

What you need to know about Leukemia

Based on a brochure from
National Institutes of Health
National Cancer Institute



CENTER FOR BLOOD CANCERS

at St. David's South Austin Medical Center

A Member of the Sarah Cannon Blood Cancer Network

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What you need to know about Leukemia

Introduction	1
What Is Leukemia?	1
Leukemia: Who's at Risk?	3
Symptoms	4
Diagnosis	5
Treatment	6
Getting a Second Opinion	7
Preparing for Treatment	7
Methods of Treatment	8
Side Effects of Treatment	12
Supportive Care	14
Infection	10
Anemia.....	10
Nutrition	14
Follow-up Care.....	14
Support for People with Leukemia	15
The Promise of Cancer Research	15
Questions for Your Doctor	16



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Introduction

This booklet has important information about leukemia, cancer that starts in blood cells. Each year, leukemia is diagnosed in about 29,000 adults and 2,000 children in the United States.

This booklet discusses possible causes, symptoms, diagnosis, treatment, and followup care. It also has information to help people with leukemia and their families cope with the disease.

Research is increasing what we know about leukemia. Scientists are studying its causes. They are also finding better ways to treat this disease. Because of research, adults and children with leukemia can look forward to a better quality of life and less chance of dying from the disease.

What Is Leukemia?

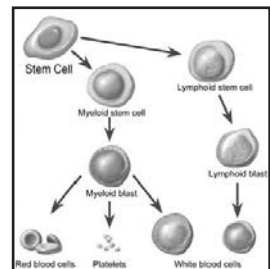
Leukemia is a type of cancer. Cancer is a group of many related diseases. All cancers begin in cells, which make up blood and other tissues. Normally, cells grow and divide to form new cells as the body needs them. When cells grow old, they die, and new cells take their place.

Sometimes this orderly process goes wrong. New cells form when the body does not need them, and old cells do not die when they should. Leukemia is cancer that begins in blood cells.

Normal Blood Cells

Blood cells form in the bone marrow. Bone marrow is the soft material in the center of most bones.

Immature blood cells are called stem cells and blasts. Most blood cells mature in the bone marrow and then move into the blood vessels. Blood flowing through the blood vessels and heart is called the peripheral blood.

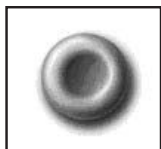


The bone marrow makes different types of blood cells. Each type has a special function:

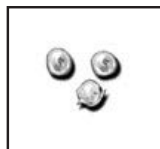
- White blood cells help fight infection.
- Red blood cells carry oxygen to tissues throughout the body.
- Platelets help form blood clots that control bleeding.



White blood cells



Red blood cells



Platelets

Leukemia Cells

In people with leukemia, the bone marrow produces abnormal white blood cells. The abnormal cells are leukemia cells. At first, leukemia cells function almost normally. In time, they may crowd out normal white blood cells, red blood cells, and platelets. This makes it hard for blood to do its work.

Types of Leukemia

The types of leukemia are grouped by how quickly the disease develops and gets worse. Leukemia is either chronic (gets worse slowly) or acute (gets worse quickly):

- **Chronic leukemia** – Early in the disease, the abnormal blood cells can still do their work, and people with chronic leukemia may not have any symptoms. Slowly, chronic leukemia gets worse. It causes symptoms as the number of leukemia cells in the blood rises.
- **Acute leukemia** – The blood cells are very abnormal. They cannot carry out their normal work. The number of abnormal cells increases rapidly. Acute leukemia worsens quickly.

The types of leukemia are also grouped by the type of white blood cell that is affected. Leukemia can arise in lymphoid cells or myeloid cells. Leukemia that affects lymphoid cells is called lymphocytic leukemia. Leukemia that affects myeloid cells is called myeloid leukemia or myelogenous leukemia.

