



What
You
Need
To
Know
About™

Hodgkin's Disease

This booklet is about Hodgkin's disease. If you have questions, call the Cancer Information Service to learn more about this disease. The staff can talk with you in English or Spanish.

The phone number is
1-800-4-CANCER (1-800-422-6237).
The number for deaf and hard of hearing
callers with TTY equipment is
1-800-332-8615. The call is free.

Este folleto es acerca de la enfermedad de Hodgkin. Si tiene preguntas, llame al Servicio de Información sobre el Cáncer para conocer más acerca de esta enfermedad. Este servicio tiene personal que habla español.

El número a llamar es el
1-800-4-CANCER (1-800-422-6237).
Personas con dificultades de audición
con equipo TTY pueden llamar al
1-800-332-8615. La llamada es gratis.

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What You Need To Know About™ Hodgkin's Disease

The diagnosis of *cancer** brings with it many questions and a need for clear, understandable answers. This National Cancer Institute (NCI) booklet is intended to help people with Hodgkin's disease and their families and friends better understand this type of cancer. We hope others will read it as well to learn more about this disease.

This booklet discusses symptoms, diagnosis, and treatment. It also has information about resources and sources of support for people with Hodgkin's disease.

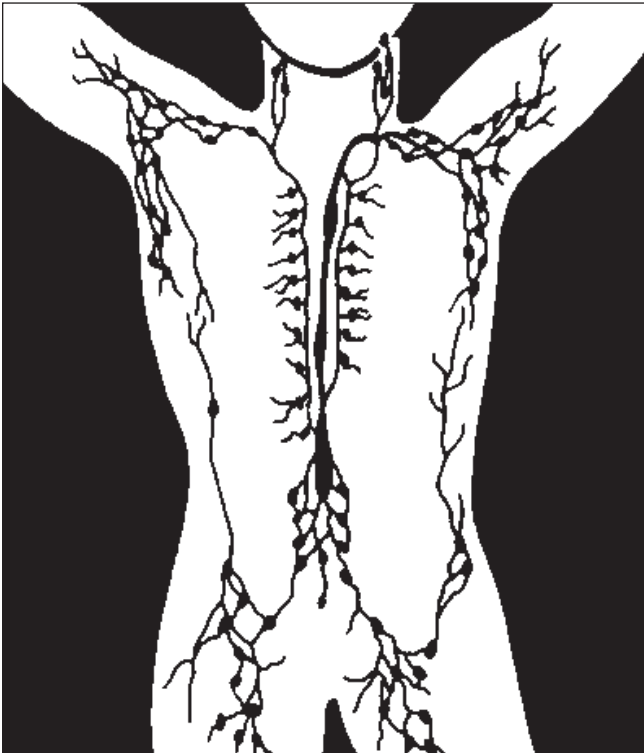
Cancer research has led to real progress against Hodgkin's disease—increased survival rates and improved quality of life. Most people diagnosed with Hodgkin's disease can now be cured, or their disease can be controlled for many years. Continuing research offers hope that, in the future, even more people with this disease will be treated successfully. Each achievement in laboratories and clinics brings researchers closer to the eventual control of Hodgkin's disease.

The Cancer Information Service and the other NCI resources listed under “National Cancer Institute Information Resources” can provide the latest, most accurate information on cancer as well as information about services and sources of support. Publications listed in the “Other Booklets” section are available from the Cancer Information Service at 1-800-4-CANCER.

*Words that may be new to readers are printed in *italics*. Definitions of these and other terms related to Hodgkin's disease are listed in the “Glossary” section. For some words, a “sounds-like” spelling is also given.

What Is Hodgkin's Disease?

Hodgkin's disease is one of a group of cancers called *lymphomas*. Lymphoma is a general term for cancers that develop in the *lymphatic system*. Hodgkin's disease, an uncommon lymphoma, accounts for less than 1 percent of all cases of cancer in this country. Other cancers of the lymphatic system are called non-Hodgkin's lymphomas.**



**Non-Hodgkin's lymphomas are the subject of another NCI booklet, *What You Need To Know About™ Non-Hodgkin's Lymphoma*.

The lymphatic system is part of the body's *immune system*. It helps the body fight disease and infection. The lymphatic system includes a network of thin lymphatic vessels that branch, like blood vessels, into tissues throughout the body. Lymphatic vessels carry *lymph*, a colorless, watery fluid that contains infection-fighting cells called *lymphocytes*. Along this network of vessels are small organs called *lymph nodes*. Clusters of lymph nodes are found in the underarms, *groin*, neck, chest, and *abdomen*. Other parts of the lymphatic system are the *spleen*, *thymus*, *tonsils*, and *bone marrow*. Lymphatic tissue is also found in other parts of the body, including the stomach, intestines, and skin.

