

From the National Cancer Institute



# Adult Hodgkin Lymphoma

## Information For You

*Learn about treatment options, staging and more.*

  
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# About This Booklet

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The information in this booklet is from the National Cancer Institute PDQ cancer information summary on **adult hodgkin lymphoma**.

Learning about medical care for adult hodgkin lymphoma can help you take an active part in making choices about your care. This booklet tells about:

Diagnosis, Staging and Treatment

Side Effects

Taking Part in Research Studies

Coping with Cancer and Managing Cancer Care

You can read this booklet from front to back. Or, you can read only the sections you need right now.

For the latest information about adult hodgkin lymphoma, please visit the National Cancer Institute (NCI) website at [www.cancer.gov/types/lymphoma/patient/adult-hodgkin-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/adult-hodgkin-treatment-pdq)

Or contact the NCI Cancer Information Service. The Cancer Information Service can answer your questions about cancer. Call 1-800-4-CANCER (1-800-422-6237).

## Words to Know

Words in **bold** are in the “Words to Know” section on page 43. The “Words to Know” section explains these words. It also shows how to pronounce them.

## Links to Cancer-Related Websites

Links you may want to learn more about are in parenthesis. (i.e. [www.cancer.gov](http://www.cancer.gov)) A complete list of the cancer-related website links begins on page 54 , at the end of this book-

# General Information About Adult Hodgkin Lymphoma

## KEY POINTS

- Adult Hodgkin lymphoma is a disease in which malignant (cancer) cells form in the lymph system.
- There are two main types of Hodgkin lymphoma: classical and nodular lymphocyte-predominant.
- Age, gender, and Epstein-Barr infection can affect the risk of adult Hodgkin lymphoma.
- Signs of adult Hodgkin lymphoma include swollen lymph nodes, fever, night sweats, and weight loss.
- Tests that examine the lymph system and other parts of the body are used to help detect (find) and diagnose adult Hodgkin lymphoma.
- Certain factors affect prognosis (chance of recovery) and treatment options.

**Adult Hodgkin lymphoma is a disease in which malignant (cancer) cells form in the lymph system.**

Adult **Hodgkin lymphoma** is a type of **cancer** that

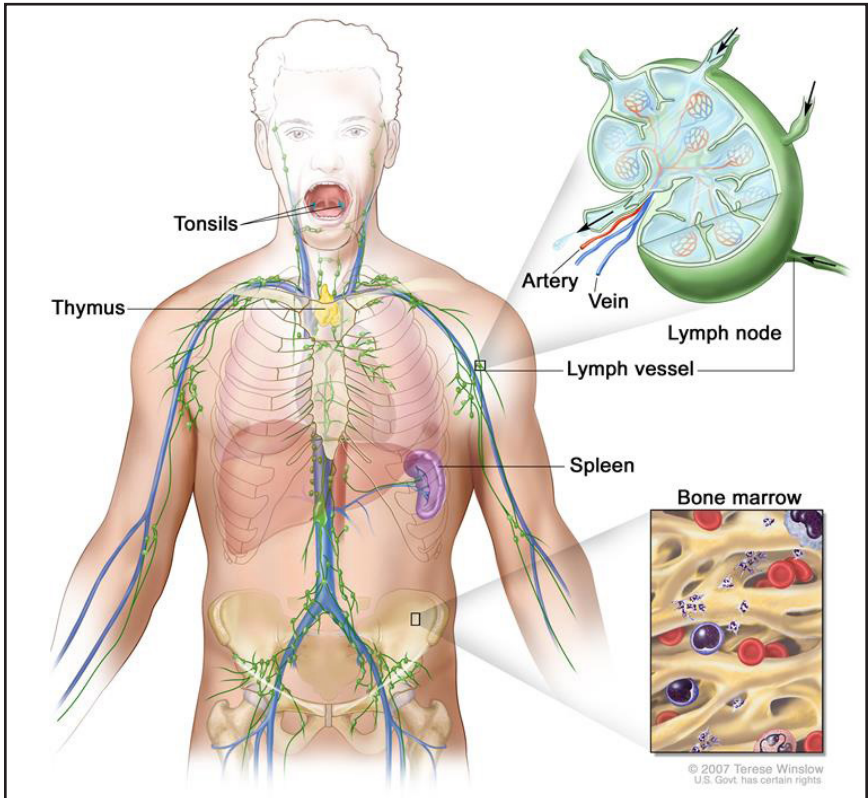
develops in the **lymph system**. The lymph system is part of the **immune system**. It helps protect the body from **infection** and disease.

The lymph system is made up of the following:

- **Lymph**: Colorless, watery **fluid** that travels through the **lymph vessels** and carries **T** and **B lymphocytes**. **Lymphocytes** are a type of **white blood cell**.
- **Lymph vessels**: A network of thin tubes that collect lymph from different parts of the body and return it to the bloodstream.
- **Lymph nodes**: Small, bean-shaped structures that filter lymph and store white blood cells that help fight infection and disease. Lymph nodes are found along a network of lymph vessels throughout the body. Groups of lymph nodes are found in the neck, underarm, **mediastinum**, **abdomen**, **pelvis**, and **groin**.
- **Spleen**: An **organ** that makes lymphocytes, stores **red blood cells** and lymphocytes, filters the **blood**, and destroys old blood **cells**. The spleen is on the left side of the abdomen near the **stomach**.
- **Thymus**: An organ in which T lymphocytes mature and multiply. The thymus is in the chest behind the **breastbone**.
- **Tonsils**: Two small masses of lymph **tissue** at the back of the throat. There is one tonsil on

each side of the throat.

- **Bone marrow:** The soft, spongy tissue in the center of certain bones, such as the hip bone and breastbone. White blood cells, red blood cells, and **platelets** are made in the bone marrow.



Anatomy of the lymph system, showing the lymph vessels and lymph organs including lymph nodes, tonsils, thymus, spleen, and bone marrow. Lymph (clear fluid) and lymphocytes travel through the lymph vessels and into the lymph nodes where the lymphocytes destroy harmful substances. The lymph enters the blood through a large vein near the heart.

Lymph tissue is also found in other parts of the body such as the stomach, **thyroid gland**, brain, and skin. Cancer can spread to the **liver** and **lungs**.

**Lymphomas** are divided into two general types: Hodgkin lymphoma and **non-Hodgkin lymphoma**. This summary is about the treatment of adult Hodgkin lymphoma. (See the **PDQ** summary on Adult Non-Hodgkin Lymphoma Treatment (**Link: [www.cancer.gov/types/lymphoma/patient/adult-nhl-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/adult-nhl-treatment-pdq)**) for more information.)

Hodgkin lymphoma can occur in both adults and children. Treatment for adults is different than treatment for children. Hodgkin lymphoma may also occur in patients who have **acquired immunodeficiency syndrome** (AIDS); these patients require special treatment.

See the following PDQ summaries for more information:

- Childhood Hodgkin Lymphoma Treatment (**Link: [www.cancer.gov/types/lymphoma/patient/child-hodgkin-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/child-hodgkin-treatment-pdq)**)
- AIDS-Related Lymphoma Treatment (**Link: [www.cancer.gov/types/lymphoma/patient/aids-related-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/aids-related-treatment-pdq)**)

Hodgkin lymphoma in **pregnant** women is the same as the disease in nonpregnant women of childbearing age. However, treatment is different for pregnant women. This summary includes information about treating Hodgkin lymphoma during



pregnancy.

## There are two main types of Hodgkin lymphoma: classical and nodular lymphocyte-predominant.

Most Hodgkin lymphomas are the **classical** type. The classical type is broken down into the following four subtypes:

- Nodular sclerosing Hodgkin lymphoma.
- Mixed cellularity Hodgkin lymphoma.
- Lymphocyte depletion Hodgkin lymphoma.
- Lymphocyte-rich classical Hodgkin lymphoma.

