STOMACH CANCER

What is cancer?

Cancer develops when cells in a part of the body begin to grow out of control. Although there are many kinds of cancer, they all start because of out-of-control growth of abnormal cells.

Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide more rapidly until the person becomes an adult. After that, cells in most parts of the body divide only to replace worn-out or dying cells and to repair injuries.

Because cancer cells continue to grow and divide, they are different from normal cells. Instead of dying, they outlive normal cells and continue to form new abnormal cells.

Cancer cells develop because of damage to DNA. This substance is in every cell and directs all its activities. Most of the time when DNA becomes damaged the body is able to repair it. In cancer cells, the damaged DNA is not repaired. People can inherit damaged DNA, which accounts for inherited cancers. Many times though, a person’s DNA becomes damaged by exposure to something in the environment, like smoking.

Cancer usually forms as a tumor. Some cancers, like leukemia, do not form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Often, cancer cells travel to other parts of the body, where they begin to grow and replace normal tissue. This process is called metastasis. Regardless of where a cancer may spread, however, it is always named for the place it began. For instance, breast cancer that spreads to the liver is still called breast cancer, not liver cancer.

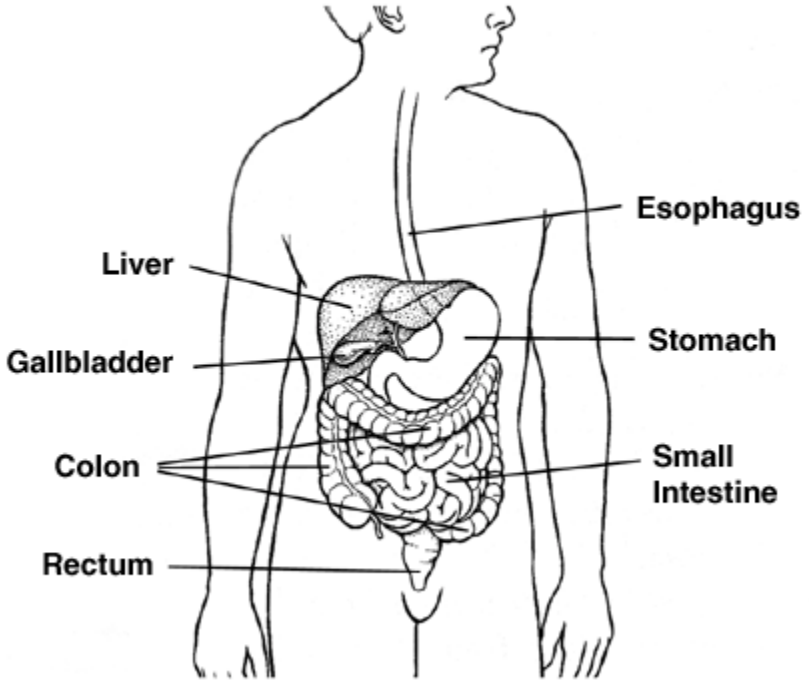
Not all tumors are cancerous. Benign (non-cancerous) tumors do not spread (metastasize) to other parts of the body and, with very rare exceptions, are not life threatening.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their particular kind of cancer.

Cancer is the second leading cause of death in the United States. Nearly half of all men and a little over one third of all women in the United States will develop cancer during their lifetimes. Today, millions of people are living with cancer or have had cancer. The risk of developing most types of cancer can be reduced by changes in a person's lifestyle, for example, by quitting smoking and eating a better diet. The sooner a cancer is found and treatment begins, the better are the chances for living for many years.

What Is Stomach Cancer?

Stomach cancer, also called *gastric cancer*, is a cancer that starts in the stomach.



After food is chewed and swallowed, it enters the esophagus, a tube that carries food through the neck and chest to the stomach. The esophagus joins the stomach just beneath the diaphragm (the breathing muscle under the lungs). The stomach is a sac-like organ that holds food and starts to digest it by secreting gastric juice. The food and gastric juice are mixed and then emptied into the first part of the small intestine called the *duodenum*.

Some people use the word *stomach* to refer to the area of the body between the chest and the pelvic area. The medical term for this area is the *abdomen*. For instance, some people with

pain in this area would say they have a "stomach ache," when in fact the pain could be coming from the appendix, small intestine, colon (large intestine), or other organs in the area. Doctors would refer to this symptom as *abdominal pain*.

This is important because the stomach is only one of many organs in the abdomen in which cancers may start. Stomach cancer should not be confused with cancers of the colon (large intestine), liver, pancreas, or small intestine because these cancers may have different symptoms, a different outlook, and different treatments.

The stomach has 5 sections. The upper portion (closest to the esophagus) is called the *cardia*. Next to this is the *fundus*. Some cells in these areas of the stomach make acid and pepsin (a digestive enzyme), the parts of the gastric juice that help digest food. The lower portion (closest to the intestine) includes the *antrum*, where the food is mixed with gastric juice, and the *pylorus*, which acts as a valve to control emptying of the stomach contents into the small intestine. The area between the proximal and distal stomach is the *body* (corpus) of the stomach. The upper parts of the stomach (cardia, fundus, and body) are sometimes called the *proximal stomach*, and the lower two (antrum and pyloris) are called *distal stomach.*

Cancers starting in different sections of the stomach may cause different symptoms and tend to have different outcomes. The location can also affect treatment options.

The stomach has 2 curves, which form its upper and lower borders. They are called the *lesser curve* and *greater curve*, respectively. Other organs next to the stomach include the colon, liver, spleen, small intestine, and pancreas.

The stomach has 5 layers. It is important to know about these layers because as a cancer grows deeper into them, the prognosis (outlook for survival) is not as good. The innermost layer is the *mucosa*. This is where stomach acid and digestive enzymes are made, and where most stomach cancers start. Under this is a supporting layer called the *submucosa*. This is surrounded by the *muscularis*, a layer of muscle that moves and mixes the stomach contents. The next 2 layers, the *subserosa* and the *outermost serosa*, act as wrapping layers for the stomach.

Stomach cancers tend to develop slowly over many years. Before a true cancer develops, pre-cancerous changes often occur in the lining of the stomach. These early changes rarely cause symptoms and therefore often go undetected.

Stomach cancers can spread, or *metastasize*, in different ways. They can grow through the wall of the stomach and invade nearby organs. They can also spread to the lymph vessels and lymph nodes. Lymph nodes are bean-sized structures near many body structures that help fight infections. The stomach has a very rich network of lymph vessels and nodes. If cancer spreads to the lymph nodes, the outlook for survival is not as good. When the stomach cancer becomes more advanced, it can travel through the bloodstream and spread to organs such as the liver, lungs, and bones.

Types of Cancers in the Stomach

Adenocarcinoma

About 90% to 95% of cancerous (malignant) tumors of the stomach are adenocarcinomas. The term *stomach cancer*, or gastric cancer, almost always refers to adenocarcinoma. This cancer develops from the cells that form the innermost lining of the stomach's mucosa.

The following other, less common tumors are also found in the stomach:

Lymphoma

These are cancers of the immune system tissue that are sometimes found in the wall of the stomach. They account for about 4% of stomach cancers. Prognosis and treatment depend on whether the lymphoma is aggressive or is a slow-growing MALT lymphoma. For further information, see the American Cancer Society document, *Non-Hodgkin Lymphoma.*

Gastrointestinal stromal tumor (GIST)

These are rare tumors that seem to start in cells in the wall of the stomach called *interstitial cells of Cajal*. Some are non-cancerous (benign); others are cancerous. Although these tumors can be found anywhere in the digestive tract, most (70%) occur in the stomach. For more information, see the American Cancer Society document, *Gastrointestinal Stromal Tumor (GIST).*

Carcinoid tumor

These are tumors that start in hormone-making cells of the stomach. Most of these do not spread to other organs. About 3% of stomach cancers are carcinoid tumors. For more information, see the American Cancer Society document *Gastrointestinal Carcinoid Tumors.*

The information in the remainder of this document refers only to adenocarcinoma of the stomach.

What Are the Key Statistics About Stomach Cancer?

About 21,500 Americans (13,190 men and 8,310 women) will be diagnosed with stomach cancer during 2008. There will be about 10,880 (6,450 men and 4,430 women) deaths from this type of cancer in 2008.

This is a disease that mostly affects older people. The average age at the time of diagnosis is 71. About two thirds of people with stomach cancer are older than 65. The risk of developing stomach cancer in a person's lifetime is about 1 in 100, but it is slightly higher in men than in women.

Stomach cancer is much more common worldwide, particularly in less developed countries. It is a leading cause of cancer-related deaths in the world.

Up until the late 1930s, stomach cancer was the leading cause of cancer deaths in the United States. Now, stomach cancer is well down on this list. The reasons for this decline are not completely known, but may be linked to increased use of refrigeration for food storage. This

led to fresh fruits and vegetables being more available and to a decreased use of salted and smoked foods. Some doctors think the decline may also be linked to the frequent use of antibiotics to treat infections in children. Antibiotics can kill the bacteria called *Helicobacter pylori* (*H. pylori*), which may be a major cause of stomach cancer.

For information on survival rates for stomach cancer, see the section, "How Is Stomach Cancer Staged?"

What Are the Risk Factors for Stomach Cancer?

A *risk factor* is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for a number of cancers. But having a risk factor, or even several risk factors, does not mean that you will get the disease. And many people who get the disease may not have had any known risk factors.

Scientists have found several risk factors that make a person more likely to get stomach cancer. Some of these can be controlled, but others cannot.