Cancer is a group of many related diseases that begin in cells, the body's basic unit of life. To understand Hodgkin's disease, it is helpful to know about normal cells and what happens when they become cancerous. The body is made up of many types of cells. Normally, cells grow and divide to produce more cells only when the body needs them. This orderly process helps keep the body healthy. Sometimes cells keep dividing when new cells are not needed, creating a mass of extra tissue. This mass is called a growth or *tumor*. Tumors can be either *benign* (not cancerous) or *malignant* (cancerous).

In Hodgkin's disease, cells in the lymphatic system become abnormal. They divide too rapidly and grow without any order or control. Because lymphatic tissue is present in many parts of the body, Hodgkin's disease can start almost anywhere. Hodgkin's disease may occur in a single lymph node, a group of lymph nodes, or, sometimes, in other parts of the lymphatic system such as the bone marrow and spleen. This type of cancer tends to spread in a fairly orderly way from one group of lymph nodes to the next group. For example, Hodgkin's disease that arises in the lymph nodes in the neck spreads first to the nodes above the collarbones,

and then to the lymph nodes under the arms and within the chest. Eventually, it can spread to almost any other part of the body.

Risk Factors Associated with Hodgkin's Disease

Scientists at hospitals and medical centers all across the country are studying Hodgkin's disease. They are trying to learn more about what causes the disease and more effective methods of treatment.

At this time, the cause or causes of Hodgkin's disease are not known, and doctors can seldom explain why one person gets this disease and another does not. It is clear, however, that Hodgkin's disease is not caused by an injury, and it is not contagious; no one can "catch" this disease from another person.

By studying patterns of cancer in the population, researchers have found certain *risk factors* that are more common in people who get Hodgkin's disease than in those who do not. However, most people with these risk factors do not get Hodgkin's disease, and many who do get this disease have none of the known risk factors.

The following are some of the risk factors associated with this disease:

- **Age/Sex**—Hodgkin's disease occurs most often in people between 15 and 34 and in people over the age of 55. It is more common in men than in women.
- **Family History**—Brothers and sisters of those with Hodgkin's disease have a higher-than-average chance of developing this disease.
- **Viruses**—Epstein-Barr virus is an infectious agent that may be associated with an increased chance of getting Hodgkin's disease.

People who are concerned about the chance of developing Hodgkin's disease should talk with their doctor about the disease, the symptoms to watch for, and an appropriate schedule for checkups. The doctor's advice will be based on the person's age, medical history, and other factors.

Symptoms

Symptoms of Hodgkin's disease may include the following:

- A painless swelling in the lymph nodes in the neck, underarm, or groin
- Unexplained recurrent fevers
- Night sweats
- Unexplained weight loss
- Itchy skin

When symptoms like these occur, they are not sure signs of Hodgkin's disease. In most cases, they are actually caused by other, less serious conditions, such as the flu. When symptoms like these persist, however, it is important to see a doctor so that any illness can be diagnosed and treated. Only a doctor can make a diagnosis of Hodgkin's disease. **Do not** wait to feel pain; early Hodgkin's disease may not cause pain.

Diagnosis and Staging

If Hodgkin's disease is suspected, the doctor asks about the person's medical history and performs a physical exam to check general signs of health. The exam includes feeling to see if the lymph nodes in the neck, underarm, or groin are enlarged. The doctor may order blood tests.

The doctor may also order tests that produce pictures of the inside of the body. These may include:

- *X-rays*: High-energy radiation used to take pictures of areas inside the body, such as the chest, bones, liver, and spleen.
- *CT (or CAT) scan*: A series of detailed pictures of areas inside the body. The pictures are created by a computer linked to an x-ray machine.
- *MRI (magnetic resonance imaging)*: Detailed pictures of areas inside the body produced with a powerful magnet linked to a computer.

