



What is Hodgkins Lymphoma Disease?

Hodgkins disease is a type of lymphoma, a **cancer of the lymph system**. When lymphatic cells mutate (change) and grow unregulated by the processes that normally decide cell growth and death, they can form tumors.

The lymph system is made up of thin tubes that branch out to all parts of the body. Its job is to fight infection and disease. The lymph system carries lymph, a colorless fluid containing white blood cells (called lymphocytes).

Groups of bean-shaped organs called lymph nodes are located throughout the body at different sites in the lymph system. There are clusters of lymph nodes in the abdomen, pelvis, underarms, and neck. Other parts of the lymph system are the spleen, which makes lymphocytes and filters blood; the thymus, an organ under the breastbone; and the tonsils, located in the throat.

Hodgkins disease most commonly affects lymph nodes, usually beginning in the neck or the area between the lungs, and behind the breastbone. It can also begin in other groups of lymph nodes, such as those under the arms, in the groin, or in the abdomen or pelvis. If Hodgkins disease spreads, spread to the spleen and liver is fairly common. Spread to other parts of the body can also occur, but is unusual.

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

Adult Hodgkin's lymphoma is a type of cancer that develops in the lymph system, part of the body's immune system.

The lymph system is made up of the following:

- **Lymph**: Colorless, watery fluid that travels through the lymph system and carries white blood cells called lymphocytes. Lymphocytes protect the body against infections and the growth of tumors.
- **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 substances in lymph and help fight infection and disease. Lymph nodes are located along the network of lymph vessels found throughout the body. Clusters of lymph nodes are found in the underarm, pelvis, neck, abdomen, and groin.

- **Spleen:** An organ that produces lymphocytes, filters the blood, stores blood cells, and destroys old blood cells. It is located on the left side of the abdomen near the stomach.
- **Thymus:** An organ in which lymphocytes grow and multiply. The thymus is in the chest behind the breastbone.
- **Tonsils:** Two small masses of lymph tissue at the back of the throat. The tonsils produce lymphocytes.
- **Bone marrow:** The soft, spongy tissue in the center of large bones. Bone marrow produces white blood cells, red blood cells, and platelets.

Because lymph tissue is found throughout the body, Hodgkin's lymphoma can begin in almost any part of the body and spread to almost any tissue or organ in the body.

- **Lymphomas are divided into 2 general types:** Hodgkin's lymphoma and non-Hodgkin's lymphoma. (Hodgkin's lymphoma can occur in both adults and children; however, treatment for adults may be different than treatment for children. Hodgkin's lymphoma may also occur in patients who have acquired immunodeficiency syndrome (AIDS); these patients require special treatment.

There are 5 different types of Hodgkin's lymphoma.

These 5 types are based on the way they look under a microscope.

- Nodular sclerosing Hodgkin's lymphoma.
- Mixed cellularity Hodgkin's lymphoma.
- Lymphocyte depletion Hodgkin's lymphoma.
- Lymphocyte-rich classical Hodgkin's lymphoma.
- Nodular lymphocyte-predominant Hodgkin's lymphoma.

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

Risk factors for adult Hodgkin's 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's lymphoma.

Possible signs of adult Hodgkin's lymphoma

These and other symptoms may be caused by adult Hodgkin's lymphoma or by other conditions. A doctor should be consulted if any of the following problems do not go away.

- Painless, swollen lymph nodes in the neck, underarm, or groin.
- Fevers (unexplained).
- Drenching night sweats.

- Weight loss (unexplained).
- Itchy skin.
- Tiredness.

Tests that examine the lymph nodes are used to detect (find) and diagnose adult Hodgkin's 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 past illnesses and treatments will also be taken.
- **Complete blood count**: 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.
- **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.
- **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 in the organ or tissue that produces it.
- **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. One of the following types of biopsies may be done:
 - **Excisional biopsy**: The removal of an entire lymph node.
 - **Incisional biopsy or core biopsy**: The removal of part of a lymph node.
 - **Needle biopsy or fine-needle aspiration**: The removal of a sample of tissue from a lymph node with a needle.
- **Immunophenotyping**: A test in which the cells in a sample of blood or bone marrow are looked at under a microscope to find out if malignant lymphocytes (cancer) began from the B lymphocytes or the T lymphocytes.

