

National Cancer Institute

What You Need
To Know About⁺

Stomach Cancer

**U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES**

National Institutes of Health

National Cancer Institute Services

This is only one of many free booklets for people with cancer.

You may want more information for yourself, your family, and your doctor.

The NCI offers comprehensive research-based information for patients and their families, health professionals, cancer researchers, advocates, and the public.

- **Call** the NCI Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)**
- **Visit** us at **<http://www.cancer.gov>** or **<http://www.cancer.gov/espanol>**
- **Chat** using **LiveHelp**, NCI's instant messaging service, at **<http://www.cancer.gov/livehelp>**
- **E-mail** us at **cancergovstaff@mail.nih.gov**
- **Order** publications at **<http://www.cancer.gov/publications>** or by calling **1-800-4-CANCER**
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About This Booklet

This National Cancer Institute (NCI) booklet is about *cancer** of the stomach. Stomach cancer is also called gastric cancer.

Each year in the United States, about 13,000 men and 8,000 women are diagnosed with stomach cancer. Most are over 70 years old.

This booklet tells about diagnosis, treatment, nutrition, supportive care, and follow-up care. It also describes how to take part in research studies. Learning about medical care for stomach cancer can help you take an active part in making choices about your care.

This booklet has lists of questions that you may want to ask your doctor. Many people find it helpful to take a list of questions to a doctor visit. To help remember what your doctor says, you can take notes. You may also want to have a family member or friend go with you when you talk with the doctor—to take notes, ask questions, or just listen.

For the latest information about stomach cancer, please visit our Web site at <http://www.cancer.gov/cancertopics/types/stomach>. Also, the NCI Cancer Information Service can answer your questions about stomach cancer. We can also send you NCI booklets and fact sheets. Call **1-800-4-CANCER (1-800-422-6237)** or instant message us through the **LiveHelp** service at <http://www.cancer.gov/help>.

*Words in *italics* are in the Dictionary on page 28. The Dictionary explains these terms. It also shows how to pronounce them.

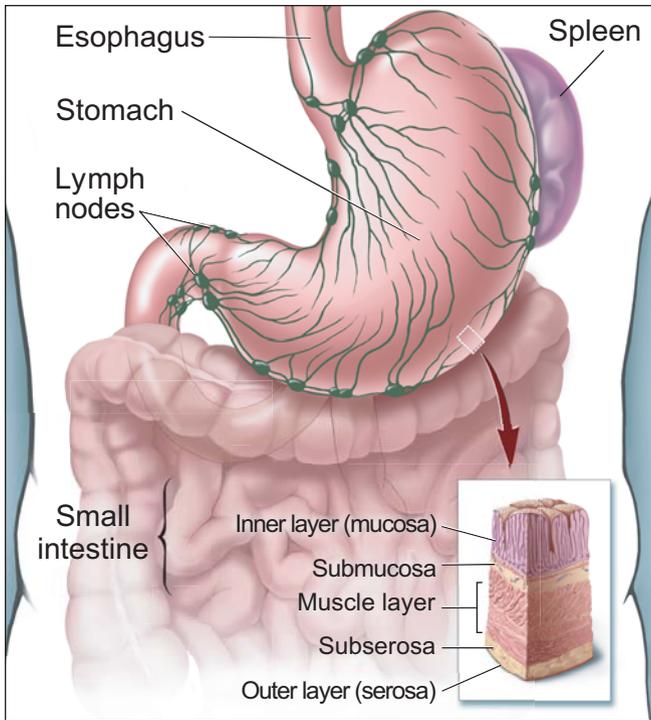
The Stomach

The stomach is a hollow *organ* in the upper *abdomen*, under the ribs.

It's part of the *digestive system*. Food moves from the mouth through the esophagus to the stomach. In the stomach, the food becomes liquid. Muscles in the stomach wall push the liquid into the small intestine.

The wall of the stomach has five layers:

- **Inner layer or lining** (*mucosa*): Juices made by *glands* in the inner layer help digest food. Most stomach cancers begin in this layer.
- **Submucosa**: This is the support *tissue* for the inner layer.
- **Muscle layer**: Muscles in this layer contract to mix and mash the food.
- **Subserosa**: This is the support tissue for the outer layer.
- **Outer layer** (*serosa*): The outer layer covers the stomach. It holds the stomach in place.



This picture shows the stomach and nearby organs.

Cancer Cells

Cancer begins in *cells*, the building blocks that make up tissues. Tissues make up the stomach and other organs of the body.

Normal cells grow and divide to form new cells as the body needs them. When normal cells grow old or get damaged, they die, and new cells take their place.

Sometimes, this process goes wrong. New cells form when the body doesn't need them, and old or damaged cells don't die as they should. The buildup of extra cells often forms a mass of tissue called a growth, *polyp*, or *tumor*.

Tumors in the stomach can be *benign* (not cancer) or *malignant* (cancer). Benign tumors are not as harmful as malignant tumors:

- **Benign tumors:**
 - are rarely a threat to life
 - can be removed and usually don't grow back
 - don't invade the tissues around them
 - don't spread to other parts of the body
- **Malignant tumors:**
 - may be a threat to life
 - often can be removed but sometimes grow back
 - can invade and damage nearby organs and tissues
 - can spread to other parts of the body

Stomach cancer usually begins in cells in the inner layer of the stomach. Over time, the cancer may invade more deeply into the stomach wall. A stomach tumor can grow through the stomach's outer layer into nearby organs, such as the liver, pancreas, esophagus, or intestine.

