



Cleveland Clinic colon and rectal cancer specialists in the Digestive Disease Institute and Taussig Cancer Institute tailor treatment plans to their patients' needs, taking into account how advanced the cancer is, the patient's age and if the cancer has spread.

This guide provides an overview of colon and rectal cancer treatment options offered at Cleveland Clinic.

## USING THIS GUIDE

Please use this guide as a resource as you examine your treatment options. Remember, it is your right as a patient to ask questions, and to seek a second opinion.

## Choosing Your Colon and Rectal Cancer Care

While you have many options for the treatment of your cancer, you should consider the experience of the program when selecting where to seek care. Cleveland Clinic colorectal surgeons in the Digestive Disease Institute and cancer specialists in the Taussig Cancer Institute work together to explore the best medical and surgical options to ensure the most successful outcome for each patient.

The Taussig Cancer Institute and the Digestive Disease Institute are both No. 1 in Ohio according to *U.S. News & World Report*. Since 2003, Cleveland Clinic also has been named one of the nation's top two digestive disease programs. Our program unites all of the specialists you need in one convenient spot, so you get the care you need right away — without waiting for separate appointments with multiple doctors in various locations.



### WHY CHOOSE A COMPREHENSIVE CANCER CENTER?

While your tumor may be non-threatening and treatment may be standardized, for many cancers there are significant differences in outcomes between centers. Besides improved survival rates, comprehensive cancer centers often offer shorter hospital stays, reduced rates of complications, better management of side effects and access to the latest clinical trials. Cleveland Clinic makes outcomes available on the web at [clevelandclinic.org/outcomes](http://clevelandclinic.org/outcomes).



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## Colon and Rectal (Colorectal) Cancer

Cancer occurs when the body's cells fail to grow, divide and reproduce in a healthy, orderly way, producing too much tissue and forming an abnormal growth or polyp. These polyps can be benign (not cancerous) or malignant (cancerous) and can spread to other parts of the body.

Cancer that begins in the colon (the first four and a half feet of the large intestine) is called colon cancer, while cancer that arises in the rectum (the last six to nine inches of the digestive tract) is known as rectal cancer. Cancers affecting either of these organs also are referred to as colorectal cancer. Colorectal cancers generally arise over time from adenomatous (precancerous) polyps.

Colorectal cancer is the third-leading cause of cancer and the second most common cause of cancer deaths in the United States for both men and women.

### How is colorectal cancer diagnosed?

Colorectal cancer typically is detected by a colonoscopy, which may be done as a screening examination or done to evaluate symptoms. Most people with colorectal cancer have no symptoms. Changes in normal bowel habits, unexplained anemia (low blood count), weight loss, blood in the stool (not visible or obvious), or abdominal pain are all possible cancer symptoms.

A biopsy of abnormal appearing tissue is used to diagnose cancer. A biopsy is a diagnostic test in which a small sample of tissue is removed and examined under a microscope.

### A MULTIDISCIPLINARY APPROACH

Cleveland Clinic is committed to a multidisciplinary approach to colorectal cancer care, providing the most advanced care through patient education, screening, polyp and cancer detection and treatment.

Our team approach brings together experts in colorectal surgery, gastroenterology, medical oncology, radiation oncology and genetic counseling. The team works with patients and their families to develop treatment plans tailored to their individual needs. This approach offers patients the greatest chance of cure and the best possible quality of life. Our experts also continually seek to improve colorectal cancer care through weekly tumor board meetings where they review colorectal cancer cases for multidisciplinary clinical management decisions, including discussing new treatments or experimental therapies. For select patients, personalized medical approaches based on genetic testing are also available.



## Stages and Treatment of Colorectal Cancer

Doctors use staging to classify the location and extent of the disease. Your physician will discuss all treatment options with you, including possible surgery, chemotherapy and radiation therapy, to determine the best treatment for you. As with other cancers, treatment is individualized based on several factors.

The stages and treatments for both colon and rectal cancer are very similar (see box at right for unique aspects of rectal cancer).

### STAGE I (Dukes A)

Stage I colon cancer tumors are confined to the lining or the muscular wall of the colon but have not penetrated the outer wall of the colon. The cancer has not spread anywhere else.

#### Treatment

Standard surgery may include removing the affected portion of the colon and a small amount of healthy colon on either side, as well as the lymph nodes in that area of the abdomen. The two ends of the colon can be reattached to maintain normal bowel function. Additional treatments, such as chemotherapy, usually are not needed.

### STAGE II (Dukes B)

Stage II colon cancer extends through the muscular wall of the colon, but there is no cancer in the lymph nodes or anywhere else in the body.

