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# Follicular Lymphoma

NON-HODGKIN'S LYMPHOMA SERIES

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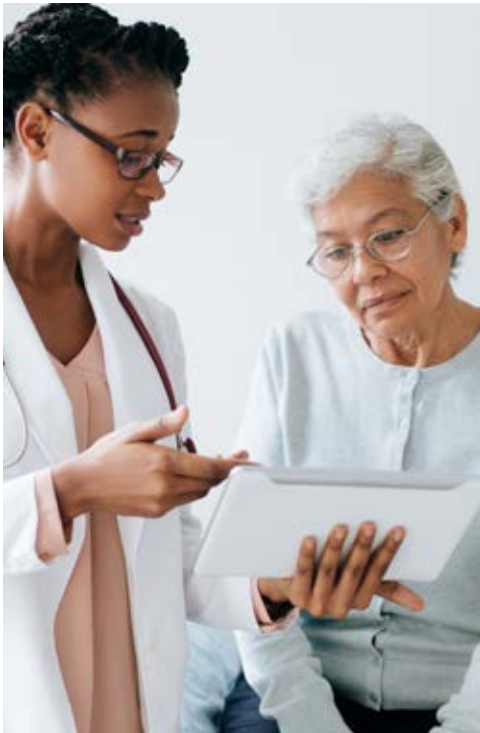
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# 1

## Follicular lymphoma basics

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You've learned that you have or may have lymphoma. It's common to feel shocked and confused. This chapter reviews some basics that may help you learn about follicular lymphoma.

## Lymph system

Before learning about follicular lymphoma, it is helpful to know about the lymph (or lymphatic) system. It is one of 13 systems of the human body. It transports fluids to the bloodstream and fights germs. It supports your blood-flowing (cardiovascular) and disease-fighting (immune) systems.

### Lymph

Cells are the building blocks of tissue in the body. The spaces between cells are filled with fluid. This fluid is called interstitial or tissue fluid. Most tissue fluid comes from parts of blood plasma that have passed out of blood

vessels. Cells also release waste and other products into tissue fluid.

When tissue fluid increases, it drains into vessels. Almost all of tissue fluid drains back into blood vessels. The rest of it drains into lymph vessels. Once inside of lymph vessels, tissue fluid is called lymph. Lymph travels in lymph vessels back to the bloodstream.

The lymph system also collects fat and some vitamins from your gastrointestinal (GI) tract. After you eat, your stomach turns food into a liquid. Then, the liquid drains into your small intestine. Within your small intestine, fat and some vitamins are absorbed into lymph vessels. This fatty lymph, called chyle, travels in lymph vessels to the bloodstream.

### Lymphoid tissues

Lymph and lymphoid tissue have high numbers of lymphocytes. Lymphocytes are a type of white blood cell. They are part of the immune system and help to fight germs. The three types of lymphocytes are B cells, T cells, and natural killer cells.

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Lymph nodes are organized masses of lymphoid tissue. As lymph travels, it passes through and is filtered by lymph nodes. There are hundreds of lymph nodes throughout your body. **See Figure 1.** High numbers of lymph nodes exist in the middle of your chest, neck, armpit, groin, pelvis, and along your gut.

Other lymphoid tissues include the spleen, tonsils, and thymus. The spleen filters and kills germs in blood. Tonsils kill germs in lymph that enter through your mouth and nose. In children, the thymus stores T cells until they are able to fight germs. There are also small clumps of lymphoid tissue in your gut, thyroid, breasts, lungs, eyes, and skin.

## A disease of cells

Your body is made of trillions of cells. Cancer is a disease of cells. There are many types of cells, so there are many types of cancers. Despite many types, all cancers share some common features. More research is needed to learn how cancers begin and worsen over time.

### Lymphoma

Each type of cancer is named after the normal cell from which it formed. Lymphoma is a cancer of lymphocytes within the lymph system. There are two main types of lymphomas. Hodgkin lymphoma is defined by the presence of Reed-Sternberg or related cells. Non-Hodgkin's lymphomas include all the other types of lymphomas.

#### Follicular lymphoma

Follicular lymphoma is a type of non-Hodgkin's lymphoma. It is a cancer of B cells. There are

**Figure 1**  
**Lymph system**

The lymph (or lymphatic) system kills germs in the body and collects and transports lymph to the bloodstream.

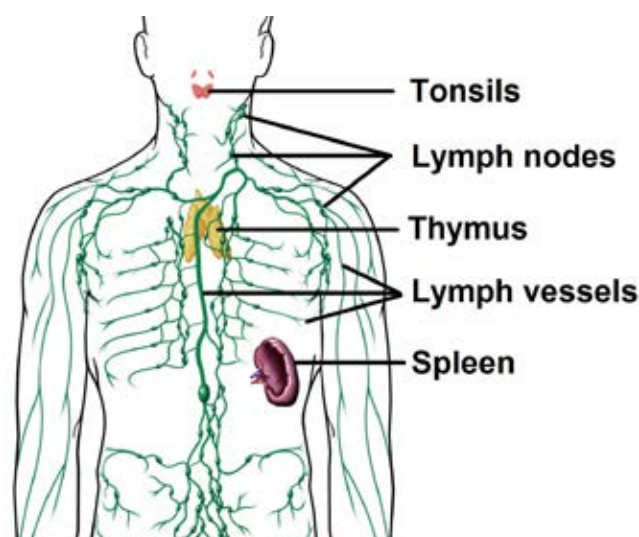


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many types of B cells and, thus, many B-cell cancers.

Follicular lymphoma is formed from B cells within germinal centers of lymph nodes. Germinal centers have a dark and light zone. In the dark zone, B cells are called centroblasts. B cells in the light zone are called centrocytes.

Follicular lymphoma is named for where this cancer grows and how it looks. Germinal centers form within the follicles of lymph nodes. On a related note, follicular lymphoma almost always grows in a follicular pattern. This pattern has the shape of a circle.

### Cancer cells

When needed, normal cells grow and then divide to make new cells. When old or damaged, they die. Normal cells also stay in place.

Cancer cells don't behave like normal cells. They make new cells that aren't needed. They die slowly when old or damaged. They can spread far through blood or lymph.

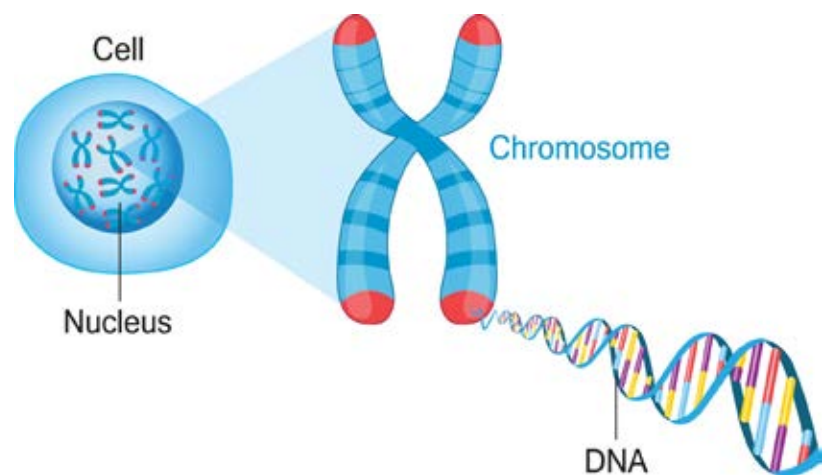
With lymphoma, cancer cells often build up in lymph nodes. They can grow through the lymph node and into nearby structures. Follicular lymphoma has often widely spread throughout the lymph system by diagnosis. It can spread to other body parts like the bone, skin, GI tract, and lung.

### Genetic changes

Many abnormal changes are needed for a cancer cell to form. These changes often include damage to the genetic information in a cell. Genetic information is passed down from parents to a child. It tells cells what to do. It is found within a part of a cell called the nucleus, as shown in **Figure 2**.

### Figure 2 Genetic information

**Most human cells contain genetic information. The information tells cells how to build your body and make it work. It is stored in DNA. A gene is a small segment of DNA that contains complex instructions. DNA is not one long strand but a set of 46 strands. Each strand is carried and protected in a chromosome.**



Genetic information is stored in DNA (or deoxyribonucleic acid). A gene is a small segment of DNA with complex instructions. Forty-six chromosomes carry and protect a long strand of DNA. In other words, DNA is like a how-to book that contains many complex paragraphs in its 46 chapters.