Factors affect prognosis and treatment options.

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

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

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

As we well know, there are many kinds of cancer; unfortunately they all come about because of the out-of-control growth of abnormal cells.

Healthy Cells vs. Cancer Cells

Healthy cells are like a cat. They need structure to determine the size of bones and shape of the body, tail and whiskers. The DNA in genes and chromosomes determine this. They need energy to play and prowl and sustain life. This is derived from chemicals in food. Cats need a system to deliver chemicals (food nutrients like amino acids, carbohydrates, fats, vitamins and minerals) to all parts of their body. These are the blood vessels. Growth factors take a kitten into a lazy old cat, all the while helping it to function normally.

The body and its cells are mostly made up of protein. The building blocks of proteins are substances called amino acids that in the form of enzymes and hormones literally control every chemical reaction within the cells. When these are modified, different messages are sent to a complex control system that can alter their function. There are twenty different kinds of amino acids that are essential to life. Twelve of these can be synthesized within the body however; eight must be supplied by the daily diet.

Structure	
Normal Cells	Cancer Cells
DNA in genes and chromosomes go about their business in a normal way.	Cancer cells develop a different DNA or gene structure or acquire abnormal numbers of chromosomes.
Cells divide in an orderly way to produce more cells only when the body needs them.	Cells continue to be created without control or order. If not needed, a mass of tissue is formed which is called a tumor.
Energy	
Normal Cells	Cancer Cells
Cells derive 70% of their energy from a system called the "Krebs Cycle."	Cells have a defective "Krebs Cycle" and derive little or no energy from it.
Cells derive only 20% of their energy from a system called "Glycolosis."	Cancer cells derive almost all their energy from "Glycolosis."
Cells derive most of their energy with the use of oxygen.	Cells derive most of their energy in the absence of oxygen.
Blood Vessels	
Normal Cells	Cancer Cells
Cells have a built-in blood vessel system.	Cells do not have a built-in blood vessel system. They require more of certain amino acids to grow.

Growth Factors	
Normal Cells	Cancer Cells
While similar to cancer cells, the amount of	These cells have over produced, require

them is more in balance to produce a more normal level of activity.	more chemicals (food) and are over active.
Functions	
Normal Cells	Cancer Cells
The enzymes and hormones go about business in a normal balanced manner.	The enzymes and hormones are either over active or under active.
Tumors are Different	
Benign	Malignant
Benign tumors are not cancerous. They do not invade nearby tissues nor spread to other parts of the body. They can be removed and are not a threat to life.	Malignant tumors are cancerous. They can invade and damage nearby tissues and organs and they can break away and enter the blood stream to form new tumors in other parts of the body. The spread of cancer is called metastasis.

After adult Hodgkin's 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 following tests and procedures may be used in the staging process:

- **CT scan (CAT scan):** A procedure that makes a series of detailed pictures of areas inside the body, 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. For adult Hodgkin's lymphoma, CT scans of the chest, abdomen, and pelvis are taken.
- **PET scan (positron emission tomography scan):** A procedure to find malignant tumor cells in the body. A small amount of radionuclide 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.
- **Bone marrow biopsy:** The removal of a small piece of bone and bone marrow by inserting a needle into the hipbone or breastbone. A pathologist views both the bone and bone marrow samples under a microscope to look for signs of cancer.
- **Laparotomy:** A surgical 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 for biopsy. This procedure is done only if it is needed to make decisions about treatment.
- **Chest x-ray:** An x-ray of the organs and bones inside the chest. An x-ray is a type of energy beam that can go through the body and onto film, making a picture of areas inside the body.

- **Needle or surgical biopsy:** The removal of tissue using a thin needle or scalpel. A pathologist views the tissue under a microscope to look for cancer cells.
- **Thoracentesis:** The removal of fluid from the space between the lining of the chest and the lung, using a needle. A pathologist views the fluid under a microscope to look for cancer cells.

Stages of adult Hodgkin's lymphoma may include A, B, E, and S.