#### Treatment

Standard surgery may include removal of the cancerous portion and a healthy piece of the colon on either side, as well as the lymph nodes in that area of the abdomen. The two ends of the colon can be reattached to maintain normal bowel function. Your doctor may recommend chemotherapy if you have Stage II cancer with certain features that suggest a high risk of recurrence.

### STAGE III (AJCC)

Stage III colon cancer has spread outside the colon to one or more lymph nodes near the bowel. Stage III is further divided into the following classifications:

**AJCC Stage IIIA** — tumors within the colon wall that have spread to lymph nodes

**AJCC Stage IIIB** — tumors that have grown through the colon wall and have spread to one to four lymph nodes

### COLON CANCER AND RECTAL CANCER:

#### What's the Difference?

Cancer that begins in the colon is called colon cancer, while cancer that begins in the rectum is known as rectal cancer. Cancers affecting either of these organs also are referred to as colorectal cancer. Both colon cancer and rectal cancer have identical risk factors and biology. However, treatment may differ.

**Colon cancers** are technically easier to remove and tumor recurrence in the abdomen near the site of the original cancer is unusual. Patients with colon cancer rarely require a permanent colostomy (an opening made in the colon for waste to exit the body) as part of their treatment. Patients with rectal cancers may require a temporary or permanent colostomy.

**Rectal cancer** is a disease in which cancer cells form in the tissues of the rectum.

Patients with Stage II or Stage III rectal cancer are at high risk for recurrence, and radiotherapy (radiation to kill cancer cells) is often used in addition to surgery. Chemotherapy added to radiotherapy has been shown to improve the outcomes in rectal cancer, similar to the effect of chemotherapy in colon cancer.

In most, but not all, cases, chemotherapy and radiation therapy are done prior to surgery.



## TREATMENT OPTIONS

**Chemotherapy** involves the use of drugs to kill cancer cells, and it may be administered orally or intravenously. Chemotherapy usually is a systemic treatment, meaning the drug enters the bloodstream and kills cancer cells anywhere in the body.

**Radiotherapy** (also called radiation therapy) uses radiation (strong beams of energy) to kill cancer cells or keep them from growing and dividing.

**Targeted therapy** A medication called regorafenib (Stivarga®) can be used to treat colon or rectal cancer that has spread to other areas of the body in patients who have already undergone chemotherapy. The drug may work by targeting proteins that the cancer needs to survive.

**AJCC Stage IIIC** — tumors that have spread to one to four lymph nodes; or tumors that have spread to less than four lymph nodes but have gone through the colon wall to involve other organs

Lymph node involvement increases the risk that the cancer has spread, as well as the risk of recurrence.

### Treatment

Standard surgery may include removal of the cancer and a healthy portion of the colon on either side, as well as all involved lymph nodes, if possible. In most cases, the two ends of the colon can be reattached to maintain normal bowel function. The addition of chemotherapy and/or radiation can enhance survival when added to surgery.

## STAGE IV

Stage IV colon cancer has spread outside the colon to other parts of the body, usually to the liver or lungs. The tumor can be any size, and it may or may not include affected lymph nodes.

### Treatment

Treatment for Stage IV colon cancer varies depending upon the individual situation. In many cases, the primary colon tumor can be removed surgically to prevent blockage and restore or maintain bowel function. In some cases, surgery may be done to remove cancer that has spread to the liver or lung, but these procedures cannot be done in all cases. Doctors prescribe chemotherapy to patients with this stage of colon cancer to control their symptoms. In select cases, liver-directed therapy is used to control liver metastases.



“Colorectal surgery is clearly changing. Over the past decade, we have led the world in laparoscopic colorectal surgery. We have one of the highest volumes at any single center in the nation. The future is to push the envelope: smaller incisions, fewer ports, different extraction sites.”

**Feza H. Remzi, Chairman, Colorectal Surgery**  
**Digestive Disease Institute**



## Surgical Treatment

Removal (resection) of a portion or all of the colon and/or rectum is the main treatment for colon and rectal cancer.

Most of the surgical procedures for colon and rectal cancer are focused on preserving the function of the anal muscles (sphincter) and avoiding a stoma (bag). When the colon and/or rectum are removed, there must be another way for solid waste to exit the body. The surgeon will create a pouch as an alternate way for you to store and pass stool. Most patients at Cleveland Clinic receive a colonic J-pouch, formed out of the individual's own proximal (ascending and transverse) colon.

Cleveland Clinic's Department of Colorectal Surgery has vast surgical experience in sphincter-sparing rectal cancer surgery with excellent outcomes.

