# Blood Cancer Types: Leukemia, Lymphomas, Myelomas, and More

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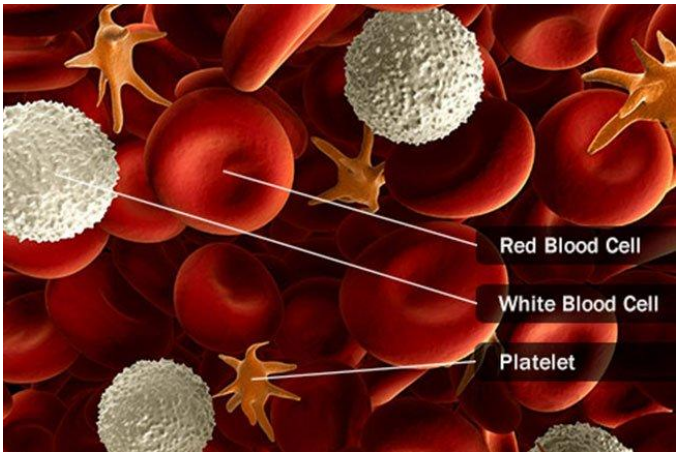
## What Is Blood Cancer?




Blood is a complex body fluid that serves many important functions in the body. It delivers oxygen and nutrients throughout the body and helps with immunity. Blood also delivers waste products to the kidneys and liver and helps regulate body temperature. Blood clotting guards against the potential for blood loss.

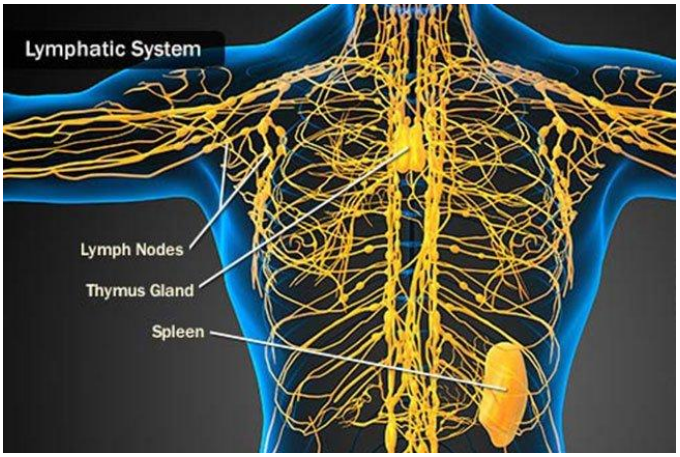
Blood is comprised of red blood cells (RBCs), white blood cells (WBCs), plasma, and platelets. Blood cancers include lymphoma, leukemia, and myeloma and affect different components of the blood. Different blood cancers interfere with the normal function of blood components.

## Risk Factors

The exact cause of cancer is unknown, but there are certain risk factors that increase the risk of blood cancers. These include:

- **Family history**: People who have blood relatives with blood cancer may be more likely to be diagnosed with it as well.
- **Genetic conditions**: Some genetic disorders, like Down's syndrome, are associated with an increased risk of developing blood cancers.
- **Chemical exposure**: Exposure to chemicals including benzene in gasoline may increase the risk of blood cancers.
- **Smoking**: Smoking is bad for overall health, but it may also increase the risk of developing some kinds of blood cancers.
- **Prior history of cancer treatment**: Some kinds of chemotherapy and radiation therapy may increase the future risk of developing a blood cancer.
- **Infections**: People who have certain viruses including Epstein-Barr virus (EBV) and human immunodeficiency virus (HIV) may be at increased risk of developing a blood cancer.

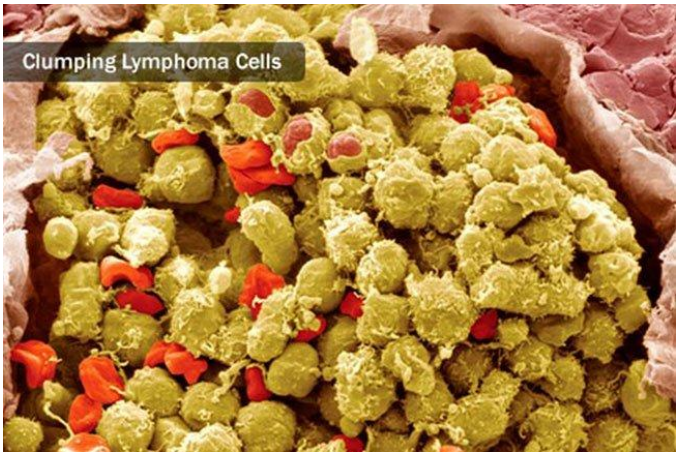
## Lymphoma




Lymphoma is a blood cancer that affects a type of white blood called lymphocytes. The lymphatic system is comprised of vessels and specialized tissues and organs that move and filter a fluid called lymph. The lymphatic system helps protect the body against infection and helps in the removal of waste.

