Learning that you have stomach cancer can feel overwhelming. The goal of this book is to help you get the best cancer treatment. This book presents which cancer tests and treatments are recommended by experts in stomach cancer.

The National Comprehensive Cancer Network® (NCCN®) is a not-for-profit alliance of 27 of the world’s leading cancer centers. Experts from NCCN have written treatment guidelines for doctors who treat stomach cancer. These treatment guidelines suggest what the best practice is for cancer care. The information in this patient book is based on the guidelines written for doctors.

This book focuses on the treatment of stomach cancer. Key points of the book are summarized in the related NCCN Quick Guide™. NCCN also offers patient books on esophageal, colon, and pancreatic cancers and other cancer types. Visit NCCN.org/patients for the full library of patient books, summaries, and other resources.
NCCN aims to improve the care given to patients with cancer. NCCN staff work with experts to create helpful programs and resources for many stakeholders. Stakeholders include health providers, patients, businesses, and others. One resource is the series of books for patients called the NCCN Guidelines for Patients®. Each book presents the best practice for a type of cancer. The patient books are based on clinical practice guidelines written for cancer doctors. These guidelines are called the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). Clinical practice guidelines list the best health care options for groups of patients. Many doctors use them to help plan cancer treatment for their patients.

Panels of experts create the NCCN Guidelines®. Most of the experts are from NCCN Member Institutions. Panelists may include surgeons, radiation oncologists, medical oncologists, and patient advocates. Recommendations in the NCCN Guidelines are based on clinical trials and the experience of the panelists. The NCCN Guidelines are updated at least once a year. When funded, the patient books are updated to reflect the most recent version of the NCCN Guidelines for doctors. For more information about the NCCN Guidelines, visit NCCN.org/clinical.asp.

NCCN staff involved in developing the NCCN Guidelines for Patients include:

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<th>Name</th>
<th>Title</th>
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<tbody>
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**DEBBIE'S DREAM FOUNDATION: CURING STOMACH CANCER**

As an organization whose mission includes providing free education and support services internationally to stomach cancer patients, families, and caregivers, Debbie’s Dream Foundation: Curing Stomach Cancer (DDF) is dedicated to raising awareness about stomach cancer, advancing funding for research, and seeking the ultimate goal of making the cure for stomach cancer a reality. DDF is proud to support this important and comprehensive resource for patients and their families.

[www.DebbiesDream.org](http://www.DebbiesDream.org)

**NO STOMACH FOR CANCER**

We are an organization that works diligently to advance stomach cancer education and awareness within the medical and scientific community and to share that information with patients and their caregivers. In keeping with the organization’s mission, NSFC supports research efforts for screening, early detection, treatment and prevention of stomach cancer. No Stomach For Cancer is proud to support this comprehensive guideline for patients and their families.

[www.nostomachforcancer.org](http://www.nostomachforcancer.org)
Stomach Cancer

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Who should read this book?
The information in this booklet is about cancer of the stomach. This cancer is also called gastric cancer. Patients and those who support them—caregivers, family, and friends—may find this book helpful. It may help you discuss and decide with doctors what care is best.

Where should I start reading?
Starting with Part 1 may be helpful. It explains what stomach cancer is. Knowing more about this cancer may help you better understand its treatment. Part 2 explains cancer staging, which is used to plan treatment. Part 3 lists which health tests and other steps of care are needed before treatment.

Parts 4 through 6 address stomach cancer treatment. Part 4 briefly describes the treatments. Part 5 is a guide to treatment options that are partly based on how far the cancer has grown. Tips for making treatment decisions are presented in Part 6.

Does the whole book apply to me?
This book includes information for many situations. Your treatment team can help. They can point out what information applies to you. They can also give you more information.

As you read through this book, you may find it helpful to make a list of questions to ask your doctors.

The recommendations in this book are based on science and the experience of NCCN experts. However, these recommendations may not be right for you. Your doctors may suggest other tests and treatments based on your health and other factors. If other suggestions are given, feel free to ask your treatment team questions.

Making sense of medical terms
In this book, many medical words are included. These are words that you will likely hear from your treatment team. Most of these words may be new to you, and it may be a lot to learn.

Don’t be discouraged as you read. Keep reading and review the information. Don’t be shy to ask your treatment team to explain a word or phrase that you do not understand.

Words that you may not know are defined in the text or in the Dictionary. Words in the Dictionary are underlined when first used on a page.

Acronyms are also defined when first used and in the Glossary. Acronyms are short words formed from the first letters of several words. One example is DNA for deoxyribonucleic acid.
1

Stomach cancer basics
You’ve learned that you have stomach cancer. It’s common to feel shocked and confused. Part 1 reviews some basics that may help you learn about stomach cancer. These basics may also help you start planning for treatment.

“The journey I’ve been on is surely one I never expected to be on. It’s been overwhelming, scary, and very intense at times. I’m so happy this guide is there for you- to help you while you are on this journey that I’m sure you, too, never expected to be on. I hope it brings you peace and reassurance especially when things seem a little unsure.”

Heather Huus
Advocate, No Stomach For Cancer
The stomach

The digestive system breaks down food for the body to use. In this system, the stomach is one of four organs that make up the GI (gastrointestinal) tract. Food is transferred from your mouth to your stomach through the esophagus. In the stomach, food is broken down into a liquid. From the stomach, food enters the small intestine where nutrients are absorbed into the bloodstream. The large intestine prepares unused food to be moved out of the body.

As shown in Figure 1, the stomach is a large, bean-shaped sac. Its wall has four main layers. The inner layer that has contact with food is called the mucosa. It is made of three sublayers—the epithelium, lamina propria, and muscularis mucosae.

Epithelium makes a sticky, thick liquid called mucus that protects the stomach. The lamina propria contains connective tissue, tiny lymph vessels, and glands. Lymph is a clear fluid that gives cells water and food and contains germ-fighting blood cells. The muscularis mucosae is a thin strip of muscle.

The second layer of the stomach wall is called the submucosa. It consists of connective tissue and blood and nerve cells. It also contains larger lymph vessels.

The third layer is called the muscularis propria. It is mostly made of muscle fibers. These muscles help move food through the stomach.

The fourth layer is the outer most part of the stomach wall. It consists of serosa. The serosa, also called the visceral peritoneum, is a membrane. It has a thin layer of connective tissue, called the subserosa, which is covered by a single row of cells that make lubricating fluid. This fluid allows the stomach to move smoothly against other organs.

Figure 1. The stomach

The stomach is part of the GI tract. It breaks food down into a liquid for the body to use. Its wall has four main layers—the mucosa, submucosa, muscularis propria, and serosa.
A disease of cells

Cancer is a disease of cells. Inside of cells are coded instructions for building new cells and controlling how cells behave. These instructions are called genes. Genes are a part of DNA (deoxyribonucleic acid), which is grouped together into bundles called chromosomes. See Figure 2. Abnormal changes (mutations) in genes cause normal cells to become cancer cells. Researchers are still trying to learn what causes genes to mutate and cause cancer.

Almost all stomach cancers are adenocarcinomas. Adenocarcinomas are cancers of cells that line glands and, in the case of stomach cancer, make mucus. Adenocarcinomas of the stomach are the focus of this book. Visit NCCN.org/patients for patient guides of lymphomas and sarcomas.

There are two major types of stomach adenocarcinomas. Cells of the intestinal-type stick together and form tube- and gland-shaped structures. Cells of the diffuse-type don't stick together and easily grow into nearby structures.

Many cancers that start in the stomach are treated as stomach cancers. However, tumors that start in the top part of the stomach and cross over into the EGJ (esophagogastric junction) are treated as esophageal cancers. The EGJ is the area between the esophagus and stomach. Read the NCCN Guidelines for Patients: Esophageal Cancer to learn the treatment options for these cancers.

Figure 2.
Genetic material in cells

Most human cells contain the “blueprint of life”—the plan by which our bodies are made and work. The plan is found inside of chromosomes, which are long strands of DNA that are tightly wrapped around proteins. Genes are small pieces of DNA that contain instructions for building new cells and controlling how cells behave. Humans have about 24,000 genes.
Cancer’s threat

Cancer cells don’t behave like normal cells in three key ways. First, mutations in genes cause cells to grow more quickly and live longer. Normal cells grow and then divide to form new cells when needed. They also die when old or damaged as shown in Figure 3. In contrast, cancer cells make new cells that aren’t needed and don’t die quickly when old or damaged. Over time, stomach cancer cells form a mass called the primary tumor.

The second way cancer cells differ from normal cells is that they can grow into nearby tissues. If not treated, the primary tumor can extend beyond the wall of the stomach and into nearby structures. The nearby structures into which stomach tumors grow are described in Part 2 Cancer staging.

Third, unlike normal cells, cancer cells can travel to other parts of the body. This process is called metastasis. In this process, cancer cells break away from the tumor and merge with blood or lymph. Then, the cancer cells travel in blood or lymph through vessels to other sites. In other sites, the cancer cells may form secondary tumors, replace many normal cells, and cause major health problems.

Figure 3. Normal cell growth vs. cancer cell growth

Normal cells increase in number when they are needed and die when old or damaged. In contrast, cancer cells quickly make new cells and live longer because of abnormal changes in genes.

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Review

- The stomach turns eaten food into a liquid.
- The wall of the stomach has four layers.
- Stomach cancer often starts in cells that line the inside of the stomach wall and make mucus.
- Cancer cells form a tumor since they don’t grow and die as normal cells do.
- Cancer cells can spread to other body parts through lymph or blood.
Cancer staging
Cancer staging is a rating by your doctors of how far the cancer has grown and spread. The rating is based on test results. Doctors plan additional tests and treatment based on how much the cancer has grown. In Part 2, the scoring system used for cancer staging is explained.

TNM scores

The AJCC (American Joint Committee on Cancer) staging system is used to stage stomach cancer. Tumors that occur in the EGI are staged according to esophageal cancers. Read the NCCN Guidelines for Patients: Esophageal Cancer for more information.

In the AJCC system, the letters T, N, and M describe a different location of cancer growth. Your doctors will assign a score to each letter. TNM scores will be combined to assign the cancer a stage. The cancer stage is used to assess the prognosis of the cancer and to decide what treatments will be used. A prognosis is the outlook (prediction) of the pattern and outcome of a disease.
T = Tumor

The T score tells into which tissues the primary tumor has grown. Stomach cancers grow through the wall of the stomach and then into nearby structures. T scores for stomach cancer include:

- **Tis** means the tumor hasn’t grown beyond the epithelium.
- **T1** tumors have invaded the lamina propria, muscularis mucosae, or submucosa.
  - T1a tumors have invaded the lamina propria or muscularis mucosae.
  - T1b tumors have invaded the submucosa.
- **T2** tumors have invaded the muscularis propria.
- **T3** tumors have invaded the subserosa.
- **T4** tumors have invaded the serosa or nearby tissues.
  - T4a tumors have invaded the serosa.
  - T4b tumors have invaded the nearby structures. These structures include the diaphragm, liver, spleen, pancreas, adrenal gland, kidney, colon, small intestine, and abdominal wall. See Figure 4.

**Figure 4. Areas of T4b growth**

The primary tumor may grow through the stomach wall and into nearby structures. Tumors that have grown into nearby structures are rated T4b. The structures that may be affected are partly based on where the tumor started in the stomach.
**N = Node**

Lymph drains from stomach tissue into vessels that transport lymph to the bloodstream. As lymph travels, it passes through small structures called lymph nodes. Lymph nodes remove germs from lymph. As shown in Figure 5, lymph nodes and vessels are found throughout the body. The N category reflects the number of lymph nodes with stomach cancer.

