Choosing Your Cancer Care

Today, the prognosis for many patients with leukemia or myelodysplastic syndromes (MDS) is very good. While you have many available treatment options to choose from, you should consider the experience of the program when selecting where to seek care.

Cleveland Clinic’s Leukemia and MDS Program is one of the largest and best respected in the world. Specialists in our Taussig Cancer Institute explore all options and tailor the most appropriate treatment plan for each patient — offering the greatest chance of curing the condition and living a long and healthy life.

Our cancer program is the top-ranked in Ohio and is ranked among the top 10 in the country by *U.S. News & World Report.*
What are leukemia and MDS?

Leukemia and myelodysplastic syndromes are conditions that develop in the bone marrow. Both are the result of bone marrow stem cells that do not mature properly.

In a healthy body, stem cells arising in the bone marrow mature into myeloid stem cells and lymphoid stem cells. Myeloid stem cells can mature into red blood cells, platelets or white blood cells, which bring oxygen to tissues, help stop bleeding and fight infections. Lymphoid stem cells mature into a different type of white blood cells.

Here is a closer look at both conditions:

**ABOUT LEUKEMIA**

In leukemia, the bone marrow makes abnormal white blood cells. As these abnormal cells accumulate, they interfere with the production of other blood cells. Eventually, the body has too few red cells for supplying oxygen to the body, too few platelets for proper blood clotting and too few healthy white cells for fighting infection.

There are many types and subtypes of leukemia. The most common forms include:

- **Chronic lymphocytic leukemia (CLL)** — The most common leukemia, a cancer of the lymphocytes (immune system white blood cells that fight infections), which grows very slowly. The disease is usually diagnosed in adults over age 55.

- **Chronic myeloid leukemia (CML)** — A cancer of the myeloid cells that tends to occur in middle-aged adults and grows slowly.

- **Acute lymphocytic leukemia (ALL)** — The most common leukemia in children, which can worsen quickly and requires immediate treatment.

- **Acute myeloid leukemia (AML)** — The most common form of acute leukemia in adults. Like ALL, it requires immediate treatment.

**ABOUT MDS**

In people with MDS, the bone marrow cells fail to develop normally. A person with MDS is then left with too few red blood cells, platelets, and/or too few white blood cells, which makes them anemic, predisposed to bleeding and/or developing infections.

There are many types of myeloplastic syndromes, including:

- **Refractory anemia** — Too few red blood cells, but a normal number of white cells and platelets.

- **Refractory neutropenia** — Too few white blood cells, but a normal number of red blood cells and platelets.

- **Refractory thrombocytopenia** — Too few platelets, but a normal number of red and white blood cells.
Refractory cytopenia with multilineage dysplasia — Too few of at least two types of blood cells.

Refractory anemia with ring sideroblasts — Too few red blood cells, but a normal number of white cells and platelets. Some existing red blood appear “ringed” under a microscope.

Refractory anemia with excess blasts — An excess percentage of “blasts” (immature white blood cells) in the bone marrow. This type of MDS may progress to acute myeloid leukemia.

Myelodysplastic syndrome associated with an isolated del(5q) chromosome abnormality — Too few red blood cells resulting from a defective chromosome.

Unclassifiable myelodysplastic syndrome — MDS that does not fit into one of the above categories.

About one-third of people with MDS go on to develop acute myeloid leukemia. Treatments try to prevent this from happening, and minimize transfusions and side effects from low blood counts.

How are leukemia and MDS diagnosed?

In their early stages, leukemia and MDS may not produce symptoms and may be found accidentally during a routine blood test.

If you have symptoms that suggest a blood or bone marrow disorder (such as fatigue, bleeding, or frequent infections), your doctor will conduct a physical exam to look for enlarged lymph nodes, swollen gums, an enlarged liver or spleen, significant bruising or a small pinpoint rash. Your doctor also will perform standard blood tests to look for abnormal numbers of red cells, white cells, platelets and blasts. A sample of your bone marrow will be taken to confirm any diagnosis and identify the specific form of leukemia or MDS.

If you are diagnosed with leukemia, your doctor also may order tests to see whether any cancer cells have spread outside the blood and bone marrow. These may include a chest X-ray to look for swollen lymph nodes in your chest, a lumbar puncture to obtain spinal fluid for examination, and an ultrasound or CT scan to look for lymph nodes in your abdomen.

Why a lab’s experience matters

The most appropriate treatment for any form of leukemia or MDS depends on an accurate diagnosis. You can rely on the internationally renowned Taussig Cancer Institute laboratory, whose team of 10 pathologists is dedicated to diseases of the blood and bone marrow. Their experience and expertise enables them to provide unprecedented accuracy. All patients also benefit from an automatic expert second opinion.

Consider these facts:

- Our pathologists find abnormalities indicating a blood or bone-marrow disease in 30 percent more patients than other labs.