Adult Hodgkin's lymphoma may be classified as follows:

- A: The patient has no symptoms.
- B: The patient has symptoms such as fever, weight loss, or night sweats.
- E: "E" stands for extranodal and means the cancer is found in an organ or tissue other than the lymph nodes or extends to tissues beyond, but near, the major lymphatic areas.
- S: "S" stands for spleen and means the cancer is found in the spleen.

The following stages are used for adult Hodgkin's lymphoma:

Stage I

Stage I is divided into stage I and stage IE.

- Stage I: Cancer is found in a single group of lymph nodes.
- Stage IE: Cancer is found in one area or organ other than the lymph nodes.

Stage I Adult Hodgkin's Lymphoma

Treatment of stage I depends on whether the patient has stage IA (without symptoms) or stage IB (with symptoms) and where the cancer is.

- **Stage IA**

If the cancer is above the diaphragm and does not involve a large part of the chest, treatment may include the following:

- Combination chemotherapy with or without radiation therapy.
- Radiation therapy to lymph nodes in the mantle field (neck, chest, and armpits), including those near the aorta, with radiation therapy to the spleen if laparotomy is not done.
- Radiation therapy to the mantle field, with or without laparotomy.
- A clinical trial of combination chemotherapy with or without radiation therapy.

If the cancer is above the diaphragm and does involve a large part of the chest, treatment may include the following:

- Combination chemotherapy and radiation therapy to the mantle field (neck, chest, and armpits).

- A clinical trial of combination chemotherapy with or without radiation therapy.

If the cancer is below the diaphragm, treatment may include the following:

- Radiation therapy to the groin.
- Combination chemotherapy with radiation therapy to involved areas.
- A clinical trial of chemotherapy.
- Stage IB. Treatment of stage IB is usually combination chemotherapy with or without radiation therapy.

Stage II

Stage II is divided into stage II and stage IIE.

- Stage II: Cancer is found in two or more lymph node groups on the same side of the diaphragm (the thin muscle below the lungs that helps breathing and separates the chest from the abdomen).
- Stage IIE: Cancer is found in one area or organ other than the lymph nodes and in the lymph nodes near that area or organ, and may have spread to other lymph node groups on the same side of the diaphragm.

Stage II Adult Hodgkin's Lymphoma

Treatment of stage II depends on whether the patient has stage IIA (without symptoms) or stage IIB (with symptoms) and where the cancer is.

- **Stage IIA**

If the cancer is above the diaphragm and does not involve a large part of the chest, treatment may include the following:

- Combination chemotherapy with or without radiation therapy.
- Radiation therapy to lymph nodes in the mantle field (neck, chest, and armpits), including those near the aorta, with radiation to the spleen if laparotomy is not done.
- Radiation therapy to the mantle field with or without laparotomy.
- A clinical trial of combination chemotherapy with or without radiation therapy.

If the cancer is above the diaphragm and does involve a large part of the chest, treatment may include the following:

- Combination chemotherapy and radiation therapy to the mantle field.
- A clinical trial of combination chemotherapy with or without radiation therapy.
- Stage IIB. Treatment of stage IIB may include the following:
 - Combination chemotherapy with or without radiation therapy.
 - A clinical trial of combination chemotherapy with or without radiation therapy.

Stage III

Stage III is divided into stage III, stage IIIE, Stage IIIS, and stage IIIS+E.

- Stage III: Cancer is found in lymph node groups on both sides of the diaphragm.
- Stage IIIE: Cancer is found in lymph node groups on both sides of the diaphragm and in a nearby area or organ other than the lymph nodes.
- Stage IIIS: Cancer is found in lymph node groups on both sides of the diaphragm and in the spleen.
- Stage IIIS+E: Cancer is found in lymph node groups on both sides of the diaphragm, in a nearby area or organ, and in the spleen.

Stage III is also divided into stage III(1) and stage III(2) as follows:

- Stage III(1): Cancer is limited to the upper abdomen above the renal vein.
- Stage III(2): Cancer is found in lymph nodes in the pelvis and/or near the heart.

Stage III Adult Hodgkin's Lymphoma

Treatment of stage III depends on whether the patient has stage IIIA (without symptoms) or stage IIIB (with symptoms) and where the cancer is.

- **Stage IIIA**

If the cancer does not involve a large part of the chest, treatment may include the following:

- Combination chemotherapy with or without radiation therapy.
- A clinical trial of combination chemotherapy with or without radiation therapy.