### What should a colon and/or rectal cancer patient know about surgery?

The best indicator of surgical outcomes is the experience of the surgeon, not the particular technique used. Cleveland Clinic surgeons have a large experience with all methods of colorectal surgery, and many new approaches have been developed here. Today, we are offering more and more procedures minimally invasively (laparoscopically) or robotically, which means less pain and quicker recoveries for our patients. Patients should learn their surgeon's level of experience when examining treatment options.

The Digestive Disease Institute's Department of Colorectal Surgery is globally recognized as a leader in colorectal surgery and surgical innovation, attracting patients from around the world. Our team has one of the highest volumes of colorectal surgery in the nation and cure and our cure and survival rates are above the national average.

### COLON RESECTION

Removal of a segment of the colon, also called a colectomy, is often done as a minimally invasive procedure, called laparoscopy, because of its benefits and comparable outcomes to open surgical procedures. Laparoscopy has evolved from requiring three or four incisions to a single-incision surgery. Depending on the location of the tumor, the segmental colectomy (removal of a portion of the colon) could be referred to as a right or left colectomy.

### TOTAL COLECTOMY

A total colectomy is the removal of the entire colon where the small bowel is reattached to the top of the rectum. This procedure is only used on occasions where patients have synchronous tumors (more than one cancer in the colon or rectum at the same time), or a strong family history of colorectal cancer, or a genetic condition that predisposes patients to developing colorectal cancer.

### TRANSANAL RESECTION

This advanced technique, in which a rectal tumor is removed by operating through the anus, can save a patient from needing a stoma (bag). This is offered for selected patients with early-stage rectal cancer.

### INNOVATIONS & EXPERIENCE

Since 1983, Cleveland Clinic has performed more than 4,200 J-pouch procedures, the most in the world.

In 2007, Cleveland Clinic surgeons performed one of their first colorectal procedures utilizing the umbilicus (belly button) as the sole access point to the abdomen.

Our colorectal surgeons perform more than 5,000 procedures annually in the DDI, including an average of 500 minimally invasive intestinal procedures.

In 2009, Cleveland Clinic colorectal surgeons performed the world's first single-incision procedure to remove the entire colon and rectum of a 13-year-old patient with a rare genetic condition that leads to colon cancer. The procedure, called a proctocolectomy, will reduce the patient's risk of colorectal cancer.

Since 2012, Cleveland Clinic surgeons have performed 54 total robotic rectal cancer surgeries.

DDI's team has the most experience with ileal pouch surgery, performing more than 500 cases to date.





#### **ROBOTIC SURGERY USES A COMPUTER-ENHANCED SURGICAL SYSTEM THAT PROVIDES:**

A 3-D view of the surgical field, including depth, magnification and high resolution

Instruments that are designed to mimic the movement of the human hands, wrists and fingers, allowing an extensive range of motion and more precision

Master controls that allow the surgeon to manipulate the instruments, translating the surgeon's natural hand and wrist movements into corresponding, precise movements

#### **HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY (HIPEC)**

This multidisciplinary approach is used to treat hard-to-treat colorectal cancers that have spread to the lining of the abdominal cavity. HIPEC circulates a heated chemotherapy solution through the abdominal cavity for up to two hours to try and kill any cancer cells that may remain following surgery to remove all visible tumors (cytoreductive surgery). This new treatment option may significantly improve survival rates for patients with Stage IV colorectal cancer.

#### **ROBOTIC COLECTOMY (colon removal)**

Cleveland Clinic colorectal surgeons also have added robotic colectomy to their range of minimally invasive surgical (MIS) treatment options for colorectal cancer. Robotically assisted surgery uses robotic equipment to imitate surgical movements. MIS procedures allow surgeons to operate through small ports rather than large incisions, resulting in shorter recovery times, fewer complications and reduced hospital stays. Surgical robotics combines minimally invasive techniques with highly advanced clinical technology.

#### **How does the new technology assist the surgeon?**

The 3-D vision system magnifies the surgical field up to 15 times and improves the surgeon's ability to perform precise dissection of tissue, thereby reducing blood loss. Robot arms remain steady at all times and robot wrists make it easier for surgeons to manipulate tissue and work from all kinds of angles and positions they would have difficulty reaching otherwise.

## **After Surgery**

Following surgery, patients typically stay two to five days in the hospital. During this time, the staff checks patients daily and provides detailed post-operative instructions at discharge. Patients are able to continue follow-up either at Cleveland Clinic or with their local physicians.



## Medical Treatment

Medical treatment involves traditional anti-cancer drugs, including:

**Chemotherapy** – Chemotherapy regimens are complicated, but can preserve quality of life and extend life even in Stage IV disease. Commonly used chemotherapy regimens include FOLFOX, FOLFIRI and an oral agent called capecitabine (Xeloda®).

Chemotherapy is usually given intravenously, but one commonly used drug is available as tablets. Treatments vary in length, doses and the way the medications are given.

