



[cancer.org](https://www.cancer.org) | 1.800.227.2345

Treating Gastrointestinal Stromal Tumors

If you've been diagnosed with a gastrointestinal stromal tumor (GIST), your cancer care team will discuss your treatment options with you. It's important to weigh the benefits of each treatment option against the possible risks and side effects.

Which treatments are used for GISTs?

Types of treatment for GIST include:

- [Surgery for Gastrointestinal Stromal Tumors](#)
- [Targeted Drug Therapy for Gastrointestinal Stromal Tumors](#)
- [Ablation and Embolization to Treat Gastrointestinal Stromal Tumors](#)
- [Chemotherapy for Gastrointestinal Stromal Tumors](#)
- [Radiation Therapy for Gastrointestinal Stromal Tumors](#)

Common treatment approaches

Not all GISTs need to be treated right away. But if treatment is needed, the main types used are surgery and targeted therapy. Other treatments, such as ablation, embolization, chemotherapy, and radiation, are used less often.

- [Typical Treatment Options for Gastrointestinal Stromal Tumors](#)

Who treats GISTs?

The treatment of GISTs can be complex, so it's important to be evaluated and treated by a team of doctors who have experience with this type of cancer. You might have

different types of doctors on your treatment team, including:

- A **surgical oncologist**: a doctor who treats cancer with surgery
- A **medical oncologist**: a doctor who treats cancer with medicines
- A **gastroenterologist**: a doctor who specializes in treating diseases of the gastrointestinal (digestive) system
- A **radiation oncologist**: a doctor who treats cancer with radiation therapy

You might have many other specialists on your treatment team as well, including physician assistants (PAs), nurse practitioners (NPs), nurses, nutrition specialists, social workers, rehabilitation specialists, psychologists, and other health professionals.

- [Health Professionals Associated with Cancer Care](#)

Making treatment decisions

It's important to discuss all treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. Some important things to consider include:

- Your age and overall health
- The location and stage of your tumor
- The likelihood that treatment will cure your tumor (or help in some other way)
- Your feelings about the possible side effects from treatment

You may feel that you need to decide quickly, but it's important to give yourself time to absorb the information you have learned. It's also very important to ask questions if there is anything you're not sure about.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Integrative Medicine](#)

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and can be an important part of your care. These might include nursing or social work services,

financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Palliative Care](#)
- [Find Support Programs and Services in Your Area](#)

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors and you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.

Surgery for Gastrointestinal Stromal Tumors

Surgery is usually the main treatment for gastrointestinal stromal tumors (GISTs) that haven't spread. The goal of the surgery is to remove all of the cancer.

The type of surgery needed depends on the location and size of the tumor.

Surgery for small GISTs

If the tumor is small, it often can be removed along with a small area of normal tissue around it. This is done through a cut (incision) in the skin. Unlike many other cancers, GISTs almost never spread to the lymph nodes, so removing nearby lymph nodes is usually not needed.

For some small cancers, “keyhole” (laparoscopic) surgery is an option. Instead of making a large incision in the skin to remove the tumor, several small ones are used. The surgeon inserts a thin, lighted tube with a tiny video camera on the end (a laparoscope) through one of them. This lets them see inside the belly. Long, thin surgical tools are then used through the other incisions to remove the tumor. Because the incisions are small, patients usually recover more quickly from this type of surgery than from traditional surgery that requires a longer incision.

Surgery for larger GISTs

If the tumor is large or growing into other organs, the surgeon might still be able to remove it entirely. To do this, parts of organs (such as a section of the intestines) might need to be removed. The surgeon might also remove tumors that have spread elsewhere in the abdomen, such as the liver.

Another option for tumors that are large or have grown into nearby areas might be to take the [targeted drug](#) imatinib (Gleevec) first, typically for at least several months. This is called neoadjuvant treatment and can often shrink the tumor, making it easier to remove with surgery.

Surgery for metastatic GISTs

Surgery is not a common treatment for a GIST that has spread (metastasized) to other parts of the body. [Targeted therapy drugs](#) are usually the first option for metastatic GISTs. But if there are no more than a few metastatic tumors and they respond well to targeted therapy, some doctors might advise surgery to remove them. No large studies have been done to show how helpful this is, but it might be an option. If your doctor offers this surgery, be sure you understand the goals and possible side effects.

If the tumors are in the liver and would be hard to remove, other options might include different types of local treatments, such as [ablation or embolization](#).

Choosing your surgeon

No matter what type of surgery is done, it's very important that it is done by a surgeon experienced in treating GISTs. GISTs are often delicate tumors, and surgeons must be careful not to open the outer lining that surrounds them (known as the **capsule**), because it might increase the risk of spreading the cancer. GISTs also tend to have a lot of blood vessels, so your surgeon has to be careful to control any bleeding from the tumor.