Stomach cancer cells can spread by breaking away from the original tumor. They enter blood vessels or *lymph vessels*, which branch into all the tissues of the body. The cancer cells may be found in *lymph nodes* near the stomach. The cancer cells may attach to other tissues and grow to form new tumors that may damage those tissues.

The spread of cancer is called *metastasis*. See the Staging section on page 10 for information about stomach cancer that has spread.

Risk Factors

When you're told that you have stomach cancer, it's natural to wonder what may have caused the disease. But no one knows the exact causes of stomach cancer. Doctors seldom know why one person develops stomach cancer and another doesn't.

Doctors do know that people with certain *risk factors* are more likely than others to develop stomach cancer. A risk factor is something that may increase the chance of getting a disease.

Studies have found the following risk factors for stomach cancer:

- ***Helicobacter pylori* infection:** *H. pylori* is a *bacterium* that commonly infects the inner lining (the mucosa) of the stomach. *Infection* with *H. pylori* can cause stomach *inflammation* and *peptic ulcers*. It also increases the risk of stomach cancer, but only a small number of infected people develop stomach cancer. You may want to read the NCI fact sheet *H. pylori and Cancer*.
- **Long-term inflammation of the stomach:** People who have conditions associated with long-term stomach inflammation (such as the blood disease *pernicious anemia*) are at increased risk of stomach cancer. Also, people who have had part of their stomach removed may have long-term stomach inflammation and increased risk of stomach cancer many years after their surgery.
- **Smoking:** Smokers are more likely than nonsmokers to develop stomach cancer. Heavy smokers are most at risk.
- **Family history:** Close relatives (parents, brothers, sisters, or children) of a person with a history of stomach cancer are somewhat more likely to develop the disease themselves. If many close relatives have a history of stomach cancer, the risk is even greater.

- **Poor diet, lack of physical activity, or obesity:**
 - Studies suggest that people who eat a diet high in foods that are smoked, salted, or pickled have an increased risk for stomach cancer. On the other hand, people who eat a diet high in fresh fruits and vegetables may have a lower risk of this disease.
 - A lack of physical activity may increase the risk of stomach cancer.
 - Also, people who are obese may have an increased risk of cancer developing in the upper part of the stomach.

Most people who have known risk factors do not develop stomach cancer. For example, many people have an *H. pylori* infection but never develop cancer. On the other hand, people who do develop the disease sometimes have no known risk factors.

Symptoms

Early stomach cancer often does not cause symptoms. As the cancer grows, the most common symptoms are:

- Discomfort or pain in the stomach area
- Difficulty swallowing
- Nausea and vomiting
- Weight loss
- Feeling full or bloated after a small meal
- Vomiting blood or having blood in the stool

Most often, these symptoms are not due to cancer. Other health problems, such as an ulcer or infection, can cause the same symptoms. Anyone who has these symptoms should tell their doctor so that problems can be diagnosed and treated as early as possible.



Diagnosis

If you have symptoms that suggest stomach cancer, your doctor will check to see whether they are due to cancer or to some other cause. Your doctor may refer you to a *gastroenterologist*, a doctor whose specialty is diagnosing and treating digestive problems.

Your doctor will ask about your personal and family health history. You may have blood or other lab tests. You also may have:

- **Physical exam:** Your doctor feels your abdomen for fluid, swelling, or other changes. Your doctor also will check for swollen lymph nodes.
- **Endoscopy:** Your doctor uses a thin, lighted tube (*endoscope*) to look into your stomach. Your doctor first numbs your throat with an *anesthetic* spray. You also may receive medicine to help you relax. The tube is passed through your mouth and esophagus to the stomach.
- **Biopsy:** An endoscope has a tool for removing tissue. Your doctor uses the endoscope to remove tissue from the stomach. A *pathologist* checks the tissue under a microscope for cancer cells. A biopsy is the only sure way to know if cancer cells are present.

You may want to ask your doctor these questions before having a biopsy:

- How will the biopsy be done?
- Will it hurt?
- Are there any risks? What are the chances of infection or bleeding after the biopsy?
- When can I resume my normal diet?
- How soon will I know the results?
- If I do have cancer, who will talk with me about the next steps? When?

Staging

If the biopsy shows that you have stomach cancer, your doctor needs to learn the stage (extent) of the disease to help you choose the best treatment.

Staging is a careful attempt to find out the following:

- How deeply the tumor invades the wall of the stomach
- Whether the stomach tumor has invaded nearby tissues
- Whether the cancer has spread and, if so, to what parts of the body.