For most people, genetic changes that start cancer occur after birth. These changes are found only in the cancer cells. Much less often, people are born with genetic errors that promote cancer. These errors are present in all cells.

Cancer can cause genetic changes that support its growth. These changes occur only in the cancer cells. There can be abnormal changes to the DNA structure, genes, and chromosomes. Sometimes, the genetic changes produce an abnormal protein that drives cancer growth.



My family and friends are very supportive. I would hate to go through this without them.

– Madeleine  
Survivor, age 81

## Tests for follicular lymphoma

Follicular lymphoma is often a slow-growing cancer. It may take years before signs and symptoms appear. One of the first signs of follicular lymphoma may be a swelling of lymph nodes. These nodes may be in your neck, armpit, or groin area. Another sign may be an enlarged spleen. Tests needed to confirm (diagnose) follicular lymphoma are described next.

### Biopsy

The only way to know if you have cancer is to test tissue or fluid. A biopsy is a procedure that removes samples of fluid or tissue for testing. There are many types of biopsies.

For B-cell lymphomas, NCCN experts advise getting an incisional or excisional biopsy. These biopsies remove tissue through a cut into your skin. An incisional biopsy removes only a part of the tumor. An excisional biopsy removes the whole tumor and not much else.

Other biopsy methods remove very small samples with a needle. Fine-needle aspiration (FNA) removes a small group of cells. A core needle biopsy removes a solid tissue sample.

Needle biopsies are not the best method for diagnosing lymphoma. Only in certain cases, a core needle biopsy may be used to obtain samples. For hard-to-reach lymph nodes, FNA and core needle biopsies may be used to obtain samples.

### Hematopathology review

Tissue samples will be sent to a doctor called a hematopathologist. These doctors are experts at diagnosing cancers of blood and immune cells. They spend much of their time working

with samples of blood, bone marrow, and lymph nodes.

There are many cancers of B cells. Knowing which type you have is very important so you get the right treatment. The hematopathologist will suspect follicular lymphoma if there is a follicular growth pattern. He or she will look for centroblasts and centrocytes. The hematopathologist will perform protein tests and maybe genetic tests.

### Protein tests

The hematopathologist will study the proteins on the surface and inside of cancer cells. **See Figure 3.** This is called immunophenotyping. It is done to assess the type of cancer. Follicular lymphoma has common patterns or a “signature” of proteins.

An immunohistochemistry (IHC) panel can be used to assess for CD3, CD5, CD10, CD20,

BCL2, BCL6, and CD21 or CD23. Sometimes, it is helpful to include Ki-67, IRF4/MUM1, and cyclin D1 in the panel. Flow cytometry may be done, too. If done, it should test for CD5, CD10, CD19, CD20, CD23, and kappa and lambda light chain proteins.

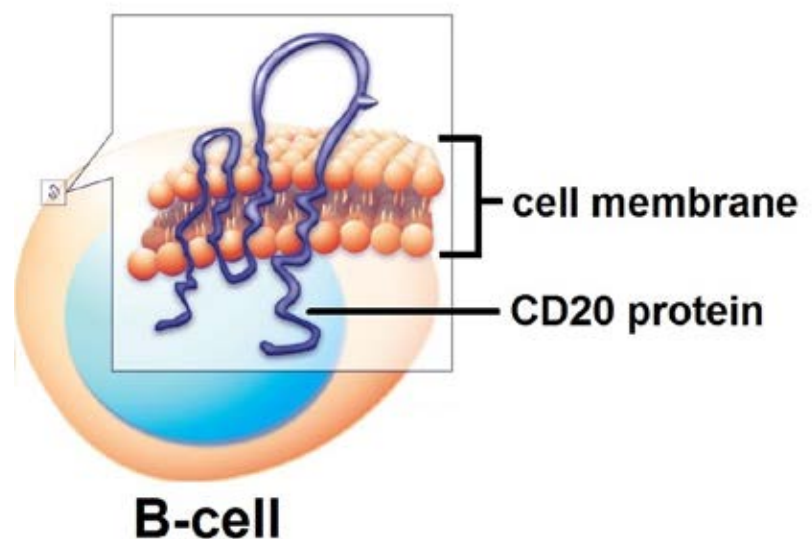
### Genetic tests

Follicular lymphoma has common abnormal changes in chromosomes and genes. At times, it may help to test for certain changes. The results can be used for diagnosis and prognosis. Prognosis is the expected outcome of the cancer.

A translocation is a switching of parts between two chromosomes. Your doctor may want to test for a translocation between chromosomes 14 and 18. Karyotype or fluorescence in situ hybridization (FISH) is the lab test used to assess for translocations.

### Figure 3 Protein tests

Follicular lymphoma has common patterns of proteins in its cells. Immunophenotyping is the process of identifying the proteins in cells.



Derivative work of NIAID - Rituxima Binding to CD20 on a B Cell Surface, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=39933221>



A gene rearrangement is the fusion of two genes that creates a new gene. Your doctor may want to test for antigen receptor and *BCL2* rearrangements. These rearrangements are assessed by molecular analysis. It may be helpful to test for *BCL6* and *IRF4* rearrangements. The FISH test is used.

A deletion is a missing part within genetic information. Your doctor may want to test for a missing part in a chromosome region called *1p36*. The FISH test is used.

### Cancer grade

The hematopathologist will assign a cancer grade. Grading of follicular lymphoma is based on the number of centroblasts seen when the microscope is at its highest power. Grade 1–2 is defined by 15 or fewer centroblasts per high-power field. Grade 3 is defined by more than 15 centroblasts per high-power field.

Grade 3 is further divided into 3A and 3B. Grade 3A is defined by a mix of centrocytes and centroblasts. Grade 3B is defined by sheets of large centroblasts and no centrocytes. Grade 3 follicular lymphoma is often treated as diffuse large B-cell lymphoma (DLBCL).

## Pathology report

Lab results used for diagnosis are included in a pathology report. This report will be sent to your doctor. Ask for a copy. Your doctor will review the results with you. Take notes and ask questions.

## IN DEPTH

## Subtypes of follicular lymphoma

Follicular lymphoma often has classic features that make it easy to diagnose. But, there are subtypes that make diagnosis harder and are treated differently. It is important to obtain a biopsy sample that is large enough to get the right diagnosis.

**Typical follicular lymphoma**

Typical follicular lymphoma is almost always composed of centrocytes and centroblasts. It grows in a follicular pattern. It can involve lymph nodes from any region of the body.

Follicular lymphoma cells often have BCL2, BCL6, CD10, and CD20 but not CD5 or CD43. BCL2 and CD10 are more likely to be missing if the cancer is grade 3. CD23 is found on some but not all cells. Cyclin D is absent.

Doctors decide the prognosis partly based on the cancer grade. Besides the grade, doctors sometimes use Ki-67. Ki-67 greater than 30% may suggest the cancer will worsen quickly.

A translocation involving chromosome 18 is present in almost all follicular lymphomas. The most common of these is t(14;18). It is less often present in grade 3 cancer.

Follicular lymphoma can have *BCL6* rearrangements. Unlike t(14;18), *BCL6* rearrangements occur more often in higher-grade cancer.

**Follicular lymphoma with 1p36 deletion**

Follicular lymphoma with 1p36 deletion often presents as one large tumor within the groin. It mostly has a diffuse growth pattern. The cells have CD23 and are grade 1–2. The outlook is good.

**Pediatric-type follicular lymphoma**

Pediatric-type follicular lymphoma (PTFL) occurs most often in children but some adults get it, too. Your doctor may suspect PTFL if the cancer cells lack BCL2 or t(14;18). Testing for *BCL6* rearrangements may help guide diagnosis.

**Follicular lymphoma with *IRF4* rearrangement**

Most lymphomas with *IRF4* rearrangement are diffuse large B-cell lymphoma (DLBCL). At times, there is a mix of cell types (ie, DLBCL with follicular lymphoma grade 3B). Less often, these lymphomas are only follicular lymphoma grade 3B. All lymphomas with *IRF4* rearrangement (or related *MUM1*) should be treated as DLBCL.

## Treatment types

This section briefly describes treatments for follicular lymphoma. Not everyone receives the same treatment. Your doctor will tailor treatment to you based on tests described in this chapter and in **Part 2**. Treatment options based on features of the cancer are listed in **Part 3** and **Part 4**.

