



PROVIDING THE LATEST INFORMATION FOR  
PATIENTS & CAREGIVERS

# The Lymphoma Guide

Information for Patients and Caregivers



Revised **2024**

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## A six-word narrative about living with blood cancer from patients in our LLS Community

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Stay strong and keep moving forward. Find the positive in every day. Be your own best patient advocate. Changed my life for the better. Accept, learn and focus on present. Learning to live a different life. Sudden and life changing—be positive. Waiting, worrying, anxiousness/happy I'm alive! Embrace a new normal each day. 5 years, 41 infusions, constant fatigue. Patience, positive attitude, hope and faith. Test to test, I will survive! Treatment, fatigue, treatment, fatigue and survival. Love life, live better every day. I don't look back only forward. So far, so good, live life. Meditation, mindfulness, wellness, faith, nutrition and optimism. Finding the joy while living with uncertainty. Watch, wait, treat, regroup, rest, re-energize. Blessed to be doing so well! Eye opening needed learning and healing. Feel great: uncertain travel plans annoying. Renewed faith, meditation, diet, mindfulness, gratitude. Watchful waiting can be watchful worrying. Scary, expensive, grateful, blessings, hope, faith. Thank god for stem cell transplants! Do not know what to expect. Extraordinarily grateful, I love my life. Diagnosed; frightened; tested; treating; waiting; hoping. I'm more generous, impatient less often. Embrace your treatment day after day. Live today, accept tomorrow, forget yesterday. Strength you never realized you had. Challenging to our hearts and minds. Life is what we make it. Live life in a beautiful way.



Discover what thousands already have at  
[www.LLS.org/Community](http://www.LLS.org/Community)

Join our online social network for people who are living with or supporting someone who has a blood cancer. Members will find

- Thousands of patients and caregivers sharing experiences and information, with support from knowledgeable staff
- Accurate and cutting-edge disease updates
- The opportunity to participate in surveys that will help improve care

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## INTRODUCTION

Thank you for picking up this Guide about lymphoma. Lymphoma is a type of blood cancer. This easy-to-understand guide will provide you with information about your diagnosis, types of treatment and questions to ask your healthcare team. If you are interested in finding out more information about Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL), you can view, print or order two other free LLS booklets: *Hodgkin Lymphoma* and *Non-Hodgkin Lymphoma*. Go online to [www.LLS.org/booklets](http://www.LLS.org/booklets) to order copies or download PDFs. You can also call an LLS Information Specialist at (800) 955-4572 for copies.




Lymphoma is a blood cancer that develops in a single white blood cell called a **lymphocyte**. White blood cells are an important part of our immune system because they fight off diseases. Infection-fighting lymphocytes are present in a vast system in our bodies called the **lymphatic system**. Throughout the system are hundreds of bean-shaped groups where lymphocytes gather together. These groups are called **lymph nodes**. See *Health Terms* starting on page 51.

Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL) are the two main types of lymphoma. About 90 percent of people with lymphoma have non-Hodgkin lymphoma. The other 10 percent have Hodgkin lymphoma. Some types of lymphoma are curable. Many patients with other types of lymphoma are able to keep their disease under control. They can have a good quality of life with medical treatment. Progress in treating lymphoma gives patients more hope than ever before.

There are an estimated 879,242 people either living with or in remission from (with no sign of disease) lymphoma in the United States. This number includes

- About 159,867 people with Hodgkin lymphoma
- About 722,631 people with non-Hodgkin lymphoma

This *Lymphoma Guide* has sections with information about Hodgkin lymphoma and non-Hodgkin lymphoma. A key at the bottom of each page shows you whether the section has

-  L Lymphoma information
-  HL Hodgkin lymphoma information
-  NHL Non-Hodgkin lymphoma information

Some words in this Guide may be new to you. Check *Health Terms* beginning on page 51. Or call our Information Specialists at (800) 955-4572.

New treatments may have been approved since this book was printed. Check [www.LLS.org/DrugUpdates](http://www.LLS.org/DrugUpdates) or call (800) 955-4572.

**Feedback.** To make suggestions about the content of this booklet, go to [www.LLS.org/PublicationFeedback](http://www.LLS.org/PublicationFeedback)

## PART 1 Understanding Lymphoma

### Overview of This Section

- The two main types of lymphoma are Hodgkin lymphoma and non-Hodgkin lymphoma.
- Blood cells are made in the bone marrow. They begin as stem cells. Stem cells develop while still in the bone marrow, and they become red blood cells, white blood cells or platelets. Then they leave the marrow and enter the blood.
- Lymph nodes are bean-shaped collections of the white blood cells called **lymphocytes**. Some lymphocytes stay in the bloodstream, but most enter the lymphatic system, a network that runs all through the body.
- Lymphoma starts with a change to just one lymphocyte.
- Choose a doctor who specializes in treating lymphoma (a hematologist-oncologist).
- Adults with lymphoma who may want children, and parents of children who have lymphoma, should ask about future fertility (ability to have a child).

# Understanding Lymphoma

Lymphoma is the general term for many different types of blood cancer. Non-Hodgkin lymphoma and Hodgkin lymphoma are the two main types of lymphoma.

## About Bone Marrow, Blood and Blood Cells

The definitions in this section about normal blood and bone marrow may help you understand the lymphoma information in the rest of this Guide.

**Bone marrow** is the spongy center located inside the bones where blood cells are made.

**Blood cells** begin as stem cells in the bone marrow. Stem cells grow and mature into different types of cells: red blood cells, white blood cells and platelets. After they have matured, the red blood cells, white blood cells and platelets enter the bloodstream.

**Platelets** help stop bleeding by clumping together (called **clotting**) at the site of an injury.

**Red blood cells** carry oxygen around the body. When the number of red blood cells is below normal, a condition called **anemia** usually develops. Anemia may make you feel tired or short of breath. It may make your skin look pale.

**White blood cells** fight infection in the body. There are two major types of white blood cells: (1) infection-fighting cells called **lymphocytes** and (2) germ-eating cells.

- The lymphocytes are
  - B cells
  - T cells
  - NK cells
- The germ-eating cells are
  - Neutrophils
  - Monocytes

**Plasma** is the liquid part of the blood. Although mostly water, plasma also has some vitamins, minerals, proteins, hormones and other natural chemicals in it.

## Normal Blood Cell Count Fast Facts

The ranges of blood cell counts below are for adults. They may be a little different from lab to lab and for children and teens.

### Red blood cell (RBC) count

- Men: 4.5 to 6 million red cells per microliter of blood
- Women: 4 to 5 million red cells per microliter of blood

### Hematocrit (the part of the blood made up of red cells)

- Men: 42% to 50%
- Women: 36% to 45%

### Hemoglobin (amount of the red cell pigment that carries oxygen)

- Men: 14 to 17 grams per deciliter (g/dL) of blood
- Women: 12 to 15 grams per deciliter (g/dL) of blood

### Platelet count

- 150,000 to 450,000 platelets per microliter of blood

### White blood cell (WBC) count

- 4,500 to 11,000 white cells per microliter of blood

### Differential (also called diff)

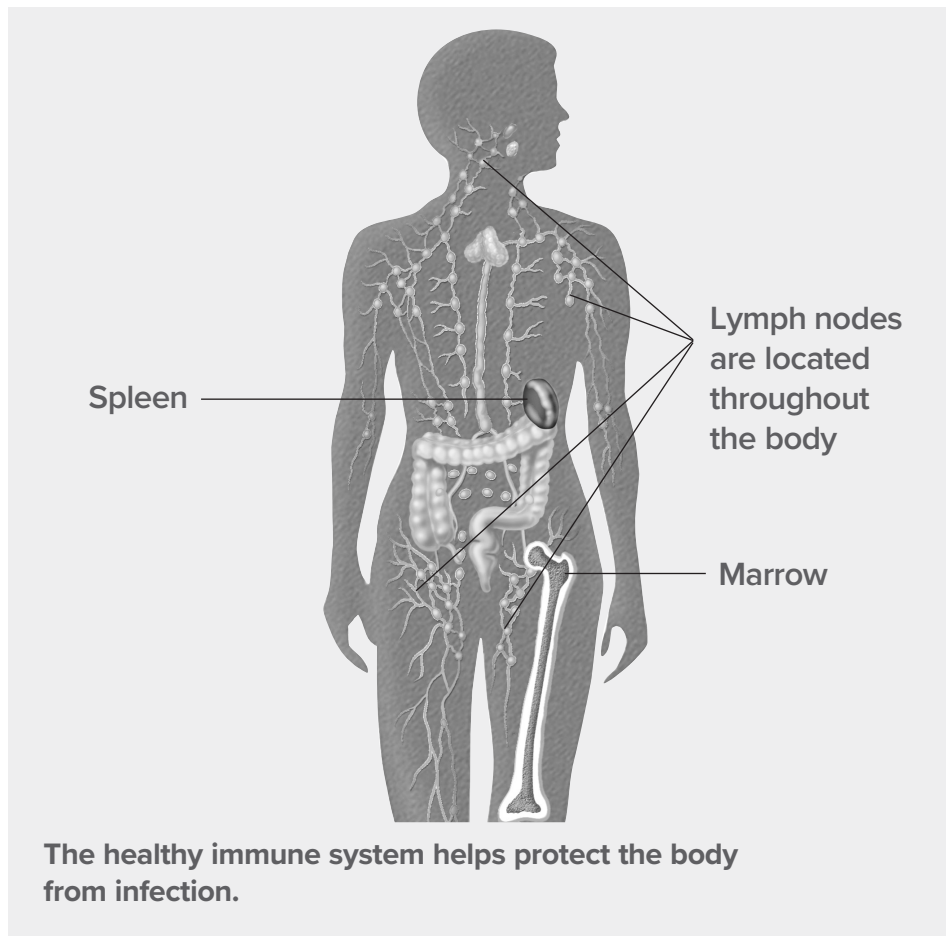
- Shows the part of the blood made up of different types of white cells
- Counts the types of white cells (neutrophils, lymphocytes, monocytes, eosinophils and basophils)
  - Normal adult white blood cell count: 60% neutrophils, 30% lymphocytes, 5% monocytes, 4% eosinophils and less than 1% basophils in the blood

# About the Immune System

The immune system is the body's defense against infection. It includes

- **Bone marrow and lymphocytes:** inside bones, marrow produces white cells called **lymphocytes** that fight infection.
- **Lymph nodes:** bean-shaped collections of lymphocytes. About 600 lymph nodes are found throughout the body—in the neck, armpits, chest, abdomen, groin and other body parts. Fluid channels throughout the body called **lymphatic vessels** connect the lymph nodes. Lymphocytes also travel through the bloodstream.
- **The spleen:** an organ on the left side of the body near the stomach. It contains lymphocytes and removes old or damaged blood cells.

## Some Parts of the Immune System





# About Lymphoma

Lymphoma starts with a change to a single lymphocyte (a type of white blood cell).

The lymphocyte undergoes an unnatural change and becomes a cancerous lymphoma cell. Lymphoma cells divide faster and live longer than normal cells. The lymphoma cells form masses. These masses gather in the lymph nodes or in other parts of the body. The cause of lymphoma is not known.

## WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Hodgkin Lymphoma* and *Non-Hodgkin Lymphoma* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

## Finding the Right Doctor

Choose a doctor who specializes in treating lymphoma and knows about the most up-to-date treatments. This type of specialist is called a **hematologist-oncologist**. A hematologist is a doctor who has special training in disorders of the blood, and an oncologist is a doctor who has special training in cancer. A hematologist-oncologist specializes in both diseases. Your local cancer specialist may work with a lymphoma specialist. Always check to see if the doctor and the doctor's affiliated hospital or your chosen hospital is covered under your insurance.

### How to Find a Lymphoma Specialist

- Ask your primary care doctor for a recommendation.
- Contact your community cancer center.
- Reach out to doctor and/or health plan referral services.
- Call an LLS Information Specialist at (800) 955-4572.
- Use online doctor-finder resources, such as The American Society of Hematology's (ASH) "Find a Hematologist" <https://www.hematology.org/education/patients/find-a-hematologist>

When you meet with the doctor, nurse and healthcare team, ask a few questions to get a better idea of the doctor's experience and to understand how the office works. See pages 58-63 for a full list of questions.

