

Non-Hodgkin Lymphoma

Definitions

Bone marrow: The bone's inner, spongy core that produces blood cells.

Immune system: Cells whose function is to fight infections and disease.

Lymph nodes: Part of the immune system, lymph nodes store white blood cells and trap and remove bacteria and other harmful substances. Lymph nodes are located in the neck, underarms, chest, abdomen, and groin and connect to lymph vessels, which circulate white blood cells throughout the body.

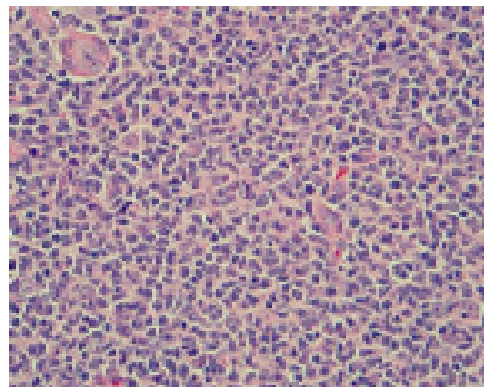
White blood cells: Cells that make up the immune system.

Pathologist: A physician who examines tissues and fluids to diagnose disease in order to assist in making treatment decisions.

What is non-Hodgkin lymphoma?

A cancer of the immune system, non-Hodgkin lymphoma often causes enlarged lymph nodes, fever, and weight loss. Some forms of this cancer are aggressive and fast-growing while others are indolent and slow-growing. Each year, about 66,000 new cases of non-Hodgkin lymphoma occur in the United States, making it the fifth most common cancer. About 20,000 Americans die each year from this disease, according to the National Cancer Institute.

While survival rates depend on the lymphoma type and how much it has spread, the five-year average survival rate for people with non-Hodgkin lymphoma is 63 percent and 10-year survival is 51 percent. Recent advancements are likely to improve survival rates for newly diagnosed patients.



Non-Hodgkin lymphoma.

Who is likely to have non-Hodgkin lymphoma?

Certain risk factors increase the chances of an individual developing this disease. These risk factors include a weakened immune system caused by a medical condition; certain types of infections including HIV, Epstein-Barr virus, *H. pylori*, (which causes stomach ulcers), hepatitis C, and human T-cell leukemia/lymphoma virus type 1 (HTLV-1); and autoimmune diseases such as rheumatoid arthritis and lupus. Researchers are studying other possible risk factors including obesity and exposure to herbicides. While non-Hodgkin lymphoma can occur at any age, most people with this cancer are older than 60.

Having one or more risk factors does not mean that a person will develop non-Hodgkin lymphoma. Most people who have risk factors never develop cancer.

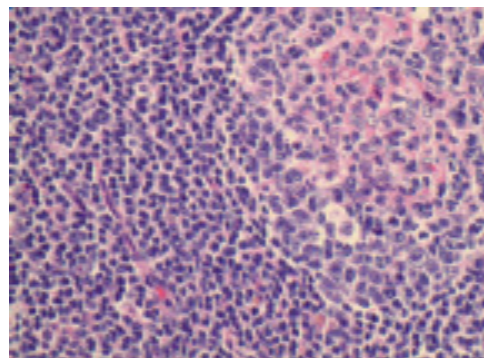
What characterizes non-Hodgkin lymphoma?

Symptoms include swollen, painless lymph nodes; weight loss; fever; and night sweats.

How does the pathologist make the diagnosis?

If you have enlarged lymph nodes or another symptom suggesting non-Hodgkin lymphoma, your primary care doctor may ask about your **personal and family medical history**, perform a **physical exam**, and order a **blood test** to check your white cell count. Your doctor may also order a **chest x-ray**. The pathologist may assist in reviewing these test results.

In a procedure known as a **biopsy**, a pathologist examines an entire lymph node or part of one under a microscope, checking the tissue for lymphoma cells. If lymphoma is found, the pathologist reports the type, including whether the lymphoma is fast- or slow-growing.



Normal lymph node cells.

What else does the pathologist look for?

If lymphoma is found, the pathologist will help evaluate tests that examine if the primary tumor in the lymph node has spread to the liver, lungs, bone, or bone marrow. These tests may include a **bone marrow biopsy** or **spinal tap**.

