Leukemia Care at MD Anderson Cancer Center

THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®

Things to Remember for Low Blood Counts

- Expect your blood counts to drop from leukemia treatments.
- Stay out of crowds when your counts are low.
- **Take your temperature every day when your counts are low.** If your temperature is greater than 100.4°F (38°C), go to the MD Anderson Acute Cancer Care Center right away. If you are at home, go to your nearest hospital emergency center.
- **Do not** ignore signs of infection. Report symptoms of infection to your doctor.
- **Do not** take aspirin or any over-the-counter medicines that contain aspirin or ibuprofen. These medicines may hide the symptoms of infection and prevent normal platelet function, causing you to bleed.
- Shave only with an electric razor.
- Use a soft toothbrush to prevent your gums from bleeding.
- Eat a well-balanced diet.
- Slowly return to normal activities.
- Keep a list of your leukemia treatments, such as the dates received and side effects.
- Plan time with family and friends. Leukemia is not contagious.

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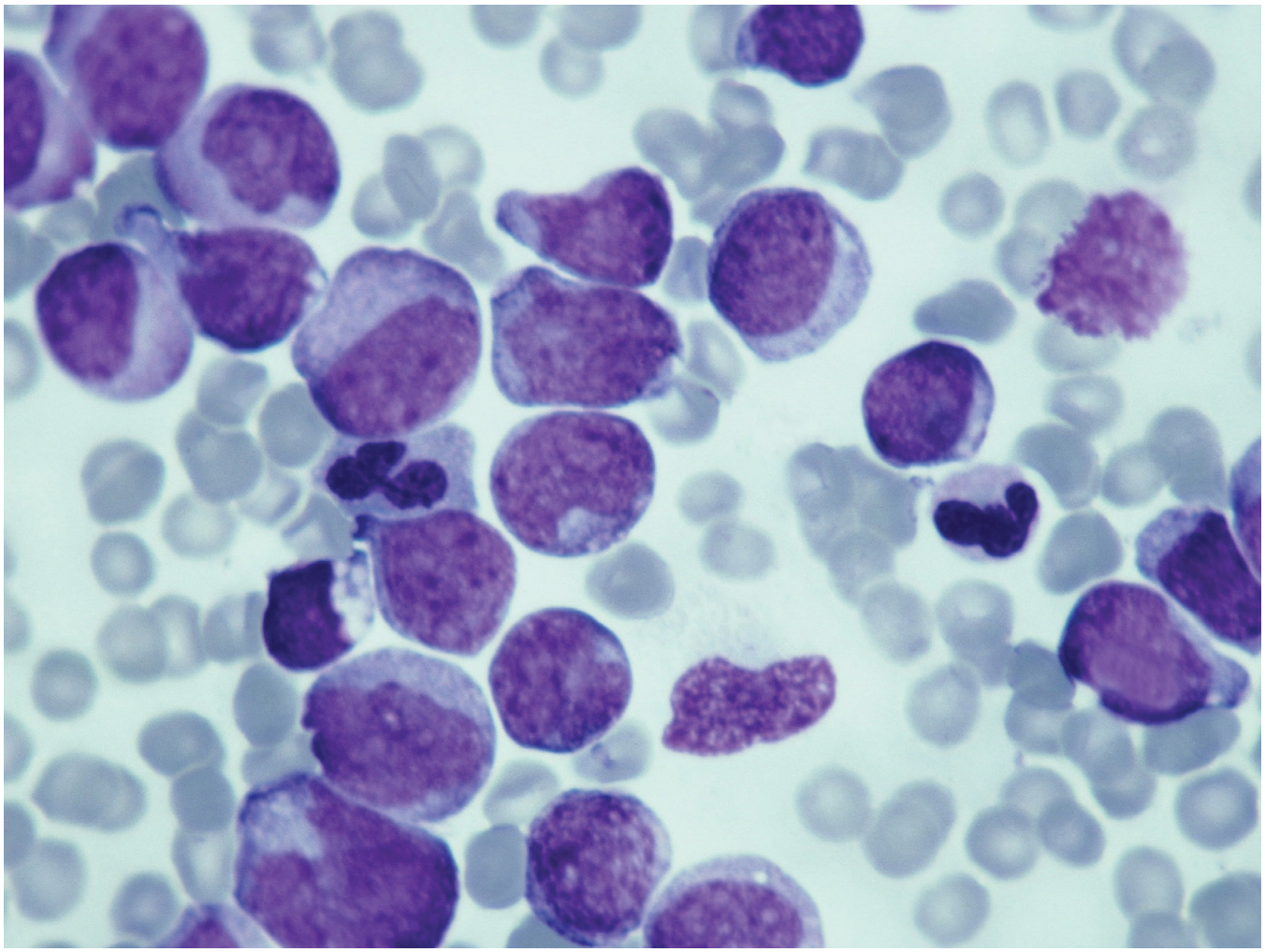


About Leukemia

Leukemia is a cancer of blood or blood-forming tissues such as the bone marrow. Most patients have leukemia that involves the bone marrow. Certain types of leukemia involve cells outside of the bone marrow (extra-medullary disease) such as masses, lymph nodes or spinal fluid.

