender

Table 5 illustrates the breakdown of incidence of lymphoma by gender. Incidence rates for Hodgkin lymphoma tend to be higher among males than among females. In aggregate, both lymphomas are more common in males than in females.

Incidence by Race and Ethnicity

Although blacks in their mid 20s to late 40s have higher incidence rates of non-Hodgkin lymphoma than whites, in general whites have higher incidence rates than blacks. After 50-54 years of age, incidence rates for non-Hodgkin lymphoma are higher in Americans of European descent than among those of African descent. Among women, Hispanics of all races have the second highest incidence rates after whites. Non-Hodgkin lymphoma is the fifth most common cancer in Hispanics, comprising nearly 5 percent of all cancers diagnosed, and is the eighth most common cause of cancer death in that group.

Incidence in Children

The incidence of Hodgkin lymphoma among people under 20 years of age was 1.1 per 100,000 children in 2003. The incidence in this group has been decreasing almost steadily and significantly between 1975 and 2003.

In the United States, about 14,233 children under the age of 20 were diagnosed with cancer in 2000-2003. Lymphomas (Hodgkin lymphoma, 6.1 percent, and non-Hodgkin lymphoma, 2.7 percent) are the third most common cancers in children, following leukemia (26.5 percent) and neoplasms of the central nervous system (18 percent). Among very young children, a diagnosis of non-Hodgkin lymphoma is more prevalent than in adolescents, whereas adolescents are more commonly diagnosed with Hodgkin lymphoma than young children.

In children less than 20 years of age, lymphomas are most commonly diagnosed in whites (24.9/1 million population), followed closely by Hispanic children of all races (20.9/1 million population). It is rarest among American Indian/Alaskan native children.

Incidence in Adults

The incidence of non-Hodgkin lymphoma increases with age. About 2.4 cases per 100,000 people occur in 20-24-year-old individuals. The rate increases more than 18 times to 44.5 cases per 100,000 by age 60, and more than 41-fold to nearly 100 cases per 100,000 persons after age 75.

Signs and Symptoms

Symptoms of Hodgkin lymphoma include painless swelling of lymph nodes in the neck, armpit or groin, persistent fatigue, recurrent high fever, sweating at night, troublesome itching and weight loss.

The most common early symptom of other forms of lymphoma is also painless swelling of the lymph nodes – usually in the neck, armpit, groin or in the abdomen. Other symptoms often include fever, night sweats, excessive tiredness, indigestion and abdominal pain, loss of appetite and bone pain.

Treatment

Hodgkin lymphoma is often treated with radiation and chemotherapy.

Early stage, localized non-Hodgkin lymphoma is sometimes treated with radiation; widespread disease requires chemotherapy or chemotherapy and/or monoclonal antibody therapy with radiation, depending on the tumor size, cell type and location of the lymphoma. Treatment for non-Hodgkin lymphoma sometimes includes vaccines and other forms of immunotherapy.

Age-Specific Incidence Rates for Hodgkin Lymphoma, 2000 – 2003

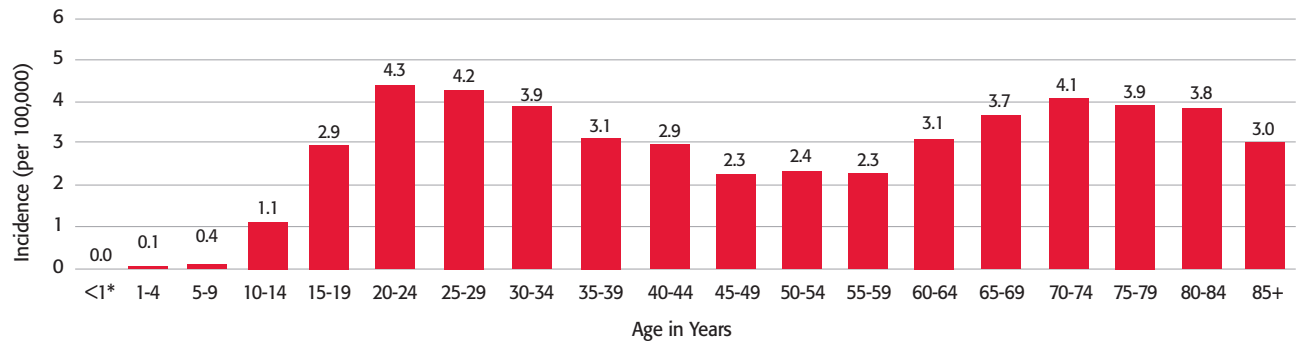


Figure 7: Sources: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.
 * < 16 cases for time interval.

