



NCCN
GUIDELINES
FOR PATIENTS®

2025

Stomach Cancer



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About the NCCN Guidelines for Patients®



National Comprehensive
Cancer Network®

Did you know that top cancer centers across the United States work together to improve cancer care? This alliance of leading cancer centers is called the National Comprehensive Cancer Network® (NCCN®).



Cancer care is always changing. NCCN develops evidence-based cancer care recommendations used by health care providers worldwide. These frequently updated recommendations are the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). The NCCN Guidelines for Patients plainly explain these expert recommendations for people with cancer and caregivers.

These NCCN Guidelines for Patients are based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Gastric Cancer, Version 2.2025 — April 4, 2025.

Learn how the NCCN Guidelines for Patients are developed

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November is Stomach Cancer Awareness Month, and our mission is to support research and unite the caring power of people worldwide affected by stomach cancer. The organization focuses on advancing awareness and education about stomach cancer, including Hereditary Diffuse Gastric Cancer (CDH1/CTNNA1 Gene Mutation), provides a support network for affected families, and supports research efforts for screening, early detection, treatment, and prevention of stomach cancer.

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NCCN Foundation seeks to support the millions of patients and their families affected by a cancer diagnosis by funding and distributing NCCN Guidelines for Patients. NCCN Foundation is also committed to advancing cancer treatment by funding the nation's promising doctors at the center of innovation in cancer research. For more details and the full library of patient and caregiver resources, visit NCCN.org/patients.

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About stomach cancer

- 5 What is stomach cancer?
- 5 What happens in stomach cancer?
- 6 How is stomach cancer treated?
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Stomach cancer happens when cells with damaged genes grow out of control in the stomach lining and form a tumor. This patient guideline provides the latest information on stomach cancer testing, staging, and treatment to help you make informed decisions with your health care team.

What is stomach cancer?

Stomach cancer (also called gastric cancer) is what happens when cells with damaged genes located in the stomach's lining multiply, grow out of control, and create a tumor.

The stomach is a large, hollow muscular organ that's part of the digestive system. It secretes digestive juices and acid to help break down food. It also stores food and moves it to the small intestine where the food is further digested and absorbed.

The wall surrounding this digestive dynamo is made up of many layers. And it's within those layers where stomach cancer begins. The tumor forms in the innermost layer of the stomach wall and grows outward (and up and down) through the layers of the wall.

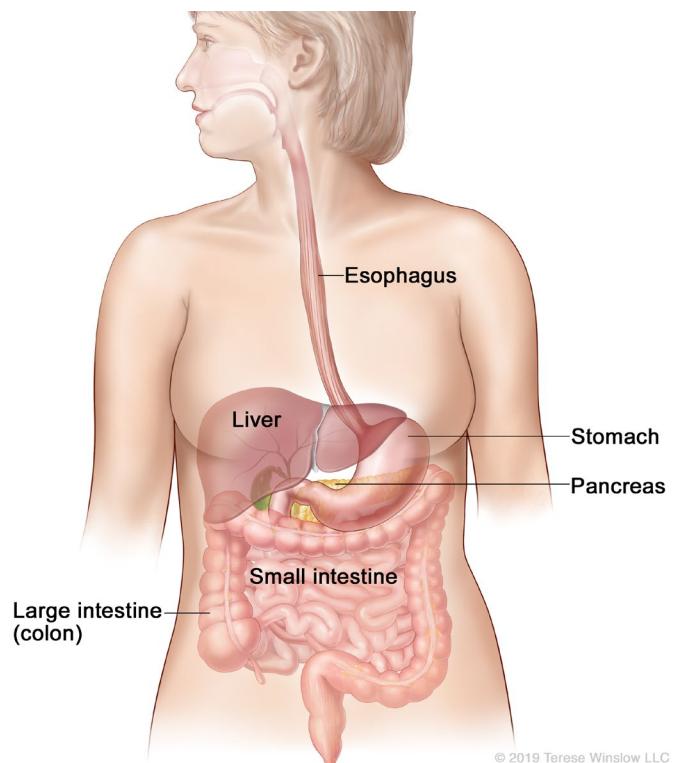
For more information on the stomach, see *Chapter 2: About the stomach*.

What happens in stomach cancer?

Stomach cancer tends to develop slowly over many years. Before cancer develops, pre-cancerous changes often occur in the inner lining (mucosa) of the stomach. Because these early changes rarely cause symptoms, they often go undetected. But newer technology with endoscopes (tubes with cameras that look inside the body) is detecting them earlier than ever before.

The digestive system

The digestive system takes in and breaks down food, absorbs nutrients, and removes waste from the body. It includes organs like your liver, gallbladder, stomach, pancreas, and intestines.



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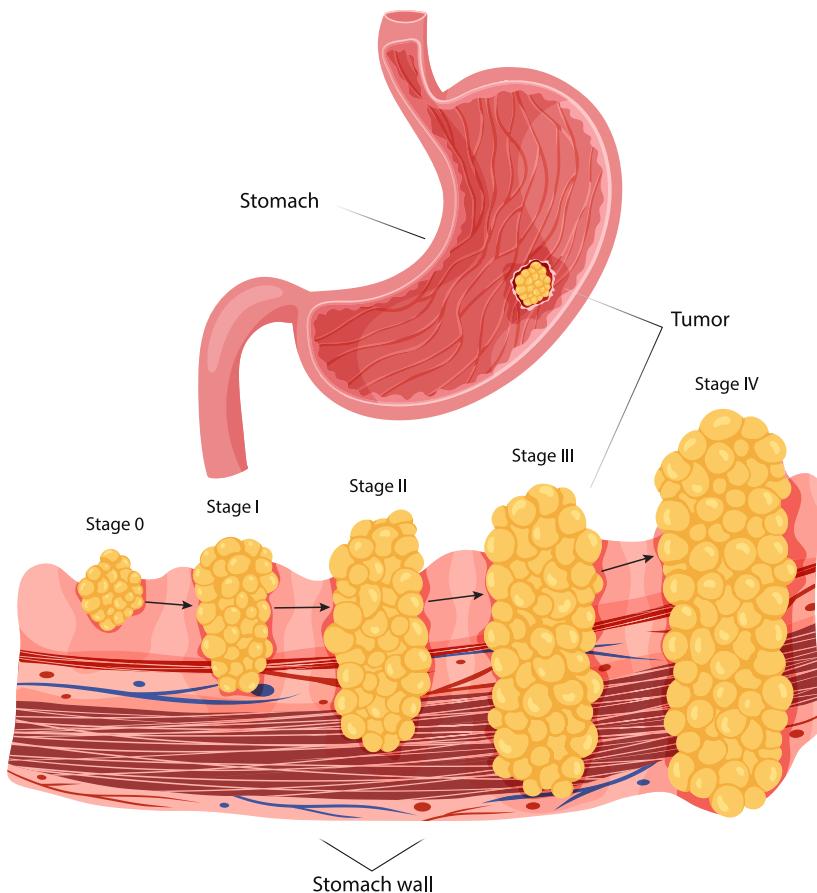
Most stomach cancers start in the cells that make mucus. These cancers are called adenocarcinomas. More than 9 in 10 stomach cancers are adenocarcinomas and they're the focus of this book.

As it grows, stomach cancer can spread (metastasize) to nearby lymph nodes (small bean-shaped, disease-fighting structures of the immune system) just outside of the stomach. It can also spread much further to lymphatic vessels, blood vessels, veins, arteries, and organs like the liver, pancreas, and spleen, as well as other parts of the body.

How is stomach cancer treated?

In general, treatment is based on the stage of stomach cancer, its location, as well as the health of the person who has cancer. A stage is a number (stage 0 through stage 4) that describes the extent of the cancer. Surgery with or without systemic therapy (chemotherapy and immunotherapy) is usually how it's treated, but it really depends on the stage and how far the cancer has spread. For example, because stage 4 stomach cancer has spread far from the original site, surgery is not an option but systemic therapy might be.

Depending on the growth of the tumor and if it has spread elsewhere, stomach cancer is classified by five stages: Stage 0, stage 1, stage 2, stage 3, and stage 4 (also known as metastatic cancer). This illustration shows tumor growth only—not lymph node involvement.



Stomach cancer stages can be grouped into 3 main categories:

- **Early-stage** stomach cancer hasn't grown beyond the first layer (mucosa) of the stomach wall. The tumor is often small and isn't in any lymph nodes outside the stomach. For more information on treatment in this stage, see *Chapter 6: Early-stage stomach cancer*.
- **Locally advanced** stomach cancer has invaded other layers of the stomach wall and/or spread to the lymph nodes or organs near the stomach. For more information, see *Chapter 7: Locally advanced stomach cancer*.
- **Metastatic** stomach cancer has spread to other parts of the body. The most common metastatic sites are the liver, abdominal lining (peritoneum), and distant lymph nodes. It may also have spread to the lungs or bones. For more information, see *Chapter 8: Recurrence and metastatic cancer*.

What are the risk factors?

A risk factor increases the chance for you to develop a disease. Risk factors for stomach cancer can be from exposure to illnesses, infections, a certain diet, smoking, or having a family member with stomach cancer. If you have any of these risk factors, it doesn't mean you'll develop stomach cancer. It just means it might be more likely because they increase the chance of damage to the cells in the stomach lining.

These are the leading risk factors:

Why you should read this book

Making decisions about cancer care can be stressful. You may need to make tough decisions under pressure about complex choices.

The NCCN Guidelines for Patients are trusted by patients and providers. They clearly explain current care recommendations made by respected experts in the field. Recommendations are based on the latest research and practices at leading cancer centers.

Cancer care is not the same for everyone. By following expert recommendations for your situation, you are more likely to improve your care and have better outcomes as a result. Use this book as your guide to find the information you need to make important decisions.

- Having *Helicobacter pylori* (*H. pylori*) infection
- A history of chronic gastritis or acid reflux
- A family history of stomach cancer
- A diet low in fruits and vegetables but high in salt, smoked, or processed foods
- Drinking alcohol
- Smoking
- Having obesity

What are the symptoms?

Often stomach cancer doesn't cause symptoms until it's in the later stages. But when it does cause symptoms, they may include:

- Fullness, bloating, or pain in the belly with or without excessive burping after eating
- Nausea
- Indigestion
- Regurgitation (bringing up swallowed food to the mouth)
- Vomiting blood
- Dark stools (poop)
- Unexplained/unintended weight loss
- Feeling full after eating a small amount
- Feeling weak or fatigued (tired)
- Anemia (low red blood cell count that can make you feel weak and extremely tired)
- Heartburn
- Difficulty swallowing that gets worse with time

What can you do to get the best care?

Advocate for yourself. You have an important role to play in your care. In fact, you're more likely to get the care you want by asking questions and making shared decisions with your care team.

The NCCN Guidelines for Patients will help you understand cancer care. With better understanding, you'll be more prepared to discuss your care with your team and share your concerns. Many people feel more satisfied when they play an active role in their care.

You may not know what to ask your care team. That's common. Each chapter in this book ends with an important section called *Questions to ask*. These suggested questions will help you get more information on all aspects of your care.

Take the next step and keep reading to learn what is the best care for you.

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About the stomach

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It helps to know about how the stomach and nearby lymph nodes work to better understand stomach cancer. This chapter helps explain this process.

The stomach

Located in the upper part of your belly (abdomen), just below your ribs, is the stomach. It's connected to the esophagus at the top and to the small intestine at the bottom. Food and drink enter the mouth and move through the esophagus into the stomach.

The stomach's main job is to take the food that you eat, mix it, and break it down so that it can be further digested by the small intestine. The muscles of the stomach contract while it secretes enzymes and acid that convert what you eat and drink into a partially digested fluid called chyme. Since only small amounts of chyme are released into the small intestine at a time, the stomach also serves as a temporary holding place. The large intestine prepares the remaining undigested food to be moved out of the body.

Fact:

When empty, your stomach is about the size of a soda can and can hold about 2.5 ounces. But after a meal, it can stretch to hold about 1 quart (32 ounces) of food.

Parts of the stomach

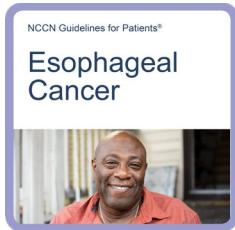
The parts of the stomach include the:

- **Cardia** – the opening where the esophagus connects to the stomach below the valve, which functions to prevent reflux
- **Fundus** – the upper part of the stomach, which forms a bulge higher than the opening of the esophagus (farthest from the pylorus). It stores undigested food and gases released from digestion
- **Body** – the main part of the stomach
- **Antrum** – the lower part of the stomach where food mixes with enzymes and acid
- **Pylorus** – connects the stomach to the first part of the small intestine (duodenum). The pylorus is a valve that opens and closes during digestion. This allows partly digested food and other stomach contents to pass from the stomach to the small intestine.

The esophagus joins the stomach just below the diaphragm at the esophagogastric junction (EGJ). The diaphragm is the thin breathing

muscle below the lungs and heart that separates the chest from the abdomen.

Tumors that start nearby in the esophagus are treated as esophageal cancers. More information on esophageal cancer is available at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



The stomach wall

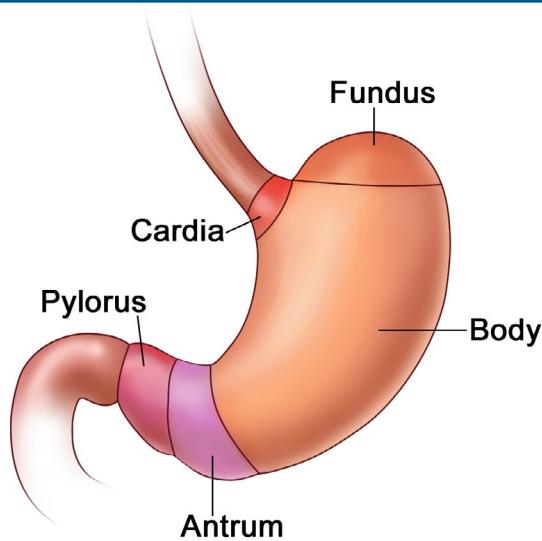
Stomach cancer starts in the innermost layer of the stomach wall and grows deeper from there, so it helps to understand its layers. The inner and outer stomach layers are membranes (a thin layer of tissue that covers parts of the body). In between these membranes are layers of muscle and connective tissue.

The wall of the stomach is made of 5 main layers.

- **Mucosa** – Inner membrane that is in contact with food. It consists of 3 layers:
 - Surface epithelium – A thin, moist layer of cells that forms the interior stomach lining. Epithelium makes a sticky, thick liquid called mucus that protects the stomach.

Parts of the stomach

The parts of the stomach include the **cardia**, **fundus**, **body**, **antrum**, and **pylorus**. The stomach is part of the digestive system. Many lymph nodes can be found along the lesser and greater curvatures of the stomach.



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- Lamina propria – A type of connective tissue found under the epithelium. Within and supported by the lamina propria are stomach glands formed by cells that have the functions of producing enzymes, acid, mucus, and hormones.
- Muscularis mucosae – A thin strip of muscle that separates the mucosa from the submucosa.
- **Submucosa** – A layer of connective tissue, blood vessels, and nerve cells. It also contains larger lymph vessels and channels.
- **Muscle** – A type of soft tissue that squeezes to help move food through the stomach. It's also called muscularis propria.

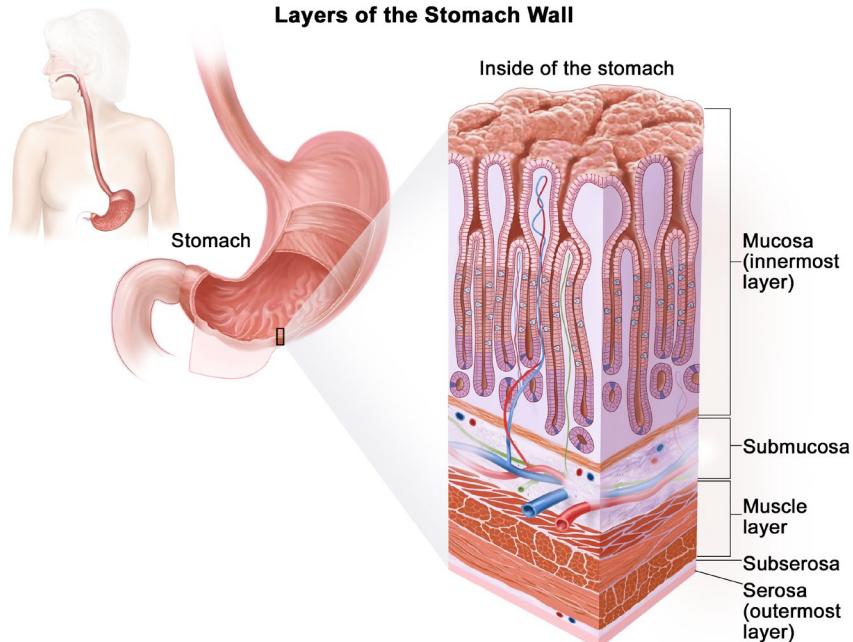
- **Serosa** – An outer membrane that covers the stomach. The serosa is also called the serous membrane.
- **Subserosa** – A layer of connective tissue that supports the serosa.

Nearby lymph nodes

Hundreds of lymph nodes exist in many areas throughout your body. They're part of the immune system and filter out bacteria, viruses, and some cancer cells. Lymph nodes found near the stomach are called regional lymph nodes. Cancer found in a regional lymph node is called a lymph node metastasis and is considered regional spread or locally advanced cancer. This is different than a distant metastasis, which is found far from the main tumor in the stomach.

Layers of the stomach wall

The wall of the stomach is made up of 5 layers: the mucosa, submucosa, muscle layer, subserosa, and serosa.



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Lymph is a clear fluid that contains infection-fighting white blood cells and flows through the lymphatic system. It drains from the stomach wall into lymphatic vessels in the mucosa and submucosa. From here it drains into lymph nodes outside the stomach. There are several groups of regional lymph nodes that drain the wall of the stomach. They include pyloric (pylorus area of stomach), perigastric, pericardiac at the EGJ, and lymph nodes near organs and arteries such as the pancreas, spleen (splenic), and liver (hepatic).