Helicobacter Pylori Infection

Infection with *Helicobacter pylori* (*H. pylori*), a type of bacteria, seems to be a major cause of stomach cancer, especially cancers in the lower (distal) part of the stomach. Long-term infection of the stomach with this germ may lead to inflammation (chronic atrophic gastritis) and pre-cancerous changes of the inner lining of the stomach. Patients with stomach cancer have a higher rate of infection than people without this cancer. *H. pylori* infection is also linked to some types of lymphoma of the stomach. Even so, the vast majority of people who carry this germ in their stomachs never develop cancer.

Gender

Stomach cancer is more common in men than in women.

Aging

There is a sharp increase in stomach cancer after the age of 50. Most people diagnosed with stomach cancer are in their late 60s, 70s, and 80s.

Ethnicity

Stomach cancer is more common in Hispanic Americans and African Americans than in non-Hispanic whites. It is most common in Asian/Pacific Islanders.

Geography

Where you live may be important. Stomach cancer is more common in Japan, China, Southern and Eastern Europe, and South and Central America. This disease is less common in Northern and Western Africa, South Central Asia, and North America.

Diet

An increased risk of stomach cancer is seen with diets containing large amounts of smoked foods, salted fish and meat, and pickled vegetables. Nitrates and nitrites are substances commonly found in cured meats. They can be converted by certain bacteria, such as *H. pylori*, into compounds that have been found to cause stomach cancer in animals.

On the other hand, eating fresh fruits and vegetables that contain antioxidant vitamins (such as A and C) appears to lower the risk of stomach cancer.

Tobacco Use

Smoking increases stomach cancer risk, particularly for cancers of the upper portion of the stomach closest to the esophagus. The rate of stomach cancer is about doubled in smokers.

Obesity

Being very overweight or obese has emerged as a possible cause of cancers of the cardia (the part of the stomach nearest the esophagus), although the strength of this link is not yet clear.

Previous Stomach Surgery

Stomach cancers are more likely to develop in people who have had part of their stomach removed to treat non-cancerous diseases such as ulcers. This may be because there are more nitrite-producing bacteria present. Also, acid production goes down after ulcer surgery, and there may be reflux (backup) of bile from the small intestine into the stomach. The risk continues to increase for as long as 15 to 20 years after surgery.

Pernicious Anemia

Certain cells in the stomach lining normally make intrinsic factor (IF), a substance needed to absorb vitamin B12 from foods. People without enough IF may end up with a vitamin B12 deficiency, which affects the body's ability to make new red blood cells. This condition is called pernicious anemia. Along with anemia (low red blood cell counts), there is a slightly increased risk of stomach cancer for patients with this disease. But because the increased risk seems to be very small, screening these patients for stomach cancer is not often recommended.

Menetrier Disease (Hypertrophic Gastropathy)

This is a condition in which excess growth of the stomach lining leads to the formation of large folds in the lining and to low levels of stomach acid. Because this disease is very rare, the exact increase in the risk of stomach cancer is not known.

Type A Blood

Blood type groups refer to certain substances that are normally present on the surface of red blood cells and some other types of cells. These groups are important in matching blood for transfusions. For unknown reasons, people with type A blood have a higher risk of getting stomach cancer.

Inherited Cancer Syndromes

Hereditary diffuse gastric cancer is an inherited condition that greatly increases the risk of developing stomach cancer. Although this condition is quite rare, the lifetime stomach cancer risk among affected people is about 70% to 80%. Researchers recently discovered the gene (E-cadherin/CDH1) responsible for this condition, and genetic testing is available at some cancer centers.

Hereditary non-polyposis colorectal cancer (HNPCC, also known as Lynch syndrome) and familial adenomatous polyposis (FAP) are also inherited genetic disorders. They cause a greatly increased risk of getting colorectal cancer and a slightly increased risk of getting stomach cancer in family members who have these gene mutations. People who carry mutations of the inherited breast cancer genes BRCA1 and BRCA2 may also have a higher rate of stomach cancer.

Family History of Stomach Cancer

People with several first-degree relatives who have had stomach cancer are more likely to develop this disease.

Some Types of Stomach Polyps

Polyps are non-cancerous growths on the lining of the stomach. Most types of polyps (such as hyperplastic polyps or inflammatory polyps) do not appear to increase a person's risk of stomach cancer, but adenomatous polyps -- also called adenomas -- can sometimes develop into cancer.

Epstein-Barr Virus Infection

This virus causes infectious mononucleosis ("mono"). Almost all adults have been infected with this virus at some time in their lives, usually as children or adolescents. It has been linked to some forms of lymphoma. Epstein-Barr virus has also been found in the stomach cancers of about 5% to 10% of people with this disease. These people tend to have a slower growing, less aggressive cancer with a lower tendency to spread. It isn’t clear what role the virus plays in the development of stomach cancer.

Certain Occupations

Workers in the coal, metal, and rubber industries seem to have a higher risk of getting stomach cancer.

Do We Know What Causes Stomach Cancer?

While there are many known risk factors for stomach cancer, it is not known exactly how these factors cause cells of the stomach lining to become cancerous. This is the subject of ongoing research.

Several changes that are thought to be pre-cancerous can occur in the stomach lining.

One of these is *atrophic gastritis*. This is a condition where the normal glands of the stomach are either decreased or absent. There is some degree of inflammation (the stomach cells are

damaged by cells of the immune system), which is often due to *H. pylori* infection. It is not known exactly why this condition progresses to cancer.

Another change that may also be pre-cancerous is *intestinal metaplasia.* This is a condition where the normal lining of the stomach is replaced with cells that closely resemble the cells that usually line the intestine. People with this condition usually have chronic atrophic gastritis as well. How and why this change occurs and progresses to stomach cancer is not well understood. This might also be related to *H. pylori* infection.

Recent research has provided clues to how some stomach cancers form. For instance, *H. pylori* bacteria, particularly certain subtypes, can convert some of the chemicals in high-risk foods into chemicals that cause mutations (changes) in the DNA of the cells in the stomach lining. This may also explain why certain foods such as preserved meats increase a person's risk for stomach cancer. On the other hand, some of the foods that lower stomach cancer risk contain antioxidants, which can block substances that damage a cell's DNA.

During the past few years, scientists have made great progress in understanding how certain changes in DNA can cause normal stomach cells to grow abnormally and form cancers. DNA is the chemical in each cell that carries our genes - the instructions for how our cells function. We resemble our parents because they are the source of our DNA.

But DNA affects more than our outward appearance. Some genes contain instructions for controlling when cells grow and divide. Certain genes that promote cell division are called *oncogenes*. Others that slow down cell division or cause cells to die at the right time are called *tumor suppressor genes*. Cancers can be caused by DNA changes that turn on oncogenes or turn off tumor suppressor genes.

There are also genes that make enzymes to repair the DNA when it develops abnormal changes. Loss of or damage to these genes can also lead to some cancers.

Inherited abnormalities of these genes (as explained in the section "What Are the Risk Factors for Stomach Cancer?") can increase a person's stomach cancer risk. But most of the genetic changes that lead to stomach cancer occur after birth. Inherited genetic changes account for only a small percentage of stomach cancers.

Can Stomach Cancer Be Prevented?

Even though we do not know the exact cause of stomach cancer, it is still possible to prevent many stomach cancers.

The dramatic decline of stomach cancer in the past several decades is thought to be a result of people reducing many of the known dietary risk factors. This includes greater use of refrigeration for food storage rather than preservation of foods by salting, pickling, and smoking. To help reduce their risk, people should avoid diets that are high in smoked and pickled foods and salted meats and fish.

A diet high in fresh fruits and vegetables can also lower stomach cancer risk. The American Cancer Society recommends that people eat a variety of healthful foods, with an emphasis on plant sources. This includes eating at least 5 servings of vegetables and fruits each day, as well whole grain foods, and limiting intake of processed and red meats.

Studies that have looked at using dietary supplements to lower stomach cancer risk have had mixed results so far. There is some evidence that combinations of antioxidant supplements (vitamins A, C, and E and the mineral selenium) may reduce the risk of stomach cancer in people with poor nutrition to begin with. But most studies looking at people who have good nutrition have not found any benefit. Further research in this area is needed.

Although some small studies suggested that tea drinking, particularly green tea, may help protect against stomach cancer, most large studies have not found such a link.

Obesity may add to the risk of stomach cancer. The American Cancer Society recommends maintaining a healthy weight throughout life by balancing calorie intake with physical activity. Aside from possible effects on the risk of stomach cancer, losing weight may also have an impact on the risk of several other cancers and health problems related to obesity.

Tobacco use can increase the risk of cancers of the proximal stomach (the portion of the stomach closest to the esophagus). Tobacco use increases the risk for many types of cancer and is responsible for about one third of all cancer deaths in the United States. If you don't use tobacco, please don't start. If you already do and want help quitting, call your health care professional or the American Cancer Society.

It is not yet clear whether antibiotic treatment should be given to people whose stomach linings are chronically infected with the bacteria *H. pylori* but who do not have any symptoms. This is a topic of current research. Some early studies have suggested that giving antibiotics to people with *H. pylori* infection may lower the number of pre-cancerous lesions in the stomach and may reduce the risk of developing stomach cancer. But not all studies have found this. More research needs to be done to be sure that this is a way to prevent stomach cancer in people with *H. pylori* infection.

If your doctor thinks you might have *H. pylori* infection, there are several ways of testing for this. One approach is to use endoscopy (see the section "How Is Stomach Cancer Diagnosed?") to take a biopsy of the stomach lining. This sample can be used for chemical tests for this kind of bacteria. Doctors can also identify *H. pylori* in biopsy samples viewed under a microscope. The biopsy sample can also be *cultured* -- placed in a nutrient medium that promotes growth of *H. pylori*. There is also a special breath test for the bacteria. First you drink a liquid containing urea. If *H. pylori* is present, it will cause chemical changes to the urea. A sample of your breath is then tested to detect these chemical changes. The simplest test is a blood test that looks for antibodies to *H. pylori*.