Age-Specific Incidence Rates for Non-Hodgkin Lymphoma, 2000–2003

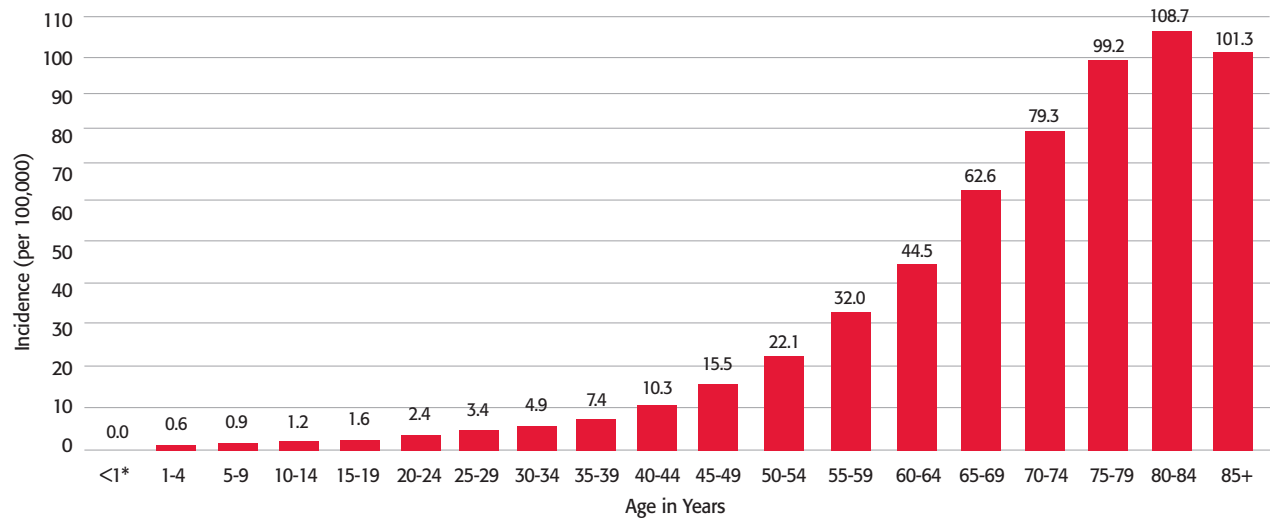


Figure 8: Sources: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.
 *Based on <16 cases per time interval.

Trends in Five-Year Relative Survival Rates by Race for Hodgkin Lymphoma and Non-Hodgkin Lymphoma

Hodgkin Lymphoma	1975-77	1981-83	1990-92	1996-2002
All races	73%	76%	83%	86%
Whites	74%	76%	84%	87%
African Americans	71%	73%	74%	81%

Non-Hodgkin Lymphoma	1975-77	1981-83	1990-92	1996-2002
All races	48%	52%	52%	63%
Whites	48%	53%	53%	64%
African Americans	48%	50%	42%	56%

Table 6: Source: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.

Survival for Adults

Hodgkin lymphoma is now considered to be one of the most curable forms of cancer. Radiation, chemotherapy or both may result in cures for most patients with Hodgkin lymphoma.

The five-year relative survival rate for patients with Hodgkin lymphoma has more than doubled from 40 percent in whites in 1960 to 86 percent for all races in 2002.

The five-year relative survival rate for non-Hodgkin lymphoma patients has risen from 31 percent in whites in 1960-63 to 62.9 percent for all races in 1996-2002.

Survival for Children

Five-year relative survival is 95.1 percent for Hodgkin lymphoma in people under 20 years of age.

In children 0-19 years of age, five-year relative survival for non-Hodgkin lymphoma is now 81.9 percent. This represents a significant improvement in the rate of recovery; even in the mid-1970s, the majority of children with non-Hodgkin lymphoma did not live five years after diagnosis.