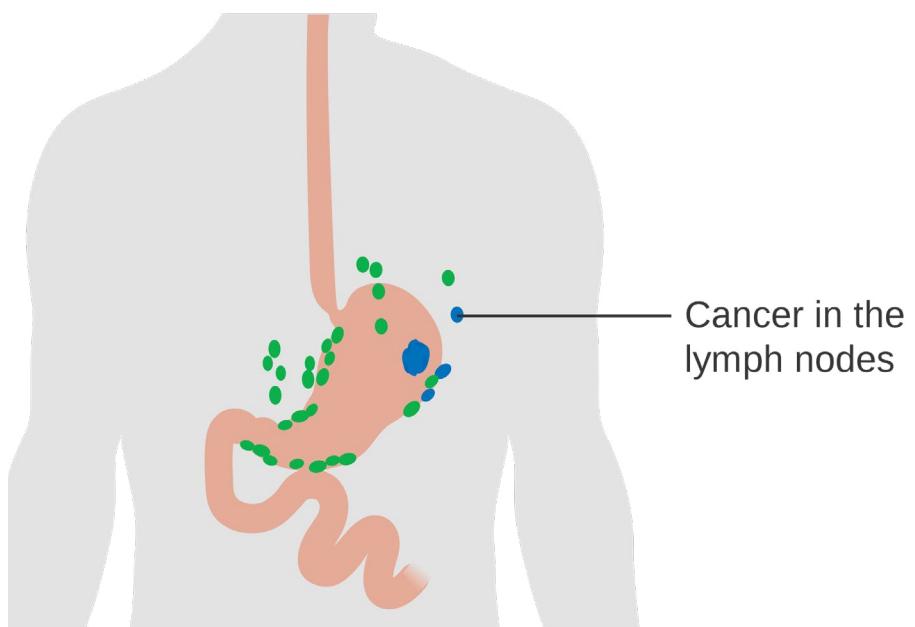
The largest group of stomach lymph nodes are the perigastric lymph nodes found along the lesser and greater curves of the stomach and in the omenta. The omenta are folds of thin tissue that line the belly (called the peritoneum) and surround the stomach and other organs in the abdomen.

The removal of lymph nodes in stomach cancer is called lymph node (or nodal) dissection. At least 16 regional nodes (called a D1 dissection) should be removed and tested. However, the removal of more than 30 regional lymph nodes (called a D2 dissection) is often recommended in stomach cancer. The reason behind it is to help with accuracy in staging and potential survival, especially in advanced cancer. It should only be done at centers with expertise in this area. For more information on lymph node dissection, see *Chapter 5: Types of treatment for stomach cancer*.

Cancer in regional lymph nodes

In locoregional or locally advanced stomach cancer, cancer may have spread to the lymph nodes near the stomach.

https://commons.wikimedia.org/wiki/File:Diagram_showing_stomach_cancer_cells_in_the_lymph_nodes_CRUK_274.svg



What's next?

Now that you've learned about the stomach and surrounding lymph nodes, it will help you better understand your cancer treatment. Read the next chapter for more information on what testing is needed before you start your treatment.

Questions to ask

- How far into the stomach wall does my cancer go?
- Does the cancer I have reach the lymph nodes outside the stomach?
- Will I have side effects from having lymph nodes removed?

Key points

- The stomach is connected to the esophagus above it and the small intestine below it.
- Stomach contractions along with enzymes and acid break down food into chyme.
- Small amounts of chyme move from the stomach to the small intestine.
- The stomach wall is made of 5 main layers.
- Cancer found in a regional lymph node is called a lymph node metastasis.
- The removal of lymph nodes in stomach cancer is called lymph node (or nodal) dissection.

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Testing for stomach cancer

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Treatment planning starts with testing. This chapter presents an overview of the tests you might receive and what to expect.

Test results

Results from imaging studies, blood tests, and biopsy (including biomarker tests) will be used to help guide your treatment plan. It's important you understand what these tests mean. Ask questions and keep copies of your test results. Online patient portals are a great way to access your test results.

Keep these things in mind:

- Choose a friend, family member, or peer who can drive you to appointments, provide meals, or offer emotional support during diagnosis and treatment.
- Bring someone with you to medical appointments, if possible.
- Write down questions and take notes during appointments. Don't be afraid to ask your care team questions.
- Get copies of blood tests, imaging results, and reports about the specific type of cancer you have. These are often available electronically through a patient portal.
- Organize your papers. Create files for insurance forms, medical records, and test results. You can do the same on your computer.

- Keep a list of contact information for everyone on your care team. Add it to your phone. Hang the list on your refrigerator or keep it in a place where someone can access it in an emergency. Keep your primary care provider informed of changes to this list. You are encouraged to keep your provider in the loop. They are great partners in your care.
- In your contact list, include information on your exact type of cancer, as well as any treatments and the date each treatment started.

For possible tests, see **Guide 1**.

General health tests

Medical history

A medical history, sometimes called a health history, is a record of all health issues and treatments you've had in your life. Be prepared to list any illness or injury and when it happened. If you've had *H. pylori* (bacteria) infection and/or treatment, it's important to let your medical team know.

Bring a list of old and new medicines and any over-the-counter medicines, herbals, or supplements you take. Some supplements interact and affect medicines that your care team may prescribe.

Tell your care team about any symptoms you have. Your medical history can help decide which treatment is best for you.

Family history

Some cancers and other diseases run in families. Your doctor will ask about the health history of family members who are blood relatives. This information is called a family history.

Ask family members on both sides of your family about their health issues like heart disease, cancer, and diabetes, and at what age they were diagnosed. It's important to know the specific type of cancer or where the cancer started, if it is in multiple locations, and if they had genetic testing.

Guide 1

Possible tests (also called the workup) and counseling for stomach cancer

Medical history and physical exam. Screen for family history.

Esophagogastroduodenoscopy (EGD) and biopsy

CT of chest and abdomen with oral and IV contrast. CT of pelvis with contrast as needed

FDG-PET/CT evaluation (skull base to mid-thigh) for locally advanced or metastatic disease, or if needed

Complete blood count (CBC) and comprehensive chemistry profile

Endoscopic ultrasound (EUS) if early-stage disease is suspected, or if early vs. locally advanced disease needs to be determined (preferred)

Endoscopic resection (ER) is essential for the accurate staging of early-stage cancers.

Biopsy of metastatic disease as needed

Testing for MSI and MMR for all newly diagnosed patients

HER2 and PD-L1 testing for if advanced or metastatic disease is suspected

CLDN18.2 testing if advanced or metastatic disease is suspected

Nutritional assessment and counseling

Smoking cessation advice, counseling, and medicine as needed

Test for *H. pylori* infection and if positive, treat. Conduct genetic testing as needed and recommend *H. pylori* testing of close family members.

Next-generation sequencing (NGS) testing should be considered.

Physical exam

During a physical exam, your health care provider may:

- Check your temperature, blood pressure, pulse, and breathing rate
- Check your height and weight
- Listen to your lungs and heart
- Look in your eyes, ears, nose, and throat
- Feel and apply pressure to parts of your body to see if organs are of normal size, are soft or hard, or cause pain when touched
- Feel for enlarged lymph nodes in your neck, underarm, and groin

Performance status

Performance status is an estimate of a person's general level of fitness and ability to perform daily tasks. It's one factor taken into consideration when deciding what intensity of treatment (surgery, systemic therapy, etc.) you and your body can tolerate.

Nutrition assessment

You should meet with a nutritionist before starting treatment because they can suggest the best foods and fluids for you.

Stomach cancer can make you lose your appetite. You may also feel full after eating very little. These changes may cause you to lose too much weight or make you feel weak and tired.



What is your family cancer health history?

Some cancers and other diseases run in families—those who are related to you through genes passed down from biological parent to child. This information is called a family health history. Ask blood relatives about their health issues like heart disease, cancer, and diabetes, and at what age they were diagnosed. For relatives who were diagnosed with cancer, ask them (or other relatives if they are no longer living) what type of cancer they had, if they died from the cancer, and at what age the cancer was diagnosed.

Start by asking your parents, siblings, and children. Next, talk to half-siblings, aunts and uncles, nieces and nephews, grandparents, and grandchildren.

Write down what you learn about your family history and share this information with your health care provider.

Some of the questions to ask include:

- ✓ How old were you when each of these diseases and health conditions was diagnosed?
- ✓ What is your family's ancestry—from what countries did your ancestors originate?

It's important that you receive adequate and sustained nutrition before you start treatment. You might need to receive food through a feeding tube, which is a soft, plastic tube inserted into the belly and directly into the stomach (gastrostomy tube or G-tube) or small intestine (jejunostomy tube or J-tube).

Blood tests

Blood tests check for signs of disease and how well organs are working. They require a sample of your blood, which is removed through a needle placed into your vein. Some blood tests are described next.

Complete blood count

A complete blood count (CBC) is a test that measures the numbers of red blood cells, white blood cells, and platelets in a sample. Red blood cells carry oxygen throughout your body, white blood cells fight infection, and platelets control bleeding. Low or high numbers of any of these blood cells can indicate a problem.

Comprehensive metabolic panel

A comprehensive metabolic panel (CMP) measures 14 different substances in your blood. It's usually done on the plasma part of your blood. A CMP provides important information about how well your kidneys and liver are working, among other things.

CA 19-9 and CEA

Cancer antigen 19-9 (CA 19-9) and carcinoembryonic antigen (CEA) are proteins occasionally made by tumors and can be detected in the blood. These tumor markers may be higher than normal in people with certain cancers. Repeating these tests over time can indicate whether a treatment is working.

Imaging tests

Imaging tests give a look inside the body through pictures. They can show where the cancer started (the primary tumor) and look for cancer in other parts of your body.

A radiologist, a doctor who interprets imaging tests, will write a report and send this report to your health care provider. It's likely that the report will be sent directly to you through your patient portal or patient access system. You should discuss these results with your provider.

You won't have all these imaging tests—this is just an overview.

CT scan

A computed tomography (CT or CAT) scan combines x-rays and computer technology to take detailed pictures of the inside of the body. A CT scan of your chest, abdomen, and/or pelvis may be one of the tests to look for cancer. Oral (by mouth) and intravenous (through a vein, called IV) contrast are often used together when testing for stomach cancer.

the body. The contrast isn't permanent and will leave the body in your urine immediately after the test. The types of contrast vary and are different for CT and MRI.

Tell your care team if you've had allergic reactions to contrast in the past. This is important. You might be given medicines to avoid the effects of those allergies. Contrast might not be used if you have a serious allergy or if your kidneys aren't working well.

MRI scan

A magnetic resonance imaging (MRI) scan uses strong magnets and radio waves to take digital pictures of the inside of the body. It does not use x-rays. Contrast might be used.

PET scan

A positron emission tomography (PET) scan uses a tracer. A tracer is a substance injected into a vein that makes cancer show up as bright areas on PET scans. However, not all tumors will appear on a PET scan and not all bright spots are cancer. It's normal for the brain, heart, kidneys, and bladder to be bright on the PET scan. Inflammation or infection can also show up as a bright spot. When a PET scan is combined with CT, it's called a PET/CT scan.

CT machine

A CT machine is large and has a tunnel in the middle. During the test, you will lie on the table that moves slowly through the tunnel.



FDG-PET/CT

An FDG-PET/CT uses a tracer called F-18 fluorodeoxyglucose (FDG), which is a radioactive label attached to a sugar molecule. This scan is most helpful when other imaging results are unclear. An FDG-PET/CT may help find cancer in lymph nodes and distant sites. You can't eat or drink for at least 4 hours before the scan.

Ultrasound

An ultrasound uses high-energy sound waves to form pictures of the inside of the body. This is similar to a sonogram used for pregnancy. A wand-like probe (transducer) will be held and moved on your skin that's covered in a gel. Ultrasound is painless and doesn't use x-rays. It can be useful for showing small areas of cancer that are near the skin. Sometimes, an ultrasound is used to guide a biopsy.

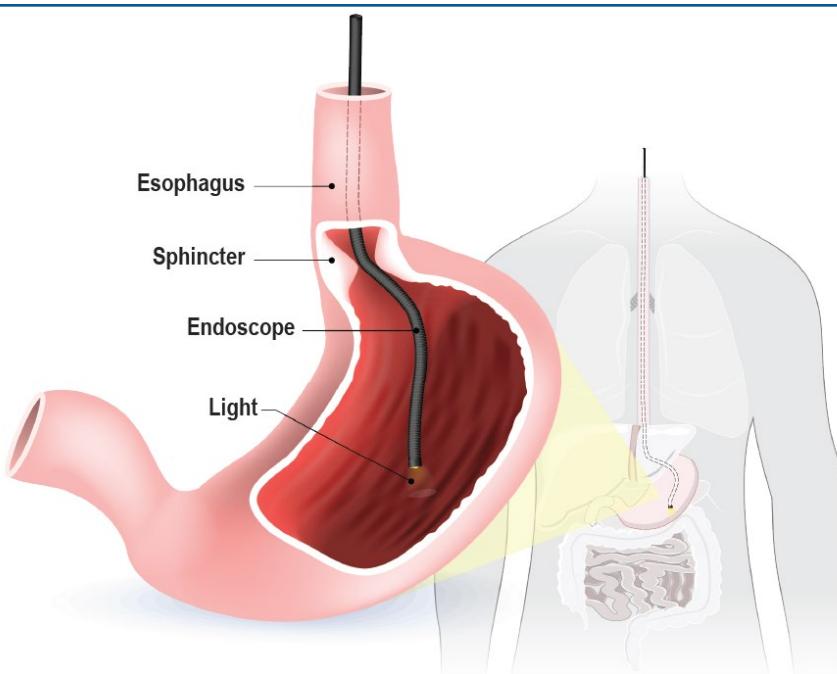
Endoscopy procedures

Some imaging tests are more invasive and use a thin, tube-shaped tool called a scope that's inserted into the body to take pictures. One end of the scope has a small light and camera to see inside your body. The scope is guided into the body through a natural opening, such as the mouth, nose, or anus. It may also be inserted through a small surgical cut. The image is sent to a video monitor, so your doctor can view inside internal organs to perform a biopsy, stent placement, or other tasks.

The type of scope often used for stomach cancer is called an endoscope. The endoscope is guided into the body through the mouth. Endoscopy is an important tool in the diagnosis, staging, treatment, and care of those with stomach cancer. Before an

Upper GI endoscopy

Upper GI (gastrointestinal) endoscopy 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.



endoscopy, you'll be given medicine to help you relax or sleep during the procedure.

Endoscopic ultrasound

Endoscopic ultrasound (EUS) is an important part of cancer diagnosis and staging that uses both imaging and an endoscope to see how deep the tumor has grown into the stomach wall. Signs of cancer within lymph nodes and other nearby organs can also be detected. Suspicious lymph nodes can be biopsied as well.

You're most likely to have an endoscopic ultrasound if your care team suspects that the cancer hasn't grown far into the stomach wall (early-stage cancer), or to figure out whether the cancer is early stage or locally advanced.

Upper GI endoscopy

In an upper gastrointestinal (GI) endoscopy (also known as esophagogastroduodenoscopy or EGD), an endoscope is guided down the throat into the esophagus, stomach, and upper parts of the small intestine (duodenum). It's used to inspect the lining of these organs and to look for any signs of cancer or other abnormalities such as enlarged blood vessels or ulcers. After the endoscopy, your throat may feel sore and swollen.

Laparoscopy

Laparoscopy (key-hole surgery) is a type of surgical procedure that allows your surgeon to see the inside of your abdomen. It uses a tool like an endoscope called a laparoscope that may introduce a camera or surgical instruments into the abdomen.

First, you'll be given general anesthesia to fall asleep, so you won't feel any pain. Then your surgeon will insert the laparoscope through a tiny cut in your abdomen (it's considered minimally invasive surgery).

Laparoscopy can be used to figure out the stage of disease and rule out metastasis. It can detect cancer spread inside your abdomen that may have been missed on imaging scans. It can also be used to obtain biopsy samples. Sometimes, laparoscopy is used to determine if you are a candidate for surgery.

H. pylori tests

Helicobacter pylori (*H. pylori*) is a bacteria that causes an infection of the stomach lining. It puts a person at risk of developing stomach cancer. You'll be tested for the infection, and if you have it, your family members might be as well because it's commonly spread among families. Testing for *H. pylori* can be done using a blood or breath test, a stool (poop) sample, or during an endoscopy.

Biopsy

A biopsy is a procedure that removes a sample of tissue or fluid that's tested for disease.

For stomach cancer, a biopsy can be done during an endoscopy. Several samples may be taken from the tumor, wall of your stomach or esophagus, lymph nodes, or organs next to your stomach, such as your liver. The samples will be sent to a pathologist, a doctor who examines cells under a microscope to find cancer.

Other types of biopsies include:

- **Fine-needle aspiration (FNA) or core biopsy (CB)** uses needles of different sizes to remove a sample of tissue or fluid. Your doctor may use an ultrasound to guide the needle or other instrument.
- **Brushings** involve removing tumor or cell samples with a small brush at the end of an endoscope.
- **Washings** use a sterile solution to wash the area of the belly and then the solution is removed to check for cancer cells. This is usually done during surgery.
- **Fluid samples** from fluid in the abdominal cavity can be removed and tested for cancer cells.
- **Liquid biopsy** uses a sample of blood for testing.

Biopsy of metastases

A metastasis is the spread of stomach cancer to a different area of the body, such as the lining of the abdomen (peritoneum) or liver. A biopsy of the metastasis may be needed to confirm the presence of cancer. If there's more than one metastasis, each site may be biopsied. The type of biopsy used depends on the location of the suspected metastases and other factors.

Biopsy results

Histology and cytology are the study of cells and tissues under a microscope. Your pathology report will have information about tumor histology or the appearance of cells. You may be recommended to have an open

biopsy (surgery) to remove (resect) the tumor to confirm its histology. Talk to your provider for more information on next steps.

Genetic risk testing

You might be thinking, “Why did I get cancer?” Most of the time, the answer is that one cell made a mistake when dividing and then a cancer formed. Some cells, however, have a predisposition (tendency) or have something in their DNA that makes them more likely to develop cancer. Understanding whether you have a cancer predisposition condition can sometimes affect your cancer treatment, but more often, it can affect screening for other cancers. So, identifying a cancer predisposition condition is important.

Genetic testing is done using blood or saliva (spitting into a cup). The goal is to look for gene mutations inherited from your biological parents called germline mutations. Some mutations can put you at risk for more than one type of cancer and can be passed down to children. Also, family members might carry these mutations. Tell your care team if there is a family history of cancer.

A genetic risk assessment will find if you carry a cancer risk and if you may benefit from genetic testing, more screening, or preventive interventions. Depending on the genetic risk assessment, you might undergo genetic testing and genetic counseling.

