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## About Non-Hodgkin Lymphoma in Children

Get an overview of non-Hodgkin lymphoma in children and teens and the latest key statistics in the US.

### Overview and Types

If your child has just been diagnosed with non-Hodgkin lymphoma or you are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Non-Hodgkin Lymphoma in Children?](#)
- [Types of Non-Hodgkin Lymphoma in Children](#)

### Research and Statistics

See the latest estimates for new cases of childhood non-Hodgkin lymphoma in the US and what research is currently being done.

- [Key Statistics for Non-Hodgkin Lymphoma in Children](#)
- [What's New in Research into Non-Hodgkin Lymphoma in Children?](#)

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## What Is Non-Hodgkin Lymphoma in

# Children?

- [Hodgkin and non-Hodgkin lymphoma](#)
- [The lymph \(lymphatic\) system](#)

The cells in which lymphoma starts (**lymphocytes**) can be found throughout the body's lymph system, so knowing about the lymph system can be helpful in understanding lymphoma.

The **lymph system** is part of the body's immune system, which helps fight infections and some other diseases. It also helps fluids move around in the body.

## Lymphocytes

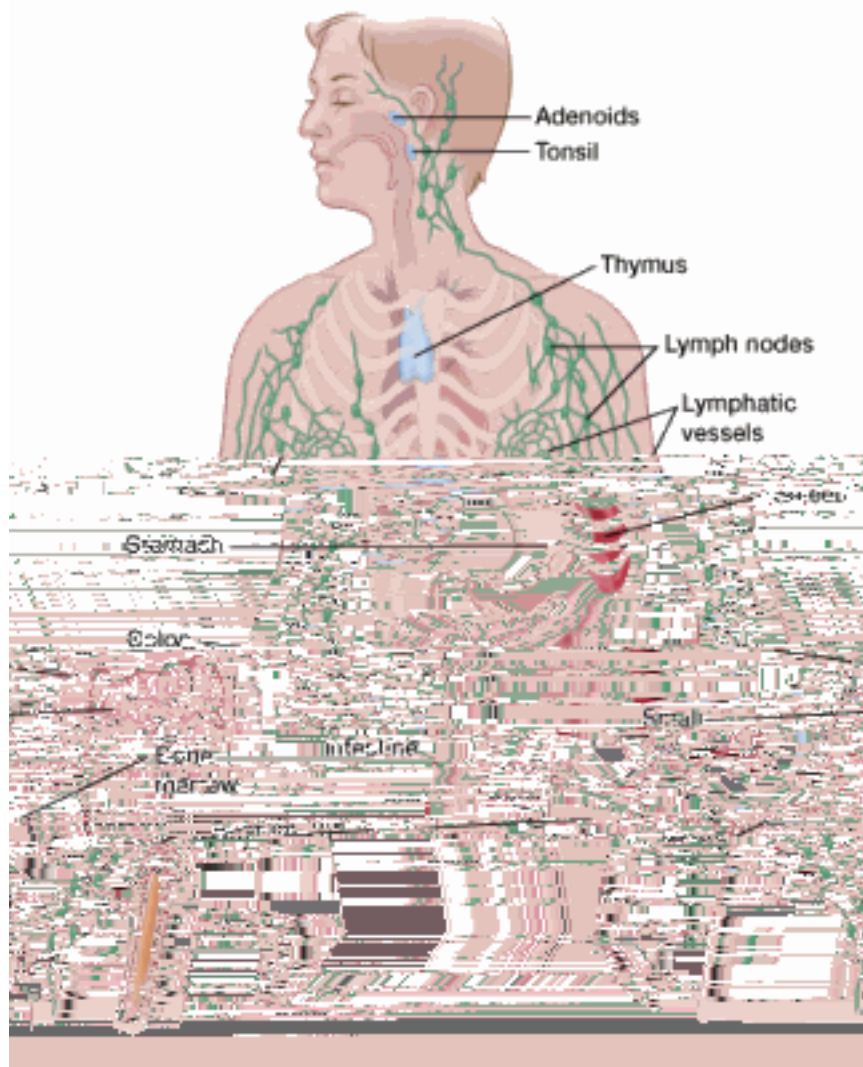
The lymph system is made up mainly of lymphocytes, a type of white blood cell. The main types of lymphocytes are:

- **B lymphocytes (B cells):** B cells normally help protect the body against germs (bacteria or viruses) by making proteins called **antibodies**. The antibodies attach to the germs, marking them for destruction by other parts of the immune system.
- **T lymphocytes (T cells):** There are several types of T cells, each with a special job. Some T cells destroy germs or abnormal cells in the body. Some T cells help boost or slow the activity of other immune system cells.

Lymphomas can develop from either B cells or T cells.

## Parts of the lymph system

The lymph system is in many parts of the body, so lymphomas can start almost anywhere. (This can affect what [symptoms](#)<sup>4</sup> a child has.)