The diagnosis depends on a *biopsy*. A surgeon removes a sample of lymphatic tissue (part or all of a lymph node) so that a *pathologist* can examine it under a microscope to check for cancer cells. Other tissues may be sampled as well. The pathologist studies the tissue and checks for *Reed-Sternberg cells*, large abnormal cells that are usually found with Hodgkin's disease.

A patient who needs a biopsy may want to ask the doctor some of the following questions:

- Why do I need to have a biopsy?
- How long will the biopsy take? Will it hurt?
- How soon will I know the results?
- If I do have cancer, who will talk with me about treatment? When?

If the biopsy reveals Hodgkin's disease, the doctor needs to learn the *stage*, or extent, of the disease. Staging is a careful attempt to find out whether the cancer has spread and, if so, what parts of the body are affected. Treatment decisions depend on these findings.

The doctor considers the following to determine the stage of Hodgkin's disease:

- The number and location of affected lymph nodes;
- Whether the affected lymph nodes are on one or both sides of the *diaphragm* (the thin muscle under the lungs and heart that separates the chest from the abdomen); and
- Whether the disease has spread to the bone marrow, spleen, or places outside the lymphatic system, such as the liver.

In staging, the doctor may use some of the same tests used for the diagnosis of Hodgkin's disease. Other staging procedures may include additional biopsies of lymph nodes, the liver, bone marrow, or other tissue. A *bone marrow biopsy* involves removing a sample of bone marrow through a needle inserted into the hip or another large bone. Rarely, an operation called a *laparotomy* may be performed. During this operation, a surgeon makes an incision through the wall of the abdomen and removes samples of tissue. A pathologist examines tissue samples under a microscope to check for cancer cells.

Treatment

The doctor develops a treatment plan to fit each patient’s needs. Treatment for Hodgkin’s disease depends on the stage of the disease, the size of the enlarged lymph nodes, which symptoms are present, the age and general health of the patient, and other factors. (Treatment for children with Hodgkin’s disease is not discussed here. The Cancer Information Service and the other resources listed under “National Cancer Institute Information Resources” can provide up-to-date information about Hodgkin’s disease in children.)

Patients with Hodgkin’s disease may be vaccinated against the flu, pneumonia, and meningitis. They should discuss a vaccination plan with their health care provider.

Hodgkin’s disease is often treated by a team of specialists that may include a *medical oncologist*, *oncology nurse*, and/or *radiation oncologist*. Hodgkin’s disease is usually treated with *radiation therapy* or *chemotherapy*. The doctors may decide to use one treatment method or a combination of methods.

Taking part in a *clinical trial* (research study) to evaluate promising new ways to treat Hodgkin’s disease is an important option for many people with this disease. For more information, see the “Clinical Trials” section.

Getting a Second Opinion

Before starting treatment, patients may want a second opinion to confirm their diagnosis and treatment plan. Some insurance companies require a second opinion; others may cover a second opinion if the patient or doctor requests it.

There are a number of ways to find a doctor who can give a second opinion:

- The patient's doctor may be able to suggest specialists to consult.
- The Cancer Information Service, at 1-800-4-CANCER, can tell callers about cancer treatment facilities, including cancer centers and other programs supported by the National Cancer Institute.
- Patients can get the names of doctors from their local medical society, a nearby hospital, or a medical school.
- The *Official ABMS Directory of Board Certified Medical Specialists* lists doctors' names along with their specialty and medical background. This resource, produced by the American Board of Medical Specialties, is available in most public libraries and on the Internet.

Preparing for Treatment

Many people with cancer want to learn all they can about their disease and their treatment choices so they can take an active part in decisions about their medical care. When a person is diagnosed with cancer, shock and stress are natural reactions. These feelings may make it difficult for people to think of everything they want to ask the doctor. Often, it helps to make a list of questions. To help remember what the doctor says, patients may take notes or ask whether they may use a tape recorder. Some people also want to have a family member or friend with them when they talk to the doctor—to take part in the discussion, to take notes, or just to listen.

These are some questions a patient may want to ask the doctor before treatment begins:

- What is my exact diagnosis?
- What is the stage of the disease?
- What are my treatment choices? Which do you recommend for me? Why?
- What are the risks and possible *side effects* of each treatment?
- What side effects should I report to you?
- How long will treatment last?
- What are the chances that the treatment will be successful?
- Will treatment affect my normal activities? If so, for how long?
- Are new treatments under study? Would a clinical trial be appropriate for me?
- What is the treatment likely to cost?