Types of leukemia are grouped by the type of cell affected and by rate of cell growth. Leukemia usually involves myeloid or lymphoid cells.

Leukemia can be **acute** or **chronic**.

Acute Leukemia

Acute leukemia is an overgrowth or fast growth of immature cells. It is diagnosed by the percentage of blasts (immature cells) in the bone marrow or blood. Blasts are cells that are not able to carry out their normal function.

There are 2 major types of acute leukemia:

- **Acute lymphocytic/lymphoblastic leukemia (ALL)** is a fast growth of immature lymphoid cells. It can involve B cells or T cells and often involves spinal fluid.
- **Acute myeloid leukemia (AML)** is a fast growth of immature myeloid cells. The bone marrow cannot produce a normal amount of white blood cells, red blood cells and platelets.
  - **Acute promyelocytic leukemia** is a subtype of AML. It has a specific chromosome abnormality t(15;17).
  - **Blastic plasmacytoid dendritic cell neoplasm (BPDCN)** is considered a type of AML but is not common. It affects the skin in more than half of patients.

Chronic Leukemia

Chronic leukemia is an overgrowth of mature cells and is usually slow growing.

There are 2 major types of chronic leukemia:

- **Chronic myeloid leukemia (CML)** is a buildup of mature granulocytes (neutrophils, basophils, eosinophils). It is related to a specific chromosome abnormality t(9;22) also known as the Philadelphia chromosome. There are different phases of the disease including chronic, accelerated and blast.
- **Chronic lymphocytic leukemia (CLL)** is a buildup of mature lymphocytes and can involve the lymph nodes. It is usually diagnosed later in life. When it is first diagnosed, treatment is not always needed, and patients can sometimes be observed for a period of time.

Blood Disorders

Blood disorders are subtypes of diseases that can start in the bone marrow and cause abnormal production of cells. These disorders can be treated by MD Anderson's Leukemia Center:

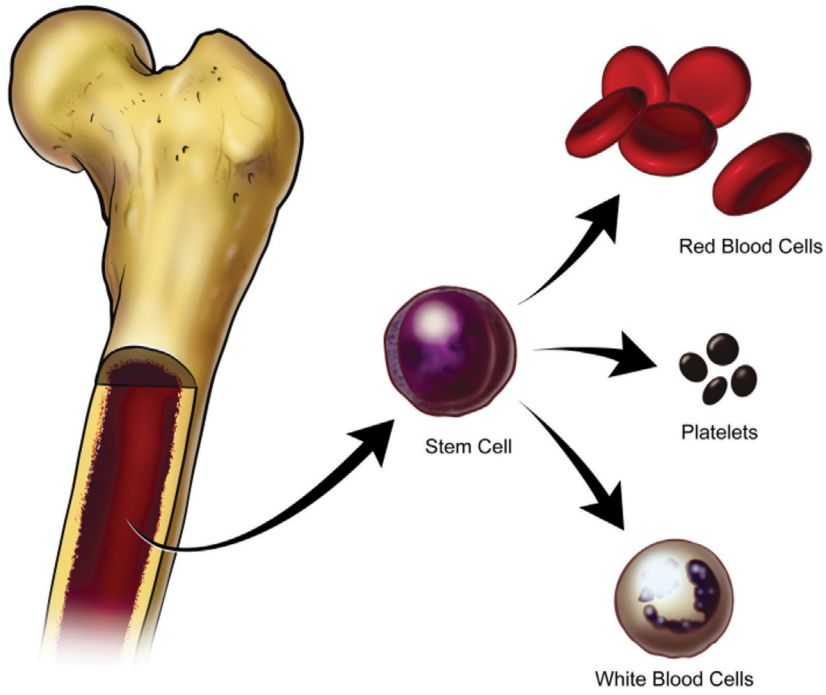
- **Myelodysplastic syndrome (MDS)** is when the bone marrow produces abnormal cells. The cells cannot perform normally. Patients may have a low neutrophil count, low hemoglobin or low platelets. The condition ranges from low risk to high risk.
- **Chronic myelomonocytic leukemia (CMML)** is an abnormal production of monocytes.
- **Myeloproliferative neoplasms (MPN)** is a group of chronic blood cancers including:
  - **Myelofibrosis (MF)** is scarring or fibrosis of the bone marrow. The bone marrow cannot produce normal cells. Patients can also have an enlarged spleen.
  - **Essential thrombocytosis (ET)** is a chronic disease where your platelets grow fast and out of control. It can cause blood clots from excess cells that thicken the blood.
  - **Polycythemia vera (PV)** is a chronic disease that develops slowly and too many red blood cells are produced. It can cause blood clots from excess cells that thicken the blood.
  - **Aplastic anemia (AA)** is when the bone marrow does not produce enough cells. Patients can have low hemoglobin, platelets or neutrophils.
  - **T cell disorders**
    - **T cell large granular lymphocytic leukemia (LGL)** is a chronic disease. Symptoms usually include neutropenia and anemia. Patients can have problems with chronic infections. Patients can be monitored or receive medicines that suppress the immune system.
    - **T cell prolymphocytic leukemia (T-PLL)** is a condition that is not common. This is shown by a rapid growth of mature T cells.