- **NX** means that the lymph nodes can’t be assessed.
- **N0** means that there is no cancer within nearby lymph nodes.
- **N1** means 1 or 2 nearby nodes have cancer.
- **N2** means 3 to 6 nearby nodes have cancer.
- **N3a** means 7 to 15 nearby lymph nodes have cancer.
- **N3b** means 16 or more nearby lymph nodes have cancer.

**M = Metastasis**

The M category tells you if there are metastases to sites not in direct contact with the stomach. Such sites include distant lymph nodes.

- **M0** means that there is no growth to distant sites.
- **M1** means that the cancer has spread to distant sites.

---

**Figure 5. Lymph nodes near the stomach**

Throughout your body is a network of vessels that transport lymph to the bloodstream. Lymph is a clear fluid that contains germ-fighting blood cells. As lymph travels in vessels, it passes through lymph nodes, which remove germs from lymph. Stomach cancer first spreads to lymph nodes next to the stomach and then beyond.
In 2010, at age 59, I was diagnosed with metastatic Stage IV gastric adenocarcinoma (T4bN3bM1). My prognosis was bad, and I thought that I was a hopeless case. Fortunately, I have been treated at a National Comprehensive Cancer Network Hospital. Five years later, I am, much to my amazement, alive and feeling well, with no evidence of disease.

My treatment has included partial gastrectomy, oral and IV chemotherapy, radiation therapy and targeted therapy. My tumor expressed the HER-2 antigen, leading to my being treated with the targeted treatment trastuzumab (Herceptin). Trastuzumab had been approved for treatment of HER-2+ breast cancer since 1997, but was approved for HER-2+ stomach cancer only a few weeks before I was diagnosed. I am continuing to receive infusions of it every three weeks and continue to be followed up at my NCCN hospital.

During my treatment, I have had most of the possible side effects, particularly nausea. I have received most of the possible medications for side effects and eventually found treatments that alleviated my side effects. Although the side effects were serious, I now, of course, consider them a small price to have had to pay.

Being diagnosed with stomach cancer is a terrible thing, but it is no longer a death sentence. I am very, very glad that you will have access, like I did, to the full range of treatments now available. I am also very, very happy that you have access to this wonderful booklet to help you understand the diagnosis and treatment of this disease.

Randy Hillard
Stage IV Cancer Survivor
Professor at Michigan State University Colleges of Medicine
Founder, East Michigan
Chapter of Debbie’s Dream Foundation
The 5 stages

Chart 1 shows the staging groups labeled by Roman numerals 0–IV. Stage 0 is also called carcinoma in situ. The stages are defined by the TNM scores.

In general, earlier cancer stages have better outcomes. However, doctors define cancer stages with information from thousands of patients, so a cancer stage gives an average outcome. It may not tell the outcome for one person. Some people will do better than expected. Others will do worse. Other factors not used for staging cancer, such as your general health, are also very important.

Cancer is often staged twice. The first rating is done before treatment and is called the clinical (or baseline) stage. The second rating is done after treatment, such as surgery, and is called the pathologic stage.
### Chart 1. Stomach cancer stages

<table>
<thead>
<tr>
<th>ANATOMIC STAGE/PROGNOSTIC GROUPS</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Stage 0</td>
<td>Tis</td>
<td>N0</td>
</tr>
<tr>
<td>Stage IA</td>
<td>T1</td>
<td>N0</td>
</tr>
<tr>
<td>Stage IB</td>
<td>T2</td>
<td>N0</td>
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<tr>
<td></td>
<td>T1</td>
<td>N1</td>
</tr>
<tr>
<td>Stage IIA</td>
<td>T3</td>
<td>N0</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>N1</td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td>N2</td>
</tr>
<tr>
<td>Stage IIB</td>
<td>T4a</td>
<td>N0</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>N1</td>
</tr>
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<td>N2</td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td>N3</td>
</tr>
<tr>
<td>Stage IIIA</td>
<td>T4a</td>
<td>N1</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>N2</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>N3</td>
</tr>
<tr>
<td>Stage IIIB</td>
<td>T4b</td>
<td>N0</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
<td>N1</td>
</tr>
<tr>
<td></td>
<td>T4a</td>
<td>N2</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>N3</td>
</tr>
<tr>
<td>Stage IIIC</td>
<td>T4b</td>
<td>N2</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
<td>N3</td>
</tr>
<tr>
<td></td>
<td>T4a</td>
<td>N3</td>
</tr>
<tr>
<td>Stage IV</td>
<td>Any T</td>
<td>Any N</td>
</tr>
</tbody>
</table>

Review

• Stomach cancer is grouped into stages to help plan treatment.

• Doctors rate the extent of cancer with T, N, and M scores.

• There are five cancer stages for stomach cancer. Earlier cancers often have better outcomes.

• The clinical stage is based on tests given before any treatment. The pathologic stage is based on the results of surgery.
Preparing for treatment
Part 3 describes some of the important events that should take place before starting treatment. Tests to learn about the cancer are needed. Based on test results, your treatment team will create a treatment plan. To get the best treatment results, it is important that you receive good nutrition and if you smoke, quit smoking.

**Cancer tests**

Before starting treatment, multiple cancer tests will be done. Such tests are listed in Guide 1. These tests will assess your health, clinical stage, and other features of the cancer.

**Medical history**

Your medical history includes any health events and medicines you’ve taken in your life. It also includes symptoms that may be related to stomach cancer. A medical history helps your doctors know if you can have surgery. It also helps doctors assess if chemotherapy will do you more good than harm.

Some people are more likely to develop stomach cancer than others. Anything that increases your chances of stomach cancer is called a risk factor. Risk factors can be activities that people do, things in the environment, or personal traits. A medical history helps your doctor assess if the stomach cancer is caused by abnormal changes in genes that are passed down from parents to children (inherited). This is called a genetic risk assessment.
Guide 1. Cancer tests before treatment

<table>
<thead>
<tr>
<th>Test name</th>
<th>Who should get this test?</th>
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<tbody>
<tr>
<td>• Medical history including your family's</td>
<td>People with any stage of stomach cancer</td>
</tr>
<tr>
<td>• Physical exam</td>
<td>People with any stage of stomach cancer</td>
</tr>
<tr>
<td>• Complete blood count</td>
<td>People with any stage of stomach cancer</td>
</tr>
<tr>
<td>• Comprehensive chemistry profile</td>
<td>People with any stage of stomach cancer</td>
</tr>
<tr>
<td>• Upper GI endoscopy</td>
<td>People with any stage of stomach cancer</td>
</tr>
<tr>
<td>• Endoscopic ultrasound</td>
<td>People with stage I, II, or III stomach cancer</td>
</tr>
<tr>
<td>• Endoscopic resection</td>
<td>People with early stomach cancer (T1a or T1b tumors)</td>
</tr>
<tr>
<td>• Laparoscopy with biopsy</td>
<td>People with T scores of T1b and higher and M0 disease who may be treated with chemoradiation or surgery</td>
</tr>
<tr>
<td>• CT with contrast of chest, abdomen, pelvis</td>
<td>People with any stage of stomach cancer</td>
</tr>
<tr>
<td>• PET/CT</td>
<td>If needed, people with any stage of stomach cancer</td>
</tr>
<tr>
<td>• Biopsy</td>
<td>If needed, people with stage IV stomach cancer</td>
</tr>
<tr>
<td>• HER2 testing</td>
<td>People with stage IV stomach cancer</td>
</tr>
</tbody>
</table>
As part of the genetic risk assessment, your doctor will ask about the medical history of your blood relatives. It’s important to know who in your family has had what diseases and at what ages the diseases started. Your doctor may ask about the health of your children and grandchildren, your siblings, your parents and their siblings, and your grandparents.

No one in your family may have had stomach or a related cancer. However, you still may have an inherited syndrome that increased your chances of getting stomach cancer. A syndrome is a group of signs or symptoms that occur together and suggest the presence of or risk for a disease. Inherited syndromes related to stomach cancer include:

- HDGC (hereditary diffuse gastric cancer),
- Lynch syndrome [HNPCC (hereditary non-polyposis colon cancer)],
- Juvenile polyposis syndrome,
- Peutz-Jeghers syndrome,
- Classic or attenuated FAP (familial adenomatous polyposis),
- Ataxia- telangiectasia,
- Bloom syndrome,
- Hereditary breast and ovarian cancer syndrome,
- Li-Fraumeni syndrome, and
- Xeroderma pigmentosum.

If your doctor thinks you have hereditary stomach cancer, you should be referred to a genetic counselor. A genetic counselor can talk with you about getting tested for syndromes related to stomach cancer. To be tested, you must provide a sample of blood. Using the sample, a pathologist can test your genes for abnormal changes that cause these syndromes.

For some syndromes, there may be health care related to cancer that you can receive. Your doctor may advise regular testing to screen for cancers. Examples include breast and colon cancer screening. There may also be treatments that can prevent certain cancers.

**Physical exam**
Doctors often perform a physical exam along with taking a medical history. A physical exam is a study of your body for signs of disease. During this exam, your doctor will listen to your lungs, heart, and gut.

Your doctor will also look at and feel parts of your body. This is done to see if organs are of normal size, are soft or hard, or cause pain when touched. Cancer and other health conditions can cause organs to become enlarged and hard.

**CBC**
A CBC (complete blood count) gives important information about the parts of blood. One example is the number of white blood cells, red blood cells, and platelets. Your blood counts may be low because the cancer has spread into your bones, the cancer is causing bleeding, or because of another health problem.

**Comprehensive chemistry profile**
Chemicals in your blood come from your liver, bone, and other organs. A comprehensive chemistry profile assesses if the chemicals in your blood are too low or high. Abnormal levels can be caused by spread of cancer or by other diseases.
I came upon an old photo recently, circa 1962, of my mother with my three brothers and me; a typical, ordinary family of the time. Never would I have imagined that four of my five family members in the photo were destined to become stomach cancer patients. In 1982, my mom (52) died shortly after her stage IV stomach cancer diagnosis. Then 25 years later, in 2007, my oldest brother (56) received the same diagnosis. These events led me on a quest for answers: could this stomach cancer be hereditary?

I learned about Hereditary Diffuse Gastric Cancer (HDGC), a syndrome sometimes related to a CDH1 gene mutation. We did not meet genetic testing criteria, but gut instinct pushed us to pursue testing. Yes, this was the culprit.

Our lives were forever changed – this was a family cancer diagnosis. My brother was undergoing the challenges of cancer treatment while other family members were going through genetic counseling, testing and prophylactic (preventive) total gastrectomy (PTG).

I was first in my family to undergo surgery, followed by my younger brother. Tragically, we lost my oldest brother in February of 2009, 17 months following his diagnosis, and just weeks before his son’s PTG was to take place. By 2015, five family members have undergone successful PTG, proactively eliminating the high risk of developing stomach cancer – and in each case, pathology revealed the presence of undetected cancer in our stomachs. What an incredible gift of knowledge to have!

Back in the 80’s there were no resources, and in 2007 resources were still sorely lacking, not only for diagnosis and treatment, but also for awareness of hereditary risk.

I am thrilled that this guide is available to help you make informed decisions about your treatment, and to reinforce the important role that genetic risk assessment plays in the prevention and treatment of stomach cancer.

Karen Chelcun Schreiber
Founder, No Stomach For Cancer
CT scan with contrast

CT (computed tomography) is used to help stage the cancer. It is an imaging test that makes pictures of the insides of your body. The pictures are called images. CT takes many pictures of a body part from different angles using x-rays. A computer combines the x-rays to make detailed pictures.

A CT scan of your chest, abdomen, and pelvis is advised. A contrast dye should be used to make the pictures clearer. The dye will be injected into your vein and mixed with a liquid you drink.