Hereditary cancer predisposition syndromes

A syndrome is a set of symptoms or conditions that occur together and suggest the presence of a certain disease or an increased risk of developing the disease. Someone who has a genetic (inherited) cancer predisposition syndrome may have a greater risk for developing stomach cancer.

Hereditary syndromes most closely related to stomach cancer include:

- Hereditary diffuse gastric cancer
- Lynch syndrome
- Juvenile polyposis syndrome
- Peutz-Jeghers syndrome
- Familial adenomatous polyposis (FAP) or attenuated FAP

Biomarker testing

A sample from a tumor biopsy may be tested to look for specific DNA mutations (changes), protein levels, or other molecular features. This information may be used to choose a more specific treatment for you.

Primary biomarkers are associated with the drugs that can be used. Additional information can be found through next-generation sequencing (NGS) on tumor tissue and/or blood. Also, genetic testing (mentioned above) can be done for inherited genetic mutations.

Biomarker testing is sometimes called molecular testing, tumor profiling, or genomic testing.

Biomarker testing includes tests of genes or their products (proteins). It shows the presence or absence of mutations and the presence of overexpression of certain proteins, both of which might suggest which treatment is needed.

Important biomarker tests for the treatment and management of metastatic stomach cancer are explained next. Biomarker testing continues to expand, so ask your care team if other tests are needed.

HER2

Human epidermal growth factor receptor 2 (HER2) is a protein involved in normal cell growth. It's found on the surface of all epithelial cells. When amounts of HER2 are high, it causes cells to grow and divide. This is called HER2-positive (HER2+), overexpression, or amplification.

There might be higher amounts of HER2 in your stomach cancer. If the tumor makes too much HER2, you might receive a targeted therapy called trastuzumab (Herceptin) or trastuzumab deruxtecan (Enhertu). These drugs target the HER2 protein and can help slow or stop the tumor from growing.

MSI-H/dMMR mutation

Microsatellites are short, repeated strings of DNA. Sometimes errors or defects occur in these microsatellites. When this happens, they're usually fixed by mismatch repair (MMR) proteins.

But some cancer cells have DNA mutations (changes) that prevent MMR proteins from fixing these errors. This is called microsatellite

instability (MSI) or mismatch repair deficient (dMMR).

When cancer cells have a high number of mutations in microsatellites, it's called MSI-H (microsatellite instability-high). MSI-H is often due to dMMR.

People with newly diagnosed stomach cancer should be tested for MMR or MSI.

PD-L1 testing

Programmed death ligand 1 (PD-L1) is a protein that keeps the body's immune system under control. But if this protein is present (expressed) on the surface of cancer cells, it can cause your immune cells to ignore the cancer and suppress the immune system's anti-tumor response.

If your cancer has this protein, you might have treatment that combines chemotherapy and an immune checkpoint inhibitor (ICI). This is designed to activate your immune system to better fight off the cancer cells.

Claudin 18 isoform 2

Claudin 18 isoform 2 (CLDN18.2) is a protein that is found on the surface of gastroesophageal (stomach and esophagus) cancer cells, especially in the advanced stages. If your cancer is found to have a high level of CLDN18.2 (known as CLDN18.2-positive), you might be able to receive a type of immunotherapy called zolbetuximab (Vyloy).

Tumor mutational burden

Tumor mutational burden (TMB) is the total number of mutations (changes) found in the DNA of cancer cells. This is important because if a tumor has a high number of mutations (or errors), it is more visible to the immune system. And because of that, the tumor might be more likely to respond to a treatment called immune checkpoint inhibitors (ICIs). In stomach cancer, ICIs target proteins called programmed cell death protein 1 (PD-1) and programmed death ligand 1 (PD-L1).

Tumor mutation testing

Tumor mutation testing uses a sample of your tumor or blood to see if the cancer cells have any specific DNA mutations. This is a different type of DNA testing than the genetic testing for mutations you may have inherited from your biological parents. In tumor mutation testing, this test looks for genetic mutations (changes) in the tumor that may be used to select therapies that work based on the mutation. Tumor mutation testing is often done if the cancer is unresectable (not removable with surgery) or metastatic.

An important reason for this testing is that certain tumor mutations such as *NTRK* fusion, *RET* fusion, and *BRAF* V600E mutation can be targeted with specific therapies.

NTRK gene fusions

An *NTRK* gene fusion occurs when a piece of the *NTRK* gene merges (fuses) with a piece of another gene, which causes uncontrolled cell growth. Larotrectinib (Vitrakvi) and entrectinib (Rozlytrek) might be used to target advanced or metastatic cancer that's due to an *NTRK* gene fusion.

RET gene fusions

Rearranged during transfection (*RET*) gene mutation is related to cell growth (proliferation). Selpercatinib (Retevmo) might be used to target unresectable (not removable with surgery) or metastatic tumors with a *RET* fusion.

BRAF V600E mutations

Mutations in the *BRAF* gene can cause normal cells to become cancerous. Dabrafenib (Tafinlar) and trametinib (Mekinist) might be used to treat tumors with *BRAF* V600E mutations.

Types of biomarker tests

FISH

Fluorescence in situ hybridization (FISH) is a testing method that involves special dyes called probes that attach to pieces of DNA, the genetic material in a person's cells. The cells are then studied using a fluorescence microscope.

Immunohistochemistry

Immunohistochemistry (IHC) is a special staining process that involves adding a chemical marker to cancer or immune cells. The cells are then studied using a microscope.

Next-generation sequencing

Next-generation sequencing (NGS) is a method that uses DNA sequencing to figure out the DNA or gene changes of cancer cells in your tumor. This method would only be used if enough tumor tissue remains after other biomarker testing has been completed. It also helps determine if more biomarker testing is needed.

PCR

A polymerase chain reaction (PCR) is a lab process that can make millions or billions of copies of your DNA (genetic information). PCR is very sensitive. It can find 1 abnormal cell among more than 100,000 normal cells. These copies called PCR product might be used for NGS.

Tumor markers

Your blood or biopsy tissue may be tested for proteins or DNA. Examples of some tumor markers in stomach cancer include cancer antigen 19-9 (CA 19-9) and carcinoembryonic antigen (CEA). An increase in the level of certain tumor markers could mean that the cancer has grown or spread (progressed). However, not everyone has elevated levels of these markers and tumor markers alone are not a reliable method of detecting stomach cancer.

Liquid biopsy

Some mutations can be found by testing circulating tumor DNA (ctDNA) in the blood. In a liquid biopsy, a sample of blood is taken to look for cancer cells or pieces of DNA from tumor cells. Those who have metastatic or advanced stomach cancer and are unable to undergo a traditional biopsy might have a liquid biopsy. Sometimes, traditional testing can quickly use up a tumor sample. In this case, a liquid biopsy might be a possibility.

What's next?

Now that you understand the many tests that help guide your treatment, read the following chapter to learn what happens after testing: Staging. This chapter will help you learn how stomach cancer is staged.



Knowledge is power. Do not settle if your questions and concerns are not properly addressed. Advocate for yourself and your needs.”

Key points

- Tests are used to find cancer, figure out the extent of cancer (staging), plan treatment, and check how well treatment is working.
- A medical history and physical exam inform your doctor about your overall health.
- Getting enough nutrition is important. You should meet with a nutritionist before starting treatment.
- Blood tests check for signs of disease and how well organs are working.
- Imaging tests give a look inside the body through pictures. Images can be made with scanning machines or scoping tools.
- A biopsy removes a sample of tissue or fluid to be tested for cancer. One example is by using an upper gastrointestinal (GI) endoscopy (or EGD).
- Genetic testing might be done to look for gene mutations inherited from your biological parents.

Questions to ask

- What tests will I have? How often will they be repeated?
- How soon will I know the results and who will explain them to me?
- How will my biopsy be performed? What else might be done at that time?
- What biomarker or genetic tests will I have?

4

Stomach cancer staging

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Staging is used to predict the cancer's outlook and guide treatment decisions. It describes the size and location of the tumor, if the tumor has grown through the layers of the stomach wall, and if cancer has spread to lymph nodes, organs, or other parts of the body.

A cancer stage is a way to describe the extent of the cancer when you're diagnosed.

How stomach cancer is staged

Based on testing, your cancer will be assigned a stage. Staging signifies how much cancer is in your body, where it's located, and what subtype you have. Knowing the cancer stage helps to predict the cancer's outlook (prognosis) and is needed to make treatment decisions.

Information gathered during staging:

- **The extent (size) of the tumor (T):** Has it grown into nearby areas? How deep into the stomach layers does it extend?
- **The spread to nearby lymph nodes (N):** Has the cancer spread to nearby lymph nodes? If so, how many? Where?

- **The spread (metastasis) to distant sites (M):** Has the cancer spread to distant organs such as the lungs or liver?
- **Grade of the cancer (G):** How much do the cancer cells look like normal cells under the microscope?
- **Biomarker testing:** Does the cancer have any genes, proteins, markers, or mutations where one kind of treatment might work better?

Staging is based on a combination of information to reach a final numbered stage. Stages range from stage 0 to stage 4, with 4 being the most advanced. They might be written by your care team with Roman numerals like stage 0, stage I, stage II, stage III, and stage IV.

Anatomic staging

The tumor, node, metastasis (TNM) system is part of what's used to stage stomach cancer and is called the anatomic stage. In this system, the letters T, N, and M describe different areas of cancer growth. Based on cancer test results, your provider will assign a score or number to each letter. The higher the number, the larger the tumor or the more the cancer has spread. These scores will be combined to assign the cancer a stage.

- **T (tumor)** – Depth and spread of the main (primary) tumor in the stomach wall
- **N (node)** – If cancer has spread to nearby (regional) lymph nodes
- **M (metastasis)** – If cancer has spread to distant parts of the body or metastasized

An example of this is T1, N2, M0, which is translated as stage 2A—in both clinical and pathological stages (described ahead).

Ask your provider to explain any part of the staging that's unclear to you.

Often, not all information is available at the first evaluation. More information can be gathered as treatment begins.

Tumor grade

Grade is the way tumor cells appear under a microscope and this information helps determine the stage. The lower the grade, the better the prognosis. Well differentiated (grade 1 or G1) means the cancer cells look similar to normal cells. Poorly differentiated (grade 3 or G3) means the cancer cells look very different compared to normal cells. G3 is the highest grade for stomach (gastric) cancers.

Biomarker testing

Some biomarkers affect how some cancer treatments work. Results of biomarker testing help figure out if a treatment might work for a specific gene, protein, or mutation. It also gives more information for staging. Biomarkers that are tested for stomach cancers include human epidermal growth factor receptor 2 (HER2), PD-L1, MSI/MMR status, CLDN18.2, TMB, *NTRK* gene fusion, *RET* gene fusion, and *BRAF* V600 mutation.

Prognostic staging

Part of staging also includes what's known as prognostic information. This is the anatomic TNM plus tumor grade and the status of the biomarkers.

Prognostic stages are divided into clinical and pathological. Stomach cancer staging is often done twice: once before surgery (clinical stage) and once after surgery (pathological stage). Staging after surgery provides more specific and accurate details about the size of the cancer and lymph node status (if it's spread to the lymph nodes) and if it's metastasized (spread to distant sites).

Clinical stage

The clinical stage is the rating given before any treatment. It happens after you've had a physical exam, biopsy, and imaging tests. In stomach cancer, the clinical (before surgery) stage is based on the endoscopic ultrasound and other imaging or biopsy results. The possible clinical stages are 0, 1, 2A, 2B, 3, 4A, and 4B. Ask your provider to explain the clinical stage in a way you can understand.

Pathological stage

The pathological stage is determined by examining tissue removed during surgery (and after preoperative therapy, if given). It's based on information gathered after surgery to remove all or part of the stomach and nearby lymph nodes. This gives a more accurate picture of how far the cancer has spread and is used to determine your treatment options after surgery. The pathological stages are: 0, 1A, 1B, 2A, 2B, 3A, 3B, 3C, and 4.

Cancer stages explained

The stages of stomach cancer may change after surgery—from the clinical stage to the pathological stage—because of the extra information from the stomach tumor and tissue samples. The pathological stages are:

Stage 0

Stage 0 is also called carcinoma in situ. This is pre-cancer with abnormal cells, and it's found in the mucosa. These cells could become cancer and spread to nearby tissue.

Stage 1

A stage 1 tumor hasn't spread to organs but has grown into other stomach wall layers and may involve the lymph nodes. It has two substages: 1A and 1B.

Stage 1A (early) means the cancer formed in the mucosa and may have spread to the submucosa but it's not in the lymph nodes.

Stage 1B could mean:

- The cancer formed in the mucosa and may have spread to the submucosa and has spread to 1 or 2 nearby lymph nodes.
- The cancer formed in the mucosa and spread to the muscle layer (*muscularis propria*) but not the lymph nodes.

For more information on stage 0 and stage 1A (early), see *Chapter 6: Early-stage stomach cancer*. For more information on stage 1B, see *Chapter 7: Locally advanced stomach cancer*.

Stage 2

A stage 2 tumor has grown into deeper stomach wall layers and may involve the lymph nodes but hasn't spread to any organs. It has two substages: 2A and 2B.

Stage 2A could mean:

- The cancer may have spread to the submucosa and has spread to 3 to 6 nearby lymph nodes.
- The cancer has spread to the muscle layer as well as to 3 to 6 nearby lymph nodes.
- The cancer has spread to the subserosa.

Stage 2B could mean:

- The cancer may have spread to the submucosa and has spread to 7 to 15 nearby lymph nodes.
- The cancer has spread to the muscle layer as well as to 3 to 6 nearby lymph nodes.
- The cancer has spread to the subserosa and to 1 or 2 nearby lymph nodes.
- The cancer has spread to the serosa.

For more information on how stage 2 is treated, see *Chapter 7: Locally advanced cancer*.

Stage 3

A stage 3 tumor has spread into deeper stomach wall layers and may have spread into nearby organs and lymph nodes but hasn't spread to distant organs. It has three substages: 3A, 3B, and 3C.

Stage 3A could mean the cancer has spread:

- To the muscle layer and to 7 to 15 nearby lymph nodes.
- To the subserosa as well as to 3 to 6 nearby lymph nodes.
- To the serosa and to 1 to 6 nearby lymph nodes.
- To nearby organs like the spleen, colon, liver, diaphragm, pancreas, kidney, or small intestine.

Stage 3B could mean the cancer has spread:

- To the submucosa or to the muscle layer and has spread to 16 or more nearby lymph nodes.
- To the subserosa or to the serosa and has spread to 7 to 16 nearby lymph nodes.
- To nearby organs, like the spleen, colon, liver, diaphragm, pancreas, kidney, or small intestine. It has also spread to 1 to 6 nearby lymph nodes.

Stage 3C could mean the cancer has spread:

- To the subserosa or to the serosa as well as to 16 or more nearby lymph nodes.
- To nearby organs like the spleen, colon, liver, diaphragm, pancreas, kidney, or small intestine. It has also spread to 7 or more nearby lymph nodes.

For more information on how stage 3 is treated, see *Chapter 7: Locally advanced cancer*.

Stage 4

Called metastatic cancer, stage 4 is when the original tumor spreads to distant parts of the body through the lymphatic system or blood. It may have spread to distant lymph nodes, the lungs, liver, brain, and tissues that line the abdomen wall called the peritoneum, as well as other organs.

For more information on how stage 4 is treated, see *Chapter 8: Recurrence and metastatic cancer*. For more information on peritoneal carcinoma as only disease (when it only spreads to the peritoneum), see *Chapter 9: Peritoneal carcinoma as only disease*.

Frequently used terms

Other terms might be used along with numbered cancer stages. This book will use the following terms to describe stomach cancer:

- **Resectable** – Tumor can be removed completely with surgery.
- **Unresectable** – Tumor cannot be removed with surgery. It might involve nearby blood vessels, the liver, the diaphragm, the heart, the airways, and arteries making it unsafe to remove.
- **Locally advanced** – Tumor might be any size and could be in any layer of the stomach. Cancer might be in nearby lymph nodes, organs, and tissues.
- **Metastatic** – Cancer that has spread to other parts of the body, including distant lymph nodes. The most common sites are the liver, abdominal lining (peritoneum), and distant lymph nodes. It may also spread to the lung or bone.

What's next?

Knowing how cancer is staged is key to understanding the next steps of cancer care. Read the next chapter to learn all about the potential treatments for stomach cancer.

Key points

- Staging helps to predict prognosis (outlook) and is needed to make treatment decisions. A prognosis is the course your cancer will likely take.
- The tumor, node, metastasis (TNM) system is used to stage stomach cancer.
- Stomach cancer staging is often done twice: before and after surgery.
- Grade describes how abnormal tumor cells look under a microscope.
- Biomarker testing helps give more specific information on genes and proteins to help guide treatment.
- The clinical stage of stomach cancer is based on the results of testing before any treatment.
- The pathological stage of stomach cancer is based on the results of tissue examined during surgery.

Questions to ask

- What biomarker or genetic tests will I have?
- If biomarker testing is complete, what are the results?
- What stage is my cancer? What does that mean for treatment?
- How often does the clinical stage move to a higher pathological stage?
- Is my cancer resectable or unresectable? What does that mean?

5

Types of treatment for stomach cancer

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There is more than one treatment for stomach cancer. This chapter describes treatment options and what to expect.

Treating stomach cancer takes a team approach. Treatment decisions should involve a multidisciplinary care team. This is a team of health care providers from different professional backgrounds who have knowledge and experience in your type of cancer. This team is united with you in the planning and implementing of your treatment. Ask who will coordinate your care.

Care team

Some members of your care team will be with you throughout cancer treatment, while others will be there for parts of it. Get to know your care team and help them get to know you.

Depending on your diagnosis, your team might include the following specialists:

Doctors who treat cancer

- **Gastroenterologists** are experts in diseases of the digestive tract.
- **Surgical oncologists** perform operations to remove cancer.
- **Medical oncologists** treat cancer in adults using systemic therapy.
- **Radiation oncologists** prescribe and deliver radiation therapy (RT) to treat cancer.

- **Diagnostic radiologists** interpret the results of imaging tests.
- **Interventional radiologists** perform needle biopsies and endoscopies, and place intravenous (IV) ports for treatment.
- **Pathologists** analyze the cells, tissues, and organs removed during a biopsy or surgery and provide cancer diagnosis, staging, and information about biomarker testing.
- **Pulmonologists** perform biopsies and use ultrasound to determine staging if the lungs and airway are involved.