Using aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen or naproxen, seems to lower the risk of stomach cancer by at least 25%. These medicines can

also lower the risk of developing colon polyps and colon cancer. But they can also cause serious (and even fatal) internal bleeding and other potential health risks in some people. Most doctors consider any reduced cancer risk an added benefit for patients who take these drugs for other reasons, such as to treat arthritis. But they do not routinely recommend NSAIDs specifically for the purpose of stomach cancer prevention. Studies have not yet determined for which patients the benefits of lowering cancer risk would outweigh the risks of bleeding complications.

Although avoiding risk factors whenever possible can lower a person's stomach cancer risk, it cannot guarantee protection from this disease. Particularly in countries where stomach cancer is common, early detection may be the best way to improve the chance of successful treatment and reduce the number of deaths caused by the disease.

Although an inherited condition known as hereditary diffuse gastric cancer accounts for only a small percentage of stomach cancers, it is very important to recognize. Because the majority of affected people who have inherited this genetic condition eventually develop stomach cancer, people with a strong family history of stomach cancer should find out if they might have this condition. If their family history suggests that they do, genetic testing can be done at some cancer centers. If the result shows an abnormal form of the E-cadherin/CHD1 gene, many doctors recommend having their stomach removed before the cancer develops.

Can Stomach Cancer Be Found Early?

Screening is the search for disease, such as cancer, in people without symptoms. In countries such as Japan, where stomach cancer is much more common than in the United States, mass screening of the population has helped find many cases at an early, curable stage. This may have reduced the number of people who die of this disease, but the studies were not designed to prove this.

Studies in the United States have not found mass screening for stomach cancer to be useful because this disease is not that common. On the other hand, people with certain stomach cancer risk factors may benefit from screening. If you have any questions about your stomach cancer risk or about the benefits of screening, please ask your doctor. Some of the tests that could be used for screening, such as upper endoscopy, are described in the section "How Is Stomach Cancer Diagnosed?"

Because mass screening for stomach cancer is not done in the United States, most people with this disease are diagnosed when they have certain signs and symptoms that point to the need for medical tests.

How Is Stomach Cancer Diagnosed?

Signs and Symptoms of Stomach Cancer

Unfortunately, early-stage stomach cancer rarely causes symptoms. This is one of the reasons why stomach cancer is so hard to detect early. The signs and symptoms of stomach cancer can include:

- unintended weight loss and lack of appetite

- abdominal pain
- vague discomfort in the abdomen, usually above the navel
- a sense of fullness in the upper abdomen after eating a small meal
- heartburn, indigestion, or ulcer-type symptoms
- nausea
- vomiting, with or without blood
- swelling or fluid build-up in the abdomen

Most of these symptoms are more likely to occur with non-cancerous conditions, such as a stomach virus. They may also occur with other types of cancer. But people who have any of these problems, especially if they persist, should check with their doctor so the cause can be determined and treated if needed.

Since symptoms of stomach cancer often do not appear until the disease is advanced, only about 20% of stomach cancers in the United States are found in the early stages, before they have spread to other areas of the body.

Medical History and Physical Exam

A complete medical history is an interview in which the doctor asks you questions about risk factors and symptoms to see if they might suggest stomach cancer or another cause. The doctor may also want to know about your general health in case you need surgery.

A physical exam provides information about your general health, possible signs of stomach cancer, and other health problems. In particular, the doctor will feel your abdomen for any abnormal changes.

Upper Endoscopy

Endoscopy is the main test used to diagnose stomach cancer when people have certain risk factors for stomach cancer or when signs and symptoms suggest this disease may be present.

During this test, you are sedated (made sleepy). The doctor passes a thin, flexible, lighted tube called an *endoscope* down your throat. This instrument allows the doctor to view the lining of your esophagus, stomach, and first part of the small intestine. If abnormal areas are noted, biopsies (tissue samples) can be taken using instruments passed through the endoscope. The tissue samples are looked at under a microscope to see if cancer is present.

When viewed through an endoscope, stomach cancer can appear as an ulcer, a mushroom-shaped or protruding mass, or a flat, thickened area of mucosa known as *linitis plastica*. Linitis plastica can be hard to recognize in its earliest stages, and a biopsy is needed to get an accurate diagnosis.

Endoscopy can also be used as part of a special imaging test known as endoscopic ultrasound, which is described below.

Imaging Tests

Imaging tests may help guide a doctor toward a diagnosis if there is some question about whether a person has cancer, but they are often used to help determine the stage (extent) of the cancer once it has already been found.

Upper Gastrointestinal (GI) Series
This is an x-ray test to look at the esophagus, stomach and first part of the small intestine. For this test, the patient drinks a barium-containing solution that coats the lining of these organs. Because x-rays can't pass through the coating of barium, this will outline any abnormalities of the lining of these organs. Several x-ray pictures are then taken. To identify early stomach cancer, a "double contrast" technique is commonly used. After the barium solution is swallowed, a thin tube is passed into the stomach and air is pumped in. This makes the barium coating very thin, so even small abnormalities will show up.

Endoscopic Ultrasound (EUS)
Ultrasound uses sound waves to produce images of organs such as the stomach. During a standard ultrasound, a transducer, which is a wand-shaped probe, is placed on the skin. It emits sound waves and detects the echoes as they bounce off internal organs. The pattern of echoes is processed by a computer to produce a black and white image on a screen. While this type of ultrasound is useful in some instances, the picture quality is limited because of the distance the sound waves and echoes have to travel and the layers of body tissue they have to go through.

Endoscopic ultrasound involves using a small transducer that is placed on the tip of an endoscope (see above), which is passed down the throat and into the stomach. It allows the doctor to look at the layers of the stomach wall, as well as the nearby lymph nodes and other structures. The picture quality is better than a standard ultrasound because of the smaller distance the sound waves have to travel.

EUS is most useful in helping to determine the local extent of the cancer -- that is, how far cancer may have spread into the wall of the stomach, to nearby tissues, and to nearby lymph nodes. It can also be used to help guide a needle into a suspicious area in order to get a tissue sample (an EUS-guided needle biopsy).

Computed Tomography (CT) Scan
The CT scan is an x-ray procedure that produces detailed cross-sectional images of your body. Instead of taking one picture, like a standard x-ray, a CT scanner takes many pictures as it rotates around you. A computer then combines these pictures into images of slices of the part of your body being studied.

Often after the first set of pictures is taken you may be asked to drink 1 or 2 pints of a radiocontrast agent, or dye, and/or you may receive an intravenous (IV) line through which the contrast dye is injected. This dye helps better outline structures in your body. A second set of pictures is then taken. The solution you drink and the injection can also cause some flushing (redness and warm feeling). Some people are allergic and get hives, or rarely more

serious reactions like trouble breathing and low blood pressure can occur. Be sure to tell the doctor if you have ever had a reaction to any contrast material used for x-rays.

CT scans take longer than regular x-rays. You need to lie still on a table while they are being done. During the test, the table moves in and out of the scanner, a ring-shaped machine that completely surrounds the table. You might feel a bit confined by the ring you have to lay in when the pictures are being taken.

CT scans show the stomach fairly clearly and often can confirm the location of the cancer. CT scans can also show the organs near the stomach, such as the liver, as well as lymph nodes and distant organs where cancer might have spread. The CT scan can help determine the extent (stage) of the cancer and whether surgery may be a good treatment option.

CT scans can also be used to guide a biopsy needle into a suspected area of cancer spread (a CT-guided needle biopsy). The patient remains on the CT scanning table while a doctor moves a biopsy needle through the skin toward the mass. CT scans are repeated until the needle is within the mass. A fine-needle biopsy sample (tiny fragment of tissue) or a core-needle biopsy sample (a thin cylinder of tissue about ½-inch long and less than 1/8-inch in diameter) is then removed and looked at under a microscope.

Magnetic Resonance Imaging (MRI) Scan
MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed by the body and then released in a pattern formed by the type of body tissue and by certain diseases. A computer translates the pattern into a very detailed image of parts of the body. Not only does this produce images of cross-sectional slices of the body like a CT scanner, it can also produce images of slices that are parallel with the length of your body. A contrast material might be injected just as with CT scans, but this is used less often.

Most doctors prefer CT scans to look at the stomach. But an MRI may sometimes provide more information.

MRI scans take longer than CT scans -- often up to an hour. You may have to lie inside a narrow tube, which is confining and can upset people with a fear of enclosed spaces. Newer, "open" MRI machines can help with this if needed. The MRI machine makes loud buzzing noises that you may find disturbing. Some places provide headphones to block this out.

Positron Emission Tomography (PET) Scan
In this test, radioactive glucose (a type of sugar) is injected into the patient's vein. Because cancer cells are growing faster than normal cells, they use sugar much faster, so they take up the radioactive material. A special camera can then create a picture of areas of radioactivity in the body. The picture is not finely detailed like a CT or MRI scan, but it provides helpful information. This test, which is still being studied, is useful for spotting cancer that has spread beyond the stomach and can't be removed by surgery. It may be a very useful test for staging the cancer.

A *PET/CT scan* combines a CT scan and a PET scan to pinpoint the tumor even better. This test may be especially useful for spotting cancer that has spread beyond the stomach and wouldn't be treatable by surgery. It may be a useful test for staging the cancer. Because this test is so new, it is still being studied.

Chest X-ray
This test can help find out whether the cancer has spread to the lungs. It may also be useful to determine whether there are any serious lung or heart diseases present.