- When the diagnosis of leukemia is reviewed by one of our pathologists, it is changed in five to 10 percent of patients. This level of accuracy plays a key role in ensuring every patient with leukemia or MDS is diagnosed early, when the chance of cure is highest, and receives the right treatment for their disease.

- Our lab’s tissue-matching skills are one of the main reasons for Cleveland Clinic’s exceptional success with bone marrow transplantation.
How is leukemia treated?

Standard treatments for leukemia include:

Chemotherapy — Drugs used to kill cancer cells throughout the body. In the hospital, chemotherapy is given through a person’s vein, or injected into the spinal column or a reservoir implanted under the scalp to target the spinal fluid. Outpatient chemotherapy is given either in pill form or through the vein.

Targeted therapy — Using monoclonal antibodies or pills to deliver drugs directly to cancer cells to kill the cells, stop their growth and prevent them from spreading.

Radiation therapy — A form of cancer treatment that uses radiation (strong beams of energy) to kill cancer cells or keep them from growing and dividing. It is used mainly prior to bone marrow transplantation.

Biologic therapy — A method of enhancing the patient’s own immune system to fight cancer.

Bone marrow transplantation (BMT) — A technique for replacing defective bone marrow with new stem cells, which multiply and create a healthy bone marrow.

It is rare that someone with leukemia requires surgery or radiation therapy to treat his or her condition. If you have a chronic form of leukemia and no symptoms, treatment may not be necessary. Your doctor will watch your condition closely. This approach is called “watchful waiting.”

The most appropriate treatment depends on the type of leukemia, its stage and symptoms:

Chronic lymphocytic leukemia — Many patients never need treatment. If the disease progresses, however, chemotherapy or bone marrow transplantation may be recommended.

Chronic myeloid leukemia — Most cases can be treated with drugs that target the abnormal myeloid cells without harming other cells. Occasionally, CML requires treatment with chemotherapy drugs, high-dose chemotherapy combined with a bone marrow transplant, donor lymphocyte infusion, or a combination of these therapies.

Acute lymphocytic leukemia — May be treated with chemotherapy introduced into the bloodstream or spinal column, chemotherapy with bone marrow transplantation, or with biologic therapy.

Acute myeloid leukemia — May be treated with chemotherapy or other drugs introduced into the bloodstream or spinal column, or with bone marrow transplantation.
How is MDS Treated?

Standard treatments for myelodysplastic syndromes include:

**Supportive care** — May include blood or platelet transfusions to replace missing blood components, or antibiotics to fight infection.

**Growth factor therapy with erythropoiesis stimulating agents (ESAs)** — Shots given weekly or every two or three weeks, which stimulate the remaining normal bone marrow cells to make more red blood cells.

**Immunosuppressive therapy** — Delivered through the vein or as a pill, this treatment prevents the immune system from attacking the bone marrow.

**Chemotherapy** — Drugs used to kill the abnormal immature blood cells or prevent them from dividing. Chemotherapy may be taken in pill form or delivered under the skin or through a vein.

**Bone marrow transplantation** — A technique taking bone marrow or stem cells from another person and transfusing them through a vein into someone with MDS.

Can I participate in a clinical trial?

Cleveland Clinic is one of the world’s leading leukemia and MDS clinical trial centers. Many clinical trials of new treatments or combinations of treatments are available for patients with both conditions.

If your Cleveland Clinic hematologist/oncologist feels you might benefit from participating in a clinical trial, the options will be discussed with you in detail.

Why choose Cleveland Clinic?

Cleveland Clinic’s Taussig Cancer Institute is dedicated to providing exceptional care and support to individuals with cancer. More than 250 cancer specialists, nurses and technicians work together to best meet your unique needs.

Our cancer program is the top-ranked in Ohio and is ranked among the top 10 in the country by *U.S. News & World Report*.

**A TEAM APPROACH**

Our physicians and nurses involved in treating leukemia and MDS meet weekly to discuss each patient’s care plan, progress and make decisions, such as whether to recommend bone marrow transplantation. This means everyone treated at Cleveland Clinic receives the input of the entire team.

We will take into consideration your goals and your desire for quality of life as well as length of life. You can be assured you will receive the most advanced, most patient-friendly treatment possible.
FACILITIES SECOND TO NONE

If you have leukemia, MDS, or need a bone marrow transplant, there’s a chance you will need to spend four to six weeks in the hospital. We make every effort to make our hospital feel like your home away from home, so the experience will be as comfortable as possible.

Our dedicated 22-bed unit was designed to meet the unique clinical and emotional needs of leukemia patients. It features large, private rooms with pull-out beds for family members, wireless Internet, flat screen TVs with built-in DVD players and expansive windows. The unit includes amenities such as computers, an exercise room, a washer and dryer, kitchen and lounge areas.

The special floor is not only more comfortable, it also is equipped to ensure the best patient care. The contained unit has the latest air handling system to minimize infection in patients whose immune systems are not functioning at their best. The system continually filters the air on the floor, removing 99.98 percent of potential pollutants.