Blood and Bone Marrow

The bone marrow is a spongy tissue found inside all bones of the body but primarily in large bones, such as the hip bone and the sternum.

Bone marrow creates our cells. All blood cells begin in the bone marrow as stem cells. Each stem cell grows into a certain type of blood cell or immune system cell as it matures.

It helps to know what makes up normal blood so you can understand what happens to your blood when you have leukemia or another other blood disorder.



Types of blood cells

There are 3 major types of blood cells: red blood cells (RBCs), platelets and white blood cells (WBCs):

- **Red blood cells** carry oxygen and carbon dioxide throughout your body. All body tissues need oxygen to work properly. When you have blood work done, the care team will look at your red blood cell levels: hemoglobin (Hgb) and hematocrit (Hct).
- **Platelets cells** help the blood clot and prevent bleeding.
- **White blood cells** protect the body against infections. There are many types of WBCs. The 3 main types are:
  - **Lymphocytes** help manage your immune system and fight viral infections.
  - **Monocytes** break down and remove foreign organisms and boost the immune system.
  - **Neutrophils** help fight bacterial and fungal infections.
    - **Absolute neutrophil count (ANC)** is a measure of the number of neutrophils you have to fight infection. A normal ANC is 1.7 to 7.3 (or 1700-7300) This range changes slightly depending on the lab. Because blood cells levels drop during leukemia treatments, an ANC starting at 1.0 (or 1000) is considered a safe level during treatments. Neutrophils help determine whether your immune system is working like it should or if you are more at risk for infections.

Damage to the Bone Marrow Function

Leukemia can damage the bone marrow function or its ability to make normal, healthy blood cells. This means that the bone marrow may produce less blood cells or abnormal (immature) blood cells. If this happens, it may lead to the following conditions:

- **Anemia** is when there is a lower number of red blood cells to carry oxygen to organs and tissue. Symptoms of anemia include shortness of breath, weakness and fatigue.
- **Neutropenia** is when there is a lower number of neutrophils (ANC less than 1000) which can lead to increased risk of infection.
- **Thrombocytopenia** is when there is a lower number of platelets to help with normal blood clotting, which can lead to an increased risk of bleeding.

Causes

Specific causes of leukemia and other blood disorders are unknown. Researchers continue to study and look for the causes of these diseases. The following are some of the known and possible risks, but there could be others.

Environmental factors

- Smoking
- Obesity

Genetics

- Mutations
- Disorders: Down syndrome, Fanconi's anemia, Li-Fraumeni syndrome and others

Exposures

Infections or types of viruses (EBV, HTLV-I, HTLV-II)

Diagnosis

The diagnosis of leukemia and blood disorders is based on blood tests and bone marrow results. Each type of diagnosis may require special imaging or other evaluation such as biopsies.

Bone marrow aspiration and biopsy are procedures where a sample of bone marrow cells (fluid) and a core biopsy are removed from the back (posterior) hip bone. The sample is sent to a pathologist for evaluation. This procedure is the standard for diagnosis and to reassess disease after treatment.

Results of a bone marrow biopsy include:

- **Blast percentage (%)** – the number of blasts (immature cells) in the bone marrow
- **Cytogenetics** – the study of chromosomes
- **Mutations** – analysis of genes to help with treatment decisions
- **Flow cytometry** – helps to verify diagnosis and reassess after treatment

Leukemia Treatment

Treatment for leukemia may include chemotherapy, radiation therapy, biological therapy, surgery and stem cell transplantation. A combination of treatments is often needed. A clinical trial may also be a treatment option for some patients.

Chemotherapy and biological therapy are the most common treatments for leukemia. You may receive one or a combination of anticancer treatments that destroy cancer cells. Certain types of leukemia are sometimes treated with radiation therapy as well.

Each type of leukemia is sensitive to different combinations of treatments. The types of medicines and the length of treatment vary from person to person. Total treatment time is usually from 1 to 2 years. During this time, your care is managed in the Leukemia Center or with your local doctor.

Chemotherapy

Your treatment may consist of different chemotherapy (chemo) medicines and biological therapies. The short-term goal is complete remission. Complete remission in acute leukemia means that the bone marrow has less than 5% blasts, the absolute neutrophil count is over 1000, the platelet count is over 100,000 and there are no leukemia cells in the bone marrow. The long-term goal is to keep you disease-free.

A cycle is the time period from the start of your chemo until the blood and bone marrow cell counts are back to normal. A cycle ends when you are able to receive more treatment. One cycle is usually 3 to 4 weeks. Timing of the start of a new cycle depends on the type of chemotherapy and how fast blood counts recover. Your treatment may involve several cycles. Ask your leukemia doctor how long these cycles will take to complete.

