

## Diffuse Large B-cell Lymphoma

*Expert review by:*

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### What is lymphoma?

Lymphoma is a cancer of the white blood cells, namely lymphocytes, that happen to constitute the lymphatic system. The two main types of lymphoma are Hodgkin lymphoma and non-Hodgkin lymphoma. Lymphoma is the most common blood cancer and the third most common cancer of childhood. Lymphoma occurs when lymphocytes, a type of white blood cell, grow abnormally. The body has two types of lymphocytes: B lymphocytes, or B-cells, and T lymphocytes, or T-cells. Although both cell types can develop into lymphomas, B-cell lymphomas are more common. Like normal lymphocytes, those that turn malignant can grow in many parts of the body, including the lymph nodes, spleen, bone marrow, blood or other organs.

### What is non-Hodgkin lymphoma?

Of the more than 35 types of lymphoma, 30 are classified as non-Hodgkin lymphoma (NHL). 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.

### What is diffuse large B-cell lymphoma?

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.

### How is diffuse large B-cell lymphoma diagnosed?

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.

### **What is the International Prognostic Index (IPI)?**

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

### **What treatments are available?**

Because diffuse large B-cell lymphoma advances very quickly, it requires immediate treatment. A combination of chemotherapy and the monoclonal antibody 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 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.

### **What if the lymphoma comes back?**

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 [www.clinicaltrials.gov](http://www.clinicaltrials.gov).

### **What about 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. These include growth factors (G-CSF or GM-CSF, to protect against infection), erythropoietin (to prevent anemia) and anti-emetic drugs (for nausea). 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.

### **Are complementary and alternative therapies safe and effective?**

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.

### **What about follow-up appointments?**

During and after treatment, patients should play an active role in their healthcare, including keeping a master file of medical records, asking questions, reporting new symptoms, exercising and eating a balanced diet. In addition, patients who smoke should strongly consider stopping. Follow-up visits, usually scheduled every few months, typically include CT scans and a variety of blood tests. After treatment, it is very important to keep these appointments. Since follicular lymphoma symptoms may resemble those of less serious illnesses, like colds or viral infection, regular medical care

is very important. In addition to looking for signs of the cancer coming back, follow-up care can help identify and resolve unusual side effects of treatment.

### **How can I find support?**

A lymphoma diagnosis may provoke a range of feelings and bring many concerns. In addition, cancer treatment can cause physical and emotional discomfort. Connecting with other people who have lymphoma, or have been cured of it, can help a great deal. Support groups and online message boards are often useful. One-to-one peer support programs, such as the Lymphoma Research Foundation's *Lymphoma Support Network*, matches lymphoma survivors (or caregivers) with volunteers who have gone through similar experiences.

### **How can I stay informed?**

The Lymphoma Research Foundation offers a wide range of resources that address treatment issues, the latest research advances, and coping with all aspects of lymphoma. For more information about any of these resources, contact LRF at 800-500-9976, e-mail: [helpline@lymphoma.org](mailto:helpline@lymphoma.org) or visit the website [www.lymphoma.org](http://www.lymphoma.org).

# Contact Us

For more information about *Getting the Facts* or information about the

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The Lymphoma Research Foundation (LRF) offers a comprehensive series of patient education and support programs including:

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

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## Glossary of Terms

**Aggressive lymphoma:** A type of lymphoma that grows and spreads quickly

**Biopsy:** Removal of a small piece of tissue (for example, a lymph node) for evaluation under a microscope

**International Prognostic Index (IPI):** An international index for aggressive forms of non-Hodgkin lymphoma that identifies five significant risk factors affecting overall survival

**LDH:** Lactate dehydrogenase; an enzyme found in blood and other body tissues; increased blood levels may be a sign of lymphoma

**Lymph nodes:** Small bean-shaped glands located in the small vessels of the lymphatic system; thousands are located throughout the body; they are most easily felt in the neck, armpits and groin

**Lymphatic system:** The vessels, tissues, and organs that store and carry lymphocytes that fight infection and other diseases

**Lymphocyte:** A type of white blood cell

**Monoclonal antibody:** Targeted biologic therapy to help combat specific tumors, including lymphoma

**Radioimmunotherapy:** A dual-action therapy that combines a monoclonal antibody with a radioactive isotope

**Refractory disease:** A cancer that is resistant to treatment

**Relapse:** The return of cancer after treatment, either in the area where it began or elsewhere in the body

## About LRF

The mission of the Lymphoma Research Foundation (LRF) is to eradicate lymphoma and serve those touched by this disease. LRF is the nation's largest lymphoma-focused voluntary health organization devoted exclusively to funding lymphoma research and providing patients and healthcare professionals with critical information on the disease. Over 85 cents of every dollar spent goes to support research and education programming. People affected by lymphoma can receive free personalized information tailored to their diagnosis, help with finding a clinical trial, and easy-to-understand information on lymphoma, current treatments, and promising research. Please call 800-500-9976, email [helpline@lymphoma.org](mailto:helpline@lymphoma.org), or visit the website [www.lymphoma.org](http://www.lymphoma.org)