NOTE: The use of "I (we)" in lists of questions is used for situations in which patients may not be old enough or able to make their own decisions. A parent, relative, or caregiver may be assisting or making the decision.

1. How many patients have you treated who have this disease?
2. What problems or symptoms should be reported to the nurse or doctor right away?
3. Is there a release form available so the family/caregiver can be given medical information?

Make sure you feel comfortable interacting with the doctor and the rest of the staff. You will be spending a lot of time speaking with the staff and at the treatment center.

### **WANT MORE INFORMATION?**



You can view, print or order the free LLS fact sheet *Choosing a Specialist or Treatment Center* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or you can contact our Information Specialists for a copy.

## Ask Your Doctor

Talk with the doctor and ask questions about how they plan to treat your lymphoma. This will help you to be actively involved in making decisions about your care.

When you meet with your doctor

- Ask questions. See pages 58-63 of this Guide for a full list of questions. Find other “What to Ask” healthcare question guides at [www.LLS.org/WhatToAsk](http://www.LLS.org/WhatToAsk). Examples of some questions include:
  - What are the treatment choices?
  - Is a clinical trial a treatment option?
  - When do you think treatment should begin?
  - How long will treatment last?
- Take notes. It may be helpful to write down the answers to your questions and review them later.
- Tape record information from the doctor and then listen to the recording later on. Ask the doctor and staff if recording is okay (most cell phones have a “record” function; ask someone how to use it).
- Bring a caregiver, friend or family member along with you who can listen to the doctor, take notes and offer support.
- Make sure you understand what the doctor is saying. If you do not understand, ask the doctor to explain.

If you need more information or are not sure about your treatment choices, consider getting another opinion (a “second opinion”) from a different qualified doctor. If you are unsure or feel uncomfortable about how to tell your doctor you are getting a second opinion, call our Information Specialists to discuss a way that makes you comfortable.

## Before-Treatment Factors

Treatment may cause infertility (inability to have children). Adults who may want to have children in the future, and parents of children who have lymphoma, should ask the doctor about ways to lessen the risk of infertility.

**Here are some questions you may want to ask your healthcare team.**

See pages 58-63 for a full list of questions in this Guide.

1. Will this treatment affect the ability to have a child in the future?
2. If yes, are there other treatment options available?
3. What are the options for preserving fertility?
4. How much time do I (we) have to make any decisions?

### **WANT MORE INFORMATION?**



You can view, print or order the free LLS fact sheet *Fertility and Cancer* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

## **PART 2 Hodgkin Lymphoma**

### **Overview of This Section**

- Hodgkin lymphoma (HL) is one of the most curable forms of cancer.
- The most common sign of HL is one or more enlarged (swollen) lymph nodes.
- Knowing the subtype of your HL helps the doctor make treatment decisions.
- There are different types of HL. Talk to your doctor about the type of HL that you have and your treatment choices.

### **Hodgkin Lymphoma (HL)**

Hodgkin lymphoma (HL) is one of the most curable forms of cancer.

Hodgkin lymphoma is distinguished from other types of lymphoma by the presence of Reed-Sternberg cells. These cells are named for the scientists who first identified them. Reed-Sternberg cells are large, abnormal lymphocytes. When Reed-Sternberg cells are seen with a microscope, the diagnosis is called **classical Hodgkin Lymphoma (cHL)**.

Doctors do not know what causes most cases of HL. There is no way to prevent lymphoma, and you cannot catch lymphoma from someone else. It is commonly diagnosed among young adults in their 20s or early 30s. It is less common in middle age and becomes more common again after age 55.

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Hodgkin Lymphoma* at [www.LLS.org/booklets](http://www.LLS.org/booklets) or contact our Information Specialists for a copy.

## Signs and Symptoms of HL

A **sign** is a change in the body that the doctor sees in an exam or a test result. A **symptom** is a change in the body that a patient can see or feel.

The most common symptom of HL is one or more enlarged (swollen) lymph nodes. The enlarged lymph node may be in the neck, upper chest, armpit, abdomen or groin. The swollen lymph node is usually painless.

Other signs and symptoms of HL may include:

- Fever\*
- Drenching night sweats\*  
(requiring you to change your pajamas and/or sheets)
- Weight loss\*  
(especially loss of more than 10 percent of your body weight)
- Cough and shortness of breath
- Tiredness
- Itchy skin
- Stomach pain or swelling and feeling of fullness (due to an enlarged spleen)

**\*B Symptoms.** Fever, drenching night sweats and loss of more than 10 percent of body weight in 6 months are called **B symptoms**. B symptoms are important to the prognosis—the likely course or outcome of a disease. B symptoms are also important to staging of the disease—in cancer, the “stage” tells the doctor how far the cancer has spread (see *Diagnosis and Staging of HL* on page 12).

# Diagnosis and Staging of HL

**Diagnosis.** Having the correct diagnosis is important for getting the right treatment. Some patients may need to get a second medical opinion about the diagnosis before they begin treatment. Talk to the doctor about the tests used to make the diagnosis.

Doctors do a test called a **lymph node biopsy** to find out if a patient has HL.

## Lymph Node Biopsy

- A surgeon removes all or part of an enlarged lymph node using a special needle.
- The cells of the node are examined by a doctor who studies blood cells and tissues under a microscope to identify disease (this type of doctor is called a **hematopathologist**).

It may be important to get another opinion about the biopsy results from a second hematopathologist to confirm the diagnosis. There are many tests used to diagnose HL. Talk to your doctor about what tests you need. You may want to call your insurance company case manager to find out if there will be any out-of-pocket costs for you.

**Here are some questions you may want to ask your healthcare team.**

See pages 58-63 for a full list of questions.

1. What kind of testing will be done to monitor the disease and treatment?
2. How long does it take to get the results back?
3. How are the results communicated to me (us)?
4. How often will testing be needed?
5. Where will the testing be done?

**Staging.** The doctor will do other tests to find the stage of the disease (how far the disease has spread throughout the body). See *Lymphoma Stages* on page 14 for descriptions of the stages.

The tests for staging include

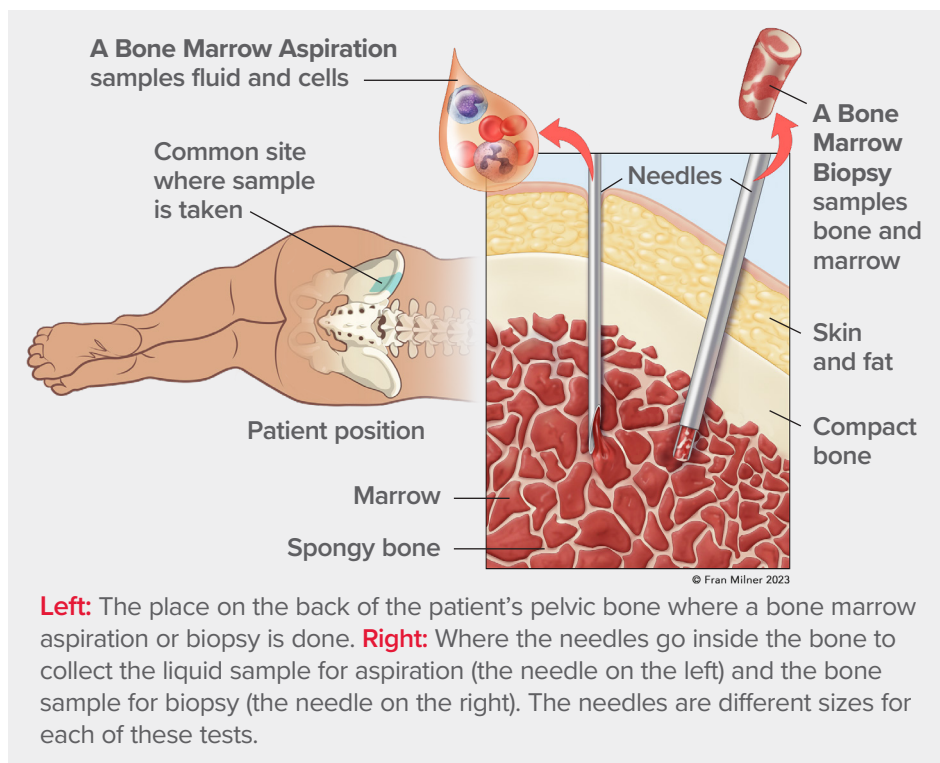
- Blood tests. To check red blood cell, white blood cell and platelet counts; blood tests also check for other signs of disease

- Bone marrow tests. To look for HL cells in the bone marrow (see below)  
Bone marrow aspiration and bone marrow biopsy are two tests that may be done in the doctor's office or in a hospital. These tests are often done at the same time.
- A bone marrow aspiration removes a certain amount of fluid from the bone marrow.
- A bone marrow biopsy is done with a slightly larger needle and removes a solid portion of bone.

Some patients are awake for this procedure. Medication may be used to numb the body area where the procedure will take place. This is usually the area in the back of the patient's pelvic bone. Some patients are given a drug and are sedated (asleep) for the procedure.

Blood and bone marrow tests may be done both during and after treatment. The tests are repeated to see if treatment is working.

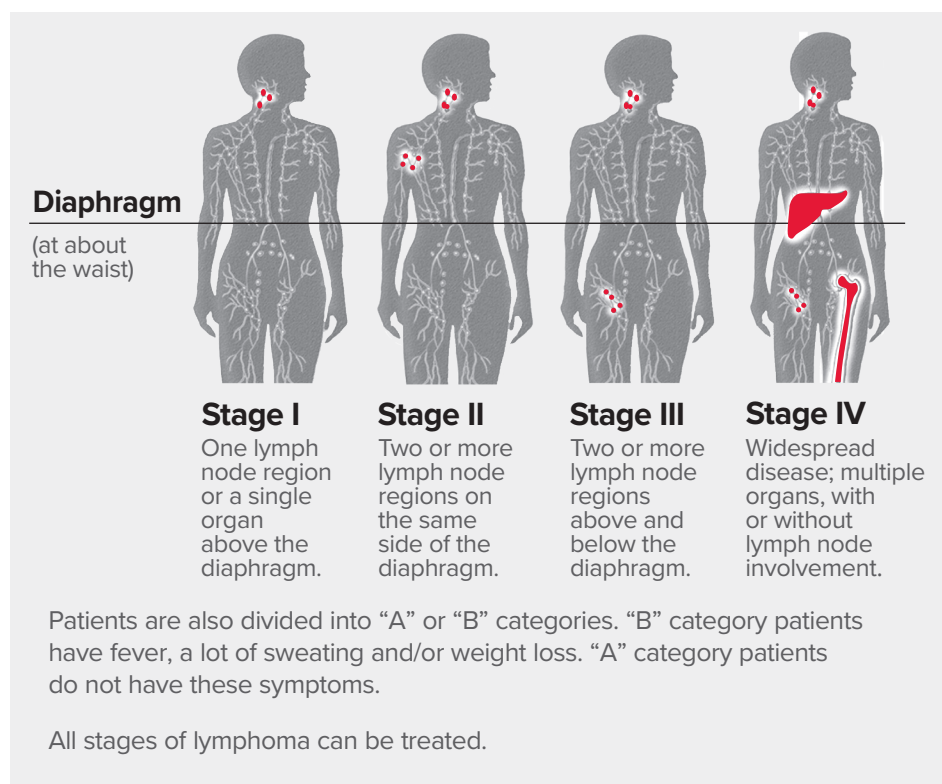
## Bone Marrow Aspiration and Biopsy



- Imaging tests. To create “pictures” of the chest and abdomen to see if there are lymphoma masses in the lymph nodes, liver, spleen or lungs. Examples of imaging tests include
  - Chest x-ray
  - PET-CT (positron emission tomography [PET] scan and computed [CT] tomography scan), two tests done at the same visit
  - MRI (magnetic resonance imaging)
- Heart and lung tests. Some HL treatments may weaken or damage the heart and lungs. The healthcare team may decide to test how well these organs work to plan for treatment.

**Pregnancy Test.** Some cancer treatments can harm an unborn baby, so a pregnancy test should be given before starting treatment. Treatment options may depend on the results.

