LYMPHOMA RESEARCH • FOUNDATION

Understanding Lymphoma: Hodgkin Lymphoma

Hodgkin lymphoma (HL), also known as Hodgkin disease, represents about 10% of all lymphomas in the U.S. It is estimated that 8,830 new cases of HL will be diagnosed in the U.S. by the end of 2023. HL can occur in both children and adults, but it is most common in young adults between the ages of 20 and 29 years, with an average age of 39 years at diagnosis.

HL is often characterized by the presence of very large cells called Reed-Sternberg (RS) cells (Figure 1) and usually starts in the lymph nodes (small bean-shaped structures that help the body fight disease; Figure 2). It can spread to other lymph nodes and, rarely, to other organs.

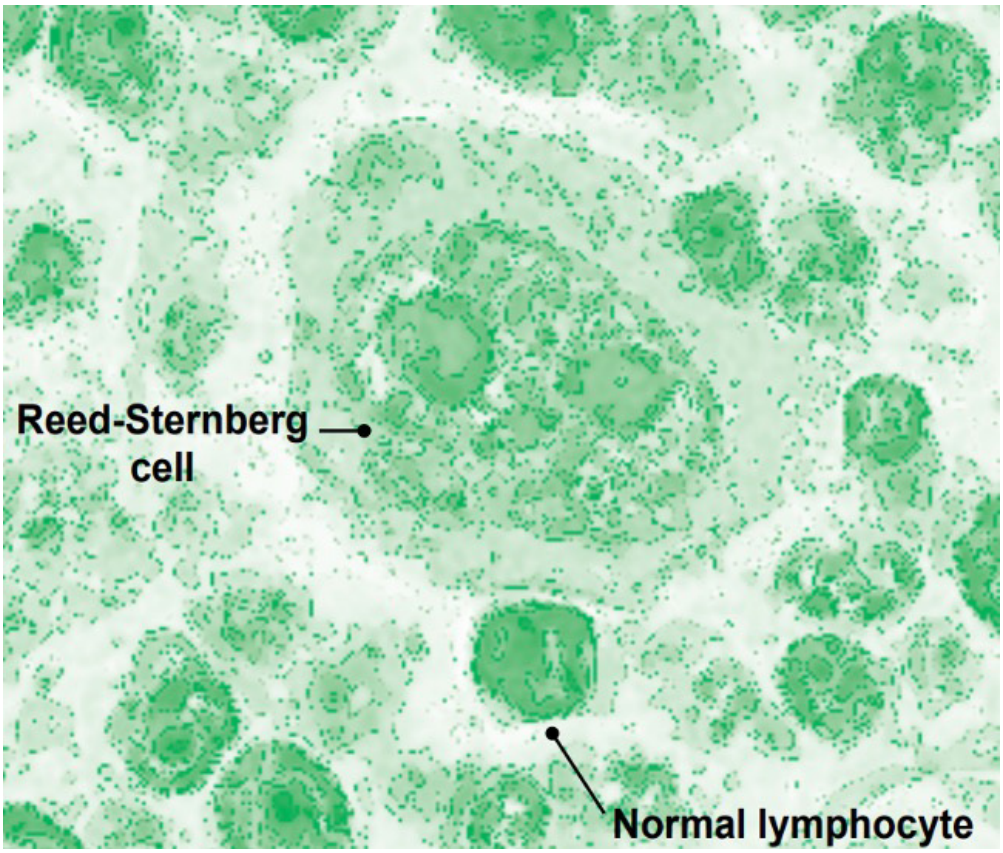

Figure 1. Example of a normal lymphocyte (a type of white blood cell that fights infection and cancer) and a Reed-Sternberg cell found in HL. HL, Hodgkin lymphoma.