### Clinical trial

One treatment choice may be a clinical trial. Joining a clinical trial is strongly supported by NCCN. NCCN believes that you will receive the best management if treated in a clinical trial.

A clinical trial is a type of research that studies a promising test or treatment in people. It gives people access to health care that otherwise couldn't usually be received. Ask your treatment team if there is an open clinical trial that you can join.

### Antibody treatment

Antibodies are proteins of the immune system. They help your body fight germs and other threats. Monoclonal antibodies can be made in a lab to treat certain types of cancer.

Rituximab and obinutuzumab are antibody treatments for follicular lymphoma. They attach to a surface protein on cells called CD20. They mark the cells so that your immune system can find and destroy them. They may directly kill cells, too.

### Chemotherapy

Chemotherapy works by damaging and killing cancer cells. It can also cause cells to destroy themselves. Chemotherapy is often used with rituximab to treat follicular lymphoma. This combined treatment is called chemoimmunotherapy.

There are many types of chemotherapy used to treat follicular lymphoma. Vincristine and etoposide belong in a class of drugs called vinca alkaloids. Doxorubicin belongs in the class of drugs called anthracyclines. Bendamustine, cyclophosphamide, and ifosfamide belong to a class of drugs called alkylating agents. Methotrexate and cytarabine belong to a class of drugs called antimetabolites.

### Corticosteroids

Corticosteroids are a class of drugs that are often used to relieve inflammation. They also are toxic to lymphoma cells. Prednisone and dexamethasone are the two main corticosteroids used for treatment. They are part of some chemoimmunotherapy regimens.

### Kinase inhibitors

Within cells, kinases are part of many chemical pathways, some of which control cell growth. They change the action of proteins by attaching phosphates to them. Kinase inhibitors are drugs that stop kinases within cancer cells.

Kinase inhibitors for follicular lymphoma target a kinase called PI3K. Idelalisib targets one form of PI3K called delta. Duvelisib targets two forms of PI3K—delta and gamma. Copanlisib mainly targets alpha and delta PI3K.

### Immunomodulators

Immunomodulators are drugs that modify some parts of the immune system. Lenalidomide is an immunomodulator that is used to treat follicular lymphoma. Rituximab may be received with lenalidomide.

### Radioimmunotherapy

Ibrutinomab tiuxetan is a radioimmunotherapy drug used for follicular lymphoma. It consists of a monoclonal antibody attached to a radioactive

atom (yttrium-90). Ibritumomab is like rituximab as far as attaching to CD20. Once attached to a cell, it releases radiation that kills the cell and nearby cells.

### CAR T-cell immunotherapy

Tisagenlecleucel and axicabtagene ciloleucel are made from your own T cells. Your T cells will be removed from your body, and in the lab, chimeric antigen receptor (CAR) will be added to them. This programs the T cells to find lymphoma cells. The CAR T cells will be infused back into your body to find and kill cancer cells.

### Radiation therapy

Radiation therapy uses high-energy x-rays to treat follicular lymphoma. The x-rays damage DNA in cancer cells. This either kills the cancer cells or stops new cancer cells from being made. Limited areas of follicular lymphoma may be treated with involved-site radiation therapy (ISRT).

### Stem cell transplant

This treatment is also called a hematopoietic cell transplant. It replaces damaged or destroyed stem cells with healthy stem cells. The healthy stem cells form new bone marrow and blood cells. There are two types of transplants.

An autologous transplant is also called high-dose therapy with autologous stem cell rescue (HDT/ASCR). First, your healthy stem cells will be removed. You will then receive chemotherapy to kill the cancer cells. It will also kill the blood-producing cells in the bone marrow. Your healthy stem cells will then be returned to “rescue” your bone marrow.

An allogeneic transplant uses healthy stem cells from a donor. You’ll first receive treatment

called conditioning to kill your bone marrow cells. Next, you’ll receive the donor cells. These cells will form new, healthy bone marrow. They will also attack cancer cells that weren’t killed by prior treatment.

## Review

- The lymph system consists of lymph and a network of vessels and organs. It helps kill germs in the body and transports fluids to the bloodstream.
- Lymphomas are cancers of lymphocytes within the lymph system. Follicular lymphoma is a cancer of lymphocytes called B cells. It is formed from B cells within germinal centers of lymph nodes.
- An incisional or excisional biopsy is often needed to diagnose B-cell lymphoma.
- Biopsy samples should be tested by a hematopathologist. The hematopathologist will perform a number of tests that assess for cell type, surface proteins, and maybe genetics.
- There are many types of treatment for follicular lymphoma. Clinical trials give people access to new tests and treatments that they otherwise couldn’t have received. Other treatments include antibody treatment, chemotherapy, corticosteroids, kinase inhibitors, immunomodulators, radioimmunotherapy, CAR T-cell immunotherapy, radiation therapy, and stem cell transplant.

# 2

## Treatment planning

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Your doctors want to learn all about the lymphoma you have. This chapter describes who should receive which tests before cancer treatment. It also describes other types of care needed before treatment.

Doctors plan treatment using many sources of information. These sources include the health care listed in [Guide 1](#). Another source is you. Tell your doctor your concerns and goals for treatment. Together, you can share in the decision-making process. Read **Part 5** to learn more about making treatment decisions.

## Medical history

Your doctor will ask about any health problems and their treatment during your lifetime. Be prepared to tell what illnesses, injuries, and health conditions you have had. It may help to bring a list of old and new medicines to your doctor's office.

Symptoms are a part of your medical history. Some symptoms of follicular lymphoma are tiredness, a feeling of fullness in your belly, and getting sick. This cancer may also cause "B symptoms." It's important that your doctor knows if you have them. These symptoms include fevers, night sweats, and weight loss without dieting.

Some cancers and other health conditions can run in families. Thus, your doctor will ask about the medical history of your close blood relatives. Such family includes your siblings, parents, and grandparents. Be prepared to tell who has had what diseases and at what ages.

## Guide 1. Health care before cancer treatment

### Must haves

- Medical history
- Physical exam with performance status
- CBC with differential
- Comprehensive metabolic panel
- LDH
- Hepatitis B tests
- Diagnostic CT with contrast, whole-body PET/CT, or both
- Bone marrow biopsy and aspiration
- Pregnancy test if you can have babies

### Sometimes useful

- Uric acid
- Beta-2 microglobulin
- SPEP, quantitative immunoglobins, or both
- Hepatitis C tests
- Echocardiogram or MUGA scan if certain chemotherapy is planned
- Neck CT with contrast
- Fertility support if wanted

## Physical exam

A physical exam is a study of your body. It is done to look for signs of disease. It is also used to help assess what treatments may be options.

To start, your basic body functions will be measured. These functions include your temperature, blood pressure, and pulse and breathing rate. Your weight will also be checked.

Your doctor will listen to your lungs, heart, and gut. He or she will also assess your eyes, skin, nose, ears, and mouth. Your doctor will feel parts of your body. This is done to see if organs are of normal size, are soft or hard, or cause pain when touched. Cancer and other health conditions can cause organs to become enlarged and hard.

### Enlarged structures

The size of certain parts of your body should be checked. Follicular lymphoma is often found in lymph nodes. Thus, areas with lots of lymph nodes should be examined. High numbers of lymph nodes exist in the middle of your chest, neck, throat, armpit, groin, pelvis, and along your gut. Other parts of your body that should be checked include your spleen and liver.

### Performance status

Your doctor will also rate your performance status. Performance status is your ability to do daily activities. It is used by doctors to assess if you can have certain treatments.

## Blood tests

Doctors test blood to look for signs of disease. Blood tests are also used to learn if cancer treatment is needed now. Blood tests require a sample of your blood. Blood samples can be removed with a blood draw.

### Blood draw

Some blood draws require no eating and drinking for hours. Your doctor will say if you can eat or drink. Blood samples will be removed from a vein with a needle.

### CBC with differential

A complete blood count (CBC) measures parts of the blood. Test results include counts of white blood cells, red blood cells, and platelets. Cancer and other health problems can cause low or high counts.

There are several types of white blood cells. A differential counts the number of each type of cell. It also checks if the counts are in balance with each other.

### Comprehensive metabolic panel

Chemicals in your blood come from your liver, bone, and other organs. A comprehensive metabolic panel often includes tests for up to 14 chemicals. The tests show if the levels of chemicals are too low or high. Abnormal levels can be caused by cancer or other health problems.