## Lymphoma Stages





**Prognosis Factors.** Prognosis is a medical term for “the likely outcome of a disease.” In HL, this forecast is based in part on what are called **risk factors**. Hodgkin lymphoma is generally classified into the following three subgroups. The subgroups are called

- Early-stage favorable: Disease is stage I-II with no unfavorable risk factors
- Early-stage unfavorable: Disease is stage I-II with unfavorable risk factors
- Advanced-stage: Disease is stage III-IV

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Hodgkin Lymphoma* (for more information about the staging system) and *Understanding Lab and Imaging Tests* (to learn more about lab tests and what to expect) at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

## Hodgkin Lymphoma Subtypes

Knowing the subtype of your HL helps the doctor make treatment decisions. Below are the names of the different HL subtypes.

- Classical Hodgkin Lymphoma (cHL)—about 95 percent of patients have this type, which has been further subdivided into these categories:
  - Nodular sclerosis
  - Mixed cellularity
  - Lymphocyte-rich
  - Lymphocyte-depleted
- Nodular Lymphocyte-Predominant B-cell Lymphoma (NLPBL), formerly called Nodular Lymphocyte-Predominant Hodgkin Lymphoma—about 5 percent of cases. NLPBL is no longer considered an HL subtype, but a separate disease.



**Write down your HL subtype here:** \_\_\_\_\_

Treatment for these subtypes may vary. For more information, see *Treatment of HL* on page 16 and our free LLS booklet *Hodgkin Lymphoma*.

# Tracking Your Lymphoma Tests

These tips may help you save time and learn more about your health.

- Ask your doctor why certain tests are being done and what to expect.
- Discuss test results with your doctor.
- Ask for and keep copies of lab reports in a file folder or binder. Organize the reports by date. Ask the healthcare team if there is an online patient portal and if so, how to access it to view medical records.
- Find out if and when follow-up tests are needed.
- Mark upcoming appointments on your calendar.

## Treatment of HL

New treatments may have been approved since this book was printed. Check [www.LLS.org/DrugUpdates](http://www.LLS.org/DrugUpdates) or call (800) 955-4572.

A patient has two options for treatment: standard care or a clinical trial. It is important to talk to the healthcare team about the best treatment option.

There are different types of HL, and HL can be cured in about 80 percent of patients. The cure rate in younger patients with early-stage favorable HL is about 90 percent. Talk to your doctor about the type of HL you have and your treatment choices.

Factors that may affect treatment include:

- The type of HL
- The stage and category of the disease
- Disease that has not responded to treatment, called **refractory** disease
- Disease that has come back after treatment, called **relapsed** disease
- Patient age
- Other medical problems, such as diabetes, or heart or kidney disease

**Fertility Concerns.** Some cancer treatments can limit a person's ability to have a baby. Talk to your doctor for information that may help lessen the risk of becoming unable to have children (infertile). See *Before-Treatment Factors* on page 9.

**Treatment Options.** Combination chemotherapy (treatment using more than one drug) is the most common treatment and can also include drug therapy. Chemotherapy is usually given in cycles. Each cycle is made up of a number of treatment days followed by a rest period (a few days or weeks) in between each cycle. Then another cycle begins. Generally, a treatment cycle is 3 to 4 weeks long. Some patients may have to stay in the hospital for a short time if they develop a fever or have other signs of infection. Some patients who need antibiotics may stay in the hospital until the infection is gone.

Combination chemotherapy, along with radiation therapy, may also be a treatment option. The radiation targets the lymph node regions that have the disease and treats the lymphoma. Involved-site radiation therapy (ISRT), a type of focused radiation, treats the lymph nodes in which the cancer first started and the cancer near those nodes. It keeps the size of the radiation area smaller to reduce radiation exposure to other non-cancerous areas.

In the process of killing the cancer cells, chemotherapy may also kill normal blood-forming cells in the bone marrow. Chemotherapy may cause very low counts of red blood cells, white blood cells or platelets.

Some patients may need a blood transfusion or drugs called **growth factors** until the side effects of chemotherapy wear off. Examples of red blood cell growth factor drugs are **Aranesp®** (darbepoetin alfa) and **Procrit®** (epoetin alfa). These can increase red blood cell counts.

#### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Blood Transfusion* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

HL affects the body's ability to fight infection. Chemotherapy and radiation can make this problem worse. Proper treatment and following the doctor's advice will help lower the risk of infection.

White blood cell growth factors may be part of treatment. The body needs neutrophils (white blood cells) to fight infection. **Neupogen®** (filgrastim) or **Neulasta®** (pegfilgrastim), both also called **granulocyte-colony stimulating factor** or **G-CSF**, and **Leukine®** (sargramostim), also called **granulocyte-macrophage colony stimulating factor** or **GM-CSF** can increase the number of neutrophils (white blood cells).

See *Side Effects of Lymphoma Treatment* on page 42 for more information.

## Some Treatment Approaches for Classical Hodgkin Lymphoma

### Early-stage classical Hodgkin lymphoma (cHL)

- Drug combinations
  - ABVD (Adriamycin® [doxorubicin], bleomycin, vinblastine, dacarbazine)
  - Dose-escalated BEACOPP (for early-stage unfavorable) (bleomycin, etoposide, Adriamycin® [doxorubicin], cyclophosphamide, Oncovin® [vincristine], procarbazine, prednisone)
  - AVD—Adriamycin® (doxorubicin), vinblastine, dacarbazine

Combination chemotherapy is administered with or without radiation therapy. Radiation can be used at the end of a chemotherapy regimen depending on how well the patient responded to the chemotherapy.

### Advanced-stage cHL

- Drug combinations
  - A+AVD (Adcetris® [brentuximab vedotin], Adriamycin® [doxorubicin], vinblastine, dacarbazine)
  - ABVD: (Adriamycin® [doxorubicin], bleomycin, vinblastine, dacarbazine)
  - ABVD followed by escalated BEACOPP (BEACOPP: bleomycin, etoposide, Adriamycin® [doxorubicin], cyclophosphamide, Oncovin® [vincristine], procarbazine, prednisone)
  - Escalated BEACOPP
  - BrECADD: (Adcetris® [brentuximab vedotin], etoposide, cyclophosphamide, Adriamycin® [doxorubicin], dacarbazine, dexamethasone)
  - N+AVD (Opdivo® [nivolumab], Adriamycin® [doxorubicin], vinblastine, dacarbazine)
- Occasionally, chemotherapy is followed by involved-site radiation therapy (ISRT).

**Relapsed/Refractory cHL** (A biopsy may be done before these treatments can begin)

- Additional drug combinations
  - BeGEV (gemcitabine/bendamustine/vinorelbine)
  - Bendamustine (Bendeka®)
  - Bendamustine + carboplatin + etoposide
  - Brentuximab vedotin (Adcetris®)
  - Brentuximab vedotin + bendamustine
  - Brentuximab vedotin + nivolumab (Opdivo®)
  - DHAP (dexamethasone, cisplatin, high-dose cytarabine)
  - Everolimus (Afinitor®)
  - GCD (gemcitabine, cisplatin, dexamethasone)
  - GEMOX (gemcitabine, oxaliplatin)
  - GVD (gemcitabine, vinorelbine, liposomal doxorubicin)
  - GVD + pembrolizumab (Keytruda®)
  - ICE (ifosfamide, carboplatin, etoposide)
  - ICE + brentuximab vedotin (Adcetris®)
  - ICE + nivolumab (Opdivo®)
  - ICE + pembrolizumab (Keytruda®)
  - IGEV (ifosfamide, gemcitabine, vinorelbine)
  - Lenalidomide (Revlimid®)
  - Nivolumab (Opdivo®)
  - Pembrolizumab (Keytruda®)
  - Vinblastine
- Stem cell transplantation
- Clinical trial

Terms: cHL, classical Hodgkin Lymphoma; Relapsed (recurrence)/Refractory (resistant), disease that comes back or does not respond to treatment.

See [www.LLS.org/drugs](http://www.LLS.org/drugs) for more information.

New treatments may have been approved since this book was printed.  
Check [www.LLS.org/DrugUpdates](http://www.LLS.org/DrugUpdates) or call (800) 955-4572.

## Nodular Lymphocyte-Predominant Hodgkin Lymphoma.

Note that nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) has been reclassified as nodular lymphocyte-predominant B-cell lymphoma (NLPBL). It is now being considered a separate disease. The following information is being provided while this change is being put into practice.

Patients with nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) need treatment that is different from that received by patients with other HL subtypes. NLPHL is slow-growing (this is called **indolent**), and it is associated with excellent long-term survival. One treatment option for some patients is the “watch-and-wait” approach, in which the patient is closely watched by the healthcare team without getting any treatment. Treatment only begins when symptoms appear or symptoms begin to change. Other common treatments for patients with early-stage NLPHL is the removal of lymph nodes by surgery and involved-site radiation therapy (ISRT). For patients with more advanced disease, combination chemotherapy with rituximab (Rituxan<sup>®</sup>) may be needed.

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Hodgkin Lymphoma* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

Use the lines provided on page 57 to write down what your treatments are and when they were prescribed to you.

**Relapsed and Refractory Hodgkin Lymphoma.** In some patients, HL may come back. Relapse means the disease comes back after a remission following treatment. Refractory means the disease has not responded to treatment. For these patients, HL is still potentially curable. Second-line treatment options include:

- **Alternate chemotherapy combinations**
- **Brentuximab vedotin (Adcetris<sup>®</sup>)**
- **Nivolumab (Opdivo<sup>®</sup>)**
- **Pembrolizumab (Keytruda<sup>®</sup>)**
- **Autologous stem cell transplantation**
- **Clinical trial** (see *About Clinical Trials* on page 40)

For information about treatment options, see *Some Treatment Approaches for Classical Hodgkin Lymphoma* on page 18. For information about each drug, visit [www.LLS.org/drugs](http://www.LLS.org/drugs).

**Stem Cell Transplantation.** This is a procedure in which patients receive healthy stem cells to replace their own stem cells that have been destroyed by cancer or cancer treatments. The goal of stem cell transplant is to help the body start a new supply of blood cells after the patient gets high-dose chemotherapy.

When doctors are planning treatment, they use a number of factors to determine a patient's need for a stem cell transplant. These factors may include the individual's disease, subtype, stage, other treatment received, and physical ability to have the transplant. A stem cell transplant is not for every patient, but it can be helpful for some.

There are two basic types of stem cell transplantation, one that replaces the patient's blood with their own stem cells (autologous), and one that gets replacement stem cells from a donor (allogeneic). Talk to your doctor about whether a stem cell transplant is a possible treatment for you.

**Autologous Stem Cell Transplantation.** Autologous transplantation is more frequently used than allogeneic transplantation for HL patients. Autologous transplants are generally done in the hospital. With an autologous transplant:

- Patients' own stem cells are collected from their blood or marrow and are frozen and stored.
- Patients are then given high-dose chemotherapy and sometimes radiation therapy to kill the lymphoma cells in their body. This treatment also kills normal stem cells in the marrow.
- Patients' stored stem cells are returned to their body through an intravenous (IV) or central line.
- The stem cells go from the patient's blood to the marrow and help start a new supply of red blood cells, white blood cells and platelets.

**Allogeneic Stem Cell Transplantation.** An allogeneic transplant is a treatment that uses stem cells from a donor. But the donor must be a "match" to the patient. The donor may be a brother or sister (siblings are most often the best match). The donor could also be an unrelated person with stem cells that match the patient's. Stem cells may also come from cord blood (the blood in the umbilical cord after a baby's birth). Allogeneic transplants are done in the hospital. With an allogeneic transplant:

- Stem cells are collected from a donor and are frozen and stored.
- The patient is given high-dose chemotherapy and sometimes radiation therapy to kill the lymphoma cells in the body.
- The donor stem cells are given to the patient through an intravenous (IV) line or central line.
- The donor stem cells go from the patient's blood to the marrow and help start a new supply of red blood cells, white blood cells and platelets.

For patients who may not be able to get the high doses of chemotherapy that are given to patients during stem cell transplant, there is another type of allogeneic stem cell transplant. **Reduced-intensity allogeneic stem cell transplant** (also called a **nonmyeloablative transplant**) is less harsh. This type uses lower doses of chemotherapy than a standard allogeneic transplant. Some older or sicker patients may be helped by this treatment. Talk to your doctor about whether stem cell transplant might work for you.

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Blood and Marrow Stem Cell Transplantation* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

## Childhood HL

Children and teens with HL should be treated at medical centers that have a pediatric oncology team.