Lymph tissue is found in:

**Lymph nodes:** Lymph nodes are bean-sized collections of lymphocytes and other immune cells throughout the body. They can sometimes be felt under the skin in the neck, under the arms, and in the groin. Lymph nodes are connected to each other by a system of lymphatic vessels.

Lymph nodes get bigger when they fight infection. Lymph nodes that grow because of infection are called **reactive nodes** or **hyperplastic nodes** and are often painful when they are touched. An enlarged lymph node in a child or teen is most often a reactive node. For exam

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<https://www.cancer.gov/types/lymphoma/patient/child-nhl-treatment-pdq> on May 5, 2021.

Termuhlen AM, Gross TG. Overview of non-Hodgkin lymphoma in children and adolescents. UpToDate. 2021. Accessed at <https://www.uptodate.com/contents/overview-of-non-hodgkin-lymphoma-in-children-and-adolescents> on May 5, 2021.

Last Revised: August 10, 2021

## Types of Non-Hodgkin Lymphoma in Children

- [Lymphoblastic lymphoma](#)
- [Burkitt lymphoma](#)
- [Diffuse large B-cell lymphoma \(DLBCL\)](#)
- [Anaplastic large cell lymphoma \(ALCL\)](#)

There are many types of non-Hodgkin lymphoma (NHL). These cancers are most often classified based on:

- The type of [lymphocyte](#) they start in
- How the lymphoma cells look under a microscope
- Whether the lymphoma cells have certain chromosome, gene, or protein changes

Special lab tests are often needed to accurately classify lymphomas. These are described in [Tests for Non-Hodgkin Lymphoma in Children<sup>1</sup>](#).

The most common types of NHL in children and teens are largely different from those in adults. Nearly all childhood NHLs are one of these types:

- **Lymphoblastic lymphoma (LBL)**
- **Burkitt lymphoma (small non-cleaved cell lymphoma)**
- **Diffuse large B-cell lymphoma (DLBCL)**
- **Anaplastic large cell lymphoma (ALCL)**

All of these types of NHL are considered high-grade or aggressive lymphomas (meaning they tend to grow quickly) . Still, it's important to find out which type a child has because they can be [treated](#)<sup>2</sup> differently.

There are many other types of NHL as well. These are much more common in adults and are rare in children, so they are not covered further here.

## Lymphoblastic lymphoma

Lymphoblastic lymphoma (LBL) accounts for about 20% of NHL in children and teens in the United States. Boys are about twice as likely to get LBL as girls.

The cancer cells of LBL are very young lymphocytes called **lymphoblasts**. They are the same cells as those seen in [acute lymphoblastic leukemia \(ALL\)](#)<sup>3</sup> in children. In fact, if more than 25% of the bone marrow is made up of lymphoblasts, the disease is classified and treated as ALL instead of lymphoma.

Most cases of LBL develop from [T cells](#) and are called **precursor T-lymphoblastic lymphomas**. These lymphomas often start in the thymus, forming a mass in the area behind the breast bone and in front of the trachea (windpipe). This can cause problems breathing, which may be the first symptom of LBL.

Less often, LBL develops in the tonsils, lymph nodes of the neck, or other lymph nodes. It can spread very quickly to the bone marrow, other lymph nodes, the surface of the brain, and/or the membranes that surround the lungs and heart.

A smaller fraction of LBLs develop from B cells, and are called **precursor B-lymphoblastic lymphomas**. These lymphomas more often begin in lymph nodes outside the chest, particularly in the neck. They can also involve the skin and bones.

LBL can grow very quickly and can often cause trouble breathing, so it needs to be diagnosed and treated quickly.

## Burkitt lymphoma

Burkitt lymphoma, also known as **small non-cleaved cell lymphoma**, accounts for about 40% of childhood NHL in the United States. It is most often seen in boys, usually between the ages of 5 and 14 years old.

Burkitt lymphoma is named after the doctor who first described it in African children. In

certain parts of Africa, Burkitt lymphoma accounts for nearly all childhood NHL and over half of all childhood cancers. In African children this lymphoma usually develops in the jaw or other facial bones.

Burkitt lymphomas in other parts of the world, including the United States, most often start in the abdomen (belly). Typically, a child will develop a large tumor in the abdomen that can sometimes block the bowels (intestines). This can cause belly pain, nausea, and vomiting. Burkitt lymphoma can also sometimes start in the neck or tonsils, or rarely in other parts of the body.

This lymphoma develops from mature forms of [B lymphocytes \(B cells\)](#). It can spread quickly to other organs, including the surface of the brain or inside the brain. It is one of the fastest growing cancers known, so it needs to be diagnosed and treated quickly.

A similar type of lymphoma, sometimes called **Burkitt-like lymphoma** or **non-Burkitt lymphoma**, also shares some features with diffuse large B-cell lymphoma (described below) when seen under the microscope.