### LDH

Lactate dehydrogenase (LDH) is a protein that is in most cells. It gets into your blood when a cell is damaged. Thus, a high level of LDH is a sign of cell damage. High levels can be caused by a fast-growing cancer or other health problems. Doctors use LDH levels to predict the outcome of the cancer.

### Beta-2 microglobulin

Beta-2 microglobulin is a small protein found on most cells. It is released by cells into the blood, especially by B cells. High levels can be caused by a fast-growing cancer or other health problems. Your doctor may test for beta-2 microglobulin to predict the outcome of the cancer.

### Uric acid

Uric acid is released by cells when DNA breaks down. Too much uric acid in the body is called hyperuricemia. You may have a high level of uric acid before starting treatment. Levels can be high due to fast-growing cancer, kidney disease, or other health problems.

### Antibody testing

Antibodies (also called immunoglobulins) are proteins that are made by B cells. B cells release antibodies into the blood to protect you from germs like viruses and bacteria. There are three major types of antibodies in blood—IgG, IgA, and IgM.

Some people with follicular lymphoma have low levels of antibodies before cancer treatment. They may be sick often. The low levels may even further drop during cancer treatment. Testing of antibodies can help your doctors know if you need treatment to prevent or cure an infection. Testing will also show whether you will need immunoglobulin replacement therapy.

### Quantitative immunoglobulins

Quantitative immunoglobulins is a test that measures the amount of each type of antibody. Testing will show if the level of any type of antibody is too high or too low.

### SPEP

Serum protein electrophoresis (SPEP) is a test that measures the amount of monoclonal

immunoglobulins. People with follicular lymphoma sometimes have very high amounts of tumor-specific immunoglobulins. This may cause a “monoclonal” spike on the SPEP test. The antibodies in a monoclonal spike are all copies (clones) of one type of antibody. If you do not have all five types of antibodies, your body will not be able to fight illnesses well.

## Hepatitis tests

Hepatitis B and hepatitis C can become active again while taking chemoimmunotherapy. These infections often need treatment even if they are causing few symptoms. Tell your treatment team if you have hepatitis. If you're unsure, testing is advised. A sample of your blood is needed for testing.

## Heart tests

Some cancer treatments can damage your heart. To plan treatment, your doctor may test how well your heart pumps blood. You may get an echocardiogram or multigated acquisition (MUGA) scan. An echocardiogram uses sound waves to make pictures of your heart. A MUGA scan makes pictures using a radiotracer and special camera.

## Imaging

Imaging makes pictures of the insides of your body. It can show which body parts have cancer. A radiologist is a doctor who is an expert in reading images. He or she will convey the test results to your doctor.

### Diagnostic CT

Computed tomography (CT) takes many pictures of a body part from different angles using x-rays. **See Figure 4.** A computer combines the x-rays to make detailed pictures. A contrast dye should be used. It makes the pictures clearer.

A CT scan of your chest, belly area, and between your hip bones is needed. A CT of your neck is sometimes useful to learn if cancer is present.

### Whole-body PET/CT

CT can be combined with positron emission tomography (PET). This imaging is called a PET/CT scan. PET shows how your cells are using a simple form of sugar (glucose). Contrast should be used with CT.

Whole-body PET/CT may be given in addition to or instead of CT. It can show the presence of cancer when other tests do not. It is an essential test if you will be treated with radiation for early cancer. Your doctor will want to be sure that the cancer is not widespread.

**Figure 4**  
**CT machine**

**Pictures of the insides of your body can be made with imaging. During the scan, you will lie on a table that will move into the tunnel of the machine. The pictures will be viewed by a doctor who will look for signs of cancer.**



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## Bone marrow exam

A bone marrow exam can be very helpful. It isn't needed to diagnose follicular lymphoma. But, your doctor may order it to confirm there's no cancer in the bone or marrow before starting treatment.

A bone marrow exam consists of two procedures. A bone marrow aspiration removes a small amount of liquid bone marrow. A bone marrow biopsy removes a sample of bone and soft bone marrow.

Often, these procedures are done at the same time. They are performed on the back of hip bone. You may receive a light sedative beforehand.

## Fertility and pregnancy

Some cancer treatments can limit your ability to have a baby. If you want the choice of having babies after treatment or are unsure, tell your doctors. It may also help to talk with a fertility specialist before you begin cancer treatment.

A fertility specialist is an expert in helping men and women have babies. The fertility specialist can discuss with you how to have a baby after treatment. Some methods of fertility preservation are discussed next. If you are of childbearing age, important information on pregnancy is also addressed.

### **Sperm banking**

Men who want to have children after cancer treatment can use sperm banking. Sperm banking stores semen for later use. This is done by freezing semen with sperm in liquid nitrogen. Talk to your treatment team about the costs of and how well sperm banking works.

### **Egg freezing**

Like sperm banking, a woman's eggs can be removed, frozen, and stored for later use. Your frozen eggs can be fertilized with sperm beforehand. Also, a part of your ovary that contains eggs can be frozen and stored.

### **Pregnancy test**

Some cancer treatments can harm an unborn baby. Get a pregnancy test before treatment if you may be pregnant now. Your treatment options will depend on the results.

### **Birth control**

During treatment, take steps to avoid getting pregnant. Your doctors can tell you which birth control methods are best to use.



## Review

- ▶ Your doctor will ask you about any health problems and treatments you've had in your lifetime. Tell your doctor if you have recently had fevers, night sweats, and weight loss without dieting. These can be symptoms of follicular lymphoma.
- ▶ Your doctor will study your body to assess your health. He or she will check the size of your lymph nodes and organs. Your doctor will also rate your ability to do everyday activities.
- ▶ Blood tests will be done to look for signs of a fast-growing cancer and other health problems.
- ▶ Tests for hepatitis B or C may be needed in order to safely receive strong cancer treatments.
- ▶ You may undergo heart tests to see if you are healthy enough to have certain cancer treatments.
- ▶ Imaging tests allow your doctors to see inside your body without cutting into it. CT, whole-body PET/CT, or both are needed. Contrast should be used with CT.
- ▶ A bone marrow biopsy removes a piece of bone and marrow to test for cancer cells. An aspirate removes liquid marrow. These tests may be helpful before starting treatment.
- ▶ Talk to a fertility specialist to learn about ways to have babies after cancer treatment. If you may be pregnant, get a pregnancy test now. Some cancer treatments can harm unborn babies.

# 3

## Treatment guide: Slow-growing follicular lymphoma

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This chapter presents the treatment options for follicular lymphoma that is slowly growing. It also reviews supportive care. Discuss with your doctor which options are right for you.

## Overview

This chapter covers treatment for follicular lymphoma that is grade 1–2. These lymphomas often grow slowly. It also has a short section on pediatric-type follicular lymphoma (PTFL). PTFL may have higher-grade cells but grows slowly.

Follicular lymphoma that is grade 3A or 3B grows fast. It is usually treated like diffuse large B-cell lymphoma (DLBCL). Likewise, lymphomas with *IRF4* rearrangements (or related *MUM1*) should also be treated as DLBCL. Click this link to read about treatment options for DLBCL: [nccn.org/patients/guidelines/cancers.aspx#nhldiffuse](https://www.nccn.org/patients/guidelines/cancers.aspx#nhldiffuse).

Treatment of follicular lymphoma includes treatment of the cancer and support for you. At this time, slow-growing follicular lymphoma is not often cured. Instead, the aim of treatment is to reduce symptoms, control the cancer, and extend life. Most people with slow-growing follicular lymphoma live for years after diagnosis.

### Initial treatment

It can take many years for follicular lymphoma to become a problem. When treatment is needed, your doctor will plan treatment based on many factors. These factors include your age and level of fitness. Your doctor will also plan treatment based on the cancer. A very important factor is the cancer stage.

### Cancer stage

The cancer stage describes the extent of cancer in the body. It is often based on blood tests, imaging, and biopsy results. The Lugano modification of the Ann Arbor Staging System is used for most lymphomas. In this system, there are five stages, which are:

- Stage I
- Stage II
- Stage II bulky
- Stage III
- Stage IV

Less often, follicular lymphoma is stage I or II at diagnosis. The extent of these cancers is limited. They involve lymph nodes or an organ on one side of the diaphragm. Stage II bulky is stage II with a large tumor.