## Age, gender, and Epstein-Barr infection can affect the risk of adult Hodgkin lymphoma.

Anything that increases your risk of getting a disease is called a **risk factor**. Having a risk factor does not mean that you will get cancer; not having risk factors doesn't mean that you will not get cancer. Talk with your doctor if you think you may be at risk. Risk factors for adult Hodgkin lymphoma include the following:

- Being in young or late adulthood.
- Being male.

- Being infected with the **Epstein-Barr virus**.
- Having a **first-degree relative** (parent, brother, or sister) with Hodgkin lymphoma.

Pregnancy is not a risk factor for Hodgkin lymphoma.

**Signs of adult Hodgkin lymphoma include swollen lymph nodes, fever, night sweats, and weight loss.**

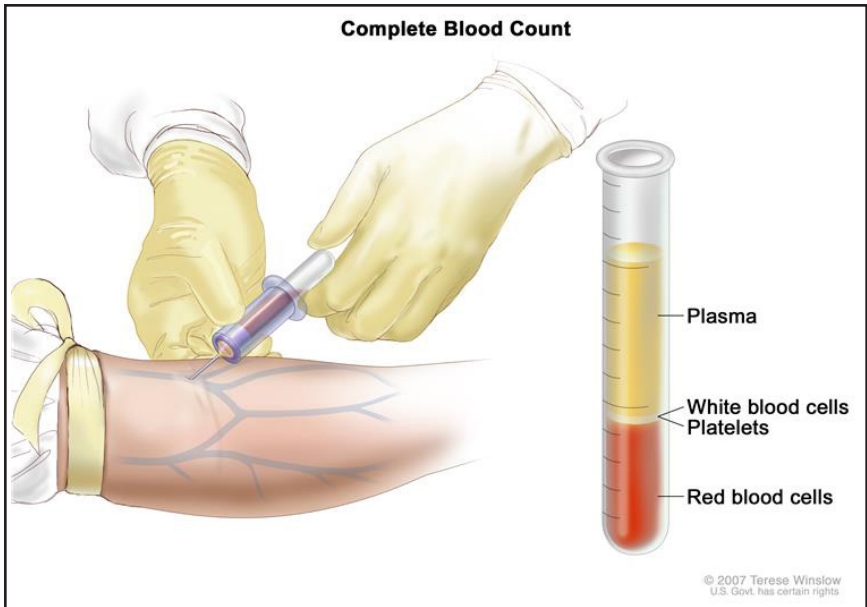
These and other **signs** and **symptoms** may be caused by adult Hodgkin lymphoma or by other **conditions**. Check with your doctor if any of the following do not go away:

- Painless, swollen lymph nodes in the neck, underarm, or groin.
- **Fever** for no known reason.
- Drenching night sweats.
- Weight loss for no known reason.
- Itchy skin.
- Feeling very tired.

## Tests that examine the lymph system and other parts of the body are used to help detect (find) and diagnose adult Hodgkin lymphoma.

The following tests and procedures may be used:

- **Physical exam and history:** An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient's health, including fever, night sweats, and weight loss, past illnesses and treatments will also be taken.
- **Complete blood count (CBC):** A procedure in which a sample of blood is drawn and checked for the following:
  - The number of red blood cells, white blood cells, and platelets.
  - The amount of **hemoglobin** (the **protein** that carries **oxygen**) in the red blood cells.
  - The portion of the sample made up of red blood cells.



**Complete blood count (CBC).** Blood is collected by inserting a needle into a vein and allowing the blood to flow into a tube. The blood sample is sent to the laboratory and the red blood cells, white blood cells, and platelets are counted. The CBC is used to test for, diagnose, and monitor many different conditions.

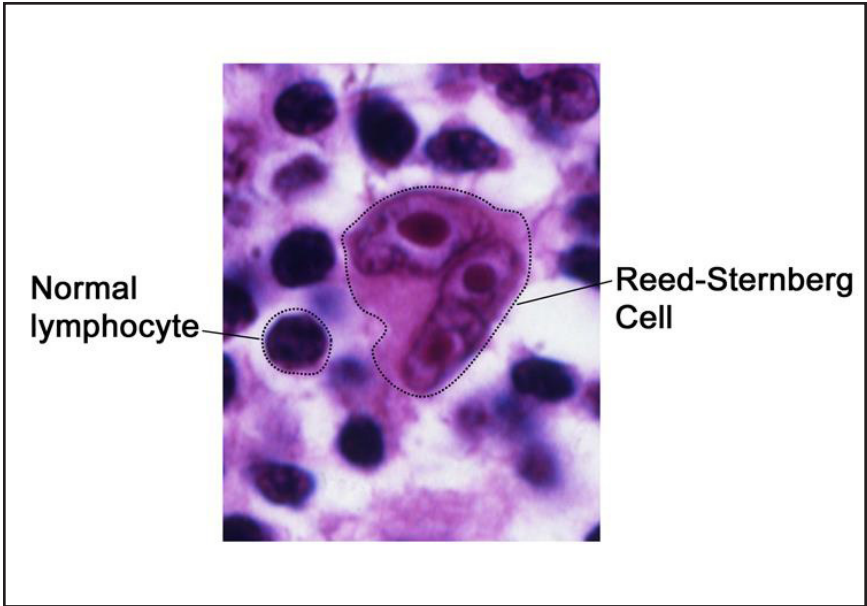
- **Blood chemistry studies:** A procedure in which a blood sample is checked to measure the amounts of certain substances released into the blood by organs and tissues in the body. An unusual (higher or lower than normal) amount of a substance can be a sign of disease.
- **LDH test:** A procedure in which a blood sample is checked to measure the amount of lactic dehydrogenase. An increased amount of LDH in the blood may be a sign of tissue damage,

lymphoma, or other diseases.

- **Hepatitis B and hepatitis C test:** A procedure in which a sample of blood is checked to measure the amounts of hepatitis B virus-specific **antigens** and/or **antibodies** and the amounts of hepatitis C virus-specific antibodies. These antigens or antibodies are called **markers**. Different markers or combinations of markers are used to determine whether a patient has a hepatitis B or C infection, has had a prior infection or **vaccination**, or is susceptible to infection.
- **HIV test:** A test to measure the level of **HIV antibodies** in a sample of blood. Antibodies are made by the body when it is invaded by a **foreign** substance. A high level of HIV antibodies may mean the body has been infected with **HIV**.
- **Sedimentation rate:** A procedure in which a sample of blood is drawn and checked for the rate at which the red blood cells settle to the bottom of the test tube. The sedimentation rate is a measure of how much **inflammation** is in the body. A higher than normal sedimentation rate may be a sign of lymphoma or another condition. Also called erythrocyte sedimentation rate, sed rate, or ESR.
- **CT scan (CAT scan):** A procedure that makes a series of detailed pictures of areas inside the body, such as the neck, chest, abdomen,

pelvis, and lymph nodes, taken from different angles. The pictures are made by a computer linked to an **x-ray** machine. A **dye** may be **injected** into a **vein** or swallowed to help the organs or tissues show up more clearly. This procedure is also called computed tomography, computerized tomography, or computerized axial tomography.

- **PET-CT scan:** A procedure that combines the pictures from a **positron emission tomography (PET) scan** and a computed tomography (CT) scan. The PET and CT scans are done at the same time on the same machine. The pictures from both scans are combined to make a more detailed picture than either test would make by itself. A PET scan is a procedure to find **malignant tumor** cells in the body. A small amount of **radioactive glucose** (sugar) is injected into a vein. The PET **scanner** rotates around the body and makes a picture of where glucose is being used in the body. Malignant tumor cells show up brighter in the picture because they are more active and take up more glucose than normal cells do.
- **Lymph node biopsy:** The removal of all or part of a lymph node. A **pathologist** views the tissue under a **microscope** to look for cancer cells, especially **Reed-Sternberg cells**. Reed-Sternberg cells are common in classical Hodgkin lymphoma.