There are four common types of leukemia:

- **Chronic lymphocytic leukemia** (chronic lymphoblastic leukemia, CLL) accounts for about 7,000 new cases of leukemia each year. Most often, people diagnosed with the disease are over age 55. It almost never affects children.
- **Chronic myeloid leukemia** (chronic myelogenous leukemia, CML) accounts for about 4,400 new cases of leukemia each year. It affects mainly adults.
- **Acute lymphocytic leukemia** (acute lymphoblastic leukemia, ALL) accounts for about 3,800 new cases of leukemia each year. It is the most common type of leukemia in young children. It also affects adults.

- **Acute myeloid leukemia** (acute myelogenous leukemia, AML) accounts for about 10,600 new cases of leukemia each year. It occurs in both adults and children.

Hairy cell leukemia is a rare type of chronic leukemia. This booklet does not deal with hairy cell leukemia or other rare types of leukemia. Together, these rare leukemias account for about 5,200 new cases of leukemia each year. The Cancer Information Service (1-800-4-CANCER) can provide information about these types of leukemia.

Leukemia: Who's at Risk?

No one knows the exact causes of leukemia. Doctors can seldom explain why one person gets this disease and another does not. However, research has shown that people with certain risk factors are more likely than others to develop leukemia. A risk factor is anything that increases a person's chance of developing a disease.

Studies have found the following risk factors for leukemia:

- **Very high levels of radiation** – People exposed to very high levels of radiation are much more likely than others to develop leukemia. Very high levels of radiation have been caused by atomic bomb explosions (such as those in Japan during World War II) and nuclear power plant accidents (such as the Chernobyl [also called Chornobyl] accident in 1986).

Medical treatment that uses radiation can be another source of high-level exposure. Radiation used for diagnosis, however, exposes people to much lower levels of radiation and is not linked to leukemia.

- **Working with certain chemicals** – Exposure to high levels of benzene in the workplace can cause leukemia. Benzene is used widely in the chemical industry. Formaldehyde is also used by the chemical industry. Workers exposed to formaldehyde also may be at greater risk of leukemia.
- **Chemotherapy** – Cancer patients treated with certain cancer-fighting drugs sometimes later develop leukemia. For example, drugs known as alkylating agents are associated with the development of leukemia many years later.
- **Down syndrome and certain other genetic diseases** – Some diseases caused by abnormal chromosomes may increase the risk of leukemia.
- **Human T-cell leukemia virus-I (HTLV-I)** – This virus causes a rare type of chronic lymphocytic leukemia known as human T-cell leukemia. However, leukemia does not appear to be contagious.

- **Myelodysplastic syndrome** – People with this blood disease are at increased risk of developing acute myeloid leukemia.

In the past, some studies suggested exposure to electromagnetic fields as another possible risk factor for leukemia. Electromagnetic fields are a type of low-energy radiation that comes from power lines and electric appliances. However, results from recent studies show that the evidence is weak for electromagnetic fields as a risk factor.

Most people who have known risk factors do not get leukemia. On the other hand, many who do get the disease have none of these risk factors. People who think they may be at risk of leukemia should discuss this concern with their doctor. The doctor may suggest ways to reduce the risk and can plan an appropriate schedule for checkups.

Symptoms

Like all blood cells, leukemia cells travel through the body. Depending on the number of abnormal cells and where these cells collect, patients with leukemia may have a number of symptoms.

Common symptoms of leukemia may include:

- Fevers or night sweats
- Frequent infections
- Feeling weak or tired
- Headache
- Bleeding and bruising easily (bleeding gums, purplish patches in the skin, or tiny red spots under the skin)
- Pain in the bones or joints
- Swelling or discomfort in the abdomen (from an enlarged spleen)
- Swollen lymph nodes, especially in the neck or armpit
- Weight loss

Such symptoms are not sure signs of leukemia. An infection or another problem also could cause these symptoms. Anyone with these symptoms should see a doctor as soon as possible. Only a doctor can diagnose and treat the problem.

In the early stages of chronic leukemia, the leukemia cells function almost normally. Symptoms may not appear for a long time. Doctors often find chronic leukemia during a routine checkup – before there are any symptoms. When symptoms do appear, they generally are mild at first and get worse gradually.