Other health care providers

- **Nurse practitioners (NPs) and physician assistants (PAs)** are called advanced practice providers. Some of your clinic visits may be done by a nurse practitioner or physician assistant.
- **Oncology nurses** provide hands-on care, like giving systemic therapy, managing your care, answering questions, and helping you cope with side effects. Sometimes these experts are called nurse navigators.
- **Oncology pharmacists** are experts in knowing how to use medicines to treat cancer and to manage symptoms and side effects.
- **Radiation therapists** provide hands-on delivery of your radiotherapy treatments.
- **Nutritionists and dietitians** can provide guidance on what foods are most suitable for your condition.

- **Psychologists and psychiatrists** are mental health experts who can help manage issues such as depression, anxiety, or other mental health conditions that can affect how you think and feel.
- **Social workers** help people prevent and solve problems in their lives. They can also help navigate the complexities of financial and insurance stresses. Those who are clinical social workers can provide counseling and help for emotional issues.

Keep a list of names and contact information for each member of your team. This will make it easier for you, and anyone involved in your care to know whom to contact with questions or concerns.

Treatment for stomach cancer often involves more than one therapy. For example, you may have surgery, then systemic therapy, and possibly supportive care. Read on for more information on each treatment.

Surgery

Surgery is an operation or procedure to remove cancer from the body. Often, surgery is the main or primary treatment to remove the cancer from the stomach. This is only one part of a treatment plan.

When preparing for surgery, seek the opinion of an experienced surgeon. Ask your primary care doctor and your friends for recommendations. The surgeon should be an expert in performing your type of surgery. Surgery for stomach cancer should be done at a high-volume center that does at least 15 to

20 stomach surgeries each year. Hospitals that perform many surgeries have better results. You can ask for a referral to a hospital or cancer center that has experience in treating stomach cancer.

The removal of the cancer through surgery can be done in different ways depending on the specific circumstances, such as the size and location of the tumor, and if there is cancer in any surrounding organs and tissues. Surgery is based on the safest and best way to remove the cancer.

Guide 2 Possible treatments for stomach cancer

Surgery

Endoscopic resection

Gastrectomy

Lymph node dissection

Other procedures

Systemic therapy

Chemotherapy

Chemoradiation

Targeted therapy

Immunotherapy

Radiation therapy

Clinical trials

Supportive care

Surgery can also provide supportive care by easing pain or discomfort. This is called palliative surgery.

Open surgery

Open surgery or laparotomy removes tissue through one large surgical cut below your ribs. The large cut lets your surgeon directly view and access the tumor in your stomach to remove it. Open surgery may take several hours or longer. After the surgery, you'll need to stay in the hospital for several days or longer to recover.

Minimally invasive surgery (laparoscopy)

Minimally invasive surgery (key-hole surgery) uses a few small incisions. Small tools are inserted through each incision to perform the surgery. One of the tools, called a laparoscope, is a long tube with a video camera at the end. The camera lets your surgeon see your stomach and other tissues inside your abdomen. Other tools are used to remove the tumor. Laparoscopic surgery can also be done using robotic arms to control the surgical tools. This is called robot-assisted (or robotic) laparoscopic surgery.

Tumor resection

The surgical removal of the tumor is called tumor resection. Imaging tests will be ordered to see if your cancer is resectable (can be removed by surgery) or unresectable (cannot be removed completely by surgery) before your surgery.

Order of treatments

Most people with stomach cancer will receive more than one type of treatment. This is an overview of the order of treatments and what they do.

Neoadjuvant (before) treatment is given to control the tumor before primary treatment (surgery). This might make surgery possible for some challenging tumors.

Primary treatment is the main treatment given to rid the body of cancer. Surgery is usually the main treatment when the tumor can be removed.

- **First-line treatment** is the first set of cancer drugs given.
- **Second-line treatment** is the next set of cancer drugs given if the first-line treatment hasn't worked.

Adjuvant (after) treatment is given after primary treatment to rid the body of any cancer cells left behind from surgery. It is also used when the risk of cancer returning (recurrence) is felt to be high.

Talk with your doctor about your treatment plan and what it means for your stage of stomach cancer.

Goal of surgery

The goal of surgery or tumor resection is to remove all of the cancer. Sometimes a tumor cannot be resected because not all of it can be removed, even if it is locally advanced. But the ultimate goal for surgery is to remove the tumor along with a rim of normal-looking tissue around its edge called the surgical margin. The surgical margin may look normal during surgery, but cancerous cells may be found when viewed under a microscope by a pathologist.

A clear or negative margin is when no cancer cells are found in the tissue around the edge of the tumor. (So, a negative margin is a good thing.)

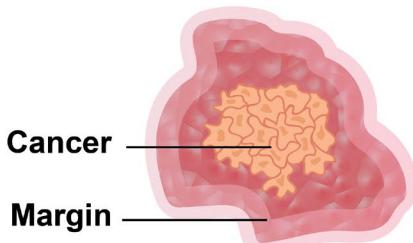
In a positive margin, cancer cells are found in the normal-looking tissue around the tumor. (A positive margin may not be a good thing.) If there's a positive margin, you may require another surgery to try to remove the remaining tumor cells. Surgery also includes removal of lymph nodes.

- **In a clear or negative margin (known as R0)**, no cancerous cells are found in the tissue around the edge of the tumor.
- **In an R1 resection**, the surgeon removes all the visible tumor, but the microscopic margins are still positive for tumor cells. This can happen despite best efforts.

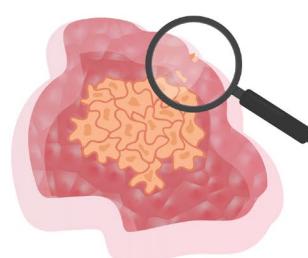
Surgical margin

The tumor will be removed, along with some normal-looking tissue around its rim. The normal-looking tissue is called the surgical margin. The surgical margin will be tested for cancer. Postoperative therapy is based on if there is cancer in the margins.

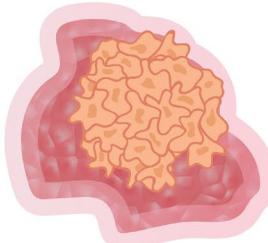
Negative margin
No cancer in margin



Positive margin
Cancer is found in margin with lab tests



Positive margin
Cancer is easily seen in margin



- **In an R2 resection**, the surgeon is unable to remove all the visible tumor or there is metastatic disease.

Your surgeon will look carefully for cancer not only along the surgical margin, but in other nearby areas. It's not always possible to find all the cancer. Sometimes, surgeons can't safely remove the tumor with a cancer-free margin.

An intraoperative pathology consultation is when a pathologist inspects the resected stomach for cancer location and distance to surgical margins during the surgery. The pathologist examines by microscope frozen sections of margins and possible other metastases such as liver or peritoneal metastases. An intraoperative pathology consultation with the surgeon serves a key role in guiding the surgery. Sometimes the surgery is not finished if the margins can't be made R0. For more information about these results, ask your care team.

After surgery, you may receive treatment such as systemic therapy to destroy any remaining cancer cells. You might have more than one surgery. You might also have a wound drain to prevent fluid from collecting in the body after surgery. It will be removed a few days after surgery.

You may receive treatment before surgery called neoadjuvant or preoperative therapy. Neoadjuvant therapy will help reduce or control the size of the tumor and the amount of cancer in the body.

If you smoke or vape, seek help to quit

A history of smoking or vaping nicotine increases your chances of developing stomach cancer. Smoking and vaping can limit how well cancer treatment works and prevent wound healing. They also greatly increase your chances of having side effects during and after surgery. Cannabis use might also affect the amount of anesthesia used during surgery.

Nicotine is the chemical in tobacco that makes you want to keep smoking and vaping. Nicotine withdrawal is challenging for most people who smoke or vape. The stress of having cancer may make it even harder to quit. If you smoke or vape, ask your care team about counseling and medicines to help you quit.

For online support, try these websites:

- [SmokeFree.gov](https://www.smokefree.gov)
- [CDC.gov/tobacco](https://www.cdc.gov/tobacco)

Endoscopic resection

For early-stage stomach cancer, endoscopic resection—either endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD)—might be options. Early-stage stomach cancer hasn't grown beyond the first layer (mucosa) of the stomach wall.

The tumor is often very small (2 centimeters or less) and isn't in any lymph nodes. Either one of these procedures might be used.

Endoscopic mucosal resection (EMR)

is a procedure to remove pre-cancerous or early-stage cancer or other abnormal tissues (lesions) from the stomach. During EMR, the endoscope is passed down your throat to reach the lesion or tumor in your stomach. The lesion can be removed through suction or cutting it away. Talk to your doctor to learn more.

Endoscopic submucosal dissection (ESD)

uses an endoscope to resect (remove) the tumor that is deeper in the stomach wall. The endoscope is inserted through the mouth. A tool is inserted through the endoscope that injects fluid between the tumor and layer of the stomach wall to help the tumor separate. Then a tool lifts and cuts away the tumor from the stomach wall.

Gastrectomy

A gastrectomy removes all or part of the stomach. Gastrectomy should also include the removal of regional lymph nodes. A nutritionist or dietician can provide guidance on what foods are best for you before and after surgery.

There are different types of gastrectomy.

Total gastrectomy

In a total gastrectomy, the whole stomach, nearby lymph nodes, and parts of your esophagus and small intestine are removed. The esophagus is reconnected to the small intestine. You'll have a working digestive system that allows swallowing, eating, and digesting food, but in a much different way.

Partial gastrectomy

In a partial gastrectomy, the part of the stomach with cancer is removed along with

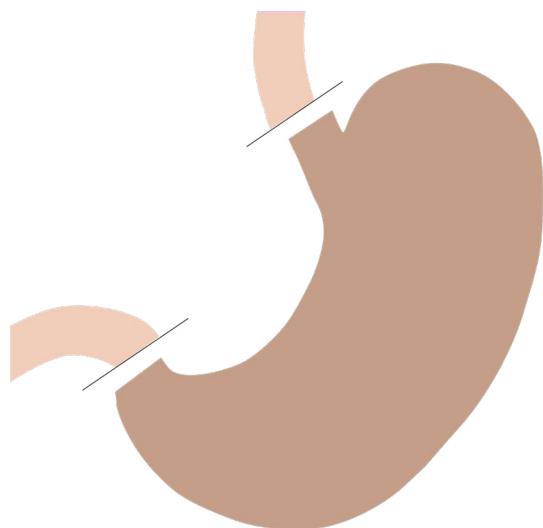
Total gastrectomy

In a total gastrectomy, the whole stomach and surrounding lymph nodes are removed. The esophagus is reattached to the middle part of the small intestine (jejunum).

Adapted from:

https://commons.wikimedia.org/wiki/Category:Gastrectomy#/media/File:Proximal_gastrectomy.png

https://commons.wikimedia.org/wiki/Category:Gastrectomy#/media/File:Distal_gastrectomy.png



nearby lymph nodes, and possibly parts of other organs near the tumor.

In a proximal gastrectomy, the top half of the stomach is removed. In a distal gastrectomy, the bottom half of the stomach is removed.

Esophagogastrectomy

In an esophagogastrectomy, the top part of the stomach and lower part of the esophagus are removed.

Lymph node dissection

The removal of lymph nodes or groups of lymph nodes is called lymph node dissection. Lymph node dissection may be classified as D0, D1, or D2 depending on the location of the tumor and the number of lymph nodes removed at the time of gastrectomy.

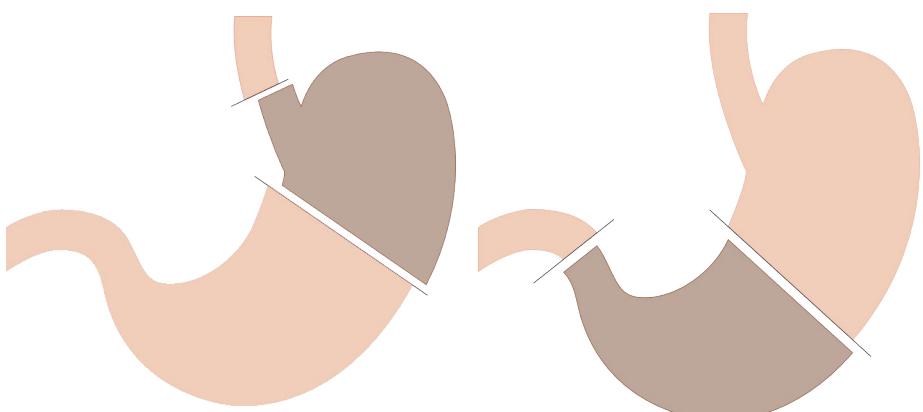
- **D0** is an incomplete resection of lymph nodes along the lesser and greater curvatures of the stomach. This means some lymph nodes were removed, but not the minimum of 16.
- **D1** is the removal of at least 16 lymph nodes as well as the greater and lesser omenta. The omenta are folds of the thin lining of the abdomen (the peritoneum). The omenta surround the stomach and other organs in the abdomen. Several regional lymph nodes are found within the omenta.
- **D2** is the removal of at least 30 lymph nodes. This involves D1 dissection plus the removal of all the lymph nodes along the left gastric (stomach) artery, common hepatic (liver) artery, celiac artery, and splenic (spleen) artery. This requires an experienced surgeon. D2 dissections should be performed in centers experienced with this technique.

Partial gastrectomy

In a proximal gastrectomy, the top half of the stomach is removed. In a distal gastrectomy, the bottom half of the stomach is removed.

https://commons.wikimedia.org/wiki/Category:Gastrectomy#/media/File:Proximal_gastrectomy.png

https://commons.wikimedia.org/wiki/Category:Gastrectomy#/media/File:Distal_gastrectomy.png



Other procedures

Gastrojejunostomy

A gastrojejunostomy is a surgery to reroute the path food takes from the stomach into the small intestine. The new path from the stomach will avoid (bypass) the blocked part of the duodenum. A gastrojejunostomy can be an open surgery or laparoscopic surgery.

You might have a gastrostomy tube or a jejunostomy tube placement at the time of gastrojejunostomy.

G-tube

A gastrostomy tube (G-tube) is a soft plastic tube inserted through the skin of the abdomen directly into the stomach. It allows air and fluid to leave the stomach and can be used to give medicines and fluids, including liquid food. Giving food through a gastrostomy tube is what is known as enteral nutrition.

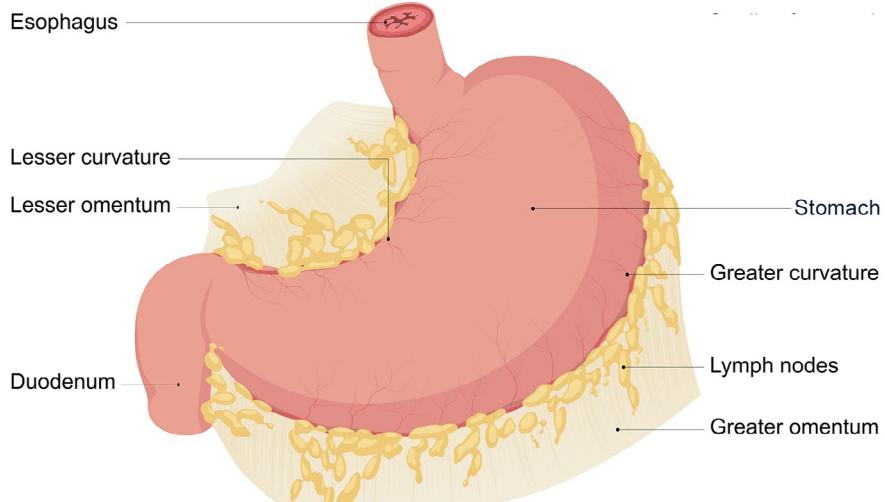
J-tube

A jejunostomy tube (J-tube) is a soft plastic tube inserted through the skin of the abdomen into the midsection of the small intestine. The tube delivers food and medicine until you are healthy enough to eat by mouth. A J-tube is a possibility during a gastrojejunostomy. You'll learn how to care for the J-tube and the skin where the tube enters the body.

Systemic therapy

Systemic therapy is treatment that works throughout the body. Systemic therapy might be used alone or with other therapies. Goals of systemic therapy should be discussed before starting treatment. Your wishes about treatment are important, so talk to your care team about them.

- Systemic therapy or chemoradiation given before surgery is called **neoadjuvant or preoperative therapy**.



Lymph nodes

At least 16 regional nodes should be removed and tested for cancer. However, the removal of more than 30 regional lymph nodes is recommended.

- Systemic therapy given before, during, and after surgery is called **perioperative therapy**.
- Systemic therapy given after surgery is called **adjuvant or postoperative** therapy.
- Systemic therapy given for advanced disease may be called **palliative therapy**.

Why some therapies are preferred

NCCN experts recommend treatments based on science and safety. When helpful, they assign a level of preference to their recommendations. There are 3 levels of preference:

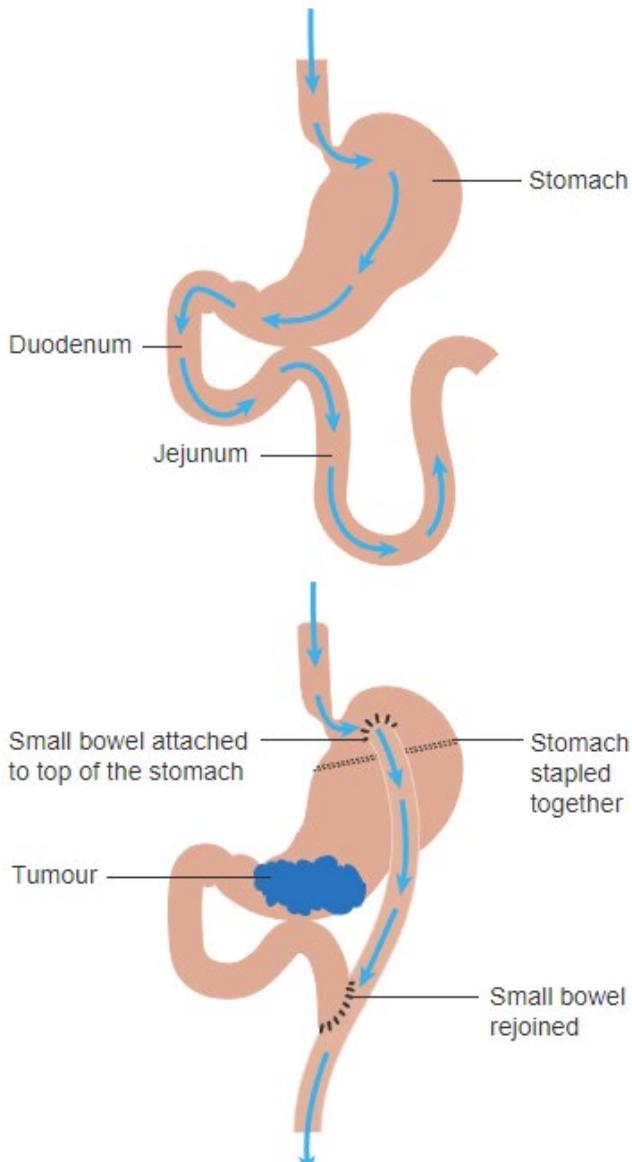
- **Preferred therapies** have the most evidence they work better and may be safer than other therapies.
- **Other recommended therapies** can provide effective results but may have less evidence, more side effects, or may not work quite as well as preferred therapies.
- **Therapies used in certain cases** work best for individuals with specific cancer features or health circumstances.