When stomach cancer spreads, cancer cells may be found in nearby lymph nodes, the liver, the pancreas, esophagus, intestine, or other organs. Your doctor may order blood tests and other tests to check these areas:

- **Chest *x-ray*:** An x-ray of your chest can show whether cancer has spread to the lungs.
- ***CT scan*:** An x-ray machine linked to a computer takes a series of detailed pictures of your organs. You may receive an *injection* of dye. The dye makes abnormal areas easier to see. Tumors in your liver, pancreas, or elsewhere in the body can show up on a CT scan.
- ***Endoscopic ultrasound*:** Your doctor passes a thin, lighted tube (endoscope) down your throat. A probe at the end of the tube sends out sound waves that you cannot hear. The waves bounce off tissues in your stomach and other organs. A computer creates a picture from the echoes. The picture can show how deeply the cancer has invaded the wall of the stomach. Your doctor may use a needle to take tissue samples of lymph nodes.

- **Laparoscopy:** A surgeon makes small *incisions* (cuts) in your abdomen. The surgeon inserts a thin, lighted tube (*laparoscope*) into the abdomen. The surgeon may remove lymph nodes or take tissue samples for biopsy.

Sometimes staging is not complete until after surgery to remove the tumor and nearby lymph nodes.

When stomach cancer spreads from its original place to another part of the body, the new tumor has the same kind of abnormal cells and the same name as the primary (original) tumor. For example, if stomach cancer spreads to the liver, the cancer cells in the liver are actually stomach cancer cells. The disease is *metastatic* stomach cancer, not liver cancer. For that reason, it is treated as stomach cancer, not liver cancer. Doctors call the new tumor “distant” or metastatic disease.

These are the stages of stomach cancer:

- **Stage 0:** The tumor is found only in the inner layer of the stomach. Stage 0 is also called *carcinoma in situ*.
- **Stage I** is one of the following:
 - The tumor has invaded only the submucosa. (The picture on page 3 shows the layers of the stomach.) Cancer cells may be found in up to 6 lymph nodes.
 - Or, the tumor has invaded the muscle layer or subserosa. Cancer cells have not spread to lymph nodes or other organs.

- **Stage II** is one of the following:
 - The tumor has invaded only the submucosa. Cancer cells have spread to 7 to 15 lymph nodes.
 - Or, the tumor has invaded the muscle layer or subserosa. Cancer cells have spread to 1 to 6 lymph nodes.
 - Or, the tumor has penetrated the outer layer of the stomach. Cancer cells have not spread to lymph nodes or other organs.
- **Stage III** is one of the following:
 - The tumor has invaded the muscle layer or subserosa. Cancer cells have spread to 7 to 15 lymph nodes.
 - Or, the tumor has penetrated the outer layer. Cancer cells have spread to 1 to 15 lymph nodes.
 - Or, the tumor has invaded nearby organs, such as the liver, colon, or spleen. Cancer cells have not spread to lymph nodes or to distant organs.
- **Stage IV** is one of the following:
 - Cancer cells have spread to more than 15 lymph nodes.
 - Or, the tumor has invaded nearby organs and at least 1 lymph node.
 - Or, cancer cells have spread to distant organs.

Treatment

The choice of treatment depends mainly on the size and location of the tumor, the stage of disease, and your general health.

Treatment for stomach cancer may involve *surgery*, *chemotherapy*, or *radiation therapy*. You'll probably receive more than one type of treatment. For example, chemotherapy may be given before or after surgery. It's often given at the same time as radiation therapy.

You may want to talk with your doctor about taking part in a *clinical trial*, a research study of new treatment methods. Clinical trials are an important option for people at any stage of stomach cancer. See the Taking Part in Cancer Research section on page 26.

You may have a team of specialists to help plan your treatment. Your doctor may refer you to a specialist, or you may ask for a referral. Specialists who treat stomach cancer include *gastroenterologists*, *surgeons*, *medical oncologists*, and *radiation oncologists*. Your health care team may also include an *oncology nurse* and a *registered dietitian*.

Your health care team can describe your treatment choices, the expected results, and the possible *side effects*. Because cancer therapy often damages healthy cells and tissues, side effects are common. Before treatment starts, ask your health care team about possible side effects, how to prevent or reduce these effects, and how treatment may change your normal activities. You and your health care team can work together to make a treatment plan that meets your needs.

You may want to ask your doctor these questions before you begin treatment:

- What is the stage of the disease? Has the cancer spread? Do any lymph nodes show signs of cancer?
- What is the goal of treatment? What are my treatment choices? Which do you suggest for me? Why?
- What are the expected benefits of each kind of treatment?
- What can I do to prepare for treatment?
- Will I need to stay in the hospital? If so, for how long?
- What are the risks and possible side effects of each treatment? How can side effects be managed?
- What is the treatment likely to cost? Will my insurance cover it?
- How will treatment affect my normal activities? Am I likely to have eating or other problems?
- Would a research study (clinical trial) be a good choice for me?
- Can you recommend other doctors who could give me a second opinion about my treatment options?
- How often should I have checkups?

Surgery

The type of surgery for stomach cancer depends mainly on where the cancer is located. The surgeon may remove the whole stomach or only the part that has the cancer.