It is important for young adults and parents of children to talk to members of the oncology team about the:

- Specific subtype of the disease
- Stage of the disease
- Fertility concerns for the child's future (See *Before-Treatment Factors* on page 9)
- Other potential risk factors
- Response to treatment

Doctors use this information about the patient's disease to find the most effective treatment. Children and young adults with HL are usually treated with combination chemotherapy. See *About Clinical Trials* on page 40 for more information.



Children may have side effects from the treatment, both in the short and long term. Some effects include second cancers, heart disease and fertility issues. Other effects can affect learning and growth. These and other possible long-term and late effects can be managed. When children return to school, families can work with the school to help their children cope and manage their schoolwork.

### WANT MORE INFORMATION?



For more information, see *Learning & Living with Cancer: advocating for your child's educational needs*. Also visit [www.LLS.org/FamilyWorkbook](http://www.LLS.org/FamilyWorkbook) to find information for children and families.

Visit [www.LLS.org/SurvivorshipWorkbook](http://www.LLS.org/SurvivorshipWorkbook) to reach the children and adolescent, young adult and adult books called *Navigating Life During and After a Blood Cancer Diagnosis*.

## PART 3 Non-Hodgkin Lymphoma

### Overview of This Section

- There are treatments for every type of non-Hodgkin lymphoma (NHL).
- The most common sign of NHL is one or more painless swollen lymph nodes in the neck, armpit or groin.
- Doctors do a test called a **lymph node biopsy** to find out the patient's specific subtype of NHL.
- Having the correct diagnosis is important for getting the right treatment.
- There are many types of treatment including “watch-and-wait,” chemotherapy, drug therapy, radiation therapy, CAR T-cell therapy, stem cell transplantation and new types of treatment.
- Treatments used for children with NHL may be different from those used for adults with NHL.

### Non-Hodgkin Lymphoma (NHL)

Non-Hodgkin lymphoma is the term that encompasses a group of blood cancers that all start from a lymphocyte. Lymphocytes are white blood cells that are part of the immune system.

## Subtypes of NHL

There are many subtypes of non-Hodgkin lymphoma (NHL). Remember that there are three types of lymphocytes: B cells, T cells and NK cells. Most people with NHL have a B-cell NHL (85% to 90%). The others have a T-cell or an NK-cell NHL.

NHL is classified by how fast it grows:

- Slow-growing, called **indolent** or **low-grade** NHL
- Fast-growing, called **aggressive** or **high-grade** NHL



**Write down if you have been diagnosed with indolent/low-grade or aggressive/high-grade NHL:**

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Talk to your doctor about the type of NHL that you have. Each type of NHL requires different treatment. Ask your doctor about your treatment options.

There are treatments for every type of NHL. Some patients with fast-growing NHL can be cured. For patients with slow-growing NHL, treatment may keep the disease in check for many years. This can be true even when tests show that disease remains in some parts of the body.

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Non-Hodgkin Lymphoma* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

## Some Types of Non-Hodgkin Lymphoma

### Types of B-Cell Lymphomas

#### Aggressive

- Diffuse Large B-Cell Lymphoma (DLBCL)—the most common fast-growing NHL
- Mantle Cell Lymphoma (MCL)—has features of both indolent and aggressive NHL
- Lymphoblastic Lymphoma
- Burkitt Lymphoma

## Slow-Growing or Indolent NHL

- Follicular Lymphoma (FL)—the most common slow-growing NHL
- Marginal Zone B-Cell Lymphoma (MZL)
- Small Lymphocytic Lymphoma (SLL)/Chronic Lymphocytic Leukemia (CLL)
- Mucosa-Associated Lymphoid Tissue (MALT) Lymphoma
- Lymphoplasmacytic Lymphoma (LPL)
- Waldenström Macroglobulinemia (WM)

## Types of T-Cell and NK-Cell Lymphomas

### Systemic

- Peripheral T-Cell Lymphoma (PTCL) (most types)
- Anaplastic Large Cell Lymphoma (ALCL)

### Primary Cutaneous

- Cutaneous T-Cell Lymphoma (CTCL) – has features of both indolent and aggressive NHL
  - Mycosis fungoides (MF)
  - Sézary syndrome (SS)



**Write down your subtype:** \_\_\_\_\_

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Mantle Cell Lymphoma*; *Marginal Zone Lymphoma*; *Cutaneous T-Cell Lymphoma*; *Waldenström Macroglobulinemia*; *Peripheral T-Cell Lymphoma* and *Chronic Lymphocytic Leukemia* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

## Signs and Symptoms of NHL

A **sign** is a change in the body that the doctor sees in an exam or a test result. A **symptom** is a change in the body that a patient can see or feel.

The most common sign of NHL is one or more painless enlarged lymph nodes in the neck, armpit or groin. Less often, enlarged lymph nodes can be near the ears, the elbow or in the throat near the tonsils. They are usually painless.

Other signs and symptoms of NHL may include:

- Fever\*
- Drenching night sweats\*  
(requiring you to change pajamas and/or sheets)
- Weight loss\*  
(especially loss of more than 10% of your body weight)
- Tiredness
- Loss of appetite
- Abdominal pain
- Itchy skin
- Rash

**\*B Symptoms.** Fever, drenching night sweats and loss of more than 10 percent of body weight in 6 months are called **B symptoms**. B symptoms are important to the prognosis and staging of the disease.

## Diagnosis and Staging of NHL

**Diagnosis.** Having the correct diagnosis is important for getting the right treatment. Some patients may need to get a second medical opinion about their diagnosis before they begin treatment. Talk to your doctor about the tests used to make the diagnosis.

Doctors do a test called a **lymph node biopsy** to find out the patient's specific subtype of NHL. Sometimes the doctor will biopsy cells from other parts of the body, such as the lungs.

### Lymph Node Biopsy

- A surgeon removes all or part of an enlarged lymph node using a special needle.
- The lymph node is examined by a doctor who identifies diseases of the blood and marrow by studying cells and tissues under a microscope (this doctor is called a **hematopathologist**).
- The doctor may look at the cells from the biopsy to see if there are changes in the chromosomes of the NHL cells. (Each cell in the body has chromosomes that carry genes. Genes give the instructions that tell each cell what to do.) This information is important so that the doctor can identify the specific subtype and the most effective treatment.

It may be important to get another opinion about the biopsy results from a second hematopathologist if there is any doubt about the diagnosis, or to confirm the diagnosis.

There are many tests that are used to diagnose NHL. Talk with your doctor about what tests you need. You may want to call your insurance case manager to see if there will be any out-of-pocket costs for you.

**Here are some questions you may want to ask your healthcare team.**

See pages 58-63 for a full list of questions.

1. What kind of testing will be done to monitor this disease and treatment?
2. How long does it take to get the test results back?
3. How are the results communicated to me (us)?
4. How often will testing be needed?
5. Where will the testing be done?

**Staging.** A physical exam plus lab and imaging tests help the doctor see how widespread the disease is. The doctor will check:

- The number of lymph nodes that are affected
- Where the affected lymph nodes are located throughout the body (for example, in the abdomen or chest or in both places)
- Whether any cancer cells are in other parts of the body besides the lymph nodes or lymphatic system, such as in the lungs or liver

The doctor will do other tests to find out the stage of the disease (the stage will tell the doctor how far the disease has spread throughout the body).

See *Lymphoma Stages* on page 29 for descriptions of the stages.

Besides the staging tests listed below, other tests may also be recommended to stage some types of NHL. Some tests for staging include:

- Blood tests. To check red blood cell, white blood cell and platelet counts. Blood tests are also used to look for other signs of disease.
- Bone marrow tests. Bone marrow aspiration and bone marrow biopsy look for NHL cells in the bone marrow (see *Bone Marrow Aspiration and Biopsy* on page 28).

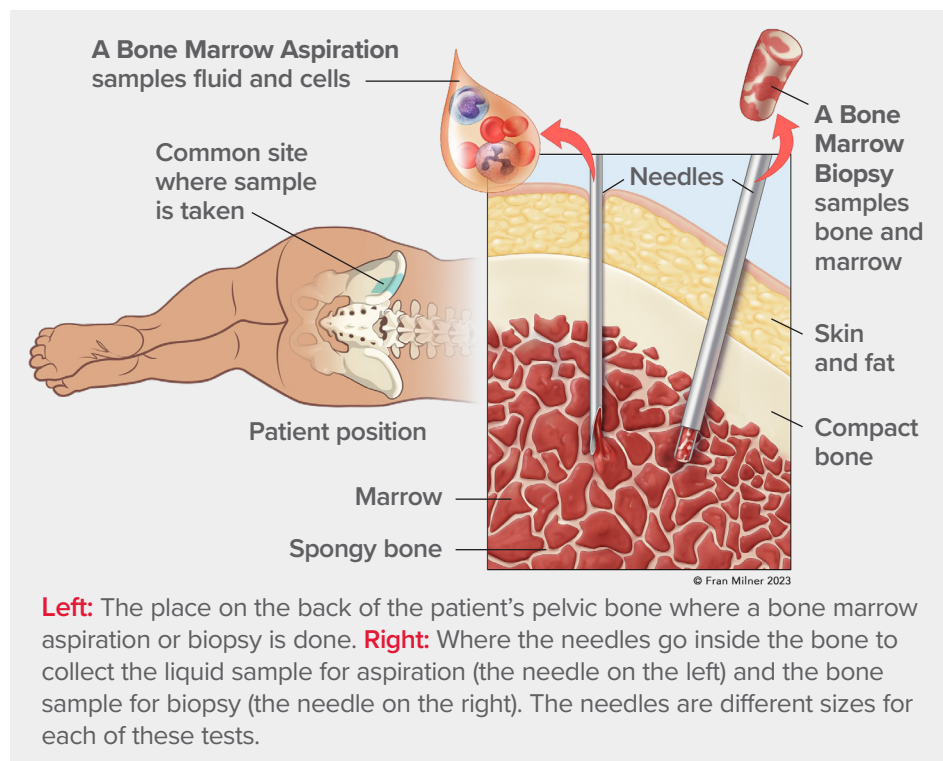
Bone marrow aspiration and bone marrow biopsy are two tests that may be done in the doctor's office or in a hospital. These tests are often done at the same time.

- A bone marrow aspiration removes a certain amount of fluid from the bone marrow.
- A bone marrow biopsy is done with a slightly larger needle and removes a portion of solid bone that has marrow inside it.

Some patients are awake for this procedure. Medication may be used to numb the body area where the procedure will take place. This is usually the area in the back of the patient's pelvic bone. Some patients are given a drug and are sedated (asleep) for the procedure.

Blood and bone marrow tests may be done both during and after treatment. The tests are repeated to see if treatment is working.