In some cases, the leukemia cells are destroyed from the blood and only partially in the bone marrow during the first cycle of chemo. This is called induction. In these cases, a second cycle of induction called re-induction is also needed to destroy the leukemia cells in the bone marrow. A different chemo drug or combination may be used to get a remission if the leukemia does not respond after 1 or 2 cycles or if a relapse occurs. Relapse is when leukemia cells continue to increase, even during or after chemotherapy treatment.

Chemotherapy can be given in many ways. It can be given into a vein through an IV (intravenous) or central line catheter, or into the spinal canal.

Radiation Therapy

Radiation therapy is used along with chemo for some types of leukemias. Radiation therapy, also called radiotherapy, uses high-energy rays to damage cancer cells and stop them from growing. The radiation comes from a large machine.

Radiation therapy for leukemia patients may be given in two ways. For some patients, the doctor may direct the radiation to a certain area of the body where there is a collection of leukemia cells, such as the spleen or brain. Other patients may receive radiation that is directed to the whole body. This is called total body irradiation. Sometimes, this type of radiation is given before a stem cell transplant.

Biological Therapy

Biological therapy, or immunotherapy, is also used to treat leukemia either alone or in combination with chemotherapy medicines. It uses your own immune system to attack tumor cells. It can enhance or suppress your immune system to fight cancer. It can also lessen the side effects that may result from other leukemia treatments.

Biological therapies include growth factors, interleukins, monoclonal antibodies and other types of medicines. You will receive more information about biological therapy if it is used as a treatment for your type of leukemia.

Splenectomy

A splenectomy is a surgery to remove the spleen. The spleen is located in the abdomen on the left side of the body. It acts as a filtering system for blood cells. When a patient has chronic leukemia, the spleen tends to collect leukemia cells, transfused platelets and red blood cells.

Often, the spleen becomes enlarged from storing these cells. This makes it difficult for chemo to reduce the amount of diseased cells. If the spleen is not removed, it sometimes grows so large that it can cause difficulty with eating and breathing as it presses against other organs. This surgery is done only if needed.

Stem Cell Transplantation

Stem cell transplantation (SCT), also known as a bone marrow transplant, is a type of treatment for leukemia patients. This treatment destroys leukemia cells in the bone marrow using high dose chemo and sometimes radiation therapy. High-dose chemo also damages the bone marrow's ability to produce cells. Healthy stem cells are then given through an IV to stimulate new bone marrow growth.

For leukemia patients, donor cells for a stem cell transplant can be obtained from siblings, matched unrelated donors or umbilical cord donors. This is known as an allogeneic stem cell transplant. It involves infusing well-matched donor bone marrow or stem cells to you.

Stem cell transplant, like other leukemia treatments, is based on many factors that help your doctor decide if stem cell transplant is the best option for you, depending on:

- Type of leukemia you have
- Your past response to chemo treatment
- Whether there are stem cells available to use
- Your age
- The status of your leukemia

Your doctor will refer you to a stem cell transplant doctor if this is a treatment option for you.

Clinical Trials

Your doctor may recommend a clinical trial as the best option for leukemia treatment. The care team will talk with you during your clinic visit or inpatient admission and review the treatment details for the clinical trial. If the care team determines that you are eligible for the clinical trial, the financial team will contact your insurance provider to request financial clearance.

Once the financial team receives insurance approval, you will meet with the research nurse to complete the consent process for the clinical trial. The research nurse will also discuss the specific details (protocols) for the treatment plan during the consent process. If you choose to sign the consent and participate in the clinical trial, the research nurse will coordinate your clinical trial visits and procedures along with the care team.

Ask your care team for a copy of the Clinical Trials at MD Anderson booklet or scan the QR code to access the booklet electronically.

Clinical Trials at MD Anderson
https://bit.ly/Clinical-Trials_MDAnderson

Blood Transfusions

Blood transfusions are a big part of the treatment for many patients with leukemia. When blood counts are low, you may receive blood product replacement through IV transfusion. You may receive whole blood with all the types of cells. Or you may receive only the cells that are low.

Types of Blood Donations

Family and friends are encouraged to donate platelets and blood for their loved one. All blood donations go directly to MD Anderson patients. Our patients use over 600 units of platelets and 200 units of red blood cells every day. MD Anderson always has a need for blood and platelets.

Whole Blood Donation

- The process takes 30 to 45 minutes.
- It is OK to donate if you have taken ibuprofen or products that contain aspirin.
- Donors can donate every 8 weeks.
- Whole blood donations have 3 donated components: red blood cells, platelets and plasma.

Platelet Donation

- The donation process takes 70 to 90 minutes.
- The donor cannot take ibuprofen (Motrin®, Advil®, Nuprin®/Ibuprofen, Aleve®, Excedrin®) or aspirin products 48 hours before donation.
- Donors can donate every 2 days.
- One donation equals 1 platelet dose.

To learn about general requirements for donating and where to go to donate, call the Blood Bank at 713-792-7777 or visit www.MDAnderson.org/BloodBank.

Treatment Side Effects

Before treatment, the care team carefully reviews your medical history. Then, your doctor will recommend the best treatment. How a person responds to their treatment and the side effects may change from person to person or from one cycle to the next. Although treatment side effects can be serious, they are not used as a measure of how the leukemia responds to the treatment. Only diagnostic tests, such as blood counts and bone marrow tests, can provide this information.