For more information about finding a surgeon, see [Where to Find Cancer Care](#)¹.

More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)².

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)³.

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/choosing-your-treatment-team/where-to-find-cancer-care.html
2. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html
3. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html

References

Casali PG, Dei Tos AP, Gro93tcp0.62745 RG 0.75 w effectCh0 0 rg 0.a872 200.63 Tm /F- 0:9oeffects

<https://www.uptodate.com/contents/local-treatment-for-gastrointestinal-stromal-tumors-leiomyomas-and-leiomyosarcomas-of-the-gastrointestinal-tract> on October 17, 2019.

National Cancer Institute. Physician Data Query (PDQ). Gastrointestinal Stromal Tumors Treatment. 2018. Accessed at www.cancer.gov/types/soft-tissue-sarcoma/hp/gist-treatment-pdq on October 17, 2019.

National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Soft Tissue Sarcoma. V.4.2019. Accessed at www.nccn.org/professionals/physician_gls/pdf/sarcoma.pdf on October 17, 2019.

Last Revised: December 1, 2019

Ablation and Embolization to Treat Gastrointestinal Stromal Tumors

If a gastrointestinal stromal tumor (GIST) has spread to the liver, treatments such as ablation and embolization might be used, especially if [surgery](#) can't be done to remove the tumors.

Ablation

Ablation is the destruction of tumors using extreme heat or cold, or using chemicals. It can sometimes be used to destroy GISTs that have spread as no more than a few small tumors in the liver. Because ablation often destroys some of the normal tissue around the tumor, it might not be a good choice for treating tumors near important structures like major blood vessels, the diaphragm (the thin breathing muscle above the liver), or major ducts in the liver.

There are several types of ablation:

- **Radiofrequency ablation (RFA)**, which uses high-energy radio waves to heat the tumor and destroy cancer cells
- **Ethanol (alcohol) ablation**, where concentrated alcohol is injected directly into the tumor to kill cancer cells

- **Microwave thermotherapy**, where microwaves transmitted through a probe placed in the tumor are used to heat and destroy the cancer cells
- **Cryosurgery (cryotherapy)**, which destroys a tumor by freezing it using a thin metal probe. This method sometimes requires general anesthesia (you are in a deep sleep and not able to feel pain)

The main type of embolization used to treat GISTs that have spread to the liver is arterial embolization (also known as **trans-arterial embolization or TAE**). In this procedure, a catheter (a thin, flexible tube) is put into an artery through a small cut in the inner thigh and threaded up into the hepatic artery in the liver. A dye is usually injected into the bloodstream at this time to help the doctor see the path of the catheter via angiography, a special type of x-ray. Once the catheter is in place, small particles are injected into the artery to plug it up.

Embolization can also be done by injecting tiny radioactive spheres into the hepatic artery (**radioembolization**), or by giving chemo directly into the artery just before plugging it up (**chemoembolization**). But it's not clear that either of these techniques is better than TAE.

This procedure might be done with general anesthesia (where you are in a deep sleep) or with conscious sedation (where you are awake but sleepy and should not feel any pain). Typically, you won't have to stay overnight in the hospital for an embolization procedure.

Possible side effects of embolization

Possible complications after embolization include abdominal (belly) pain, fever, nausea, infection in the liver, gallbladder inflammation, and blood clots in the main blood vessels of the liver. Because healthy liver tissue can be affected, there is a risk that liver function will get worse after treatment. This risk is higher if a large branch of the hepatic artery is embolized. Serious complications are not common, but they are possible.

References

Casali PG, Dei Tos AP, Gronchi A. Chapter 60: Gastrointestinal Stromal Tumor. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Morgan J, Raut CP. Local treatment for gastrointestinal stromal tumors, leiomyomas, and leiomyosarcomas of the gastrointestinal tract. UpToDate. 2019. Accessed at <https://www.uptodate.com/contents/local-treatment-for-gastrointestinal-stromal-tumors-leiomyomas-and-leiomyosarcomas-of-the-gastrointestinal-tract> on October 17, 2019.

National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines

tumors returning (based on the tumor's size, location, and mitotic rate).

- For larger tumors that may be hard to remove, imatinib may be used first to try to shrink the tumor and make surgery easier. This is known as **neoadjuvant therapy**. Imatinib is often given again after surgery as well, typically for at least 2 years.
- Imatinib is usually the treatment of choice for **advanced GISTs** that have spread too far to be removed by surgery. While it's unlikely to cure these tumors, it can often shrink or slow their growth for several years, helping people live longer and feel better. If the drug stops working and the tumor starts growing again, raising the dose of imatinib may help slow the growth for some time, but higher doses can also have more side effects.