Deaths

An estimated 20,330 persons will die from lymphoma in the United States in 2006 (18,840 from non-Hodgkin lymphoma; 1,490 from Hodgkin lymphoma). Death rates have been decreasing for Hodgkin lymphoma patients since the mid-1970s.

Estimated Deaths by Gender from Hodgkin Lymphoma and Non-Hodgkin Lymphoma

Type	Overall	Male	Female
Hodgkin Lymphoma	1,490	770	720
Non-Hodgkin Lymphoma	18,840	10,000	8,840
Total	20,330	10,770	9,560

Table 7: Source: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.

Myeloma

Myeloma is a cancer of the plasma cells, a type of white blood cell found in many tissues of the body, but primarily in the bone marrow. In myeloma, a B lymphocyte, the cell that forms plasma cells, becomes malignant. It grows continuously and forms masses of plasma cells, especially in the marrow, destroying normal bone tissue, causing pain and crowding out normal blood cell production.

Malignant plasma cells produce an abnormal protein called monoclonal immunoglobulin. Immunoglobulins (or antibodies) are an important part of the body's natural defense against infection because they recognize microbes that invade the body and permit them to be removed and destroyed. The onset of myeloma interferes with normal production of antibodies and makes myeloma patients susceptible to infections.

Living with Myeloma

An estimated 58,336 people in the United States are living with myeloma. Seventy percent of those were diagnosed with the disease within the previous five years.

New Cases

An estimated 16,570 (9,250 men and 7,320 women) new cases of myeloma will be diagnosed in the United States in 2006.

- The median age at diagnosis is 70 years of age, and it rarely occurs in people under age 45.
- The median age at diagnosis for African-Americans is 67.
- Americans of African descent have a much higher incidence rate (11.2/100,000) of myeloma than those of European descent (5.1/100,000). The highest rates are found in black men 80-84 years of age and older (112.1/100,000).
- From 2000-2003, myeloma was the 11th most commonly diagnosed cancer among African-American women and the 10th most commonly diagnosed cancer in African-American men.
- The incidence rate in men (6.8/100,000) is 62 percent higher than for women (4.2/100,000) for all racial and ethnic groups.

Signs and Symptoms

Often the first symptom of myeloma is bone pain caused by the effects of myeloma cells in the marrow. Patients may have anemia, tire more easily and feel weak. Fractures may occur as a result of the weakened bones. Recurrent infections may be an early sign of the disease.

Possible Causes

The cause of myeloma is not known.

Treatment

Chemotherapy for myeloma has led to sustained remissions in some patients. At times, two or three drugs are used simultaneously. Bortezomib (Velcade) has been approved for treating myeloma in patients who have had at least two prior therapies. Lenalidomide (Revlimid) has been studied in clinical trials and has been found to be very useful. Thalidomide was recently approved by the FDA for use in treating newly diagnosed myeloma. Treatment may include intensive chemotherapy followed by stem cell transplantation to restore normal blood cell production. Usually, the patient's own stem cells are used (autologous stem cell infusion). Treatment is aimed at slowing progress of the disease.

Survival

Current statistical databases show that overall five-year relative survival in patients with myeloma has shown a significant improvement since the 1960s: 12 percent in 1960-63 for whites to 33 percent from 1996-2002 for all races. Total survival for males, especially, has been increasing.

Although newer treatments are expected to improve survival rates, even the most aggressive therapies rarely cure the disease.

Deaths

Approximately 11,310 deaths from myeloma are anticipated this year. Myeloma was the 10th most common cause of cancer deaths for women in 2000-2003. Approximately 3 percent of all cancer-related deaths among African-Americans in 2000-2003 were from myeloma. The mortality rate from myeloma for people of African descent is more than double the rate for whites (7.2/100,000 to 3.5/100,000) The U.S. median age at death from multiple myeloma is 74. It is 71 for African-Americans.

