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# About Hodgkin Lymphoma

## Overview and Types

If you've been diagnosed with Hodgkin lymphoma or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Hodgkin Lymphoma?](#)

## Research and Statistics

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

- [Key Statistics for Hodgkin Lymphoma](#)
- [What's New in Hodgkin Lymphoma Research and Treatment?](#)

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# What Is Hodgkin Lymphoma?

Cancer starts when cells start to grow out of control. Cells in nearly any part of the body can become cancer, and can then spread to other parts of the body. To learn more about how cancers start and spread, see [What Is Cancer?](#)<sup>1</sup>

**Lymphomas are cancers that start in white blood cells called lymphocytes.** There are 2 main types of lymphoma:

- Hodgkin lymphoma (HL)
- Non-Hodgkin lymphoma (NHL)

They behave, spread, and respond to treatment differently, so it's important for you to know which one you have.

This information is about Hodgkin lymphoma. To learn about the other type, see [Non-Hodgkin Lymphoma](#)<sup>2</sup>.

## The lymph system

To understand what Hodgkin lymphoma is, it helps to know about the [lymph system](#)<sup>3</sup> (also known as the **lymphatic system**). The lymph system is part of the immune system, which helps fight infections and some other diseases. The lymph system also helps control the flow of fluids in the body.

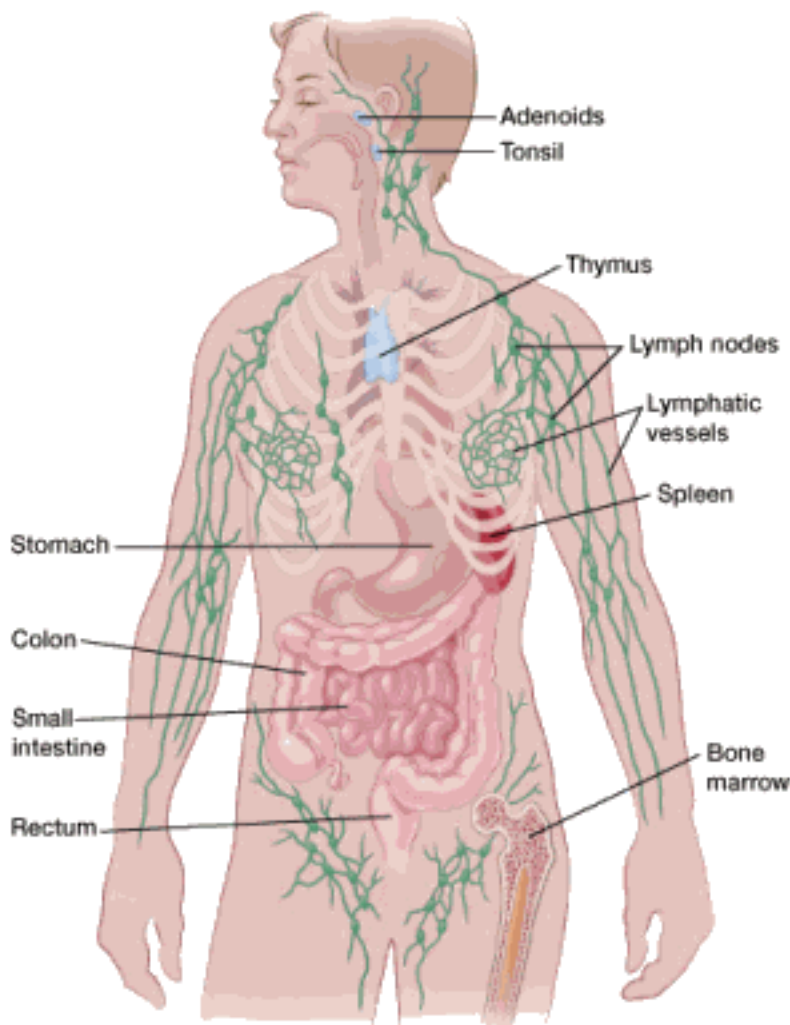
The lymph system is made up mainly of cells called **lymphocytes**, a type of white blood cell. There are 2 main types of lymphocytes:

- **B lymphocytes (B cells):** B cells make proteins called **antibodies** to help protect the body from germs (bacteria and viruses).
- **T lymphocytes (T cells):** There are many types of T cells. Some T cells destroy germs or abnormal cells in the body. Other T cells help boost or slow the activity of other immune system cells.