Patients do not need to ask all their questions or remember all the answers at one time. They will have other chances to ask the doctor to explain things and to get more information.

Methods of Treatment

Radiation therapy and chemotherapy are the most common treatments for Hodgkin's disease, although *bone marrow transplantation*, *peripheral stem cell transplantation*, and *biological therapies* are being studied in clinical trials.

Radiation therapy (also called radiotherapy) is the use of high-energy rays to kill cancer cells. Depending on the stage of the disease, treatment with radiation may be given alone or with chemotherapy. Radiation therapy is *local therapy*; it affects cancer cells only in the treated area. Radiation treatment for Hodgkin's disease usually involves *external radiation*, which comes from a machine that aims the rays at a specific area of the body. External radiation does **not** cause the body to become radioactive. Most often, treatment is given on an outpatient basis in a hospital or clinic.

These are some questions a patient may want to ask the doctor before having radiation therapy:

- What is the goal of this treatment?
- What are its risks and possible side effects?
- What side effects should I report to you?
- How will the radiation be given?
- When will the treatments begin? When will they end?
- How will I feel during therapy?
- What can I do to take care of myself during therapy?
- How will we know if the radiation therapy is working?
- How will treatment affect my normal activities?

Chemotherapy is the use of drugs to kill cancer cells. Chemotherapy for Hodgkin's disease usually consists of a combination of several drugs. It may be given alone or followed by radiation therapy.

Chemotherapy is usually given in cycles: a treatment period followed by a recovery period, then another treatment period, and so on. Most anticancer drugs are given by injection into a blood vessel (*IV*); some are given by mouth. Chemotherapy is a *systemic therapy*, meaning that the drugs enter the bloodstream and travel throughout the body.

Usually, a patient has chemotherapy as an outpatient (at the hospital, at the doctor's office, or at home). However, depending on which drugs are given and the patient's general health, a short hospital stay may be needed.

These are some questions patients may want to ask the doctor before starting chemotherapy:

- What is the goal of this treatment?
- What drugs will I be taking?
- Will the drugs cause side effects? What can I do about them?
- What side effects should I report to you?
- How long will I need to take this treatment?
- What can I do to take care of myself during treatment?
- How will we know if the drugs are working?

Clinical Trials

Many people with Hodgkin's disease take part in clinical trials. Doctors conduct clinical trials to learn about the effectiveness and side effects of new treatments. Trials are exploring new ways of giving radiation therapy and chemotherapy, new drugs and new drug combinations, and biological therapies. High-dose chemotherapy with bone marrow or peripheral stem cell transplantation is also being evaluated. In some trials, all patients receive the new treatment. In others, doctors compare different therapies by giving the new treatment to one group of patients and the standard treatment to another group; or they may compare one standard treatment with another. Research like this has led to significant advances in the treatment of Hodgkin's disease. Each achievement brings researchers closer to the eventual control of cancer.

People who take part in clinical trials have the first chance to benefit from treatments that have shown promise in earlier research. They also make an important contribution to medical science.

Patients who are interested in entering a clinical trial should talk with their doctor. They may also want to read the National Cancer Institute booklet *Taking Part in Clinical Trials: What Cancer Patients Need To Know*, which describes how studies are carried out and explains their possible benefits and risks. The NCI cancerTrials™ Web site at <http://cancertrials.nci.nih.gov> provides detailed information about ongoing studies for Hodgkin's disease. Another way to learn about clinical trials is through the Cancer Information Service.

Side Effects of Treatment

Treatments for Hodgkin’s disease are very powerful. It is hard to limit the effects of therapy so that only cancer cells are destroyed. Because treatment also damages healthy cells and tissues, it often causes side effects.

The side effects of cancer treatment depend mainly on the type and extent of the therapy. Side effects may not be the same for everyone, and they may even change from one treatment to the next. Doctors and nurses can explain the possible side effects of treatment. They can also lessen or control many of the side effects that may occur during and after treatment.

Radiation Therapy

The side effects of radiation depend on the treatment dose and the part of the body that is treated. During radiation therapy, people are likely to become extremely tired, especially in the later weeks of treatment. Rest is important, but doctors usually advise patients to try to stay as active as they can.