In acute leukemia, symptoms appear and get worse quickly. People with this disease go to their doctor because they feel sick. Other symptoms of acute leukemia are vomiting, confusion, loss of muscle control, and seizures. Leukemia cells also can collect in the testicles and cause swelling. Also, some patients develop sores in the eyes or on the skin. Leukemia also can affect the digestive tract, kidneys, lungs, or other parts of the body.

Diagnosis

If a person has symptoms that suggest leukemia, the doctor may do a physical exam and ask about the patient's personal and family medical history. The doctor also may order laboratory tests, especially blood tests.

The exams and tests may include the following:

- **Physical exam** – The doctor checks for swelling of the lymph nodes, spleen, and liver.
- **Blood tests** – The lab checks the level of blood cells. Leukemia causes a very high level of white blood cells. It also causes low levels of platelets and hemoglobin, which is found inside red blood cells. The lab also may check the blood for signs that leukemia has affected the liver and kidneys.
- **Biopsy** – The doctor removes some bone marrow from the hipbone or another large bone. A pathologist examines the sample under a microscope. The removal of tissue to look for cancer cells is called a biopsy. A biopsy is the only sure way to know whether leukemia cells are in the bone marrow.

There are two ways the doctor can obtain bone marrow. Some patients will have both procedures:

- **Bone marrow aspiration:** The doctor uses a needle to remove samples of bone marrow.
- **Bone marrow biopsy:** The doctor uses a very thick needle to remove a small piece of bone and bone marrow.

Local anesthesia helps to make the patient more comfortable.

- **Cytogenetics** – The lab looks at the chromosomes of cells from samples of peripheral blood, bone marrow, or lymph nodes.
- **Spinal tap** – The doctor removes some of the cerebrospinal fluid (the fluid that fills the spaces in and around the brain and spinal cord). The doctor uses a long, thin needle to remove fluid from the spinal column. The procedure takes about 30 minutes and is performed with local anesthesia. The patient must lie flat for several hours afterward to keep from getting a headache. The lab checks the fluid for leukemia cells or other signs of problems.
- **Chest x-ray** – The x-ray can reveal signs of disease in the chest.

A person who needs a bone marrow aspiration or bone marrow biopsy may want to ask the doctor the following questions:

- Will you remove the sample of bone marrow from the hip or from another bone?
- How long will the procedure take? Will I be awake? Will it hurt?
- How soon will you have the results? Who will explain them to me?
- If I do have leukemia, who will talk to me about treatment? When?

Treatment

Many people with leukemia want to take an active part in making decisions about their medical care. They want to learn all they can about their disease and their treatment choices. However, the shock and stress after a diagnosis of cancer can make it hard to think of everything to ask the doctor. Often it helps to make a list of questions before an appointment. To help remember what the doctor says, patients may take notes or ask whether they may use a tape recorder. Some also want to have a family member or friend with them when they talk to the doctor – to take part in the discussion, to take notes, or just to listen.

The doctor may refer patients to doctors who specialize in treating leukemia, or patients may ask for a referral. Specialists who treat leukemia include hematologists, medical oncologists, and radiation oncologists. Pediatric oncologists and hematologists treat childhood leukemia.

Whenever possible, patients should be treated at a medical center that has doctors experienced in treating leukemia. If this is not possible, the patient’s doctor may discuss the treatment plan with a specialist at such a center.

Getting a Second Opinion

Sometimes it is helpful to have a second opinion about the diagnosis and the treatment plan. Some insurance companies require a second opinion; others may cover a second opinion if the patient or doctor requests it. There are a number of ways to find a doctor for a second opinion:

- The patient's doctor may be able to suggest a doctor who specializes in adult or childhood leukemia. At cancer centers, several specialists often work together as a team.
- A local or state medical society, a nearby hospital, or a medical school can usually provide the names of specialists.
- The American Board of Medical Specialties (ABMS) has a list of doctors who have met certain education and training requirements and have passed specialty examinations. The Official ABMS Directory of Board Certified Medical Specialists lists doctors' names along with their specialty and their educational background. The directory is available in most public libraries. Also, ABMS offers this information on the Internet at <http://www.abms.org>. (Click on "Who's Certified.")