Other Tests

Laparoscopy
This test is usually done only after stomach cancer has already been found. While CT or MRI scans can create detailed pictures of the inside of the body, they may miss some tumors, especially if they are very small. To help confirm a stomach cancer is still localized enough to be treated with surgery, doctors often do a laparoscopy first. This involves inserting a laparoscope (a thin, flexible tube) through a small surgical opening in the patient's side. The laparoscope has a small camera on its end, which transmits pictures of the inside of the abdomen to a TV screen. Doctors can look at the surfaces of the organs and nearby lymph nodes closely to make sure the cancer hasn't spread and that all the cancer can be removed. Sometimes laparoscopy is combined with ultrasound to give a better picture of the cancer.

Lab Tests
When looking for signs of stomach cancer, a doctor may order a blood test called a complete blood count (CBC) to look for anemia (which could be caused by internal bleeding). A fecal occult blood test may be done to look for blood in stool (feces).

The doctor may recommend other tests if cancer is found, especially if you are going to have surgery. For instance, blood tests can be done to make sure your liver and kidney function are normal. You may also have an electrocardiogram (EKG) to make sure your heart is functioning well.

How Is Stomach Cancer Staged?

Staging is the process of finding out how far a cancer has spread. The extent of spread of stomach cancer is an important factor in choosing treatment options and predicting a patient’s outlook for survival (prognosis). The tests described above (see the section "How Is Stomach Cancer Diagnosed?") are the ones used to determine the stage of the cancer.

A staging system is a way for members of the cancer care team to describe the extent of a cancer's spread. The stage of a cancer can be determined by the information gathered before surgery (clinical stage) or from the results of the surgery after looking at the removed tissues (pathologic stage). The stages described below are the pathologic stages, determined by the results of surgery.

The American Joint Committee on Cancer (AJCC) TNM System

The system most often used to stage stomach cancer in the United States is the American Joint Commission on Cancer (AJCC) TNM system. The TNM system for staging contains 3 key pieces of information:

- **T** describes the extent of the primary **t**umor (how far it has grown into the wall of the stomach and into nearby organs).
- **N** describes the spread to nearby (regional) lymph **n**odes.
- **M** indicates whether the cancer has **m**etastasized (spread) to other organs of the body. (The most common sites of distant spread of stomach cancer are the liver, the peritoneum (the lining of the space around the digestive organs), and distant lymph nodes. Less common sites of spread include the lungs and brain.)

Numbers or letters appear after T, N, and M to provide more details about each of these factors:

- The numbers 0 through 4 indicate increasing severity.
- The letter X means "cannot be assessed" because the information is not available.
- The letters "is" mean "carcinoma in situ," which means the tumor is contained within the top layer of mucosa cells and has not yet invaded deeper layers of tissue.

T Categories of Stomach Cancer

The T category describes how far down through the stomach layers the cancer has invaded. To recall, the stomach is made of 5 layers. Starting from the inside and working our way out, the innermost layer is the *mucosa*. This is where stomach acid and digestive enzymes are made. Next is a supporting layer called the *submucosa*. This is surrounded by the *muscularis*, a layer of muscle that moves and mixes the stomach contents. The next 2 layers, the *subserosa* and the *outermost serosa* act as wrapping layers for the stomach.

- **TX:** The main tumor cannot be assessed
- **T0:** No evidence of a main tumor
- **Tis (carcinoma in situ):** Cancer cells are limited to the mucosa (innermost layer of the stomach) and have not invaded deeper layers of the stomach
- **T1:** Tumor invades below the mucosa, into the connective tissue (lamina propria) or submucosa
- **T2:** Tumor invades the muscularis (T2a) or tumor invades the subserosa (T2b)
- **T3:** Tumor invades the serosa, but doesn't invade any nearby organ
- **T4:** Tumor goes through the serosa and invades a nearby organ (spleen, intestines, pancreas, kidney, etc.) or other structures such as major blood vessels

N Categories of Stomach Cancer

- **NX:** Regional lymph nodes cannot be assessed
- **N0:** No spread to nearby (regional) lymph nodes
- **N1:** The cancer has spread to 1 to 6 nearby lymph nodes
- **N2:** The cancer has spread to 7 to 15 nearby lymph nodes
- **N3:** The cancer has spread to more than 15 nearby lymph nodes

M Categories of Stomach Cancer

- **MX:** Spread to distant organs cannot be assessed
- **M0:** No distant metastasis
- **M1:** Distant metastasis (spread of the cancer to tissues or organs far away from the stomach)

TNM Stage Grouping

The T, N, and M categories are combined and expressed as a stage, using Roman numerals I through IV. This is known as stage grouping.

Stage 0: Tis, N0, M0: This is cancer in its earliest stage. It has not grown beyond the inner layer of cells that line the stomach. This stage is also known as carcinoma in situ.

Stage IA: T1, N0, M0: The cancer has invaded beneath the mucosa into the connective tissue (lamina propria) or the submucosa. But it has not grown into the main muscle layer of the stomach, called the muscularis. The cancer has not spread to any lymph nodes or anywhere else.

Stage IB: Two combinations of T and N features are assigned to this stage.

- **T1, N1, M0:** Just as in stage IA, the cancer has grown into the connective tissue (lamina propria) or submucosa but it has not grown into the muscularis, the main muscle layer of the stomach. It has also spread to as many as 6 lymph nodes near the stomach, but not to any other tissues or organs.

- **T2a/b, N0, M0:** The cancer has grown into the main muscle layer of the stomach wall, called the muscularis, and may have grown into the subserosa. It has not spread to any other tissues or organs and has not spread to any lymph nodes.

Stage II: Three combinations of T and N features are assigned to this stage.

- **T1, N2, M0:** The cancer has invaded beneath the mucosa into the connective tissue (lamina propria) or the submucosa. It has not grown into the main muscle layer, but it has spread to between 7 and 15 lymph nodes near the stomach.

- **T2a/b, N1, M0:** The cancer has grown into the main muscle layer and may have grown into the subserosa. It has not spread to any nearby tissues or organs, but it has spread to 1 to 6 lymph nodes near the stomach.

- **T3, N0, M0:** The cancer has grown through all the layers to the outside the stomach. It has not spread to any nearby tissues or organs and it has not spread to any lymph nodes.

Stage IIIA: Three combinations of T and N features are assigned to this stage.

- **T2a/b, N2, M0:** The cancer has grown into the main muscle layer and may have spread into the subserosa. It has not spread to any nearby tissues or organs, but it has spread to between 7 and 15 lymph nodes near the stomach.

- **T3, N1, M0:** The cancer has grown completely through all the layers to the outside of the stomach. It has not spread to any nearby tissues or organs, but it has spread to between 1 and 6 lymph nodes near the stomach.

- **T4, N0, M0:** The cancer has grown completely through the stomach wall and into other nearby organs, such as the spleen, intestines, kidneys, or pancreas. It has not spread to any lymph nodes.

Stage IIIB: T3, N2, M0: The cancer has grown completely through all the layers to the outside of the stomach. It has not spread to any nearby tissues or organs, but it has spread to between 7 and 15 lymph nodes near the stomach.

Stage IV: Three combinations of T, N, and M features are assigned to this stage.

- **T4, N1-3, M0:** The cancer has grown completely through the stomach wall into other nearby organs, such as the spleen, liver, intestines, kidneys, or pancreas. It has also spread to nearby lymph nodes, but it has not spread to distant organs.

- **T1-3, N3, M0:** The cancer has spread to more than 15 lymph nodes, but it has not spread to distant organs.

- **Any T, any N, M1:** The cancer has spread to distant organs such as the liver, lungs, brain, or bones.

If you have any questions about the stage of your disease, ask your doctor to explain this to you. The stage of a stomach cancer is an important factor, but it is not the only factor in considering treatment options and in predicting outlook for survival.

Five-Year Survival Statistics by Stage

The *5-year survival rate* refers to the percentage of patients who live at least 5 years after their cancer is diagnosed. Of course, some people live much longer than 5 years. Five-year rates are used as a standard way of discussing prognosis. The *5-year relative survival rate* compares the observed survival of people with stomach cancer to that expected for people without stomach cancer. Therefore, relative survival mainly talks about deaths from stomach cancer; it tries to exclude people with stomach cancer who might die from other causes. This is thought to be a more accurate way to describe the outlook for patients with a certain type and stage of cancer.

The overall 5-year *relative* survival rate of all people with stomach cancer in the United States is about 24%. This survival rate has improved only slightly in the last 20 years. One reason for this is that most stomach cancers in the United States are diagnosed at an advanced rather than an early stage. The stage (extent) of the cancer has a major effect on a patient's prognosis (outlook for survival).

Another important factor is the location of the cancer. The 5-year survival rate for cancers of the distal stomach (the lower portion of the stomach) is higher than for cancers in the proximal stomach (the upper portion of the stomach).

It is important to remember that statistics on cancer survival are averages. The outlook for any individual patient can't be predicted with certainty, and many people survive much longer than would be expected based on the stage of their cancer.

The 5-year relative survival rates for stomach cancer by stage are as follows:

Stage 0:	77%
Stage IA:	66%
Stage IB:	57%
Stage II:	35%
Stage IIIA:	17%
Stage IIIB:	12%
Stage IV:	3%

These numbers come from the American College of Surgeons National Cancer Data Base and refer to more than 11,000 patients who were treated in 1998. Because these numbers are several years old, outcomes for people diagnosed with stomach cancer today may be better.

How Is Stomach Cancer Treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.

Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

No matter what stage of stomach cancer you have, treatment is available. The choice of treatment you receive depends on many factors. The location and the stage (extent of spread) of the tumor are very important. In choosing your treatment plan, you and your cancer care team will also take your age, general state of health, and personal preferences into account.

The main treatments for stomach cancer are surgery, chemotherapy, and radiation therapy. Often the best approach uses 2 or more of these treatment methods.