Your care team can help you manage and cope with common side effects of treatment.

Infection

In general, your white blood cell count will fall within the first week after you start chemo. As a result, you may get an infection more easily. **Hand washing with soap and water is the most important precaution** you can take to prevent infection. Use a hand sanitizer if soap and water is not available.

Symptoms of infection include:

- Fever of 100.4°F (38°C) or higher.
  - **Do not** use aspirin, acetaminophen, or fever-reducing medicine unless approved by your doctor.
- Chills
- Burning feeling when you pee (urinate)
- Cough
- Short of breath
- Pain, redness, swelling or tenderness around your CVC or PICC line or any other wound

Fatigue

Your red blood cell count will decrease soon after treatment starts. This drop is seen in either your hematocrit or hemoglobin levels which causes fatigue. A red blood cell transfusion may be given when your hemoglobin is low. As your red blood cell count drops, your heart may beat fast, or you may feel lightheaded when you get up quickly. Report these side effects to your care team.

Bleeding

A decrease in the number of platelets is another side effect of chemotherapy. Nosebleeds, bleeding gums or blood in the urine or stool are likely to happen. Little red dots may appear on parts of your body, like the arms and legs. These dots are called "petechiae" and occur when the small blood vessels in the skin bleed. It is common to give a platelet transfusion when the platelet count is less than 20,000 or any time bleeding occurs. Tell your care team any time you have bleeding.

When your platelet count is low:

- Use a very soft toothbrush so you do not irritate your gums.
- Use an electric shaver to shave, not a razor blade.
- Continue to floss if it is a routine part of your mouth care, but do not go down to the gum line.
- For females, your doctor may prescribe medicines such as hormones if you have vaginal bleeding.

Try not to strain during bowel movements. It may cause rectal bleeding. Ask your doctor to prescribe a stool softener if needed. Drink enough fluids to help keep your stools soft.

If you have a nosebleed or bleeding from a cut, apply direct pressure for 5 to 10 minutes. If bleeding does not stop, seek emergency care right away.

Bowel Problems

You can have diarrhea and constipation with treatment. Diarrhea is described as bowel movements that are loose for 2 days or more. It often presents with mild to severe cramping or stomach discomfort. Diarrhea can lead to dehydration.

Constipation is described as few or difficult bowel movements that cause you to be uncomfortable. Symptoms include stomachache or cramps, gas, loss of appetite, hard bowel movements and nausea or vomiting. Tell your care team if you have diarrhea or constipation. Medicine can be prescribed to help treat both and prevent more problems.

Nausea and Vomiting

Your leukemia treatment can also cause nausea and vomiting. This may be different for each patient based on treatment. If you have nausea and vomiting, tell your care team. They can give you medicine to help manage your symptoms. Some of these medicines may make you feel sleepy.

Other Side Effects

Other side effects of treatment may include:

- Mouth and throat problems, such as sores, dryness, burning, problems with swallowing, changes in taste, hot and cold sensitivity and white patches
- Hair loss
- Decreased appetite and weight loss

Treatment-Related Procedures

There are procedures that are necessary for most leukemia patients. The most common procedures are bone marrow procedures, central line insertion procedures and lumbar puncture procedures.

Bone Marrow Procedure

A bone marrow aspiration is a procedure that takes out a small amount of bone marrow fluid (aspirate) through a needle. A bone marrow biopsy uses a needle to take out a small piece of the bone the thickness of a toothpick. These samples are then checked under a microscope.

A bone marrow procedure offers detailed information about the condition of your bone marrow and blood cells. Your doctor may order a bone marrow exam if blood tests are not normal or do not provide enough information about a suspected problem.

Your doctor may request a bone marrow procedure to:

- Diagnose a disease or condition that involves the bone marrow or blood cells.
- Determine the stage or progression of a disease.
- Monitor treatment.
- Check the cause of anemia.
- Check for certain blood cell conditions, such as:
  - Leukocytosis – too few or too many of certain types of blood cells are produced
  - Leukopenia – decreased white blood cells
  - Thrombocytosis – elevated platelet count
  - Thrombocytopenia – low platelet count

Risks

Bone marrow procedures are usually safe and problems are not common but can include:

- Excessive bleeding, especially in people with low platelets
- Infection, especially in people with a weakened immune system
- Pain at the bone marrow site

If you are scheduled to have a bone marrow procedure, the care team will review it with you.

Central Line Insertion Procedure (CVC/PICC)

A central line is a catheter (thin, flexible tube) that is inserted into a large vein that leads to the heart. There are many different types of central line catheters and your doctor will decide which kind is best for you.

A central venous catheter (CVC) refers to a tube that is inserted into a vein under the collarbone. A peripherally inserted central catheter (PICC) refers to a tube that is inserted into the upper arm. These catheters can stay in place for the entire time of your treatment.