**Hodgkin lymphoma usually starts in B lymphocytes.**

## Start and spread of Hodgkin lymphoma

Lymph tissue is in many parts of your body, so Hodgkin lymphoma can start almost anywhere.



The major sites of lymphoid tissue are:

**Lymph nodes:** Lymph nodes are bean-sized collections of lymphocytes and other immune system cells. They're found throughout the body, including inside the chest, abdomen (belly), and pelvis. They're connected to each other by a system of lymphatic vessels.

**Lymph vessels:** A network of tiny tubes (a lot like blood vessels) that connect lymph nodes and carry immune cells in a clear fluid called lymph. Lymph is collected from around the body and put into the bloodstream.

**Spleen:** The spleen is an organ that's under the lower ribs on your left side. The spleen is part of your immune system. It makes lymphocytes and other immune system cells. It

also stores healthy blood cells and filters out damaged blood cells, bacteria, and cell waste.

**Bone marrow:** The bone marrow is the liquid, spongy tissue inside certain bones. New blood cells (including some lymphocytes) are made there.

**Thymus:** The thymus is a small organ behind the upper part of the breastbone and in front of the heart. It's important for T lymphocyte development.

**Adenoids and tonsils:** These are collections of lymph tissue in the back of your throat. They help make antibodies against germs that are breathed in or swallowed.

**Digestive tract:** The stomach, intestines, and many other organs also have lymph tissue.

Although Hodgkin lymphoma can start almost anywhere, most often it starts in lymph nodes in the upper part of the body. The most common sites are in the chest, neck, or under the arms.

Hodgkin lymphoma most often spreads through the lymph vessels from lymph node to lymph node. Rarely, late in the disease, it can invade the bloodstream and spread to other parts of the body, such as the liver, lungs, and/or bone marrow.

## Types of Hodgkin lymphoma

Different types of Hodgkin lymphoma can grow and spread differently and may be treated differently.

### Classic Hodgkin lymphoma

Classic Hodgkin lymphoma (cHL) accounts for more than 9 in 10 cases of Hodgkin lymphoma in developed countries.

The cancer cells in cHL are called Reed-Sternberg cells. These cells are usually an abnormal type of B lymphocyte. Enlarged lymph nodes in people with cHL usually have a small number of Reed-Sternberg cells with a lot of normal immune cells around them. These other immune cells cause most of the swelling in the lymph nodes.

Classic HL has 4 subtypes:

- **Nodular sclerosis Hodgkin lymphoma or NSCHL:** This is the most common type

of Hodgkin disease in developed countries. It accounts for about 7 out of 10 cases. It's most common in teens and young adults, but it can occur in people of any age. It tends to start in lymph nodes in the neck or chest.

- **Mixed cellularity Hodgkin lymphoma** or **MCCHL**: This is the second most common type, found in about 4 out 10 cases. It's seen mostly in people with HIV infection. It's also found in children or the elderly . It can start in any lymph node but most often occurs in the upper half of the body.
- **Lymphocyte-rich Hodgkin lymphoma**: This sub-type isn't common. It usually occurs in the upper half of the body and is rarely found in more than a few lymph nodes.
- **Lymphocyte-depleted Hodgkin lymphoma**: This is a rare form of Hodgkin disease. It's seen mainly in older people and those with HIV infection. It's more aggressive than other types of HL and likely to be advanced when first found. It's most often in lymph nodes in the abdomen (belly) as well as in the spleen, liver, and bone marrow.

## Nodular lymphocyte-predominant Hodgkin lymphoma

Nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) accounts for about 5% of cases. The cancer cells in NLPHL are large cells called popcorn cells (because they look like popcorn), which are variants of Reed-Sternberg cells. You may also hear these cells called lymphocytic and histiocytic (L&H) cells.