You and your surgeon can talk about the types of surgery and which may be right for you:

- **Partial (subtotal) gastrectomy for tumors at the lower part of the stomach:** The surgeon removes the lower part of the stomach with the cancer. The surgeon attaches the remaining part of the stomach to the intestine. Nearby lymph nodes and other tissues may also be removed.
- **Total gastrectomy for tumors at the upper part of the stomach:** The surgeon removes the entire stomach, nearby lymph nodes, parts of the esophagus and small intestine, and other tissues near the tumor. Rarely, the spleen also may be removed. The surgeon then connects the esophagus directly to the small intestine.

The time it takes to heal after surgery is different for each person, and you may be in the hospital for a week or longer. You may have pain for the first few days. Medicine can help control your pain. Before surgery, you should discuss the plan for pain relief with your doctor or nurse. After surgery, your doctor can adjust the plan if you need more pain relief.

Many people who have stomach surgery feel tired or weak for a while. Your health care team will watch for signs of bleeding, infection, or other problems that may require treatment.

The surgery can also cause *constipation* or *diarrhea*. These symptoms usually can be controlled with diet changes and medicine. See the Nutrition section on page 20 for information about eating after surgery.

You may want to ask your doctor these questions before having surgery:

- What kind of surgery do you recommend for me? Why?
- Will you remove lymph nodes? Will you remove other tissue? Why?
- How will I feel after surgery?
- Will I need a special diet?
- If I have pain, how will you control it?
- How long will I be in the hospital?
- Am I likely to have eating problems?
- Will I have any long-term side effects?

Chemotherapy

Most people with stomach cancer get chemotherapy. Chemotherapy uses drugs to kill cancer cells.

It may be given before or after surgery. After surgery, radiation therapy may be given along with chemotherapy.

The drugs that treat stomach cancer are usually given through a vein (*intravenous*). You'll probably receive a combination of drugs.

You may receive chemotherapy in an outpatient part of the hospital, at the doctor's office, or at home. Some people need to stay in the hospital during treatment.

The side effects depend mainly on which drugs are given and how much. Chemotherapy kills fast-growing cancer cells, but the drugs can also harm normal cells that divide rapidly:

- **Blood cells:** When drugs lower the levels of healthy blood cells, you're more likely to get infections, bruise or bleed easily, and feel very weak and tired. Your health care team will check for low levels of blood cells. If your levels are low, your health care team may stop the chemotherapy for a while or reduce the dose of the drug. There are also medicines that can help your body make new blood cells.
- **Cells in hair roots:** Chemotherapy may cause hair loss. If you lose your hair, it will grow back after treatment, but the color and texture may be changed.
- **Cells that line the digestive tract:** Chemotherapy can cause a poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores. Your health care team can give you medicines and suggest other ways to help with these problems. They usually go away when treatment ends.

Some drugs used for stomach cancer also may cause a skin rash, hearing loss, and tingling or numbness in your hands and feet. Your health care team can suggest ways to control many of these side effects.

You may want to read the NCI booklet *Chemotherapy and You*.

You may want to ask your doctor these questions before having chemotherapy:

- Why do I need this treatment?
- Which drug or drugs will I have?
- How do the drugs work?
- When will treatment start? When will it end?
- Will I have any long-term side effects?

Radiation Therapy

Radiation therapy (also called radiotherapy) uses high-energy rays to kill cancer cells. It affects cells only in the part of the body that is treated. Radiation therapy is usually given with chemotherapy to treat stomach cancer.

The radiation comes from a large machine outside the body. You'll go to a hospital or clinic for treatment. Treatments are usually 5 days a week for several weeks.

Side effects depend mainly on the dose and type of radiation. External radiation therapy to the chest and abdomen may cause a sore throat, pain similar to heartburn, or pain in the stomach or the intestine. You may have nausea and diarrhea. Your health care team can give you medicines to prevent or control these problems.

It's common for the skin in the treated area to become red, dry, tender, and itchy.

You're likely to become very tired during radiation therapy, especially in the later weeks of treatment. Resting is important, but doctors usually advise patients to try to stay active, unless it leads to pain or other problems.

Although the side effects of radiation therapy can be distressing, your doctor can usually treat or control them. Also, side effects usually go away after treatment ends.

You may find it helpful to read the NCI booklet *Radiation Therapy and You*.

You may want to ask your doctor these questions before having radiation therapy:

- Why do I need this treatment?
- When will the treatments begin? When will they end?
- How will I feel during treatment?
- How will we know if the radiation treatment is working?
- Will I have any long-term side effects?

Second Opinion

Before starting treatment, you might want a second opinion from another doctor about your diagnosis and treatment plan. Some people worry that their doctor will be offended if they ask for a second opinion. Usually the opposite is true. Most doctors welcome a second opinion. And many health insurance companies will pay for a second opinion if you or your doctor requests it. Some companies require a second opinion.

If you get a second opinion, the doctor may agree with your first doctor's diagnosis and treatment plan. Or the second doctor may suggest another approach. Either way, you'll have more information and perhaps a greater sense of control. You may also feel more confident about the decisions you make, knowing that you've looked carefully at your options.

It may take some time and effort to gather your medical records and see another doctor. Usually it's not a problem if it takes you several weeks to get a second opinion. In most cases, the delay in starting treatment will not make treatment less effective. To make sure, you should discuss this possible delay with your doctor. Some people with stomach cancer need treatment right away.