**Reed-Sternberg cell.** Reed-Sternberg cells are large, abnormal lymphocytes that may contain more than one nucleus. These cells are found in Hodgkin lymphoma.

One of the following types of **biopsies** may be done:

- **Excisional biopsy:** The removal of an entire lymph node.
- **Incisional biopsy:** The removal of part of a lymph node.
- **Core biopsy:** The removal of tissue from a lymph node using a wide needle.

Other areas of the body, such as the liver, lung, bone, bone marrow, and brain, may also have a sample of tissue removed and checked by a pathologist for signs of cancer.

The following test may be done on tissue that was removed:

- **Immunophenotyping:** A **laboratory test** used to identify cells, based on the types of antigens or markers on the surface of the cell. This test is used to **diagnose** the specific type of lymphoma by comparing the cancer cells to normal cells of the immune system.

For pregnant women with Hodgkin lymphoma, **staging** tests that protect the **fetus** from the harms of **radiation** are used. These include:

- **MRI (magnetic resonance imaging):** A procedure that uses a magnet, **radio waves**, and a computer to make a series of detailed pictures of areas inside the body. This procedure is also called nuclear magnetic resonance imaging (NMRI).
- **Ultrasound exam:** A procedure in which high-energy sound waves (ultrasound) are bounced off internal tissues or organs and make echoes. The echoes form a picture of body tissues called a **sonogram**.

## **Certain factors affect prognosis (chance of recovery) and treatment options.**

The **prognosis** (chance of **recovery**) and treatment options depend on the following:

- The patient's signs and symptoms.



- The **stage** of the cancer.
- The type of Hodgkin lymphoma.
- **Blood test** results.
- The patient's age, gender, and general health.
- Whether the cancer is **recurrent** or **progressive**.

For Hodgkin lymphoma during pregnancy, treatment options also depend on:

- The wishes of the patient.
- The age of the fetus.

Adult Hodgkin lymphoma can usually be **cured** if found and treated early.

## Stages of Adult Hodgkin Lymphoma

### KEY POINTS

- After adult Hodgkin lymphoma has been diagnosed, tests are done to find out if cancer cells have spread within the lymph system or to other parts of the body.
- There are three ways that cancer spreads in the body.
- The following stages are used for adult Hodgkin lymphoma:
  - Stage I

- Stage II
- Stage III
- Stage IV
- Adult Hodgkin lymphoma may be grouped for treatment as follows:
  - Early Favorable
  - Early Unfavorable
  - Advanced

**After adult Hodgkin lymphoma has been diagnosed, tests are done to find out if cancer cells have spread within the lymph system or to other parts of the body.**

The process used to find out if **cancer** has spread within the **lymph system** or to other parts of the body is called **staging**. The information gathered from the staging process determines the **stage** of the disease. It is important to know the stage in order to plan treatment. The results of the tests and procedures ([Link: www.cancer.gov/types/lymphoma/patient/adult-hodgkin-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/adult-hodgkin-treatment-pdq)) done to **diagnose Hodgkin lymphoma** are used to help make decisions about treatment.

**There are three ways that cancer spreads in the body.**

Cancer can spread through **tissue**, the **lymph system**, and the **blood**:

- Tissue. The cancer spreads from where it began by growing into nearby areas.
- Lymph system. The cancer spreads from where it began by getting into the lymph system. The cancer travels through the **lymph vessels** to other parts of the body.
- Blood. The cancer spreads from where it began by getting into the blood. The cancer travels through the **blood vessels** to other parts of the body.

**The following stages are used for adult Hodgkin lymphoma:**

## **Stage I**

**Stage I adult Hodgkin lymphoma** is divided into stages I and IE.

- In stage I, **cancer** is found in one of the following places in the **lymph system**:
  - One or more **lymph nodes** in a group of lymph nodes.
  - **Waldeyer's ring**.
  - **Thymus**.
  - **Spleen**.

- In stage IE, cancer is found in one area outside the lymph system.

## Stage II

**Stage II adult Hodgkin lymphoma** is divided into stages II and IIE.

- In stage II, **cancer** is found in two or more groups of **lymph nodes** that are either above the **diaphragm** or below the diaphragm.
- In stage IIE, cancer has spread from a group of lymph nodes to a nearby area that is outside the **lymph system**. Cancer may have spread to other lymph node groups on the same side of the diaphragm.

In stage II, the term bulky disease refers to a larger **tumor** mass. The size of the tumor mass that is referred to as bulky disease varies based on the type of **lymphoma**.

## Stage III

In **stage III adult Hodgkin lymphoma**, **cancer** is found:

- in groups of **lymph nodes** both above and below the **diaphragm**; or
- in lymph nodes above the diaphragm and in the **spleen**.

## Stage IV

In **stage IV adult Hodgkin lymphoma**, cancer:

- has spread throughout one or more **organs** outside the **lymph system**; or
- is found in two or more groups of **lymph nodes** that are either above the **diaphragm** or below the diaphragm and in one organ that is outside the lymph system and not near the affected lymph nodes; or
- is found in groups of lymph nodes both above and below the diaphragm and in any organ that is outside the lymph system; or
- is found in the **liver**, **bone marrow**, more than one place in the **lung**, or **cerebrospinal fluid** (CSF). The cancer has not spread directly into the liver, bone marrow, lung, or CSF from nearby lymph nodes.

**Adult Hodgkin lymphoma may be grouped for treatment as follows:**

### Early Favorable

Early favorable adult **Hodgkin lymphoma** is **stage I** or **stage II**, without risk factors.

### Early Unfavorable

Early unfavorable adult **Hodgkin lymphoma** is

**stage I** or **stage II** with one or more of the following risk factors:

- A **tumor** in the chest that is larger than 1/3 of the width of the chest or at least 10 **centimeters**.
- **Cancer** in an **organ** other than the **lymph nodes**.
- A high **sedimentation rate** (in a sample of **blood**, the **red blood cells** settle to the bottom of the test tube more quickly than normal).
- Three or more lymph nodes with cancer.
- Symptoms such as **fever**, weight loss, or night sweats.

## Advanced

Advanced **Hodgkin lymphoma** includes some or all of the following risk factors:

- Being male.
- Being aged 45 years or older.
- Having stage IV disease.
- Having a low **blood albumin (protein)** level (below 4).
- Having a low **hemoglobin** level (below 10.5).
- Having a high **white blood cell count** (15,000 or higher).

- Having a low **lymphocyte** count (below 600 or less than 8% of the white blood cell count).

## Recurrent Adult Hodgkin Lymphoma

**Recurrent** adult **Hodgkin lymphoma** is **cancer** that has recurred (come back) after it has been treated. The cancer may come back in the **lymph system** or in other parts of the body.

## Treatment Option Overview

### KEY POINTS

- There are different types of treatment for patients with adult Hodgkin lymphoma.
- Patients with Hodgkin lymphoma should have their treatment planned by a team of health care providers with expertise in treating lymphomas.
- Treatment for adult Hodgkin lymphoma may cause side effects.
- Three types of standard treatment are used:
  - Chemotherapy
  - Radiation therapy
  - Surgery

- For pregnant patients with Hodgkin lymphoma, treatment options also include:
  - Watchful waiting
  - Steroid therapy
- New types of treatment are being tested in clinical trials.
  - Chemotherapy and radiation therapy with stem cell transplant
  - Monoclonal antibody therapy
- Patients may want to think about taking part in a clinical trial.
- Patients can enter clinical trials before, during, or after starting their cancer treatment.
- Follow-up tests may be needed.