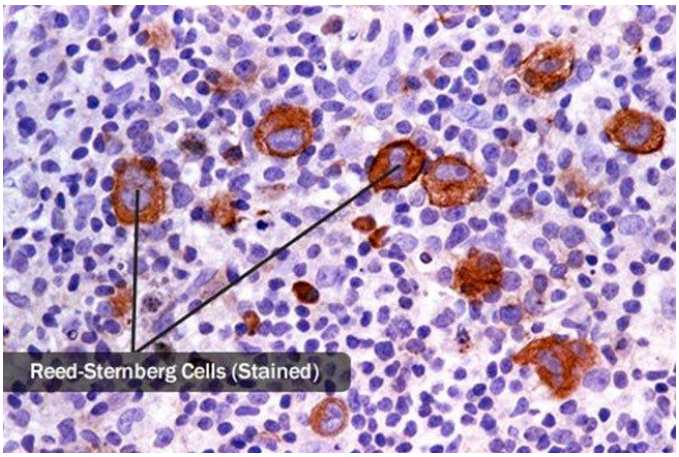
Lymphoma occurs when abnormal lymphocytes turn into cancer cells. Lymphoma may occur anywhere, including in lymph nodes or other areas. Lymphoma is the most common type of blood cancer.

## Lymphoma Types



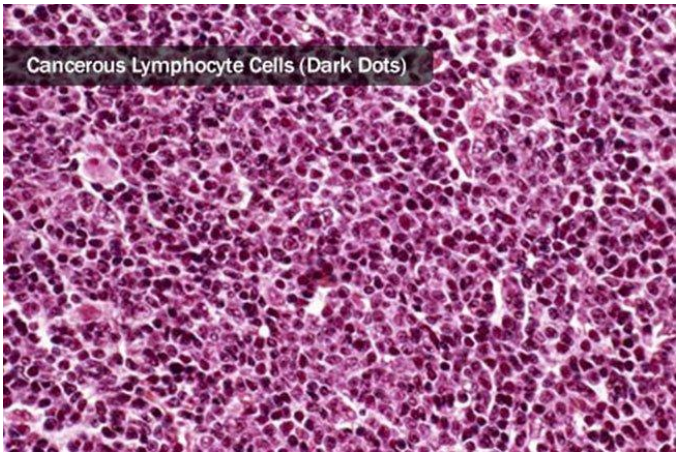

There are many different kinds of lymphoma – more than 70 types; however, they fall into two main categories. There is Hodgkin's lymphoma and non-Hodgkin's lymphoma (NHL). NHL is the more common type and it mostly affects older adults. Hodgkin's lymphoma arises from a lymphocyte that resides in the bone marrow. Hodgkin's lymphoma is considered a highly curable blood cancer.

## Hodgkin's Lymphoma



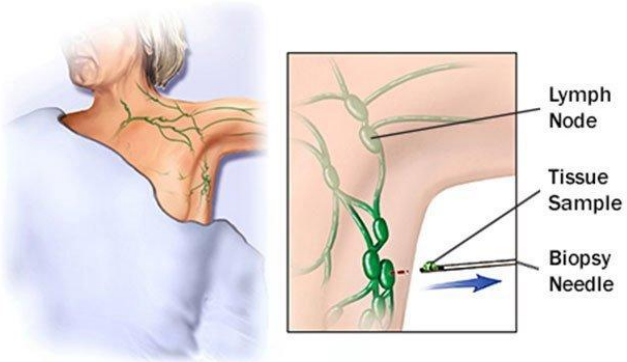

There are two main types of Hodgkin's lymphoma: classical Hodgkin's lymphoma and nodular lymphocyte-predominant Hodgkin's lymphoma. Classical Hodgkin's lymphoma is the most common. The presence of so-called, Reed-Sternberg cells, helps identify this type of lymphoma. There are four subtypes of classical Hodgkin's lymphoma.
Nodular lymphocyte-predominant Hodgkin's lymphoma is the less common form of Hodgkin's lymphoma. It is more common in males and in those between the ages of 30 and 50. It is highly curable, especially when it's diagnosed early.