SUPPORT EVERY STEP OF THE WAY

Cancer care doesn’t end after treatment. Once you have cancer, you need to be followed regularly to watch for issues common to survivors, such as recurrences or side effects from treatment.

You may find it comforting to know that your Cleveland Clinic hematologist/oncologist is dedicated to continuing to provide your follow up care for years to come. If you live out of town or move away, we understand this may not be possible. In these cases, we will be happy to coordinate your care with a local physician.

Contacting Cleveland Clinic

Still have questions? Call our Cancer Answer Line.

We are here to help you get the cancer information you need. Please contact Cleveland Clinic Cancer Answer Line at 216.444.HOPE (4673) or toll-free at 866.223.8100. Two oncology clinical nurse specialists and their staff provide information and answer questions about cancer. The Cancer Answer Line operates from 8 a.m. to 5 p.m., ET, Monday-Friday.

Ready to schedule an appointment?

If you would like to set up a consultation with a Cleveland Clinic specialist, please call the Cancer Answer Line at 216.444.HOPE (4673) or toll-free at 866.223.8100. Our leukemia/MDS direct consultation line is: 216.445.0087.
Making your care easier

Patient resource center
If your care brings you to Cleveland Clinic Taussig Cancer Institute, please visit the Patient Resource Center in the northeast corner of the building. It is a place for patients, their friends and families to come for cancer information. The Patient Resource Center is open from 8 a.m. to 5 p.m., Monday-Friday.

Medical concierge
If you are traveling from out of state and need any assistance, call the complimentary Medical Concierge at 800.223.2273, ext. 55580, or email medicalconcierge@ccf.org.

Global patient services
Complimentary assistance for national and international patients and families is available at 001.216.444.8184, or visit clevelandclinic.org/gps.

MyChart
This secure online tool connects patients to their own health information from the privacy of their home anytime, day or night. Some features include renewing prescriptions, reviewing test results and viewing medications, all online. For the convenience of physicians and patients across the country, MyChart now offers a secure connection to Google™ Health. Google Health users can securely share personal health information with Cleveland Clinic, and record and share the details of their Cleveland Clinic treatment with the physicians and healthcare providers of their choice. To establish a MyChart account, visit clevelandclinic.org/mychart.

Our treatment team
For more information about our staff, including complete profiles, visit clevelandclinic.org/staff

Online resources
More information on the diagnosis and treatment of leukemia can be found on Cleveland Clinic's website:
Cleveland Clinic oncologists also recommend the following resources:
www.Cancer.net
www.AAMDS.org
www.LLS.org
Locations

Cleveland Clinic Main Campus
Taussig Cancer Institute
9500 Euclid Ave./R35
Cleveland, OH 44195

Cleveland Clinic Cancer Centers
Clyde
509 W. McPherson Highway
Clyde, OH 43410

Independence
6100 West Creek Road,
Suites 15 & 16
Independence, OH 44131

Medina - Medical Office Building
970 E. Washington St.
Medina, OH 44256

Norwalk
272 Benedict Ave.
Norwalk, OH 44857

Parma
6525 Powers Blvd.
Parma, OH 44129

Sandusky
417 Quarry Lakes Drive
Sandusky, OH 44870

Community Hospitals
Fairview Hospital
18200 Lorain Ave.
Cleveland, OH 44111

Hillcrest Hospital
6780 Mayfield Road
Mayfield Heights, OH 44124

Medina Hospital
1000 E. Washington St.
Medina, OH 44256

Family Health Centers
Beachwood Family Health and Surgery Center
26900 Cedar Road
Beachwood, OH 44122

Fairview Hospital
Moll Pavilion
18101 Lorain Ave.
Cleveland, OH 44111

Lorain Family Health and Surgery Center
5700 Cooper Foster Park
Lorain, OH 44053

Richard E. Jacobs Health Center
33100 Cleveland Clinic Blvd.
Avon, OH 44011

Strongsville Family Health and Surgery Center
16761 SouthPark Center
Strongsville, OH 44136

Twinsburg Family Health and Surgery Center
8701 Darrow Road
Twinsburg, OH 44087

Willoughby Hills Family Health Center
2550 & 2570 SOM Center Road
Willoughby Hills, OH 44094

Wooster Family Health Center
1740 Cleveland Road
Wooster, OH 44691

Every life deserves world class care.

9500 Euclid Avenue, Cleveland, OH 44195

The Taussig Cancer Institute provides world-class cancer care enhanced by innovative basic, genetic and translational research. It offers the most effective techniques to achieve long-term survival and quality of life. The Taussig Cancer Institute’s more than 250 specialists care for approximately 30,000 patients a year, with access to a wide range of clinical trials. The Taussig Cancer Institute is one of 26 institutes at Cleveland Clinic, a not-for-profit academic medical center ranked among the nation’s top hospitals (U.S. News & World Report), where nearly 3,000 physicians in 120 specialties collaborate to give every patient the best outcome and experience.
clevelandclinic.org

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