Age-Specific Incidence Rates for Myeloma, 2000-2003

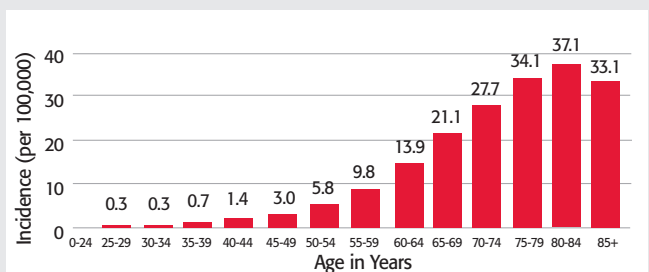


Figure 9: Source: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.
* < 16 cases for each age interval (<1, 1-4, 5-9, 10-14, 15-19, 20-24).

Incidence Rates: Leukemia, Lymphoma and Myeloma

The following tables showing incidence rates for leukemia, Hodgkin and non-Hodgkin lymphoma and myeloma use figures from 2000-2003, the most recent available. Rates are per 100,000 population and are age-adjusted to the 2000 population.

Incidence Rate by Gender, All Races, Per 100,000 Population (2000-2003)

Type	Overall	Male	Female
Leukemia	12.2	15.9	9.4
Non-Hodgkin Lymphoma	19.1	23.0	16.1
Hodgkin Lymphoma	2.7	3.0	2.3
Myeloma	5.5	6.9	4.5

Table 8: Source: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006. (Based on SEER 17 areas).

Incidence Rate by Gender, for Blacks, Per 100,000 Population (2000-2003)

Type	Overall	Male	Female
Leukemia	10.1	12.9	8.0
Non-Hodgkin Lymphoma	14.3	17.6	11.7
Hodgkin Lymphoma	2.4	2.8	2.0
Myeloma	10.9	13.7	9.1

Table 9: Source: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006. (Based on SEER 17 areas).

Incidence Rate by Gender, for Whites, Per 100,000 Population (2000-2003)

Type	Overall	Male	Female
Leukemia	12.7	16.5	9.8
Non-Hodgkin Lymphoma	19.9	23.8	16.8
Hodgkin Lymphoma	2.9	3.2	2.6
Myeloma	5.1	6.5	4.1

Table 10: Source: SEER (*Surveillance, Epidemiology and End Results*) Cancer Statistics Review 1975-2003, National Cancer Institute, 2006. (Based on SEER 17 areas).

Estimated New Cases of Blood Cancers by Site, by State, 2006

State	Leukemia	Non-Hodgkin Lymphoma	Hodgkin Lymphoma	Myeloma
Alabama	550	1,030	160	310
Alaska	50	90	*	*
Arizona	630	1,060	160	280
Arkansas	390	660	100	180
California	3,450	5,840	790	1,610
Colorado	470	810	100	220
Connecticut	470	750	50	220
Delaware	130	190	*	*
District of Columbia	50	120	50	*
Florida	2,660	4,060	470	950
Georgia	820	1,470	160	470
Hawaii	130	280	50	60
Idaho	170	280	50	60
Illinois	1,620	2,280	310	730
Indiana	820	1,410	100	370
Iowa	490	840	100	190
Kansas	390	720	100	160
Kentucky	520	970	160	260
Louisiana	540	870	100	290
Maine	160	280	*	90
Maryland	630	1,060	160	340
Massachusetts	770	1,310	210	380
Michigan	1,240	2,280	260	660
Minnesota	660	1,060	160	290
Mississippi	360	560	100	160
Missouri	790	1,590	160	350
Montana	140	220	50	70
Nebraska	250	370	100	100
Nevada	270	470	50	120
New Hampshire	160	310	50	70
New Jersey	1,100	1,870	260	530
New Mexico	190	370	50	120
New York	2,160	3,030	520	1,000
North Carolina	990	1,840	210	540
North Dakota	90	160	*	*
Ohio	1,540	2,190	370	670
Oklahoma	460	720	160	180
Oregon	420	1,090	100	250
Pennsylvania	1,700	3,410	470	840
Rhode Island	130	220	50	60
South Carolina	520	940	100	320
South Dakota	130	250	50	60
Tennessee	760	1,440	160	400
Texas	2,250	3,340	580	1,100
Utah	190	440	50	100
Vermont	80	190	*	*
Virginia	800	1,060	210	420
Washington	690	1,410	160	380
West Virginia	240	560	50	130
Wisconsin	770	870	160	280
Wyoming	60	120	*	*
Total**	35,070	58,870	8,020	16,370

Table 11: Source: American Cancer Society, *Cancer Facts and Figures 2006*, and additional data supplied by the American Cancer Society. Used with permission. Numbers are rounded to the nearest 10. * Estimate is fewer than 50 cases. ** State estimates may not add up to U.S. total because of rounding and exclusion of estimates that are fewer than 50 cases. Note: These estimates are offered as a rough guide and should be interpreted with caution. Method of derivation is described in Jemal *et al.*, 2006.