NLPHL usually starts in lymph nodes in the neck and under the arm. It can occur in people of any age, and is more common in men than in women. This type of HL tends to grow more slowly and is treated differently from the classic types.

## Hyperlinks

1. [www.cancer.org/cancer/cancer-basics/what-is-cancer.html](http://www.cancer.org/cancer/cancer-basics/what-is-cancer.html)
2. [www.cancer.org/cancer/non-hodgkin-lymphoma.html](http://www.cancer.org/cancer/non-hodgkin-lymphoma.html)
3. [www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html](http://www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html)

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## Key Statistics for Hodgkin Lymphoma

The American Cancer Society's estimates for Hodgkin lymphoma in the United States for 2019 are:

- About 8,110 new cases (3,540 in females and 4,570 in males)
- About 1,000 deaths (410 females, 590 males) from this cancer

Both children and adults can develop Hodgkin lymphoma, but it's most common in early adulthood (especially in a person's 20s). The risk of Hodgkin lymphoma rises again in late adulthood (after age 55). Overall, the average age at the time of diagnosis is 39.

Hodgkin lymphoma is rare in children younger than 5 years old. But it's the most common cancer diagnosed in teenagers ages 15 to 19 years.

Survival rates have improved in the past few decades, largely due to advances in treatment. The 5-year relative survival rate for all patients diagnosed with Hodgkin lymphoma is now about 86%. Certain factors such as the [stage<sup>1</sup>](#) (extent) of Hodgkin lymphoma and a person's age affect these rates. For more, see [Survival Rates for Hodgkin Lymphoma by Stage<sup>2</sup>](#).

Visit the [American Cancer Society's Cancer Statistics Center](#)<sup>3</sup> for more key statistics.

## Hyperlinks

1. [www.cancer.org/cancer/hodgkin-lymphoma/detection-diagnosis-staging/staging.html](http://www.cancer.org/cancer/hodgkin-lymphoma/detection-diagnosis-staging/staging.html)
2. [www.cancer.org/cancer/hodgkin-lymphoma/detection-diagnosis-staging/survival-rates.html](http://www.cancer.org/cancer/hodgkin-lymphoma/detection-diagnosis-staging/survival-rates.html)
3. <https://cancerstatisticscenter.cancer.org/>

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# What's New In Hodgkin Lymphoma Research?

Treatments used today cure about 8 out of 10 cases of Hodgkin lymphoma (HL). Still, important research is going on in many university hospitals, medical centers, and other institutions around the world. Scientists are getting closer to finding out what causes the disease and how to better treat it. This is of special interest for hard-to-treat cases, like those that don't respond to current treatments or come back after treatment. Doctors are also looking for ways to limit the [long-term side effects](#)<sup>1</sup> linked to HL treatment.

## Imaging tests

[PET/CT scans](#)<sup>2</sup> are commonly used to help doctors stage HL and decide how much treatment needs to be given. Doctors are also looking at whether PET/CT scans done during treatment can help decide if more or less treatment is needed.

Researchers are trying to find out if [MRI](#)<sup>3</sup> scans might work as well in children and teens with HL. If so, it would mean less [radiation exposure](#)<sup>4</sup> and the resulting long-term side effects in young people.

## Treatment

Overall cure rates for HL are high, but long-term side effects of treatment are an important issue. A very active area of research is directed at learning which patients can be treated with gentler therapy and which patients need stronger treatment.

## Radiation

Doctors are looking to see which patients (especially children) might do just as well with lower doses of radiation, or even no radiation. They're also studying if newer forms of [radiation therapy](#)<sup>5</sup>, such as intensity-modulated radiation therapy (IMRT) and proton therapy, might be useful for HL. These approaches focus radiation more precisely on tumors, which limits the doses reaching nearby normal tissues.