The dye may cause you to feel flushed or get hives. Rarely, serious allergic reactions occur. Tell your doctor and the technicians if you have had bad reactions in the past.

Before the scan, you may need to stop taking some medicines, stop eating and drinking for a few hours, and remove metal objects from your body. During the scan, you will need to lie face up on a table that moves through the machine. See Figure 6.

As the machine takes pictures, you may hear buzzing, clicking, or whirring sounds. You will be alone, but a technician will operate the machine in a nearby room. He or she will be able to see, hear, and speak with you at all times. One scan is completed in about 30 seconds.

You will likely be able to resume your activities right away unless you took a sedative. You may not learn of the results for a few days since a radiologist needs to see the pictures. A radiologist is a doctor who’s an expert in reading the images.

Figure 6.
CT machine

Pictures of the insides of your body can be made with an imaging test. No devices will be inserted into your body. However, you may be injected with and have to drink a contrast dye. During the test, you will lie on a table that will move into the tunnel of the imaging machine. The pictures will be viewed by a doctor who will look for signs of cancer.
PET/CT scan
Sometimes CT is combined with another imaging test called PET (positron emission tomography). When used together, they are called a PET/CT scan. PET/CT is advised when there may be metastases but a CT scan didn’t detect any.

PET/CT may be done with one or two machines depending on the cancer center. Before PET, you must fast for 4 hours or more. There may be other limits to your diet. About an hour before the scan, you will be injected with a sugar radiotracer.

The radiotracer emits a small amount of energy that is detected by the imaging machine. Cancer appears brighter in the pictures because cancer cells use sugar more quickly than normal cells. PET can show even small amounts of cancer because the images are based on the cells’ use of sugar (cell metabolism).

Upper GI endoscopy
An upper GI endoscopy allows your doctor to see inside your esophagus and stomach. It is also called an EGD (esophagogastroduodenoscopy). For this test, a tool called an endoscope is used.

Part of the endoscope will be guided down your mouth. This part looks like a thin, long tube that is a little thicker than a pencil. See Figure 7. You will likely be sedated and thus unaware while the test is occurring.

At the tip of the endoscope is a light and camera that allows your doctor to see. Your doctor will record where the tumor is in your stomach or esophagus. If the tumor is near the esophagus, the distance from the EGJ may also be recorded.

Figure 7. Upper GI endoscopy
“Scopes” are tools that are inserted into your body to let your doctor see live video of inside your body. An endoscope is one such tool that is guided down your mouth into your stomach. It allows your doctor to see the inner wall of your stomach and esophagus. If ultrasound is used, your doctor will be able to see the deeper wall layers and nearby organs.
Your doctor may obtain a sample of the tumor. This is called a biopsy. Also, samples from tissue that is at high risk for cancer and tissue with possible cancer may be collected. The presence of Barrett’s metaplasia or dysplasia increases the likelihood of cancer.

Biopsy samples are removed with small forceps that are inserted through the open channel of the endoscope. Six to eight biopsy samples may be removed. Biopsy samples will be sent to a pathologist for testing. After the endoscopy, you may feel some swelling and sound hoarse.

**EUS**

EUS (endoscopic ultrasound) uses both imaging and an endoscope to see how deep the tumor has grown into the stomach wall. Also, signs of cancer within lymph nodes and other nearby organs can be detected.

Like EGD, you will likely be sedated for EUS. The EUS endoscope will be guided down your esophagus. The ultrasound device bounces sound waves off organs to make pictures.

If it looks like the cancer has spread, the endoscope can be used to do an FNA (fine-needle aspiration). An FNA is a type of biopsy. A needle will be inserted through the wall of your stomach or esophagus and into nearby tissue to get samples. Samples may be obtained from lymph nodes or organs next to your stomach, such as your liver. An FNA may be done as long as the needle doesn’t go through the primary tumor or major blood vessels.

After the FNA, the endoscopist will provide clinical staging information. He or she will report the depth of tumor growth (T stage) and whether cancer is present in your lymph nodes (N stage). This information will help your doctor plan the best treatment for you.

**Endoscopic resection**

Instead of a diagnostic tool, endoscopic resection is more often used as treatment of tumors that haven’t grown deep into the stomach wall. Read Part 4 for more details. Briefly, your doctor may be able to remove tumor(s) and high-risk tissue with tools inserted through an endoscope.

**Laparoscopy with biopsy**

This test is a type of surgery that allows your doctor to look for diseases inside your belly area (abdomen). Laparoscopy is advised for stomach cancer that 1) has spread beyond the first layer of the stomach wall (T1b and higher scores), 2) is not detected in distant sites (M0 score) by other tests, and 3) may be treated with chemoradiation or surgery. Laparoscopy may detect distant metastases in the tissue lining of the abdomen (peritoneum) or liver.

Laparoscopy is done under general anesthesia. It involves the use of a tool called a laparoscope, which is much like an endoscope. The tube-like part of the laparoscope will be inserted through a tiny cut in your abdomen. Your doctor will be able to look for signs of cancer and obtain fluid for cancer testing (peritoneal washings).

Laparoscopy is done in an operating room and takes about 30 minutes. After the surgery, you may feel tired and may have some pain. You may also have a small scar after the cut has healed. You will be able to go home about one hour after the procedure is completed and can go back to work the next day.

**Biopsy of distant sites**

An M1 score is defined as cancer spread to sites distant from the stomach. If imaging suggests a rating of M1, a biopsy of the distant site may be needed to confirm the presence of cancer. The type of biopsy used depends on the site and other factors.
**HER2 testing**

In normal stomach cells, there are two copies of the gene that makes HER2. HER2 is a surface receptor found in the membrane of cells. See Figure 8. When activated, it sends signals within the cell telling it to grow and divide.

Some stomach cancers have cells with more than two copies of the HER2 gene, thus causing too many HER2 receptors to be made. Other stomach cancers have cells with only two HER2 gene copies, but still too many HER2 receptors are made. With too many HER2 receptors, the cancer cells grow and divide fast. However, there is treatment that targets HER2.

Based on current research, HER2 testing is advised for metastatic cancer. Due to high costs and the side effects of treatment, it is very important to have tests that correctly show HER2 status. IHC (immunohistochemistry) is the test used to measure the amount of HER2 receptors. Another test of HER2 status is ISH (in situ hybridization). ISH counts the number of copies of the HER2 gene.

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**Figure 8. HER2**

Some stomach cancers consist of cells with many HER2 receptors. HER2 is one type of surface receptor that triggers growth signals within cells. It is important to test for HER2 status if the cancer has spread to distant sites (M1 stage). Testing will allow your doctor to plan the best treatment.
Treatment team meetings

Treatment of stomach cancer takes a team of doctors and other experts. It is important that all the experts involved in your care meet often to make joint decisions about your health care. NCCN experts advise that meetings take place every week or every other week. Your treatment team may include a:

- **Pathologist** – an expert in testing tissue to find disease,
- **Radiologist** – an expert in reading imaging tests,
- **Oncology surgeon** – an expert in cancer surgery,
- **Medical oncologist** – an expert in cancer drugs,
- **Gastroenterologist** – an expert in digestive diseases,
- **Radiation oncologist** – an expert in radiation treatment,
- **Supportive care** specialist – an expert in improving quality of life,
- **Nutritionist** – an expert in healthy foods and drinks,
- **Nurse** – an expert trained to care for the sick,
- **Integrative medicine doctor** – an expert in mind-body treatments, and a
- **Social worker** – an expert in meeting social and emotional needs.

At the meetings, your treatment team will create a treatment plan based on the **clinical stage** of the cancer. Your treatment team will also meet while you are on treatment and afterward to discuss the treatment results and the next steps of care.

Good nutrition

You should meet with a nutritionist before starting treatment. The nutritionist can assess the toll of the cancer on your nutrition. For example, the cancer may have made swallowing difficult or painful. This is called dysphagia, which may have stopped you from getting good nutrition. Likewise, the cancer may also have caused you to lose too much weight.

It is important that you receive adequate and sustained nutrition before you start treatment. Surgery and other cancer treatments may be too dangerous if you are weak from a lack of nutrition. A nutritionist can advise you on ways to eat or drink better.

You may be advised to receive your food through a feeding tube. Two options are a **PEG** (percutaneous endoscopic gastrostomy) tube and a **J-tube** (jejunostomy tube). See Figure 9. A PEG tube is inserted through your skin and into your stomach. A J-tube is inserted through your skin and into your small intestine.
Quit smoking

If you were smoking tobacco before you learned you had cancer, it is important to quit. Nicotine addiction is one of the hardest addictions to stop. The stress of having stomach cancer may make it harder to quit. Quitting is important since smoking can limit how well cancer treatment works. Smoking also greatly increases your chances of having side effects after surgery. If you smoke, ask your doctor about counseling and drugs to help you quit.

Figure 9. Feeding tubes

Feeding tubes may help you gain strength to undergo treatment. A PEG tube is inserted through your skin and into your stomach. A J-tube is inserted through your skin and into your intestine.
Review

- Before treatment, cancer tests are given to help plan treatment.

- Treatment of stomach cancer takes a team of experts.

- Getting good nutrition is important before starting treatment.

- If you smoke tobacco, it is important to quit so that you get the best treatment results.
Overview of cancer treatments
In Part 4, the main treatment types for stomach cancer are briefly described. Knowing what a treatment is will help you understand your treatment options listed in Part 5. There is more than one treatment for stomach cancer. Not every person will receive every treatment described in this chapter.

Endoscopic treatment

Some stomach tumors and high-risk tissue may be treated with an endoscopic resection. This treatment removes early tumors using tools inserted through an endoscope. See Figure 10. Early tumors include those confined to the first layer of the stomach wall (Tis and T1a scores). Doctors who perform endoscopic resections are called endoscopists.

There are two main types of endoscopic treatment. Both types first inject a liquid under the tumor to move it away from other tissue. However, the tools used to remove the tumor differ. More details on how the two types differ are discussed next.
**EMR**

**EMR (endoscopic mucosal resection)** removes a tumor with an endoscope that has a wire loop called a snare. There is more than one method of how to do EMR. The methods mainly differ by what devices are used with the snare to remove the tumor.

Sometimes EMR is all that is needed to remove a tumor. Other times, the tissue removed by EMR helps with diagnosis but more treatment is needed. Some tumors may be removed in multiple pieces with EMR. However, the larger and deeper a tumor is, the higher the risk of the tumor returning (recurrence). Therefore, an expert endoscopist will only perform EMR on people who are most likely to benefit.

EMR requires that you be sedated but some people do receive general anesthesia. The procedure can take about 1 hour to complete. EMR is generally an outpatient procedure. However, you may stay in the hospital for 1 or 2 days.

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**Figure 10. Endoscopic resection**

Stomach tumors that have not invaded deep into the stomach wall may be removed with endoscopic resection. This treatment removes tumors with tools inserted through an endoscope.
ESD

ESD (endoscopic submucosal dissection) is a newer type of endoscopic treatment that is more extensive than EMR. It is likely the preferred endoscopic method for removing deeper, early stomach tumors.

ESD removes a tumor in one piece with special knives. Removing the tumor in one piece reduces the chance of the tumor returning. This is a very challenging procedure to do. ESD is generally only done at centers that specialize in such procedures. Only a small group of people with stomach cancer are able to have this treatment.

ESD is often performed under general anesthesia. The procedure may take 2 to 4 hours to complete. You may stay in the hospital for a few days or up to 5 days if there are major complications like a tear in the stomach wall. After healing, your stomach will likely work almost as well as before since only the first layer of the stomach wall is removed.