Estimated Deaths from Blood Cancers by Site, by State, 2006

State	Leukemia	Non-Hodgkin Lymphoma	Hodgkin Lymphoma	Myeloma
Alabama	350	330	*	210
Alaska	*	*	*	*
Arizona	400	340	*	190
Arkansas	250	210	*	120
California	2,190	1,870	150	1,100
Colorado	300	260	*	150
Connecticut	300	240	*	150
Delaware	80	60	*	*
District of Columbia	*	*	*	*
Florida	1,690	1,300	90	650
Georgia	520	470	*	320
Hawaii	80	90	*	*
Idaho	110	90	*	*
Illinois	1,030	730	60	500
Indiana	520	450	*	250
Iowa	310	270	*	130
Kansas	250	230	*	110
Kentucky	330	310	*	180
Louisiana	340	280	*	200
Maine	100	90	*	60
Maryland	400	340	*	230
Massachusetts	490	420	*	260
Michigan	790	730	50	450
Minnesota	420	340	*	200
Mississippi	230	180	*	110
Missouri	500	510	*	240
Montana	90	70	*	50
Nebraska	160	120	*	70
Nevada	170	150	*	80
New Hampshire	100	100	*	50
New Jersey	700	600	50	360
New Mexico	120	120	*	80
New York	1,370	970	100	680
North Carolina	630	590	*	370
North Dakota	60	50	*	*
Ohio	980	700	70	460
Oklahoma	290	230	*	120
Oregon	270	350	*	170
Pennsylvania	1,080	1,090	90	570
Rhode Island	80	70	*	*
South Carolina	330	300	*	220
South Dakota	80	80	*	*
Tennessee	480	460	*	270
Texas	1,430	1,070	110	750
Utah	120	140	*	70
Vermont	50	60	*	*
Virginia	510	340	*	290
Washington	440	450	*	260
West Virginia	150	180	*	90
Wisconsin	490	280	*	190
Wyoming	*	*	*	*
Total**	22,280	18,840	770	11,010

Table 12: Source: American Cancer Society, *Cancer Facts and Figures 2006* and additional data supplied by the American Cancer Society, based on data from U.S. Mortality Public Use Data Tapes, 1969-2003. National Center for Health Statistics, Centers for Disease Control & Prevention, 2006. Used with permission. Rounded to nearest 10. * Estimate is fewer than 50 deaths. ** State estimates may not add up to U.S. total because of rounding and exclusion of estimates that are fewer than 50 cases. Method of derivation is described in Jemal *et al.*, 2006.

Notes, Definitions and Citations

Notes

The United States does not have a nationwide reporting system or registry for blood cancers, so the exact number of cases is not known. The data presented in this report are an extrapolation or estimate of the number of cases reported by the 17 Surveillance, Epidemiology and End Results Program (SEER) regions (or, in some cases fewer than 17 SEER regions) and death data from the National Center for Health Statistics. These numbers are extrapolated to the entire 17 SEER regions by dividing the number of cancer cases or deaths in a specific region by the U.S. Bureau of the Census' 2000 population data for that region. Mortality data reflected in the 2006 SEER report used as a reference reflect data updates from 2004.

Because of changes in the information – such as racial classification – gathered in the 2000 U.S. Census, estimates of cancer incidence, survival and mortality have been revised, mostly upward, in comparison to the 2002 SEER report. Because of reporting delays from some of the SEER regions, the data presented in the 2006 SEER report placed online on May 1, 2006, may be incomplete in some cases.

The SEER (17 region) data cover only about 26.2 percent of the U.S. population. The data can be extrapolated for the entire United States by multiplying by the population ratio, but these figures do not take into account differences in geography, race and ethnicity in various regions and region-specific health risks.

Jemal *et al.* describe the American Cancer Society's methods for determining its estimates of new cancer cases and cancer deaths for 2006.