Preparing for Treatment

The doctor can describe treatment choices and discuss the results expected with each treatment option. The doctor and patient can work together to develop a treatment plan that fits the patient's needs.

Treatment depends on a number of factors, including the type of leukemia, the patient's age, whether leukemia cells are present in the cerebrospinal fluid, and whether the leukemia has been treated before. It also may depend on certain features of the leukemia cells. The doctor also takes into consideration the patient's symptoms and general health.

These are some questions a person may want to ask the doctor before treatment begins:

- What type of leukemia do I have?
- What are my treatment choices? Which do you recommend for me? Why?
- What are the benefits of each kind of treatment?
- What are the risks and possible side effects of each treatment?
- If I have pain, how will you help me?

- What is the treatment likely to cost?
- How will treatment affect my normal activities?
- Would a clinical trial (research study) be appropriate for me? Can you help me find one?

People do not need to ask all of their questions or understand all of the answers at one time. They will have other chances to ask the doctor to explain things that are not clear and to ask for more information.

Methods of Treatment

The doctor is the best person to describe the treatment choices and discuss the expected results. Depending on the type and extent of the disease, patients may have chemotherapy, biological therapy, radiation therapy, or bone marrow transplantation. If the patient's spleen is enlarged, the doctor may suggest surgery to remove it. Some patients receive a combination of treatments.

People with acute leukemia need to be treated right away. The goal of treatment is to bring about a remission. Then, when signs and symptoms disappear, more therapy may be given to prevent a relapse. This type of therapy is called maintenance therapy. Many people with acute leukemia can be cured.

Chronic leukemia patients who do not have symptoms may not require immediate treatment. The doctor may suggest watchful waiting for some patients with chronic lymphocytic leukemia. The healthcare team will monitor the patient's health so that treatment can begin if symptoms occur or worsen. When treatment for chronic leukemia is needed, it can often control the disease and its symptoms. However, chronic leukemia can seldom be cured. Patients may receive maintenance therapy to help keep the cancer in remission.

A patient may want to talk to the doctor about taking part in a clinical trial, a research study of new treatment methods. The section on "The Promise of Cancer Research" has more information about clinical trials.

In addition to anticancer therapy, people with leukemia may have treatment to control pain and other symptoms of the cancer, to relieve the side effects of therapy, or to ease emotional problems. This kind of treatment is called symptom management, supportive care, or palliative care.

Chemotherapy

Most patients with leukemia receive chemotherapy. This type of cancer treatment

uses drugs to kill leukemia cells. Depending on the type of leukemia, the patient may receive a single drug or a combination of two or more drugs.

People with leukemia may receive chemotherapy in several different ways:

- **By mouth**
- **By injection directly into a vein** (IV or intravenous)
- Through a **catheter** (a thin, flexible tube) placed in a large vein, often in the upper chest – A catheter that stays in place is useful for patients who need many IV treatments. The healthcare professional injects drugs into the catheter, rather than directly into a vein. This method avoids the need for many injections, which can cause discomfort and injure the veins and skin.
- **By injection directly into the cerebrospinal fluid** – If the pathologist finds leukemia cells in the fluid that fills the spaces in and around the brain and spinal cord, the doctor may order intrathecal chemotherapy. The doctor injects drugs directly into the cerebrospinal fluid. This method is used because drugs given by IV injection or taken by mouth often do not reach cells in the brain and spinal cord. (A network of blood vessels filters blood going to the brain and spinal cord. This blood-brain barrier stops drugs from reaching the brain.)

The patient may receive the drugs in two ways:

- **Injection into the spine:** The doctor injects the drugs into the lower part of the spinal column.
- **Ommaya reservoir:** Children and some adult patients receive intrathecal chemotherapy through a special catheter called an Ommaya reservoir. The doctor places the catheter under the scalp. The doctor injects the anticancer drugs into the catheter. This method avoids the discomfort of injections into the spine.