Types of systemic therapy include chemotherapy, chemoradiation, targeted therapy, and immunotherapy.

Gastrojejunostomy

A tumor can block the esophagus or small intestine. Surgery that reroutes the path food takes from the stomach to the small intestine is called a **gastrojejunostomy**.

https://commons.wikimedia.org/wiki/File:Diagram_showing_before_and_after_stomach_bypass_surgery_CRUK_108.svg



Chemotherapy

Chemotherapy is a type of systemic therapy that kills fast-dividing cells throughout the body, including cancer cells and some normal cells. More than one chemotherapy may be used to treat stomach cancer.

Some chemotherapy drugs are liquids that are infused into a vein or injected under the skin with a needle. Other chemotherapy drugs may be given as a pill that's swallowed.

Some examples of chemotherapy drugs for stomach cancer include:

- Capecitabine (Xeloda) or Fluorouracil
- Oxaliplatin (Eloxatin)
- Irinotecan (Camptosar)
- Docetaxel (Taxotere)
- Paclitaxel
- Carboplatin
- Cisplatin

Antibody-drug conjugates

Antibody-drug conjugates (ADCs) deliver cell-specific chemotherapy. They attach to a particular protein found on the outside of the cancer cell, then enter the cell. Once inside the cell, chemotherapy is released. An example is famtrastuzumab deruxtecan-nxki (Enhertu), which attaches to HER2.



Warnings about supplements and drug interactions

You might be asked to stop taking or avoid certain herbal supplements when on a systemic therapy. Some supplements can affect the ability of a drug to do its job. This is called a drug interaction.

It is critical to speak with your care team about any supplements you may be taking. Some examples include:

- Turmeric
- Gingko biloba
- Green tea extract
- St. John's Wort
- Antioxidants

Certain medicines can also affect the ability of a drug to do its job. Antacids, heart or blood pressure medicine, and antidepressants are just some of the medicines that might interact with a systemic therapy. Therefore, it is very important to tell your care team about any medicines, vitamins, over-the-counter (OTC) drugs, herbals, or supplements you are taking.

Bring a list with you to every visit.

Chemoradiation

Chemotherapy may improve how well radiation therapy (RT) works, so they're sometimes used together and called chemoradiation. Chemoradiation is local RT enhanced by chemotherapy. It's not used often but it can be an option for some people.

Targeted therapy

Targeted therapy focuses on specific or unique features of cancer cells. Targeted therapies seek out how cancer cells grow, divide, and move in the body. These drugs stop or block the action of molecules that help cancer cells grow and/or survive.

Targeted therapies for stomach cancer include:

- Trastuzumab (Herceptin)
- Ramucirumab (Cyramza)

In certain cases, the following targeted therapies might be used:

- Entrectinib (Rozlytrek)
- Dabrafenib (Tafinlar)
- Larotrectinib (Vitrakvi)
- Selpercatinib (Retevmo)
- Trametinib (Mekinist)

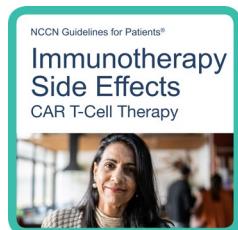
Immunotherapy

The immune system has many “on” and “off” switches. Tumors take advantage of off switches such as PD-1 and CTLA-4. Immunotherapy is a type of systemic treatment that tries to turn the immune system back on to destroy tumor cells. Immune checkpoint inhibitors (ICIs) are one type of immunotherapy.

Immunotherapy can be given alone or with other types of treatment. Some examples of immunotherapy for stomach cancer are:

- Nivolumab (Opdivo)
- Pembrolizumab (Keytruda)
- Tislelizumab (Tevimbra)
- Dostarlimab-gxly (Jemperli)

More information on ICIs and immunotherapy side effects is available at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer app](https://www.NCCN.org/Pages/Patient-Guides-for-Cancer.aspx).



Radiation therapy

Radiation therapy (RT) uses high-energy x-rays, photons, protons, electrons, and other sources to destroy cancer cells and shrink tumors. RT can be given alone or with other treatments. It is used less frequently when treating stomach cancer but can be used for some people.

RT is a local therapy, which is used to treat a tumor in targeted areas. It may focus on individual tumors, a small area/region of the body, specific lymph nodes, or areas where there may be small, undetectable tumor deposits. However, RT cannot be safely used to treat very large areas, so it can't replace systemic therapy that circulates everywhere in the body.

RT is most commonly used as supportive care (palliative care) to help ease pain or discomfort caused by cancer, or to control bleeding caused by a tumor. RT can also be given before or after surgery to treat or slow the growth of cancer, especially if the surgical margins have cancer cells.

Most types of radiation include short treatment sessions that are given in small doses, once a day over a few days to weeks. This keeps your internal organs safe while still killing tumor cells in the targeted area. For this reason, RT can treat areas that may not be possible to remove with surgery. Most of the time you won't feel the radiation treatment each day, but side effects might develop over the weeks of treatment. Ask your care team which radiation option(s) are best for you and what side effects and long-term effects to expect.



Finding a clinical trial

In the United States

NCCN Cancer Centers
NCCN.org/cancercenters

The National Cancer Institute (NCI)
cancer.gov/about-cancer/treatment/clinical-trials/search

Worldwide

The U.S. National Library of Medicine (NLM)
clinicaltrials.gov

Need help finding a clinical trial?

NCI's Cancer Information Service (CIS)
1.800.4.CANCER (1.800.422.6237)
cancer.gov/contact

A four-dimensional (4D) CT scan might be used to plan RT. A 4D-CT records multiple images over time. It allows playback of the scan as a video, so that internal movement of your organs can be tracked and accounted for in targeting the RT.

Clinical trials

Another treatment option at any stage of disease is participating in a clinical trial. A clinical trial is a type of medical research study. After being developed and tested in a lab, potential new ways of fighting cancer need to be studied in people.

If found to be safe and effective in a clinical trial, a drug, device, or treatment approach may be approved by the U.S. Food and Drug Administration (FDA).

Everyone with cancer should carefully consider all of the treatment options available for their cancer type, including standard treatments and clinical trials. Talk to your doctor about whether a clinical trial may make sense for you.

Phases

Most cancer clinical trials focus on treatment and are done in phases.

- **Phase 1** trials study the safety and side effects of an investigational drug or treatment approach.
- **Phase 2** trials study how well the drug or approach works against a specific type of cancer.
- **Phase 3** trials test the drug or approach against a standard treatment. If the results are good, it may be approved by the FDA.
- **Phase 4** trials study the safety and benefit of an FDA-approved treatment.

Who can enroll?

It depends on the clinical trial's rules, called eligibility criteria. The rules may be about age, cancer type and stage, treatment history, or general health. They ensure that participants are alike in specific ways and that the trial is as safe as possible for the participants.

Informed consent

Clinical trials are managed by a research team. This group of experts will review the study with you in detail, including its purpose and the risks and benefits of joining. All of this information is also provided in an informed consent form. Read the form carefully and ask questions before signing it. Take time to discuss it with people you trust. Keep in mind that you can leave the trial and seek treatment outside of the clinical trial at any time.

Will I get a placebo?

Placebos (inactive versions of real medicines) are almost never used alone in cancer clinical trials. It's common to receive either a placebo with a standard treatment, or a new drug with a standard treatment. You'll be informed, verbally and in writing, if a placebo is part of a clinical trial before you enroll.

Are clinical trials free?

There is no fee to enroll in a clinical trial. The study sponsor pays for research-related costs, including the study drug. But you may need to pay for other services, like transportation or childcare, due to extra appointments. During the trial, you'll continue to receive standard cancer care. This care is often covered by insurance.

Supportive care

Supportive care (also known as palliative care) will be specific to your needs. Supportive care is health care given to prevent, reduce, and relieve symptoms and side effects, and to improve your quality of life. It might include pain relief, emotional or spiritual support, financial aid, or family counseling. Tell your care team how you're feeling and about any treatment side effects, so they can be managed.

It's very important to take care of yourself by eating well, drinking plenty of fluids, exercising, and doing things that make you feel energized. Strength is needed to sustain you during treatment. For more information on supportive care, see *Chapter 10: Supportive care*.

Ask your care team what treatment options are available and if a clinical trial might be right for you.

Side effects

All cancer treatments can cause unwanted health issues called side effects. Supportive care is there to help you manage them. Side effects depend on many factors like the drug type and dose, length of treatment, and the person. Some side effects may be harmful to your health and very serious, while others may just be unpleasant.

Ask for a complete list of side effects of your treatments. Also, tell your care team about any new or worsening symptoms. There may be ways to prevent some side effects and help you feel better.

Late side effects

Late effects are side effects that occur months or years after a disease is diagnosed or after treatment has ended. Late effects may be caused by cancer or cancer treatment and



Be sure to tell your care team about any and all side effects.

could include physical, mental, and social problems as well as second cancers. The sooner late effects are treated, the better. Ask your care team about what late effects could occur and for approaches to prevent and treat them. This will help you know what to look for. For more information about late effects, see *Chapter 11: After treatment*.

Survivorship

A person is a cancer survivor from the time of diagnosis until the end of life. When treatment leads to remission (or no evidence of disease), you'll need follow-up or survivorship care for late effects. During survivorship care, you'll still have a care team but it'll be different.

Seek out peer support groups, whether online or in person. For more information on survivorship, see *Chapter 11: After treatment*.

What's next?

Now that you've read about all the treatment possibilities, you can find more specific treatment information for your specific cancer stage: early-stage disease (Chapter 6), locally advanced disease (Chapter 7), recurrence or metastatic cancer (Chapter 8), peritoneal carcinoma as only disease (Chapter 9).

Key points

- Surgery is a main or primary treatment for stomach cancer. A gastrectomy is surgery that removes all or part of the stomach.
- A resectable tumor can be removed with surgery. An unresectable tumor cannot be removed with surgery.
- You can live without a stomach. You'll have a working digestive system that allows swallowing, eating, and digesting food, but in a different way. Your care team can prepare you and help you manage this.
- Systemic therapy works throughout the body. It includes chemotherapy, chemoradiation, targeted therapy, and immunotherapy.
- Radiation therapy (RT) uses high-energy x-rays, protons, photons, and other sources to kill cancer cells and shrink tumors. It is used less frequently in treating stomach cancer but can be used for some people.
- A clinical trial is a type of research that studies a treatment to see how safe it is and how well it works.

- Supportive care relieves symptoms caused by cancer or its treatment and improves quality of life.

Questions to ask

- If I need surgery, will all or part of my stomach be removed?
- What other organs or tissues might be removed during surgery?
- What can be done to prevent or relieve the side effects of treatment?
- In what situations should I call my care team? Do side effects have to be bad to let them know?
- If I need chemotherapy, what type will I have?

Did you know?

The terms chemotherapy and systemic therapy are often used interchangeably, but they aren't the same. Systemic therapy works throughout the body. Chemotherapy is a type of systemic therapy. Immunotherapy and targeted therapy are also systemic therapies.

6

Early-stage stomach cancer

52 Treatment

53 Follow-up care

54 What's next?

54 Key points

54 Questions to ask

Early-stage stomach cancer hasn't grown beyond the first layer of the stomach wall. Treatment is an endoscopic resection or surgery.

Early-stage stomach cancer includes stage 0 (also called carcinoma in situ), which is considered pre-cancer, and stage 1 tumors that haven't grown beyond the first layer of the stomach wall. For more information, see the description and illustration of the stomach's layers in *Chapter 2: About the stomach*.

When cancer is in its early stages, it's easier to treat because it hasn't had a chance to spread too far from where it started.

Treatment

Before treatment, your care team will review your test results. They'll decide with you if endoscopic resection (ER) or surgery (gastrectomy) is a better choice, or if you're not a candidate for surgery.

Being a candidate for surgery means you must be healthy enough for it and not have other serious health issues. The type of surgery for early-stage stomach cancer is commonly a partial gastrectomy (part of the stomach removed). Less often, treatment involves a total gastrectomy (complete stomach removal).

Even if you're a candidate for surgery, you may not want to have surgery, and that's okay.

If surgery isn't an option for you, an endoscopic resection can be done. In this procedure, an endoscope is passed down your throat to remove the tumor in your stomach. After an ER, you'll start follow-up visits (surveillance) where you'll be checked for the return of cancer (recurrence). See *Follow-up care*.

Otherwise, if you're healthy enough to tolerate surgery, then that will come next. For more information on some of the aftereffects from your surgery, see *Chapter 11: After treatment*.

A sample of your tumor removed during surgery will be tested and restaged. If tests confirm the cancer is in the early pathological stages (stage 0 or stage 1A), then you'll have follow-up visits to watch for the return of cancer. See *Follow-up care*.

But if the cancer has been restaged as pathological stage 1B through stage 3, it's considered locally advanced cancer, which is detailed in the next chapter.

**Guide 3
Possible treatment for early-stage
stomach cancer**

Endoscopic resection

Surgery (total or partial gastrectomy)

Follow-up care

After treatment, you'll receive follow-up care. It's important to keep any follow-up visits and imaging test appointments.

Stage 0

If you have stage 0 (carcinoma in situ) stomach cancer that was successfully treated with an endoscopic resection, then your follow-up care might include:

- Medical history and physical exam every 3 to 6 months for 1 to 2 years, then every 6 to 12 months for 3 to 5 years
- Complete blood count (CBC) and chemistry profile, as needed
- Upper GI endoscopy (EGD) every 6 months for 1 year, then annually for 3 years
- Routine imaging (CT scan of chest/abdomen/pelvis with oral and IV contrast) as needed based on symptoms and concern for recurrence

Stage 1 (early)

A tumor that hasn't grown further than the first layer of the stomach wall (the mucosa) is an early stage 1 stomach cancer. If it's successfully treated with an endoscopic resection or surgery, then follow-up care might include:

- Medical history and physical exam every 3 to 6 months for 1 to 2 years, then every 6 to 12 months for 3 to 5 years
- CBC and chemistry profile, as needed
- CT scan of chest/abdomen/pelvis with oral and IV contrast, as needed
- Checking for nutritional deficiency (such as low levels of B12 and iron), especially after total gastrectomy, as needed
- After endoscopic resection – upper GI endoscopy every 6 months for 1 year, then once a year for up to 5 years, and then as needed based on symptoms and/or test results
- After surgery – upper GI endoscopy as needed

If you need support while dealing with your diagnosis, ask about a nearby in-person or online cancer support group.



What's next?

After your treatment, you'll continue to receive regular exams and imaging. See *Chapter 10: Supportive care* and *Chapter 11: After treatment* to find out what else you might expect.

Key points

- Early-stage stomach cancer is easier to treat than later stages.
- An early stage 1 tumor hasn't grown beyond the mucosa, the first layer of the stomach wall.
- Surgery is not for everyone. You must be healthy enough for surgery and not have other serious health issues.
- You have the option of not having surgery if you don't want it.
- You may be able to have an endoscopic resection (ER) instead of surgery.
- After treatment with an ER or surgery, you'll receive follow-up care. It's important to keep any follow-up visits and imaging test appointments.

Questions to ask

- What are the chances that my cancer will return after treatment?
- What decisions must be made today?
- How many procedures like the one you're suggesting have you done?
- What are the possible complications of treatment?
- Who will manage my day-to-day care?

7

Locally advanced stomach cancer

56 Potentially resectable

60 Unresectable

61 Follow-up care

61 What's next?

62 Key points

62 Questions to ask

In locally advanced stomach cancer, the tumor has grown into the second layer of the stomach wall (the submucosa). It may have also spread to the lymph nodes or organs near the stomach. Locally advanced disease hasn't spread to distant sites in the body.

Locally advanced disease is cancer that has grown beyond the inner layer of the stomach wall and/or has spread to nearby lymph nodes or organs.

After you've had the workup that involves endoscopic ultrasound and biopsies (see **Guide 1** in *Chapter 3: Testing for stomach cancer*), and it's been determined that you have locally advanced cancer, your provider might recommend a laparoscopy with cytology to get more information.

In this minimally invasive procedure, the surgeon will insert a laparoscope (a type of endoscope tube with a camera on the end) into the belly to look for cancer in the abdominal lining (peritoneum). Fluid or tissue samples will be removed from the area. The samples will be sent to the lab where a pathologist will examine the cells for cancer to help further guide treatment (cytology).

The point of a laparoscopy and cytology is to find out whether your cancer is potentially resectable (removable with surgery) or unresectable (not removable with surgery). Once this result is in, your care team will

discuss treatment options with you. **See Guide 4.**

Potentially resectable

If the tumor is considered by your care team to be potentially resectable, it means it has a good chance of being completely removed with surgery.

If you have a clinical stage 1 tumor that has grown into the second layer of the stomach wall (the submucosa) and you're healthy enough for surgery, your care team will likely recommend surgery to remove the tumor. See *Surgery without systemic therapy* for what treatment you might expect.

If you have a tumor that has grown into the third layer of the stomach wall (the muscle layer) or deeper, and cancer may or may not be in the lymph nodes (this means it could be a clinical stage 1 or stage 2A, 2B, 3, 4A, or 4B), you'll likely have 1 of 3 options:

Guide 4 Possible treatment for locoregional disease

Surgery

Perioperative chemotherapy

Neoadjuvant or perioperative immune checkpoint inhibitors, only for MSI-H/dMMR-positive tumors

Chemotherapy

Chemoradiation

- Surgery (only). If you have only surgery, see *Surgery without systemic therapy*.
- Perioperative chemotherapy (around the time of surgery)
- Neoadjuvant (before surgery or preoperative) or perioperative immune checkpoint inhibitor (ICI) treatment only if the tumor has MSI-H/dMMR

Surgery without systemic therapy

Most patients with stomach cancer will need surgery (gastrectomy). During surgery, a sample of your tumor and at least 16 lymph nodes will be removed (D1 lymph node dissection) and tested and your cancer will be restaged. (This is called the pathological stage.) What treatment you'll have next is based on this stage.