## **Diffuse large B-cell lymphoma (DLBCL)**

This type of lymphoma accounts for about 15% to 20% of childhood NHL. It starts in mature forms of B cells, and it can grow almost anywhere in the body. DLBCL tends to occur more often in older children and teens than among younger children.

Compared to the lymphomas above, DLBCL isn't as likely to grow as quickly, and it's less likely to spread to the bone marrow or to the brain or spinal cord. Still, it needs to be treated aggressively, typically the same way that Burkitt lymphoma is treated.

A related but less common type of NHL, known as **primary mediastinal B-cell lymphoma (PMBCL)**, grows as a large mass in the mediastinum (the space between the lungs). It tends to be seen most often in older teens.

## **Anaplastic large cell lymphoma (ALCL)**

This type of lymphoma makes up about 10% of all NHL in children and teens. It usually develops from mature T cells. It may start in lymph nodes in the neck or other areas, and it may be found in the skin, lungs, bone, digestive tract, or other organs.

ALCL tends to develop more often in older children and teens than in younger children. It isn't as likely to spread to the bone marrow or brain as some other childhood lymphomas, nor does it tend to grow as quickly.



In most children with ALCL, the lymphoma cells have changes in the *ALK* gene that help the cells grow. Newer [targeted drugs](#)<sup>4</sup> called **ALK inhibitors**, which attack cells with *ALK* gene changes, have shown promise in treating childhood ALCL in recent years.

## Hyperlinks

1. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/detection-diagnosis-staging/how-diagnosed.html)
2. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating.html)
3. [www.cancer.org/cancer/types/leukemia-in-children.html](http://www.cancer.org/cancer/types/leukemia-in-children.html)
4. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/monoclonal-antibodies.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/monoclonal-antibodies.html)

## References

Gross TG, Kamdar KY, Bollard CM. Chapter 19: Malignant Non–Hodgkin Lymphomas in Children. In: Blaney SM, Adamson PC, Helman LJ, eds. *Pizzo and Poplack's Principles and Practice of Pediatric Oncology*. 8th ed. Philadelphia Pa: Lippincott

# Key Statistics for Non-Hodgkin Lymphoma in Children

About 7% of all cancers in children and teens are non-Hodgkin lymphomas (NHLs).

About 1,200 children and teens are diagnosed with NHL in the United States each year.

NHL is about 2 to 3 times more common in boys than in girls, and it is more common in White children than Black children.

Overall, the risk of NHL in children increases with age. It can develop in children at any age, but it's uncommon in children younger than 5.

Statistics on survival can be found in [Survival Rates for Childhood Non-Hodgkin Lymphoma](#)<sup>1</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/detection-diagnosis-staging/survival-rates.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/detection-diagnosis-staging/survival-rates.html)

## References

Gross TG, Kamdar KY, Bollard CM. Chapter 19: Malignant Non–Hodgkin Lymphomas in Children. In: Blaney SM, Adamson PC, Helman LJ, eds. *Pizzo and Poplack's Principles and Practice of Pediatric Oncology*. 8th ed. Philadelphia Pa: Lippincott Williams & Wilkins; 2021.

National Cancer Institute. Childhood Non-Hodgkin Lymphoma Treatment (PDQ®)—Health Professional Version. 2024. Accessed

# What's New in Research into Non-Hodgkin Lymphoma in Children?

- [Genetics](#)
- [Clinical trials of new treatments](#)

Research into the causes, diagnosis, and treatment of childhood non-Hodgkin lymphoma (NHL) is being done at many medical centers, university hospitals, and other institutions around the world.

## Genetics

As noted in [What Causes Non-Hodgkin Lymphoma in Children?](#)<sup>1</sup>

- Can newer, targeted drugs such as monoclonal antibodies be helpful in treating NHL, either alone or added to current treatments to make them better? (See [Other Drugs for Non-Hodgkin Lymphoma in Children](#)<sup>5</sup>.)
- Can newer forms of [immunotherapy](#)<sup>6</sup> (treatments that boost the immune system), such as CAR T-cell therapy or immune checkpoint inhibitors, be helpful in treating childhood NHL, especially if other treatments are no longer working?

### [Childhood Cancer Research Highlights](#) <sup>7</sup>

The American Cancer Society is committed to finding new answers to help every child and family affected by cancer--see some of our latest research

### Hyperlinks

1. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/causes-risks-prevention/what-causes.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/causes-risks-prevention/what-causes.html)
2. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
3. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/chemotherapy.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/chemotherapy.html)
4. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/bone-marrow-stem-cell-transplant.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/bone-marrow-stem-cell-transplant.html)
5. [www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/monoclonal-antibodies.html](http://www.cancer.org/cancer/types/childhood-non-hodgkin-lymphoma/treating/monoclonal-antibodies.html)