Side effects of imatinib can include mild stomach upset, diarrhea, muscle pain, and skin rashes. The stomach upset is lessened if the drug is taken with food. Imatinib can also make people retain fluid. Often this causes some swelling in the face (around the eyes) or in the ankles. The drug rarely can cause more severe problems, such as fluid building up in the lungs or in the abdomen. It can also affect heart function in some people.

One other concern when using this drug to treat large GISTs is that these tumors often have a lot of fragile blood vessels. If imatinib causes the tumor to shrink quickly, it could lead to internal bleeding. For this reason, doctors watch patients carefully when they first start taking this drug.

Sunitinib (Sutent)

This drug can be useful in treating GISTs if imatinib is no longer working or if a person can't take imatinib

Regorafenib can be used to treat advanced GISTs if imatinib and sunitinib stop working, or if a person can't take these drugs for some reason. This drug targets many proteins, including KIT and PDGFRA.

Regorafenib can slow tumor growth and even shrink some tumors, although it's not clear if it can help people live longer.

Common **side effects of regorafenib** include belly pain, diarrhea, feeling tired or weak, mouth or throat irritation, fever, loss of appetite, and weight loss. Less common but more serious side effects can include infections, high blood pressure, heart problems, serious bleeding, trouble with wound healing, holes forming in the wall of the stomach or intestines, severe rashes, and problems with redness, pain, or even blistering of the palms of the hands and soles of the feet (called **hand-foot syndrome**).

Ripretinib (Qinlock)

Ripretinib is typically used to treat advanced GISTs if other TKIs such as imatinib, sunitinib, and regorafenib are no longer helpful, or if a person can't take these drugs for some reason. This drug targets many kinase proteins, including KIT and PDGFRA.

Ripretinib can slow tumor growth and even shrink some tumors, although it's not yet clear if it can help people live longer.

Common **side effects of ripretinib** can include hair loss, nausea and vomiting, loss of appetite, diarrhea or constipation, feeling tired, and muscle or belly pain. Less common but more serious side effects can include high blood pressure, an increased risk of new skin cancers, heart problems, trouble with wound healing, and problems with redness, pain, or even blistering of the palms of the hands and soles of the feet (called **hand-foot syndrome**).

Avapritinib (Ayvakit)

This is another TKI that targets PDGFRA and KIT, as well as several other proteins.

Avapritinib is used mainly to treat advanced GISTs whose cells have a change in the *PDGFRA* gene known as an **exon 18 mutation**. These cancers typically don't respond well to treatment with the TKIs above.

Common **side effects of avapritinib** can include swelling or fluid retention, fatigue, nausea and vomiting, loss of appetite, diarrhea or constipation, increased tears in the eyes, hair color changes, belly pain, rash, and dizziness.

More serious side effects can include bleeding in the brain, as well as central nervous system (CNS) effects, such as:

- Forgetfulness
- Confusion
- Trouble thinking
- Drowsiness
- Trouble sleeping
- Hallucinations
- Changes in mood or behavior

Other tyrosine kinase inhibitors

Several other TKIs are now being studied for use against GISTs as well. While there is limited evidence on how useful they are, some of the TKIs that might be options if those listed above are no longer working include:

- Sorafenib (Nexavar)
- Nilotinib (Tasigna)
- Dasatinib (Sprycel)
- Pazopanib (Votrient)

Because it's not exactly clear how well these and other TKIs work against GISTs, taking part in a [clinical trial](#)¹ studying them might be a good option.

More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy](#)².

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)³.

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
2. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html

Any drug used to treat cancer can be considered chemo, even the [targeted therapy drugs](#) like imatinib (Gleevec) that are now commonly used to treat gastrointestinal stromal tumors (GISTs). But the term **chemo** is generally used to describe certain drugs that work by attacking quickly growing cells anywhere in the body, which includes cancer cells.

Before targeted therapy drugs were found to be helpful in treating GISTs, traditional chemo drugs were often tried. But GISTs rarely shrink in response to these drugs, so traditional chemo is rarely used today. People considering chemo may want to think about taking part in a [clinical trial](#)¹.

Possible side effects

Chemo drugs can cause [side effects](#)². These depend on the specific drugs used, their doses, and how long they are taken. Common side effects of chemo include:

- Nausea and vomiting
- Loss of appetite
- Mouth sores
- Diarrhea
- Hair loss
- An increased chance of infection (from a shortage of white blood cells)
- Problems with bleeding or bruising (from a shortage of blood platelets)
- Fatigue or shortness of breath (from a shortage of red blood cells)

Along with the risks above, some chemo drugs can cause other side effects.