R0

In a clear or negative resection margin (R0), no cancer cells are found in the tissue around the edge of the tumor. But cancer may still be in regional lymph nodes. The next steps depend on how far the tumor has grown into the wall of the stomach and if there was any cancer in regional lymph nodes.

If the cancer is now stage 0 or stage 1A, you'll begin observation. See *Follow-up care* for more details.

If the cancer is now stage 1B with no cancer in the lymph nodes, you'll receive either:

- Observation
- Chemotherapy using fluoropyrimidine (fluorouracil or capecitabine), then fluoropyrimidine-based chemoradiation, then more fluoropyrimidine for some patients

If after surgery, and you didn't receive preoperative therapy, your cancer is now stage 2A or 2B with or without cancer in your lymph nodes, or stage 1B or higher (2A, 2B, 3A, 3B, or 3C), with cancer in your lymph nodes, you'll receive one of the following:

- Chemotherapy using fluoropyrimidine (fluorouracil or capecitabine), then fluoropyrimidine-based chemoradiation, then more fluoropyrimidine if fewer than 30 lymph nodes were removed
- Chemotherapy for people who've had 30 or more lymph nodes removed (D2 lymph node dissection)

R1

An R1 positive margin means the surgeon removed all the visible tumor, but microscopic cancer remains in the margin. This cancer can't be seen with the human eye, but it can be seen under a microscope.

For treatment, you'll receive chemoradiation with fluoropyrimidine. See *Follow-up care* for what comes next.

R2

An R2 resection means that the surgeon was unable to remove all the visible tumor or there's cancer in the margin that can be seen with the human eye. The remaining cancer after surgery may be near where the primary tumor was and in the lymph nodes or at distant sites (metastatic). Your treatment will be either chemoradiation with fluoropyrimidine or supportive care.

Metastatic cancer

If the surgeon found that the cancer has spread to distant parts of the body (metastasized), you will not have surgery. Sometimes you might receive radiation, chemotherapy, or both. You have the option of doing nothing. Instead, you may receive supportive care. For more information on supportive care, read the next chapter and *Chapter 10: Supportive care*.

Perioperative chemotherapy

If you have perioperative chemotherapy, it means it will be given before and after surgery. For systemic therapy options, **see Guide 5**.

After this systemic therapy, you'll need a chest/abdomen/pelvis CT with oral and IV contrast afterward to see if the treatment helped control the tumor. If needed, you might also have an FDG-PET/CT.

At that point, your cancer will be classified again as either resectable or unresectable. If it's considered resectable, then you'll have another surgery (which is preferred). At that time, the cancer might be determined to be unresectable and peritoneal spread might be

found. See *Surgery after systemic therapy* for what comes next.

But if you have resectable cancer and decide not to have surgery, you'll receive supportive care. Supportive care (also called palliative care) is available to you as a way to manage symptoms, improve quality of life, and extend life. Systemic therapy with or without radiation therapy may be an option. More information on supportive care can be found in the next chapter and in *Chapter 10: Supportive care*.

If your cancer is considered unresectable or is metastatic (has spread to distant sites), then you'll receive supportive care (see next chapter).

Neoadjuvant or perioperative ICI for MSI-H/dMMR tumor

If biomarker testing shows that your tumor has MSI-H/dMMR, your provider might suggest neoadjuvant (preoperative) or perioperative ICI treatment (without chemotherapy). For treatment options, **see Guide 5**.

After that treatment, you'll have imaging or upper GI endoscopy and biopsy. This testing will show one of three outcomes:

- **No evidence of disease:** This means no stomach cancer was found, and you'll have either observation (see *Follow-up care*) or surgery (see *Surgery after systemic therapy*)
- **Persistent local disease:** This means the local disease is still there. The preferred treatment for it is surgery, or you might have supportive (palliative) care.

- **New metastatic disease:** This means that there are signs of the cancer's spread that weren't present before, and you'll receive supportive care.

It's important to note that sometimes unresectable disease will be found during surgery.

Guide 5 Systemic therapy options

Perioperative chemotherapy (around the time of surgery)

Preferred:

- FLOT (Fluorouracil, leucovorin, oxaliplatin, and docetaxel)
- Fluoropyrimidine and oxaliplatin

Other recommended:

- Fluorouracil and cisplatin

Neoadjuvant (before surgery) or perioperative immune checkpoint inhibitors for MSI-H/dMMR-positive tumors

Used in some cases:

- Nivolumab and ipilimumab followed by nivolumab
- Pembrolizumab
- Tremelimumab and durvalumab for neoadjuvant therapy only

Chemoradiation (after surgery)

- Fluoropyrimidine (fluorouracil or capecitabine) before and after fluoropyrimidine-based chemoradiation

Chemotherapy (after surgery) for patients with D2 lymph node dissection

Preferred:

- Capecitabine and oxaliplatin
- Fluorouracil and oxaliplatin

Chemoradiation for unresectable disease

Preferred:

- Fluorouracil and oxaliplatin
- Fluorouracil and cisplatin

Other recommended:

- Fluoropyrimidine (fluorouracil or capecitabine) and paclitaxel

Surgery after systemic therapy

Systemic therapy is given to control the tumor before surgery. For systemic therapy options, **see Guide 5**. The goal of surgery (gastrectomy) is to remove the tumor and any remaining cancer. Your treatment after surgery depends on the result of the surgery and whether any cancer is in the surgical margin: R0, R1, and R2.

R0

If your surgery left no cancer in the surgical margin (R0), your treatment will be more systemic therapy, and then you'll begin observation (see *Follow-up care*).

R1

If the result of surgery was microscopic cancer in the margin (R1), then you'll receive either chemoradiation (with a fluoropyrimidine chemotherapy) or have another surgery to remove the remaining cancer. Next, you'll have follow-up care (see *Follow-up care*).

R2

If cancer could be seen in the margin during surgery (so it's unresectable), then you'll receive chemoradiation (with a fluoropyrimidine chemotherapy) or supportive (palliative) care.

Metastatic cancer

If you received systemic therapy before your surgery and the cancer was found to have spread to distant areas (metastasized) or has become unresectable or involves the peritoneum, then you'll receive supportive care. For more information on supportive

It helps to ask questions to learn all you can. It will give you a more active role in your care and may help you feel a sense of control.

care, read the next chapter and *Chapter 10: Supportive care*.

No surgery

Surgery is not for everyone. Maybe your body isn't strong or healthy enough for surgery, or maybe you simply choose not to have it. (Your wishes about treatment are always important.)

If you're not having surgery or you have cancer that has spread (metastasized), or has become unresectable or involves the peritoneum, then treatment will focus on supportive care. This is care that helps manage symptoms, improve your quality of life, and extend life. More information on supportive care can be found in the next chapter and in *Chapter 10: Supportive care*.

Unresectable

Not all tumors can be removed with surgery. This might be due to its size or its location, or because it has spread, or the person isn't healthy enough for major surgery. In other

words, the tumor can't be cut out safely and completely, which is called an unresectable tumor.

Unresectable cancer might be treated instead with chemoradiation or systemic therapy. **See Guide 5** for systemic therapy options.

This is sometimes called neoadjuvant or preoperative therapy. If you're healthy enough for surgery, the goal is to try to shrink the tumor to make it easier to remove during surgery.

After neoadjuvant treatment, you'll have imaging and blood tests to restage the cancer. If the tumor is now resectable and can be removed, then surgery is the preferred treatment, when possible, or you move to follow-up care (see *Follow-up care*).

If the tumor stays unresectable and/or there is disease that has spread (metastasized), then treatment will focus on palliative management (see the next chapter).

Follow-up care

If your cancer is stage 1 and your tumor was treated with surgery or endoscopic resection (ER), then follow-up care might include:

- Medical history and physical exam every 3 to 6 months for 1 to 2 years, then every 6 to 12 months for 3 to 5 years
- Complete blood count (CBC) and chemistry profile, as needed
- For patients treated by ER, upper gastrointestinal (GI) endoscopy every 6 months for 1 year, then yearly for up to 5

years or longer based on symptoms and imaging findings

- For patients who had surgery, upper GI endoscopy, as needed. CT scan of chest/abdomen/pelvis with contrast, as needed
- Check for nutritional deficiency (such as low levels of B12 and iron), as needed

If your cancer is stage 2 or 3 and you didn't have systemic therapy, or if it's stage 1, 2, or 3 and you were treated with systemic therapy before or after surgery, then follow-up care might include:

- Medical history and physical exam every 3 to 6 months for 1 to 2 years, then every 6 to 12 months for 3 to 5 years
- Complete blood count (CBC) and chemistry profile, as needed
- For patients who had partial gastrectomy, upper GI endoscopy, as needed
- CT scan of chest/abdomen/pelvis with contrast every 6 months for the first 2 years, then annually for up to 5 years
- Check for nutritional deficiency (such as low levels of B12 and iron), as needed

What's next?

After your treatment and as mentioned above, you'll receive regular exams and imaging. See *Chapter 10: Supportive care* and *Chapter 11: After treatment* for what you might expect.

Key points

- In locally advanced stomach cancer, the tumor has grown beyond the first layer of the stomach wall and may have spread to nearby lymph nodes or organs.
- Locally advanced stomach cancer isn't metastatic disease.
- Surgery is not indicated for everyone. If surgery isn't an option, then treatment will focus on supportive care. Your wishes are always important.
- Supportive care is given to manage symptoms, improve quality of life, and extend life.
- Not all tumors can be removed with surgery. This is called an unresectable tumor.
- Unresectable cancer might be treated with chemoradiation or systemic therapy. If the tumor shrinks, then surgery might be possible.
- You'll have follow-up care after surgery to check for cancer recurrence.

“

Be your own advocate. Talk to someone who has gone through the same thing as you. Ask a lot of questions, even the ones you are afraid to ask. You have to protect yourself and ensure you make the best decisions for you, and get the best care for your particular situation.”

Questions to ask

- How do my age, overall health, and other factors affect my options?
- What will happen if I do nothing?
- How do I get a second opinion?
- Which option is proven to work best for my cancer, age, overall health, and other factors?
- Am I a candidate for a clinical trial? Can I join a clinical trial at any time?

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Recurrence and metastatic cancer

64 Treatment options

65 Palliative management

69 Key points

69 Questions to ask

This chapter discusses treatment options for recurrence and metastatic cancer. Recurrence is the return of stomach cancer either near the original tumor or the cancer may have spread to distant sites in the body, called metastatic cancer.

When cancer returns at or near the original tumor in the stomach, it's called locally advanced recurrence. Locally advanced recurrence can appear in the nearby lymph nodes, tissues in the abdomen, as well as the location of the original surgery, if you had one. Stomach cancer that has spread to distant sites in the body is called metastatic disease, also known as stage 4. It might have been previously unresectable and spread as well. Recurrence is when any of these situations happen.

If you have a recurrence and you're feeling overwhelmed, don't hesitate to reach out to your care team to let them know. They may be able to direct you to extra support or programs that can help you manage your feelings. You're not alone.

Treatment options

If the recurrent locally advanced tumor can be removed (is resectable), surgery might be an option. But palliative management is also a possibility, which is explained ahead.

For locally advanced tumors that can't be removed with surgery (unresectable) or if there's metastatic disease, the goal of treatment is to reduce the amount of cancer and prevent it from spreading. Palliative management can help with this.

Your performance status helps determine the type of palliative management. If you're active enough to walk around and take care of yourself, you'll be able to have biomarker testing, if not already done. And if you're healthy enough for chemoradiation or systemic therapy, you might receive one of these options. For more information on performance status, see *Chapter 3: Testing for stomach cancer*.

But if you're not very active and not able to take care of yourself on your own, then supportive care (an aspect of palliative management) is probably the best treatment for you.

Guide 6 Possible treatment for recurrence and metastatic disease

Surgery

Palliative management

Systemic therapy

Chemoradiation

Palliative management

Aside of surgery, treatment for locally advanced recurrence and metastatic disease might be referred to as palliative management. It means you have different options to help you feel less pain or discomfort.

If you haven't had biomarker tumor testing before, you might have that before any of the next steps that could include the following:

- Chemoradiation (chemotherapy and radiation given together)
- Systemic therapy
- Supportive care
- Treatment for peritoneal carcinoma as only disease (stomach cancer limited to peritoneum). See the next chapter for options.

Chemoradiation

If the locoregional tumor is unresectable and you haven't yet received chemoradiation, you might have chemoradiation as a treatment option. The goal is to help shrink tumors to help with pain and keep cancer from spreading.

Systemic therapy

At this stage of the disease, systemic therapy like chemotherapy and targeted therapies are used to shrink tumors, and can help ease pain, nausea, or bleeding.

When it comes to cancer recurrence, there is an order based on how effective they might be for your type of cancer: first-line and next-line therapies. First-line options are considered more effective than next-line options, and because of that, should be tried first. Options are based on the systemic therapy you had before and your performance status.

Your preferences about treatment are always important. Talk to your care team and make your wishes known.



Guide 7**First-line systemic therapy options**

For HER2-positive tumors:

- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and trastuzumab
- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, trastuzumab, and pembrolizumab for PD-L1 positive
- Fluoropyrimidine (fluorouracil or capecitabine), cisplatin, and trastuzumab
- Fluoropyrimidine (fluorouracil or capecitabine), cisplatin, trastuzumab, and pembrolizumab for PD-L1 positive

For HER2-negative tumors:

- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and nivolumab for PD-L1 positive
- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and pembrolizumab for PD-L1 positive
- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and tislelizumab-jsgr for PD-L1 positive
- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and zolbetuximab-clzb for CLDN18.2 positive
- Fluoropyrimidine (fluorouracil or capecitabine) and oxaliplatin
- Fluoropyrimidine (fluorouracil or capecitabine), cisplatin, and pembrolizumab for PD-L1 positive
- Fluoropyrimidine (fluorouracil or capecitabine), cisplatin, and tislelizumab-jsgr for PD-L1 positive
- Fluoropyrimidine (fluorouracil or capecitabine) and cisplatin

For MSI-H/dMMR-positive tumors (independent of PD-L1 status):

- Pembrolizumab
- Dostarlimab-gxly
- Nivolumab and ipilimumab
- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and nivolumab
- Fluoropyrimidine (fluorouracil or capecitabine), oxaliplatin, and pembrolizumab

Other recommended

- Fluorouracil and irinotecan
- Paclitaxel with or without carboplatin or cisplatin
- Docetaxel with or without cisplatin
- Fluoropyrimidine (fluorouracil or capecitabine)
- Docetaxel, cisplatin or oxaliplatin, and fluorouracil

Used in some cases

- Entrectinib, larotrectinib, or repotrectinib for *NTRK* gene fusion-positive tumors

First-line systemic therapy options can be found in **Guide 7**.

Next-line systemic therapy options can be found in **Guide 8**.

Guide 8

Next-line systemic therapy options

Preferred options	<ul style="list-style-type: none">Ramucirumab and paclitaxelFam-trastuzumab deruxtecan-nxki for HER2-positiveDocetaxelPaclitaxelIrinotecanFluorouracil and irinotecanTrifluridine and tipiracil for third-line or later therapy
Other recommended	<ul style="list-style-type: none">RamucirumabIrinotecan and cisplatinFluorouracil, irinotecan, and ramucirumabIrinotecan and ramucirumabDocetaxel and irinotecan
Used in some cases	<ul style="list-style-type: none">Entrectinib, larotrectinib, or repotrectinib for <i>NTRK</i> gene fusion-positive tumorsPembrolizumab for MSI-H or dMMR tumorsNivolumab and ipilimumab for MSI-H or dMMR tumorsPembrolizumab for TMB-H tumors (10 or more mutations per megabase)Dostarlimab-gxly for MSI-H or dMMR tumorsDabrafenib and trametinib for <i>BRAF</i> V600E mutated tumorsSelpercatinib for <i>RET</i> gene fusion-positive tumors
Notes	<ul style="list-style-type: none">Leucovorin might be added to fluorouracil-based regimens depending on availability.

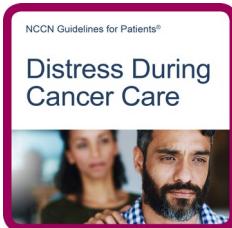
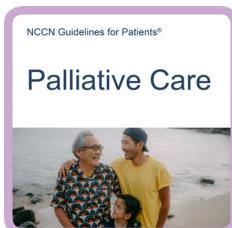
Supportive care

The goal of supportive care (also called palliative care) is to prevent and relieve pain and discomfort and provide the best quality of life for you. Supportive care includes treatment like those mentioned previously as well as complementary therapies for bleeding, blockages, pain, nausea, and vomiting.

Receiving supportive care is still treatment. You're actively choosing care to help you feel better. While the goal is different (relieving pain and discomfort), your wishes and opinions are just as important as they were with other treatment options.

If you have any questions about what your supportive care options are, don't hesitate to ask your care team. For more information, see *Chapter 10: Supportive care*. More on the topic can be found in *NCCN Guidelines for Patients: Palliative Care*. For more information on dealing with feelings and emotions that come with cancer care, see *NCCN Guidelines for Patients: Distress During Cancer Care*.

Both are available at [NCCN.org/
patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient
Guides for Cancer](#) app.



Keep a pain diary

A pain diary is a written record that helps you keep track of when you have pain, how bad it is, what causes it, and what makes it better or worse. Use a pain diary to discuss your pain with your care team. You might be referred to a specialist for pain management.

Include in your pain diary:

- ✓ The time and dose of all medicines
- ✓ When pain starts and ends or lessens
- ✓ Where you feel pain
- ✓ A description of your pain. Is it throbbing, sharp, tingling, shooting, or burning? Is it constant, or does it come and go?
- ✓ Does the pain change at different times of day? When?
- ✓ Does the pain get worse before or after meals? Does certain food or drink make it better?
- ✓ Does the pain get better or worse with activity? What kind of activity?
- ✓ Does the pain keep you from falling asleep at night? Does pain wake you up in the night?
- ✓ A rating of your pain from 0 (no pain) to 10 (worst pain you have ever felt)
- ✓ Does pain get in the way of you doing the things you enjoy?