## Chemotherapy

A related area of research is finding less-toxic treatments that have fewer serious long-term side effects, yet still cure as many patients as possible. Lower doses of [chemotherapy](#)<sup>6</sup> (chemo), as well as new chemo drugs and drug combinations are being studied. Many of these drugs are already used to treat other cancers and have shown promise against HL that has come back (relapsed) after other chemo treatments. Studies are in progress to see if these drugs could work better than the ones now in use.

Doctors are also looking for better chemo drugs to use with stem cell transplant. Again, improving outcomes while limiting long-term side effects is the goal.

Another approach is using newer drugs that better target HL cells. Some of these are described below.



## Targeted therapy

Newer drugs that work differently from standard chemo drugs are now being studied. Researchers are learning a lot about the gene changes found in HL cells. This could lead to drugs that target these changes and spare normal cells. These are known as [targeted therapy](#)<sup>7</sup> drugs. Many other types of cancer are already treated with targeted therapies.

Some of these targeted drugs are being studied in combinations, in the hope that they might work better when given together. Many are given along with other cancer treatments, like chemo and/or radiation.

## Immunotherapy (including monoclonal antibodies)

[Immunotherapy](#)<sup>8</sup> is treatment that helps the body's immune system find and attack cancer cells. Immunotherapy is helpful against several types of cancer, including Hodgkin lymphoma.

### *Immune checkpoint inhibitors*

Immune system cells normally have substances on them that act as checkpoints to keep them from attacking healthy cells in the body. Cancer cells sometimes use these checkpoints to avoid being attacked by the immune system. Today, drugs that block these checkpoints are used to treat HL after other treatments have been tried. Researchers are now studying other ways to use these drugs. For instance, they're looking at whether these drugs might be used as "maintenance therapy" to keep HL from coming back after transplant. They're also testing them as a first treatment for HL. The use of immune checkpoint inhibitors in children and teens, as well as in older people who are too sick to get standard treatment, is also being studied. Several other checkpoint inhibitor drugs are being studied, too.

### *Chimeric antigen receptor (CAR) T-cell therapy*

In this treatment, immune cells called **T cells** are removed from the patient's blood and altered in the lab so they have receptors called **chimeric antigen receptors**, or CARs on their surface. These receptors can attach to proteins on the surface of lymphoma cells. The altered T cells are then multiplied in the lab and put back into the patient's blood. They can then find the lymphoma cells and launch a precise immune attack against them.

This technique has shown encouraging results in early clinical trials against some hard-

to-treat Hodgkin lymphomas. Doctors are still improving how they make the T cells and are learning the best ways to use them. CAR T-cell therapy is only available in [clinical trials](#)<sup>9</sup> at this time.

### ***Monoclonal antibodies***

[Monoclonal antibodies](#)<sup>10</sup> (mAbs) are man-made versions of immune system proteins. Some can kill cancer cells by themselves. Others have radioactive molecules or cell poisons attached to them, which help kill cancer cells. An advantage of these drugs is that they seem to target lymphoma cells while having fewer side effects than standard chemo drugs. They may be used alone or along with chemo.

Some mAbs, such as brentuximab vedotin (Adcetris) and rituximab (Rituxan), are already being used to treat some cases of HL. Researchers are now studying if these drugs might be useful in other ways. For instance, brentuximab is now being studied to see if it might be helpful earlier in the course of the disease or as part of the treatment used to get ready for a [transplant](#).<sup>11</sup> And studies are now being done to see if rituximab can help treat classic forms of HL as well as the nodular lymphocyte-predominant type. Researchers are also looking for the best way to use mAbs along with standard treatment. Many newer mAbs are now being studied, too.

### **Hyperlinks**

1. [www.cancer.org/cancer/hodgkin-lymphoma/after-treatment/lifestyle-changes.html](http://www.cancer.org/cancer/hodgkin-lymphoma/after-treatment/lifestyle-changes.html)
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11. [www.cancer.org/cancer/hodgkin-lymphoma/treating/high-dose-chemo-and-stem-cell.html](http://www.cancer.org/cancer/hodgkin-lymphoma/treating/high-dose-chemo-and-stem-cell.html)

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## Written by

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