Most often, follicular lymphoma is stage III or IV at diagnosis. The extent of these cancers is advanced. Stage III cancers involve 1) lymph nodes on both sides of the diaphragm; or 2) lymph nodes above the diaphragm and the spleen. Stage IV cancers have widely spread outside of the lymph system.

### Treatment response

Testing will be done to assess treatment outcomes. These tests include PET/CT. Contrast should be used with the CT scan.

Tests done after treatment will be compared to those done before treatment. In the Lugano system, there are 4 types of treatment response.

- **Complete response** is the best result. Tests detect less cancer to the extent that suggests a good outlook (prognosis). Organs are a normal size. Bone marrow is normal.
- **Partial response** is a decrease in cancer but less so than a complete response.
- **Stable disease** is no clear change in the cancer.
- **Progressive disease** is a worsening of the cancer.

### Follow-up care

You may start follow-up care if there's a complete or partial response. During follow-up care, you will have scheduled visits with your cancer doctor a few times a year. You will receive tests to assess the status of the cancer. Your doctor will also ask about any health problems related to your cancer treatment.

### Second-line treatment

Doctors give second-line treatment for a few reasons. It is given if the cancer is stable or progresses during initial treatment. This is called refractory disease. Second-line treatment is also given to treat cancer that worsens during follow-up care. This is called a relapse. It usually takes years for follicular lymphoma to worsen after first-line treatment.

### Transformed lymphoma

Refractory and relapsed follicular lymphoma can change into a faster-growing cancer. It may change into DLBCL. When it changes, it is called transformed follicular lymphoma.

Treatment for transformed lymphoma is covered in **Part 4**. If the cancer has not transformed, options for second-line treatment are listed in this chapter.

### Supportive care

Cancer and its treatment may cause health problems. You may be treated to prevent or control these health problems. This treatment is a part of supportive care. Work with your doctor to create a supportive care plan that is best for you.



I was very fortunate in that I did not have many side effects from my treatment. I took nausea meds for a few days, then was fine. Not much curtailing of activities.

– Madeleine

Survivor, age 81

## Initial treatment

The options for initial treatment are listed in [Guide 2](#). They are grouped by cancer stages. The treatment goals and process can differ between stages.

### Stages I and II

Treatment for stages I and II is often started right away. For a small group of people, the cancer may be cured. For many others, growth of the cancer can be controlled for a long period of time.

#### ISRT

ISRT stands for involved-site radiation therapy. It can treat very limited cancers. The cancer must be either stage I or II and smaller than 7 cm. If there's more than one area with cancer, the areas must be next to each other.

ISRT can cure or provide long-term cancer control. No further treatment is needed if a complete or partial response is attained. If ISRT doesn't work, treatment used for stage III and IV may be received.

ISRT may not be an option because of the treatment site. ISRT can cause major side effects in a few parts of the body. In these cases, a watch-and-wait approach may be an option.

#### Antibody treatment

Antibody treatment is an option for larger stage I and II cancers. Rituximab can be received without other cancer drugs for treatment (ie, single agent). It can control cancer growth for a long time.

Chemotherapy may be given with either rituximab or obinutuzumab. This combined treatment is called chemoimmunotherapy.

## Guide 2. Initial treatment

### Stages I and II

#### What are the options?

- ISRT for very small cancers
- Antibody treatment
  - Chemotherapy, ISRT, or both may be added
- Watch and wait

### Stages III and IV

#### What are the options?

- Watch and wait
- First-line regimens
- Clinical trial
- ISRT for symptoms

Adding chemotherapy may control the cancer longer but does not extend life.

Antibody treatment with ISRT may be an option. Chemotherapy may be added. Adding ISRT may improve results, but more research is needed.

The results of treatment will be assessed. If you did not have ISRT, your doctor may advise it to improve a partial or no response. Otherwise, no further treatment is needed after a complete or partial response. For no response, the next step is to get treatment used for stages III and IV.

#### Watch and wait

For some people, treatment may not be started right away. Instead, a watch-and-wait approach is used to decide when to start treatment. This approach is also called observation.

## Stages III and IV

Treatment for advanced cancer greatly varies. Some people can delay treatment while other people start right away. When treatment is needed, you may have more than one option.

### Watch and wait

For a slow-growing lymphoma, you may not have to start treatment right away. Instead, you may start observation. This watch-and-wait approach may be an option if the following statements describe you:

- There are no clinical trials that you can join.
- The cancer is not causing symptoms.
- The cancer is not limiting organs from working.
- The cancer is not causing low blood cell counts.
- The cancer has not grown large or spread far.
- The cancer has not increased your spleen size.
- The cancer is not growing fast or steadily.

Research has shown that starting treatment now does not treat the cancer any better. Your length of life will not be extended. During observation, your doctor will look for signs to start treatment.

### First-line regimens

Your options for the first-line regimen will be partly based on your age and health. Preferred options for fit adults include chemoimmunotherapy and lenalidomide with rituximab. The preferred option for frail adults is rituximab.

## IN DEPTH First-line regimens

First-line regimens often consist of multiple drugs. They can be very complex. Ask your doctor about the details of your treatment. Which drugs will be given and at what doses? On which days will treatment be given? How many weeks will treatment last?

### Fit adults

#### Preferred regimens

- Bendamustine and (obinutuzumab or rituximab)
- CHOP and (obinutuzumab or rituximab)
- CVP and (obinutuzumab or rituximab)
- Lenalidomide and rituximab

#### Other regimens

- Rituximab

### Frail adults

#### Preferred regimens

- Rituximab

#### Other regimens

- Chlorambucil and rituximab
- Cyclophosphamide and rituximab
- Chlorambucil
- Cyclophosphamide
- Ibritumomab tiuxetan



After the first-line regimen, your doctor may advise receiving more treatment. Consolidation treatment is given to improve the results of a first-line regimen. Options for consolidation are rituximab or ibritumomab tiuxetan. Maintenance treatment is given to increase the amount of time until the cancer comes back. Options for maintenance are rituximab or obinutuzumab.

#### Clinical trial

A clinical trial may be an option. Ask your doctor if there's a clinical trial that is right for you. A clinical trial may test which current treatment is best or may test a new treatment.

#### ISRT

For stages III and IV, ISRT is used to relieve symptoms of cancer. It may be part of your treatment plan in addition to cancer drugs. It can also be used alone.

## Follow-up care

Follow-up care is started after a partial or complete response is achieved. [Guide 3](#) lists the types of and schedule for follow-up care. However, this care may be received whenever there are signs or symptoms of cancer.

CT is the standard imaging test used during follow-up. Scans of your chest, abdomen, and pelvis with contrast are advised. PET/CT may clarify if a mass found by CT is cancer or just scar tissue. It is also used if CT can't detect the cancer, such as cancer in bone.

## Guide 3. Follow-up care

Type of care	How often is this care needed?
Medical history and physical exam	Every 3–6 months for 5 years <ul style="list-style-type: none"> <li>• If normal for 5 years, repeat every year or when needed</li> </ul>
CBC, chemistry panel	Every 3–6 months for 5 years <ul style="list-style-type: none"> <li>• If normal for 5 years, repeat every year or when needed</li> </ul>
CT scan	Not more often than every 6 months for 2 years <ul style="list-style-type: none"> <li>• If normal for 2 years, repeat no more often than every year</li> </ul>

## Second-line treatment

Options for second-line treatment are listed in [Guide 4](#). Like initial treatment, you may not have to start treatment right away. Instead, a watch-and-wait approach is used to decide when to start treatment. When treatment is needed, your doctor may want you to get a PET/CT scan.

There are three treatment options. The first option is a second-line regimen. It may consist of one or more of these drugs: an antibody, chemotherapy, a kinase inhibitor, radioimmunotherapy, or an immunomodulator. Other options are a clinical trial or radiation therapy to relieve cancer symptoms.

After a second-line regimen, your doctor may advise receiving more treatment. Rituximab or obinutuzumab may be received for maintenance. For consolidation, a stem cell transplant is an option. An autologous transplant is more commonly used for follicular lymphoma. For some people, an allogeneic transplant is an option.

### Guide 4. Second-line treatment

#### What are the options?

- Watch and wait
- Second-line regimens
- Clinical trial
- ISRT for cancer symptoms

## IN DEPTH Second-line regimens

Second-line regimens are used for refractory and relapsed cancer. Your options depend on your level of fitness, prior treatment, and length of time to relapse.