Your recovery is one goal of your cancer care team. If a cure is not possible, treatment is aimed at relieving symptoms, such as trouble eating, pain, or bleeding. It is important that you understand the goal of your treatment -- whether it is to cure your cancer or to relieve symptoms -- before starting treatment. If the goal of your treatment is a cure, you will also receive treatment to relieve symptoms and side effects.

Surgery

Depending on the type and stage of stomach cancer, surgery may be used to remove the cancer and part or all of the stomach. The surgeon will try to leave behind as much normal stomach as possible.

At this time, surgery offers the only realistic chance to cure stomach cancer. If a patient has a stage 0, I, II, or III cancer and is healthy enough, an attempt should be made to treat the cancer with surgery. Patients with stage IV cancer that has not spread to distant sites may also benefit from surgery.

Even if the cancer is too widespread to be removed completely by surgery, most patients are helped by it because it may help prevent bleeding from the tumor or prevent the stomach from being blocked by tumor growth. This type of surgery is called *palliative surgery*, meaning that it relieves or prevents symptoms but it is not expected to cure the cancer.

The type of operation usually depends on what part of the stomach is involved and how much cancer is in the surrounding tissue. There are 3 kinds of surgery that may be used to try to cure stomach cancer:

Endoscopic Mucosal Resection
In this procedure, the cancer is removed through an endoscope -- a long, flexible tube passed down the throat and into the stomach. This can only be done for very early stage cancers, where the chance of spread to the lymph nodes is very low.

Subtotal Gastrectomy
This operation is recommended if the cancer is only in the lower part of the stomach. It is also sometimes used for cancers that are only in the upper part of the stomach. Only part of the stomach is removed, sometimes along with part of the esophagus or the first part of the small intestine (the duodenum). Nearby lymph nodes are also removed. The remaining section of stomach is then reattached. With only part of the stomach removed, eating is much easier than with removal of the entire stomach.

Total Gastrectomy
This operation is used if the cancer is spread throughout the stomach. It is also often advised if the cancer is in the upper part of the stomach, near the esophagus. It involves the total removal of the stomach and nearby lymph nodes, and may include the spleen and parts of the esophagus, intestines, pancreas, and other nearby organs. If you have a total gastrectomy, the surgeon will make a new "stomach" out of intestinal tissue. Usually the end of the esophagus is attached to part of the small intestine, and some extra intestine is also attached. This can make room for food to be stored before moving down the intestinal tract, and will allow you to eat some food before getting filled up. But people who have a total gastrectomy can only eat a small amount of food at a time. Because of this, they must eat more often.

In either a subtotal or total gastrectomy, the nearby lymph nodes and some of the omentum are usually removed. The omentum is an area of fatty tissue near the stomach and intestines.

Lymph node removal is a very important part of the operation. Many doctors feel that the success of the surgery is directly related to how many lymph nodes the surgeon removes. Stomach cancer may also spread to lymph nodes that are farther away in the abdomen. Some surgeons feel that these also must be removed. But this is still unclear, and many surgeons are wary about doing such an extensive operation because it causes more complications.

Surgeons in Japan have had very high success rates by removing all the lymph nodes near the cancer. Surgeons in Europe and the United States have not been able to equal the results of the Japanese surgeons. It is not clear if this is because Japanese surgeons are more experienced (stomach cancer is much more common in their country), because Japanese patients have earlier stage disease and are healthier, or if there are other factors that play a role. In any event, it takes a skilled surgeon who is experienced in stomach cancer surgery to remove all the lymph nodes successfully. It is important that you ask your surgeon about his or her experience in operating on stomach cancer. Studies have shown that the results are better when both the surgeon and the hospital have had extensive experience in treating patients with stomach cancer.

Surgery for stomach cancer is difficult, and complications can occur. These can include bleeding from the surgery, blood clots, and damage to nearby organs during the operation. Rarely, the new connections made between the ends of the stomach or esophagus and small intestine may leak. With improvements in surgical techniques in recent years, only about 1% to 2% of people die from surgery for stomach cancer. This number is higher when the operation is more extensive, such as when all the lymph nodes are removed. As many as 5% to 15% of their patients may die from the surgery when surgeons try to remove all the lymph nodes. This number is lower in the hands of highly skilled surgeons.

You may develop other side effects after you have recovered from surgery. These can include frequent heartburn, abdominal pain (particularly after eating), and vitamin deficiencies. The stomach is important in helping the body to absorb some vitamins. If certain parts of the stomach are removed, doctors routinely prescribe vitamin supplements, some of which can be taken only by injection. Changes in your diet will often be needed after a partial or total gastrectomy. The biggest change is that you will need to eat smaller, more frequent meals.

Because of these problems, it is important that you discuss with your surgeon how big an operation he or she intends to do. Some surgeons try to leave behind as much of the stomach as they can to allow patients to be able to eat more normally afterward. The tradeoff is that the cancer might be more likely to come back. The extent of the surgery should be discussed between patient and doctor before it is done.

It cannot be stressed enough that your surgeon must be highly skilled. He or she should be experienced in treating stomach cancer and able to perform the most up-to-date operations to reduce your risk of complications.

Chemotherapy

Chemotherapy uses anti-cancer drugs that are injected into a vein or given by mouth as pills. These drugs enter the bloodstream and reach all areas of the body, making this treatment useful for cancer that has spread to organs beyond the stomach.

Chemotherapy may be given as the primary (main) treatment for stomach cancer that has spread to distant organs. It may help relieve symptoms for some patients, especially those with spread (metastases) to other areas of the body. It may also help some patients live longer.

Chemotherapy is also used as an adjuvant treatment (given after surgery) along with radiation therapy for some stages of stomach cancer. This combination is called chemoradiation. It may delay cancer recurrence and extend the life span of people with less advanced stomach cancer, especially if their cancer could not be removed completely by surgery.

The use of chemotherapy as a neoadjuvant treatment (given before surgery) in some situations is still being studied.

Chemotherapy for stomach cancer may use one drug such as 5-fluorouracil (5-FU), which is often combined with radiation therapy. Or chemotherapy may use several drugs combined. The most commonly used drugs are 5-FU, doxorubicin, methotrexate, etoposide, and cisplatin. Other drugs that may be helpful are docetaxel, irinotecan, capecitabine, and oxaliplatin. It is not yet clear which drugs or combinations of drugs work best against stomach cancer.

Chemotherapy drugs kill cancer cells but also damage some normal cells, which can lead to side effects. The type of side effects depends on the type of drugs, the amount taken, and the length of treatment. Short-term side effects might include nausea and vomiting, loss of appetite, hair loss, diarrhea, and mouth sores. Because chemotherapy can damage the bone marrow, where new blood cells are made, your blood cell counts might become low. This can result in:

- increased chance of infection (due to a shortage of white blood cells)
- bleeding or bruising after minor cuts or injuries (due to a shortage of platelets)
- fatigue and shortness of breath (due to low red blood cell counts)

Most side effects go away once treatment is stopped. For example, hair will usually grow back after treatment ends.

It is important to talk to your doctor or nurse about any side effects you have. There are treatments that can help reduce them or make them go away. For example, drugs can be given to help to prevent or reduce nausea and vomiting.

Targeted Therapies

Newer drugs, which target specific parts of cancer cells, are now being tested against stomach cancer. Some of these are discussed in more detail in the section "What's New in Stomach Cancer Research and Treatment?"

Radiation Therapy

Radiation therapy uses high-energy rays or particles to kill cancer cells in a specific area of the body.

External-beam radiation therapy is the type of radiation therapy often used to treat stomach cancer. This treatment involves focusing the radiation on the cancer from a machine outside the body. Having this type of radiation therapy is like having an x-ray, except that each treatment lasts longer, and the patient usually receives 5 treatments per week over a period of weeks or months.

After surgery, radiation therapy can be used to kill very small remnants of the cancer that cannot be seen and removed during surgery. Radiation therapy, especially when combined with chemotherapy drugs such as 5-FU, may delay or prevent cancer recurrence after surgery and may help patients live longer. Radiation therapy can also be used to ease the symptoms of stomach cancer, such as pain, bleeding, and eating problems.

Side effects from radiation therapy can include mild skin problems, nausea, vomiting, diarrhea, or fatigue. These usually go away 2 to 3 weeks after the treatment is finished. Radiation therapy may also make the side effects of chemotherapy worse. Please be sure to talk with your doctor about these side effects since there are ways to relieve them. It is also very important that you receive your treatment at a center that has experience in treating stomach cancer.

Clinical Trials

You have had to make a lot of decisions since you've been told you have cancer. One of the most important decisions you will make is deciding which treatment is best for you. You may have heard about clinical trials being done for your type of cancer. Or maybe someone on your health care team has mentioned a clinical trial to you. Clinical trials are one way to get state-of-the art cancer care. Still, they are not right for everyone.

Here we will give you a brief review of clinical trials. Talking to your health care team, your family, and your friends can help you make the best treatment choice for you.

What Are Clinical Trials?

Clinical trials are carefully controlled research studies that are done with patients. These studies test whether a new treatment is safe and how well it works in patients, or they may test new ways to diagnose or prevent a disease. Clinical trials have led to many advances in cancer prevention, diagnosis, and treatment.

The Purpose of Clinical Trials

Clinical trials are done to get a closer look at promising new treatments or procedures in patients. A clinical trial is only done when there is good reason to believe that the treatment, test, or procedure being studied may be better than the one used now. Treatments used in clinical trials are often found to have real benefits and may go on to become tomorrow's standard treatment.