Side effects of endoscopic treatment

Side effects are unhealthy or unpleasant physical or emotional responses to treatment. Endoscopic treatments may cause a sore throat, pain in the chest, or gas. More serious but less common problems are bleeding, a tear through the stomach wall, or narrowing of the stomach. The chances for bleeding and tears are greater for ESD than for EMR.

Not all side effects of endoscopic treatment are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better.

Supportive care

Supportive care doesn’t aim to treat cancer but aims to improve quality of life. It is also called palliative care. It can address many needs.

One example is treatment for physical and emotional symptoms. Supportive care can also help with treatment decisions as you may have more than one option. It can also help with coordination of care between health providers.

Talk with your treatment team to plan the best supportive care for you.
Surgical treatment

Surgery is a primary treatment for early and some locoregional stomach cancers. Primary treatment is the main treatment used to rid the body of cancer. The goal of surgery is to remove the entire tumor and some normal-looking tissue around its rim. The normal-looking tissue is called the surgical margin. A margin width of 4 cm or greater is advised.

You will be given instructions on how to prepare for your surgery. The week before your surgery you may have to stop taking some medicines. On the day of your surgery, you should not eat or drink. General anesthesia will be used. In some people, general anesthesia causes nausea with vomiting, confusion, muscle aches, and itching.

Gastrectomy

A gastrectomy is a surgery that removes some or all of the stomach. See Figure 11. The stomach tumor may have grown into nearby structures. In this case, the stomach and other tissue should be removed together and not in pieces. Removal of your spleen is not required unless cancer is present.

How much of your stomach will be removed depends on the extent of the cancer. A total gastrectomy removes your whole stomach. A subtotal gastrectomy removes part of your stomach. A distal gastrectomy is a subtotal gastrectomy of the lower half of your stomach. A proximal gastrectomy is a subtotal gastrectomy of the upper half of your stomach.

Figure 11. Gastrectomy

A gastrectomy removes some or all of your stomach. Any nearby structures that have been invaded by the tumor will be removed, too. During surgery, some lymph nodes will be removed and tested for cancer.
Lymph node dissection
During the gastrectomy, some lymph nodes near to your stomach will be removed, too. This is called a lymph node dissection. Removal of at least 15 lymph nodes is advised.

A D1 dissection removes lymph nodes right next to the stomach. A D2 dissection removes D1 nodes as well as lymph nodes next to nearby arteries and your spleen. A pathologist will test your lymph nodes for cancer so your surgeon knows if more tissue should be removed.

Surgical methods
Surgery removes tissue from your body through cuts (incisions) made with a surgical knife. Gastrectomy can be performed by three methods. An open gastrectomy is one method that removes tissue through a large cut in your belly area.

Laparoscopic or robotic gastrectomy removes tissue with small tools that are inserted through small cuts. Because small cuts are used, doctors describe these methods as “minimally invasive.” Laparoscopic or robotic gastrectomy is appropriate for some but not all stomach cancers. Your surgeon will discuss with you whether your stomach cancer can be removed by these methods.

After the cancer is removed, your remaining organs will be attached. For a total gastrectomy, your small intestine will be attached to your esophagus. For a subtotal or distal gastrectomy, your remaining stomach will be attached to your intestine or esophagus.

The entire surgery can take 2 to 3 hours to complete. Most people stay in the hospital about one week to recover. As you heal from surgery, you will receive nutrition through a needle placed in your vein or receive food through a feeding tube.

Side effects of surgery
Surgery causes pain, swelling, and scars. Pain and swelling often fade away in the weeks following surgery. As with any surgery, there is a chance of infection, heart attack, or a blood clot.

Side effects of a gastrectomy differ between people. You may have few or many side effects. Side effects of a gastrectomy include nausea, vomiting, and diarrhea. You may lose weight or not absorb enough vitamins. Gastrectomy can cause heartburn (acid reflux). Long-term leakage of stomach acid can scar and constrict your esophagus. Less often, food may leak from your stomach into your chest and cause pain.

Not all side effects of surgery are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better.
Radiation therapy

Radiation therapy uses high-energy rays to treat cancer. The rays damage DNA. This either kills the cancer cells or stops new cancer cells from being made. For stomach cancer, radiation therapy is often given with chemotherapy. Chemotherapy may improve how well radiation works. This combined treatment is called chemoradiation.

EBRT (external beam radiation therapy) is the method used to treat stomach cancer. This method delivers radiation from outside your body using a large machine. See Figure 12. The radiation passes through your skin and other tissue to reach the tumor.

Simulation session

To receive radiation therapy, you first must have a planning (simulation) session. Do not eat a heavy meal 3 hours beforehand. A 3D image of the tumor will be made with a CT scan. Contrast may be used to enhance images.

Images are taken after your body is moved into the position needed for treatment. It is advised that you lie on your back and be kept from moving with an immobilization device. For some people, 4D-CT planning and other methods to control movement may be used.

Using the scans, your treatment team will plan the best radiation dose, number and shape of radiation beams, and number of treatment sessions. Beams are shaped with computer software and hardware that

Figure 12.
External beam radiation therapy

Radiation therapy is often delivered from a large machine. The rays pass through skin and travel to the tumor. Healthy tissue is protected by using modern types of treatment.
are added to the radiation machine. Radiation beams are aimed at the tumor with help from ink marks on the skin or marker seeds in the tumor.

Receiving radiation
Do not eat a heavy meal 3 hours before treatment. During treatment, you will lie on a table in the same position as done for simulation. Devices may be used to keep you from moving so that the radiation targets the tumor.

You will be alone while the technician operates the machine from a nearby room. He or she will be able to see, hear, and speak with you at all times. As treatment is given, you may hear noises. One session can take less than 10 minutes.

There are multiple types of EBRT. For stomach cancer, 3D-CRT (three-dimensional conformal radiation therapy) is strongly advised. In 3D-CRT, the radiation beams match the shape of your tumor to avoid healthy tissues.

Sometimes vital organs may be within the field of the radiation beam if 3D-CRT is used. Vital organs include the heart, lungs, liver, and kidneys. In these cases, IMRT (intensity-modulated radiation therapy) may be used. IMRT is a more precise type of 3D-CRT that may be used to avoid giving radiation to vital organs. The radiation beam is divided into smaller beams, and the strength of each beam can vary.

Side effects of radiation
Radiation therapy is likely to cause changes in your skin. Skin that was exposed to radiation will look and feel as if it has been sunburned. It will likely become red and may also become dry, sore, and feel painful when touched.

Radiation therapy to a stomach tumor may also cause GI symptoms. You may feel nauseated, vomit, and have diarrhea. You may have pain in the area. Other reactions may include extreme tiredness despite sleep (fatigue) and loss of appetite.

Not all side effects of radiation therapy are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better.
In April 2008, I was 40 years old, the mother of three children, a practicing attorney, and married to a physician. Life changed dramatically when I was diagnosed with stage IV, inoperable and incurable stomach cancer; was told I would need chemotherapy for the rest of my life; and my chance of being alive in five years was only four percent. There were very few treatment options for advanced stomach cancer because it is not a common cancer in the United States.

I began to educate myself and to seek the best available care. I was told that I only had a few weeks to live, so my first thought was that my three-year-old daughter would not remember me, and my 10-year-old twins would go through their teenage years without a mother. I could not imagine missing out on my children’s lives. I was determined to live to celebrate milestones with them that every mom waits for. The possibility of not seeing them grow up was not an option.

I have had eight recurrences and remain in treatment to this day. I have been treated with several different chemotherapy regimens and three rounds of radiation.

I currently live in Florida with my husband and children. My family has helped me to get through a very difficult time in life. Now, being with my children and husband is my main priority and every birthday, talent show, soccer game, karate tournament, and recital I can attend is a blessing. There were no resources available to me when I was diagnosed, so I am very happy that this guide is available to you as a resource to help you on your journey.

Debbie Zelman
Stage IV Cancer Survivor
Founder, Debbie’s Dream Foundation:
Curing Stomach Cancer
Chemotherapy

Chemotherapy, or “chemo,” includes drugs that disrupt the life cycle of cancer cells. Some chemotherapy drugs kill cancer cells by damaging their DNA or by disrupting the making of DNA. Other drugs interfere with cell parts that are needed for making new cells. Thus, no new cells are made to replace dying cells. Chemotherapy can affect both cancer and normal cells.

As shown in Figure 13, some chemotherapy drugs work when cells are in an active growth phase. During the active growth phase, cells grow and divide to form a new cell. Chemotherapy drugs that disrupt the growth phase work well for cancer cells that are growing and dividing quickly. Other chemotherapy drugs work in any growth or resting phase.

Chemotherapy and other cancer drugs used for stomach cancer are listed in Guide 2. Sometimes, only one drug is used. Other times, more than one drug is used because drugs differ in the way they work. A combination regimen is the use of two or more chemotherapy drugs.

Most chemotherapy drugs for stomach cancer are liquids that are slowly injected into a vein. Only capecitabine is made as a pill. By any method, the drugs travel in your bloodstream to treat cancer throughout your body. Doctors use the term “systemic” when talking about a cancer treatment for the whole body.

Chemotherapy is given in cycles of treatment days followed by days of rest. This allows the body to recover before the next cycle. Cycles vary in length depending on which drugs are used. Often, a cycle is 14, 21, or 28 days long.
## Guide 2. Cancer drugs for stomach cancer

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Side effects of chemotherapy

Side effects of chemotherapy depend on many factors. These factors include the drug type, amount taken, length of treatment, and the person. Some people have many side effects. Others have few. Some side effects can be very serious while others can be unpleasant but not serious. Most side effects appear shortly after treatment starts and will stop after treatment. However, other side effects are long-term or may appear years later.

In general, most side effects are caused by the death of fast-growing cells. These cells are found in the blood, gut, hair follicles, and mouth. Thus, common side effects include low blood cell counts, not feeling hungry, nausea, vomiting, diarrhea, hair loss, and mouth sores. Your nails may also change in color, strength, dryness, and smoothness.

Another common side effect of some chemotherapy drugs is sensory neuropathy. Sensory neuropathy is damage to sensory nerves. It can be caused by oxaliplatin, paclitaxel, docetaxel, and 5-FU.

Symptoms of sensory neuropathy include numbness, tingling, and pain in fingers and toes. You may also have sensitivity to cold and pain to light touch. It may take months or years for symptoms to resolve. For some people, sensory neuropathy is permanent. Talk with your doctor about ways to prevent or reduce the symptoms of sensory neuropathy.

Not all side effects of chemotherapy are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better.

Complementary and alternative medicine

CAM (complementary and alternative medicine) is a group of treatments that aren’t often given by doctors. There is much interest today in CAM for cancer. Many CAMs are being studied to see if they are truly helpful.

Complementary medicines are treatments given along with usual medical treatments. While CAMs aren’t known to kill cancer cells, they may improve your comfort and well-being. Two examples are acupuncture for pain management and yoga for relaxation.

Alternative medicine is used in place of usual medicine. Some alternative medicines are sold as cures even though they haven’t been proven to work. If there was good proof that CAMs or other treatments cured cancer, they would be included in this book.

It is important to tell your treatment team if you are using any CAMs. They can tell you which CAMs may be helpful and which CAMs may limit how well medical treatments work.
Targeted therapy

Targeted therapy is a class of drugs that stops the action of molecules that help cancer cells grow. It is less likely to harm normal cells than chemotherapy. Targeted therapy for stomach cancer targets either VEGF (vascular endothelial growth factor) or HER2.

These treatments are briefly described next. Some side effects are listed. Ask your treatment team for a full list of common and rare side effects. In Part 5, information on who should receive these drugs is provided.

