

Non-Hodgkin Lymphoma

Lymphoma comprises more than 67 subtypes of two closely related cancers that affect the lymphatic system, non-Hodgkin lymphoma (NHL) and Hodgkin lymphoma (HL)¹. There are six primary types of Hodgkin lymphoma and at least 61 types of non-Hodgkin lymphoma¹.

Non-Hodgkin Lymphoma Overview

Non-Hodgkin lymphoma (NHL) is the most common cancer of the lymphatic system. Since the early 1970's, incidence rates for non-Hodgkin lymphoma have nearly doubled. The overall five-year survival rate is only 61.6 percent. Of the nearly 500,000 Americans with lymphoma, approximately 332,000 have this form. In 2009, it is estimated that 74,490 people will be diagnosed with lymphoma (65,980 cases of non-Hodgkin lymphoma and 8,510 Hodgkin lymphoma) and 20,790 (19,500 from non-Hodgkin lymphoma and 1,290 from Hodgkin lymphoma) will die from the disease in the United States². NHL is not a single disease, but rather a group of several closely related cancers that affect the lymphatic system, which is part of the immune system.

NHL is broadly divided into two major groups: B-cell lymphoma (which develops from abnormal B-lymphocytes, is most common), and T-cell lymphomas (which develop from abnormal T-lymphocytes). Lymphocytes are a type of white blood cell that helps the body fight infections. B-cells develop into plasma cells that produce antibodies to fight infections, while T-cells attack foreign invaders (bacteria, viruses, cells, etc.) directly.

Non-Hodgkin lymphoma can start in the lymph nodes, in a specialized lymphatic organ such as the spleen, or in lymph tissue found in organs such as the stomach or intestines. Since lymphocytes can circulate to all parts of the body through the lymphatic vessels and bloodstream, abnormal lymphocytes can reach any part of the body. Thus, NHL

can start in or spread to any part of the body. While some NHLs are localized to one area, most are present in several parts of the body by the time the diagnosis is confirmed.

Warning Signs

While most people who have these complaints will not have NHL, anyone with persistent symptoms should be seen by a doctor to make sure that lymphoma is not present: chills, swelling of the lymph nodes, which are often, but not always painless, fever, night sweats, unexplained weight loss, lack of energy and itching.

Risk Factors

The causes of NHL remain unknown, but immune system impairment and exposure to environmental carcinogens, pesticides, herbicides, viruses and bacteria may play a role. There may be a higher risk for getting NHL in individuals:

- With a family history of NHL (though no hereditary pattern has been well established)
- Affected with autoimmune disease
- Who received an organ transplant
- Exposed to chemicals such as pesticides, fertilizers or organic solvents
- Infected with viruses such as Epstein-Barr, human T-lymphotropic virus type 1 (HTLV-1), HIV, hepatitis C or certain bacteria, such as H-pylori

Treatment Options

While many effective treatment options exist, low grades of NHL usually recur—some people go in and out of remission for years. In certain patients with indolent disease, treatment may not be necessary until there are signs

1. Jaffe, E. S., Harris, N. L., Stein, H., & Isaacson, P. G. (2008). Classification of lymphoid neoplasms: The microscope as a tool for disease discovery. *Blood*, 112(12), 4384-4399.

2. American Cancer Society. *Cancer Facts and Figures 2009*. Atlanta: American Cancer Society; 2009.

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- *Lymphoma Helpline & Clinical Trials Information Service*
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- Publications and newsletters
- Informational teleconferences and webcasts
- In-person conferences
- National Chapter Network

For more detailed information on non-Hodgkin lymphoma, including treatment options, please see LRF's *Understanding Non-Hodgkin Lymphoma Guide for Patients, Survivors and Loved Ones*.

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Last Updated July 2009

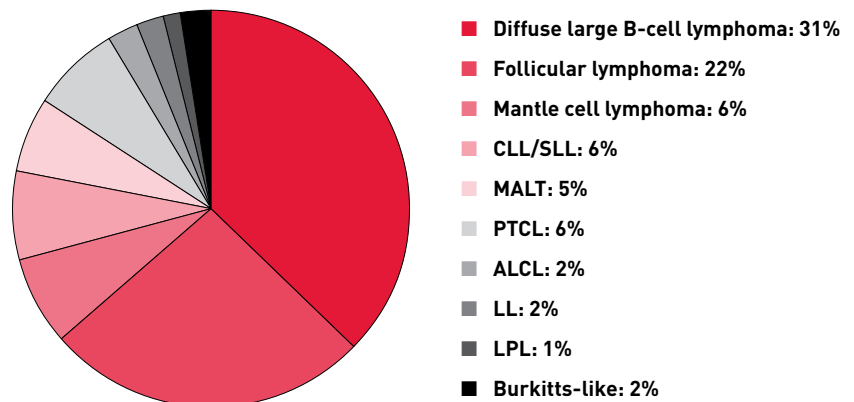
of progression, and response to treatment can change over time. Treatment that worked initially may be ineffective the next time, making it necessary to always keep abreast of the latest information on new or experimental treatment options. However, thirty percent to sixty percent of patients with "aggressive" NHL can be cured. Although the advanced "indolent" forms of NHL are not currently curable with conventional treatments, the prognosis is still very good, and patients may live for 20 years or more. Many people treated for NHL will receive some form of chemotherapy, radiation therapy, biologic therapy, or a combination of these. Bone marrow or stem cell transplantation may sometimes be used. Surgery may be used under special circumstances, but is used primarily to obtain a biopsy for diagnostic purposes.

Research Advances

Lymphoma is often called the "Rosetta Stone" of cancer research because it has helped unlock the mysteries of several other types of cancer. Some promising research areas are:

- Profiling tumors by examining the finger-print-like pattern expressed by genes, thus aiding in prognosis and development of new treatments
- New antibody treatments, which act like guided missiles that zero in on specific targets (antigens) on the lymphoma cells
- Testing new therapies that are biologically targeted to unique abnormalities specific to certain lymphomas

Relative Incidence of NHL Subtypes



Armitage et al. Journal of Clinical Oncology. 1998; 16:2780.