## There are different types of treatment for patients with adult Hodgkin lymphoma.

Different types of treatment are available for patients with adult **Hodgkin lymphoma**. Some treatments are **standard** (the currently used treatment), and some are being tested in **clinical trials**. A treatment clinical trial is a **research study** meant to help improve current treatments or obtain information on new treatments for patients with **cancer**. When clinical trials show that a new treatment is better



than the standard treatment, the new treatment may become the standard treatment. Patients may want to think about taking part in a clinical trial. Some clinical trials are open only to patients who have not started treatment.

For **pregnant** women with Hodgkin lymphoma, treatment is carefully chosen to protect the **fetus**. Treatment decisions are based on the mother's wishes, the **stage** of the Hodgkin lymphoma, and the age of the fetus. The treatment plan may change as the **signs** and **symptoms**, cancer, and pregnancy change. Choosing the most appropriate cancer treatment is a decision that ideally involves the patient, family, and health care team.

**Patients with Hodgkin lymphoma should have their treatment planned by a team of health care providers with expertise in treating lymphomas.**

Treatment will be overseen by a **medical oncologist**, a doctor who specializes in treating cancer. The medical oncologist may refer you to other health care providers who have experience and expertise in treating adult Hodgkin lymphoma and who specialize in certain areas of **medicine**. These may include the following **specialists**:

- **Neurosurgeon.**
- **Neurologist.**
- **Rehabilitation specialist.**

- **Radiation oncologist.**
- **Endocrinologist.**
- **Hematologist.**
- Other **oncology** specialists.

## Treatment for adult Hodgkin lymphoma may cause side effects.

For information about **side effects** that begin during treatment for cancer, see our Side Effects ([Link: www.cancer.gov/about-cancer/treatment/side-effects](http://www.cancer.gov/about-cancer/treatment/side-effects)) page.

Side effects from cancer treatment that begin after treatment and continue for months or years are called **late effects**. Treatment with **chemotherapy** and/or **radiation therapy** for Hodgkin lymphoma may increase the risk of **second cancers** and other health problems for many months or years after treatment. These late effects depend on the type of treatment and the patient's age when treated, and may include the following:

- **Acute myelogenous leukemia.**
- Cancer of the **breast, bone, cervix, gastrointestinal tract**, head and neck, **lung, soft tissue**, and **thyroid**.
- **Heart, lung**, and thyroid disease.
- **Avascular necrosis** of bone (death of bone cells caused by lack of **blood** flow).

- **Herpes zoster** (shingles) or severe **infection**.
- **Depression** and **fatigue**.
- **Infertility**.
- Hypogonadism (low levels of **testosterone** and **estrogen**).

Regular **follow-up** by doctors who are expert in finding and treating late effects is important for the long-term health of patients treated for Hodgkin lymphoma.

**Three types of standard treatment are used:**

## **Chemotherapy**

Chemotherapy is a cancer treatment that uses **drugs** to stop the growth of cancer **cells**, either by killing the cells or by stopping them from dividing. When chemotherapy is taken by mouth or **injected** into a **vein** or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (**systemic chemotherapy**). When chemotherapy is placed directly into the **cerebrospinal fluid**, an **organ**, or a body **cavity** such as the **abdomen**, the drugs mainly affect cancer cells in those areas (**regional chemotherapy**). The way the chemotherapy is given depends on the type and **stage** of the cancer being treated. **Combination chemotherapy** is treatment with more than one anticancer drug.

When a pregnant woman is treated with chemotherapy for Hodgkin lymphoma, it isn't possible to protect the fetus from being exposed to the chemotherapy. Some chemotherapy **regimens** may cause birth defects if given in the first trimester. **Vinblastine** is an anticancer drug that has not been linked with birth defects when given in the second half of pregnancy.

See Drugs Approved for Hodgkin Lymphoma ([Link: www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma](http://www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma)) for more information.

## Radiation therapy

Radiation therapy is a cancer treatment that uses high-energy **x-rays** or other types of **radiation** to kill cancer cells or keep them from growing. There are two types of radiation therapy:

- **External radiation therapy** uses a machine outside the body to send radiation toward the cancer. Certain ways of giving radiation therapy can help keep radiation from damaging nearby healthy tissue. These types of external radiation therapy include the following:
  - **Proton beam radiation therapy:** Proton-beam therapy is a type of high-energy, external radiation therapy. A radiation therapy machine aims streams of **protons** (tiny, invisible, positively-charged particles) at the cancer cells to kill them.

- **Internal radiation therapy** uses a **radioactive** substance sealed in needles, **seeds**, wires, or **catheters** that are placed directly into or near the cancer.

The way the radiation therapy is given depends on the type and stage of the cancer being treated. External radiation therapy is used to treat adult Hodgkin lymphoma.

For a pregnant woman with Hodgkin lymphoma, radiation therapy should be postponed until after delivery, if possible, to avoid any risk to the fetus. If immediate treatment is needed, the woman may decide to continue the pregnancy and receive radiation therapy. However, lead used to shield the fetus may not protect it from scattered radiation that could possibly cause cancer in the future.

## Surgery

**Laparotomy** is a procedure in which an **incision** (cut) is made in the wall of the abdomen to check the inside of the abdomen for signs of disease.

The size of the incision depends on the reason the laparotomy is being done. Sometimes organs are removed or **tissue** samples are taken and checked under a **microscope** for signs of disease. If cancer is found, the tissue or organ is removed during the laparotomy.

**For pregnant patients with Hodgkin lymphoma, treatment options also include:**

## Watchful waiting

**Watchful waiting** is closely **monitoring** a patient's **condition** without giving any treatment unless signs or symptoms appear or change. Delivery may be induced when the fetus is 32 to 36 weeks old, so that the mother can begin treatment.

## Steroid therapy

**Steroids** are **hormones** made naturally in the body by the **adrenal glands** and by **reproductive organs**. Some types of steroids are made in a laboratory. Certain steroid drugs have been found to help chemotherapy work better and help stop the growth of cancer cells. Steroids can also help the lungs of the fetus develop faster than normal. This is important when delivery is induced early.

See Drugs Approved for Hodgkin Lymphoma ([Link: www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma](http://www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma)) for more information.

## New types of treatment are being tested in clinical trials.

This summary section describes treatments that are being studied in clinical trials. It may not mention every new treatment being studied. Information about clinical trials is available from the NCI website ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials](http://www.cancer.gov/about-cancer/treatment/clinical-trials)).

## Chemotherapy and radiation therapy with stem cell transplant

High doses of chemotherapy and radiation therapy are given to kill cancer cells. Healthy cells, including **blood**-forming cells, are also destroyed by the cancer treatment. **Stem cell transplant** is a treatment to replace the blood-forming cells. **Stem cells** (immature blood cells) are removed from the blood or **bone marrow** of the patient or a **donor** and are frozen and stored. After the patient completes chemotherapy and radiation therapy, the stored stem cells are thawed and given back to the patient through an **infusion**. These reinfused stem cells grow into (and restore) the body's blood cells.

## Monoclonal antibody therapy

**Monoclonal antibody therapy** is a cancer treatment that uses **antibodies** made in the laboratory, from a single type of **immune system** cell. These antibodies can identify substances on cancer cells or normal substances that may help cancer cells grow. The antibodies attach to the substances and kill the cancer cells, block their growth, or keep them from spreading. Monoclonal antibodies are given by infusion. They may be used alone or to carry drugs, **toxins**, or radioactive material directly to cancer cells.

**Patients may want to think about taking part in a clinical trial.**

For some patients, taking part in a **clinical trial** may be the best treatment choice. Clinical trials are part of the cancer research process. Clinical trials are done to find out if new cancer treatments are safe and effective or better than the **standard treatment**.

Many of today's standard treatments for cancer are based on earlier clinical trials. Patients who take part in a clinical trial may receive the standard treatment or be among the first to receive a new treatment.