VEGF pathway
Cancer cells need the food and oxygen in blood to grow. Cancer cells get blood from blood vessels that have grown into the tumor. VEGF is one of the molecules that triggers the growth of these blood vessels.

VEGF is made by cancer cells. It travels from cancer cells to endothelial cells, which form blood vessels. VEGF attaches to surface receptors on the outside of endothelial cells. Surface receptors are proteins within cell membranes that extend from the inside to the outside of cells. Attachment of VEGF to receptors triggers growth signals. Ramucirumab is a medicine that targets VEGF.

Ramucirumab
Ramucirumab attaches to VEGF receptors on the outside of endothelial cells. See Figure 14. This blocks VEGF from attaching. No growth signals caused by VEGF are started.

Ramucirumab is given by infusion. It takes 60 minutes to receive the full dose. Ramucirumab is always given with chemotherapy. It is given every two weeks on the first day of chemotherapy.

Common side effects of ramucirumab are high blood pressure and diarrhea. Serious side effects include bleeding; blood clots; holes in the gut; abnormal passage between body parts; and slow wound healing.
**HER2 pathway**

Cell growth is started by growth signals. HER2 is one of the **surface receptors** in stomach cancer cells that can trigger growth signals. When HER2 attaches to other receptors, the chemical pathway that sends growth signals is turned on.

Some people with stomach cancer have too many HER2s. With too many HER2s, new cancer cells form quickly. Trastuzumab is a medicine used to stop the growth signals from HER2s. Research has shown that it slows down growth of **metastatic cancer** that has too many HER2 receptors.

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**Trastuzumab**

Trastuzumab attaches to the end of HER2 that is outside of the cell. In doing so, it stops HER2 from attaching to other surface receptors. See **Figure 15**. No growth signals are started.

Trastuzumab is given with **chemotherapy**. It is given as an injection into a vein. The drug then travels in the bloodstream to treat cancer throughout the body.

You may have a mild flu-like response to the first dose of trastuzumab that includes fever, chills, headache, muscle aches, and nausea. This response is less common with the second and third doses. Rare **side effects** include damage to the heart or lungs.

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**Figure 15. HER2 targeted therapy**

Some stomach cancers consists of cancer cells with too many HER2s. HER2s trigger growth signals with cancer cells. Trastuzumab blocks HER2 from attaching to other surface receptors and starting growth signals.
Clinical trials

New tests and treatments aren’t offered to the public as soon as they’re made. They need to be studied. A **clinical trial** is a type of research that studies a test or treatment.

Clinical trials study how safe and helpful tests and treatments are. When found to be safe and helpful, they may become tomorrow’s standard of care. Because of clinical trials, the tests and treatments in this book are now widely used to help people with stomach cancer.

New tests and treatments go through a series of clinical trials to make sure they’re safe and work. Without clinical trials, there is no way to know if a test or treatment is safe or helpful. Clinical trials have four phases. Examples of the four phases for treatment are:

- **Phase I** trials aim to find the best dose of a new drug with the fewest **side effects**.
- **Phase II** trials assess if a drug works for a specific type of cancer.
- **Phase III** trials compare a new drug to the standard treatment.
- **Phase IV** trials test new drugs approved by the U.S. FDA (Food and Drug Administration) in many patients with different types of cancer.

Joining a clinical trial has benefits. First, you’ll have access to the most current cancer care. Second, you will receive the best management of care. Third, the results of your treatment—both good and bad—will be carefully tracked. Fourth, you may help other patients with cancer.

Clinical trials have risks, too. Like any test or treatment, there may be side effects. Also, new tests or treatments may not help. Another downside may be that paperwork or more trips to the hospital are needed.

To join a clinical trial, you must meet the conditions of the study. Patients in a clinical trial are often alike in terms of their cancer and general health. This is to know that any progress is because of the treatment and not because of differences between patients.

To join, you’ll need to review and sign a paper called an informed consent form. This form describes the study in detail, including the risks and benefits.

Ask your treatment team if there is an open clinical trial that you can join. There may be clinical trials where you’re getting treatment or at other treatment centers nearby. You can also find clinical trials through the websites listed in Part 6.
Review

- Endoscopic resection removes early tumors with small tools that are guided down the throat and into the stomach.

- A gastrectomy removes some or all of the stomach along with nearby lymph nodes through an incision made in the belly area. This surgery may be done through one large cut (open method) or a few small cuts (minimally invasive method).

- Radiation therapy uses high-energy rays to kill cancer cells or stop new cancer cells from being made.

- Chemotherapy stops cancer cells from completing their life cycle so they can’t increase in number.

- One type of targeted therapy stops the growth of new blood vessels into stomach tumors. Without blood, cancer cells starve and die. A second type of targeted therapy for stomach cancer stops the cancer cells from receiving certain growth signals.

- Clinical trials give people access to new tests and treatments that otherwise can’t usually be received. These new tests and treatments may, in time, be approved by the FDA.
5 Treatment guide

50 Very early cancer

This section is a guide to treatment of cancer that has not grown beyond the first layer of the stomach wall. There is no proof of cancer in nearby lymph nodes or distant sites. These cancers include stages 0 and IA (T1a).

54 Locoregional cancer

This section is a guide to treatment of cancer that has grown beyond the first layer of the stomach wall. There may be proof of cancer in nearby lymph nodes but there is no proof of cancer in distant sites. These cancers include stages IA (T1b), IB, II, and III.

62 Metastatic cancer

This section is a guide to treatment of stomach cancer that has spread to distant sites. Treatment consists of supportive care. Supportive care is also an option for people who can’t have or decline surgery for non-metastatic cancer.

68 Review
Part 5 is a guide to the treatment options for people with stomach cancer. Treatment options are grouped by the extent of the cancer. This information is taken from the treatment guidelines written by NCCN experts for doctors who treat stomach cancer. Your doctors may suggest other treatments than those listed in Part 5 based on your health and personal wishes.
## Very early cancer

### Guide 3. Initial treatment

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### Guide 4. Next treatment after surgery

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<td>• Chemoradiation, or</td>
</tr>
<tr>
<td></td>
<td>• Surgery</td>
</tr>
<tr>
<td>Some cancer remains in or near your stomach</td>
<td>• Chemoradiation, or</td>
</tr>
<tr>
<td></td>
<td>• Supportive care</td>
</tr>
<tr>
<td>Cancer is found in distant sites</td>
<td>• Supportive care</td>
</tr>
</tbody>
</table>
**Guide 3** lists options for initial treatment of very early cancers. These cancers have not grown beyond the first layer of the stomach wall (*mucosa*). There is no proof of cancer in nearby *lymph nodes* or distant sites. The TMN scores for very early cancers are Tis, N0, M0 (stage 0) and T1a, N0, M0 (stage IA).

Treatment options are based on whether you are healthy enough for surgery. Your willingness to have surgery is also a factor. Your doctors will assess if you are able to undergo surgery by testing your lungs, heart, and nutritional intake.

For all very early cancers, options include **EMR** and **ESD**. If you are able to have surgery, **gastrectomy with lymph node dissection** is another option. In centers with experts in ESD, it is preferred over other options for initial treatment of very early cancer.

After EMR or ESD, test results may suggest a higher-risk cancer. Higher-risk cancers are more likely to have spread to the lymph nodes. Signs of higher risk include cancer cells that look very different than normal cells (poorly differentiated) and tumor growth into the second layer of the stomach wall (*submucosa*). In this case, you may receive a gastrectomy with lymph node removal.

**Guide 4** lists options for the next treatment after surgery. The results of surgery are used to decide if more treatment is needed. Surgery results include, 1) no cancer is in the *surgical margin* or lymph nodes; 2) cancer is in the surgical margin; 3) not all the cancer that the surgeon could see in or near the stomach was removed, and 4) cancer was found in distant sites (M1 score).

Your surgeon may have been able to remove all the cancer and a cancer-free surgical margin. In this case, no more treatment is needed if the lymph nodes are cancer-free. The next step is to start follow-up care.

If cancer is found in the surgical margin, **chemoradiation** or another surgery is advised. Chemoradiation will treat any cancer that may remain in your body. Likewise, if your surgeon wasn’t able to remove all the cancer in or near your stomach, chemoradiation is one of two options. In these cases, **chemotherapy** with infusional 5-FU or capecitabine before and after fluoropyrimidine-based chemoradiation is advised.

You may receive **supportive care**. It is a second option when cancer remains in or near your stomach after surgery. It is also advised if M1 cancer is found during surgery. Supportive care is addressed in the section, *Metastatic cancer*. 

---

NCCN Guidelines for Patients®
Guide 5. Follow-up care after cancer treatment

<table>
<thead>
<tr>
<th>Cancer treatment</th>
<th>Type of care</th>
<th>How often should I get this care?</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMR or ESD</td>
<td>EUS with upper GI endoscopy</td>
<td>• Generally, every 6–12 months</td>
</tr>
<tr>
<td>Surgery</td>
<td>Medical history and physical exam</td>
<td>• Every 3–6 months for 1–2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>◦ If normal results, then repeat every 6–12 months for 3–5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>◦ If normal results, then repeat every year</td>
</tr>
<tr>
<td></td>
<td>CBC and chemistry profile</td>
<td>• As needed</td>
</tr>
<tr>
<td></td>
<td>CT with contrast of chest and abdomen or upper GI endoscopy</td>
<td>• As needed</td>
</tr>
<tr>
<td></td>
<td>Malnutrition testing</td>
<td>• On a regular basis</td>
</tr>
</tbody>
</table>
Guide 5 lists follow-up care after cancer treatment. Follow-up care is started when there are no signs of cancer after treatment. It is based on which cancer treatment you had.

After EMR or ESD
EUS with upper GI endoscopy is needed. EUS with an endoscopy finds cancer—if it returns—very well. Four to six biopsies of abnormal spots are advised.

After surgery
Updates of your medical history and physical exams should be done regularly. Blood tests, CT scans, and upper GI endoscopies are only done when needed.

Due to surgery, you may not be getting enough nutrients. You should be tested for low B12, iron, and other levels. Treatment should be received as needed.

Recurrence
The cancer may return during follow-up care. This is called a recurrence. Treatment options are based on where the cancer returned.

Cancer that returns near to where the stomach is (or was) is called locoregional cancer. Surgery may be an option if you are healthy enough.

Otherwise, supportive care is advised for locoregional and metastatic cancer. Supportive care is addressed in the section, Metastatic cancer.
### Guide 6. Initial treatment

<table>
<thead>
<tr>
<th>Surgery status</th>
<th>Clinical stage</th>
<th>What are my options?</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are approved and agree to surgery</td>
<td>T1a, N1–N3, M0</td>
<td>• Surgery</td>
</tr>
<tr>
<td></td>
<td>T1b, Any N, M0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T2, Any N, M0</td>
<td>• Surgery,</td>
</tr>
<tr>
<td></td>
<td>T3, Any N, M0</td>
<td>• Chemotherapy before and after surgery, or</td>
</tr>
<tr>
<td></td>
<td>T4, Any N, M0</td>
<td>• Chemoradiation before surgery</td>
</tr>
<tr>
<td>You may be approved for surgery</td>
<td>Any</td>
<td>• Chemoradiation ± surgery, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Chemotherapy ± surgery</td>
</tr>
<tr>
<td>You are not approved or decline surgery</td>
<td>Any</td>
<td>• Chemoradiation, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Supportive care</td>
</tr>
</tbody>
</table>
Guide 6 lists options for initial treatment of locoregional cancer. These cancers have grown beyond the first layer of the stomach wall (mucosa). There may be cancer in nearby lymph nodes but not in distant sites. A list of clinical stages that are locoregional cancers is included in Guide 6.