It is common to lose hair in the treated area and for the skin to become red, dry, tender, and itchy. There may also be permanent darkening or “bronzing” of the skin in the treated area.

When the chest and neck are treated, patients may have a dry, sore throat and some trouble swallowing. Sometimes, they have shortness of breath or a dry cough. Radiation therapy to the abdomen may cause nausea, vomiting, diarrhea, or urinary discomfort. Often, changes in diet or medicine can ease these problems.

Radiation therapy also may cause a decrease in the number of white blood cells, cells that help protect the body against infection, or platelets, cells that help the blood to clot. If that happens, patients need to be careful to avoid possible sources of infection or injury. The doctor monitors a patient's blood count very carefully during radiation treatment. If necessary, treatment may have to be postponed to let the blood counts return to normal.

Although the side effects of radiation therapy can be difficult, they can usually be treated or controlled. It may also help to know that, in most cases, side effects are not permanent. However, patients may want to discuss with their doctor the possible long-term effects of radiation treatment on *fertility* (the ability to produce children) and the increased chance of second cancers after treatment is over. (The "Followup Care" section includes more information about the chance for second cancers.) Loss of fertility may be temporary or permanent, depending on if the testes or ovaries received radiation and the patient's age. For men, *sperm banking* before treatment may be a choice. Women's menstrual periods may stop, and they may have hot flashes and vaginal dryness. Menstrual periods are more likely to return for younger women. The National Cancer Institute booklet *Radiation Therapy and You* has helpful information about radiation therapy and managing its side effects.

Chemotherapy

The side effects of chemotherapy depend mainly on the specific drugs and the doses the patient receives. As with other types of treatment, side effects may vary from person to person.

Anticancer drugs generally affect cells that divide rapidly. In addition to cancer cells, these include blood cells, which fight infection, help the blood to clot, and carry oxygen to all parts of the body. When blood cells are affected, the patient is more likely to get infections, may bruise or bleed easily, and may feel unusually weak and tired.

Cells in hair roots also divide rapidly; therefore, chemotherapy may lead to hair loss. Hair loss is a major concern for many patients. Some anticancer drugs only cause the hair to thin out, while others may result in the loss of all body hair. People may cope with hair loss better if they decide how to handle hair loss before starting treatment.

Cells that line the digestive tract also divide rapidly, and are often damaged by chemotherapy. As a result, side effects may include poor appetite, nausea and vomiting, and/or mouth and lip sores.

Most side effects go away gradually during the recovery periods between treatments or after treatment is over. Sometimes, however, chemotherapy results in a permanent loss of fertility. The National Cancer Institute booklet *Chemotherapy and You* has helpful information about chemotherapy and coping with side effects.

Nutrition During Cancer Treatment

Eating well during cancer treatment means getting enough calories and protein to help prevent weight loss and regain strength. Good nutrition often helps people feel better and have more energy.

Some people with cancer find it hard to eat a balanced diet because they may lose their appetite. In addition, common side effects of treatment, such as

nausea, vomiting, or mouth sores, can make eating difficult. Often, foods taste different. Also, people being treated for cancer may not feel like eating when they are uncomfortable or tired.

Doctors, nurses, and dietitians can offer advice on how to get enough calories and protein during cancer treatment. Patients and their families also may want to read the National Cancer Institute booklet *Eating Hints for Cancer Patients*, which contains many useful suggestions.

Recovery and Outlook

It is natural for anyone facing cancer to be concerned about what the future holds.

Understanding the nature of cancer and what to expect can help patients and their loved ones plan treatment, anticipate lifestyle changes, and make quality of life and financial decisions.

Cancer patients frequently ask their doctors or search on their own for statistics to answer the question, “What is my *prognosis*?” Prognosis is a prediction of the future course and outcome of a disease and an indication of the likelihood of recovery from that disease. However, it is only an estimate. When doctors discuss a patient’s prognosis, they are attempting to project what is likely to occur for that individual patient. The prognosis for Hodgkin’s disease can be affected by many factors, particularly the stage of the cancer, the patient’s response to treatment, and the patient’s age and general health.

Sometimes people use statistics to try to figure out their chances of being cured. However, statistics reflect the experience of a large group of patients. They cannot be used to predict what will happen to a particular patient because no two patients are alike;

treatment and responses vary greatly. The doctor who is most familiar with a patient's situation is in the best position to help interpret statistics and discuss the patient's prognosis.