Patients who take part in clinical trials also help improve the way cancer will be treated in the future. Even when clinical trials do not lead to effective new treatments, they often answer important questions and help move research forward.

## **Patients can enter clinical trials before, during, or after starting their cancer treatment.**

Some clinical trials only include patients who have not yet received treatment. Other trials test treatments for patients whose cancer has not gotten better. There are also clinical trials that test new ways to stop cancer from **recurring** (coming back) or reduce the **side effects** of cancer treatment.

Clinical trials are taking place in many parts of the country. Information about clinical trials supported by NCI can be found on NCI's clinical trials search (**Link: [www.cancer.gov/about-cancer/treatment/](http://www.cancer.gov/about-cancer/treatment/)**



[clinical-trials/search](#)) webpage. Clinical trials supported by other organizations can be found on the ClinicalTrials.gov ([Link: clinicaltrials.gov/](#)) website.

## Follow-up tests may be needed.

Some of the tests that were done to **diagnose** the cancer or to find out the **stage** of the cancer may be repeated. Some tests will be repeated in order to see how well the treatment is working. Decisions about whether to continue, change, or stop treatment may be based on the results of these tests.

Some of the tests will continue to be done from time to time after treatment has ended. The results of these tests can show if your **condition** has changed or if the cancer has **recurred** (come back). These tests are sometimes called **follow-up** tests or check-ups.

## Treatment Options for Adult Hodgkin Lymphoma

For information about the treatments listed below, see the Treatment Option Overview section.

### Early Favorable Hodgkin Lymphoma

Treatment of early favorable **Hodgkin lymphoma** may include the following:

- **Combination chemotherapy.**
- Combination chemotherapy with **radiation**

**therapy** to parts of the body with **cancer**.

- Radiation therapy alone to areas of the body with cancer or to the **mantle field** (neck, chest, armpits).

Use our clinical trial search ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/search](http://www.cancer.gov/about-cancer/treatment/clinical-trials/search)) to find NCI-supported cancer clinical trials that are accepting patients. You can search for trials based on the type of cancer, the age of the patient, and where the trials are being done. General information ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/](http://www.cancer.gov/about-cancer/treatment/clinical-trials/)) about clinical trials is also available.

## Early Unfavorable Hodgkin Lymphoma

Treatment of early unfavorable **Hodgkin lymphoma** may include the following:

- **Combination chemotherapy**.
- Combination chemotherapy with **radiation therapy** to parts of the body with **cancer**.

Use our clinical trial search ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/search](http://www.cancer.gov/about-cancer/treatment/clinical-trials/search)) to find NCI-supported cancer clinical trials that are accepting patients. You can search for trials based on the type of cancer, the age of the patient, and where the trials are being done. General information ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/](http://www.cancer.gov/about-cancer/treatment/clinical-trials/)) about clinical trials is also available.

## Advanced Hodgkin Lymphoma

Treatment of advanced **Hodgkin lymphoma** may include the following:

- **Combination chemotherapy.**

Use our clinical trial search ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/search](http://www.cancer.gov/about-cancer/treatment/clinical-trials/search)) to find NCI-supported cancer clinical trials that are accepting patients. You can search for trials based on the type of cancer, the age of the patient, and where the trials are being done. General information ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/](http://www.cancer.gov/about-cancer/treatment/clinical-trials/)) about clinical trials is also available.

## Recurrent Adult Hodgkin Lymphoma

Treatment of **recurrent Hodgkin lymphoma** may include the following:

- **Combination chemotherapy.**
- Combination chemotherapy followed by **high-dose chemotherapy** and **stem cell transplant** with or without **radiation therapy.**
- Combination chemotherapy with radiation therapy to parts of the body with **cancer** in patients older than 60 years.
- Radiation therapy with or without **chemotherapy.**
- Chemotherapy as **palliative therapy** to relieve **symptoms** and improve **quality of life.**

- A **clinical trial** of high-dose chemotherapy and stem cell transplant.
- A clinical trial of lower-dose chemotherapy and radiation therapy followed by stem cell transplant.
- A clinical trial of a **monoclonal antibody**.
- A clinical trial of chemotherapy.

Use our clinical trial search ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/search](http://www.cancer.gov/about-cancer/treatment/clinical-trials/search)) to find NCI-supported cancer clinical trials that are accepting patients. You can search for trials based on the type of cancer, the age of the patient, and where the trials are being done. General information ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials/](http://www.cancer.gov/about-cancer/treatment/clinical-trials/)) about clinical trials is also available.

## Treatment Options for Hodgkin Lymphoma During Pregnancy

For information about the treatments listed below, see the Treatment Option Overview section.

### Hodgkin Lymphoma During the First Trimester of Pregnancy

When **Hodgkin lymphoma** is **diagnosed** in the first trimester of **pregnancy**, it does not necessarily mean that the woman will be advised to end the pregnancy. Each woman's treatment will depend on the **stage** of the **lymphoma**, how fast it is growing, and

her wishes. For women who choose to continue the pregnancy, treatment of Hodgkin lymphoma during the first trimester of pregnancy may include the following:

- **Watchful waiting** when the **cancer** is above the **diaphragm** and is slow-growing. Delivery may be induced when the **fetus** is 32 to 36 weeks old so the mother can begin treatment.
- **Radiation therapy** above the diaphragm. (A lead shield is used to protect the fetus from the **radiation** as much as possible.)
- **Systemic chemotherapy** using one or more **drugs**.

## Hodgkin Lymphoma During the Second Half of Pregnancy

When **Hodgkin lymphoma** is **diagnosed** in the second half of **pregnancy**, most women can delay treatment until after the baby is born. Treatment of Hodgkin lymphoma during the second half of pregnancy may include the following:

- **Watchful waiting**, with plans to induce delivery when the **fetus** is 32 to 36 weeks old.
- **Systemic chemotherapy** using one or more **drugs**.
- **Steroid therapy**.
- **Radiation therapy** to relieve breathing problems caused by a large **tumor** in the chest.

# To Learn More About Adult Hodgkin Lymphoma

For more information from the **National Cancer Institute** about adult Hodgkin lymphoma, see the following:

- Lymphoma Home Page (**Link: [www.cancer.gov/types/lymphoma](http://www.cancer.gov/types/lymphoma)**)
- Drugs Approved for Hodgkin Lymphoma (**Link: [www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma](http://www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma)**)

For general **cancer** information and other resources from the National Cancer Institute, see the following:

- About Cancer (**Link: [www.cancer.gov/about-cancer](http://www.cancer.gov/about-cancer)**)
- Staging (**Link: [www.cancer.gov/about-cancer/diagnosis-staging/staging](http://www.cancer.gov/about-cancer/diagnosis-staging/staging)**)
- Chemotherapy and You: Support for People With Cancer (**Link: [www.cancer.gov/publications/patient-education/chemo-and-you](http://www.cancer.gov/publications/patient-education/chemo-and-you)**)
- Radiation Therapy and You: Support for People With Cancer (**Link: [www.cancer.gov/publications/patient-education/radiation-therapy-and-you](http://www.cancer.gov/publications/patient-education/radiation-therapy-and-you)**)
- Coping with Cancer (**Link: [www.cancer.gov/](http://www.cancer.gov/)**)

## about-cancer/coping)

- Questions to Ask Your Doctor about Cancer (Link: [www.cancer.gov/about-cancer/coping/questions](http://www.cancer.gov/about-cancer/coping/questions))
- For Survivors and Caregivers (Link: [cancer-control.cancer.gov/ocs/resources/survivors.html](http://cancer-control.cancer.gov/ocs/resources/survivors.html))

## About This PDQ Summary

### About PDQ

Physician Data Query (PDQ) is the National Cancer Institute's (NCI's) comprehensive cancer information database. The PDQ database contains summaries of the latest published information on cancer prevention, detection, genetics, treatment, supportive care, and complementary and alternative medicine. Most summaries come in two versions. The health professional versions have detailed information written in technical language. The patient versions are written in easy-to-understand, nontechnical language. Both versions have cancer information that is accurate and up to date and most versions are also available in Spanish (Link: [www.cancer.gov/espanol/publicaciones/pdq](http://www.cancer.gov/espanol/publicaciones/pdq)).