## Bone Marrow Aspiration and Biopsy



- Heart tests. To check how a patient's heart functions before treatment. Some cancer treatments can damage the heart.
- Imaging tests. These create "pictures" of the chest and abdomen to see if there are lymphoma masses in the lymph nodes, liver, spleen or lungs. Examples of imaging tests include:

- Chest x-ray
- PET-CT (positron emission tomography-computed tomography) scans, two tests done at the same time
- MRI (magnetic resonance imaging)

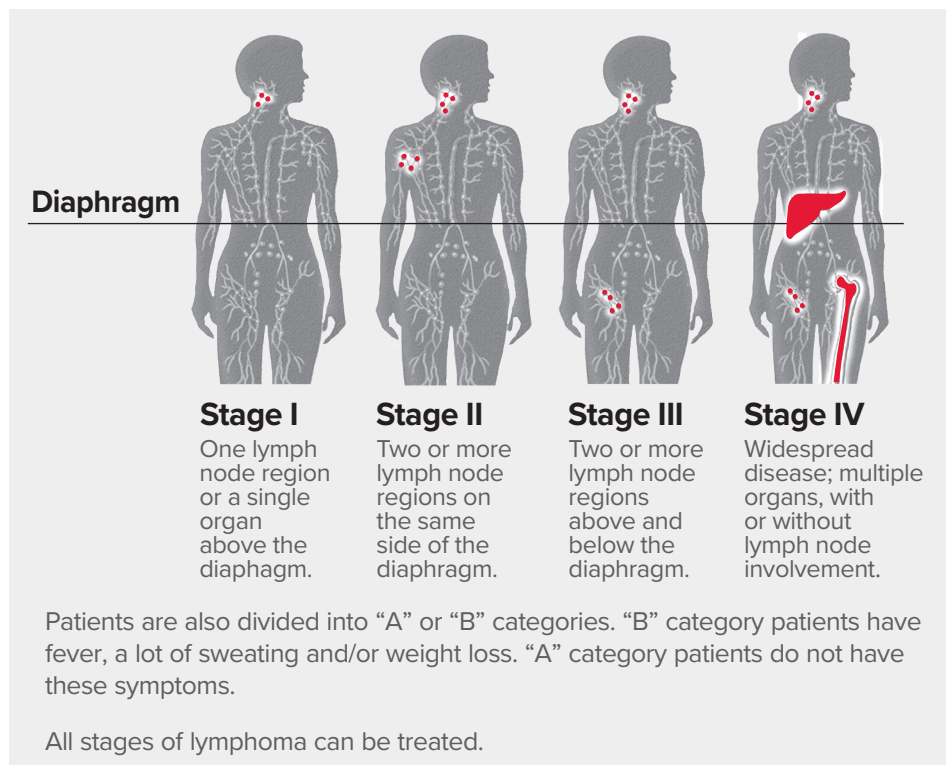
**Biomarker Tests.** A biomarker test uses a sample of tissue, blood, or other body fluid to check for certain genes, proteins or other molecules that may be a sign of a disease or condition such as cancer. These types of tests include:

**Immunophenotyping.** This test can find out if the patient's NHL cells are B cells, T cells or NK cells. This is a lab test that can use the sample cells from the lymph node, from the bone marrow biopsy or from blood.

**Flow cytometry.** In this test, lymphoma cells are analyzed as they flow through a machine.

**Fluorescence in situ hybridization (FISH).** This is a type of molecular test that uses special dyes to look for abnormalities in chromosomes. These abnormalities are important to identify your NHL subtype and choose the best treatment.

## Lymphoma Stages



# Tracking Your Lymphoma Tests

The tips listed below may help you save time and learn more about your health.

- Ask your doctor why certain tests are being done and what to expect.
- Discuss test results with your doctor.
- Ask for and keep copies of lab reports in a file folder or binder. Organize the reports by date. Ask the healthcare team if there is an online patient portal and if so, how to access it to view medical records.
- Find out if and when follow-up tests are needed.
- Mark upcoming appointments on your calendar.

## Treatment of NHL

New treatments may have been approved since this book was printed. Check [www.LLS.org/DrugUpdates](http://www.LLS.org/DrugUpdates) or call (800) 955-4572.

It is important for patients to talk to their healthcare team about the best treatment option. The doctor has to take into account many factors to make a treatment plan for a patient with NHL, including:

- The type of NHL
- The stage and category of the disease
- Factors such as fever, drenching night sweats and weight loss of more than 10 percent of body weight, referred to as “B symptoms”
- The presence of lymphoma in areas of the body outside the lymph nodes
- The patient’s age and overall health

Types of treatment are:

- Watch-and-wait—a medical approach for some types of NHL
- Chemotherapy—the main type of treatment for NHL
- Drug therapy—**Rituximab (Rituxan®)** and certain other drugs used to treat some types of NHL
- Radiation therapy—an important added treatment given along with chemotherapy for some types of NHL (but not usually the only or main treatment)



- Stem cell transplantation—a procedure used for some types of NHL
- Chimeric antigen receptor (CAR) T-cell therapy—used for some types of NHL
- New types of treatment—now under study in clinical trials (see *About Clinical Trials* on page 40)

**Biosimilars.** A biosimilar is a biological product that is very similar to another biological drug (called the “reference drug”) that has already received FDA approval. Both the reference drug and biosimilar drugs are made from living organisms, but they may be made in different ways and with slightly different substances. To be called a biosimilar drug, a biological drug must be shown to be as safe and effective as the reference drug, and also work in the same way. It must also be used in the same way, at the same dose and for the same condition as the reference drug. Biosimilar drugs must be approved by the FDA and may cost less than the reference drugs.

**Off-Label Use.** The US Food and Drug Administration (FDA) approves drugs for certain health conditions. Some drugs that are not FDA-approved to treat lymphoma can be used as “off-label” treatments. “Off-label” prescribing is when a doctor gives a drug that is FDA-approved to treat one condition for another condition, if the doctor feels it will benefit the patient. This is a common practice.

**Here are some questions you may want to ask your healthcare team.** See pages 58-63 for a full list of questions.

1. What is the subtype?
2. What are the treatment options, including clinical trials?
3. What is the goal of treatment?
4. What are the benefits and risks of different treatments?
5. Is there one treatment recommended over the others?
6. How can potential side effects be prevented or managed?

Ask your healthcare team about all of your treatment options. Discuss with your healthcare team the right treatment for you.

**Watch-and-Wait.** In most cases, a patient begins treatment for NHL right away. But when a patient has NHL that is not growing—or is growing very slowly—the doctor may recommend a watch-and-wait approach.

The watch-and-wait approach means that a doctor watches a patient's condition but does not treat the patient with drugs or radiation therapy. Patients may think that they should have treatment right away. But watch-and-wait is a real medical approach that is proven to work. It is sometimes truly better not to start treatment for patients with slow-growing disease and no symptoms. This allows the patient to avoid the side effects of therapy until treatment is needed.

Patients in a watch-and-wait situation are not ignored and **do** need frequent follow-up visits with their doctor. At each office visit, the doctor will check for any health changes. The results of exams and lab tests over time will help the doctor advise the patient about when to start treatment with drugs or radiation.

Treatment will begin if a patient develops symptoms or there are signs that the NHL is starting to grow.

#### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Watch and Wait* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

**Chemotherapy and Drug Therapy.** Patients may be treated with one to five drugs at a time. The goal of treatment is a series of remissions—each remission can last a number of years. This can be true even when tests show that the disease remains in some parts of the body. Many patients lead active, good-quality lives.

High-dose chemotherapy may, unfortunately, kill normal blood-forming cells in the marrow. Chemotherapy may cause very low counts of red blood cells, white blood cells or platelets. A red blood cell transfusion or drugs called **blood cell growth factors** may be needed until the side effects of chemotherapy wear off.

#### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Blood Transfusion* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

Most treatment for NHL takes place in an outpatient setting. Some patients may need to stay in the hospital (inpatient) for a short time—for example, if they develop a fever or have other signs of infection. Some patients who need antibiotics may stay in the hospital until the infection is gone.

### Some Common Drug Combinations Used to Treat NHL

A number of drug combinations include the drug **rituximab** (**Rituxan**®). Rituximab kills certain types of cancer cells.

**R or O-CHOP:** rituximab (Rituxan®) or obinutuzumab (Gazyva®) plus cyclophosphamide, hydroxydoxorubicin (doxorubicin), Oncovin® (vincristine) and prednisone

**B+O or R:** bendamustine hydrochloride (Bendeka®) plus obinutuzumab (Gazyva®) or rituximab

**B+R:** bendamustine hydrochloride (Bendeka®) plus rituximab

**R+ICE:** rituximab plus ifosfamide, carboplatin, etoposide

**R or O-CVP:** rituximab or obinutuzumab plus cyclophosphamide, vincristine and prednisone

**R-HCVAD:** rituximab plus cyclophosphamide, vincristine, Adriamycin® (doxorubicin) and dexamethasone

**R<sup>2</sup>:** rituximab and lenalidomide (Revlimid®)

**R-EPOCH:** rituximab plus etoposide, prednisone, Oncovin® (vincristine), cyclophosphamide, hydroxydaunorubicin

**DHAP:** dexamethasone, high-dose Ara-C® (cytarabine), Platinol® (cisplatin)

**ICE:** ifosfamide, carboplatin, etoposide

**CODOX-M/IVAC:** cyclophosphamide, vincristine (Oncovin®), doxorubicin and high-dose methotrexate, alternating with IVAC (ifosfamide, etoposide and high-dose cytarabine)

Many drug combinations are used to treat NHL. The drug choice depends on the type of NHL and the stage of the disease.

See [www.LLS.org/drugs](http://www.LLS.org/drugs) for more information.

New treatments may have been approved since this book was printed. Check [www.LLS.org/DrugUpdates](http://www.LLS.org/DrugUpdates) or call (800) 955-4572.

## Some Drugs Used to Treat NHL

### Follicular Lymphoma

- Axicabtagene ciloleucel (Yescarta®)
- Ibritumomab tiuxetan (Zevalin®)
- Lenalidomide (Revlimid<sup>®</sup>)
- Mosunetuzumab-axgb (Lunsumio™)
- Obinutuzumab (Gazyva®)
- Rituximab (Rituxan®)
- Rituximab-abbs (Truxima®)\*\*
- Rituximab-pvvr (Ruxience®)\*\*
- Rituximab and hyaluronidase human (Rituxan Hycela®)\*
- Tazemetostat (Tazverik®)
- Zanubrutinib (Brukinsa®)

### Slow-Growing B-cell NHL

- Bendamustine hydrochloride (Bendeka®)
- Rituximab-abbs (Truxima®)\*
- Rituximab-pvvr (Ruxience®)\*

### Burkitt Lymphoma

- Cyclophosphamide (Cytosan®)
- Rituximab (Rituxan®)

### Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma

- Acalabrutinib (Calquence®)
- Bendamustine hydrochloride (Bendeka®) - CLL only
- Duvelisib (Copiktra®)
- Fludarabine (Fludara)
- Ibrutinib (Imbruvica®)
- Idelalisib (Zydelig®) - CLL only
- Lisocabtagene maraleucel (Breyanzi®)
- Obinutuzumab (Gazyva®) - CLL only
- Ofatumumab (Arzerra<sup>®</sup>) - CLL only
- Pirtobrutinib (Jaypirca™)
- Rituximab (Rituxan®) - CLL only
- Rituximab and hyaluronidase human (Rituxan Hycela®)\* - CLL only
- Rituximab-abbs (Truxima®)\*
- Rituximab-pvvr (Ruxience®)\*
- Venetoclax (Venclexta®)
- Zanubrutinib (Brukinsa®)

\*Limitations of Use of Rituxan Hycela: Initiate treatment with Rituxan Hycela only after patients have received at least one full dose of a rituximab product by intravenous infusion.

\*\* This drug is a biosimilar.

## Some Drugs Used to Treat NHL (con't)

### High Grade B-Cell Lymphoma

- Axicabtagene ciloleucel (Yescarta®)
- Epcoritamab-bysp (Epkinly™)
- Glofitamab-gxbm (Columvi™)
- Lisocabtagene maraleucel (Breyanzi®)
- Loncastuximab tesirine-lpyl (Zynlonta®)
- Polatuzumab vedotin-piiq (Polivy®)
- Tisagenlecleucel (Kymriah®)

### Diffuse Large B-cell Lymphoma

- Axicabtagene ciloleucel (Yescarta®)
- Epcoritamab-bysp (Epkinly™)
- Glofitamab-gxbm (Columvi™)
- Lisocabtagene maraleucel (Breyanzi®)
- Loncastuximab tesirine-lpyl (Zynlonta®)
- Polatuzumab vedotin-piiq (Polivy®)
- Rituximab (Rituxan®)
- Rituximab and hyaluronidase human (Rituxan Hycela®)\*
- Rituximab-abbs (Truxima®)\*
- Rituximab-pvvr (Ruxience®)\*
- Selinexor (Xpovio®)
- Tafasitamab-cxix (Monjuvi®)
- Tisagenlecleucel (Kymriah®)

### Anaplastic Large Cell Lymphoma (ALCL); Primary Cutaneous Anaplastic Large Cell Lymphoma (pcALCL); or Mycosis Fungoides (MF)

- Brentuximab vedotin (Adcetris®)
- Crizotinib (Xalkori®)

### Peripheral T-cell Lymphoma

- Belinostat (Beleodaq®)
- Pralatrexate (Folotyn®)
- Brentuximab vedotin (Adcetris®)

\*Limitations of Use of Rituxan Hycela: Initiate treatment with Rituxan Hycela only after patients have received at least one full dose of a rituximab product by intravenous infusion.

\*\* This drug is a biosimilar.