Clinical trials can focus on many things, such as:

- new uses of drugs that are already approved by the US Food and Drug Administration (FDA)
- new drugs that have not yet been approved by the FDA
- non-drug treatments (such as radiation therapy)
- medical procedures (such as types of surgery)
- herbs and vitamins
- tools to improve the ways medicines or diagnostic tests are used
- medicines or procedures to relieve symptoms or improve comfort
- combinations of treatments and procedures

Researchers conduct studies of new treatments to try to answer the following questions:

- Is the treatment helpful?
- What's the best way to give it?
- Does it work better than other treatments already available?
- What side effects does the treatment cause?
- Are there more or fewer side effects than the standard treatment used now?
- Do the benefits outweigh the side effects?
- In which patients is the treatment most likely to be helpful?

Phases of Clinical Trials

There are 4 phases of clinical trials, which are numbered I, II, III, and IV. We will use the example of testing a new cancer treatment drug to look at what each phase is like.

Phase I clinical trials: The purpose of a phase I study is to find the best way to give a new treatment safely to patients. The cancer care team closely watches patients for any harmful side effects.

For phase I studies, the drug has already been tested in lab and animal studies, but the side effects in patients are not fully known. Doctors start by giving very low doses of the drug to the first patients and increase the doses for later groups of patients until side effects appear or the desired effect is seen. Doctors are hoping to help patients, but the main purpose of a phase I trial is to test the safety of the drug.

Phase I clinical trials are often done in small groups of people with different cancers that have not responded to standard treatment, or that keep coming back (recurring) after

treatment. If a drug is found to be reasonably safe in phase I studies, it can be tested in a phase II clinical trial.

Phase II clinical trials: These studies are designed to see if the drug works. Patients are given the best dose as determined from phase I studies. They are closely watched for an effect on the cancer. The cancer care team also looks for side effects.

Phase II trials are often done in larger groups of patients with a specific cancer type that has not responded to standard treatment. If a drug is found to be effective in phase II studies, it can be tested in a phase III clinical trial.

Phase III clinical trials: Phase III studies involve large numbers of patients -- most often those who have just been diagnosed with a specific type of cancer. Phase III clinical trials may enroll thousands of patients.

Often, these studies are randomized. This means that patients are randomly put in one of two (or more) groups. One group (called the control group) gets the standard, most accepted treatment. Another group (or more than one group) will get the new treatment being studied. All patients in phase III studies are closely watched. The study will be stopped early if the side effects of the new treatment are too severe or if one group has much better results than the others.

Phase III clinical trials are usually needed before the FDA will approve a treatment for use by the general public.

Phase IV clinical trials: Once a drug has been approved by the FDA and is available for all patients, it is still studied in other clinical trials (sometimes referred to as phase IV studies). This way more can be learned about short-term and long-term side effects and safety as the drug is used in larger numbers of patients with many types of diseases. Doctors can also learn more about how well the drug works, and if it might be helpful when used in other ways (such as in combination with other treatments).

What It Will Be Like to Be in a Clinical Trial

If you are in a clinical trial, you will have a team of experts taking care of you and watching your progress very carefully. Depending on the phase of the clinical trial, you may receive more attention (such as having more doctor visits and lab tests) than you would if you were treated outside of a clinical trial. Clinical trials are specially designed to pay close attention to you.

However, there are some risks. No one involved in the study knows in advance whether the treatment will work or exactly what side effects will occur. That is what the study is designed to find out. While most side effects go away in time, some may be long-lasting or even life threatening. Keep in mind, though, that even standard treatments have side effects. Depending on many factors, you may decide to enter (enroll in) a clinical trial.

Deciding to Enter a Clinical Trial
If you would like to take part in a clinical trial, you should begin by asking your doctor if your clinic or hospital conducts clinical trials. There are requirements you must meet to take part in any clinical trial. But whether or not you enter (enroll in) a clinical trial is completely up to you.

Your doctors and nurses will explain the study to you in detail. They will go over the possible risks and benefits and give you a form to read and sign. The form says that you understand the clinical trial and want to take part in it. This process is known as giving your informed consent. Even after reading and signing the form and after the clinical trial begins, you are free to leave the study at any time, for any reason. Taking part in a clinical trial does not keep you from getting any other medical care you may need.

To find out more about clinical trials, talk to your cancer care team. Here are some questions you might ask:

- Is there a clinical trial that I could take part in?
- What is the purpose of the study?
- What kinds of tests and treatments does the study involve?
- What does this treatment do? Has it been used before?
- Will I know which treatment I receive?
- What is likely to happen in my case with, or without, this new treatment?
- What are my other choices and their pros and cons?
- How could the study affect my daily life?
- What side effects can I expect from the study? Can the side effects be controlled?
- Will I have to stay in the hospital? If so, how often and for how long?
- Will the study cost me anything? Will any of the treatment be free?
- If I am harmed as a result of the research, what treatment would I be entitled to?
- What type of long-term follow-up care is part of the study?
- Has the treatment been used to treat other types of cancers?

How Can I Find Out More About Clinical Trials That Might Be Right for Me?
The American Cancer Society offers a clinical trials matching service for patients, their family, and friends. You can reach this service at 1-800-303-5691 or on our Web site at http://clinicaltrials.cancer.org.

Based on the information you give about your cancer type, stage, and previous treatments, this service can put together a list of clinical trials that match your medical needs. The service will also ask where you live and whether you are willing to travel so that it can look for a treatment center that you can get to.

You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials Web site at www.cancer.gov/clinicaltrials.

For even more information on clinical trials, the American Cancer Society has a document called *Clinical Trials: What You Need to Know.* You can read this on the Web site, www.cancer.org, or have it sent to you by calling 1-800-ACS-2345.

Complementary and Alternative Therapies

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that are different from mainstream (standard) medical treatment. These methods can include vitamins, herbs, and special diets, or methods such as acupuncture or massage—among many others. You may have a lot of questions about these treatments. Here are some you may have thought of already:

- How do I know if a non-standard treatment is safe?
- How do I know if it works?
- Should I try one or more of these treatments?
- What does my doctor know/think about these methods? Should I tell the doctor that I'm thinking about trying them?
- Will these treatments cause a problem with my standard medical treatment?
- What is the difference between "complementary" and "alternative" methods?
- Where can I find out more about these treatments?

The Terms Can Be Confusing

Not everyone uses these terms the same way, so it can be confusing. The American Cancer Society uses *complementary* to refer to medicines or methods that are used *along with* your regular medical care. *Alternative* medicine is a treatment used *instead of* standard medical treatment.

Complementary Methods: Complementary treatment methods, for the most part, are not presented as cures for cancer. Most often they are used to help you feel better. Some methods that can be used in a complementary way are meditation to reduce stress, acupuncture to relieve pain or peppermint tea to relieve nausea. There are many others. Some of these methods are known to help, while others have not been tested. Some have been proven not be helpful. A few have even been found harmful. However, some of these methods may add to your comfort and well-being.

There are many complementary methods that you can safely use right along with your medical treatment to help relieve symptoms or side effects, to ease pain, and to help you enjoy life more. For example, some people find methods such as aromatherapy, massage therapy, meditation, or yoga to be useful.

Alternative Treatments: Alternative treatments are those that are used instead of standard medical care. These treatments have not been proven safe and effective in clinical trials. Some of these methods may even be dangerous and some have life-threatening side effects. The biggest danger in most cases is that you may lose the chance to benefit from standard

treatment. Delays or interruptions in your standard medical treatment may give the cancer more time to grow.

Deciding What to Do
It is easy to see why people with cancer may consider alternative methods. You want to do all you can to fight the cancer. Sometimes mainstream treatments such as chemotherapy can be hard to take, or they may no longer be working.

Sometimes people suggest that their method can cure your cancer without having serious side effects, and it's normal to want to believe them. But the truth is that most non-standard methods of treatment have not been tested and proven to be effective for treating cancer.

As you consider your options, here are 3 important steps you can take:

- Talk to your doctor or nurse about any method you are thinking about using.
- Check the list of "red flags" below.
- Contact the American Cancer Society at 1-800-ACS-2345 to learn more about complementary and alternative methods in general and to learn more about the specific methods you are thinking about.

Red Flags
You can use the questions below to spot treatments or methods to avoid. A "yes" answer to any one of these questions should raise a "red flag."

- Does the treatment promise a cure for all or most cancers?
- Are you told not to use standard medical treatment?
- Is the treatment or drug a "secret" that only certain people can give?
- Does the treatment require you to travel to another country?
- Do the promoters attack the medical or scientific community?

The Decision Is Yours
Decisions about how to treat or manage your cancer are always yours to make. If you are thinking about using a complementary or alternative method, be sure to learn about the method and talk to your doctor about it. With reliable information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

Treatment Choices by Type and Stage of Stomach Cancer

Treatment of stomach cancer depends to a large degree on where the cancer started in the stomach and how far it has spread.

Stage 0
Because stage 0 cancers are limited to the inner lining layer of the stomach and have not invaded deeper layers, they can be treated by surgery alone. No chemotherapy or radiation

therapy is needed. Gastrectomy (surgical removal of part or all of the stomach) and lymphadenectomy (removal of the nearby lymph nodes) is usually done.

Small cancers that are caught very early can sometimes be treated by endoscopic mucosal resection. In this procedure the cancer is removed through an endoscope passed down the throat. This is done more often in Japan, where cancers are often detected early because of screening. It is not a standard procedure in the United States, as cancers found here are usually more advanced.

Stage I
People with stage I stomach cancer will have their cancer removed by a total or partial gastrectomy, as well as removal of the omentum (fatty tissue in the abdomen) and nearby lymph nodes. No additional treatment is usually needed for stage IA patients. Those with stage IB disease might be considered for adjuvant chemotherapy after surgery with a drug such as 5-FU, along with radiation therapy. Studies have shown that this may help people with stage IB stomach cancer to live longer.