Surgery may be a treatment option for these cancers. Your doctors will assess if you are able to undergo surgery by testing your lungs, heart, and nutritional intake. Your doctors will also assess if chemotherapy or chemoradiation would do more help than harm.

Approved and agree to surgery
If you are approved and agree to surgery, your initial treatment may be surgery only. However, for most people, surgery alone is not enough. As such, there are two more options if the tumor has grown beyond the second layer of the stomach wall. These tumors include those scored T2, T3, or T4.

The second option is to receive chemotherapy before and after surgery. This is called perioperative chemotherapy. The third option is chemoradiation before surgery (preoperative) but more research is needed to know how well it works.

The recommended regimens for perioperative chemotherapy are:

- 5-FU and cisplatin,
- ECF (epirubicin, cisplatin, and fluorouracil),
- Epirubicin, oxaliplatin, and fluorouracil,
- Epirubicin, cisplatin, and capecitabine, and
- Epirubicin, oxaliplatin, and capecitabine.

The recommended chemotherapy regimens for preoperative chemoradiation are:

**Preferred regimens**
- Paclitaxel and carboplatin,
- Cisplatin and 5-FU (or capecitabine),
- Oxaliplatin and 5-FU (or capecitabine), and

**Other regimens**
- Paclitaxel and 5-FU (or capecitabine).

May be approved for surgery
You may be approved for surgery if the cancer is widespread around your stomach. Other treatments may shrink the cancer enough for surgery. Fluoropyrimidine- or taxane-based chemoradiation may shrink the cancer. A second option is to shrink the cancer with only chemotherapy.

The cancer will be re-staged to assess if the cancer shrunk. Staging should be done with a CT scan, CBC, and a comprehensive chemistry profile. CT should be of your chest, abdomen, and pelvis. Contrast will be injected into your vein and you will be given as a liquid to drink. You may receive PET/CT if needed.

If the tumor shrunk a lot, you may be approved for surgery. Another option is to start follow-up care.

If the tumor didn't shrink enough, supportive care is an option. Supportive care is addressed in the next section, Metastatic cancer.

Not approved or decline surgery
If you are not approved for or decline surgery, chemoradiation to try to cure the cancer is an option. Doctors call this type of chemoradiation “definitive chemoradiation.” Fluoropyrimidine- or taxane-based chemotherapy should be used.

A second option is supportive care. Supportive care is addressed in the next section, Metastatic cancer.
**Guide 7. Next treatment after surgery only**

<table>
<thead>
<tr>
<th>Surgical results</th>
<th>Pathologic stage</th>
<th>What are my options?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cancer is in the surgical margin</td>
<td>T1b, N0, M0</td>
<td>• Start follow-up care</td>
</tr>
</tbody>
</table>
|  | T2, N0, M0 | • Start follow-up care, or  
|  |  | • Chemoradiation if cancer is likely to return |
|  | T1, N1–N3, M0  
|  | T2, N1–N3, M0  
|  | T3, Any N, M0  
|  | T4, Any N, M0 | • Chemoradiation, or  
|  |  | • Chemotherapy if D2 lymph nodes removed |
| Cancer is in the surgical margin | Any | • Chemoradiation |
| Some cancer remains in or near your stomach | Any | • Chemoradiation, or  
|  |  | • Supportive care |
| Cancer is found in distant sites | Any | • Supportive care |
Guide 7 lists options for the next treatment after initial treatment with surgery only. The results of surgery are used to decide if more treatment is needed. Surgery results include, 1) no cancer is in the surgical margin; 2) cancer is in the surgical margin; 3) not all the cancer that the surgeon could see in or near the stomach was removed; and 4) cancer was found in distant sites (M1 score).

When the surgical margin is cancer-free, options are also based on the pathologic stage. That's the cancer stage after surgery. No more treatment is needed if the cancer is rated T1b, N0, M0 or T2, N0, M0. The next step is to start follow-up care. Chemoradiation is only advised for T2 tumors if the chances of the cancer returning are high. The cancer is more likely to return if:

- The cancer cells don't look much like normal cells,
- Cancer has spread to lymph vessels or nerves,
- You are younger than 50 years of age, or
- D2 lymph nodes weren't removed.

Even when the margin is cancer-free, cancers that should receive more treatment include those rated 1) T1 or T2 with cancer in lymph nodes or 2) T3 or T4 with or without cancer in lymph nodes. For these cancers, chemoradiation is one option. Chemoradiation with infusional 5-FU or capecitabine before and after fluoropyrimidine-based chemoradiation is advised.

A second option for people who had D2 lymph nodes removed is chemotherapy without radiation. D2 lymph nodes include those next to nearby arteries and the spleen. In this case, capecitabine with oxaliplatin or cisplatin is advised.

If cancer is found in the surgical margin, chemoradiation is advised. Chemoradiation will treat any cancer that may remain in your body. Likewise, if your surgeon wasn't able to remove all the cancer in or near your stomach, chemoradiation is one of two options. In these cases, chemotherapy with infusional 5-FU or capecitabine before and after fluoropyrimidine-based chemoradiation is advised.

You may receive supportive care. It is a second option when cancer remains in or near your stomach after surgery. It is also advised if M1 cancer is found during surgery. Supportive care is addressed in the next section, Metastatic cancer.
Guide 8. Next treatment after pre- or perioperative treatment + surgery

<table>
<thead>
<tr>
<th>Surgical results</th>
<th>Pathologic stage</th>
<th>What are my options?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cancer is in the surgical margin</td>
<td>Any T, N0, M0</td>
<td>• Start follow-up care, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Chemotherapy if received before surgery</td>
</tr>
<tr>
<td></td>
<td>Any T, N1–N3, M0</td>
<td>• Chemotherapy if received before surgery</td>
</tr>
<tr>
<td>Cancer is in the surgical margin</td>
<td>Any</td>
<td>• Chemoradiation if not received before surgery</td>
</tr>
<tr>
<td>Some cancer remains in or near your stomach</td>
<td>Any</td>
<td>• Chemoradiation if not received before surgery, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Supportive care</td>
</tr>
<tr>
<td>Cancer is found in distant sites</td>
<td>Any</td>
<td>• Supportive care</td>
</tr>
</tbody>
</table>
Guide 8 lists options for the next treatment after initial treatment with chemoradiation or chemotherapy followed by surgery. The results of surgery are used to decide if more treatment is needed. Surgery results include, 1) no cancer is in the surgical margin; 2) cancer is in the surgical margin; 3) not all the cancer that the surgeon could see in or near the stomach was removed; and 4) cancer was found in distant sites (M1 score).

When no cancer is in the surgical margin, options are also based on the pathologic stage. That's the cancer stage after surgery. For cancers rated N0, no more treatment is needed unless you had chemotherapy before surgery. If you received chemotherapy with or without radiation before surgery, more chemotherapy is advised for cancers scored N0, N1, N2, or N3. The recommended regimens for chemotherapy after surgery are:

- ECF (epirubicin, cisplatin, and fluorouracil),
- Epirubicin, oxaliplatin, and fluorouracil,
- Epirubicin, cisplatin, and capecitabine, and
- Epirubicin, oxaliplatin, and capecitabine.

If cancer is found in the surgical margin, chemoradiation is advised if you didn’t receive it before surgery. Chemoradiation will treat any cancer that may remain in your body. Likewise, if your surgeon wasn’t able to remove all the cancer in or near your stomach, chemoradiation is one of two options. In these cases, chemotherapy with infusional 5-FU or capecitabine before and after fluoropyrimidine-based chemoradiation is advised.

You may receive supportive care. It is a second option when cancer remains in or near your stomach after surgery. It is also advised if M1 cancer is found during surgery. Supportive care is addressed in the next section, Metastatic cancer.
### Guide 9. Follow-up care after cancer treatment

<table>
<thead>
<tr>
<th>Type of care</th>
<th>How often should I get this care?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical history and physical exam</td>
<td>• Every 3–6 months for 1–2 years&lt;br&gt;◦ If normal results, then repeat every 6–12 months for 3–5 years&lt;br&gt;◦ If normal results, then repeat every year</td>
</tr>
<tr>
<td>CBC and chemistry profile</td>
<td>• As needed</td>
</tr>
<tr>
<td>CT with contrast of chest and abdomen or upper GI endoscopy</td>
<td>• As needed</td>
</tr>
<tr>
<td>Malnutrition testing</td>
<td>• On a regular basis</td>
</tr>
</tbody>
</table>
Guide 9 lists follow-up care after cancer treatment. Follow-up care is started when there are no signs of cancer after treatment.

Updates of your medical history and physical exams should be done regularly. Blood tests, CT scans, and upper GI endoscopy are only done when needed.

Due to surgery, you may not be getting enough nutrients. You should be tested for low B12, iron, and other levels. Treatment should be received as needed.

Recurrence
The cancer may return during follow-up care. This is called a recurrence. Treatment options are based on where the cancer returned.

Cancer that returns near to where the stomach is (or was) is called locoregional cancer. Surgery may be an option if you are healthy enough.

Otherwise, supportive care is advised for locoregional and metastatic cancer. Supportive care is addressed in the next section, Metastatic cancer.
## Guide 10. Supportive care

<table>
<thead>
<tr>
<th>Performance status score</th>
<th>What are my options?</th>
</tr>
</thead>
</table>
| ECOG ≤2 or KPS ≥60       | • Supportive care with systemic therapy (see page 64),  
                          | • Clinical trial, or  
                          | • Supportive care without systemic therapy (see page 66) |
| ECOG ≥3 or KPS <60       | • Supportive care without systemic therapy (see page 66) |
Supportive care
Metastatic cancer that is rated M1 cannot be treated with local treatments. Metastatic cancer includes stage IV. Instead, supportive care is given to slow down cancer growth. When used for advanced cancers, supportive care is often called palliative care.

The goal of supportive care is to prevent and relieve discomfort you may have since the cancer can’t be cured. Supportive care may also extend life, improve your eating, and help you feel better overall.

People with non-metastatic cancer also receive supportive care. If surgery isn’t an option, systemic treatment to control cancer growth may be an option. Systemic therapy treats cancer anywhere in the body. Other aspects of supportive care, such as symptom control, are useful for many people with any stage of stomach cancer.

Guide 10 lists the options used to manage metastatic and other advanced cancers. Options are based on your performance status, which is your ability to do activities. Your doctor will rate your performance status by one of two scales:

ECOG (Eastern Cooperative Oncology Group) Performance Scale
- A score of 0 means you are fully active.
- A score of 1 means you are able to do all self-care activities but are unable to do hard physical work.
- A score of 2 means you are able to do all self-care activities and spend most of waking time out of bed but you are unable to do any work.
- A score of 3 means you are unable to do all self-care activities and any work and spend most of waking time in bed.
- A score of 4 means you are fully disabled.

KPS (Karnofsky Performance Status)
- A score of 0 to 49 means you are unable to care for yourself.
- A score of 50 to 79 means you are unable to work and some assistance is needed.
- A score of 80 to 100 means you are able to do your normal work and activities.

Chemotherapy can cause severe side effects. As such, it is only given if your health hasn’t seriously limited your activities.

If you have an ECOG score of 2 or less or a KPS score of 60 more, you have two options. The first option is supportive care with systemic therapy. A second option is to join a clinical trial testing a new systemic therapy. A third option is supportive care without systemic therapy.

Systemic therapies recommended by NCCN experts are listed on page 64. Symptom control is addressed on page 66.