When doctors talk about surviving cancer, they may use the term *remission* rather than cure. Although many people with Hodgkin's disease are successfully treated, doctors use the term remission because cancer can return. It is important to discuss the possibility of *recurrence* with the doctor.

Followup Care

People who have had Hodgkin's disease should have regular followup examinations after their treatment is over and for the rest of their lives. Followup care is an important part of the overall treatment process, and people who have had cancer should not hesitate to discuss it with their health care provider. Patients treated for Hodgkin's disease have an increased chance of developing *leukemia*; non-Hodgkin's lymphoma; and cancers of the colon, lung, bone, thyroid, and breast. Regular followup care ensures that patients are carefully monitored, any changes in health are discussed, and new or recurrent cancer can be detected and treated as soon as possible. Between followup appointments, people who have had Hodgkin's disease should report any health problems as soon as they appear.

Support for People with Cancer

Living with a serious disease is not easy. People with cancer and those who care about them face many problems and challenges. Coping with these problems is often easier when people have helpful information and support services. Several useful booklets, including *Taking Time*, are available from the Cancer Information Service and through other sources listed in the “National Cancer Institute Information Resources” section.

Friends and relatives can be very supportive. Also, it helps many patients to discuss their concerns with others who have cancer. Cancer patients often get together in support groups, where they can share what they have learned about coping with cancer and the effects of treatment. It is important to keep in mind, however, that each person is different. Treatments and ways of dealing with cancer that work for one person may not be right for another—even if they both have the same kind of cancer. It is always a good idea to discuss the advice of friends and family members with the health care provider.

People living with cancer may worry about what the future holds. They may worry about holding their jobs, caring for their families, personal relationships, or continuing with daily activities. Concerns about tests, treatments, hospital stays, and medical bills are also common. Doctors, nurses, and other members of the health care team can answer questions about treatment, working, or other activities. Meeting with a social worker, counselor, psychologist, or member of the clergy can be helpful to people who want to talk about their feelings or discuss their concerns. Often, a social

worker can suggest groups that can help with rehabilitation, emotional support, financial aid, transportation, or home care.

Additional information about locating support services for people with cancer and their families is available through the Cancer Information Service and other sources described in the “National Cancer Institute Information Resources” section.

Glossary

Abdomen (AB-do-men): The part of the body that contains the pancreas, stomach, intestines, liver, gallbladder, and other organs.

Benign (beh-NINE): Not cancerous; does not invade nearby tissue or spread to other parts of the body.

Biological therapy (by-o-LAHJ-i-kul): Treatment to stimulate or restore the ability of the immune system to fight infection and disease. Also used to lessen side effects that may be caused by some cancer treatments. Also called immunotherapy or biological response modifier (BRM) therapy.

Biopsy (BY-ahp-see): The removal of cells or tissues for examination under a microscope. When only a sample of tissue is removed, the procedure is called an incisional biopsy or core biopsy. When the whole tumor is removed, the procedure is called an excisional biopsy. When a sample of tissue or fluid is removed with a needle, the procedure is called a needle biopsy or fine-needle aspiration.

Bone marrow: The soft, sponge-like tissue in the center of large bones that produces white blood cells, red blood cells, and platelets.

Bone marrow biopsy (BY-ahp-see): The removal of a sample of tissue from the bone marrow with a needle for examination under a microscope.

Bone marrow transplantation (trans-plan-TAY-shun): A procedure to replace bone marrow destroyed by treatment with high doses of anticancer drugs or radiation. Transplantation may be autologous (the person's own marrow saved before treatment), allogeneic (marrow donated by someone else), or syngeneic (marrow donated by an identical twin).

Cancer: A term for diseases in which abnormal cells divide without control. Cancer cells can invade nearby tissues and can spread through the bloodstream and lymphatic system to other parts of the body.

Chemotherapy (kee-mo-THER-a-pee): Treatment with anticancer drugs.

Clinical trial: A research study that evaluates the effectiveness of new interventions in people. Each study is designed to evaluate new methods of screening, prevention, diagnosis, or treatment of cancer.

CT scan: Computed tomography scan. A series of detailed pictures of areas inside the body; the pictures are created by a computer linked to an x-ray machine. Also called computed axial tomography (CAT) scan.

Diaphragm (DYE-a-frag): The thin muscle below the lungs and heart that separates the chest from the abdomen.