Stage II
People with stage II stomach cancer are treated with surgical removal of all or part of their stomach, the omentum, and removal of nearby lymph nodes. After surgery, adjuvant chemotherapy with 5-FU along with radiation therapy has been shown to help people with stage II stomach cancer to live longer.

Stage III
Patients with this stage disease should have surgery (unless they have other medical conditions that make them too ill for surgery) because up to 15% of these cancers may be successfully treated. The surgery may also help relieve symptoms from the cancer. Adjuvant chemotherapy with 5-FU after surgery along with radiation therapy has been shown to help people with stage III stomach cancer to live longer.

Stage IV
Because stage IV stomach cancer has spread to distant organs, a cure is usually not possible. Patients with advanced stomach cancer may receive palliative treatment, including palliative surgery to prevent the stomach and/or intestines from becoming obstructed (blocked) or to control bleeding.

In some cases, a laser beam directed through an endoscope (a long, flexible tube passed down the throat) can vaporize most of the tumor and relieve obstruction without surgery. If needed, a stent (a hollow metal tube) may be placed at the junction of the esophagus and stomach to help keep it open and allow food to pass through it. This can also be done at the junction of the stomach and the small intestine.

Chemotherapy and/or radiation therapy can often help shrink the cancer and relieve some symptoms but is usually not expected to cure the cancer. The chemotherapy drugs often used include 5-FU, cisplatin, and either epirubicin or etoposide. Docetaxel or irinotecan may also

be used. The preferred way to give the 5-FU is by continuous infusion through a catheter (a thin tube used to inject or withdraw fluids) placed into a large vein. But other approaches may be just as successful. New treatments being tested in clinical trials may benefit some patients.

Even if treatments do not succeed in destroying or shrinking the cancer, there are ways to relieve the pain and symptoms from the disease. Patients should tell their cancer care team about any symptoms or pain they have right way, so they can be effectively managed.

Nutrition is another area of concern for many patients with stomach cancer. There is help available for those who have trouble eating, ranging from nutritional counseling to placement of a tube in the stomach to help provide nutrition, if needed.

Recurrent Cancer
Cancer that comes back after initial treatment is known as recurrent cancer. Treatment options for recurrent disease are generally the same as they are for stage IV cancers.

More Treatment Information

For more details on treatment options -- including some that may not be addressed in this document -- the National Comprehensive Cancer Network (NCCN) and the National Cancer Institute (NCI) are good sources of information.

The NCCN, made up of experts from many of the nation's leading cancer centers, develops cancer treatment guidelines for doctors to use when treating patients. Those are available on the NCCN Web site (www.nccn.org).

The NCI provides treatment guidelines via its telephone information center (1-800-4-CANCER) and its Web site (www.cancer.gov). Detailed guidelines intended for use by cancer care professionals are also available on www.cancer.gov.

What Should You Ask Your Doctor About Stomach Cancer?

It is important to have honest, open discussions with your cancer care team. They want to answer all of your questions, no matter how trivial they might seem to you.

For instance, consider these questions:

- What kind of stomach cancer do I have?
- Where is the cancer in my stomach?
- What is the stage of my cancer and what does that mean in my case?
- What treatment choices do I have?
- What do you recommend and why?
- What risks or side effects are there to the treatments you suggest? How would treatment affect my daily life?
- What are the chances of recurrence of my cancer with these treatment plans?
- What should I do to be ready for treatment?

- Based on what you've learned about my cancer, what is my prognosis (the outlook for survival)?
- What is the goal of my treatment? To cure or to ease symptoms?
- If I am to have surgery, what is your experience in this type of surgery for stomach cancer?
- If I am to have surgery, what is the experience of the hospital in this type of surgery for stomach cancer?

In addition to these sample questions, be sure to write down some of your own. For instance, you might want more information about recovery times. Or you may want to ask about second opinions or about clinical trials for which you may qualify.

What Happens After Treatment for Stomach Cancer?

Completing treatment can be both stressful and exciting. You will be relieved to finish treatment, yet it is hard not to worry about cancer coming back. (When cancer returns, it is called recurrence.) This is a very common concern among those who have had cancer.

It may take a while before your confidence in your own recovery begins to feel real and your fears are somewhat relieved. Even with no recurrences, people who have had cancer learn to live with uncertainty.

Follow-up Care

After your treatment is over, it is very important to keep all follow-up appointments. During these visits, your doctors will ask about symptoms, do physical exams, and order blood tests or imaging studies such as CT scans or x-rays. Follow-up is needed to check for cancer recurrence or spread, as well as possible side effects of certain treatments. Most doctors recommend careful follow-up, often every 4 to 6 months for the first 3 years, then at least yearly after that. This is the time for you to ask your health care team any questions you need answered and to discuss any concerns you might have.

Almost any cancer treatment can have side effects. Some may last for a few weeks to several months, but others can be permanent. Don't hesitate to tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

It is also important to keep medical insurance. Even though no one wants to think of their cancer coming back, it is always a possibility. If it happens, the last thing you want is to have to worry about paying for treatment. Many people have been bankrupted by cancer recurrence.

Having surgery for stomach cancer will likely mean that your eating habits will have to change to some degree. You probably won't be able to eat large amounts of food at one time. Your health care team may suggest that you meet with a nutritionist, who can help you adjust to this.

People who have had surgery -- especially if they had the upper part of their stomach removed (in either a subtotal or total gastrectomy) -- will likely need to get vitamin supplements, which may include B12 injections. They may need to have their vitamin blood levels tested regularly.

Seeing a New Doctor

At some point after your cancer diagnosis and treatment, you may find yourself in the office of a new doctor. Your original doctor may have moved or retired, or you may have moved or changed doctors for some reason. It is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Make sure you have the following information handy:

- a copy of your pathology report from any biopsy or surgery
- if you had surgery, a copy of your operative report
- if you were hospitalized, a copy of the discharge summary that every doctor must prepare when patients are sent home from the hospital
- finally, since some drugs can have long-term side effects, a list of your drugs, drug doses, and when you took them

Lifestyle Changes to Consider During and After Treatment

Having cancer and dealing with treatment can be time-consuming and emotionally draining, but it can also be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even begin this process during cancer treatment.

Make Healthier Choices

Think about your life before you learned you had cancer. Were there things you did that might have made you less healthy? Maybe you drank too much alcohol, or ate more than you needed, or smoked, or didn't exercise very often. Emotionally, maybe you kept your feelings bottled up, or maybe you let stressful situations go on too long.

Now is not the time to feel guilty or to blame yourself. However, you can start making changes today that can have positive effects for the rest of your life. Not only will you feel better but you will also be healthier. What better time than now to take advantage of the motivation you have as a result of going through a life-changing experience like having cancer?

You can start by working on those things that you feel most concerned about. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society's Quitline® tobacco cessation program at 1-800-ACS-2345.

Diet and Nutrition

Eating right can be a challenge for anyone, but it can get even tougher during and after cancer treatment. For instance, treatment often may change your sense of taste. Nausea can be a problem. You may lose your appetite for a while and lose weight when you don't want

to. On the other hand, some people gain weight even without eating more. This can be frustrating, too.

If you are losing weight or have taste problems during treatment, do the best you can with eating and remember that these problems usually improve over time. You may want to ask your cancer team for a referral to a dietitian, an expert in nutrition who can give you ideas on how to fight some of the side effects of your treatment. You may also find it helps to eat small portions every 2 to 3 hours until you feel better and can go back to a more normal schedule.

As mentioned, surgery for stomach cancer usually requires long-term changes in the way you eat. A dietitian can help you adjust your eating patterns in ways that make sense for you.

One of the best things you can do after treatment is to put healthy eating habits into place. You will be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Try to eat 5 or more servings of vegetables and fruits each day. Choose whole grain foods instead of white flour and sugars. Try to limit meats that are high in fat. Cut back on processed meats like hot dogs, bologna, and bacon. Get rid of them altogether if you can. If you drink alcohol, limit yourself to 1 or 2 drinks a day at the most. And don't forget to get some type of regular exercise. The combination of a good diet and regular exercise will help you maintain a healthy weight and keep you feeling more energetic.

Rest, Fatigue, Work, and Exercise

Fatigue is a very common symptom in people being treated for cancer. This is often not an ordinary type of tiredness but a “bone-weary” exhaustion that doesn’t get better with rest. For some, this fatigue lasts a long time after treatment, and can discourage them from physical activity.

However, exercise can actually help you reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel physically and emotionally improved and can cope better.

If you are ill and need to be on bed rest during treatment, it is normal to expect your fitness, endurance, and muscle strength to decline some. Physical therapy can help you maintain strength and range of motion in your muscles, which can help fight fatigue and the sense of depression that sometimes comes with feeling so tired.

Any program of physical activity should fit your own situation. An older person who has never exercised will not be able to take on the same amount of exercise as a 20-year-old who plays tennis 3 times a week. If you haven’t exercised in a few years but can still get around, you may want to think about taking short walks.

Talk with your health care team before starting, and get their opinion about your exercise plans. Then, try to get an exercise buddy so that you’re not doing it alone. Having family or

friends involved when starting a new exercise program can give you that extra boost of support to keep you going when the push just isn't there.

If you are very tired, though, you will need to balance activity with rest. It is okay to rest when you need to. It is really hard for some people to allow themselves to do that when they are used to working all day or taking care of a household. (For more information about fatigue, please see the publication, *Cancer Related Fatigue and Anemia Treatment Guidelines for Patients.*)

Exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- It strengthens your muscles.
- It reduces fatigue.
- It lowers anxiety and depression.
- It makes you feel generally happier.
- It helps you feel better about yourself.

How About Your Emotional Health?