There are many ways to find a doctor for a second opinion. You can ask your doctor, a local or state medical society, a nearby hospital, or a medical school for names of specialists.

Also, you can request a consultation with specialists at the National Institutes of Health Clinical Center in Bethesda, Maryland. Specialists in the NCI Surgery Branch provide consultations and surgical care for people with stomach cancer. The telephone number is 301-496-4164. The Web site is located at **<http://ccr.cancer.gov/labs/lab.asp?labid=93>**.

The NCI Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)** or at **LiveHelp (<http://www.cancer.gov/help>)** can tell you about nearby treatment centers. Other sources can be found in the NCI fact sheet *How To Find a Doctor or Treatment Facility If You Have Cancer*.

Nutrition

Nutrition is an important part of your treatment for stomach cancer. You need the right amount of calories, protein, vitamins, and minerals to maintain your strength and to heal.



However, when you have stomach cancer, it may be difficult to eat. You may be uncomfortable or tired, and you may not feel like eating. You also may have nausea, vomiting, constipation, or diarrhea from cancer treatment or pain medicine.

Tell your health care team if you're losing weight or having any problems digesting your food. A dietitian can help you choose the foods and nutrition products that will meet your needs. Some people with stomach cancer are helped by receiving nutrition by IV (intravenous). A temporary feeding tube is rarely needed.

You may want to read the NCI booklet *Eating Hints*. It contains many useful ideas and recipes.

Nutrition after Stomach Surgery

A registered dietitian can help you plan a diet that will meet your nutrition needs. A plan that describes the type and amount of food to eat after surgery can help you prevent weight loss and discomfort with eating.

After stomach surgery, you may need to take daily supplements of vitamins and minerals, such as *vitamin D*, *calcium*, and *iron*. You may also need *vitamin B12* shots.

Some people have problems eating and drinking after stomach surgery. Liquids may pass into the small intestine too fast, which causes *dumping syndrome*. The symptoms are cramps, nausea, bloating, diarrhea, and dizziness. To prevent these symptoms, it may help to make the following changes:

- Plan to have smaller, more frequent meals (some doctors suggest 6 meals per day)
- Drink liquids before or after meals
- Cut down on very sweet foods and drinks (such as cookies, candy, soda, and juices)
- Ask your health care team if they can suggest medicine to control the symptoms

You may want to ask a dietitian these questions about nutrition:

- What foods are best soon after surgery?
- How can I avoid dumping syndrome?
- Are there foods or drinks that I should avoid?

Supportive Care

Stomach cancer and its treatment can lead to other health problems. You can have supportive care before, during, and after cancer treatment.

Supportive care is treatment to control pain and other symptoms, to relieve the side effects of therapy, and to help you cope with the feelings that a diagnosis of cancer can bring. You may receive supportive care to prevent or control these problems and to improve your comfort and quality of life during treatment.

You can get information about supportive care on NCI's Web site at <http://www.cancer.gov/cancerinfo/coping> and from NCI's Cancer Information Service at **1-800-4-CANCER** or **LiveHelp** (<http://www.cancer.gov/help>).

Cancer That Blocks the Digestive Tract

People with advanced stomach cancer may develop a tumor that blocks the passage of food through the digestive tract. Your health care team may suggest one or more of the following options:

- **Stent:** The doctor uses an endoscope to place a stent (a tube made of metal mesh or plastic) in your intestine. Food and liquid can pass through the center of the tube.
- **Radiation therapy:** Radiation therapy may help shrink the tumor that is blocking the intestine.
- **Laser therapy:** A *laser* is a concentrated beam of intense light that kills tissue with heat. The doctor uses an endoscope to place the laser in your digestive tract. The laser destroys the cancer cells blocking the digestive tract.

Pain

Cancer and its treatments may cause pain. Your health care team or a pain control specialist can suggest ways to relieve or reduce pain. Radiation therapy and pain medicine may help. More information about pain control can be found in the NCI booklet *Pain Control*.

Follow-up Care

You'll need regular checkups after treatment for stomach cancer. Checkups help ensure that any changes in your health are noted and treated if needed. If you have any health problems between checkups, you should contact your doctor.

Your doctor will check for return of the cancer. Also, checkups help detect health problems that can result from cancer treatment.



Checkups may include a physical exam, blood tests, x-rays, CT scans, endoscopy, or other tests. If you had surgery on the stomach, your doctor may order blood tests to check the levels of certain vitamins and minerals, such as vitamin B12, calcium, and iron.

You may find it helpful to read the NCI booklet *Facing Forward: Life After Cancer Treatment*. You may also want to read the NCI fact sheet *Follow-up Care After Cancer Treatment*.

Sources of Support

Learning that you have stomach cancer can change your life and the lives of those close to you. These changes can be hard to handle. It's normal for you, your family, and your friends to need help coping with the feelings that such a diagnosis can bring.

Concerns about treatments and managing side effects, hospital stays, and medical bills are common. You may also worry about caring for your family, keeping your job, or continuing daily activities.

Here's where you can go for support:

- Doctors, nurses, and other members of your health care team can answer questions about treatment, working, or other activities.
- Social workers, counselors, or members of the clergy can be helpful if you want to talk about your feelings or concerns. Often, social workers can suggest resources for financial aid, transportation, home care, or emotional support.

