About Hodgkin Lymphoma

Overview and Types

If you have 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?

- 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?

What Is Hodgkin Lymphoma?

Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can then spread to other areas of the body. To learn more about how cancers start and spread, see What Is Cancer?

Lymphomas are cancers that start in white blood cells called lymphocytes. There are 2 main types of lymphoma. Hodgkin lymphoma (HL) and 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 focuses on Hodgkin Lymphoma. For information on the other type, see Non-Hodgkin Lymphoma.
The lymph system

To understand what Hodgkin lymphoma is, it helps to know about the lymph system (also known as the lymphatic system). The lymph system is part of the immune system, which helps fight infections and some other diseases. It also helps 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 several 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 throughout the body, including inside the chest, abdomen, and pelvis. They are connected to each other by a system of lymphatic vessels.

**Spleen:** The spleen is an organ under the lower ribs on your left side. The spleen 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 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 is important for T lymphocyte development.

**Adenoids and tonsils:** These are collections of lymphoid 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 about 95% of all cases of Hodgkin lymphomas 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 and a large number of surrounding normal immune cells. These other immune cells make up most of the enlarged lymph nodes.

Classic HL has 4 subtypes:

**Nodular sclerosis Hodgkin lymphoma:** This is the most common type of Hodgkin disease in developed countries. It is 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:** This is the second most common type and is seen mostly in older adults (although it can occur at any age). It can start in any lymph
node but most often occurs in the upper half of the body.

**Lymphocyte-rich Hodgkin lymphoma:** This subtype 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 the least common form of Hodgkin disease. It is seen mainly in older people. It is more likely to be advanced when first found, in lymph nodes in the abdomen 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.

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 is treated differently from the classic types.

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About 8,500 new cases (3,660 in females and 4,840 in males)
About 1,050 deaths (430 females, 620 males) from this cancer

Both children and adults can develop Hodgkin lymphoma, but it is 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 of age. About 10% to 15% of cases are diagnosed in children and teenagers.

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 (extent) of Hodgkin lymphoma and a person’s age affect these rates. For more on survival rates, see Survival Rates for Hodgkin Disease by Stage.

Visit the American Cancer Society’s Cancer Statistics Center for more key statistics.

- References


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What's New In Hodgkin Lymphoma Research and Treatment?

Important research into Hodgkin lymphoma 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 improve treatment.

Imaging tests

In recent years, PET/CT scans have been found to be very helpful in determining the extent of Hodgkin disease in the body and in assessing how well treatment is working. PET/CT scans are now commonly used early in the course of treatment to help doctors decide how much treatment needs to be given.

Tailoring treatment

In general, cure rates for Hodgkin lymphoma 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.

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. New chemotherapy (chemo) combinations of as many as 10 different drugs are being studied. The reasoning behind this approach is that even though more drugs are needed, using less of each drug might lead to fewer side effects. Another approach is using newer drugs that better target Hodgkin lymphoma cells, as opposed to chemo drugs. Some of these are described below.

The same is true for radiation therapy. Doctors are looking to see which patients (especially children) might do just as well with lower doses of radiation, or even no radiation. Doctors are also studying whether newer forms of radiation therapy, such as intensity-modulated radiation therapy (IMRT) and proton therapy, might be useful for Hodgkin lymphoma. These approaches focus radiation more precisely on tumors, which limits the doses reaching nearby normal tissues.
Chemotherapy

New chemo drugs and drug combinations are being studied in patients with Hodgkin disease. Some drugs, such as vinorelbine, idarubicin, bendamustine, and gemcitabine, are already used to treat other cancers, and have shown promise against Hodgkin disease that has relapsed after other chemo treatments. Studies are in progress to see if these drugs could be more effective than the ones now in use.

Targeted therapy

Newer drugs that work differently from standard chemo drugs are now being studied as well. These are known as targeted therapy drugs. Some of the types of targeted drugs that have shown promise against Hodgkin lymphoma in early studies include:

- **Phosphatidyl-inositol 3 kinase (PI3K) inhibitors**, such as idelalisib and INCB040093
- **Janus kinase (JAK) inhibitors**, such as ruxolitinib
- **mTOR inhibitors**, such as sirolimus, temsirolimus, and everolimus
- **Histone deacetylase (HDAC) inhibitors**, such as panobinostat and vorinostat

Some of these targeted drugs are being studied in combinations, in the hope that they might be more effective when given together. Many other targeted drugs are being studied as well.

Immunotherapy (including monoclonal antibodies)

Immunotherapy is treatment that helps the body’s immune system attack cancer cells more effectively. Newer forms of immunotherapy have shown to be helpful against several types of cancer in recent years, including Hodgkin lymphoma.

Immune checkpoint inhibitors

Immune system cells normally have substances that act as checkpoints to keep them from attacking other healthy cells in the body. Cancer cells sometimes take advantage of these checkpoints to avoid being attacked by the immune system.

Some newer drugs, such as nivolumab (Opdivo) and pembrolizumab (Keytruda), work by blocking these checkpoints, which can boost the immune response against cancer cells in the body. These drugs have shown promising results against Hodgkin
lymphoma, even in people who have already had several other treatments. They are now approved for use against Hodgkin lymphoma after other treatments have been tried, and several other checkpoint inhibitors are now being studied as well.

**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 to have specific receptors (called *chimeric antigen receptors*, or CARs) on their surface. These receptors can attach to proteins on the surface of lymphoma cells. The T cells are then multiplied in the lab and given back into the patient's blood, where they can seek out 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 at this time.

**Monoclonal antibodies**

*Monoclonal antibodies* (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 combined with chemo.

Some mAbs, such as brentuximab vedotin (Adcetris) and rituximab (Rituxan), are already being used to treat Hodgkin lymphoma in some situations. Researchers are now studying if these drugs might be useful in other situations. For example, brentuximab is now being studied to see if it might be helpful earlier in the course of the disease. And studies are now being done to see if rituximab can help treat classic forms of Hodgkin lymphoma as well as the nodular lymphocyte predominant type.

Many newer mAbs are now being studied as well.

- **References**


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