## Some Drugs Used to Treat NHL (con't)

### Cutaneous T-Cell Lymphoma

- Bexarotene (Targretin®)
- Mogamulizumab-kpkc (Poteligeo®)
- Romidepsin (Istodax®)
- Vorinostat (Zolinza®)

### Primary Mediastinal Large B-cell Lymphoma

- Axicabtagene ciloleucel (Yescarta®)
- Lisocabtagene maraleucel (Breyanzi®)
- Pembrolizumab (Keytruda®)

### Mantle Cell Lymphoma

- Acalabrutinib (Calquence®)
- Bortezomib (Velcade®)
- Brexucabtagene autoleucel (Tecartus®)
- Lenalidomide (Revlimid®)
- Pirtobrutinib (Jaypirca™)
- Zanubrutinib (Brukinsa®)

### Marginal Zone Lymphoma

- Lenalidomide (Revlimid®)
- Zanubrutinib (Brukinsa®)

### Waldenström Macroglobulinemia (WM)

- Ibrutinib (Imbruvica®)
- Zanubrutinib (Brukinsa®)

Please visit [www.LLS.org/drugs](http://www.LLS.org/drugs) for each of these treatments' full indication.

New treatments may have been approved since this book was printed. Check [www.LLS.org/DrugUpdates](http://www.LLS.org/DrugUpdates) or call (800) 955-4572.

## WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Non-Hodgkin Lymphoma*, *Chimeric Antigen Receptor (CAR) T-Cell Therapy* and *Immunotherapy* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

Use the lines provided on page 57 to write down what your treatments are and when they were prescribed to you.

**Maintenance for Slow-Growing NHL.** People with some types of slow-growing lymphoma may continue treatment to stay in remission. This is called **maintenance therapy**. The drugs **rituximab (Rituxan®)** and **obinutuzumab (Gazyva®)** are approved for maintenance therapy for patients with follicular lymphoma.

**Radiation Therapy.** Radiation uses high-energy rays to kill lymphoma cells in one area of the body. Radiation can be used along with chemotherapy when there are very large masses of lymphoma cells in a small area of the body. Radiation can also be used when large lymph nodes are pressing on an organ (such as the bowel), and chemotherapy cannot control them. But radiation alone is not usually the only treatment for NHL because the lymphoma cells are likely to be in many areas of the body.

**Stem Cell Transplantation.** This is a procedure in which patients receive healthy stem cells to replace their own stem cells that have been destroyed by cancer or cancer treatments. The goal of stem cell transplant is to help the body start a new supply of blood cells after the patient gets high-dose chemotherapy.

When doctors are planning treatment, they use a number of factors to determine a patient's need for a stem cell transplant. These factors may include the individual's disease, subtype, stage, other treatment received and physical ability to have the transplant. A stem cell transplant is not for every patient, but it can be helpful for some.

There are two main types of stem cell transplantation, one that replaces the patient's blood with their own stem cells (autologous), and one that gets replacement stem cells from a donor (allogeneic). Reduced-intensity allogeneic stem cell transplant (also called a nonmyeloablative transplant) uses lower doses of chemotherapy than a standard allogeneic transplant. Some older or sicker patients may be helped by this treatment. Talk to your doctor about whether a stem cell transplant is a treatment for you.

**Autologous Stem Cell Transplantation.** Autologous transplantation is more frequently used than allogeneic transplantation for NHL patients. Autologous transplants are generally done in the hospital. With an autologous transplant:

- Patients' own stem cells are collected from their blood or marrow and are frozen and stored.
- Patients are then given high-dose chemotherapy and sometimes radiation to kill the lymphoma cells in their body. This treatment also kills normal stem cells in the marrow.
- Patients' stored stem cells are returned to their body through an intravenous (IV) or central line.
- The stem cells go from the patient's blood to the marrow and help start a new supply of red blood cells, white blood cells and platelets.

**Allogeneic Stem Cell Transplantation.** An allogeneic transplant is a treatment that uses stem cells from a donor. But the donor must be a "match" to the patient. The donor may be a brother or sister (siblings are most often the best match). The donor could be an unrelated person with stem cells that match the patient's. Stem cells may also come from cord blood (the blood in the umbilical cord after a baby's birth). Allogeneic transplants are done in the hospital. With an allogeneic transplant:

- Stem cells are collected from a donor and are frozen and stored.
- The patient is given high-dose chemotherapy and sometimes radiation therapy to kill the lymphoma cells in the body.
- The donor stem cells are given to the patient through an intravenous (IV) line or central line.
- The donor stem cells go from the patient's blood to the marrow and help start a new supply of red blood cells, white blood cells and platelets.

**Chimeric Antigen Receptor (CAR) T-Cell Therapy.** This is a treatment that uses a patient's own T cells (a type of white blood cell) to identify and attack cancer cells. The T cells are taken from the patient's blood and sent to a laboratory, where they are genetically modified to attack cancer cells. The engineered T cells are then multiplied and later re-infused into the patient's blood stream.



### WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Blood and Marrow Stem Cell Transplantation* and *Chimeric Antigen Receptor (CAR) T-Cell Therapy* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

**Refractory or Relapsed NHL.** In some patients, NHL does not respond to initial treatment. This is called **refractory** NHL. And in some patients, disease can come back months or even years after treatment ends. This is called **relapsed** NHL.

There are many drug choices and approaches to treatment for patients with relapsed or refractory NHL. If relapse occurs long after treatment, the same drugs that were used for the patient before may be tried again. In other cases, new drugs or treatments are used. Patients with refractory or relapsed NHL should also ask the doctor about participating in a clinical trial (see page 40).

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Non-Hodgkin Lymphoma* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for a copy.

## Childhood NHL

Burkitt lymphoma is the most common type of NHL in children ages 5 through 14 years.

Children and teens with NHL are best treated at medical centers that have a pediatric hematology-oncology team. It is important for young adults and parents of children to talk to members of the oncology team about the

- Specific subtype of NHL
- Stage of the disease
- Fertility concerns (see *Before-Treatment Factors* on page 9)
- Lab test results

Doctors use this information about the patient's disease to determine the most effective therapy. Treatments used for children with NHL may be different from those used for adults with NHL.

### WANT MORE INFORMATION?



For more information, see *Learning & Living with Cancer: advocating for your child's educational needs*. Also visit [www.LLS.org/FamilyWorkbook](http://www.LLS.org/FamilyWorkbook) to find information for children and families.

Visit [www.LLS.org/SurvivorshipWorkbook](http://www.LLS.org/SurvivorshipWorkbook) to reach the children and adolescent, young adult and adult books called *Navigating Life During and After a Blood Cancer Diagnosis*.

## PART 4 Clinical Trials

### About Clinical Trials

There are new treatments under study for lymphoma patients of all ages. New treatments are studied in clinical trials. Clinical trials are also used to study new uses for approved drugs or treatments, such as changing the dose of the drug, giving the drug along with another type of treatment, or ordering drugs in new sequences. Different approaches may be more effective in treating the disease.

There are clinical trials for:

- Newly diagnosed lymphoma patients
- Patients who did not get a good response to treatment (refractory disease)
- Patients whose disease returned (relapsed disease)
- Patients who need to continue treatment after remission (maintenance)

A carefully conducted clinical trial may provide the best available therapy for patients with HL or NHL.

#### **Here are some questions you may want to ask your healthcare team.**

See pages 58-63 for a full list of questions.

1. Is a clinical trial a treatment option?
2. How can I (we) find out if the insurance covers the cost of the clinical trial treatment and treatment-related costs, such as testing?
3. Who pays for the travel costs to get to the trial?

Ask your doctor if treatment in a clinical trial may be right for you. For more information, please call (800) 955-4572 to speak with an LLS Information Specialist who can provide more information about clinical trials. Personalized clinical-trial navigation by trained nurses through the LLS Clinical Trial Support Center is also available at [www.LLS.org/CTSC](http://www.LLS.org/CTSC).

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Understanding Clinical Trials for Blood Cancers* and *Knowing All Your Treatment Options* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

## PART 5 Side Effects and Follow-Up Care

### Overview of This Section

- Treatment side effects vary depending on the type of treatment (for example, chemotherapy, targeted therapy, radiation, etc.).
- Some of the common side effects of treatment for HL and NHL may include mouth sores, nausea, diarrhea and/or constipation, or changes in blood counts.
- Parents should talk to the doctor if they think their child's learning skills may have been affected by lymphoma or its treatment. The child's learning skills should be checked.
- Children and adults who have been treated for lymphoma should see their primary care doctor and a cancer specialist for follow-up care.

### Side Effects and Follow-Up Care

The side effects of lymphoma depend on many factors. It is important to follow up with your doctor about any side effects while on treatment as well as long-term and late effects that may develop.

# Side Effects of Lymphoma Treatment

The aim of treatment for HL and NHL is to kill the lymphoma cells. Treatment side effects depend on the type of treatment. The term side effect is used to describe how treatment affects people's bodies, and often defines the negative or undesirable effects from a treatment. Patients react to treatments in different ways. Sometimes there are very mild side effects. Other side effects may be uncomfortable and difficult. Some side effects are serious and last a long time. Lymphoma patients should talk with their doctors about side effects before they begin any type of treatment.

**Here are some questions you may want to ask your healthcare team.**

See pages 58-63 for a full list of questions.

1. What side effects should be reported to the healthcare team right away?
2. What are the common side effects of treatment?
3. How long will the side effects last?
4. How can potential side effects be prevented or managed?

Lymphoma treatment may affect your blood counts.

- The number of red blood cells may decrease (this is called **anemia**).
  - Blood transfusions may be needed to increase red blood cells.
  - Drugs called **growth factors** such as **Aranesp®** and **Procrit®** may be given to increase the red blood cell count.
- Patients may have a drop in the number of platelets in their blood. A platelet transfusion may be needed to prevent bleeding if the platelet count is very low.
- A severe drop in white blood cells may lead to infection.
  - Infections caused by bacteria or fungi are treated with antibiotics.
  - To help improve a patient's white blood cell count:
    - The amount of chemotherapy drugs may be reduced.
    - The time between treatments may be increased.
    - Growth factors such as **Neupogen®**, **Neulasta®** and **Leukine®** may be given to increase white blood cell counts.

**Common Side Effects.** Some of the common side effects of treatment for HL and NHL may include:

- Mouth sores
- Nausea
- Vomiting
- Diarrhea
- Constipation
- Bladder irritation
- Blood in the urine

Other side effects of treatment may include:

- Extreme tiredness
- Fever
- Cough
- Rash
- Bone loss and fractures
- Hair loss
- Weakness
- Tingling sensation in fingertips and toes
- Lung, heart or nerve problems

There may be other side effects that are not listed here that you should watch for when taking a specific treatment. Talk to your doctor about the possible side effects of your treatment. You can also call our Information Specialists.

Not all patients have these side effects. Treatment to prevent or manage nausea, vomiting, diarrhea and other side effects can help patients feel more comfortable.

### **WANT MORE INFORMATION?**



You can view, print or order the free LLS *Side Effect Management* series at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

## Long-Term and Late Effects

**Long-term effects** are side effects of treatment that may last for months or years after treatment ends. Fatigue is an example of a long-term side effect. In children, learning skills may be affected.

**Late effects** are side effects of treatment that may not show up until years after treatment ends. Heart disease is an example of a possible late side effect.

Not everyone who is treated for lymphoma develops long-term or late effects. It depends on the patient's age, overall health and specific treatment. Some examples of long-term and late effects include heart disease, second cancers, decreased fertility (the ability to have a child), lung damage and decreased thyroid function.

Patients should talk with their doctors about any long-term or late effects that they experience. Parents should talk to the doctor if they think their child's learning skills may have been affected by the lymphoma or the treatment, and should be checked by a specialist.

**Here are some questions you may want to ask your healthcare team.**

See pages 58-63 for a full list of questions.

1. Who should I (we) work with to ensure life-long follow up?
2. How can I (we) be monitored for long-term and late effects of treatment?
3. What types of long-term and late effects should be brought to the healthcare team's attention?

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklet *Learning & Living with Cancer: advocating for your child's educational needs* at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.

Visit [www.LLS.org/FamilyWorkbook](http://www.LLS.org/FamilyWorkbook) to find additional information about long-term and late effects in children in the chapter, *Beyond Treatment*.