Both the CVC and PICC lines can be used to give medicines, blood products, total parenteral nutrition feeding (IV feeding) and fluids. Blood may also be drawn from the central line for lab tests if your doctor approves. Most patients keep their central line in place after they leave the hospital to use as an outpatient.

You and the person that will help you with your catheter care will need to attend the Catheter Care Class and schedule an appointment with Vascular Access and Procedures to demonstrate the catheter care.

Lumbar Puncture Procedure (Spinal Tap)

Sometimes chemotherapy is infused into the spinal canal through a lumbar puncture (spinal tap). This method of treatment is called intrathecal (IT) chemotherapy. It is used when a patient is at high risk of having leukemia spread in their central nervous system. Intrathecal chemo is used to destroy leukemia cells and decreases their growth in the cerebrospinal fluid (CSF). CSF is a colorless fluid found in the tissue that surrounds the brain and spinal cord.

The doctor or advanced practice provider will explain the procedure and obtain consent. After the procedure, you will need to lie flat in bed for 1 to 2 hours after to prevent a headache.

Outpatient Care

The Leukemia Center

Monday through Friday, 8 a.m. to 5 p.m.
713-792-8760

The Leukemia Center uses a team approach and works together with many clinical areas to care for you. Your team of leukemia doctors have expert knowledge in patient care, treatments with immunotherapy and stem cell transplant, clinical trials research, as well as staging and treating rare conditions.

Other care team members include:

- Advanced practice provider
- Nurses
- Case manager
- Dietitian
- Pharmacist
- Social worker
- Occupational or physical therapist
- Patient advocate
- Chaplain
- Integrative medicine
- Business specialists
- Others from supportive care

Visitor Information

Visitors are welcome in the Leukemia Center. To prevent the spread of infection, all children under the age of 13 must be screened at the Welcome Desk before going to the Leukemia Center. For safety, children under the age of 13 years must be supervised by a parent or adult at all times.

MD Anderson may also require other visitor policies and precautions to protect all patients and staff. Ask your care team or go to www.MDAnderson.org to view the most current visitor policy.

Appointments and Blood Work

Hematology Lab

Located within the Leukemia Center

- You will have blood work drawn before every appointment. Blood work can be drawn at the Hematology Lab.
- If it is after hours, blood work can be done at the Diagnostic Center.
- If approved by your care team, you may choose to have your blood work drawn and your lab review done at any MD Anderson lab locations. If your lab review shows that you need a transfusion, same-day transfusions are only available at the Texas Medical Center location.
- If you are on a clinical trial, your research nurse will let you know if you need to have your blood work drawn at the Leukemia Center.

Leukemia Fast Track

Located within the Leukemia Center

- You may be seen in the Leukemia Fast Track Clinic in between visits with your leukemia doctor. This visit may include a lab review by an advanced practice provider, which is usually done from 7:30 a.m. to 12 p.m.
- Labs must be drawn by 10:30 a.m. for same-day lab review by an advanced practice provider.
- If transfusions or IV fluids are needed after the lab review, an appointment will be ordered by the advanced practice provider in the Ambulatory Treatment Center (ATC).

Weekend Lab Check Clinic

Located in the Diagnostic Center

- Your outpatient care team may schedule you for visits in the Weekend Lab Check Clinic.
- After your blood is drawn, you will go to the Sarcoma and Orthopaedic Center for your lab review. The care team will decide if blood products, fluids, medicines or any further replacements are needed.
- You must arrive to the Sarcoma and Orthopaedic Center no later than 10:30 a.m. for lab review. Your results cannot be given over the phone or through a caregiver.

Ambulatory Treatment Center (ATC)

Multiple Locations

- The ATC provides care to patients receiving antibiotics, hydration and electrolyte replacement, blood products, chemotherapy (targeted and immunotherapy), injections (chemo and non-chemo) and intravenous immunoglobulin (IVIG).
- For more information on what to expect during your ATC visit, the ATC locations and hours of operation, scan the QR codes or ask your care team for the handouts.

Ambulatory Treatment Center: Welcome Letter
https://bit.ly/ATCWelcome_MDAnderson

Understanding Your Ambulatory Treatment Center (ATC) Schedule
https://bit.ly/ATCSchedule_MDAnderson

Inpatient Care

You may be admitted to the hospital for your leukemia treatment or if the care team needs to closely monitor your care or condition.

While you are in the hospital, the inpatient care team is responsible for your care. A doctor (attending physician) in the Leukemia Center will coordinate your care and make treatment decisions while you are an inpatient in the hospital.

There are many care team members who take part in your care. You care team may also include:

- Fellow (a doctor that works under the attending physician)
- Advanced practice provider (advanced practice nurse or physician assistant)
- Nurses
- Dietitian
- Pharmacist
- Vascular Access and Procedures team
- Physical therapist or occupational therapist
- Social worker
- Case manager
- Chaplain

Members of the care team will come to see you every day to discuss your treatment plans, current health status and answer any questions or concerns you may have. It helps to keep a notebook with you so you can write down questions to ask your care team during their visit.

Each night there are on-call teams. These teams include doctors and advanced practice nurses or physician assistants who stay in the hospital. The on-call doctor will care for you if you need medical attention during the night. This doctor will have access to your medical chart and daily notes, and any notes written by the fellow.