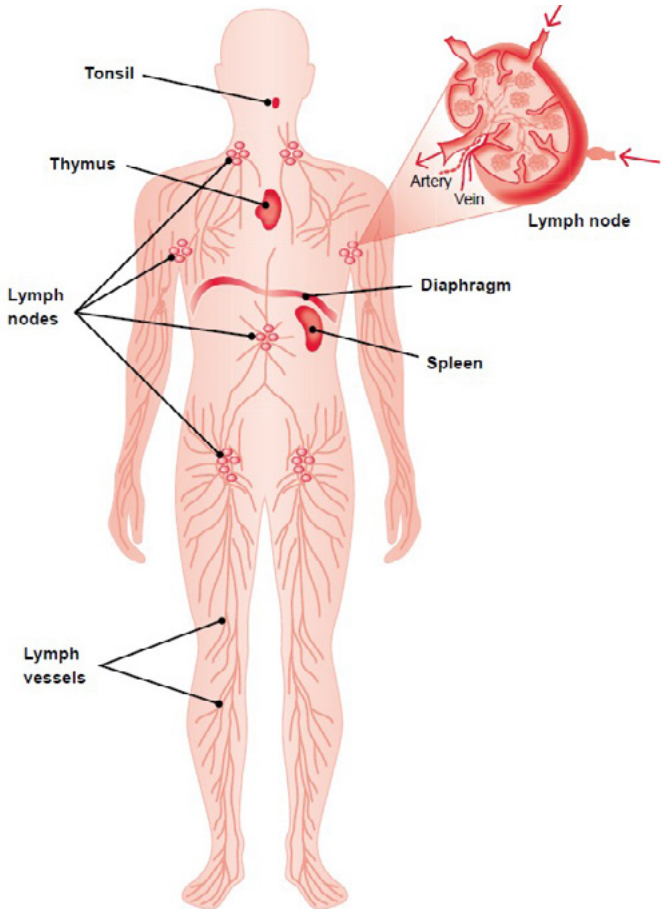

Figure 2. The lymphatic system (tissues and organs that produce, store, and carry white blood cells) and lymph nodes.

Common signs and symptoms of HL include:

- Swelling of the lymph nodes (usually painless)
- Fever
- Night sweats
- Unexplained weight loss
- Itching
- Lack of energy

While most people who have these complaints do not have HL, anyone with persistent symptoms should see a physician to make sure that lymphoma is not present.

COMMON TYPES OF HL

HL is divided into two main classifications: classical HL (cHL), which accounts for the majority of cases, and nodular lymphocyte-predominant HL (NLPHL). The type of HL a patient has may affect their treatment choices.

CLASSICAL HL

Nodular Sclerosis cHL is the most common subtype of cHL in the U.S. The involved lymph nodes contain a lot of scar tissue, which is where the name nodular sclerosis (scarring) comes from. The disease is more common in women than in men, and it usually affects adolescents and adults under the age of 50 years. The majority of patients are cured with current treatments.

Mixed Cellularity cHL is the second most prevalent form of cHL cases. The disease is more common in men than in women and primarily affects older adults and people with human immunodeficiency virus (HIV) infection. More advanced disease is usually present by the time this subtype is diagnosed.

Lymphocyte-Rich cHL is a less common subtype of cHL. This subtype of HL is usually diagnosed at an early stage (cancer is small and has not spread) in older adults and has a low risk of relapse (disease returns after treatment).

Lymphocyte-Depleted cHL is a rare form of cHL and occurs mainly in older people and those with HIV infection. This subtype is aggressive (grows rapidly) and usually not diagnosed until it is widespread throughout the body.

LYMPHOCYTE-PREDOMINANT HL

Nodular Lymphocyte-Predominant HL (NLPHL) accounts for 5% of all HL cases. It affects men more often than women and is usually diagnosed before the age of 35 years. This subtype is characterized by the appearance of large white blood cells (lymphocytes and histiocytes, sometimes called popcorn cells), as well as small B-cells under the microscope. This form of HL grows slowly and can relapse many years later.

TREATMENT OPTIONS

The majority of patients with newly diagnosed HL can be cured. While the treatment depends on the type of HL and the patient's overall health, most patients treated for HL receive some form of chemotherapy, sometimes followed by radiation therapy and/or other therapies, as their first treatment. Common chemotherapy regimens used as initial treatment (frontline chemotherapy) for cHL are listed in Table 1. Some chemotherapy regimens include steroids (like dexamethasone or prednisone), which treat cancer and help to relieve inflammation (redness, swelling, pain, and/or a feeling of heat in an area of the body). The antibody-drug conjugate (a monoclonal antibody attached to a chemotherapy drug) brentuximab vedotin (Adcetris) can also be used as frontline therapy for stage III or IV cHL, in combination with doxorubicin, vinblastine, and dacarbazine (A+AVD). For more information on antibody-drug conjugates and other types of immunotherapy (drugs that help the body's immune system fight cancer), please view the *Understanding Immunotherapy and Lymphoma* fact sheet on the Lymphoma Research Foundation's (LRF's) website (**lymphoma.org/publications**).