## Follow-Up Care

Follow-up medical care is important for every lymphoma patient. Follow-up care helps the doctor monitor you to see if disease has recurred or relapsed, or to see if more treatment is needed.

Children and adults who have been treated for lymphoma should see their primary care doctor and a hematologist-oncologist (cancer specialist) for follow-up care. Patients should talk to the doctor about how often to have follow-up visits. You can ask your doctor what tests will be needed and find out how often you should have these tests. It is important to get a record of your cancer treatment including the drugs you receive and the date you receive them, so that your doctor can follow up on specific long-term effects that may be associated with your treatment.

**Here are some questions you may want to ask your healthcare team.**  
See pages 58-63 for a full list of questions.

1. Who should I (we) work with to ensure life-long follow up?
2. Will I (we) continue to see this healthcare team?
3. What information can be provided to the primary doctor about past treatment and what may be needed in the future?

Follow-up care may include physical exams, imaging and blood tests. Sometimes bone marrow tests are also needed. The doctor may advise longer periods of time between follow-up visits if a patient:

- Continues to be free of signs of lymphoma
- Does not need medical care for any long-term or late effects

To find a survivorship clinic and other resources for child and adult survivors, contact our Information Specialists at (800) 955-4572.

### WANT MORE INFORMATION?



Visit [www.LLS.org/SurvivorshipWorkbook](http://www.LLS.org/SurvivorshipWorkbook) to reach the children and adolescent, young adult and adult books called *Navigating Life During and After a Blood Cancer Diagnosis*.

## Take Care of Yourself

- Keep all appointments with the doctor.
- Discuss how you feel with the doctor at each visit. Ask any questions you have about side effects.
- People with lymphoma may have more infections. Follow the doctor's advice for preventing infection.
- Eat healthy foods each day. It is okay to eat four or five smaller meals instead of three bigger ones.
- Contact the doctor about tiredness, fever or other symptoms.
- Do not smoke or vape. Patients who smoke or vape are encouraged to get help to quit.
- Get enough rest and exercise. Talk with your doctor before starting an exercise program.
- Keep a healthcare file with copies of lab reports and treatment records.
- Have regular cancer screenings. See your primary care doctor to keep up with other healthcare needs.
- Talk with family and friends about how you feel. When family and friends know about lymphoma and its treatment, they may worry less.
- Seek medical advice if you feel sad or depressed and your mood does not improve over time. For example, if you feel sad or depressed every day for a two-week period, seek help. Depression is an illness. It can be treated at the same time that a person is being treated for lymphoma. Treatment for depression has benefits for people living with cancer.

### WANT MORE INFORMATION?



You can view, print or order the free LLS booklets *Nutrition Handbook* and *Managing Stress* as well as other support materials at [www.LLS.org/booklets](http://www.LLS.org/booklets), or contact our Information Specialists for copies.



## RESOURCES AND INFORMATION

LLS offers free information and services for patients and families affected by blood cancers. This section lists various resources you may find helpful.

### For Help and Information

**Consult with an Information Specialist.** Information Specialists can assist you through cancer treatment, financial and social challenges and give accurate, up-to-date disease, treatment and support information. Our Information Specialists are highly trained oncology social workers and nurses. Language services are available. For more information, please:

- Call: (800) 955-4572 (Monday through Friday, 9 a.m. to 9 p.m. ET)
- Email and Live chat: [www.LLS.org/InformationSpecialists](http://www.LLS.org/InformationSpecialists)

**Clinical Trials (Research Studies).** Research is ongoing to develop new treatment options for patients. LLS offers help for patients and caregivers in understanding, identifying and accessing clinical trials. Pediatric and adult patients and caregivers can work with our Clinical Trial Nurse Navigators who will help find clinical trials and provide personalized support throughout the entire clinical trial process. Visit [www.LLS.org/CTSC](http://www.LLS.org/CTSC) for more information.

**Nutrition Consultations.** Schedule a free one-on-one nutrition consultation with one of our registered dietitians who have expertise in oncology nutrition. Consultations are available to patients and caregivers of all cancer types. Dietitians can assist with information about healthy eating strategies, side effect management and more. Please visit [www.LLS.org/nutrition](http://www.LLS.org/nutrition) for more information.

**Free Information Booklets.** LLS offers free education and support booklets for patients, caregivers and healthcare professionals that can either be read online or ordered. Please visit [www.LLS.org/booklets](http://www.LLS.org/booklets) for more information.

**Telephone/Web Education Programs.** LLS offers free telephone/Web and video education programs for patients, caregivers and healthcare professionals. Please visit [www.LLS.org/programs](http://www.LLS.org/programs) for more information.

**Financial Assistance.** LLS offers financial support to eligible individuals with blood cancer for insurance premiums, co-pays, and non-medical expenses like travel, food, utilities, housing, etc.

For more information, please:

- Call: (877) 557-2672
- Visit: [www.LLS.org/finances](http://www.LLS.org/finances)

**Resources for Families.** Blood cancer occurs in a small number of children. Families face new challenges, and the child, parents and siblings may all need support. LLS has many materials for families including a caregiver workbook, children's book series, emotion flipbook, dry erase calendar, coloring books and coloring app, school re-entry program and other resources.

For more information, please:

- Call: (800) 955-4572
- Visit: [www.LLS.org/FamilyWorkbook](http://www.LLS.org/FamilyWorkbook)

**Podcast.** *The Bloodline with LLS* is here to remind you that after a diagnosis comes hope. Listen in as patients, caregivers, advocates, doctors and other healthcare professionals discuss diagnosis, treatment options, quality-of-life concerns, treatment side effects, doctor-patient communication and other important survivorship topics. Visit [www.LLS.org/TheBloodline](http://www.LLS.org/TheBloodline) for more information and to subscribe to access exclusive content, submit ideas and topics, and connect with other listeners.

**3D Models.** LLS offers interactive 3D images to help visualize and better understand blood cell development, intrathecal therapy, leukemia, lymphoma, myeloma, MDS, MPNs, and lab and imaging tests. Visit [www.LLS.org/3D](http://www.LLS.org/3D) for more.

### **Free Mobile Apps.**

- LLS Coloring For Kids™—Allows children (and adults) to express their creativity and offers activities to help them learn about blood cancer and its treatment. Visit [www.LLS.org/ColoringApp](http://www.LLS.org/ColoringApp) to download for free.
- LLS Health Manager™—Helps you track side effects, medication, food and hydration, questions for your doctor, and more. Visit [www.LLS.org/HealthManager](http://www.LLS.org/HealthManager) to download for free.

**Suggested Reading.** LLS provides a list of selected books recommended for patients, caregivers, children and teens. Visit [www.LLS.org/SuggestedReading](http://www.LLS.org/SuggestedReading) to find out more.

### **Connecting With Patients, Caregivers and Community Resources**

**LLS Community.** The one-stop virtual meeting place for talking with other patients and receiving the latest blood cancer resources and information. Share your experiences with other patients and caregivers and get personalized support from trained LLS staff. Visit [www.LLS.org/community](http://www.LLS.org/community) to join.

**Weekly Online Chats.** Moderated online chats can provide support and help cancer patients and caregivers reach out and share information. Please visit [www.LLS.org/chat](http://www.LLS.org/chat) for more information.

**Local Programs.** LLS offers community support and services in the United States and Canada including the *Patti Robinson Kaufmann First Connection® Program* (a peer-to-peer support program), local support groups and other great resources. For more information about these programs or to contact your region, please:

- Call: (800) 955-4572
- Visit: [www.LLS.org/LocalPrograms](http://www.LLS.org/LocalPrograms)

**Advocacy and Public Policy.** Working closely with dedicated volunteer advocates, LLS's Office of Public Policy elevates the voices of patients to state and federal elected officials, the White House, governors and even courts. Together, we advocate for safe and effective treatments. We pursue policies that would make care more accessible to all patients. And, most of all, we advocate for the hope for a cure. Want to join our work? Visit [www.LLS.org/advocacy](http://www.LLS.org/advocacy) for more information.

**Other Helpful Organizations.** LLS offers an extensive list of resources for patients and families. There are resources that provide help with financial assistance, counseling, transportation, patient care and other needs. For more information, please visit [www.LLS.org/ResourceDirectory](http://www.LLS.org/ResourceDirectory) to view the directory.

### **Additional Help for Specific Populations**

**Información en Español (LLS information in Spanish).** Please visit [www.LLS.org/espanol](http://www.LLS.org/espanol) for more information.

**Language Services.** Let members of your healthcare team know if you need translation or interpreting services because English is not your native language, or if you need other assistance, such as a sign language interpreter. Often these services are free.

**Information for Veterans.** Veterans who were exposed to Agent Orange while serving in Vietnam may be able to get help from the United States Department of Veterans Affairs. For more information, please:

- Call: the VA (800) 749-8387
- Visit: [www.publichealth.va.gov/exposures/AgentOrange](http://www.publichealth.va.gov/exposures/AgentOrange)

**Information for Firefighters.** Firefighters are at an increased risk of developing cancer. There are steps that firefighters can take to reduce the risk. Please visit [www.LLS.org/FireFighters](http://www.LLS.org/FireFighters) for resources and information.

**World Trade Center Health Program.** People involved in the aftermath of the 9/11 attacks and subsequently diagnosed with a blood cancer may be able to get help from the World Trade Center (WTC) Health Program. People eligible for help include:

- Responders
- Workers and volunteers who helped with rescue, recovery and cleanup at the WTC-related sites in New York City (NYC)
- Survivors who were in the NYC disaster area and those who lived, worked or were in school in that area
- Responders to the Pentagon and the Shanksville, PA, crashes

For more information, please:

- Call: WTC Health Program at (888) 982-4748
- Visit: [www.cdc.gov/wtc/faq.html](http://www.cdc.gov/wtc/faq.html)

**People With Depression.** Treating depression has benefits for cancer patients. Seek medical advice if your mood does not improve over time, for example, if you feel depressed every day for a two-week period. For more information, please:

- Call: The National Institute of Mental Health (NIMH) at (866) 615-6464
- Visit: NIMH at [www.nimh.nih.gov](http://www.nimh.nih.gov) and enter “depression” in the search box

## Health Terms

**Antibiotic.** A drug that is used to treat infections caused by bacteria and fungi. Penicillin is one type of antibiotic.

**Antibody.** A protein made by plasma cells. Antibodies help fight infection in the body.

**Bone marrow aspiration.** A test that checks to see if the fluid in a patient's bone marrow is normal. A sample of cells is taken from the patient. The cells are looked at under a microscope. Bone marrow aspiration and biopsy are usually done at the same visit.

**Bone marrow biopsy.** A test that checks the marrow cells in the bone to see if they are normal. A very small amount of bone is removed from the body. The cells within it are looked at under a microscope. Bone marrow aspiration and bone marrow biopsy are usually done at the same visit.

**Central line.** A special tube the doctor puts into a large vein of the patient. The vein is usually in the upper chest. The central line is used to give the patient chemotherapy drugs and blood cells. It can also be used to take blood samples from the patient.

**Chemotherapy or drug therapy.** Chemical agents that treat lymphoma and other cancers.

**Chromosome.** The 23 pairs of certain basic structures in human cells. Chromosomes are made up of genes. Genes give instructions that tell the cells what to do. In cancer, the number or the shape of chromosomes may be altered or not normal.

**Clinical trials.** Careful studies done by doctors to test new drugs or treatments. Trials also find new uses for approved drugs or treatments. The goal of clinical trials is to improve treatment and quality of life for patients, and to find cures for blood cancer.

**Combination chemotherapy or drug therapy.** The use of two or more drugs together to treat lymphoma and other cancers.

**Diagnose.** To determine a disease from a person's signs, symptoms and test results. The doctor diagnoses a patient.

**Fertility.** Ability to have children.

**FDA.** The short name for the United States Food and Drug Administration. Part of the FDA's job is to ensure that drugs are safe and that they really work. The FDA also checks on medical devices (like implants) and ensures the safety of the US food supply.

**FDG-PET (fluorodeoxyglucose[FDG]-positron emission tomography[PET]) scan.** A PET scan is a test that produces a 3D image of what is going on in the body. A FDG-PET scan uses a small amount of a radioactive sugar called **FDG** to show the difference between healthy and diseased tissue.