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What kinds of questions should I ask my doctors?

Ask any question you want. There are no questions you should be reluctant to ask. Here are a few to consider:

- Please describe the type of cancer I have and what treatment options are available.
- What is the stage of my cancer?
- What are the chances for full remission?
- What treatment options do you recommend? Why do you believe these are the best treatments?
- What are the pros and cons of these treatment options?
- What are the side effects?
- Is your medical team experienced in treating the type of cancer I have?
- Can you provide me with information about the physicians and others on the medical team?
- If I want a second opinion, could you provide me with the names of physicians and/or institutions that you would recommend?

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What is meant by the stage of the cancer?

Your pathologist and primary care doctor determine the cancer's **stage** to plan the best treatment. Stage I cancers are small and confined to one lymph node group, and stage IV tumors have spread into other parts of the body. Stages II and III describe states in between these two extremes.

How do doctors determine what treatment will be necessary?

Your treatment will depend on the type of non-Hodgkin lymphoma you have, its stage, how quickly the cancer is growing, your age, and whether or not you have other health problems. Medical professionals, including pathologists, oncologists, and radiologists, use their combined experience and knowledge and recommend treatment options most appropriate for your condition. It's important to learn as much as you can about your treatment options and make the decision that's right for you.

What kinds of treatments are available for non-Hodgkin lymphoma?

If you have slow-growing non-Hodgkin lymphoma without symptoms, you may not need to undergo treatment right away. Instead, your physician will watch your health closely and begin treatment after symptoms begin. This approach is called **watchful waiting**.

If you have slow-growing lymphoma with symptoms, your physician may recommend **chemotherapy** and **biological therapy**. Physicians prescribe cancer-killing drugs delivered through oral or IV medicines, which can kill or slow the progression of tumor cells and reduce symptoms. These drugs are usually given in outpatient treatment cycles scheduled three or four weeks apart. The most common combination of drugs is called CHOP—cyclophosphamide (Cytoxan), doxorubicin (Adriamycin), vincristine (Oncovin), and prednisone. Another common combination called CVP leaves out doxorubicin. Other chemotherapy drugs used to treat this cancer are chlorambucil, fludarabine, and etoposide.

Biological therapy activates the natural defenses of the immune system—or uses versions of natural substances made in the laboratory—to kill lymphoma cells and slow their growth. Pathologists may request and interpret a special laboratory test that helps the medical team to determine your cancer's likely response to specialized biologic therapies.

If the slow-growing tumor is in stage I or II, your physician may recommend **radiation therapy**—pinpointed high-energy beams that can shrink tumors or destroy cancer cells remaining after surgery.

For fast-growing lymphomas, physicians often recommend a combination of chemotherapy and biological therapy and sometimes include radiation therapy.

If a non-Hodgkin lymphoma patient experiences a **relapse** or **recurrence** of the cancer after treatment, physicians may recommend high doses of chemotherapy, radiation therapy, or both followed by **stem cell transplantation**. In this procedure, lymphoma cells destroyed by cancer treatment are replaced by stem cells that produce healthy blood cells and help the bone marrow to recover.

Non-Hodgkin lymphoma and its treatment can lead to other health problems, such as anemia and infections. Drugs or blood transfusions are used to treat anemia, and your physician may prescribe antibiotics or other drugs to manage infections. Any infection you develop can be serious, and you will need treatment as soon as possible.

Complementary and alternative medicine approaches may contribute to healing by helping patients to manage stress and pain. These approaches include massage, behavioral therapy, meditation, and spirituality. Eating right and staying physically active are also very important, even though on some days you will feel tired and not have an appetite.

Patients should consider enrolling in a **clinical trial**, which tests new treatments. These treatments are experimental in nature but may be an option, especially for advanced cancers. Clinical trials for non-Hodgkin lymphoma may be found at www.cancer.gov/clinicaltrials or by calling NCI's Cancer Information Service at 800-4-CANCER (800-422-6237).

For more information, go to www.cancer.gov (National Cancer Institute) or www.cancer.org (American Cancer Society). Type the keywords **non-Hodgkin lymphoma** into the search box.