Ask your health care team what side effects you can expect based on the specific drugs you will get. Be sure to tell your doctor or nurse if you do have side effects, as there are often ways to help with them. For example, drugs can be given to help prevent or reduce nausea and vomiting.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see [Chemotherapy](#)³.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)⁴.

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
2. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html
3. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
4. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html

References

Casali PG, Dei Tos AP, Gronchi A. Chapter 60: Gastrointestinal Stromal Tumor. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Cancer Institute. Physician Data Query (PDQ). Gastrointestinal Stromal Tumors Treatment. 2018. Accessed at www.cancer.gov/types/soft-tissue-sarcoma/hp/gist-treatment-pdq on October 21, 2019.

National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Soft Tissue Sarcoma. V.4.2019. Accessed at www.nccn.org/professionals/physician_gls/pdf/sarcoma.pdf on October 21, 2019.

Last Revised: December 1, 2019

Radiation Therapy for Gastrointestinal Stromal Tumors

Radiation therapy is the use of high-energy x-rays (or particles) to kill cancer cells. Radiation is not very helpful in treating gastrointestinal stromal tumors (GISTs), so it is not used often. But sometimes it can be used to relieve symptoms like bone pain.

Before your treatment starts, the radiation team will take careful measurements to find the correct angles for aiming the radiation beams and the proper dose of radiation. This

References

Casali PG, Dei Tos AP, Gronchi A. Chapter 60: Gastrointestinal Stromal Tumor. In: DeVita VT, Lawrence TS, Rosenberg SA, eds.

Localized, smaller (resectable) tumors

Most small GISTs need to be treated. But some very small tumors (less than 2 centimeters across) that are not causing any symptoms might never grow enough to cause any problems. One option for such a tumor might be to just watch it carefully, checking it with [endoscopy](#)⁴ at regular intervals, such as once or twice a year. As long as it is not growing, you might not need further treatment.

[Surgery](#) is the main treatment for most other small tumors. The need for further treatment after surgery depends on the risk of the GIST coming back.

Tumors that are small and are not growing quickly typically have a low risk of coming back, so often no further treatment is needed.

The risk of a GIST coming back after surgery is higher if:

- The tumor is larger

doctor may advise removing the main tumor and trying to remove these other tumors as well. If this is the case, be sure to talk with your doctor about what the goals of treatment are (whether it is to try to cure the cancer, to help you live longer, or to prevent or reduce symptoms), as well as its possible benefits and risks.

Other options to treat cancers that have spread to the liver include [ablation and embolization](#) to try to destroy these tumors.

Cancers that are no longer responding to the [targeted drugs](#) discussed above can be hard to treat. Some doctors may recommend trying other targeted drugs, such as sorafenib (Nexavar), dasatinib (Sprycel), nilotinib (Tasigna), or pazopanib (Votrient), although it's not yet clear how helpful these drugs are.

Standard [chemotherapy drugs](#)

Because these cancers are often hard to treat, you may want to consider taking part in [clinical trials](#)⁹ of newer treatments as well.

Hyperlinks

1. www.cancer.org/cancer/gastrointestinal-stromal-tumor/detection-diagnosis-staging/staging.html
2. www.cancer.org/cancer/gastrointestinal-stromal-tumor/detection-diagnosis-staging/how-diagnosed.html
3. www.cancer.org/cancer/gastrointestinal-stromal-tumor/detection-diagnosis-staging/how-diagnosed.html
4. www.cancer.org/cancer/gastrointestinal-stromal-tumor/detection-diagnosis-staging/how-diagnosed.html
5. www.cancer.org/cancer/gastrointestinal-stromal-tumor/detection-diagnosis-staging/how-diagnosed.html
6. www.cancer.org/cancer/gastrointestinal-stromal-tumor/detection-diagnosis-staging/how-diagnosed.html
7. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
8. www.cancer.org/treatment/survivorship-during-and-after-treatment/long-term-health-concerns/recurrence.html
9. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html

References

Casali PG, Dei Tos AP, Gronchi A. Chapter 60: Gastrointestinal Stromal Tumor. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Morgan J. Tyrosine kinase inhibitor therapy for advanced gastrointestinal stromal tumors. UpToDate. 2019. Accessed at <https://www.uptodate.com/contents/tyrosine-kinase-inhibitor-therapy-for-advanced-gastrointestinal-stromal-tumors> on October 21, 2019.

Morgan J, Raut CP. Adjuvant and neoadjuvant imatinib for gastrointestinal stromal tumors. UpToDate. 2019. Accessed at <https://www.uptodate.com/contents/adjuvant-and-neoadjuvant-imatinib-for-gastrointestinal-stromal-tumors> on October 21, 2019.

Morgan J, Raut CP. Local treatment for gastrointestinal stromal tumors, leiomyomas,