Table 1. Common Frontline Chemotherapy Regimens Used To Treat cHL

Regimen (Abbreviation)	Description
ABVD	Doxorubicin, bleomycin, vinblastine, and dacarbazine
ABVE-PC	Doxorubicin, bleomycin, vinblastine, etoposide, prednisone and cyclophosphamide
AVD	Doxorubicin, vinblastine, and dacarbazine
BEACOPP	Bleomycin, etoposide, doxorubicin, cyclophosphamide, vincristine, procarbazine, and prednisone
A+AVD[a]	Brentuximab vedotin (Adcetris) + doxorubicin, vinblastine, and dacarbazine

[a]Also referred to as BV+AVD. BV, brentuximab vedotin¸ cHL, classical Hodgkin lymphoma.

Patients with NLPHL can be treated with radiation therapy, chemotherapy, immunotherapy with rituximab (Rituxan), or surgery. The treatments may be used alone or combined, depending on:

- The stage of the disease (how much the cancer has grown and if it has spread in the body)
- The experiencing of B symptoms (fever without infection, drenching night sweats, and unexplained weight loss)

NLPHL is very treatable, and there are many approaches that can be used. In cases where it is isolated in one lymph node, surgery alone can be used. In other patients with early-stage disease, radiation or rituximab (Rituxan) may be used. More advanced disease is usually treated with rituximab (Rituxan) in combination with chemotherapy, as listed in Table 2.

Table 2. Common Frontline Combination Therapies Used To Treat NLPHL

Regimen (Abbreviation)	Description
R-ABVD	Doxorubicin, bleomycin, vinblastine, and dacarbazine + rituximab
R-CHOP	Cyclophosphamide, doxorubicin, vincristine, and prednisone + rituximab
R-CVP	Cyclophosphamide, vinblastine, and prednisolone + rituximab

There are a number of single-agent (a drug that is used alone) and combination treatments also available for patients with relapsed (disease returns after treatment) or refractory (disease does not respond to treatment) HL, including:

- Stem cell transplantation
- Brentuximab vedotin (Adcetris)
- Nivolumab (Opdivo)
- Pembrolizumab (Keytruda)
- Other chemotherapy regimens
- Radiation therapy

For more information on relapsed and refractory HL, view the *Understanding Hodgkin Lymphoma: Relapse/Refractory* fact sheet on the LRF's website (**lymphoma.org/publications**).

TREATMENTS UNDER INVESTIGATION

Although many individuals diagnosed with HL are cured after treatment, researchers continue to develop new therapies that are more effective and have less side effects. New drugs under study include immune checkpoint inhibitors (drugs that block proteins that help cancer cells evade immune response).

Investigators (experts who run clinical research) are also looking for ways to treat those patients who are not cured and in need of more treatment. These include new combinations of targeted therapies (drugs that target specific molecules that cancer cells use to survive and spread) or immunotherapies. Table 3 (below) lists some of these investigational drugs that can be accessed through a clinical trial. For more information on clinical trials, view the *Understanding Clinical Trials* fact sheet on the LRF's website at **lymphoma.org/publication**. It is also very important that patients with HL consult with their doctor to clear up any questions they may have.