- Support groups also can help. In these groups, people with stomach cancer or their family members meet with other patients or their families to share what they have learned about coping with the disease and the effects of treatment. Groups may offer support in person, over the telephone, or on the Internet. You may want to talk with a member of your health care team about finding a support group.
- Information specialists at **1-800-4-CANCER (1-800-422-6237)** and at **LiveHelp (<http://www.cancer.gov/help>)** can help you locate programs, services, and publications. They can send you a list of organizations that offer services to people with cancer.

For tips on coping, you may want to read the NCI booklet *Taking Time: Support for People With Cancer*.

Taking Part in Cancer Research

Doctors all over the country are conducting many types of clinical trials (research studies in which people volunteer to take part). Clinical trials are designed to find out whether new approaches are safe and effective.

Doctors are trying to find better ways to care for people with stomach cancer. They are studying many types of treatment and their combinations.

Even if the people in a trial do not benefit directly, they may still make an important contribution by helping doctors learn more about stomach cancer and how to control it. Although clinical trials may pose some risks, doctors do all they can to protect their patients.

If you're interested in being part of a clinical trial, talk with your doctor. You may want to read the NCI booklet *Taking Part in Cancer Treatment Research Studies*. It describes how treatment studies are carried out and explains their possible benefits and risks.

The NCI Web site includes a section on clinical trials at <http://www.cancer.gov/clinicaltrials>. It has general information about clinical trials as well as detailed information about specific ongoing studies of stomach cancer. Information specialists at 1-800-4-CANCER (1-800-422-6237) or at LiveHelp at <http://www.cancer.gov/help> can answer questions and provide information about clinical trials.

Also, you may wish to contact the NCI Surgery Branch at the National Institutes of Health Clinical Center in Bethesda, Maryland. The telephone number is 301-496-4164. The Web site is located at **<http://ccr.cancer.gov/labs/lab.asp?labid=93>**.

Dictionary

Definitions of thousands of terms are on the NCI Web site in the NCI Dictionary of Cancer Terms. You can access it at <http://www.cancer.gov/dictionary>.

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

Anesthetic (a-nes-THEH-tik): A drug or other substance that causes a loss of feeling or awareness.

Bacteria (bak-TEER-ee-uh): A large group of single-cell microorganisms. Some cause infections and disease in animals and humans. The singular of bacteria is bacterium.

Benign (beh-NINE): Not cancerous. Benign tumors may grow larger but do not spread to other parts of the body. Also called nonmalignant.

Biopsy (BY-op-see): The removal of cells or tissues for examination by a pathologist. The pathologist may study the tissue under a microscope or perform other tests on the cells or tissue.

Calcium (KAL-see-um): A mineral needed for healthy teeth, bones, and other body tissues. It is the most common mineral in the body.

Cancer (KAN-ser): A term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems.

Carcinoma in situ (KAR-sih-NOH-muh in SY-too): A group of abnormal cells that remain in the place where they first formed. They have not spread. These abnormal cells may become cancer and spread into nearby normal tissue. Also called stage 0 disease.

Cell: The individual unit that makes up the tissues of the body. All living things are made up of one or more cells.

Chemotherapy (KEE-moh-THAYR-uh-pee): Treatment with drugs that kill cancer cells.

Clinical trial: A type of research study that tests how well new medical approaches work in people. These studies test new methods of screening, prevention, diagnosis, or treatment of a disease. Also called a clinical study.

Constipation (KAHN-stih-PAY-shun): A condition in which stool becomes hard, dry, and difficult to pass, and bowel movements don't happen very often. Other symptoms may include painful bowel movements, and feeling bloated, uncomfortable, and sluggish.

CT scan: A series of detailed pictures of areas inside the body taken from different angles. The pictures are created by a computer linked to an x-ray machine. Also called CAT scan, computed tomography scan, computerized axial tomography scan, and computerized tomography.

Diarrhea: Frequent and watery bowel movements.

Digestive system (dy-JES-tiv): The organs that take in food and turn it into products that the body can use to stay healthy. Waste products the body cannot use leave the body through bowel movements. The digestive system includes the salivary glands, mouth, esophagus, stomach, liver, pancreas, gallbladder, small and large intestines, and rectum.

Dumping syndrome: A condition that occurs when food or liquid moves too fast into the small intestine. Symptoms include cramps, nausea, diarrhea, sweating, weakness, and dizziness. Dumping syndrome sometimes occurs in people who have had part or all of their stomach removed.

Endoscope (EN-doh-SKOPE): A thin, tube-like instrument used to look at tissues inside the body. An endoscope has a light and a lens for viewing and may have a tool to remove tissue.

Endoscopic ultrasound (en-doh-SKAH-pik UL-truh-SOWND): A procedure in which an endoscope is inserted into the body. An endoscope is a thin, tube-like instrument that has a light and a lens for viewing. A probe at the end of the endoscope is used to bounce high-energy sound waves (ultrasound) off internal organs to make a picture (sonogram). Also called endosonography and EUS.