### Fit adults

#### Preferred regimens

- Bendamustine and (obinutuzumab or rituximab)
- CHOP and (obinutuzumab or rituximab)
- CVP and (obinutuzumab or rituximab)
- Rituximab
- Lenalidomide with or without rituximab

#### Other regimens

- Ibritumomab tiuxetan
- Idelalisib (if two prior regimens failed)
- Copanlisib (if two prior regimens failed)
- Duvelisib (if two prior regimens failed)
- Second-line treatment used for diffuse large B-cell lymphoma

### Frail adults

#### Preferred regimens

- Rituximab

#### Other regimens

- Chlorambucil and rituximab
- Cyclophosphamide and rituximab
- Chlorambucil
- Cyclophosphamide
- Ibritumomab tiuxetan

## Supportive care

Supportive care aims to improve your quality of life. It is sometimes called palliative care. It's important for everyone, not just people at the end of life. Talk with your treatment team to plan the best supportive care for you.

Supportive care can address many needs. It can prevent or relieve emotional or physical symptoms. It can also help with making treatment decisions. Supportive care also includes help with coordination of care between health providers.

### Treatment side effects

All cancer treatments can cause unwanted health issues. Such health issues are called side effects. Some side effects may be harmful to your health. Others may just be unpleasant.

Side effects differ between people. Some people have side effects while others have none. Some people have mild side effects while others have severe effects. Side effects depend on the treatment type, length or dose of treatment, and the person.

Most side effects appear shortly after treatment starts and will stop after treatment. However, other side effects are long-term or may appear years later. Ask your treatment team for a complete list of side effects of your treatments.

Tell your treatment team about any new or worse symptoms you get. There may be ways to help you feel better. There are also ways to prevent some side effects.



## Adults with pediatric-type follicular lymphoma

Pediatric-type follicular lymphoma (PTFL) occurs most often in children, but some adults get it, too. It often occurs in the head and neck region. It is stage I or II.

Excision is a type of surgery that removes the tumor and not much else. NCCN experts prefer this option for PTFL. Another option is ISRT. If neither surgery or ISRT are options, you may receive chemoimmunotherapy. The regimen that is used is called RCHOP.

After radiation or chemotherapy, PET/CT is used to assess the cancer stage again. If there is a complete response, start follow-up care. Follow-up imaging is not needed when the outlook is good. If a complete response wasn't attained, second-line treatment is an option.

## Review

- ▶ The goal of treatment is to achieve a complete response and stop the cancer from growing.
- ▶ Treatment options are partly based on the cancer stage.
- ▶ Small stage I or II cancers may be treated with radiation therapy. Larger stage I or II cancers may be treated with antibody treatment. Chemotherapy, ISRT, or both may be added.
- ▶ For stages III and IV, treatment may not be needed right away. When treatment is needed, chemoimmunotherapy is commonly received. You may receive extra treatment to improve treatment results.
- ▶ Follow-up care may include a medical history, physical exam, blood tests, and imaging.
- ▶ If initial treatment doesn't work or the cancer relapses, you may receive the same or a different type of treatment. Options for second-line treatment include one or more of these drugs: an antibody, chemotherapy, a kinase inhibitor, radioimmunotherapy, or an immunomodulator.
- ▶ Supportive care is an important part of your cancer care. It can help prevent or reduce side effects of treatment.

# 4

## Treatment guide: Transformed follicular lymphoma

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This chapter presents the tests and treatment options for transformed follicular lymphoma. Discuss with your doctor which options are right for you.

Follicular lymphoma sometimes changes into diffuse large B-cell lymphoma (DLBCL). Doctors call this transformed lymphoma. Only a few people have transformed follicular lymphoma at diagnosis. Most often, it transforms after cancer treatment but it is not caused by treatment.

## Testing

After cancer treatment, your doctor may suspect the cancer has transformed if it worsens. Signs include a cancer that is growing fast in one area or has spread outside the lymph system. Other signs are a rising LDH level and new B symptoms.

A PET scan may help detect transformed cancer. An FDG radiotracer should be used. A biopsy is needed to confirm if the cancer has transformed.

If you have had little or no chemotherapy, testing for *BCL2* and *MYC* rearrangements may be done. Lymphoma that has 1) an *MYC* rearrangement and 2) either a *BCL2* or *BCL6* rearrangement is called a “double-hit” lymphoma. If all three rearrangements are present, the cancer is a “triple-hit” lymphoma. These cancers grow faster than others.

## Treatment

Research on the treatment of transformed lymphoma is limited. The treatment listed in [Guide 5](#) is based on research when research exists. The options that are best for you depend on many factors, such as your age, health, and prior treatment.

### Clinical trial

More research on treatment of transformed lymphoma is needed. Well-designed clinical trials will show how well treatments work and which treatments are best. Ask your doctor if there is a clinical trial that is right for you.

### Chemoimmunotherapy with or without ISRT

In general, chemoimmunotherapy regimens that are used to treat DLBCL may be options. This combined treatment uses both chemotherapy and antibody treatment. ISRT may also be received to treat a certain area. ISRT stands for involved-site radiation therapy.

## Guide 5. Treatment for transformed follicular lymphoma

### What are the options?

- Clinical trial
- Chemoimmunotherapy with or without ISRT
- Ibritumomab tiuxetan
- Axicabtagene ciloleucel or tisagenlecleucel
- Stem cell transplant with or without ISRT
- ISRT
- Supportive care



If you have had little or no chemotherapy, you will likely be treated with a first-line regimen like RCHOP. If you have had more than one chemotherapy regimen, second-line regimens are options.

Double- and triple-hit lymphomas are treated as high-grade B-cell lymphomas. NCCN experts advise a clinical trial because there is so little research. Otherwise, your doctor may advise chemoimmunotherapy like DA-EPOCH-R, R-hyper-CVAD, or R-CODOX-M/R-IVAC. You may also receive treatment to prevent the lymphoma from spreading to your spinal fluid and brain.

### **Ibritumomab tiuxetan**

After first-line chemoimmunotherapy for transformed lymphoma, ibritumomab tiuxetan is an option if there was less than a complete response. It may be used for consolidation. It may also be used to treat refractory disease.

You may have had multiple lines of chemotherapy for typical follicular lymphoma. In this case, more chemotherapy may not be the best option. Instead, ibritumomab tiuxetan may be used for initial treatment of transformed lymphoma.

### **Axicabtagene ciloleucel or tisagenlecleucel**

CAR T-cell immunotherapy includes axicabtagene ciloleucel or tisagenlecleucel. You must have received two or more chemoimmunotherapy regimens in the past. You must not have received CAR T-cell therapy in the past.

### **Stem cell transplant with or without ISRT**

A stem cell transplant may be used for consolidation treatment. Consolidation is given

to improve the results of a drug regimen. ISRT may be added to treat a certain area.

There is more research on autologous transplants than for allogeneic transplants. Still, the research for either transplant is very limited for transformed lymphoma. Do not get an autologous transplant after axicabtagene ciloleucel. An allogeneic transplant is used in some cases. It can cause major side effects.

### **ISRT**

ISRT is used to treat lymphoma within a limited area. The area must not have been irradiated in the past. ISRT may be used to treat a partial response after chemoimmunotherapy for transformed lymphoma. It is also sometimes used alone for initial treatment of transformed lymphoma if prior treatment included chemoimmunotherapy.

### **Supportive care**

Supportive care aims to improve your quality of life. The goal of care is not to control cancer growth. Instead, the goal is to prevent or relieve symptoms.

## **Review**

- Sometimes, follicular lymphoma transforms into DLBCL.
- A biopsy is needed to confirm the presence of transformed lymphoma.
- Due to a lack of research, NCCN experts advise a clinical trial. Other options include chemoimmunotherapy, ISRT, radioimmunotherapy, and CAR T-cell therapy. Supportive care may be received to relieve symptoms.

# 5

## Making treatment decisions

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Having cancer is very stressful. While absorbing the fact that you have cancer, you have to learn about tests and treatments. In addition, the time you have to accept a treatment plan feels short. Parts 1 through 4 described the cancer and treatment options. Part 5 aims to help you make decisions that are in line with your beliefs, wishes, and values.