Patients receive chemotherapy in cycles: a treatment period, then a recovery period, and then another treatment period. In some cases, the patient has chemotherapy as an outpatient at the hospital, at the doctor's office, or at home. However, depending on which drugs are given, and the patient's general health, a hospital stay may be necessary.

Some people with chronic myeloid leukemia receive a new type of treatment called targeted therapy. Targeted therapy blocks the production of leukemia cells but does not harm normal cells. Gleevec, also called STI-571, is the first targeted therapy approved for chronic myeloid leukemia.

Biological Therapy

People with some types of leukemia have biological therapy. This type of treatment improves the body's natural defenses against cancer. The therapy is given by injection into a vein.

For some patients with chronic lymphocytic leukemia, the type of biological therapy used is a monoclonal antibody. This substance binds to the leukemia cells. This therapy enables the immune system to kill leukemia cells in the blood and bone marrow.

Patients may want to ask these questions about chemotherapy or biological therapy:

- Why do I need this treatment?
- What drugs will I get?
- Should I see my dentist before treatment begins?
- What will the treatment do?
- Will I have to stay in the hospital?
- How will we know the drugs are working?
- How long will I be on this treatment?
- Will I have side effects during treatment? How long will they last? What can I do about them?
- Can these drugs cause side effects later on?
- How often will I need checkups?

Radiation Therapy

Radiation therapy (also called radiotherapy) uses high-energy rays to kill leukemia cells. For most patients, a large machine directs radiation at the spleen, the brain, or other parts of the body where leukemia cells have collected. Some patients receive radiation that is directed to the whole body. (Total-body irradiation usually is given before a bone marrow transplant.) Patients receive radiation therapy at a hospital or clinic.

These are some questions a person may want to ask the doctor before having radiation therapy:

- Why do I need this treatment?
- When will the treatments begin? How often will they be given? When will they end?

- How will I feel during therapy? Will there be side effects? How long will they last? What can we do about them?
- Can radiation therapy cause side effects later on?
- What can I do to take care of myself during therapy?
- How will we know if the radiation is working?
- Will I be able to continue my normal activities during treatment?
- How often will I need checkups?

Stem Cell Transplantation

Some patients with leukemia have stem cell transplantation. A stem cell transplant allows a patient to be treated with high doses of drugs, radiation, or both. The high doses destroy both leukemia cells and normal blood cells in the bone marrow. Later, the patient receives healthy stem cells through a flexible tube that is placed in a large vein in the neck or chest area. New blood cells develop from the transplanted stem cells.

There are several types of stem cell transplantation:

- **Bone marrow transplantation** – The stem cells come from bone marrow.
- **Peripheral stem cell transplantation** – The stem cells come from peripheral blood.
- **Umbilical cord blood transplantation** – For a child with no donor, the doctor may use stem cells from umbilical cord blood. The umbilical cord blood is from a newborn baby. Sometimes umbilical cord blood is frozen for use later.

Stem cells may come from the patient or from a donor:

- **Autologous stem cell transplantation** – This type of transplant uses the patient’s own stem cells. The stem cells are removed from the patient, and the cells may be treated to kill any leukemia cells present. The stem cells are frozen and stored. After the patient receives high-dose chemotherapy or radiation therapy, the stored stem cells are thawed and returned to the patient.
- **Allogeneic stem cell transplantation** – This type of transplant uses healthy stem cells from a donor. The patient’s brother, sister, or parent may be the donor. Sometimes the stem cells come from an unrelated donor. Doctors use blood tests to be sure the donor’s cells match the patient’s cells.

- **Syngeneic stem cell transplantation** – This type of transplant uses stem cells from the patient’s healthy identical twin.

After a stem cell transplant, patients usually stay in the hospital for several weeks. The healthcare team protects patients from infection until the transplanted stem cells begin to produce enough white blood cells.

These are some questions a person may want to ask the doctor before having a stem cell transplant:

- What kind of stem cell transplant will I have? If I need a donor, how will we find one?
- How long will I be in the hospital? What care will I need when I leave the hospital?
- How will we know if the treatment is working?
- What are the risks and the side effects? What can we do about them?
- What changes in normal activities will be necessary?
- What is my chance of a full recovery? How long will that take?
- How often will I need checkups?