Definitions

Incidence is the number of newly diagnosed cases for a specific cancer or for all cancers combined during a specific time period. When expressed as a rate, it is the number of new cases per standard unit of population during the time period. Incidence rates can be calculated based on a number of factors such as age, race or sex.

Age-adjusted rate is an incidence or mortality rate that has been adjusted to reduce the effects of differences in the age distributions of the populations being compared.

Relative survival rate is an estimate of the percentage of patients who would be expected to survive the effects of the cancer. This rate is calculated by adjusting the observed survival rate so that the effects of causes of death other than those related to the cancer in question are removed. The relative survival rate is a comparison of survival to a person

who is free of the disease. (Observed survival is the actual percentage of patients still alive at some specified time after diagnosis of cancer. It considers deaths from all causes, cancer or otherwise.)

Prevalence is the estimated number of people alive on a certain date in a population who previously had a diagnosis of the disease. It includes new (incidence) and pre-existing cases and is a function of both past incidence and survival. Prevalence may be calculated in a number of different ways, especially in looking at populations in which individuals have had more than one type of cancer. In some prevalence statistics, only the first diagnosed cancer counts. Thus, if a person is initially diagnosed with melanoma and later develops leukemia, their survival with leukemia may not be counted in leukemia prevalence statistics. Thus, prevalence numbers reported may vary depending upon the method used to determine them.

In this report, complete prevalence is reported as defined by SEER as “an estimate of the number of persons (or the proportion of population) alive on a specified date who had been diagnosed with the given cancer, no matter how long ago that diagnosis was.” We are using the “28-year limited duration” prevalence figures, based on the “first invasive tumor for each cancer site diagnosed during the previous 28 years (1975-2002),” as per SEER table I-17. The specified date is 1/1/2003 for the prevalence estimates.

Source Citations

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About the Society

The Leukemia & Lymphoma Society® is the world's largest voluntary health organization dedicated to funding blood cancer research and providing education and patient services. We offer a wide variety of programs and services in support of our mission: Cure leukemia, lymphoma, Hodgkin's disease and myeloma, and improve the quality of life of patients and their families.

The Society is a nonprofit organization that relies on the generosity of individual and corporate contributions to advance its mission.

Research

Research Grant Programs

The Society's research programs are based on the belief that all scientifically sound approaches toward a cure for, or control of, leukemia, lymphoma and myeloma should be encouraged on a worldwide basis. Since the first funding in 1954, the Society has awarded \$483 million in research grants. Now about \$58 million annually, the Society's grant programs are among the most prestigious in the fields of hematology and oncology.

Research grants are awarded in three program areas: Career Development, Translational Research and the Specialized Center of Research (SCOR).

Career Development Program

The *Career Development Program* supports promising young scientists (Scholars, Special Fellows and Fellows) pursuing careers and is stratified into two separately reviewed programs in basic or clinical research:

Basic Research

- Scholars are awarded \$110,000 a year for a total of \$550,000 over five years.
- Special Fellows are awarded \$60,000 a year for a total of \$180,000 over three years.
- Fellows are awarded \$50,000 a year for a total of \$150,000 over three years.

Translational Research

- Scholars in Clinical Research are awarded \$110,000 a year for a total of \$550,000 over five years.
- Special Fellows in Clinical Research are awarded \$60,000 a year for a total of \$180,000 over three years.

Translational Research Program

The *Translational Research Program* provides early-stage support for research on leukemia, lymphoma and myeloma that is intended to advance treatment, diagnosis or prevention in the near term.

Translational Research Awards are made for an initial three-year period. Awards up to \$200,000 per year for three years, for a total of \$600,000, are granted each year. Funding for two additional years may be provided for highly promising projects that are entering Phase I clinical trial. Thus, research reaching a clinical trial can receive \$1 million over five years to facilitate new drug discovery or advances in diagnosis or prevention.

The Specialized Center of Research (SCOR) in Leukemia, Lymphoma and Myeloma

These center grants are awarded to a cluster of at least three research groups that interact to foster advances in the diagnosis, treatment or prevention of leukemia, lymphoma or myeloma. The *SCOR* grants also support scientific core laboratories to provide access to innovative technology if required by the participating research programs. The program is expected to generate new knowledge and breakthrough discoveries, leading to better survival rates and prevention measures for patients. Each *SCOR* is funded up to \$1.25 million per year over a five-year period, to a total cost of \$6.25 million.