## Non-Hodgkin's Lymphoma



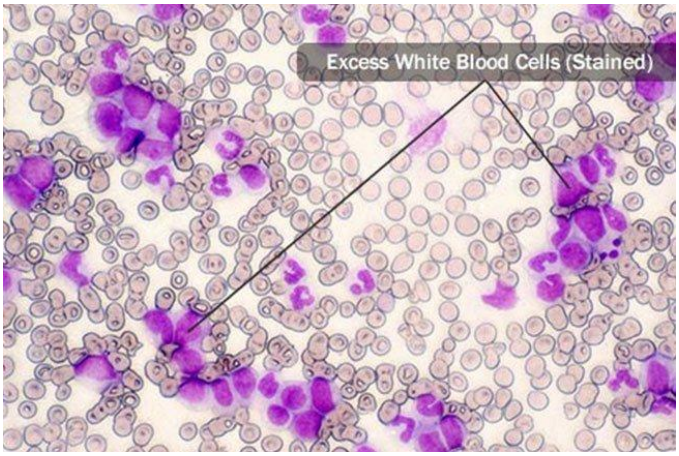

Non-Hodgkin's lymphoma (NHL) is the most common type of lymphoma. It may involve B lymphocytes (B cells) or T lymphocytes (T cells). B cells make antibodies to protect the body against bacteria and viruses. T cells destroy pathogens and diseased or damaged cells. There are more than 60 different types of NHL.
NHL occurs mostly in adults although it may affect children, too.
If it doesn't have Reed-Sternberg cells, it's called non-Hodgkin's lymphoma. This is the most common form of lymphoma. More than 30 types of cancer fall into this category. Some kinds grow slowly, while others grow very fast and can spread to other parts of your body. These need to be treated right away and can be hard to cure.

## Lymphoma Symptoms and Diagnosis



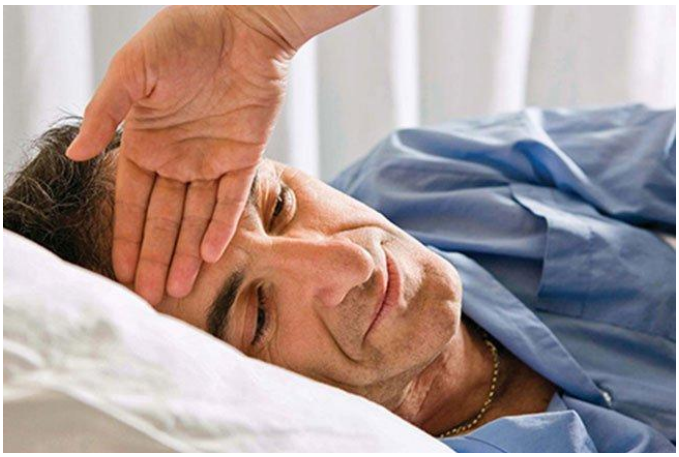

Blood cancer signs and symptoms with lymphoma may include night sweats, fatigue, swollen lymph nodes, and unexplained weight loss. People who develop lymphoma may develop a fever, cough, pain in the abdomen or chest, itchy skin, and loss of appetite. Enlargement of the liver and spleen may be present. If the doctor suspects lymphoma, a lymph node biopsy and other tests may be ordered.

## Leukemia




Leukemia is a type of blood cancer that originates inside of the bone marrow. When leukemia occurs, abnormal cells grow and interfere with or block the development of normal marrow cells. The net result is that the patient with leukemia may not make sufficient red blood cells and platelets. There are several different types of leukemia. The blood cancer is more common in children than in adults.

## Leukemia Symptoms

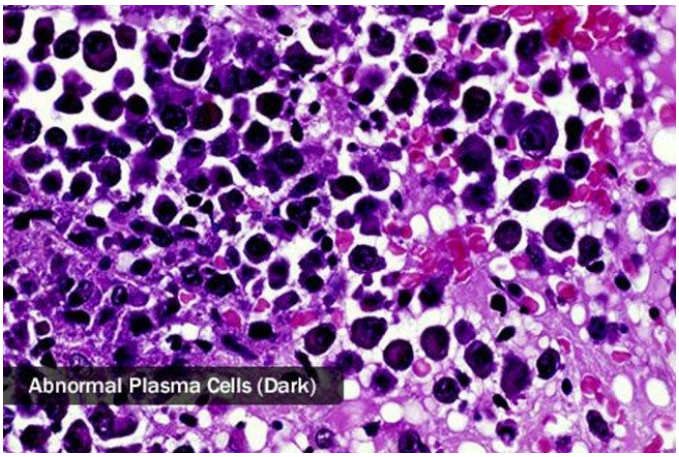


There are more than 60 different types of leukemia. The symptoms of each may be different. Symptoms and signs of the blood cancer may include fever, fatigue, unexpected weight loss, swollen lymph nodes, night sweats, and bone pain. People with this blood cancer may bruise easily, have nosebleeds, and may develop red spots on the skin (petechiae). People who get leukemia may come down with frequent infections or may get severe infections when they get sick.

## Leukemia Diagnosis

Can cancer be detected in a blood test? If a doctor suspects that a patient has leukemia, they will order a blood test to check the levels of blood cells and other blood cell components. Abnormal levels of blood cells may indicate a blood cancer. A physical exam and hearing the account of a patient's symptoms are also part of the evaluation. The doctor may order a bone marrow biopsy to evaluate the bone marrow for cancer cells.