Table 3. Investigational Drugs for cHL

Treatments	Class	Condition
Ipilimumab (Yervoy)	Immunotherapy; immune checkpoint inhibitor	cHL
Avelumab (Bavencio)	Immunotherapy; immune checkpoint inhibitor	cHL
Camrelizumab (SHR-1210)	Immunotherapy; immune checkpoint inhibitor	cHL
Sintilimab (Tyvyt)	Immunotherapy; immune checkpoint inhibitor	cHL
Lenalidomide (Revlimid)	Immunotherapy; Immunomodulatory drug	cHL and r/r cHL
Tislelizumab (BGB-A317)	Immunotherapy; immune checkpoint inhibitor	cHL and r/r cHL
Camidanlumab tesirine	Immunotherapy; antibody-drug conjugate	r/r cHL
THOR-707	Immunotherapy; modified cytokine	r/r cHL
AB-205	Immunotherapy; cellular therapy	r/r cHL
CAR T-cells	Immunotherapy; cellular therapy	r/r cHL
Ibrutinib (Imbruvica)	Targeted therapy; BTK inhibitor	r/r cHL

BTK, Bruton's tyrosine kinase; CAR, chimeric antigen receptor; cHL, classical Hodgkin lymphoma; r/r, relapsed or refractory.

CLINICAL TRIALS

Clinical trials are crucial in identifying effective drugs and optimal treatment for patients with lymphoma. Patients interested in participating in a clinical trial should view the *Understanding Clinical Trials* fact sheet on LRF's website (**lymphoma.org/publications**), talk to their physician, or contact the LRF Helpline for an individualized clinical trial search by calling **(800) 500-9976** or emailing **helpline@lymphoma.org**.

FOLLOW-UP

Patients with lymphoma should have regular visits with a physician who is familiar with their medical history and the treatments they have received. Medical tests (such as blood tests and computed tomography [CT]/positron emission tomography [PET] scans) may be required at various times during remission to evaluate the need for additional treatment.

HL is a highly curable cancer mostly affecting young people with long life expectancy. Because of that, there is a growing number of HL survivors who may have special medical needs, such as screening for secondary cancers or monitoring for long-term side effects of treatment (occur during treatment and continue for months or years). Long-term follow-up in a survivorship clinic is a way to quickly identify and address these issues. Additional resources for adolescents and young adults living with cancer are available on LRF's website (**lymphoma.org/publications**).

Patients and their caregivers are encouraged to keep copies of all medical records. This includes test results as well as information on the type, amount, and duration of all treatments received. Medical records are important for keeping track of any side effects resulting from treatment or potential disease recurrences. LRF's award-winning *Focus on Lymphoma* mobile app (**lymphoma.org/mobileapp**) and *Lymphoma Care Plan* (**lymphoma.org/publications**) can help patients manage this documentation.

LYMPHOMA CARE PLAN AND PATIENT EDUCATION PROGRAMS

Keeping your information in one location can help you feel more organized and in control. This also makes it easier to find information pertaining to your care and saves valuable time. LRF's *Lymphoma Care Plan* fact sheet organizes information on your health care team, treatment regimen, and follow-up care. You can also keep track of health screenings and any symptoms you experience to discuss with your health care provider during future appointments. The *Lymphoma Care Plan* fact sheet can be accessed by visiting **lymphoma.org/publications**. LRF also offers a variety of educational activities, including live meetings and webinars for individuals looking to learn directly from lymphoma experts. To view our schedule of upcoming programs, please visit **lymphoma.org/programs**.

LRF Helpline

The LRF Helpline staff is available to answer your general questions about lymphoma and treatment information, as well as provide individual support and referrals to you and your loved ones. Callers may request the services of a language interpreter. LRF also offers a one-to-one peer support program called the Lymphoma Support Network and clinical trials information through our Clinical Trials Information Service. For more information about any of these resources, visit our website at **lymphoma.org**, or contact the LRF Helpline at **(800) 500-9976** or **helpline@lymphoma.org**.

Para información en Español, por favor visite **lymphoma.org/es**. (For Information in Spanish, please visit lymphoma.org/es).

LRF FOCUS ON LYMPHOMA MOBILE APP

Focus on Lymphoma is the first app to provide patients and their caregivers with tailored content based on lymphoma subtype and actionable tools to better manage diagnosis and treatment. Experience comprehensive lymphoma management, conveniently in one secure and easy-to-navigate app, no matter where you are on the care continuum. Get the right information first, with resources from the entire LRF content library, use unique tracking and reminder tools, and connect with a community of specialists and patients. To learn more this resource, visit our website at **lymphoma.org/mobileapp**, or contact the LRF Helpline at **800-500-9976** or **helpline@lymphoma.org**.

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