The *SCOR* program brings together research teams working in complementary areas, each focused on the discovery of new approaches to benefit patients or those at risk for developing leukemia, lymphoma and myeloma. Awards go to those groups that best demonstrate the synergy that will occur from their close interaction. The participating scientists may be at different institutions or from any country.

Experts in the field of leukemia, lymphoma and myeloma research composing four review subcommittees – 1) *Career Development Program* (CDP)-basic, 2) CDP-translational, 3) *Translational Research Programs*, 4) *Specialized Center of Research Program* – carefully evaluate all grant applications.

Guidelines and applications for the Society's three research programs may be obtained by contacting the Research Department at (914) 949-5213, faxing to (914) 949-6691 or emailing researchprograms@LLS.org. Detailed instructions for proposal submissions are posted on the Society's Web site, www.LLS.org.

As of June 30, 2006 the Society will have 355 active grantees at 114 institutions in the United States and abroad. This support should advance the understanding, treatment and prevention of leukemia, lymphoma and myeloma.

Professional Education

The Society serves the continuing educational needs of the medical and research community through professional symposia offered throughout the year. The educational program offers varying formats to facilitate the exchange of information and ideas on the newest developments in cancer research and treatment. The Annual Research Symposium, sponsored by the Society, is held each December on the Friday immediately before the American Society of Hematology meeting. The Society funds several Focused Workshops each year on important topics relevant to hematological malignancies. Other meetings are held for the Society's grantees. These include the Stohlman Scholar Symposium, the Translational Research Grant Progress Review Meeting and the SCOR Progress Review Meeting.

Patient Services

The Society has a network of 66 chapters throughout the United States and Canada. These offices conduct life-enhancing patient services, including support groups, peer counseling and patient financial aid. The Society also hosts numerous teleconferences and Webcasts, where medical professionals share the latest research findings.

Information Resource Center (IRC)

The Society strives to be the world's foremost source of information on leukemia, lymphoma and myeloma. The IRC is a nationwide link to information and resources useful to patients, their families and healthcare professionals. Information specialists are oncology social workers and health educators who provide callers with current information on blood cancers, treatments, clinical trials and offer guidance on coping. They are available to talk one-on-one, Monday through Friday, 9 a.m. to 6 p.m. ET. Patients, families and professionals may call the IRC toll free at (800) 955-4572 in addition to corresponding by email at infocenter@LLS.org. You may also chat online with an information specialist on the Society's Web site, www.LLS.org, and click "Live Help."

The Society's Web Site

The Society's Web site, www.LLS.org, serves a wide variety of education and information needs. Initiated in

1996, the site has undergone explosive growth and is continually being updated and expanded to support and promote the Society's mission. The user has the opportunity to create personalized pages with identified interests. The site features a comprehensive overview of blood cancers, the Society's programs and services, Family Support Group locations, information about our peer-to-peer program *First Connection* and other programs.

Teleconferences and Webcasts

The Society sponsors more than 20 educational teleconferences and Webcasts each year on topics of interest to patients and caregivers. Information on registration for these free events can be accessed at www.LLS.org; audio, podcasts and Webcast archives of these programs are available at www.LLS.org.

Educational Materials

An extensive collection of free educational materials are offered to patients and health professionals. Each year, the Society distributes nearly 1 million booklets, brochures and videos through the IRC and local Society chapters. Much of the content of these materials is available to view and download at www.LLS.org.

Chapter Programs:

- **Family Support Groups.** The Society has developed more than 400 Family Support Groups at 66 chapters. Guided by two volunteer oncology health professionals, each group provides information and support, and encourages greater communication among patients, families, friends and healthcare professionals.
- **First Connection.** This program links newly diagnosed patients to a peer volunteer who has experienced a similar diagnosis. A trained patient-volunteer currently in remission phones the new patient to share information and support.
- **Patient Financial Aid Program.** For more than 31 years, the Society has helped patients demonstrating a need for financial assistance cover a portion of their treatment costs. Through the *Patient Financial Aid Program*, reimbursement of up to \$500 per year helps cover the costs of transportation, drugs and various treatments not covered by insurance. Patient financial aid funds are subject to availability.