## Myeloma




Myeloma is a blood cancer that results from plasma cells, a type of white blood cell. Plasma cells reside in the bone marrow and help the body fight off infection. If a plasma cell becomes cancerous, it results in a blood cancer called multiple myeloma. When white blood cells called B cells are confronted with an infection, they mature into plasma cells. These plasma cells manufacture antibodies to fight off infection. When plasma cells become cancerous, they manufacture an abnormal protein that can damage organs and systems in the body.

## Myeloma Symptoms and Diagnosis

Some patients who have myeloma do not experience any symptoms while others have symptoms that involve the bones, nervous system, kidneys, and blood. Bone issues related to myeloma may include bone pain in the skull, back, and hips. This may result in weak or broken bones due to osteoporosis. Myeloma may also be associated with high calcium levels (hypercalcemia) that cause excess thirst, dehydration, constipation, weakness, loss of appetite, frequent urination, and fatigue.
Weakness in the spine resulting from myeloma may cause numbness, weakness, and back pain. Abnormal protein created by cancerous plasma cells may damage the kidneys leading to difficulty breathing, weakness, swelling in the legs, and itching. The abnormal protein may also be irritating to the nerves causing numbness and tingling due to peripheral neuropathy. The malformed proteins may thicken the blood and lead to dizziness, confusion, and stroke-like symptoms. Decreased levels of blood cells and platelets also occur in myeloma causing symptoms and reduce ability to fight infections.

## Radiation and Chemotherapy

Chemotherapy and radiation are two cancer treatments that may be used for blood cancer. Cancer treatment differs depending on the type and extent of the cancer, the overall health of the patient, and other factors. The doctors will help the patient discuss treatment choices.

Chemotherapy consists of the administration of drugs to kill cancer cells. Radiation involves the application of intense energy to attack cancer cells. Both chemotherapy and radiation have the potential to cause side effects. Patients should discuss side effect management with their doctors.

## Stem Cell Transplant

Another potential treatment for blood cancer is a stem cell transplant, also known as a bone marrow transplant. The bone marrow produces blood stem cells. These cells are special because they can differentiate and turn into any blood cell type.

A stem cell transplant involves first using high-dose radiation or chemotherapy to kill off cancer cells. Then the patient is transfused with stem cells either from themselves (autologous transplant) or a donor (allogeneic transplant). Stem cells then travel to the bone marrow and begin differentiating into new healthy blood cells.

## Targeted Therapy

Targeted therapies are revolutionary cancer treatments that destroy cancer cells, but leave healthy cells intact. These therapies are often associated with fewer side effects compared to traditional cancer therapies like radiation and chemotherapy.

**Immunotherapy** stimulate the patient's own immune system to attack cancer cells. There are several different types of immunotherapy including cytokine treatment, monoclonal antibodies, therapeutic cancer vaccines, and radioimmunotherapy.

Tyrosine kinase inhibitors block enzymes called tyrosine kinases, which help cells grow, divide, and function. Blocking these enzymes may help stop the growth of cancer cells.

Proteasome inhibitors inhibit the action of proteasomes, which are structures that break down proteins within a cell. Proteasome inhibitors destroy cancer cells by interfering with the recycling of old, damaged proteins. This allows levels of bad proteins to increase within the cancer cell, killing it.

## Immunotherapy


Immunotherapy stimulates the body's immune system to fight cancer. There are several different kinds of immunotherapies.

- **Cytokine treatment** involves the administration of substances, including interleukin-2 (IL-2), interferon, and others, that stimulate the immune system.
- **Monoclonal antibodies** attach to proteins on the surface of cancer cells to kill them or interfere with their growth.
- **Therapeutic cancer vaccines** are designed to boost the patient's immune system to kill cancer.
- **Radioimmunotherapy** is a therapy where a radioactive agent combined with a monoclonal antibody is used to target cancer cells.
- **Immune checkpoint inhibitors**

Another name for immunotherapy is biological therapy.

## Car T-Cell Therapy

Chimeric antigen receptor (CAR) T-cell therapy is an emerging type of immunotherapy in which a patient's T cells – a type of white blood cell – are modified genetically to target cancer cells. The patient receives chemotherapy and then receives the transfused modified cells. This treatment is used in some patients who have leukemia or lymphoma.


## Research and New Treatments

Research and development of new treatments for blood cancers is ongoing. Patients who are not helped with existing treatments may be eligible for clinical trials, which test new therapies and help determine if they are safe and effective. Researchers are also examining the role of genetic factors of tumor cells, gut microbes, diet, and other features in relation to blood cancer treatment.

**Sources:**



Source slideshow on OnHealth

https://www.medicinenet.com/blood_cancer_types_leukemia_lymphomas_myelomas/article.htm