**Hemoglobin.** The part of the red blood cell that carries oxygen throughout the body.

**Hematologist.** A doctor who has special training in the treatment of blood diseases.

**Hematopathologist.** A doctor who studies blood cells and tissues under a microscope to identify disease.

**Immune system.** A network of cells and organs that help defend the body from infection. Lymphocytes, lymph nodes and the spleen are some parts of the immune system.

**Immunophenotyping.** A lab test that can be used to identify types of lymphoma cells.

**Immunotherapy.** Treatments that help the body's immune system fight lymphoma and other diseases. Some types of immunotherapy are monoclonal antibody therapy, radioimmunotherapy, chimeric antigen receptor (CAR) T-cell therapy and vaccines.

**Lymph node.** Small bean-shaped structure that contains a large number of lymphocytes (white blood cells). Lymph nodes are a part of the body's immune system. There are about 600 lymph nodes in the body.

**Lymphatic system.** The system that connects the lymph nodes. This network runs all throughout the body to carry infection-fighting cells. It is an important part of the immune system.

**Lymphocytes.** White blood cells that fight infection. They are carried through the lymphatic system and cluster together in lymph nodes.

**Monoclonal antibody therapy.** A treatment that targets and kills certain cancer cells. In general, it does not cause as many side effects as chemotherapy.

**Oncologist.** A doctor who has special training to treat patients who have cancer.

**Pathologist.** A doctor who identifies diseases by looking at cells and tissues under a microscope.

**Platelets.** Blood cells that help prevent or stop bleeding. Platelets clump together at the site of an injury and “clot” so that bleeding will stop.

**Radiation therapy.** Treatment with x-rays or other high-energy rays.

**Radioimmunotherapy.** Treatment that uses antibodies to carry a radioactive substance to lymphoma cells to kill them.

**Red blood cells.** Blood cells that contain hemoglobin that binds to oxygen and carries it to the tissues of the body.

**Refractory lymphoma.** Lymphoma that does not respond to treatment. Refractory lymphoma may also be disease that is getting worse or staying the same.

**Relapsed lymphoma.** Lymphoma that at first, or for a time, responded to treatment, but then returns.

**Remission.** No sign of disease, usually as a result of treatment.

**Spleen.** An organ found on the left side of the body near the stomach. It contains lymphocytes and removes old or damaged cells from the blood.

**Stem cell.** A type of cell found in bone marrow that makes red blood cells, white blood cells and platelets.

**Systemic therapies.** Drugs that spread throughout the body to reach the affected cells.

**White blood cells.** Cells that fight infection in the body. There are two major types of white blood cells: infection-fighting lymphocytes (B cells, T cells and natural killer [NK] cells; and germ-eating cells [neutrophils and monocytes]).

## My Healthcare Team Contact List

Use this list to remember names and contact information for members of your healthcare team.

CAREGIVER NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

PRIMARY CARE DOCTOR NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

PHARMACY NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Additional information: \_\_\_\_\_

**Information Specialists:**

**Phone: 1-800-955-4572**

**Website: [www.LLS.org/InformationSpecialist](http://www.LLS.org/InformationSpecialist)**



HEMATOLOGIST-ONCOLOGIST NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Website/Portal: \_\_\_\_\_

Additional information: \_\_\_\_\_

NURSE/NURSE PRACTITIONER NAME:

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

SOCIAL WORKER NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

INSURANCE CASE MANAGER/  
CARE COORDINATOR NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Website or email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

PHYSICIAN ASSISTANT NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

NURSE NAVIGATOR NAME:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

OTHER:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

OTHER:

Address: \_\_\_\_\_

Phone number/Fax number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

## My List of Treatments

Use this space to write down what your treatments are and when they were prescribed to you.

DATE: \_\_\_\_\_

Treatment: \_\_\_\_\_

\_\_\_\_\_

DATE: \_\_\_\_\_

Treatment: \_\_\_\_\_

\_\_\_\_\_

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Treatment: \_\_\_\_\_

\_\_\_\_\_

## Question Guide: My First Doctor's Visit

Asking questions will help you take an active role in managing your (or your loved one's) care. If you do not understand any part of the information your healthcare provider gives you, ask them to explain it in another way. The following are questions you may want to ask your healthcare team.

When you meet with the doctor, nurse and healthcare team, ask a few questions to get a better idea of the doctor's experience and to understand how the office works.

(Note: The use of "I (we)" in lists of questions is used for situations in which the patients may not be old enough or able to make their own decisions. A parent, relative, or caregiver may be assisting or making the decision.)

### Questions for the Doctor

DOCTOR'S NAME: \_\_\_\_\_

Date of appointment or phone call: \_\_\_\_\_

1. How many patients have you treated who have my disease?
2. What problems or symptoms should be reported to the nurse or doctor right away?
3. How long does it normally take to receive return of a phone call?
4. How can you be contacted when there are questions?
5. How can you be contacted at night? On weekends? On holidays?
6. Who are the other members of the team that I (we) should be aware of?
7. Is there a release form available so the family/caregiver can be given medical information?

## Questions for the Nurse

NURSE OR OTHER HEALTHCARE TEAM MEMBER'S NAME:

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1. How long would I (we) have to wait for appointments?
2. What problems or symptoms should be reported to the nurse or doctor right away?
3. How long does it usually take to receive return of a phone call?
4. Will there be nurses, social workers and case managers available to help with support needs and quality-of-life concerns?
5. Does your office accept my (our) insurance? Is it considered in-network?

**To print copies of other question guides, go to [www.LLS.org/WhatToAsk](http://www.LLS.org/WhatToAsk) or call (800) 955-4572.**

## Question Guide: Treatment and Follow-up Care

Talk with the doctor and ask questions about how they plan to treat your (your loved one's) lymphoma. This will help you and your loved one to be actively involved in making decisions about medical care. The following are questions you may want to ask your healthcare team.

(Note: The use of "I (we)" in lists of questions is used for situations in which the patients may not be old enough or able to make their own decisions. A parent, relative, or caregiver may be assisting or making the decision.)

DOCTOR'S NAME: \_\_\_\_\_

Date of appointment or phone call: \_\_\_\_\_

Write down your diagnosis:

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Write down your lymphoma subtype:

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## Before Treatment Begins

1. Will this treatment affect the ability to have a child in the future?
2. If yes, are there other treatment options available?
3. What are the options for preserving fertility?
4. How much time do I (we) have to make any decisions?
5. What is the subtype?
6. What is the goal of treatment?
7. What are the treatment options?
8. Is a clinical trial a treatment option?
9. When do you think treatment should begin?
10. How long will treatment last?
11. What are the benefits and risks of these treatments?
12. Is there one treatment recommended over the others?
13. How can potential side effects be prevented or managed?

## Testing

1. What kind of testing will be done to monitor the disease and treatment?
2. How long does it take to get the results back?
3. How are the results communicated to me (us)?
4. How often will testing be needed?
5. Where will the testing be done?

## **Treatment**

1. Will this be an in-hospital or an outpatient treatment?  
If the treatment is outpatient:
  - 1a. Is work or attending school during treatment going to be all right?
  - 1b. Will someone be needed to drive me home after treatment?
2. What kind of testing will be done to monitor this disease and treatment? How often will testing be needed? Where is the testing done?
3. How can it be known if the treatment is effective? What options are available if the treatment is not effective?
4. What is the likely outcome of the disease (prognosis)?

## **Side Effects**

1. What are the common side effects for this treatment?
2. What side effects should be reported to the healthcare team right away?
3. How long will the side effects last?
4. How can potential side effects be prevented or managed?
5. How should I report side effects (phone call, at the office visit, etc.)?



## **Social/Financial Concerns**

1. Are there any side effects that will affect appearance or ability to do a job/go to school?
2. What kind of financial and social support services are available to me and my family?
3. How can I (we) find out if insurance will cover the costs of the treatment or the study treatment?
4. Who is the best person to speak to about bills and insurance coverage?
5. If I (we) do not have insurance coverage, how can the healthcare team help get the treatment needed? Is there someone who can be spoken to for assistance?
6. If I (we) get in a study treatment (clinical trial), will I (we) be responsible for paying treatment-related costs, such as tests, travel or for clinical trial drugs?
7. How can I (we) find out if insurance covers the cost of the clinical trial treatment and treatment-related costs such as testing?

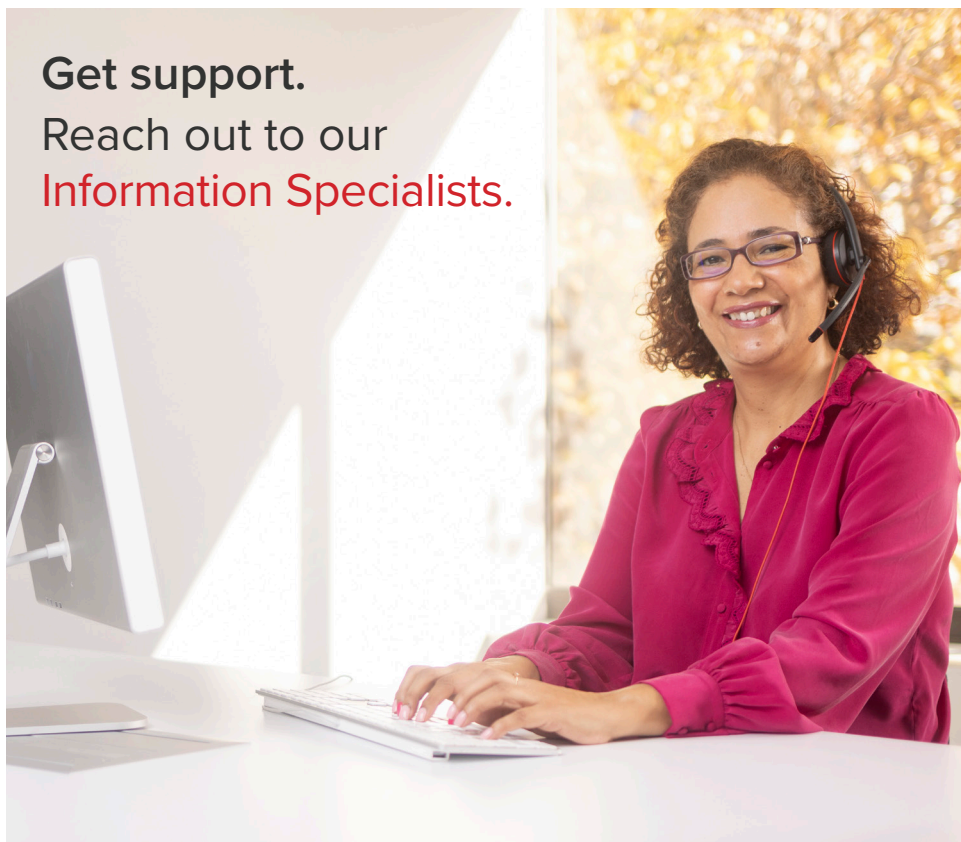
## **Follow-Up Care and Long-Term and Late Effects**

1. Who should I (we) work with to ensure life-long follow up?
2. Will I (we) continue to see this healthcare team?
3. How can I (we) be monitored for long-term and late effects of treatment?
4. What types of long-term and late effects should be brought to the healthcare team's attention?
5. If I have side effects later, how can the healthcare team be reached?
6. What information can be provided to the primary doctor about past treatment and what may be needed in the future?

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**Get support.**  
Reach out to our  
**Information Specialists.**



The Leukemia & Lymphoma Society® team consists of highly trained oncology social workers and nurses who are available by phone, email and live chat Monday through Friday, 9 a.m. to 9 p.m. (ET).

- Get one-on-one personalized support and information about blood cancers
- Know the questions to ask your doctor
- Discuss financial resources
- Receive individualized clinical-trial searches
- Get connected to resources

Contact us at  
**800.955.4572**  
or **www.LLS.org/**  
**InformationSpecialists**

(Language interpreters  
can be requested.)



For more information, please  
contact our Information Specialists  
**800.955.4572** (Language interpreters  
available upon request).

**National Office** 3 International Drive, Suite 200 Rye Brook, NY 10573

The mission of The Leukemia & Lymphoma Society (LLS) is to cure leukemia, lymphoma,  
Hodgkin's disease and myeloma, and improve the quality of life of patients and their families.  
Find out more at [www.LLS.org](http://www.LLS.org).