- *Meet the Expert on Non-Hodgkin Lymphoma*. This program presents basic information on terminology, risk factors, diagnosis, staging and classification of non-Hodgkin lymphoma (NHL). New insights, treatments and future directions for NHL are also discussed. This program is also accessible as a Webcast at www.LLS.org and is being sponsored by a generous, unrestricted educational grant from Genentech BioOncology and Biogen Idec Inc.
- *Exploring Myeloma*. This program presents an overview of myeloma, treatments, emerging therapies and managing side effects and how to find emotional support when living with the illness. This Society program is being supported by Celgene Corp.
- *Breaking the Age Barrier: Getting the Best Cancer Treatment*. This education program presents an overview of the many factors (not age alone) that healthcare professionals should assess to determine an appropriate cancer treatment plan for an older adult. It is supported by Amgen Oncology.
- *CML Issues and Insights: A Nursing Education Program on Chronic Myelogenous Leukemia*. This nursing education program provides an overview of CML, treatments, emerging therapies and side effects. The program addresses the unique challenges of nursing management of these patients. This program is being sponsored by an unrestricted education grant from Novartis Oncology.
- *Paving the Way for Progress: Clinical Trials in Blood Cancers*. This program provides patients, families and healthcare professionals with a clear description of what clinical trials are, how cancer drugs are developed, and what the emerging treatment options are for leukemia, lymphoma and myeloma. This program will launch in August 2006 and is provided through an unrestricted educational grant by Bristol-Myers Squibb Co.
- *The Trish Greene Back to School Program for the Child with Cancer*. This program is designed to increase communication among healthcare professionals, parents, patients and school personnel to assure youngsters a smooth transition from active treatment back to school. Printed literature, videos and other materials to aid the process are available through all local chapters.
- *Welcome Back: Facilitating the Return to School for Children with Cancer*. A new addition to *The Trish Greene Back to School Program*, this education program discusses possible emotional,

physical and cognitive late effects of cancer treatment in children and offers numerous resources that can assist childhood cancer survivors to flourish in the school environment post-treatment. This program is made possible by the Lance Armstrong Foundation.

Advocacy

Since 1994, the Society's advocacy program has been a strong voice in Washington, DC, representing to policy makers at all levels of government the healthcare quality concerns and medical research interests of patients and their families. Society volunteers and staff visit Capitol Hill regularly to lobby Congress in support of issues that impact research and patient care. Working through chapters across the country, local volunteers and staff are building a grassroots advocates' network to rally patients and their families to promote common goals related to cancer research and treatment. That network now numbers more than 35,000 and has become a potent voice in public policy deliberations.

The Society has identified key issues that currently shape its advocacy agenda, including:

- Insurance coverage of patient-care costs in clinical trials
- Ready access by all Americans to quality cancer care
- Increased funding for the National Institutes of Health and National Cancer Institute (NCI)
- Increased funding for blood cancer research at other federal institutions
- Federal funding for patient education and support programs

In 2001, the Society successfully lobbied Congress to institute a blood cancer research initiative as part of the U.S. Department of Defense's medical research program. To date, that program has funded \$23 million in additional blood cancer research.

In 2002, the Society successfully lobbied Congress for legislation that authorizes a new blood cancer research effort at the NCI and creates a new blood cancer education program for patients and the public under the Centers for Disease Control and Prevention. The patient education program was funded at \$13 million through 2006, providing additional support for blood cancer patients and their families nationwide.

On the state level, the Society has successfully ensured coverage of routine care in cancer clinical trials in three states and secured additional funding for patient support programs in four others.

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This publication is designed to provide information in regard to the subject matter covered. It is distributed as a public service by The Leukemia & Lymphoma Society Inc. with the understanding that the Society is not engaged in rendering medical or other professional services.

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*Our mission: Cure leukemia, lymphoma,
Hodgkin's disease and myeloma, and improve
the quality of life of patients and their families.*

The Society is a nonprofit organization that relies on the generosity of corporate and individual contributions to advance its mission.



**The Leukemia &
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Fighting Blood Cancers