External radiation (ray-dee-AY-shun): Radiation therapy that uses a machine to aim high-energy rays at the cancer. Also called external-beam radiation.

Fertility (fer-TIL-i-tee): The ability to produce children.

Groin: The area where the thigh meets the abdomen.

Immune system (im-YOON): The complex group of organs and cells that defends the body against infection or disease.

IV: Intravenous (in-tra-VEE-nus). Injected in a blood vessel.

Laparotomy (lap-a-RAH-toe-mee): A surgical incision made into the wall of the abdomen.

Leukemia (loo-KEE-mee-a): Cancer of blood-forming tissue.

Local therapy: Treatment that affects cells in the tumor and the area close to it.

Lymph (limf): The almost colorless fluid that travels through the lymphatic system and carries cells that help fight infection and disease.

Lymph nodes: Small organs located throughout the body along the channels of the lymphatic system. The lymph nodes store special cells that fight infection and other diseases. Clusters of lymph nodes are found in the underarms, groin, neck, chest, and abdomen. Also called lymph glands.

Lymphatic system (lim-FAT-ik): The tissues and organs that produce, store, and carry white blood cells that fight infection and other diseases. This system includes the bone marrow, spleen, thymus, and lymph nodes and a network of thin tubes that carry lymph and white blood cells. These tubes branch, like blood vessels, into all the tissues of the body.

Lymphocytes (LIM-fo-sites): White blood cells. Lymphocytes have a number of roles in the immune system, including the production of antibodies and other substances that fight infection and other diseases.

Lymphoma (lim-FO-ma): Cancer that arises in cells of the lymphatic system.

Malignant (ma-LIG-nant): Cancerous; a growth with a tendency to invade and destroy nearby tissue and spread to other parts of the body.

Medical oncologist (on-KOL-o-jist): A doctor who specializes in diagnosing and treating cancer using chemotherapy, hormone therapy, and biological therapy. A medical oncologist often serves as the patient's main caretaker and coordinates treatment provided by other specialists.

MRI: Magnetic resonance imaging (mag-NET-ik REZ-o-nans IM-a-jing). A procedure in which a magnet linked to a computer is used to create detailed pictures of areas inside the body.

Oncology nurse: A nurse who specializes in treating and caring for people who have cancer.

Pathologist (pa-THOL-o-jist): A doctor who identifies diseases by studying cells and tissues under a microscope.

Peripheral stem cell transplantation (per-IF-er-al): A method of replacing blood-forming cells destroyed by cancer treatment. Immature blood cells (stem cells) in the circulating blood that are similar to those in the bone marrow are given to the person after treatment to help the bone marrow recover and continue producing healthy blood cells. Transplantation may be autologous (the person's own blood cells saved earlier), allogeneic (blood cells donated by someone else), or syngeneic (blood cells donated by an identical twin). Also called peripheral stem cell support.

Prognosis (prog-NO-sis): The likely outcome or course of a disease; the chance of recovery.

Radiation oncologist (ray-dee-AY-shun on-KOL-o-jist): A doctor who specializes in using radiation to treat cancer.

Radiation therapy (ray-dee-AY-shun): Radiation therapy (also called radiotherapy) uses high-energy radiation from x-rays, neutrons, and other sources to kill cancer cells and shrink tumors. Radiation may come from a machine outside the body (external-beam radiation therapy) or from materials (radioisotopes) that produce radiation which are placed in or near the tumor or in the area where the cancer cells are found (internal radiation therapy, implant radiation, or brachytherapy). Systemic radiation therapy involves

giving a radioactive substance, such as a radiolabeled monoclonal antibody, that circulates throughout the body.

Recurrence: The return of cancer, at the same site as the original (primary) tumor or in another location, after it had disappeared.

Reed-Sternberg cell: A type of cell that appears in people with Hodgkin's disease. The number of these cells increases as the disease advances.

Remission: Disappearance of the signs and symptoms of cancer. When this happens, the disease is said to be "in remission." A remission can be temporary or permanent.

Risk factor: Anything that increases the chance of developing a disease.

Side effects: Problems that occur when treatment affects healthy cells. Common side effects of cancer treatment are fatigue, nausea, vomiting, decreased blood cell counts, hair loss, and mouth sores.

Sperm banking: Freezing sperm for use in the future. This procedure can allow men to father children after loss of fertility.