Endoscopy (en-DOSS-koh-pee): A procedure that uses an endoscope to examine the inside of the body. An endoscope is a thin, tube-like instrument with a light and a lens for viewing. It may also have a tool to remove tissue to be checked under a microscope for signs of disease.

Gastrectomy (ga-STREK-toh-mee): An operation to remove all or part of the stomach.

Gastroenterologist (GAS-troh-EN-teh-RAH-loh-jist): A doctor who specializes in diagnosing and treating disorders of the digestive system.

Gland: An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva, or milk.

Helicobacter pylori (HEEL-ih-koh-BAK-ter py-LOR-ee): A type of bacterium that causes inflammation and ulcers in the stomach or small intestine. People with *Helicobacter pylori* infections may be more likely to develop cancer in the stomach, including MALT (mucosa-associated lymphoid tissue) lymphoma. Also called *H. pylori*.

Incision (in-SIH-zhun): A cut made in the body to perform surgery.

Infection: Invasion and multiplication of germs in the body. Infections can occur in any part of the body and can spread throughout the body. The germs may be bacteria, viruses, yeast, or fungi. They can cause a fever and other problems, depending on where the infection occurs. When the body's natural defense system is strong, it can often fight the germs and prevent infection. Some cancer treatments can weaken the natural defense system.

Inflammation (in-fluh-MAY-shun): Redness, swelling, pain, and/or a feeling of heat in an area of the body. This is a protective reaction to injury, disease, or irritation of the tissues.

Injection: Use of a syringe and needle to push fluids or drugs into the body; often called a "shot."

Intravenous (IN-truh-VEE-nus): Into or within a vein. Intravenous usually refers to a way of giving a drug or other substance through a needle or tube inserted into a vein. Also called IV.

Iron: An important mineral the body needs to make hemoglobin, a substance in the blood that carries oxygen from the lungs to tissues throughout the body. Iron is also an important part of many other proteins and enzymes needed by the body for normal growth and development.

Laparoscope (LA-puh-ruh-SKOPE): A thin, tube-like instrument used to look at tissues and organs inside the abdomen. A laparoscope has a light and a lens for viewing and may have a tool to remove tissue.

Laparoscopy (LA-puh-ROS-koh-pee): A procedure that uses a laparoscope, inserted through the abdominal wall, to examine the inside of the abdomen. A laparoscope is a thin, tube-like instrument with a light and a lens for viewing. It may also have a tool to remove tissue to be checked under a microscope for signs of disease.

Laser (LAY-zer): A device that concentrates light into an intense, narrow beam used to cut or destroy tissue. It is used in microsurgery, in photodynamic therapy, and for a variety of diagnostic purposes.

Laser therapy (LAY-zer THAYR-uh-pee): The use of an intensely powerful beam of light to kill cancer cells.

Lymph node (limf): A rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Lymph nodes filter lymph (lymphatic fluid), and they store lymphocytes (white blood cells). They are located along lymphatic vessels. Also called a lymph gland.

Lymph vessel (limf): A thin tube that carries lymph (lymphatic fluid) and white blood cells through the lymphatic system. Also called lymphatic vessel.

Malignant (muh-LIG-nunt): Cancerous. Malignant tumors can invade and destroy nearby tissue and spread to other parts of the body.

Medical oncologist (MEH-dih-kul on-KAH-loh-jist): A doctor who specializes in diagnosing and treating cancer using chemotherapy, hormonal therapy, targeted therapy, and biological 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.

Metastasis (meh-TAS-tuh-sis): The spread of cancer from one part of the body to another. A tumor formed by cells that have spread is called a “metastatic tumor” or a “metastasis.” The metastatic tumor contains cells that are like those in the original (primary) tumor. The plural form of metastasis is metastases (meh-TAS-ta-seez).

Metastatic (meh-tuh-STA-tik): Having to do with metastasis, which is the spread of cancer from the primary site (place where it started) to other places in the body.

Mucosa (myoo-KOH-suh): The moist, inner lining of some organs and body cavities (such as the nose, mouth, lungs, and stomach). Glands in the mucosa make mucus (a thick, slippery fluid). Also called mucous membrane.

Oncology nurse (on-KAH-loh-jee): A nurse who specializes in treating and caring for people who have cancer.

Organ: A part of the body that performs a specific function. For example, the heart is an organ.

Pathologist (puh-THAH-loh-jist): A doctor who identifies diseases by studying cells and tissues under a microscope.

Peptic ulcer (UHL-ser): A break in the lining of the lower part of the esophagus, the stomach, or the upper part of the small intestine. Peptic ulcers form when the surface cells become inflamed and die. They are caused mainly by a bacterium known as *Helicobacter pylori* and by certain medicines, such as aspirin. Peptic ulcers may be linked to cancer and other diseases.

Pernicious anemia (per-NIH-shush uh-NEE-mee-uh): A type of anemia (low red blood cell count) caused by the body's inability to absorb vitamin B12.

Polyp (PAH-lip): A growth that protrudes from a mucous membrane.

Radiation oncologist (RAY-dee-AY-shun on-KAH-loh-jist): A doctor who specializes in using radiation to treat cancer.