PDQ is a service of the NCI. The NCI is part of the National Institutes of Health (NIH). NIH is the federal government's center of biomedical research. The PDQ summaries are based on an independent

review of the medical literature. They are not policy statements of the NCI or the NIH.

## Purpose of This Summary

This PDQ cancer information summary has current information about the treatment of adult Hodgkin lymphoma. It is meant to inform and help patients, families, and caregivers. It does not give formal guidelines or recommendations for making decisions about health care.

## Reviewers and Updates

Editorial Boards write the PDQ cancer information summaries and keep them up to date. These Boards are made up of experts in cancer treatment and other specialties related to cancer. The summaries are reviewed regularly and changes are made when there is new information. The date on each summary ("Updated") is the date of the most recent change.

The information in this patient summary was taken from the health professional version, which is reviewed regularly and updated as needed, by the PDQ Adult Treatment Editorial Board ([Link: www.cancer.gov/publications/pdq/editorial-boards/adult-treatment](http://www.cancer.gov/publications/pdq/editorial-boards/adult-treatment)).

## Clinical Trial Information

A clinical trial is a study to answer a scientific question, such as whether one treatment is better than



another. Trials are based on past studies and what has been learned in the laboratory. Each trial answers certain scientific questions in order to find new and better ways to help cancer patients. During treatment clinical trials, information is collected about the effects of a new treatment and how well it works. If a clinical trial shows that a new treatment is better than one currently being used, the new treatment may become "standard." Patients may want to think about taking part in a clinical trial. Some clinical trials are open only to patients who have not started treatment.

Clinical trials can be found online at NCI's website ([Link: www.cancer.gov/about-cancer/treatment/clinical-trials](http://www.cancer.gov/about-cancer/treatment/clinical-trials)). For more information, call the Cancer Information Service ([Link: www.cancer.gov/contact/contact-center](http://www.cancer.gov/contact/contact-center)) (CIS), NCI's contact center, at 1-800-4-CANCER (1-800-422-6237).

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## Disclaimer

The information in these summaries should not be used to make decisions about insurance reimbursement. More information on insurance coverage is available on Cancer.gov on the Managing Cancer Care ([Link: www.cancer.gov/about-cancer/managing-care](https://www.cancer.gov/about-cancer/managing-care)) page.

## Contact Us

More information about contacting us or receiving help with the Cancer.gov website can be found on our Contact Us for Help ([Link: www.cancer.gov/contact](http://www.cancer.gov/contact)) page. Questions can also be submitted to Cancer.gov through the website's E-mail Us ([Link: www.cancer.gov/contact/email-us](http://www.cancer.gov/contact/email-us)).

Date this NCI Patient Education Statement was updated: 2019-02-14.

## Words to Know

### **Lymph node biopsy (limf node BY-op-see)**

A procedure in which all or part of a lymph node is removed and checked under a microscope for signs of infection or disease, such as cancer. There are several types of lymph node biopsies, including excisional biopsy (removal of entire lymph node), incisional biopsy (removal of part of a lymph node), core needle biopsy (removal of tissue from a lymph node using a wide needle), and fine-needle aspiration biopsy (removal of tissue from a lymph node using a thin needle).

### **Recurrent (ree-KER-ent KAN-ser)**

Cancer that has recurred (come back), usually after a period of time during which the cancer could not be detected. The cancer may come back to the same place as the original (primary) tumor or to another place in the body. Also called recurrence.

## **acquired immunodeficiency syndrome (uh-KWY-erd IH-myoo-noh-deh-FIH-shun-see SIN-drome)**

A disease caused by the human immunodeficiency virus (HIV). People with acquired immunodeficiency syndrome are at an increased risk for developing certain cancers and for infections that usually occur only in individuals with a weak immune system. Also called AIDS.

## **Acute myelogenous leukemia (uh-KYOOT MY-eh-LAH-jeh-nus loo-KEE-mee-uh)**

An aggressive (fast-growing) disease in which too many myeloblasts (immature white blood cells that are not lymphoblasts) are found in the bone marrow and blood. Also called acute myeloblastic leukemia, acute myeloid leukemia, acute nonlymphocytic leukemia, AML, and ANLL.

## **Avascular necrosis (ay-VAS-kyoo-ler neh-KROH-sis)**

A condition in which there is a loss of blood flow to bone tissue, which causes the bone to die. It is most common in the hips, knees, shoulders, and ankles. It may be caused by long-term use of steroid medicines, alcohol abuse, joint injuries, and certain diseases, such as cancer and arthritis. It may also occur at some point in time after cancer treatment that included methotrexate, bisphosphonates, or corticosteroids. Also called aseptic necrosis, ischemic necrosis, and osteonecrosis.

## **Blood test (blud test)**

A test done on a sample of blood to measure the amount of certain substances in the blood or to count different types of blood cells. Blood tests may be done to look for signs of disease or agents that cause disease, to check for antibodies or tumor markers, or to see how well treatments are working.

## **bone (bone KAN-ser)**

Primary bone cancer is cancer that forms in cells of the bone. Some types of primary bone cancer are osteosarcoma, Ewing sarcoma, malignant fibrous histiocytoma, and chondrosarcoma. Secondary bone cancer is cancer that spreads to the bone from another part of the body (such as the prostate, breast, or lung).

## **classical Hodgkin lymphoma (KLA-sih-kul HOJ-kin lim-FOH-muh)**

The most common type of Hodgkin lymphoma, which is a cancer of the immune system. Classical Hodgkin lymphoma is marked by the presence of a type of cell called the Reed-Sternberg cell.

## **Combination chemotherapy (KOM-bih-NAY-shun KEE-moh-THAYR-uh-pee)**

Treatment using more than one anticancer drug.

## **count (blud sel kownt)**

A measure of the number of red blood cells, white blood cells, and platelets in the blood. The amount of hemoglobin (substance in the blood that carries oxygen) and the hematocrit (the amount of whole blood that is made up of red blood cells) are also measured. A blood cell count is used to help diagnose and monitor many conditions. Also called CBC, complete blood count, and full blood count.

## **Depression (dee-PREH-shun)**

A mental condition marked by ongoing feelings of sadness, despair, loss of energy, and difficulty dealing with normal daily life. Other symptoms of depression include feelings of worthlessness and hopelessness, loss of pleasure in activities, changes in eating or sleeping habits, and thoughts of death or suicide. Depression can affect anyone, and can be successfully treated. Depression affects 15-25% of cancer patients.

## **Endocrinologist (EN-doh-krih-NAH-loh-jist)**

A doctor who has special training in diagnosing and treating disorders of the endocrine system (the glands and organs that make hormones). These disorders include diabetes, infertility, and thyroid, adrenal, and pituitary gland problems.

## **Epstein-Barr virus (ep-stine-BAR VY-rus)**

A common virus that remains dormant in most people. It causes infectious mononucleosis and has been associated with certain cancers, including Burkitt lymphoma, immunoblastic lymphoma, and nasopharyngeal carcinoma. Also called EBV.

### **Excisional biopsy (ek-SIH-zhuh-nul BY-op-see)**

A surgical procedure in which an entire lump or suspicious area is removed for diagnosis. The tissue is then examined under a microscope.

### **fatigue (fuh-TEEG)**

A condition marked by extreme tiredness and inability to function due to lack of energy. Fatigue may be acute or chronic.

### **foreign (FOR-in)**

In medicine, foreign describes something that comes from outside the body. A foreign substance in the body's tissues, such as a bacterium or virus, may be recognized by the immune system as not belonging to the body. This causes an immune response. Other foreign substances in the body, such as artificial joints, are designed to not cause an immune response.