If the cancer does involve a large part of the chest, treatment may include the following:

- Combination chemotherapy with radiation therapy.
- A clinical trial of combination chemotherapy with or without radiation therapy.
- A clinical trial of combination chemotherapy and stem cell transplantation.
- Stage IIIB. Treatment of stage IIIB may include the following:
 - Combination chemotherapy with or without radiation therapy.
 - A clinical trial of combination chemotherapy with or without radiation therapy.
 - A clinical trial of combination chemotherapy and stem cell transplantation.

Stage IV

In stage IV, the cancer either:

- is found throughout at least one organ other than the lymph nodes and may be in lymph nodes near those organs; or

- is found in one organ other than the lymph nodes and has spread to lymph nodes far away from that organ.

Stage IV Adult Hodgkin's Lymphoma

Treatment of stage IV may include the following:

- Combination chemotherapy.
- A clinical trial of combination chemotherapy with or without radiation therapy.
- A clinical trial of chemotherapy and stem cell transplantation.
- A clinical trial of new treatment options.

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

Different types of treatment are available for patients with adult Hodgkin's lymphoma. Some treatments are standard (the currently used treatment), and some are being tested in clinical trials. Before starting treatment, patients may want to think about taking part in a clinical trial. 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 with Hodgkin's lymphoma should have their treatment planned by a team of doctors 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 doctors who have experience and expertise in treating adult Hodgkin's 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.

Three types of standard treatment are used:

1. Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping the cells 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 spinal column, 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.

2. Radiation therapy

Radiation therapy is a cancer treatment that uses high-energy x-rays or other types of radiation to kill cancer cells. There are two types of radiation therapy. External radiation therapy uses a machine outside the body to send radiation toward the cancer. 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.

3. 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 for biopsy. If cancer is found, the tissue or organ is removed during the laparotomy.

What are the side effects of treatment for Hodgkin's disease?

The methods used to treat Hodgkin's disease are very powerful. That is why the treatment often causes side effects - both short-term and permanent. Side effects depend on the type of treatment and on the part of the body being treated. Also, each patient may respond differently.

During radiation therapy, patients can become unusually tired as therapy continues. Resting as much as possible is important. Skin reactions (redness or dryness) in the area being treated are common. Patients should be gentle with the treated area of skin. Lotions and creams should not be used without the doctor's advice. When the chest is treated, patients can have a dry, sore throat and have trouble swallowing. Sometimes they have shortness of breath or a dry cough. Radiation treatment to the lower abdomen can cause nausea, vomiting, or diarrhea. Some patients have tingling or numbness in their arms, legs, and lower back. These side effects gradually disappear when treatment is over.

The side effects of chemotherapy depend mainly on the drugs that are given. In general, anticancer drugs affect rapidly growing cells, such as blood cells that fight infection, cells that line the digestive tract, and cells in the hair follicles. As a result, patients can have side effects such as a lowered resistance to infection, nausea, vomiting, or mouth sores. They can also have less energy and may their hair.

Loss of appetite can be a problem for patients receiving radiation therapy or chemotherapy. Researchers are learning that patients who eat well may be better able to tolerate the side effects of their treatment. Therefore, nutrition is an important part of the treatment plan. Eating well means getting enough calories to prevent weight loss and

having enough protein in the diet to build and repair skin, hair, muscles, and organs. Many patients find that eating several small meals and snacks throughout the day is easier than trying to have three large meals.

Treatment for Hodgkin's disease can cause fertility problems. Women's menstrual periods may stop. Periods are more likely to return in younger women. In men, both Hodgkin's disease and its treatment can affect fertility. Younger men are more likely to regain their fertility. Sperm banking before treatment can be an option for some men.

The side effects that patients have during cancer therapy vary from person to person and may even be different from one treatment to the next. Attempts are made to plan treatment to keep problems to a minimum. Doctors, nurses, and dietitians can explain the side effects of cancer treatment and can suggest ways to deal with them.

Source: A. P. John Institute for Cancer Research

When considering any type of complementary cancer treatment or alternative cancer treatment, always consult with your physician first, as possible interactions could reduce your treatment protocol's efficacy.