Once your treatment ends, you may find yourself overwhelmed by emotions. This happens to a lot of people. You may have been going through so much during treatment that you could only focus on getting through your treatment.

Now you may find that you think about the potential of your own death, or the effect of your cancer on your family, friends, and career. You may also begin to re-evaluate your relationship with your spouse or partner. Unexpected issues may also cause concern -- for instance, as you become healthier and have fewer doctor visits, you will see your health care team less often. That can be a source of anxiety for some.

This is an ideal time to seek out emotional and social support. You need people you can turn to for strength and comfort. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or individual counselors.

Almost everyone who has been through cancer can benefit from getting some type of support. What's best for you depends on your situation and personality. Some people feel safe in peer-support groups or education groups. Others would rather talk in an informal setting, such as church. Others may feel more at ease talking one-on-one with a trusted friend or counselor. Whatever your source of strength or comfort, make sure you have a place to go with your concerns.

The cancer journey can feel very lonely. It is not necessary or realistic to go it all by yourself. And your friends and family may feel shut out if you decide not include them. Let them in -- and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-ACS-2345 and we can put you in touch with an appropriate group or resource.

You can’t change the fact that you have had cancer. What you can change is how you live the rest of your life -- making healthy choices and feeling as well as possible, physically and emotionally.

What Happens if Treatment Is No Longer Working?

If cancer continues to grow after one kind of treatment, or if it returns, it is often possible to try another treatment plan that might still cure the cancer, or at least shrink the tumors enough to help you live longer and feel better. On the other hand, when a person has received several different medical treatments and the cancer has not been cured, over time the cancer tends to become resistant to all treatment. At this time it’s important to weigh the possible limited benefit of a new treatment against the possible downsides, including continued doctor visits and treatment side effects.

Everyone has his or her own way of looking at this. Some people may want to focus on remaining comfortable during their limited time left.

This is likely to be the most difficult time in your battle with cancer -- when you have tried everything medically within reason and it’s just not working anymore. Although your doctor may offer you new treatment, you need to consider that at some point, continuing treatment is not likely to improve your health or change your prognosis or survival.

If you want to continue treatment to fight your cancer as long as you can, you still need to consider the odds of more treatment having any benefit. In many cases, your doctor can estimate the response rate for the treatment you are considering. Some people are tempted to try more chemotherapy or radiation, for example, even when their doctors say that the odds of benefit are less than 1%. In this situation, you need to think about and understand your reasons for choosing this plan.

No matter what you decide to do, it is important that you be as comfortable as possible. Make sure you are asking for and getting treatment for any symptoms you might have, such as pain. This type of treatment is called “palliative” treatment.

Palliative treatment helps relieve these symptoms, but is not expected to cure the disease; its main purpose is to improve your quality of life. Sometimes, the treatments you get to control your symptoms are similar to the treatments used to treat cancer. For example, radiation therapy might be given to help relieve bone pain from bone metastasis. Or chemotherapy might be given to help shrink a tumor and keep it from causing a bowel obstruction. But this is not the same as receiving treatment to try to cure the cancer.

At some point, you may benefit from hospice care. Most of the time, this can be given at home. Your cancer may be causing symptoms or problems that need attention, and hospice focuses on your comfort. You should know that receiving hospice care doesn’t mean you can’t have treatment for the problems caused by your cancer or other health conditions. It just

means that the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult stage of your cancer.

Remember also that maintaining hope is important. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends -- times that are filled with happiness and meaning. In a way, pausing at this time in your cancer treatment is an opportunity to refocus on the most important things in your life. This is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do.

What's New in Stomach Cancer Research and Treatment?

Research is always being done in the area of stomach cancer. In addition to looking for the causes and ways to prevent stomach cancer, scientists continue to research improved treatments.

Risk Factors

Diet: Over many years research has clearly shown that differences in diet are an important factor in explaining variations in stomach cancer risk around the world. Recent research in countries with relatively low stomach cancer risk has provided some insight into risk factors. Diets high in preserved meats and low in fresh fruits and vegetables have been linked with higher risk.

Some studies have found that a diet high in red meat is another possible risk factor. Eating red meat an average of about twice a day seems to raise the risk of stomach cancer. This risk is increased even more if the meat is barbecued and well done.

Helicobacter Pylori Infection

Recent studies have shown that certain types of *H. pylori* (especially the cagA strains) are more strongly linked to stomach cancer. Some inherited traits related to blood groups may also affect whether someone infected with *H. pylori* will develop cancer. Further research is needed to help doctors to determine how to use this information to test which people might be at higher risk for developing stomach cancer. Recent research has also studied the interaction of helicobacter infection with other risk factors. For example, they have found that a healthy diet is especially important for reducing stomach cancer risk for people infected with *H. pylori*.

Chemoprevention

Chemoprevention is the use of natural or man-made chemicals to lower the risk of developing cancer. Two types of chemicals might be useful in preventing stomach cancer: antioxidants and antibiotics.

Antioxidants

Many cancer-causing factors cause changes in cells that form a type of chemical called a "free radical." Free radicals can damage important parts of cells such as genes. Depending on how severe the damage is, the cells may die or they may become cancerous.

Antioxidants are a group of nutrients and other chemicals that can destroy free radicals or prevent them from forming. These nutrients include vitamin C, beta-carotene, and vitamin E (alpha-tocopherol), and the mineral selenium. Studies that have looked at using dietary supplements to lower stomach cancer risk have had mixed results so far. There is some evidence that combinations of antioxidant supplements may reduce the risk of stomach cancer in people with poor nutrition to begin with. Further research in this area is needed.

Antibiotics
Studies are being done to see whether antibiotic treatment of people who are chronically infected by the *Helicobacter pylori* will help prevent stomach cancer. Some studies have found that treating this infection may prevent pre-cancerous stomach abnormalities, but more research is needed.

Staging

Sentinel Lymph Node Mapping
Doctors are trying to identify the spread of stomach cancer to lymph nodes using this technique, which has proved very successful in melanoma and breast cancer. In sentinel lymph node mapping, the surgeon injects a blue dye and a radioactive tracer substance into the cancer. These will go to lymph nodes that would be the first site of cancer spread. Doctors can remove these lymph nodes and look for cancer. If there is no cancer found, then it may be that full lymph node removal isn't needed. This would make surgery much easier for the patient. If there is cancer present, then all the lymph nodes need to be removed.

As an operation for stomach cancer, this procedure is still in the clinical trial stage and not yet ready for widespread use. It isn't certain yet whether sentinel lymph node mapping will identify the cancer-containing lymph nodes.

Treatment

Laparoscopic Surgery
Laparoscopy is commonly used to help stage (determine the extent of) stomach cancer. In countries such as Japan, doctors are now studying the use of laparoscopic (keyhole) surgery to remove small stomach cancers. In this technique, the surgeon creates several small holes in the abdomen, each about an inch long. Special long, thin instruments are inserted into these holes, one of which has a small video camera on the end. The others are used to cut, staple, or sew sections of the stomach.

One of the advantages of this type of surgery is that it does not require a large incision in the abdomen, so recovery time is usually quicker. But it is not yet known if it is as effective as standard surgery. This technique is rarely used in the United States at this time.

New Chemotherapy Drug Combinations
Clinical trials are in progress to test new chemotherapy drugs. Some studies are testing new ways to combine drugs already known to be active against stomach cancer or other cancers. Other studies are testing the best ways to combine chemotherapy with radiation therapy or immunotherapy. The most effort is being directed to improving the results of surgery by

adding chemotherapy and/or radiation therapy either before or after surgery. Several clinical trials of this approach are in progress.

Targeted Therapies
Chemotherapy drugs target cells that divide rapidly, which is why they are often effective against cancer cells. But there are other aspects of cancer cells that make them different from normal cells. In recent years, researchers have developed several new "targeted" drugs to try to exploit these differences. Targeted drugs generally do not have the same types of severe side effects as chemotherapy drugs.

One example is a drug called bevacizumab (Avastin). This drug is thought to work by affecting the blood vessels that supply tumors. Some small, early studies have found that when this drug is combined with chemotherapy, it seems to work better than chemotherapy alone. Larger studies trying to confirm this finding are now in progress.

Other agents that target different aspects of cancer cells are also being studied against stomach cancer, either alone or combined with other drugs. These include cetuximab (Erbitux) and sunitinib (Sutent), and others.

If you want to search for clinical trials in your area, contact the American Cancer Society at 1-800-ACS-2345 or visit us on the Web at www.cancer.org.

Additional Resources

More Information From Your American Cancer Society

We have selected some related information that may also be helpful to you. These materials may be ordered from our toll-free number, 1-800-ACS-2345.

After Diagnosis: A Guide for Patients and Families (also available in Spanish)

Caring for the Patient With Cancer at Home (also available in Spanish)

Pain Control: A Guide for People with Cancer and Their Families (also available in Spanish)

The following books are available from the American Cancer Society. Call us at 1-800-ACS-2345 to ask about costs or to place your order.

American Cancer Society’s Guide to Pain Control

Cancer in the Family: Helping Children Cope With a Parent’s Illness

Caregiving: A Step-By-Step Resource for Caring for the Person With Cancer at Home

National Organizations and Web Sites*

In addition to the American Cancer Society, other sources of patient information and support include:

National Cancer Institute
Telephone: 1-800-4-CANCER (1-800-422-6237)
Internet Address: www.cancer.gov

National Coalition for Cancer Survivorship
Telephone: 1-888-650-9127
Internet Address: www.canceradvocacy.org

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

The American Cancer Society is happy to address almost any cancer-related topic. If you have any more questions, please call us at 1-800-ACS-2345 at any time, 24 hours a day.

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Last Medical Review: 4/23/2007

Last Revised: 3/22/2008