### **Heart (KOR-uh-NAYR-ee AR-tuh-ree dih-ZEEZ)**

A disease in which there is a narrowing or blockage of the coronary arteries (blood vessels that carry blood and oxygen to the heart). Coronary artery disease is usually caused by atherosclerosis (a buildup of fatty material and plaque inside the coronary arteries). The disease may cause chest pain, shortness of breath during exercise, and heart attacks. The risk of coronary artery disease is increased by having a family history of coronary artery disease before age 50, older age, smoking tobacco, high blood pressure, high cholesterol, diabetes, lack of exercise, and obesity. Also called CAD and coronary heart disease.

### **Hematologist (HEE-muh-TAH-loh-jist)**

A doctor who has special training in diagnosing and treating blood disorders.

### **Hepatitis B (HEH-puh-TY-tis ... VY-rus)**

A virus that causes hepatitis (inflammation of the liver). It is carried and passed to others through the blood and other body fluids. Different ways the virus is spread include sharing needles with an infected person and being stuck accidentally by a needle

contaminated with the virus. Infants born to infected mothers may also become infected with the virus. Although many patients who are infected with hepatitis B virus may not have symptoms, long-term infection may lead to cirrhosis (scarring of the liver) and liver cancer. Also called HBV.

### **hepatitis C (HEH-puh-TY-tis ... VY-rus)**

A virus that causes hepatitis (inflammation of the liver). It is carried and passed to others through the blood and other body fluids. Different ways the virus is spread include sharing needles with an infected person and being stuck accidentally by a needle contaminated with the virus. Infants born to infected mothers may also become infected with the virus. Although patients who are infected with hepatitis C virus may not have symptoms, long-term infection may lead to cirrhosis (scarring of the liver) and liver cancer. These patients may also have an increased risk for certain types of non-Hodgkin lymphoma. Also called HCV.

### **Herpes zoster (HER-peeZ-VY-rus)**

A member of the herpes family of viruses.

### **HIV**

The cause of acquired immunodeficiency syndrome (AIDS). Also called human immunodeficiency virus.

### **HIV antibodies (... AN-tee-BAH-dee)**

A substance produced by certain white blood cells in reaction to contact with the human immunodeficiency virus (HIV).

### **HIV test (... test)**

A test to check for human immunodeficiency virus (HIV) infection. HIV is the virus that causes acquired immunodeficiency syndrome (AIDS). The most common type of HIV test is called the HIV antibody test, which checks for antibodies against HIV in a sample of blood, urine, or fluid from the mouth. It can take from 2 weeks to 6 months after a person is infected with HIV before the antibodies are found with an HIV antibody test. Another type of HIV test checks for RNA or DNA from HIV in a sample of blood. This test can find HIV in a person's blood about 9-11 days after the person is infected with the virus.

## **Hodgkin lymphoma (HOJ-kin lim-FOH-muh)**

A cancer of the immune system that is marked by the presence of a type of cell called the Reed-Sternberg cell. The two major types of Hodgkin lymphoma are classical Hodgkin lymphoma and nodular lymphocyte-predominant Hodgkin lymphoma. Symptoms include the painless enlargement of lymph nodes, spleen, or other immune tissue. Other symptoms include fever, weight loss, fatigue, or night sweats. Also called Hodgkin disease.

## **Infertility (IN-fer-TIH-lih-tee)**

The inability to produce children.

## **LDH**

One of a group of enzymes found in the blood and other body tissues, and involved in energy production in cells. An increased amount in the blood may be a sign of tissue damage and some types of cancer or other diseases. Also called lactate dehydrogenase and lactic acid dehydrogenase.

## **lymph system (lim-FA-tik SIS-tem)**

The tissues and organs that produce, store, and carry white blood cells that fight infections and other diseases. This system includes the bone marrow, spleen, thymus, lymph nodes, and lymphatic vessels (a network of thin tubes that carry lymph and white blood cells). Lymphatic vessels branch, like blood vessels, into all the tissues of the body. Also called lymph system.

## **lymphocyte (LIM-foh-site)**

A type of immune cell that is made in the bone marrow and is found in the blood and in lymph tissue. The two main types of lymphocytes are B lymphocytes and T lymphocytes. B lymphocytes make antibodies, and T lymphocytes help kill tumor cells and help control immune responses. A lymphocyte is a type of white blood cell.

## **lymphoma (lim-FOH-muh)**

Cancer that begins in cells of the immune system. There are two basic categories of lymphomas. One kind is Hodgkin lympho-



ma, which is marked by the presence of a type of cell called the Reed-Sternberg cell. The other category is non-Hodgkin lymphomas, which includes a large, diverse group of cancers of immune system cells. Non-Hodgkin lymphomas can be further divided into cancers that have an indolent (slow-growing) course and those that have an aggressive (fast-growing) course. These subtypes behave and respond to treatment differently. Both Hodgkin and non-Hodgkin lymphomas can occur in children and adults, and prognosis and treatment depend on the stage and the type of cancer.

### **mantle field (MAN-tul ...)**

The area of the neck, chest, and lymph nodes in the armpit that are exposed to radiation.

### **mediastinum (MEE-dee-uh-STY-num)**

The area between the lungs. The organs in this area include the heart and its large blood vessels, the trachea, the esophagus, the thymus, and lymph nodes but not the lungs.

### **medical oncologist (MEH-dih-kul on-KAH-loh-jist)**

A doctor who has special training in diagnosing and treating cancer in adults using chemotherapy, hormonal therapy, biological therapy, and targeted therapy. A medical oncologist often is the main health care provider for someone who has cancer. A medical oncologist also gives supportive care and may coordinate treatment given by other specialists.

### **Neurologist (noor-AH-loh-jist)**

A doctor who has special training in diagnosing and treating disorders of the nervous system.

### **Neurosurgeon (NOOR-oh-SER-jun)**

A doctor who has special training in surgery on the brain, spine, and other parts of the nervous system.

### **non-Hodgkin lymphoma (non-HOJ-kin lim-FOH-muh)**

Any of a large group of cancers of lymphocytes (white blood cells). Non-Hodgkin lymphomas can occur at any age and are often marked by lymph nodes that are larger than normal, fever,

and weight loss. There are many different types of non-Hodgkin lymphoma. These types can be divided into aggressive (fast-growing) and indolent (slow-growing) types, and they can be formed from either B-cells or T-cells. B-cell non-Hodgkin lymphomas include Burkitt lymphoma, chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL), diffuse large B-cell lymphoma, follicular lymphoma, immunoblastic large cell lymphoma, precursor B-lymphoblastic lymphoma, and mantle cell lymphoma. T-cell non-Hodgkin lymphomas include mycosis fungoides, anaplastic large cell lymphoma, and precursor T-lymphoblastic lymphoma. Lymphomas that occur after bone marrow or stem cell transplantation are usually B-cell non-Hodgkin lymphomas. Prognosis and treatment depend on the stage and type of disease. Also called NHL.

### **oncology (on-KAH-loh-jee)**

A branch of medicine that specializes in the diagnosis and treatment of cancer. It includes medical oncology (the use of chemotherapy, hormone therapy, and other drugs to treat cancer), radiation oncology (the use of radiation therapy to treat cancer), and surgical oncology (the use of surgery and other procedures to treat cancer).

### **palliative therapy (PA-lee-uh-tiv THAYR-uh-pee)**

Treatment given to relieve the symptoms and reduce the suffering caused by cancer and other life-threatening diseases. Palliative cancer therapies are given together with other cancer treatments, from the time of diagnosis, through treatment, survivorship, recurrent or advanced disease, and at the end of life.