Key points

- When stomach cancer comes back in the same place (or almost the same place), it's called locally advanced recurrence.
- Stomach cancer that has spread to distant sites in the body is called metastatic disease.
- Surgery might be a possibility for those with a locally advanced resectable tumor.
- For unresectable locally advanced recurrence, metastatic disease, or those who aren't having surgery, then treatment will focus on palliative management. This is care to manage symptoms, improve quality of life, and extend life.
- Options for managing recurrence and metastatic disease are based on your performance status. This is an estimate of a person's general level of fitness and ability to perform daily tasks.
- Supportive care is an option for anyone.
- First-line therapies are considered best to start with. Options are based on the systemic therapy you had before and your performance status.

Questions to ask

- Does the order of available treatments matter?
- When will I start treatment?
- What should I expect from treatment? What are the side effects?
- How much pain will I be in? What will be done to manage it?
- Can you help direct me to emotional support resources?

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Peritoneal carcinoma as only disease

71 Treatment options

73 Key points

73 Questions to ask

Peritoneal carcinoma as only disease is when stomach cancer spreads only to the peritoneum. This isn't common, but if it occurs new treatments might be able to help.

Sometimes stomach cancer spreads (metastasizes) only to the peritoneum. This is the tissue that lines the abdomen and covers most of your organs. When cancer spreads there but nowhere else, it's called peritoneal carcinoma as only disease. This might be found at laparoscopy or after neoadjuvant (preoperative) therapy. While this type of metastasis is serious and is stage 4 stomach cancer, newer ways of treating it have become available for some people.

Treatment options

One of those new treatments is called intraperitoneal chemotherapy (IC)/hyperthermic intraperitoneal chemotherapy (HIPEC) and it's performed with a gastrectomy as part of cytoreduction surgery (reducing the amount of cancer in the belly).

A complete cytoreduction surgery means removing all the cancerous tissue. An incomplete cytoreduction means some of the cancerous tissue remains after surgery. More information can be found in *Low PCI* ahead.

If you have the diagnosis of peritoneal carcinoma as only disease and have already had a workup with physical exam, staging with

imaging, and a diagnostic laparoscopy, you'll receive systemic therapy for at least 3 months.

See Guide 7 and Guide 8 in Chapter 8: Recurrence and metastatic cancer for the types of systemic therapy.

If you haven't had the workup yet (**Guide 1** in *Chapter 3: Testing for stomach cancer*), you'll have that before moving to systemic therapy.

After systemic therapy is completed for at least 3 months, your cancer will be restaged and include the following tests:

- CT scan
- Diagnostic laparoscopy with washings that document the peritoneal cancer index (PCI) with or without a biopsy
- FDG-PET/CT scan, if needed
- Upper gastrointestinal (GI) endoscopy, if needed

After restaging, your cancer will either be considered low PCI (which means stable or improved disease with no evidence of further spread) or high PCI (disease progression and there is spread outside of the peritoneum).

Guide 9 Possible treatment for peritoneal carcinoma as only disease

IC/HIPEC

Systemic therapy

Clinical trial

Supportive care

Low PCI

If you're diagnosed with low PCI, your care team will meet to discuss the next steps. If they think that complete cytoreduction (removing all the cancerous tissue) might be possible, then you'll have the following options:

- Participation in a clinical trial
- Gastrectomy with cytoreductive surgery and IC/HIPEC
- Continue systemic therapy

What is IC/HIPEC?

IC/HIPEC is a procedure that happens right after cytoreductive surgery. The way it works is by circulating high doses of a heated chemotherapy solution throughout the belly (to get to the peritoneum). It can get to places where traditional chemotherapy can't. But it's important to know that IC/HIPEC is still under investigation in clinical trials. So, the experts at NCCN recommend that IC/HIPEC should only be used in some cases and that you and your care team have a discussion to decide whether this is a good option for you.

But if your care team thinks a cytoreduction may be incomplete, then IC/HIPEC isn't recommended. If this is the case, you'll have one of these treatments:

- Participation in a clinical trial
- Continuing systemic therapy

High PCI

If the stomach cancer is considered high PCI (cancer progression that has spread outside of the peritoneum), your options include:

- Continuing systemic therapy
- Participation in a clinical trial
- Supportive care

Supportive care

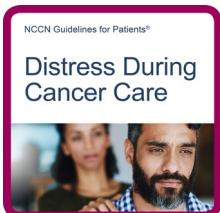
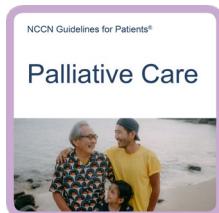
Supportive care (also known as palliative care) is care that can help you feel better at any stage of cancer. Supportive care can include surgery, medications, and complementary therapies for bleeding, blockages, pain, nausea, and vomiting, among other health issues.

A clinical trial is always an option for this stage of cancer.



Whatever treatment you decide on with your care team—or maybe you choose not to have further treatment and opt for supportive care—you are not alone. There is help and support available for you. For more information on supportive care, see *Chapter 10: Supportive care*.

More on the topic can be found in *NCCN Guidelines for Patients: Palliative Care*. For more information on dealing with feelings and emotions that come with cancer care, see *NCCN Guidelines for Patients: Distress During Cancer Care*. Both are available at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](https://www.nccn.org/patient-guides/cancer) app.



- Participation in a clinical trial is always an option with peritoneal carcinoma as only disease.
- Systemic therapy is always a possibility with peritoneal carcinoma as only disease.
- Supportive care is an option at any stage of cancer.

Questions to ask

- If I'm a candidate for IC/HIPEC, where can I get it done? Do I have to travel far?
- Would my insurance pay for IC/HIPEC?
- What are the chances that my cancer will return after having IC/HIPEC?
- How do I join a clinical trial?
- Will I be able to get other treatments if IC/HIPEC doesn't work for me?

Key points

- Peritoneal carcinoma as only disease is when stomach cancer spreads only to the peritoneum.
- Intraperitoneal chemotherapy (IC)/hyperthermic intraperitoneal chemotherapy (HIPEC) is given with a gastrectomy as part of cytoreduction surgery.
- A complete cytoreduction surgery means removing all the cancerous tissue.
- If you have a low peritoneal cancer index (PCI), you might receive IC/HIPEC as a treatment.

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Supportive care

75 Help with physical symptoms

78 Help with emotions

79 Help with financial issues

79 Help with end-of-life planning

81 What's next?

81 Key points

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At any point during your treatment for stomach cancer, you can receive supportive care. It's meant to help lessen symptoms you feel and promote your comfort.

Supportive care helps improve your quality of life during and after cancer treatment. The goal is to prevent or manage the symptoms of cancer and the side effects of cancer treatment, like pain and cancer-related fatigue. It also addresses the mental, social, and spiritual concerns faced by those with cancer. There are experts in supportive care who can provide these services so be sure to ask your care team about them.

Supportive care is available to everyone with cancer and their families, not just those at the end of life. Palliative care is another name for supportive care.

Supportive care can also help with:

- Making treatment decisions
- Coordinating your care
- Paying for care
- Planning for advanced care and end of life

Help with physical symptoms

When it comes to stomach cancer, supportive care can relieve major symptoms and side

effects and may even extend life. This is especially true when a multidisciplinary care team is involved throughout your cancer care. It's also why NCCN experts encourage supportive care.

Below are some ways that supportive care can help prevent, reduce, and/or relieve your symptoms and side effects:

Bleeding

Bleeding is common in patients with stomach cancer and can be from surgery, treatment, or both. Stopping it can help people with cancer feel better. Bleeding is considered either acute (sudden bleeding that lasts a short time) or chronic (bleeding that lasts a long time). Bleeding can be stopped through the following ways:

- **Endoscopic treatment:** This treatment uses an endoscope for injection therapy (injecting medicines to the area), mechanical therapy (moving small metal clips to close off the bleeding), having the area ablated (using heat to seal a bleeding vessel), or a combination of these methods.
- **Interventional radiology:** This is minimally invasive treatment that uses imaging tests to find bleeding and small tools to treat it. Interventional radiology can sometimes help stop bleeding when endoscopy isn't helpful or causes more bleeding. One example is angiography. In an angiography, a catheter (thin plastic tube) is inserted into a blood vessel through a small incision in the skin and guided to the area with the use of x-rays. Contrast dye is then injected through the tube to help show a clearer picture of the

bleeding on the x-ray, which is called an angiogram. Once the bleeding is found, the interventional radiologist can perform embolization (blocking blood flow) techniques to stop the bleeding.

- **Palliative gastrectomy:** This is a gastrectomy that isn't meant to cure the cancer but to relieve symptoms (like bleeding or a blockage) and improve quality of life for some patients.
- **External beam radiation therapy (EBRT):** This is a radiation treatment that's targeted at the bleeding area and has been proven to help both acute and chronic bleeding.

Blockage

When there is a blockage (obstruction) in the stomach, supportive care can come in the form of surgery, endoscopy, EBRT, or chemotherapy. These methods can also help reduce nausea and vomiting and help people get back to a normal diet.

Blocked esophagus

A tumor may block the esophagus, the esophagogastric junction (EGJ), or the stomach cardia. An esophageal stent is a tube that widens the esophagus so food can pass into the stomach.

Blocked stomach

A tumor may block food from passing out of your stomach and into the first part of the small intestine (duodenum). This blockage can cause pain, vomiting, weight loss, and other problems. Treatments for a blocked stomach include systemic therapy and radiation therapy, as well as the following:

- **Stent** – This is a metal or plastic tube that expands to keep the stomach open, allowing food to pass through.
- **Gastrostomy tube (G-tube)** – A G-tube is inserted through a cut in the abdomen and placed in the stomach. Food is given through this tube.
- **Stomach-duodenum bypass (gastrojejunostomy)** – A gastrojejunostomy is a surgery to reroute the path food takes from the stomach into the small intestine. The new path from the stomach will avoid (bypass) the blocked part of the duodenum. This surgery may also be done as a preventive measure if there's a high risk that your stomach may become blocked.

Pain

Pain is often a result of stomach cancer either due to surgery or side effects of cancer treatment.

Pain is also common in people with locally advanced and metastatic stomach cancer and in those who have a tumor causing a blockage. Severe abdominal pain can occur when the tumor grows into nearby nerves or presses against other organs. This pain is treated with around-the-clock medicine such as morphine

or other opioids (narcotics). Sometimes, non-narcotic medicines are used to treat pain.

Some people may benefit from palliative radiation therapy (EBRT), with or without systemic therapy, to help relieve pain. During this treatment, a radiation beam is focused on the tumor, not to cure it but to try to shrink it and lessen any pain.

Pain can also be helped with certain chemotherapy treatments, or even by removing a gastric stent, if one was used. Tell your care team about any pain or discomfort. You might meet with a palliative care specialist or with a pain specialist to manage pain.

Integrative medicine programs at hospitals and cancer centers can be personalized to help with your specific pain problems. These use complementary therapies, like massage, to help with pain. Ask your care team about them.

Nausea and vomiting

Nausea and vomiting are very common side effects of cancer treatment but can be controlled by using anti-nausea and anti-vomiting (antiemetic) medicines. Be sure to work closely with your care team if you're vomiting or feeling nauseated on a regular basis.

Poor appetite

Sometimes side effects from cancer or its treatment (such as surgery) might cause you to feel not hungry or sick to your stomach (nauseated). You might have a sore mouth. Healthy eating is important during treatment. It includes eating a balanced diet, as well as the right amount of food, and drinking enough

fluids, or altering the types of food you eat. A registered dietitian, who's an expert in nutrition and food, can help give you strategies to manage it. Speak to your care team if you have trouble eating or maintaining weight.

Diarrhea

Diarrhea is frequent and watery bowel movements. It can be a symptom of stomach cancer and a side effect of treatment. Your care team will tell you how to manage diarrhea. It's important to drink lots of fluids to prevent dehydration (when your body lacks enough water to function normally) that can happen because of diarrhea.

Fatigue

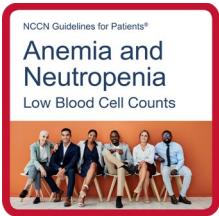
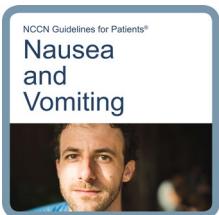
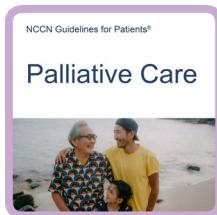
Fatigue is a feeling of extreme tiredness. It's common in stomach cancer. It could be caused by cancer or as a side effect of treatment. Let your care team know how you're feeling and if fatigue is getting in the way of doing the things you enjoy. Eating a balanced diet, exercise, yoga, acupuncture, massage therapy, and some medications, can help. You might be referred to a nutritionist or dietitian to help you manage your fatigue.

Neuropathy

Neuropathy is damage to the nerves that causes pain, numbness, tingling, swelling, or muscle weakness in different parts of the body. Peripheral neuropathy (neuropathy in the hands and feet) may be caused by cancer or cancer treatment. Neuropathy may lessen or go away after treatment is completed, but sometimes the condition can last for weeks to years. Your care team can help you manage neuropathy with medicines and refer you to

occupational therapy or physical therapy, if needed.

More information on the physical aspects of supportive care is available at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



Help with emotions

Depression, anxiety, fear, and distress are very common feelings for people with cancer. These feelings can make it harder to deal with cancer and cancer treatment. They can hold you back even when you want to move forward.

Getting help when you're feeling worried or hopeless is an important part of cancer care. And if you have a caregiver, this could apply to them, too. If you're both feeling anxious or overwhelmed, ask your care team for help.

Part of asking for help could also mean talking to other people like you who are going through the same type of cancer. Often the best advice comes from others who've been there. And there are dozens of online and in-person

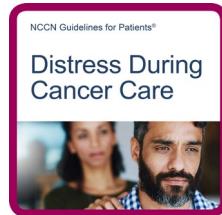
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From a patient's perspective, having a combination of a supportive team of medical professionals and the experiences from other patients gives one a sense of confidence and control that is invaluable when it comes to making decisions about their treatment options.”

support groups available where you can share your feelings and worries or anything on your mind. Most cancer centers have patient-to-patient peer support groups. Don't hesitate to ask your care team (like a social worker or a behavioral health expert) to recommend support groups or do an online search of groups that meet near you or others that might meet virtually.

Or, if you're looking for spiritual help and guidance, ask your care team about any resources for that, too.

For more information on dealing with feelings and emotions that come with cancer care, see *NCCN Guidelines for Patients: Distress During Cancer Care* available at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



Help with financial issues

Going through cancer treatment is stressful enough without having to worry about paying for it. Even if you have health insurance, it doesn't always cover everything. And you might have to be out of work for treatment and not getting paid. Maybe you're having trouble paying for food, housing, transportation, medical bills, or other bills because of your cancer care expenses. But if you have any worries over the financial aspect of your care, be sure to talk to your care team. They can direct you to social workers or to programs at your health care center or elsewhere that might be able to help you pay for some of these expenses. Be sure to check out some of the resources in the next chapter, too.

Help with end-of-life planning

When cancer is diagnosed very late or keeps progressing despite all treatment efforts, it may be time to consider what lies ahead. This exploration of what's important to you is called **advance care planning**.

Advance care planning is for everyone, not just for those who are very sick. Even when cancers are curable, talking about future scenarios should begin when starting treatment. And you might hear the term "goals of care." This means having an understanding with your care team about your wishes and expectations about your treatment. It's important especially if the cancer progresses.

Advance care planning means deciding what care you would want if you become unable to make medical decisions for yourself. It helps ensure that your wishes are understood and respected. The focus is on you receiving the best possible care at the end of your life. Patients with incurable cancer can set up an advance care plan early on to feel less stressed and better able to cope with their condition.

The advance care planning process starts with an open and honest discussion with your care team about your prognosis—what you may experience in the coming months—and the medications or therapies that may give you the best quality of life. Quality of life refers to a person's overall enjoyment of life, including their sense of well-being and ability to participate in their usual activities.

This discussion should include your spouse or partner and other loved ones who are likely to be with you at the end.

Advance directive

You can decide if there is a point where you might want to stop cancer treatment. You can also decide what treatments you would want for symptom relief.

Once you've made these decisions, you'll fill out a legal document that explains what you want to be done if you aren't able to tell your care team yourself. This document is called an advance directive. Doctors are required to follow the instructions in an **advance directive** when you're too ill to make decisions about your care.

Tell your care team and family about your advance directive and its contents. Give a copy of your advance directive to all your providers. Make sure you give a copy to anyone you've authorized to make decisions on your behalf (health care proxy). If your family or loved ones disagree with your plan, speak to your care team. Sometimes they or other specialists can help you and your family navigate these difficult conversations.

You can change your advance care plan at any time. Frequent conversations with your care team can help.

End-of-life considerations

End-of-life care provides medical, psychological, and spiritual support for people who are close to the end of life as well as the people who love them. The goal is comfort, not a cure. It may also be called comfort care or hospice.

Note that hospice is a special kind of end-of-life care. Hospice refers specifically to an insurance benefit for people whose life expectancy is 6 months or less. Hospice supports those at the end of life by bringing in additional care providers and resources such as home care.

The goal of end-of-life care is to give people the best life possible with the time they have left. Care can be provided in your home, a hospice facility, or even in the hospital. A major goal is to keep you pain-free and make sure that you can leave this world comfortably and with dignity. Hospice doctors, nurses, social workers, and chaplains are experts in helping patients work through the spiritual and emotional challenges of coping with the end of life.

Providing support for family members is a key part of hospice care. Most programs offer counseling and support groups for family members, including support after the person has died. This is referred to as bereavement. It

Supportive care is available at any stage of cancer treatment. It can involve help with physical, emotional, financial, and end-of-life planning. Your care team is there to help you through it all.



can be very comforting to know that your loved ones will have that kind of support after you're gone.

What's next?

Understanding that supportive care is there for you throughout your cancer care, and asking for it, could make a big difference for you. But after you finish your treatment, there might be other health issues to consider. Read the next chapter for more information on what you might expect after treatment.

Key points

- Supportive care is also referred to as palliative care.
- Supportive care can help with physical symptoms like bleeding, blockages, pain, as well as nausea and vomiting.
- Emotional support is also part of supportive care. All you need to do is ask your care team about it.
- Cancer and its treatment can be expensive. Supportive care can also help you find programs that might be able to pay for some of these costs.
- Part of supportive care can include plans and discussions about end-of-life care.
- Hospice care helps at the end of life by providing extra support and resources.
- The goal of end-of-life care is to give people the best quality of life possible with the time they have left.