Supportive care that excludes systemic therapy is an option if you have an ECOG score of 3 or more or a KPS score of less than 60. You may receive other types of care to improve your quality of life.
### Guide 11. First-line systemic treatments*

<table>
<thead>
<tr>
<th>Preferred regimens</th>
<th>Other regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoropyrimidine + cisplatin</td>
<td>Paclitaxel + cisplatin or carboplatin</td>
</tr>
<tr>
<td>Fluoropyrimidine + oxaliplatin</td>
<td>Docetaxel + cisplatin</td>
</tr>
<tr>
<td>*5-FU or capecitabine</td>
<td>Docetaxel</td>
</tr>
<tr>
<td></td>
<td>5-FU + irinotecan</td>
</tr>
<tr>
<td></td>
<td>Docetaxel + cisplatin + fluorouracil</td>
</tr>
<tr>
<td></td>
<td>Docetaxel + oxaliplatin + fluorouracil</td>
</tr>
<tr>
<td></td>
<td>Docetaxel + carboplatin + fluorouracil</td>
</tr>
<tr>
<td></td>
<td>ECF (epirubicin + cisplatin + fluorouracil)</td>
</tr>
<tr>
<td></td>
<td>Epirubicin + oxaliplatin + fluorouracil</td>
</tr>
<tr>
<td></td>
<td>Epirubicin + cisplatin + capecitabine</td>
</tr>
<tr>
<td></td>
<td>Epirubicin + oxaliplatin + capecitabine</td>
</tr>
</tbody>
</table>

*Trastuzumab should be received with chemotherapy if the cancer cells have too many HER2 receptors.

### Guide 12. Second-line systemic treatments

<table>
<thead>
<tr>
<th>Preferred regimens</th>
<th>Other regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramucirumab + paclitaxel</td>
<td>Irinotecan + cisplatin</td>
</tr>
<tr>
<td>Docetaxel</td>
<td>Irinotecan + fluoropyrimidine (5-FU or capecitabine)</td>
</tr>
<tr>
<td>Paclitaxel</td>
<td>Docetaxel + irinotecan</td>
</tr>
<tr>
<td>Irinotecan</td>
<td></td>
</tr>
<tr>
<td>Ramucirumab</td>
<td></td>
</tr>
</tbody>
</table>
Systemic treatment
Doctors use the term “systemic” when talking about a cancer treatment for the whole body. Chemotherapy is the type of systemic treatment most often used for stomach cancer.

Targeted therapy is a newer drug treatment for advanced stomach cancers. Trastuzumab is one such drug. It should be received with fist-line chemotherapy if the cancer cells have too many HER2 receptors except if taking an anthracycline. Epirubicin is an anthracycline.

Guide 11 lists the regimens first used to manage advanced cancers. Your doctor will choose a regimen based on your health and treatment side effects. Regimens consisting of two drugs have less severe side effects than three-drug regimens. If you are given 5-FU, leucovorin may be added to limit side effects of the chemotherapy. No matter what regimen you receive, you should be assessed for side effects on a regular basis.

Guide 12 lists the regimens that are given if the cancer doesn’t respond to first-line regimens. The regimen that is best for you depends on your prior treatment and performance status. Preferred regimens in Guide 12 have been shown within well-designed clinical trials to control cancer growth better than other treatments.
Symptom control
Cancer or its treatment can cause unpleasant and sometimes harmful symptoms. One of the most common symptoms among people with stomach cancer is bleeding. Bleeding may be caused by the cancer or cancer treatment.

Endoscopic treatment may be used to stop bleeding. Endoscopic methods include injections, clips, and heat. Endoscopic treatment may work at first but often bleeding returns in time. More research is needed to learn how well endoscopic treatment works.

There are two other treatment options in addition to endoscopic treatment. Embolization may be used to close up or block blood vessels. Some research supports use of EBRT to control bleeding. EBRT stops both recent and ongoing blood loss.

Proton pump inhibitors can be prescribed by doctors for bleeding. However, it is unclear how well they work to stop bleeding. More research is needed.

Other symptoms related to stomach cancer include pain and nausea with or without vomiting. Pain may be controlled with radiation therapy, chemotherapy, pain medication, and other methods. Likewise, there are medicines and other methods that may help stop nausea and vomiting. Treatment for these symptoms will be based on whether they are caused by a tumor blocking your gut. Read the next section, GI blockage, to learn more.

You may have other symptoms that aren’t listed here. If you have a new or worse symptom, tell your treatment team. There may be ways to help you feel better.

GI blockage
The cancer may block food from passing through your stomach and intestines. If your doctor thinks there is a blockage (obstruction), you will need to be tested. An endoscope may be inserted down your throat and into your stomach so your doctor can see. Another option is to swallow a contrast dye while being x-rayed. The x-rays are used to create a live video of the inside of your stomach. This is a fluoroscopic assessment.

Endoscopic treatment may be used to unblock your stomach. This treatment involves placement of a thin metal stent while you are sedated. The stent may be placed in the opening between your esophagus and stomach or in the opening between your stomach and small intestine. The stent will expand in the opening and remain in your body to allow food to pass through. Placement of the stent can be done on an outpatient basis.

Another treatment for obstruction is surgery. General anesthesia is needed. Surgery may create a bypass around the blockage or remove some of your stomach.

Shrinking the cancer may also help unblock your stomach. To shrink the cancer, EBRT or chemotherapy may be used.
Review

- Endoscopic treatment and surgery are options for stomach cancer within the first layer of the stomach wall. Surgery may be followed by chemoradiation to help stop the cancer from returning.

- For locoregional tumors, surgery or chemoradiation are used to try to cure the cancer. You may receive chemotherapy or chemoradiation before surgery to shrink the cancer. You may receive chemotherapy or chemoradiation after surgery to help stop the cancer from returning. Locoregional cancer that is unable to be cured can be treated with supportive care.

- Metastatic cancer that has spread to distant sites may be treated with supportive care. Supportive care may include treatment to slow down cancer growth and treatment to prevent or reduce symptoms caused by the cancer. There are many options for drug treatment if you are healthy enough to endure side effects.
Making treatment decisions
Having cancer is very stressful. While absorbing the fact that you have cancer, you have to learn about tests and treatments. In addition, the time you have to accept a treatment plan feels short. Parts 1 through 5 described the cancer and the test and treatment options recommended by NCCN experts. These options are based on science and agreement among NCCN experts. Part 6 aims to help you make decisions that are in line with your beliefs, wishes, and values.

“I had this surgery August 16th, 2016. I am now figuring out my new life without a stomach. I wouldn’t say it’s been easy, but it’s definitely worth it to not have those large odds against me. I look forward to growing old with my husband and being able to be there for my now 4-year-old daughter. I look forward to watching her grow, learn, and become an amazing young lady and, of course, being there for all of those milestones in life makes losing my stomach worth it.”

Heather Huus
Advocate, No Stomach For Cancer
It’s your choice

The role patients want in choosing their treatment differs. You may feel uneasy about making treatment decisions. It may be hard to hear or know what others are saying. This may be due to a high level of stress. Stress, pain, and drugs can limit your ability to make good decisions. You may feel uneasy because you don’t know much about cancer. You’ve never heard the words used to describe cancer, tests, or treatments. Likewise, you may think that your judgment isn’t any better than your doctors’.

Your doctors will give you the information you need to make an informed choice. In early-stage disease, there are often multiple good options. It is good news to have multiple options.

Letting others decide which option is best may make you feel more at ease. But, whom do you want to make the decisions? You may rely on your doctors alone to make the right decisions. However, your doctors may not tell you which to choose if you have multiple good options. You can also have loved ones help. They can gather information, speak on your behalf, and share in decision-making with your doctors. Even if others decide which treatment you will receive, you still have to agree by signing a consent form.

On the other hand, you may want to take the lead or share in decision-making. Most patients do. In shared decision-making, you and your doctors share information, weigh the options, and agree on a treatment plan. Your doctors know the science behind your plan but you know your concerns and goals. By working together, you are likely to get a higher quality of care and be more satisfied. You’ll likely get the treatment you want, at the place you want, and by the doctors you want.
Questions to ask your doctors

You will likely meet with experts from different fields of medicine. Strive to have helpful talks with each person. Prepare questions before your visit and ask questions if the person isn’t clear. Bring a pad of paper to take notes. You can also record your talks and get copies of your medical records. It may be helpful to have your spouse, partner, or a friend with you at these visits. A patient advocate or navigator might also be able to come. They can help to ask questions and remember what was said. Suggested questions to ask include:
What’s my diagnosis and prognosis?

It’s important to know that there are different types of cancer. Cancer can greatly differ even when people have a tumor in the same organ. Based on your test results, your doctors can tell you which type of cancer you have. He or she can also give a prognosis. A prognosis is a prediction of the pattern and outcome of a disease. Knowing the prognosis may affect what you decide about treatment.

1. Where did the cancer start? In what type of cell?
2. Is this cancer common?
3. What is the cancer stage? Does this stage mean the cancer has spread far?
4. Is this a fast- or slow-growing cancer?
5. Do I have hereditary stomach cancer? Should I and my family receive genetic counseling?
6. What other test results are important to know?
7. How often are these tests wrong?
8. Would you give me a copy of the pathology report and other test results?
9. Can the cancer be cured? If not, how well can treatment stop the cancer from growing?
What are my options?

There is no single treatment practice that is best for all patients. There is often more than one treatment option along with clinical trial options. Your doctor will review your test results and recommend treatment options.

1. What will happen if I do nothing?
2. Can I just carefully monitor the cancer?
3. Do you consult NCCN recommendations when considering options?
4. Are you suggesting options other than what NCCN recommends? If yes, why? From what source are these options based?
5. How do my age, health, and other factors affect my options?
6. Which option is proven to work best?
7. Which options lack scientific proof?
8. What are the benefits of each option? Does any option offer a cure? Are my chances any better for one option than another? Which option spares the most healthy tissue? Is any option less invasive? Less time-consuming? Less expensive?
9. What are the risks of each option? What are possible complications? What are the rare and common side effects? Short-lived and long-lasting side effects? Serious or mild side effects? Other risks?
10. What can be done to prevent or relieve the side effects of treatment?
11. What are my chances that the cancer will return?
What does each option require of me?

Many patients consider how each option will practically affect their lives. This information may be important because you have family, jobs, and other duties to take care of. You also may be concerned about getting the help you need. If you have more than one option, choosing the option that is the least taxing may be important to you:

1. Will I have to go to the hospital or elsewhere? How often? How long is each visit?
2. Do I have a choice of when to begin treatment? Can I choose the days and times of treatment?
3. How do I prepare for treatment? Do I have to stop taking any of my medicines? Are there foods I will have to avoid?
4. Should I bring someone with me when I get treated?
5. Will the treatment hurt?
6. How much will the treatment cost me? What does my insurance cover?
7. Will I miss work or school? Will I be able to drive?
8. Is home care after treatment needed? If yes, what type?
9. How soon will I be able to manage my own health?
10. When will I be able to return to my normal activities?
What is your experience?

More and more research is finding that patients treated by more experienced doctors have better results. It is important to learn if a doctor is an expert in the cancer treatment he or she is offering.

1. Are you board certified? If yes, in what area?
2. How many patients like me have you treated?
3. How many procedures like the one you’re suggesting have you done?
4. Is this treatment a major part of your practice?
5. How many of your patients have had complications?
Weighing your options

Deciding which option is best can be hard. Doctors from different fields of medicine may have different opinions on which option is best for you. This can be very confusing. Your spouse or partner may disagree with which option you want. This can be stressful. In some cases, one option hasn’t been shown to work better than another, so science isn’t helpful. Some ways to decide on treatment are discussed next.

2nd opinion
The time around a cancer diagnosis is very stressful. People with cancer often want to get treated as soon as possible. They want to make their cancer go away before it spreads farther. While cancer can’t be ignored, there is time to think about and choose which option is best for you.