Upon discharge, your care team will provide you with a detailed plan about your care after the hospital stay.

Leukemia Specialty Care Unit

Newly diagnosed patients with acute myeloid leukemia (AML) (age 50 and older) and acute lymphocytic/lymphoblastic leukemia (ALL) patients (age 60 and older on certain treatments) are admitted to an area called the Leukemia Specialty Care Unit. Exceptions to these guidelines are sometimes made by the leukemia doctor.

The Leukemia Specialty Care Unit is designed to be as clean as possible to reduce the chance of infection while your immune system is low. You may stay in the specialty care room for 3 to 4 weeks. Specialty care rooms are different from regular hospital rooms in many ways, including the following:

- Staff and visitors must wear a gown, mask and gloves to enter the room.
- Visits with family are limited to decrease the chance of infection. Ask your care team for more details.
- Visitors are screened at the front desk. Visitors that are sick are not allowed to enter your room.
- Visitors under the age of 13 are not allowed in specialty care rooms.
- You are not able to leave your room except for tests or procedures that cannot be done inside your room.
- Water from the sink and shower are filtered.

Your Care and Well-Being

Exercise

Exercise is very important to your inpatient and outpatient care. It helps to maintain muscle tone, blood flow, breathing and also encourages a positive attitude. The more time you spend out of the bed during the day, the better you may feel. If you need to rest or do not feel well, take short naps or sit up in a chair. Although you are encouraged to exercise, always check with your nurse before you leave the inpatient floor to take a walk.

MD Anderson's Integrative Medicine Center offers exercise and physical activity consults. For more information, visit their website at www.MDAnderson.org/IntegrativeMedCenter.

MD Anderson's Rehabilitation Services can help you with exercise. Your doctor can arrange for you to attend physical and occupational therapy sessions. At home, you can walk, use a stationary bike or treadmill.

Mind and Body

Cancer is one of the biggest challenges a person can face. Worries about the future and the physical toll of care can cause patients to suffer both physically and emotionally.

MD Anderson's Integrative Medicine Center offers therapies that reduce patients' stress and anxiety and improve their physical, mental and emotional well-being.

If you have questions about the Integrative Medicine Services, call 713-794-4700 or visit their website at www.MDAnderson.org/IntegrativeMedCenter.

Sexuality

Sexual contact is part of a healthy, intimate relationship. Love, affection and intimacy can be expressed in a number of ways, such as touching, closeness, tenderness and sharing. These do not have to stop when one partner is diagnosed with leukemia. For many, the need for intimacy increases. It is still possible to have sexual intercourse even though you have leukemia.

Leukemia and treatment side effects can have an effect on your body image and how you see yourself sexually. It is common to feel self-conscious when it comes to sexual intercourse because of the physical changes that occur with treatment. Your desire for intimacy, and your response to it, may be very low. Fatigue may decrease your desire too. Be sure you talk with your doctor or nurse.

Others cannot "catch" leukemia through physical contact. It cannot be transmitted from one person to another. As long as your blood counts are not low, intimate contact is not dangerous. This means that there is only a slight risk of bleeding when your platelet count is less than 50,000. A water-based lubricant, if needed, may help reduce friction that could lead to bleeding during intercourse. Talk with your doctor or nurse if you have any questions or concerns about sexual activity and your platelet counts.

Fertility

The side effects of leukemia treatments can cause certain physical changes. In males, most treatments for leukemia can cause low sperm count or no sperm in the semen. Sperm production may return once you are done with your treatment. Banking sperm before you begin chemo may be an option. Ask your care team for more information.

In females, certain treatment medicines and doses may affect fertility such as being able to become pregnant and carry a pregnancy to a live birth. Some cancer treatments can cause infertility (being unable to become pregnant). Infertility can be temporary or permanent.

Once treatments are stopped and you are in remission, it may still be possible to have children. Before you start treatment, it is important to discuss your family planning questions and concerns with your doctor.

Options to preserve fertility before treatment may include:

- Embryo freezing
- Ovarian tissue freezing
- Ovarian transposition
- Medicines to suppress ovarian function

Fertility options after treatment may include:

- In vitro fertilization
- Frozen eggs or embryos
- Donor eggs or embryos
- Surrogacy

It is important to use a birth control method during your leukemia treatment because the medicines can have harmful effects on a fetus. Cancer treatments are not an effective means of birth control and should not be relied on to prevent pregnancy. Birth control pills, condoms and spermicidal foam or jelly may be used for birth control. An intrauterine device (IUD) or diaphragm cannot be used. Ask your health care team if you have questions about which birth control method to use.

During your hospital stay, the staff will be sensitive to your privacy needs. Tell your care team if you need some special time alone with your loved one. An open conversation with your partner and your doctor or nurse may help ease any fears and concerns you have about your sexuality.