### **positron emission tomography (PET) scan (PAH-zih-tron ee-MIH-shun toh-MAH-gruh-fee skan)**

A procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed, computerized pictures of areas inside the body where the glucose is taken up. Because cancer cells often take up more glucose than normal cells, the pictures can be used to find cancer cells in the body. Also called PET scan.

### **Radiation oncologist (RAY-dee-AY-shun on-KAH-loh-jist)**

A doctor who has special training in using radiation to treat cancer.

### **Reed-Sternberg cells (reed-STERN-berg sel)**

A type of cell that appears in people with Hodgkin disease. The number of these cells increases as the disease advances.

### **Rehabilitation specialist (REE-huh-BIH-lih-TAY-shun SPEH-shuh-list)**

A healthcare professional who helps people recover from an illness or injury and return to daily life. Examples of rehabilitation specialists are physical therapists and occupational therapists.

### **Sedimentation rate (SEH-dih-men-TAY-shun rayt)**

The distance red blood cells travel in one hour in a sample of blood as they settle to the bottom of a test tube. The sedimentation rate is increased in inflammation, infection, cancer, rheumatic diseases, and diseases of the blood and bone marrow. Also called erythrocyte sedimentation rate and ESR.

### **specialists (SPEH-shuh-list)**

In medicine, a doctor or other health care professional who is trained and licensed in a special area of practice. Examples of medical specialists include oncologists (cancer specialists) and hematologists (blood specialists).

### **Stage I adult Hodgkin lymphoma (... uh-dult HOJ-kin lim-FOH-muh)**

Stage I is divided into stages I and IE. In stage I, cancer is found in one of the following places in the lymph system: (1) one or more lymph nodes in a group of lymph nodes; (2) Waldeyer's ring; (3) thymus; or (4) spleen. In stage IE, cancer is found in one area outside the lymph system.

### **Stage II adult Hodgkin lymphoma (... uh-dult HOJ-kin lim-FOH-muh)**

Stage II is divided into stages II and IIE. In stage II, cancer is found in two or more groups of lymph nodes that are either above the diaphragm or below the diaphragm. In stage IIE, cancer has spread from a group of lymph nodes to a nearby area that is out-

side the lymph system. Cancer may have spread to other lymph node groups on the same side of the diaphragm.

### **stage III adult Hodgkin lymphoma (... uh-dult HOJ-kin lim-FOH-muh)**

Cancer is found (1) in groups of lymph nodes both above and below the diaphragm; or (2) in lymph nodes above the diaphragm and in the spleen.

### **stage IV adult Hodgkin lymphoma (... uh-dult HOJ-kin lim-FOH-muh)**

Cancer (1) has spread throughout one or more organs outside the lymph system; or (2) is found in two or more groups of lymph nodes that are either above the diaphragm or below the diaphragm and in one organ that is outside the lymph system and not near the affected lymph nodes; or (3) is found in groups of lymph nodes both above and below the diaphragm and in any organ that is outside the lymph system; or (4) is found in the liver, bone marrow, more than one place in the lung, or cerebrospinal fluid (CSF). The cancer has not spread directly into the liver, bone marrow, lung, or CSF from nearby lymph nodes.

### **T lymphocyte (... LIM-foh-site)**

A type of white blood cell. T lymphocytes are part of the immune system and develop from stem cells in the bone marrow. They help protect the body from infection and may help fight cancer. Also called T cell and thymocyte.

### **Thymus (THY-mus)**

An organ that is part of the lymphatic system, in which T lymphocytes grow and multiply. The thymus is in the chest behind the breastbone.

### **thyroid cancer (THY-royd KAN-ser)**

Cancer that forms in the thyroid gland (an organ at the base of the throat that makes hormones that help control heart rate, blood pressure, body temperature, and weight). Four main types of thyroid cancer are papillary, follicular, medullary, and anaplastic thyroid cancer. The four types are based on how the cancer cells look under a microscope.

### **thyroid gland (THY-royd...)**

A gland located beneath the larynx (voice box) that makes thyroid hormone and calcitonin. The thyroid gland helps regulate growth and metabolism. Also called thyroid.

### **Tonsils (TON-sil)**

One of two small masses of lymphoid tissue on either side of the throat.

### **vaccination (VAK-sih-NAY-shun)**

Treatment with a vaccine.

### **Vinblastine (vin-BLAS-teen SUL-fayt)**

A drug used to treat breast cancer and choriocarcinoma (a type of gestational trophoblastic tumor) that have not gotten better with other treatment. It is also used to treat Hodgkin lymphoma, non-Hodgkin lymphoma, Kaposi sarcoma, mycosis fungoides, and testicular cancer. It is also being studied in the treatment of other types of cancer. Vinblastine sulfate blocks cell growth by stopping cell division and may kill cancer cells. It is a type of vinca alkaloid and a type of antimitotic agent. The brand name Velban has been taken off the market and is no longer available.

### **Waldeyer's ring (VAL-dy-erz ...)**

A ring of lymphoid tissue found in the throat. The Waldeyer's ring is made up of the tonsils, adenoids, and other lymphoid tissue. It contains lymphocytes (a type of immune cell) that help the body fight infection and disease.

# Links to Cancer-Related Websites

## Adult Hodgkin Lymphoma Treatment

[www.cancer.gov/types/lymphoma/patient/adult-hodgkin-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/adult-hodgkin-treatment-pdq)

## Adult Non-Hodgkin Lymphoma Treatment

[www.cancer.gov/types/lymphoma/patient/adult-nhl-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/adult-nhl-treatment-pdq)

## AIDS-Related Lymphoma Treatment

[www.cancer.gov/types/lymphoma/patient/aids-related-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/aids-related-treatment-pdq)

## Childhood Hodgkin Lymphoma Treatment

[www.cancer.gov/types/lymphoma/patient/child-hodgkin-treatment-pdq](http://www.cancer.gov/types/lymphoma/patient/child-hodgkin-treatment-pdq)

## Clinical Trials General information

[www.cancer.gov/about-cancer/treatment/clinical-trials/](http://www.cancer.gov/about-cancer/treatment/clinical-trials/)

## Clinical Trials Search

[www.cancer.gov/about-cancer/treatment/clinical-trials/search](http://www.cancer.gov/about-cancer/treatment/clinical-trials/search)

## Clinical Trials Supported by Other Organizations

[ClinicalTrials.gov](http://ClinicalTrials.gov)

## Drugs Approved for Hodgkin Lymphoma

[www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma](http://www.cancer.gov/about-cancer/treatment/drugs/hodgkin-lymphoma)

**E-mail Us**

[www.cancer.gov/contact/email-us](http://www.cancer.gov/contact/email-us)

**Managing Cancer Care**

[www.cancer.gov/about-cancer/managing-care](http://www.cancer.gov/about-cancer/managing-care)

**Questions to Ask Your Doctor about Cancer**

[www.cancer.gov/about-cancer/coping/questions](http://www.cancer.gov/about-cancer/coping/questions)

**Radiation Therapy and You: Support for People With Cancer**

[www.cancer.gov/publications/patient-education/radiation-therapy-and-you](http://www.cancer.gov/publications/patient-education/radiation-therapy-and-you)

**Spanish**

[www.cancer.gov/espanol/publicaciones/pdq](http://www.cancer.gov/espanol/publicaciones/pdq)

**Staging**

[www.cancer.gov/about-cancer/diagnosis-staging/staging](http://www.cancer.gov/about-cancer/diagnosis-staging/staging)

# Notes



Access the AdventHealth Cancer Institute's  
CancerHelp Online Website with your Smartphone or  
Tablet by scanning this QR Code:



CancerHelp Online is a patient education program of  
The CancerHelp Institute, an official Content  
Distribution Partner of the National Cancer Institute.  
Funding is provided in part by the  
AdventHealth Foundation.

[www.cancerhelpadventhealth.com](http://www.cancerhelpadventhealth.com)