You may wish to have another doctor review your test results and suggest a treatment plan. This is called getting a 2nd opinion. You may completely trust your doctor, but a 2nd opinion on which option is best can help.

Copies of the pathology report, a DVD of the imaging tests, and other test results need to be sent to the doctor giving the 2nd opinion. Some people feel uneasy asking for copies from their doctors. However, a 2nd opinion is a normal part of cancer care.

When doctors have cancer, most will talk with more than one doctor before choosing their treatment. What’s more, some health plans require a 2nd opinion. If your health plan doesn’t cover the cost of a 2nd opinion, you have the choice of paying for it yourself.

If the two opinions are the same, you may feel more at peace about the treatment you accept to have. If the two opinions differ, think about getting a 3rd opinion. A 3rd opinion may help you decide between your options. Choosing your cancer treatment is a very important decision. It can affect your length and quality of life.

Support groups
Besides talking to health experts, it may help to talk to patients who have walked in your shoes. Support groups often consist of people at different stages of treatment. Some may be in the process of deciding while others may be finished with treatment. At support groups, you can ask questions and hear about the experiences of other people with stomach cancer.

Compare benefits and downsides
Every option has benefits and downsides. Consider these when deciding which option is best. Talking to others can help pinpoint benefits and downsides you haven’t thought of. Scoring each factor from 0 to 10 can also help since some factors may be more important to you than others.
Websites

**American Cancer Society**
www.cancer.org/cancer/stomachcancer/index

**Debbie's Dream Foundation: Curing Stomach Cancer**
www.DebbiesDream.org

**National Cancer Institute**
www.cancer.gov/types/stomach

**National Coalition for Cancer Survivorship**
www.canceradvocacy.org/toolbox

**NCCN**
www.nccn.org/patients

**No Stomach For Cancer**
www.nostomachforcancer.org

Review

- Shared decision-making is a process in which you and your doctors plan treatment together.
- Asking your doctors questions is vital to getting the information you need to make informed decisions.
- Getting a 2nd opinion, attending support groups, and comparing benefits and downsides may help you decide which treatment is best for you.
Glossary

Dictionary

Acronyms
abdomen
The belly area between the chest and pelvis.

adenocarcinoma
Cancer of cells that make fluids or hormones.

biopsy
Removal of small amounts of tissue or fluid to be tested for disease.

cancer stage
A rating of the growth and spread of cancer.

chemoradiation
Treatment that combines chemotherapy with radiation therapy.

chemotherapy
Drugs that stop the life cycle of cells so they don't increase in number.

clinical stage
Rating the extent of a tumor based on tests before treatment.

clinical trial
Research on a test or treatment to assess its safety or how well it works.

complete blood count (CBC)
A test of the number of blood cells.

comprehensive chemistry profile
Measurement of the amount of chemicals in the blood.

computed tomography (CT)
A test that uses x-rays to view body parts.

contrast
A dye put into your body to make clearer pictures during imaging tests.

diaphragm
A sheet of muscles below the ribs that helps a person to breathe.

digestive system
A set of organs that breaks down food for the body to use.

Eastern Cooperative Oncology Group (ECOG)
Performance Scale
A rating scale of one's ability to do daily activities.

endoscope
A thin, long tube fitted with tools that is guided down the mouth.

endoscopic mucosal resection (EMR)
Removal of early tumors with a snare that has been guided down the throat.

endoscopic resection
Treatment that removes early tumors with a tool guided down the throat.

endoscopic submucosal dissection (ESD)
Removal of early tumors with a special knife that has been guided down the throat.

endoscopic ultrasound (EUS)
A device guided down your throat to make pictures using sound waves.

epithelium
Tissue that lines the stomach wall.

esophagastroduodenoscopy (EGD)
Use of a thin tool guided down the throat into the esophagus and stomach. Also called an upper GI endoscopy.

esophagogastric junction (EGJ)
The area where the esophagus and stomach join.

esophagus
The tube-shaped organ between the throat and stomach.

external beam radiation therapy (EBRT)
Radiation therapy received from a machine outside the body.

fine-needle aspiration (FNA)
Removal of a tissue sample with a small needle.

gastrectomy
A surgery that removes some or all of the stomach.

gastroenterologist
A doctor who's an expert in digestive diseases.
**general anesthesia**
A controlled loss of wakefulness from drugs.

**gene**
Instructions in cells for making and controlling cells.

**human epidermal growth factor receptor 2 (HER2)**
A protein on the edge of a cell that sends signals for the cell to grow.

**imaging**
A test that makes pictures of the insides of the body.

**immunohistochemistry (IHC)**
A lab test of cancer cells to find specific cell traits involved in abnormal cell growth.

**in situ hybridization (ISH)**
A lab test that shows the number of a specific gene.

**intensity-modulated radiation therapy (IMRT)**
Radiation therapy that uses small beams of different strengths based on the thickness of the tissue.

**jejunostomy tube (J-tube)**
A feeding tube that is inserted though a cut into the intestine.

**Karnofsky Performance Status (KPS)**
A rating scale of one’s ability to do daily activities.

**lamina propria**
Connective tissue within the mucosa of the stomach wall.

**laparoscopy**
Use of a thin tool inserted through a cut made into the belly area.

**lymph**
A clear fluid containing white blood cells.

**lymph node**
A small group of special disease-fighting cells located throughout the body.

**lymph node dissection**
A type of surgery that removes some disease-fighting structures called lymph nodes.

**medical history**
All health events and medications taken to date.

**medical oncologist**
A doctor who’s an expert in cancer drugs.

**metastasis**
The spread of cancer cells from the first tumor to another body part.

**mucosa**
The first, inner layer of the stomach wall.

**muscularis mucosae**
A thin layer of muscle within the mucosa of the stomach wall.

**muscularis propria**
The third layer of the stomach wall made mostly of muscle.

**nutritionist**
An expert in healthy foods and drinks.

**oncology surgeon**
A doctor who’s an expert in cancer surgery.

**pathologic stage**
A rating of the extent of cancer based on tests after treatment.

**pathologist**
A doctor who’s an expert in testing cells to find disease.

**pelvis**
The area of the body between the hip bones.

**percutaneous endoscopic gastrostomy (PEG)**
A feeding tube inserted through a small cut into the stomach.

**physical exam**
A study of the body by a health expert for signs of disease.

**positron emission tomography-computed tomography (PET/CT)**
A test that uses radioactive material and x-rays to see the shape and function of body parts.

**primary treatment**
The main treatment used to rid the body of cancer.

**primary tumor**
The first mass of cancer cells in the body.

**radiation oncologist**
A doctor who’s an expert in radiation treatment.

**radiation therapy**
The use of radiation to treat cancer.

**radiologist**
A doctor who’s an expert in reading imaging tests.
**recurrence**  
The return of cancer after treatment.

**sedative**  
A drug that helps a person to relax or go to sleep.

**serosa**  
The outer layer of the stomach wall that makes fluid so that organs can slide against one another. Also called the visceral peritoneum.

**side effect**  
An unhealthy or unpleasant physical or emotional response to treatment.

**small intestine**  
The digestive organ that absorbs nutrients from eaten food.

**spleen**  
An organ to the left of the stomach that helps protect the body from disease.

**submucosa**  
The second layer of the stomach wall made mostly of connective tissue.

**subserosa**  
A thin layer of connective tissue within the wall of the stomach.

**supportive care**  
Treatment for symptoms of a disease.

**surface receptor**  
Proteins on the edge of a cell that send signals for the cell to grow.

**surgical margin**  
The normal tissue around the tumor removed during surgery.

**targeted therapy**  
Drugs that stop the growth process specific to cancer cells.

**upper gastrointestinal (GI) endoscopy**  
Use of a thin tool guided down the throat into the esophagus and stomach. Also called esophagastroduodenoscopy (EGD).

**vascular endothelial growth factor (VEGF)**  
A molecule that binds to cells that form blood vessels.
Acronyms

3D-CRT
three-dimensional conformal radiation therapy

AJCC
American Joint Committee on Cancer

CAM
complementary and alternative medicine

CBC
complete blood count

CT
computed tomography

DNA
deoxyribonucleic acid

EBRT
external beam radiation therapy

ECOG
Eastern Cooperative Oncology Group

EGD
esophagogastroduodenoscopy

EGJ
esophagogastric junction

EMR
endoscopic mucosal resection

ESD
endoscopic submucosal dissection

EUS
endoscopic ultrasound

FAP
familial adenomatous polyposis

FDA
Food and Drug Administration

FNA
fine-needle aspiration

GI
gastrointestinal

HDGC
hereditary diffuse gastric cancer

HER2
human epidermal growth factor receptor 2

HNPCC
hereditary non-polyposis colon cancer

IHC
immunohistochemistry

IMRT
intensity-modulated radiation therapy

ISH
in situ hybridization

J-tube
jejunostomy tube

KPS
Karnofsky Performance Status

PEG
percutaneous endoscopic gastrostomy

PET
positron emission tomography

PET/CT
positron emission tomography/computed tomography

VEGF
vascular endothelial growth factor

NCCN Abbreviations and Acronyms

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nebraskamed.com/cancer

Case Comprehensive Cancer Center/
University Hospitals Seidman Cancer Center and Cleveland Clinic
Taussig Cancer Institute
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866.223.8100 • CC Taussig Cancer Institute
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case.edu/cancer

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ci\tyofhope.org

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massgeneral.org/cancer

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dukecancerinstitute.org

Fox Chase Cancer Center
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foxcchase.org

Huntsman Cancer Institute
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Salt Lake City, Utah
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huntsman\ncancer.org

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Seattle Cancer Care Alliance
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206.667.5000 • fredhutch.org

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hopkinskimmelcancercenter.org

Robert H. Lurie Comprehensive Cancer Center of Northwestern University
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866.587.4322
cancer.northwestern.edu

Mayo Clinic Cancer Center
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Jacksonville, Florida
Rochester, Minnesota
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904.953.0853 • Florida
507.538.3270 • Minnesota
mayoclinic.org/departments-centers/mayo-clinic-cancer-center

Memorial Sloan Kettering Cancer Center
New York, New York
800.525.2225
mskcc.org

Moffitt Cancer Center
Tampa, Florida
800.456.3434
moffitt.org

The Ohio State University Comprehensive Cancer Center - James Cancer Hospital and Solove Research Institute
Columbus, Ohio
800.293.5066
cancer.osu.edu

Roswell Park Cancer Institute
Buffalo, New York
877.275.7724
roswellpark.org

Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine
St. Louis, Missouri
800.600.3606
siteman.wustl.edu

St. Jude Children’s Research Hospital/
The University of Tennessee Health Science Center
Memphis, Tennessee
888.226.4343 • sjude.org
901.683.0055 • westclinic.com

Stanford Cancer Institute
Stanford, California
877.668.7535
cancer.stanford.edu

University of Alabama at Birmingham Comprehensive Cancer Center
Birmingham, Alabama
800.822.0933
www.3ccc.uab.edu

UC San Diego Moores Cancer Center
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858.657.7000
cancer.ucsd.edu

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University of Colorado Cancer Center
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colorado\ncancercenter.org

University of Michigan Comprehensive Cancer Center
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mcancer.org

The University of Texas MD Anderson Cancer Center
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800.392.1611
mdanderson.org

Vanderbilt-Ingram Cancer Center
Nashville, Tennessee
800.811.8480
vicc.org

University of Wisconsin Carbone Cancer Center
Madison, Wisconsin
608.265.1700
uwhealth.org/cancer

Yale Cancer Center/
Smilow Cancer Hospital
New Haven, Connecticut
855.4.SMILOW
yalecancercenter.org
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