Spleen: An organ that is a part of the lymphatic system. The spleen produces lymphocytes, filters the blood, stores blood cells, and destroys those that are aging. It is located on the left side of the abdomen near the stomach.

Stage: The extent of a cancer within the body, including whether the disease has spread from the original site to other parts of the body. Staging refers to the determination of the extent of cancer.

Systemic therapy (sis-TEM-ik): Treatment that uses substances that travel through the bloodstream, reaching and affecting cells all over the body.

Thymus: An organ that is part of the lymphatic system in which T lymphocytes mature and multiply. It is located in the chest, behind the breastbone.

Tonsils: Small masses of lymphoid tissue on either side of the throat.

Tumor (TOO-mer): An abnormal mass of tissue that results from excessive cell division. Tumors perform no useful body function. They may be either benign (not cancerous) or malignant (cancerous).

X-ray: High-energy radiation used in low doses to diagnose diseases and in high doses to treat cancer.

National Cancer Institute Information Resources

You may want more information for yourself, your family, and your doctor. The following National Cancer Institute (NCI) services are available to help you.

Telephone

Cancer Information Service (CIS)

Provides accurate, up-to-date information on cancer to patients and their families, health professionals, and the general public. Information specialists translate the latest scientific information into understandable language and respond in English, Spanish, or on TTY equipment.

Toll-free: 1-800-4-CANCER (1-800-422-6237)

TTY (for deaf and hard of hearing callers):
1-800-332-8615

Internet

These Web sites may be useful:

<http://www.nci.nih.gov>

NCI's primary Web site; contains information about the Institute and its programs.

<http://cancertrials.nci.nih.gov>

cancerTrials™; NCI's comprehensive clinical trials information center for patients, health professionals, and the public. Includes information on understanding trials, deciding whether to participate in trials, finding specific trials, plus research news and other resources.

<http://cancernet.nci.nih.gov>

CancerNet™; contains material for health professionals, patients, and the public, including information from PDQ® about cancer treatment, screening, prevention, supportive care, and clinical trials; and CANCERLIT®, a bibliographic database.

E-mail

CancerMail

Includes NCI information about cancer treatment, screening, prevention, and supportive care. To obtain a contents list, send e-mail to cancermail@icicc.nci.nih.gov with the word “help” in the body of the message.

Fax

CancerFax®

Includes NCI information about cancer treatment, screening, prevention, and supportive care. To obtain a contents list, dial 301–402–5874 from a fax machine hand set and follow the recorded instructions.

Other Booklets

The National Cancer Institute booklets listed below and other materials may be ordered from the Cancer Information Service by calling 1-800-4-CANCER.

Booklets About Cancer Treatment

- *Chemotherapy and You: A Guide to Self-Help During Treatment*
- *Get Relief From Cancer Pain*
- *Helping Yourself During Chemotherapy: 4 Steps for Patients*
- *Questions and Answers About Pain Control*
- *Radiation Therapy and You: A Guide to Self-Help During Treatment*
- *Research Report: Bone Marrow Transplantation and Peripheral Blood Stem Cell Transplantation*
- *Taking Part in Clinical Trials: What Cancer Patients Need To Know*
- *Datos sobre el tratamiento de quimioterapia contra el cáncer (Facts About Chemotherapy)*
- *El tratamiento de radioterapia: Guía para el paciente durante el tratamiento (Radiation Therapy and You: A Guide to Self-Help During Treatment)*
- *¿En qué consisten los estudios clínicos? Un folleto para los pacientes de cáncer (What Are Clinical Trials All About? A Guide for Cancer Patients)*

Booklets About Living With Cancer

- *Advanced Cancer: Living Each Day*
- *Eating Hints for Cancer Patients*
- *Facing Forward: A Guide for Cancer Survivors*
- *Taking Time: Support for People With Cancer and the People Who Care About Them*
- *When Cancer Recurs: Meeting the Challenge*

The National Cancer Act, passed by Congress in 1971, made research a national priority. Since that time, the National Cancer Institute (NCI), the lead Federal agency for cancer research, has collaborated with top researchers and facilities across the country to conduct innovative research leading to progress in cancer prevention, detection, diagnosis, and treatment. These efforts have resulted in a decrease in the overall cancer death rate, and have helped improve and extend the lives of millions of Americans.

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