Side Effects of Treatment

Because cancer treatment may damage healthy cells and tissues, unwanted side effects are common. Specific side effects depend on many factors, including the type and extent of the treatment. Side effects may not be the same for each person, and they may even change from one treatment session to the next. Before treatment starts, healthcare providers will explain possible side effects and suggest ways to manage them.

Chemotherapy

The side effects of chemotherapy depend mainly on the specific drugs and the dose. In general, anticancer drugs affect cells that divide rapidly, especially leukemia cells. Chemotherapy can also affect other rapidly dividing cells:

- **Blood cells:** These cells fight infection, help the blood to clot, and carry oxygen to all parts of the body. When blood cells are affected, patients are more likely to get infections, may bruise or bleed easily, and may feel very weak and tired.
- **Cells in hair roots:** Chemotherapy can lead to hair loss. The hair grows back, but the new hair may be somewhat different in color and texture.

- **Cells that line the digestive tract:** Chemotherapy can cause mouth and lip sores, nausea and vomiting, diarrhea, and poor appetite. Many of these side effects can be controlled with drugs.

Some anticancer drugs can affect a patient's fertility. Women may have irregular menstrual periods or periods may stop altogether. Women may have symptoms of menopause, such as hot flashes and vaginal dryness. Men may stop producing sperm. Because these changes may be permanent, some men have their sperm frozen and stored before treatment. Most children treated for leukemia appear to have normal fertility when they grow up. However, depending on the drugs and doses used and the age of the patient, some boys and girls may be infertile when they mature.

Because targeted therapy (sometimes used for chronic myeloid leukemia) affects only leukemia cells, it causes fewer side effects than most other anticancer drugs. However, Gleevec may cause patients to retain water. This may cause swelling or bloating.

Biological Therapy

The side effects of biological therapy differ with the types of substances used, and from patient to patient. Rashes or swelling where the biological therapy is injected are common. Flu-like symptoms also may occur. The healthcare team may monitor the blood for signs of anemia and other problems.

Radiation Therapy

Radiation therapy may cause patients to become very tired as treatment continues. Resting is important, but doctors usually advise patients to try to stay as active as they can. In addition, when patients receive radiation therapy, it is common for their skin to become red, dry, and tender in the treated area. Other side effects depend on the area of the body that is treated. If chemotherapy is given at the same time, the side effects may be worse. The doctor can suggest ways to ease these problems.

Stem Cell Transplantation

Patients who have stem cell transplantation face an increased risk of infection, bleeding, and other side effects because of the large doses of chemotherapy and radiation they receive. In addition, graft-versus-host disease (GVHD) may occur in patients who receive stem cells from a donor's bone marrow. In GVHD, the donated stem cells react against the patient's tissues. Most often, the liver, skin, or digestive tract is affected. GVHD can be mild or very severe. It can occur any time after the transplant, even years later. Steroids or other drugs may help.

Supportive Care

Leukemia and its treatment can lead to other health problems. Patients receive supportive care to prevent or control these problems and to improve their comfort and quality of life during treatment.

Because people with leukemia get infections very easily, they may receive antibiotics and other drugs to help protect them from infections. The healthcare team may advise them to stay away from crowds and from people with colds and other contagious diseases. If an infection develops, it can be serious and should be treated promptly. Patients may need to stay in the hospital for treatment.

Anemia and bleeding are other problems that often require supportive care. Patients may need transfusions of red blood cells to help them have more energy. Platelet transfusions can help reduce the risk of serious bleeding.

Dental care also is very important. Leukemia and chemotherapy can make the mouth sensitive, easily infected, and likely to bleed. Doctors often advise patients to have a complete dental exam and, if possible, undergo needed dental care before chemotherapy begins. Dentists show patients how to keep their mouth clean and healthy during treatment.

Nutrition

Patients need to eat well during cancer therapy. They need enough calories to maintain a good weight and protein to keep up strength. Good nutrition often helps people with cancer feel better and have more energy.