Radiation therapy (RAY-dee-AY-shun THAYR-uh-pee): The use of high-energy radiation from x-rays, gamma rays, neutrons, protons, and other sources to kill cancer cells and shrink tumors. Also called radiotherapy.

Registered dietitian (dy-eh-TIH-shun): A health professional with special training in the use of diet and nutrition to keep the body healthy. A registered dietitian may help the medical team improve the nutritional health of a patient.

Risk factor: Something that may increase the chance of developing a disease. Some examples of risk factors for cancer include age, a family history of certain cancers, use of tobacco products, certain eating habits, obesity, lack of exercise, exposure to radiation or other cancer-causing agents, and certain genetic changes.

Serosa (seh-ROH-suh): The outer lining of organs and body cavities of the abdomen and chest, including the stomach. Also called serous membrane.

Side effect: A problem that occurs when treatment affects healthy tissues or organs. Some common side effects of cancer treatment are fatigue, pain, nausea, vomiting, decreased blood cell counts, hair loss, and mouth sores.

Stent: A device placed in a body structure (such as a blood vessel or the gastrointestinal tract) to keep the structure open.

Submucosa (sub-myoo-KOH-suh): The layer of tissue under the mucosa (inner lining of some organs and body cavities that makes mucus).

Subserosa (sub-seh-ROH-suh): The layer of tissue under the serosa (outer lining of some organs and body cavities).

Surgeon: A doctor who removes or repairs a part of the body by operating on the patient.

Surgery (SER-juh-ree): A procedure to remove or repair a part of the body or to find out whether disease is present. An operation.

Tissue (TISH-oo): A group or layer of cells that work together to perform a specific function.

Tumor (TOO-mer): An abnormal mass of tissue that results when cells divide more than they should or do not die when they should. Tumors may be benign (not cancer), or malignant (cancer). Also called neoplasm.

Vitamin B12: A vitamin that is needed to make red blood cells and keep nerve cells healthy.

Vitamin D: A vitamin that helps the body use calcium and phosphorus to make strong bones and teeth.

X-ray: A type of high-energy radiation. In low doses, x-rays are used to diagnose diseases by making pictures of the inside of the body. In high doses, x-rays are used to treat cancer.

National Cancer Institute Publications

NCI provides publications about cancer, including the booklets and fact sheets mentioned in this booklet. Many are available in both English and Spanish.

You may order these publications by telephone, on the Internet, or by mail. You may also read them online and print your own copy.

- **By telephone:** People in the United States and its territories may order these and other NCI publications by calling the NCI Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)**.
- **On the Internet:** Many NCI publications may be viewed, downloaded, and ordered from **<http://www.cancer.gov/publications>** on the Internet. People in the United States and its territories may use this Web site to order printed copies. This Web site also explains how people outside the United States can mail or fax their requests for NCI booklets.
- **By mail:** NCI publications may be ordered by writing to the address below:

Publications Ordering Service
National Cancer Institute
P.O. Box 24128
Baltimore, MD 21227

Clinical Trials

- *Taking Part in Cancer Treatment Research Studies*

Finding a Doctor, Support Groups, or Other Organizations

- *How To Find a Doctor or Treatment Facility If You Have Cancer* (also in Spanish)
- *National Organizations That Offer Services to People With Cancer and Their Families* (also in Spanish)

Cancer Treatment and Supportive Care

- *Radiation Therapy and You* (also in Spanish)
- *Understanding Radiation Therapy: What To Know About External Beam Radiation Therapy* (also in Spanish)
- *Chemotherapy and You* (also in Spanish)
- *Eating Hints for Cancer Patients* (also in Spanish)
- *Pain Control* (also in Spanish)

Coping with Cancer

- *Taking Time: Support for People with Cancer*
- *Managing Radiation Therapy Side Effects: What To Do When You Feel Weak or Tired (Fatigue)* (also in Spanish)

Life After Cancer Treatment

- *Facing Forward: Life After Cancer Treatment* (also in Spanish)
- *Follow-up Care After Cancer Treatment*
- *Facing Forward: Ways You Can Make a Difference in Cancer*

Advanced or Recurrent Cancer

- *Coping With Advanced Cancer*
- *When Cancer Returns*

Complementary Medicine

- *Thinking about Complementary & Alternative Medicine: A guide for people with cancer*
- *Complementary and Alternative Medicine in Cancer Treatment (also in Spanish)*

Caregivers

- *When Someone You Love Is Being Treated for Cancer: Support for Caregivers*
- *When Someone You Love Has Advanced Cancer: Support for Caregivers*
- *Facing Forward: When Someone You Love Has Completed Cancer Treatment*
- *Caring for the Caregiver: Support for Cancer Caregivers*

Risk Factors

- *H. pylori and Cancer*

Quitting Smoking

- *Clearing the Air: Quit Smoking Today*
- *You Can Quit Smoking*

The National Cancer Institute

The National Cancer Institute (NCI), part of the National Institutes of Health, is the Federal Government's principal agency for cancer research and training. NCI conducts and supports basic and clinical research to find better ways to prevent, diagnose, and treat cancer. The Institute also supports education and training for cancer research and treatment programs. In addition, NCI is responsible for communicating its research findings to the medical community and the public.

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