## It's your choice

The role each person wants in choosing his or her treatment differs. You may feel uneasy about making treatment decisions. This may be due to a high level of stress. It may be hard to hear or know what others are saying. Stress, pain, and drugs can limit your ability to make good decisions. You may feel uneasy because you don't know much about cancer. You've never heard the words used to describe cancer, tests, or treatments. Likewise, you may think that your judgment isn't any better than your doctors'.

Letting others decide which option is best may make you feel more at ease. But, whom do you want to make the decisions? You may rely on your doctors alone to make the right decisions. However, your doctors may not tell you which option to choose if you have multiple good options. You can also have loved ones help. They can gather information, speak on your behalf, and share in decision-making with your doctors. Even if others decide which treatment you will receive, you still have to agree by signing a consent form.

On the other hand, you may want to take the lead or share in decision-making. Most patients do. In shared decision-making, you and your doctors share information, weigh the options, and agree on a treatment plan. Your doctors know the science behind your plan but you know your concerns and goals. By working together, you are likely to get a higher quality of care and be more satisfied. You'll likely get the treatment you want, at the place you want, and by the doctors you want.

## Questions to ask your doctors

You may meet with experts from different fields of medicine. Strive to have helpful talks with each person. Prepare questions before your visit and ask questions if the person isn't clear. You can also take notes and get copies of your medical records.

It may be helpful to have your spouse, partner, family member, or a friend with you at these visits. A patient advocate or navigator might also be able to come. They can help to ask questions and remember what was said. Suggested questions to ask are listed on the following pages.

## What's my diagnosis and prognosis?

It's important to know that there are different types of cancer. Cancers with the same name can even greatly differ. Based on your test results, your doctor can tell you which type of cancer you have. Your doctor can also give a prognosis. A prognosis is a prediction of the pattern and outcome of a disease. Knowing the prognosis may affect what you decide about treatment.

1. What type of cancer do I have? From what type of cell did it form? Is this cancer common?
2. What is the cancer stage? Does this stage mean the cancer is advanced?
3. Is this a fast- or slow-growing lymphoma?
4. What tests do you recommend for me?
5. Where will the tests take place? How long will the tests take and will any test hurt?
6. What if I am pregnant?
7. How do I prepare for testing?
8. Should I bring a list of my medications?
9. Should I bring someone with me?
10. How often are these tests wrong?
11. Would you give me a copy of the pathology report and other test results?
12. Who will talk with me about the next steps? When?

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## What are my options?

There is no single treatment practice that is best for all people. There is often more than one treatment option along with clinical trial options. Your doctor will review your test results and recommend treatment options.

1. What will happen if I do nothing?
  2. Can I just carefully monitor the cancer?
  3. Do you consult NCCN recommendations when considering options?
  4. Are you suggesting options other than what NCCN recommends? If yes, why?
  5. Do your suggested options include clinical trials? Please explain why.
  6. How do my age, health, and other factors affect my options? What if I am pregnant?
  7. Which option is proven to work best?
  8. Which options lack scientific proof?
  9. What are the benefits of each option? Does any option offer a cure or long-term cancer control? Are my chances any better for one option than another? Less time-consuming? Less expensive?
  10. What are the risks of each option? What are possible complications? What are the rare and common side effects? Short-lived and long-lasting side effects? Serious or mild side effects? Other risks?
  11. How do you know if treatment is working?
  12. What are my options if treatment isn't working?
  13. What can be done to prevent or relieve the side effects of treatment?
  14. What are my chances that the cancer will relapse?
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## What does each option require of me?

Many patients consider how each option will practically affect their lives. This information may be important because you have family, jobs, and other duties to take care of. You also may be concerned about getting the help you need. If you have more than one option, choosing the option that is the least taxing may be important to you:

1. Will I have to go to the hospital or elsewhere? How often? How long is each visit?
2. What do I need to think about if I will travel for treatment?
3. Do I have a choice of when to begin treatment? Can I choose the days and times of treatment?
4. How do I prepare for treatment? Do I have to stop taking any of my medicines? Are there foods I will have to avoid?
5. Should I bring someone with me when I get treated?
6. Will the treatment hurt?
7. How much will the treatment cost me? What does my insurance cover?
8. Will I miss work or school? Will I be able to drive?
9. Is home care after treatment needed? If yes, what type?
10. How soon will I be able to manage my own health?
11. When will I be able to return to my normal activities?

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## Deciding between options

Deciding which option is best can be hard. Doctors from different fields of medicine may have different opinions on which option is best for you. This can be very confusing. Your spouse or partner may disagree with which option you want. This can be stressful. In some cases, one option hasn't been shown to work better than another. Some ways to decide on treatment are discussed next.

### Second opinion

The time around deciding a treatment is very stressful. People with cancer often want to get treated as soon as possible. They want to make their cancer go away before it spreads farther. While cancer can't be ignored, usually there is time to think about and choose which option is best for you.

You may wish to have another doctor review your test results and suggest a treatment plan. This is called getting a second opinion. You may completely trust your doctor, but a second opinion about which option is best can help.

Copies of the pathology report, imaging, and other test results need to be sent to the doctor giving the second opinion. Some people feel uneasy asking for copies from their doctors. However, a second opinion is a normal part of cancer care.

When doctors have cancer, most will talk with more than one doctor before choosing their treatment. What's more, some health plans require a second opinion. If your health plan doesn't cover the cost of a second opinion, you have the choice of paying for it yourself.

If the two opinions are the same, you may feel more at peace about treatment. If the two opinions differ, think about getting a third opinion. A third opinion may help you decide between your options. Choosing your cancer treatment is a very important decision. It can affect your length and quality of life.

### Support groups

Support groups often include people at different stages of treatment. Some may be in the process of deciding while others may be finished with treatment. At support groups, you can ask questions and hear about the experiences of other people with follicular lymphoma. If your hospital or community doesn't have support groups for people with follicular lymphoma, check out the websites on the next page.

### Compare benefits and downsides

Every option has benefits and downsides. Consider these when deciding which option is best for you. Talking to others can help identify benefits and downsides you haven't thought of. Scoring each factor from 0 to 10 can also help since some factors may be more important to you than others.

## Websites

### American Cancer Society

[cancer.org/cancer/non-hodgkin-lymphoma.html](https://cancer.org/cancer/non-hodgkin-lymphoma.html)

### Be The Match

[bethematch.org](https://bethematch.org)

### BMT InfoNet

[bmtinfonet.org](https://bmtinfonet.org)

### The Leukemia & Lymphoma Society (LLS)

[LLS.org/PatientSupport](https://LLS.org/PatientSupport)

### National Cancer Institute

[www.cancer.gov/types/lymphoma](https://www.cancer.gov/types/lymphoma)

### National Coalition for Cancer Survivorship

[canceradvocacy.org/toolbox](https://canceradvocacy.org/toolbox)

### nbmtLINK

[nbmtlink.org](https://nbmtlink.org)

### NCCN for Patients®

[nccn.org/patients](https://nccn.org/patients)

## Review

- ▶ Shared decision-making is a process in which you and your doctors plan treatment together.
- ▶ Asking your doctors questions is vital to getting the information you need to make informed decisions.
- ▶ Getting a second opinion, attending support groups, and comparing benefits and risks may help you decide which treatment is best for you.



## Words to know

### **allogeneic stem cell transplant**

A cancer treatment that replaces abnormal blood stem cells with healthy donor cells. Also called allogeneic hematopoietic cell transplant.

### **autologous blood stem cell transplant**

A cancer treatment that destroys cancer cells with intense treatment then rebuilds destroyed bone marrow with your own healthy blood stem cells. Also called high-dose therapy with autologous stem cell rescue (HDT/ASCR).

### **B cell**

A type of a white blood cell called a lymphocyte. Also called B-lymphocyte.

### **B symptoms**

Fevers, heavy night sweats, and weight loss without dieting caused by B-cell cancers.

### **beta-2 microglobulin**

A small protein made by many types of cells.

### **biopsy**

A procedure that removes fluid or tissue samples to be tested for a disease.

### **bone marrow**

The sponge-like tissue in the center of most bones.

### **bone marrow aspiration**

A procedure that removes a liquid bone marrow sample to test for a disease.

### **bone marrow biopsy**

A procedure that removes bone and solid bone marrow samples to test for a disease.

### **cancer stage**

A rating of the outlook of a cancer based on its growth and spread.

### **CAR**

chimeric antigen receptor

### **centroblast**

A type of fast-growing B cell within lymph structures.

### **centrocyte**

A type of B cell that is found within lymph structures and has a dent in its edge.

