

## Diffuse Large B-cell Lymphoma

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### Non-Hodgkin Lymphoma Overview

Lymphoma is a cancer of the white blood cells, namely lymphocytes, that happen to constitute the lymphatic system. Lymphoma comprises more than 67 subtypes of two closely related cancers that affect the lymphatic system, non-Hodgkin lymphoma (NHL) and Hodgkin lymphoma (HL)<sup>1</sup>. There are six primary types of Hodgkin lymphoma and at least 61 types of non-Hodgkin lymphoma<sup>1</sup>. 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 20,510 (19,160 from non-Hodgkin lymphoma and 1,350 from Hodgkin lymphoma) will die from the disease in the United States<sup>1</sup>. Nearly all non-Hodgkin lymphoma cases occur in adults, with the average age of diagnosis in the 60's. While scientists do not know the exact causes of non-Hodgkin lymphoma, they do know that it is not caused by injury or by coming into contact with someone else with the disease. Most people diagnosed with non-Hodgkin lymphoma have no known risk factors, though increasingly many scientists believe infections may play an important role in causing select types of non-Hodgkin lymphoma.

### Diffuse Large B-cell Lymphoma Overview

Diffuse large B-cell lymphoma is the most common of the non-Hodgkin lymphomas, accounting for up to 30 percent of newly diagnosed cases. Diffuse large B-cell lymphoma is an aggressive, or fast-growing lymphoma. It can arise in lymph nodes or outside of the lymphatic system, in the gastrointestinal tract, testes, thyroid, skin, breast, bone or brain. Often, the first sign of diffuse large B-cell lymphoma

is a painless or even painful rapid swelling in the neck, armpit or groin caused by enlarged lymph nodes. Other symptoms include night sweats, unexplained fevers and weight loss.

### Diagnosing Diffuse Large B-cell Lymphoma

Doctors usually diagnose diffuse large B-cell lymphoma by taking a small sample (called a biopsy) of the tumor and looking at the cells under a microscope. They will also examine other organs, such as the spleen, liver and bone marrow. Additional tests, such as blood tests, x-rays, and scans may be used and can also help determine how far the cancer has spread, indicating its "stage." In Stage I, lymphoma appears only in one group of lymph nodes in a particular body region, while in patients with Stage II, disease in more than one lymph node group is involved but limited to one side of the diaphragm (midline of chest and abdomen). In contrast, patients with Stage III disease have lymphoma on both sides of the diaphragm, while those with stage IV disease have involvement of other non-lymph node organs such as the liver or bone marrow. Most patients with diffuse large B-cell lymphoma are adults, although this lymphoma is sometimes seen in children.

### The International Prognostic Index (IPI)

Doctors around the world use a set of guidelines for diagnosing and deciding how to treat aggressive forms

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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of non-Hodgkin lymphoma. This system, known as the International Prognostic Index, or IPI, uses known risk factors to predict overall survival and sometimes to guide treatment. For diffuse large B-cell lymphoma, certain factors can predict risk of relapse, including age at diagnosis, blood levels of the LDH protein, a person's ability to function without help, his or her disease stage and whether the lymphoma cells appear in organs outside of the lymphatic system.

### Treatments Options

Because diffuse large B-cell lymphoma advances very quickly, it requires immediate treatment. A combination of chemotherapy and the monoclonal antibody rituximab (Rituxan) can lead to a cure in a large number of people with this form of lymphoma. Even when a cure is not possible, treatment can often keep the disease away for many years. The most widely used chemotherapy treatment is a mixture of drugs abbreviated CHOP, a combination of medicines that includes cyclophosphamide, doxorubicin, vincristine and prednisone. In addition, doctors may treat diffuse large B-cell lymphoma with radiation often in combination with chemotherapy and rituximab (Rituxan). Because the chemotherapy drug doxorubicin can damage the heart, doctors closely monitor heart function during treatment.

All patients with a higher risk of relapse should consider participating in a clinical trial as initial therapy. Many of the improvements in survival have been made using investigational therapies aiming to improve on the best available conventional treatments.

### Treatment Resistance

Bone marrow, or stem cell transplantation is the treatment of choice for diffuse large B-cell patients whose cancer

has returned or relapsed. In addition, investigational treatments are currently being tested against diffuse large B-cell lymphoma. Many of these clinical trials are recruiting patients; more information can be obtained by contacting the Lymphoma Research Foundation or visiting the National Institutes of Health website [clinicaltrials.gov](http://clinicaltrials.gov).

### Side Effects

Some chemotherapy drugs can damage healthy cells and cause side effects such as nausea and vomiting, reduced appetite, hair loss and mouth sores. Damage to healthy immune cells may also put lymphoma patients undergoing treatment at risk for infection. Doctors can prescribe medicines to offset these effects. Since chemotherapy may cause infertility, this should be discussed with your doctor, prior to starting therapy. Sperm banking is generally recommended in men and measures to attempt fertility preservation in women may be considered. It is essential that birth control be used during treatment.

### Complementary and Alternative Therapies

Complementary and alternative therapies are non-standard therapies that may help patients cope with their cancer and its treatment, but that should not be used as the only treatment. No alternative therapy has been proven effective against lymphoma. However, complementary therapies such as meditation, exercise, prayer, diet, and relaxation techniques may provide comfort and emotional strength. It is very important for patients considering alternative or complementary treatments to discuss the matter openly with their healthcare team. Certain unproven treatments, including some herbal supplements, can interfere with standard lymphoma treatments or may cause serious side effects.