But eating well can be difficult. Patients may not feel like eating if they are uncomfortable or tired. Also, the side effects of treatment, such as poor appetite, nausea, or vomiting, can be a problem. Foods may taste different.

The doctor, dietitian, or other healthcare provider can suggest ways to maintain a healthy diet.

Followup Care

Followup care after treatment for leukemia is an important part of the overall treatment plan. Regular checkups ensure that any changes in health are noted. The doctor can find problems and treat them as soon as possible. Checkups may include a careful physical exam, blood tests, x-rays, bone marrow aspiration, or spinal tap. The doctor can explain the followup plan – how often the patient must visit the doctor and what tests are needed.

Support for People with Leukemia

Living with a serious disease such as leukemia is not easy. Some people find they need help coping with the emotional and practical aspects of their disease. Support groups can help. In these groups, patients or their family members get together to share what they have learned about coping with the disease and the effects of treatment. Patients may want to talk with a member of their healthcare team about finding a support group. Groups may offer support in person, over the telephone, or on the Internet.

People living with cancer may worry about caring for their families, keeping their jobs, or continuing daily activities. Concerns about treatments and managing side effects, hospital stays, and medical bills are also common. Doctors, nurses, and other members of the healthcare team can answer questions about treatment, working, or other activities. Meeting with a social worker, counselor, or member of the clergy can be helpful to those who want to talk about their feelings or discuss their concerns. Often, a social worker can suggest resources for financial aid, transportation, home care, or emotional support.

The Promise of Cancer Research

Doctors all over the country are conducting many types of clinical trials. These are research studies in which people take part voluntarily. Studies include new methods of treatment and supportive care for patients with leukemia. Research already has led to advances, and researchers continue to search for more effective approaches.

Patients who join these studies have the first chance to benefit from treatments that have shown promise in earlier research. They also make an important contribution to medical science by helping doctors learn more about the disease. Although clinical trials may pose some risks, researchers take very careful steps to protect their patients.

Researchers are testing new biological therapies and new anticancer drugs, doses, and treatment schedules. They also are working with various drugs and with combinations of drugs, biological therapy, radiation therapy, and stem cell transplantation.

Questions for Your Doctor

This booklet is designed to help you get information you need from your doctor, so that you can make informed decisions about your healthcare. In addition, asking your doctor the following questions will help you further understand your condition. To help you remember what the doctor says, you may take notes or ask whether you may use a tape recorder. Some people also want to have a family member or friend with them when they talk to the doctor – to take part in the discussion, to take notes, or just to listen.

Diagnosis

- What tests can diagnose leukemia? Are they painful?
- How soon after the tests will I learn the results?

Treatment

- What treatments are recommended for me?
- What clinical trials are appropriate for my type of cancer?
- Will I need to be in the hospital to receive my treatment? For how long?
- How might my normal activities change during my treatment?

Side Effects

- What side effects should I expect? How long will they last?
- What side effects should I report? Whom should I call?

Followup

- After treatment, how often do I need to be checked?
- What type of follow-up care should I have?
- Will I eventually be able to resume my normal activities?

The Healthcare Team

- Who will be involved with my treatment and rehabilitation? What is the role of each member of the healthcare team in my care?
- What has been your experience in caring for patients with leukemia?

Resources

- Are there support groups in the area with people I can talk to? Are there organizations where I can get more information about cancer, specifically leukemia?

In Fall 2013, St. David's HealthCare will open the area's first blood cancer and bone marrow transplant center, bringing to Central Texans a more complete spectrum of oncology services. The program will be located at St. David's South Austin Medical Center, which is the organization's leader in cancer care.

Consistent with its commitment to providing the finest care and service, St. David's HealthCare has developed affiliations with a team of world class physicians, organizations and technology. Three industry leaders – Sarah Cannon Research Institute, Texas Transplant Institute and Texas Oncology – are working together with St. David's HealthCare to provide patients and families with access to leading edge cancer care closer to home. Support from these renowned programs provides national expertise in a community setting.

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