Fertility Resources

MD Anderson Cancer Center, Oncofertility Clinic
713-792-6810
Services include:

- Fertility assessment
- Fertility education and counseling
- Fertility preservation methods
- Financial assistance program (including LIVESTRONG Fertility)
- Options for parenthood

Baylor College of Medicine Medical Center,
Scott Department of Urology
713-798-4001
Services for males include:

- Semen analysis
- Sperm banking
- Financial assistance program (including LIVESTRONG Fertility and Heroes for Children)

Caregiver Support

Your caregiver may feel anxious about your care and everyday needs. They need support too. Caregivers also need time alone just as you do. At first, your caregivers may feel uneasy about leaving you. This is normal. Your caregivers will have the opportunity to learn about MD Anderson resources and meet other caregivers who are also caring for a loved one.

Support Groups

Our inpatient leukemia units offer a number of support groups for inpatients and caregivers. These groups give patients and caregivers a chance to express feelings and share experiences and ideas for dealing with certain situations. The sessions focus mainly on the emotional needs of the group members and medical information is only given if needed. Ask your care team for more information about meeting dates and times.

myCancerConnection offers educational programs and one-on-one support by connecting people to a cancer support community of patients, survivors and caregivers. Visit the website at www.MDAnderson.org/MyCancerConnection for more details.

At Home

At some point, your treatment may be managed by your local doctor if you live outside the Houston area. Your leukemia doctor will contact your local doctor to discuss your current status and your future treatment at home and in Houston. Although your local doctor will care for you at home, your overall treatment will still be managed by your MD Anderson care team. Weekly blood tests may be needed, and results will be sent to your leukemia doctor to monitor the status of your leukemia.

Before you leave, your leukemia doctor will discuss your home treatment plan with you. Be sure to ask questions if any information is unclear. Call your leukemia doctor if you or your local doctor have any questions or concerns.

Try to return to your normal routine when you get home, as much as possible. You will tire easily at first because you have not been active for many weeks. Start slow and work up to your prior level of activity. Be sure to rest and take breaks when needed. Your energy level will increase the sooner you get back to a normal routine and the more you stay active.

You may do what you did before you were diagnosed. Talk with your doctor if you have questions about work, school or other activities.

Some family and friends may feel unsure about asking how you are doing. For some, it may not be easy to talk openly about cancer. Think about what you want to communicate to your family and friends so you can start or lead the conversation. If you are comfortable talking about your illness, others probably will be too.

Pet Precautions

Pet ownership has been linked to both emotional and physical health benefits. Most pets do not pose any great risk to patients with a compromised immune system. Here are recommended pet ownership practices if you have pets at home or work with animals.

Patients with a compromised immune system should avoid:

- Animals less than 6 months old or less than 1 year for cats
- Pets with diarrhea or respiratory illness
- Cleaning litter trays and contact with feces
- Contact with reptiles, snakes or lizards due to risk of salmonella

Follow these guidelines for healthy pets and patients:

- A veterinarian should examine all new pets. Pets must be up-to-date on vaccinations and worming or flea control programs.
- Keep pets clean and brushed. Clip the nails short to reduce scratches.
- Always wash your hands after you handle pets, especially before you eat.
- Feed your pets store-bought pet food only.
- Do not let your pet eat from the garbage.
- Give your pets clean tap water to drink.
- Keep cats indoors as much as possible.

Resources

MD Anderson Resources

For a complete list of MD Anderson resources, visit our Services and Amenities page at www.MDAnderson.org or view the Resources and Services guide.

askMDAnderson

877-632-6789

Get answers to questions about making an appointment at any MD Anderson location, understanding treatment options, learning about clinical trials and locating community cancer resources.

The Learning Center

713-745-8063

The Learning Center is a patient education library located at the Texas Medical Center campus that provides current and reliable information on cancer prevention, treatment, coping and general health.

Community Resources

Leukemia & Lymphoma Society

Texas Gulf Coast Chapter: 713-840-0483

National Home Office: 914-949-5213

www.LLS.org

This organization supports and provides information and financial help to patients with leukemia. It also offers support groups for patients and their families and provides referrals to other sources of help in the community.

Leukemia Texas

214-265-7393

www.LeukemiaTexas.org

This independent nonprofit corporation is dedicated to fighting leukemia through the funding of leukemia research and patient aid in Texas. Leukemia Texas provides financial assistance to leukemia patients needing help with their necessary treatment expenses.

When to Seek Emergency Care

Go to the nearest hospital emergency center right away if you have any of these signs or symptoms:

- Fever of 100.4°F (38°C) or higher
- Chills
- Cough
- Short of breath
- Bleeding that does not stop after 5 to 10 minutes of direct pressure
- Nausea and vomiting that does not get better
- Vomiting blood (may look like coffee grounds)
- Cannot control bowel movements
- Pain when you urinate, have blood in your urine or stool, or have dark to very little urine when you use the bathroom
- Pain, redness, swelling or tenderness around your CVC or PICC line or around any other wound

MD Anderson's Acute Cancer Care Center is open 24 hours a day, every day. From Holcombe Boulevard, turn at Entrance Marker 3. The entrance is on Bates Street for patient drop off only. You can park in Garage 2.

Leukemia Care at MD Anderson Cancer Center

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