### **chemotherapy**

Cancer drugs that stop the cell life cycle so cells don't increase in number.

### **chromosome**

The structures within cells that contain coded instructions for cell behavior (genes).

### **clinical trial**

A type of research that assesses how well health tests or treatments work in people.

### **complete blood count (CBC)**

A lab test that measures the number of red blood cells, white blood cells, and platelets.

### **complete response**

An absence of all signs and symptoms of cancer after treatment.

### **computed tomography (CT)**

A test that uses x-rays from many angles to make a picture of the insides of the body.

### **consolidation**

A treatment phase to further reduce the number of cancer cells.

### **contrast**

A dye put into your body to make clearer pictures during imaging tests.

### **corticosteroid**

A drug used to reduce redness, swelling, and pain, but also to kill cancer cells.

**deoxyribonucleic acid (DNA)**

A chain of chemicals in cells that contains coded instructions for making and controlling cells.

**diagnosis**

An identification of an illness based on tests.

**diaphragm**

A sheet of muscles below the ribs that helps a person to breathe.

**differential**

A lab test of the number of white blood cells for each type.

**DLBCL**

diffuse large B-cell lymphoma

**echocardiogram**

A test that uses sound waves to make pictures of the heart.

**endoscopy**

A procedure to work inside the digestive tract with a device that is guided through natural openings.

**fertility specialist**

An expert who helps people to have babies.

**flow cytometry**

A lab test of substances on the surface of cells to identify the type of cells present.

**fluorescence in situ hybridization (FISH)**

A lab test that uses special dyes to look for abnormal chromosomes and genes.

**FNA**

fine-needle aspiration

**gastrointestinal (GI) tract**

The group of organs through which food passes after being eaten. Also called digestive tract.

**gene**

Coded instructions in cells for making new cells and controlling how cells behave.

**HDT-ASCR**

high-dose therapy-autologous stem cell rescue

**imaging**

A test that makes pictures (images) of the insides of the body.

**immune system**

The body's natural defense against infection and disease.

**immunohistochemistry (IHC)**

A lab test of cancer cells to find specific cell traits involved in abnormal cell growth.

**immunomodulator**

A cancer drug that modifies some parts of the body's disease-fighting system.

**immunotherapy**

A treatment with drugs that may help the body find and destroy cancer cells.

**involved-site radiation therapy (ISRT)**

Treatment with radiation that is delivered to lymph nodes and nearby sites with cancer.

**karyotype**

A lab test that makes a map of chromosomes to find defects.

**kinase inhibitor**

A drug that blocks the transfer of phosphate.

**lactate dehydrogenase (LDH)**

A protein that helps to make energy in cells.

**lymph**

A clear fluid containing white blood cells.

**lymph node**

A small, bean-shaped, disease-fighting structure.

**lymph system**

A network of organs and vessels that collects and transports a fluid called lymph.



**lymphocyte**

One of three main types of white blood cells that help protect the body from illness.

**lymphoma**

A cancer of white blood cells called lymphocytes that are within the lymph system.

**maintenance**

A treatment phase that is given to prolong good treatment results.

**medical history**

A report of all your health events and medications.

**monoclonal antibody**

A type of cancer drug that stops growth signals.

**multigated acquisition (MUGA) scan**

A test that uses radiation to make pictures of the heart.

**mutation**

An abnormal change.

**physical exam**

A study of the body by a health expert for signs of disease.

**positron emission tomography (PET)**

A test that uses radioactive material to see the shape and function of body parts.

**prognosis**

The likely course and outcome of a disease based on tests.

**PTFL**

pediatric-type follicular lymphoma

**quantitative immunoglobulin**

A test that measures the amount of different types of antibodies in the blood.

**radiation therapy**

A treatment that uses intense energy to kill cancer cells.

**radioimmunotherapy**

A treatment that attaches to cancer cells then releases radiation.

**relapse**

The return of cancer after a period of improvement.

**serum protein electrophoresis (SPEP)**

A test that measures how many types of antibodies are present.

**side effect**

An unhealthy or unpleasant physical or emotional response to treatment.

**spleen**

An organ to the left of the stomach that helps protect the body from disease.

**supportive care**

Health care that includes symptom relief but not cancer treatment. Also called palliative care.

**T cell**

A type of a white blood cell called a lymphocyte.

**translocation**

The switching of parts between chromosomes.

**white blood cell**

A type of blood cell that fights disease and infection.

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Fred & Pamela Buffett Cancer Center  
Omaha, Nebraska  
800.999.5465  
[nebraskamed.com/cancer](http://nebraskamed.com/cancer)

Case Comprehensive Cancer Center/  
University Hospitals Seidman Cancer  
Center and Cleveland Clinic Taussig  
Cancer Institute  
Cleveland, Ohio  
800.641.2422 • UH Seidman Cancer Center  
[uhhospitals.org/services/cancer-services](http://uhhospitals.org/services/cancer-services)  
866.223.8100 • CC Taussig Cancer Institute  
[my.clevelandclinic.org/departments/cancer](http://my.clevelandclinic.org/departments/cancer)  
216.844.8797 • Case CCC  
[case.edu/cancer](http://case.edu/cancer)

City of Hope National Medical Center  
Los Angeles, California  
800.826.4673  
[cityofhope.org](http://cityofhope.org)

Dana-Farber/Brigham and  
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Duke Cancer Institute  
Durham, North Carolina  
888.275.3853  
[dukecancerinstitute.org](http://dukecancerinstitute.org)

Fox Chase Cancer Center  
Philadelphia, Pennsylvania  
888.369.2427  
[foxchase.org](http://foxchase.org)

Huntsman Cancer Institute  
at the University of Utah  
Salt Lake City, Utah  
877.585.0303  
[huntsmancancer.org](http://huntsmancancer.org)

Fred Hutchinson Cancer  
Research Center/Seattle  
Cancer Care Alliance  
Seattle, Washington  
206.288.7222 • [seattlecca.org](http://seattlecca.org)  
206.667.5000 • [fredhutch.org](http://fredhutch.org)

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Baltimore, Maryland  
410.955.8964  
[hopkinskimmelfcancercenter.org](http://hopkinskimmelfcancercenter.org)

Robert H. Lurie Comprehensive  
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New York, New York  
800.525.2225  
[mskcc.org](http://mskcc.org)

Moffitt Cancer Center  
Tampa, Florida  
800.456.3434  
[moffitt.org](http://moffitt.org)

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800.293.5066  
[cancer.osu.edu](http://cancer.osu.edu)

O'Neal Comprehensive  
Cancer Center at UAB  
Birmingham, Alabama  
800.822.0933  
[uab.edu/onealcancercenter](http://uab.edu/onealcancercenter)

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Buffalo, New York  
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[roswellpark.org](http://roswellpark.org)

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Memphis, Tennessee  
888.226.4343 • [stjude.org](http://stjude.org)  
901.683.0055 • [westclinic.com](http://westclinic.com)

Stanford Cancer Institute  
Stanford, California  
877.668.7535  
[cancer.stanford.edu](http://cancer.stanford.edu)

UC San Diego Moores Cancer Center  
La Jolla, California  
858.657.7000  
[cancer.ucsd.edu](http://cancer.ucsd.edu)

UCSF Helen Diller Family  
Comprehensive Cancer Center  
San Francisco, California  
800.689.8273  
[cancer.ucsf.edu](http://cancer.ucsf.edu)

University of Colorado Cancer Center  
Aurora, Colorado  
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University of Michigan  
Rogel Cancer Center  
Ann Arbor, Michigan  
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[rogelcancercenter.org](http://rogelcancercenter.org)

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University of Wisconsin  
Carbone Cancer Center  
Madison, Wisconsin  
608.265.1700  
[uwhealth.org/cancer](http://uwhealth.org/cancer)

Vanderbilt-Ingram Cancer Center  
Nashville, Tennessee  
800.811.8480  
[vicc.org](http://vicc.org)

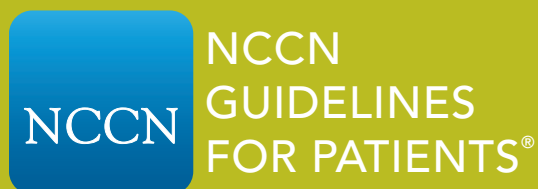
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Smilow Cancer Hospital  
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855.4.SMILOW  
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# Follicular Lymphoma

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