We want your feedback!

Our goal is to provide helpful and easy-to-understand information on cancer.

Take our survey to let us know what we got right and what we could do better.

NCCN.org/patients/feedback

Questions to ask

- Can you tell me all about my supportive care options (both physical and emotional)?
- Is there one care team member whom I should call first about supportive care?
- If I need transportation to and from appointments, can you suggest any programs that might help?
- What supportive care resources can you suggest that might help me at my health care facility?
- What resources can you recommend that are online?

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After treatment

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After your treatment, you'll be checked for any new or ongoing health concerns. This is a time when it's especially helpful to speak up about any symptoms you're experiencing.

Stomach cancer treatment can cause long-term side effects (those that occur during or shortly after treatment and last for months or years) and late effects (side effects that occur months or years after a disease is diagnosed or after treatment has ended). Still, it's encouraging to know that these side effects can be managed with a variety of medicines and strategies.

After your care is completed, you'll have regular visits with your provider to check on your health. Don't hesitate to let your provider know of any ongoing and new issues at each visit.

Monitoring

In addition to monitoring for the possible return of cancer (recurrence), seek routine medical care with a primary care provider you trust. This includes regular visits for preventive care. Routine stomach cancer-specific tests such as imaging, endoscopy, or tumor tests are recommended up until 5 years after treatment ends. It's important to keep any follow-up care team visits and imaging test appointments.

Cancer screenings

Schedule cancer screenings and vaccinations as recommended by your provider based on your age, risk, and other factors. See your provider regularly for checkups and cancer screenings, which may include screenings for skin, breast, prostate, colorectal, and other types of cancer.

Long-term and late side effects

Stomach cancer survivors are checked for long-term and late side effects. The good news is there is help for side effects, but you have to let your care team know about them.

Blind loop syndrome

Blind loop syndrome happens when food doesn't move normally through a section of your intestines, often as a result of having a gastrectomy. This can create a "blind loop" where food gets stuck and can cause bacteria to build up resulting in diarrhea, nausea, and weight loss. It's usually treated with antibiotics. But a diet high in protein and low in carbohydrates might help. So, talk to your care team if you're feeling these symptoms.

Bone health

You'll be screened regularly for low bone density (osteopenia/osteoporosis). You may receive medicine to manage low bone density. In addition, your provider may consider vitamin D testing as needed. Talk to your provider before taking any over-the-counter (OTC) supplements, vitamins, or medicines.

Diarrhea

Diarrhea is frequent and watery bowel movements. Your care team will tell you how to manage diarrhea and may recommend medicines to stop the diarrhea. It's important to drink lots of fluids to prevent dehydration (losing too much fluid or water from your body). Changes to your diet might help, too.

Dumping syndrome

Dumping syndrome is when food travels from the stomach and empties too fast in the small intestine. It's a common side effect of surgery on your stomach. This may happen within 30 minutes after eating a meal (early dumping syndrome) or within 2 to 3 hours of eating (late dumping syndrome).

Symptoms of early dumping syndrome include heart racing/pounding, diarrhea, nausea, and cramps. Late dumping syndrome tends to cause dizziness, hunger, cold sweats, and faintness.

To help manage the symptoms of dumping syndrome:

- Eat often throughout the day
- Avoid drinking fluids with meals
- Eat a diet high in protein and fiber and low in simple carbohydrates and sugars

Fatigue

Fatigue is feeling extremely tired and having no energy to do things you'd like to do. Let your care team know if fatigue is affecting your quality of life. Eating a balanced diet, exercise, yoga, acupuncture, and massage therapy can

help. You might be referred to a nutritionist or dietitian to help you manage fatigue.

Fullness after meals

Eat small portions and eat more often to cope with feeling full after meals. Also, avoid drinking fluids with meals as it can make you feel fuller. Continue to drink fluids between meals.

Indigestion

Indigestion is feeling pain or discomfort in the upper abdomen (belly) after eating. It can feel like fullness, bloating, gassiness, heartburn, or nausea.

To prevent indigestion:

- Avoid foods that increase acid production such as citrus juices, tomato sauces, and spicy foods.
- Avoid foods like caffeine, peppermint, and chocolate that decrease gastroesophageal sphincter tone (the muscular tension or pressure of the area).

Low iron

Low iron levels can cause too few healthy red blood cells in the body, which is a condition called anemia. You'll be checked for low levels of iron, called an iron deficiency. A complete blood count (CBC) and iron levels should be done at least once a year. You may be given iron supplements, if needed. But certain iron supplements might need to be avoided. Ask your provider for more information.

Low vitamin B12

B12 is a vitamin that helps your body make red blood cells. If you had a gastrectomy, you may not be getting enough vitamin B12 from food that you eat. So, you'll be checked for low levels of vitamin B12, which is called vitamin B12 deficiency. A CBC and B12 levels should be done every 3 months for up to 3 years, then every 6 months for up to 5 years, and once a year after 5 years. You may be given vitamin B12 supplements, if needed.

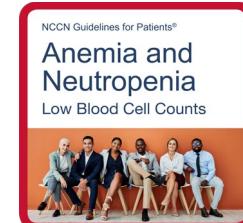
Neuropathy

Neuropathy happens as a result of damage to the nerves. It feels like prickling, tingling, numbness, and pain. Neuropathy caused by chemotherapy is called chemotherapy-induced neuropathy. Peripheral neuropathy is nerve damage in the hands and feet. You might be given medicines to deal with it or referred to occupational therapy and/or physical therapy.

Weight loss/lack of appetite

After a gastrectomy, your weight will be checked for changes. Healthy eating is important after treatment. It includes eating a balanced diet, eating the right amount of food, and drinking enough fluids. Eat often and avoid fluids with meals. A registered dietitian, who's an expert in nutrition and food, can help if you have trouble eating or maintaining weight.

More information on fatigue and anemia is available at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



Survivorship

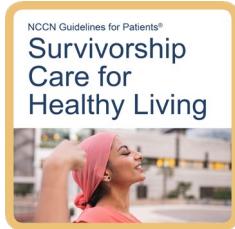
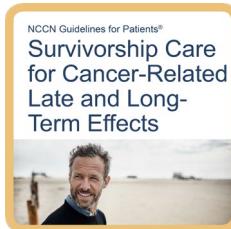
A person is a cancer survivor from the time of diagnosis until the end of life. When treatment leads to remission (no evidence of disease), you'll need follow-up or survivorship care for long-term side effects and late effects.

Seek out peer support groups, either online or in person, to help with managing your feelings and emotions. Ask your cancer center about a patient-to-patient peer support program.

In general:

- Keep a healthy weight for your body throughout life.
- Adopt a physically active lifestyle and avoid inactivity. Aim for at least 30 minutes of exercise (that boosts your heart rate) most days of the week.
- Eat a mostly plant-based diet.
- Limit alcohol use.
- If you smoke or vape, seek help to quit.

More information on survivorship is available at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



For more information on quitting smoking, read *NCCN Guidelines for Patients: Quitting Smoking* at [NCCN.org/patientguidelines](https://www.NCCN.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



Key points

- Surgery to remove all or part of your stomach can cause health problems.
- Your health will be monitored on a regular basis.
- There are treatments for long-term side effects.
- A nutritionist or dietician provides guidance on what foods are best for your condition.
- Continue to see your primary health care provider on a regular basis and have preventive cancer screenings as recommended by your provider.
- Keep a healthy body weight and active lifestyle.
- Eat a plant-based diet.
- Avoid smoking and alcohol.

Questions to ask

- What changes will I need to make to my diet after surgery? How can I prepare?
- What changes should I make to my diet now?
- Who can help me with meal planning?
- Should I keep a food diary?
- I often do not feel well enough to cook or prepare meals. What do you recommend?

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Other resources

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89 Questions to ask

Want to learn more? Here's how you can get additional help.

What else to know

This book can help you improve your cancer care. It plainly explains expert recommendations and suggests questions to ask your care team. But it's not the only resource that you have.

You're welcome to receive as much information and help as you need. Many people are interested in learning more about:

- The details of stomach cancer and its treatment
- Being a part of a care team
- Getting financial help
- Finding a care provider who's an expert in their field
- Coping with side effects and other health problems

What else to do

Your health care center can help you with next steps. They often have on-site resources to help meet your needs and find answers to your questions. Health care centers can also inform you of resources in your community.

In addition to help from your providers, the resources listed in the next section provide support for many people like yourself. Look through the list and visit the provided websites to learn more about these organizations.

Where to get help

Bag It

Bagitcancer.org

CancerCare

Cancercare.org

Cancer Survivor Care

Cancersurvivorcare.org

Debbie's Dream Foundation: Curing Stomach Cancer

Debbiesdream.org

GRACE

Cancergrace.org

Hope for Stomach Cancer

Stocan.org

Imerman Angels
Imermanangels.org

My Faulty Gene
Myfaultygene.org

National Coalition for Cancer Survivorship
Canceradvocacy.org

No Stomach for Cancer
Nostomachforcancer.org

TargetCancer Foundation
Targetcancer.org

Triage Cancer
Triagecancer.org

Questions to ask

- Who can I talk to about help with housing, food, and other basic needs?
- What assistance is available for transportation, childcare, and home care?
- How much will I have to pay for treatment?
- What help is available to pay for medicines and other treatment?
- What other services are available to me and my caregivers?



Words to know

abdomen

The belly area between the chest and pelvis.

adenocarcinoma

A cancer that starts in the mucus-making cells of the body.

biopsy

A procedure that removes fluid or tissue samples to be tested for a disease.

cancer stage

A rating of the growth and spread of cancer.

chemoradiation

Treatment that combines chemotherapy with radiation therapy.

chemotherapy

Drugs that kill fast-dividing cells throughout the body, including cancer cells and some normal cells.

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.

computed tomography (CT)

A test that combines many x-rays to make pictures of the inside of the body.

contrast

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

deoxyribonucleic acid (DNA)

A chain of chemicals in cells that contains coded instructions for making and controlling cells.

digestive system

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

digestive tract

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

duodenum

First part of the small intestine.

early-stage cancer

Cancer that has had little or no growth into nearby tissues.

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 (ER)

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

Cells that line the stomach wall.

esophagogastric junction (EGJ)

The area where the esophagus and stomach join.

esophagus

The tube-shaped organ between the throat and stomach.

fine-needle aspiration (FNA)

Removal of a tissue sample with a thin needle.

gastrectomy

A surgery that removes part or all of the stomach.

gastroenterologist

A doctor who's an expert in digestive diseases.

gastrointestinal (GI) tract

The group of organs through which food passes after being eaten. Also called digestive tract.

gastrostomy tube (G-tube)

A tube inserted through the wall of the abdomen directly into the stomach and can be used to give drugs and liquids, including liquid food.

gene

Coded instructions in cells for making new cells and controlling how cells behave.

genetic counseling

Expert guidance on the chance for a disease that is passed down in families.

hereditary

Passed down from biological parent to child through coded information in cells.

histology

The structure of cells, tissue, and organs as viewed under a microscope.

human epidermal growth factor receptor 2 (HER2)

A protein on the surface of a cell that sends signals for the cell to grow.

imaging

A test that makes pictures (images) of the insides of the body.

immune system

The body's natural defense against infection and disease.

immunotherapy

A treatment with drugs that help the body find and destroy cancer cells.

infection

An illness caused by germs.

interventional radiologist

A doctor who is an expert in imaging tests and using image-guided tools to perform minimally invasive techniques to diagnose or treat disease.

intestine

The organ that food passes through after leaving the stomach.

intravenous (IV)

A method of giving drugs by a needle or tube inserted into a vein.

jejunostomy tube (J-tube)

A feeding tube that is inserted through a cut into the intestine as part of a jejunostomy.

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 disease-fighting cells located throughout the body.

Words to know

lymph node dissection

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

magnetic resonance imaging (MRI)

A test that uses radio waves and powerful magnets to make pictures of the insides of the body.

medical oncologist

A doctor who's an expert in treating cancer with drugs.

metastasis

The spread of cancer cells from the first (primary) tumor to a new site.

microsatellite instability (MSI)

Errors made in small, repeated DNA parts during the copy process because of an abnormal repair system.

microsatellite instability-high (MSI-H)

Mutations in 30% or more microsatellites.

minimally invasive procedure

A procedure that uses small incisions or a tool placed into the opening of the body to reduce damage to body tissue.

mucosa

The first, inner layer of the stomach wall.

mucus

A sticky, thick liquid that moisturizes or lubricates.

muscularis mucosae

A thin layer of muscle separating the mucosa from the submucosa of the stomach wall.

muscularis propria

The third layer of the stomach wall made mostly of muscle.

mutation

An abnormal change.

pathological stage

A rating of the extent of cancer based on microscopic review after treatment.

pathologist

A doctor who's an expert in examining tissue and cells to find disease.

pelvis

The area of the body between the hip bones.

peritoneum

The membrane that lines the abdominal wall and covers most of the organs in the abdomen.

positron emission tomography (PET)

A test that uses radioactive material to see the shape and function of body parts.

primary treatment

The main treatment used to rid the body of cancer.

prognosis

The likely course and outcome of a disease based on tests.

radiation oncologist

A doctor who's an expert in radiation treatment.

radiation therapy

A treatment that uses high-energy rays.

radiologist

A doctor who is an expert in imaging tests.

recurrence

The return of cancer after a cancer-free period.

resectable

Cancer that can be removed with surgery.

risk factor

Something that increases the chance of getting a disease.

Words to know

serosa

The outer lining of organs within the abdominal cavity, including the stomach. Also called serous membrane.

side effect

An outcome of a treatment that is unwanted or unpleasant.

small intestine

The digestive organ that absorbs nutrients from eaten food.

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.

subtype

A smaller group within a type of cancer that is based on certain cell features.

supportive care

Health care that includes symptom relief but not cancer treatment. Also called palliative care or best supportive care.

surgical margin

The normal-looking tissue around the edge of a tumor that is removed during surgery.

surgical oncologist

A surgeon who's an expert in performing surgical procedures in patients with cancer.

targeted therapy

Drugs that stop the growth process specific to cancer cells.

tumor

An abnormal mass of cells.

tumor marker

A substance found in body tissue or fluid that may be a sign of cancer.

ultrasound

A test that uses sound waves to take pictures of the insides of the body.

unresectable

Cancer that can't be removed by surgery.

upper GI endoscopy

Use of a thin tool guided down the throat into the esophagus and stomach.

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NCCN Cancer Centers

Abramson Cancer Center
at the University of Pennsylvania
Philadelphia, Pennsylvania
800.789.7366 • pennmedicine.org/cancer

Case Comprehensive Cancer Center/
University Hospitals Seidman Cancer Center and
Cleveland Clinic Taussig Cancer Institute
Cleveland, Ohio
UH Seidman Cancer Center
800.641.2422 • uhhospitals.org/services/cancer-services
CC Taussig Cancer Institute
866.223.8100 • my.clevelandclinic.org/departments/cancer
Case CCC
216.844.8797 • case.edu/cancer

City of Hope National Medical Center
Duarte, California
800.826.4673 • cityofhope.org

Dana-Farber/Brigham and Women's Cancer Center |
Mass General Cancer Center
Boston, Massachusetts
877.442.3324 • youhaveus.org
617.726.5130 • massgeneral.org/cancer-center

Duke Cancer Institute
Durham, North Carolina
888.275.3853 • dukecancerinstitute.org

Fox Chase Cancer Center
Philadelphia, Pennsylvania
888.369.2427 • foxchase.org

Fred & Pamela Buffett Cancer Center
Omaha, Nebraska
402.559.5600 • unmc.edu/cancercenter

Fred Hutchinson Cancer Center
Seattle, Washington
206.667.5000 • fredhutch.org

Huntsman Cancer Institute at the University of Utah
Salt Lake City, Utah
800.824.2073 • healthcare.utah.edu/huntsmancancerinstitute

Indiana University Melvin and Bren Simon
Comprehensive Cancer Center
Indianapolis, Indiana
888.600.4822 • www.cancer.iu.edu

Johns Hopkins Kimmel Cancer Center
Baltimore, Maryland
410.955.8964
www.hopkinskimmelcancercenter.org

Mayo Clinic Comprehensive Cancer Center
Phoenix/Scottsdale, Arizona
Jacksonville, Florida
Rochester, Minnesota
480.301.8000 • *Arizona*
904.953.0853 • *Florida*
507.538.3270 • *Minnesota*
mayoclinic.org/cancercenter

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

Moffitt Cancer Center
Tampa, Florida
888.663.3488 • moffitt.org

O'Neal Comprehensive Cancer Center at UAB
Birmingham, Alabama
800.822.0933 • uab.edu/onealcancercenter

Robert H. Lurie Comprehensive Cancer Center
of Northwestern University
Chicago, Illinois
866.587.4322 • cancer.northwestern.edu

Roswell Park Comprehensive Cancer Center
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
866.278.5833 • stjude.org
901.448.5500 • uthsc.edu

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

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

The UChicago Medicine Comprehensive Cancer Center
Chicago, Illinois
773.702.1000 • uchicagomedicine.org/cancer

The University of Texas MD Anderson Cancer Center
Houston, Texas
844.269.5922 • mdanderson.org

UC Davis Comprehensive Cancer Center
Sacramento, California
916.734.5959 • 800.770.9261
health.ucdavis.edu/cancer

UC San Diego Moores Cancer Center
La Jolla, California
858.822.6100 • cancer.ucsd.edu

UCLA Jonsson Comprehensive Cancer Center
Los Angeles, California
310.825.5268 • uclahealth.org/cancer

UCSF Helen Diller Family
Comprehensive Cancer Center
San Francisco, California
800.689.8273 • cancer.ucsf.edu

University of Colorado Cancer Center
Aurora, Colorado
720.848.0300 • coloradocancercenter.org

University of Michigan Rogel Cancer Center
Ann Arbor, Michigan
800.865.1125 • rogelcancercenter.org

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

UT Southwestern Simmons
Comprehensive Cancer Center
Dallas, Texas
214.648.3111 • utsouthwestern.edu/simmons

Vanderbilt-Ingram Cancer Center
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877.936.8422 • vicc.org

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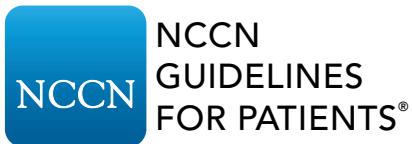


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