Side effects of chemotherapy for colon cancer are common but usually not serious. Most patients get nausea and inflammation of the lining of the mouth. Diarrhea and a feeling of pins and needles in the arms and legs may occur. There is not usually hair loss, and side effects go away after treatment.

**Targeted therapy** – This new generation of cancer drugs is specifically designed to affect particular targets on the surface of tumor cells. These include antibodies such as bevacizumab (Avastin®), cetuximab (Erbix®) or panitumumab (Vectibix®) or small molecule oral kinase inhibitors such as regorafenib (Stivarga®). These medications are generally added to enhance the effects of chemotherapy, but they may sometimes be used alone.

**Personalized medicine approaches** – Recent data shows that a “one-size-fits-all” approach does not work. Instead, personalizing medical care based on an individual patient’s tumor characteristics is the best approach and is becoming more common. This is done through performing a genetic analysis of a tumor specimen to find out which medications are more likely to work. In clinical trials, Cleveland Clinic also is adopting a whole-genomic- based approach to help identify targets and drugs that may affect them.

### STEREOTACTIC BODY RADIATION THERAPY (SBRT)

Cleveland Clinic radiation oncologists have used stereotactic body radiation treatments (also known as radiosurgery) for treating metastases to the liver and lung. This treatment allows the radiation to be delivered in a small number of fractions or treatments that are concentrated to a well-defined precise area. This technique allows better sparing of the normal structures, such as the liver and lung.

### RADIATION THERAPY

Radiation therapy is used in select cases to help control colon cancer. For example, colon cancer that has spread to the liver can be treated with radiation in some cases. Radiation can be delivered through machines that deliver high-energy X-ray and cause damage to the cancer cells leading to tumor shrinkage or control. The radiation may be delivered by special



### CLINICAL TRIALS

Cleveland Clinic Taussig Cancer Institute physicians and staff are dedicated to providing their patients with the most up-to-date cancer treatment options. At any given time, we offer several hundred cancer clinical trials for qualifying patients. If you would like to be evaluated by one of our physicians for participation in a cancer clinical trial, please call 001.216.444.7923 to schedule an appointment to discuss your potential involvement in a cancer clinical trial.

To learn more about clinical trials, visit [clevelandclinic.org/cancertrials](https://clevelandclinic.org/cancertrials).



equipment that delivers radiation from outside the body (external beam radiation). New radiation techniques such as stereotactic body radiation (also called radiosurgery) are used to deliver large radiation doses to the tumor while sparing the normal liver from injury. In addition, radiation may also be delivered to some sites through an implant placed in the body (brachytherapy) or through small embolic beads (selective internal radiation therapy) that are delivered through the blood supply.

### LIVER RESECTION FOR METASTATIC COLORECTAL CANCER

Long term survival is possible even when the colorectal tumor has spread to the liver (liver metastases). The combination of chemotherapy and advanced liver surgery, when possible and indicated, is very safe, usually very well

tolerated by patients and represents the best treatment for colorectal liver metastasis. The liver is able to rapidly regenerate in case of need. This allows surgeons to remove large amount of liver when needed.

Liver resection (removal of the tumor along with part of the healthy liver) can be achieved either using minimally invasive surgical techniques (laparoscopy) or through an incision (open liver resection). The technique used depends on location, number and size of liver metastasis.

### LIVER-DIRECTED THERAPY

For patients whose colon cancer has spread to the liver (stage IV), liver-directed therapies may be offered if it is not possible to remove the cancer surgically. These therapies, which may be used alone or with biologic agents, include:

## A Less-Radical Alternative Brings Better Quality of Life

Brenda Swain began thinking it was time to get down to business about her health somewhere in the sky between Africa and Northeast Ohio. In February 2009, prior to her trip, she had noticed some bleeding, which she brought to the attention of her primary care physician. A colonoscopy at a local hospital revealed a polyp that tested positive for cancer.



Doctors told Ms. Swain that she would need a permanent colostomy (bag) and wanted to perform surgery immediately. "They were offering me a radical surgery that would have removed my rectum and a lot of my bowel," says the 58-year-old resident of Akron. "It would have been irreversible."

Although her physicians were insistent, Ms. Swain wasn't ready to make a decision. She was in the midst of preparing for a missionary trip to Rwanda. "I told [the doctors] they would have to wait until I came back to discuss it further," Ms. Swain says.

Sitting on the plane on the flight home, Ms. Swain made an important decision. "It was as clear as day," she says. "Something in my heart told me to call Cleveland Clinic."

Ms. Swain didn't waste a moment once her plane touched ground. She headed home — not even bothering to bring in her suitcases from the car — and called for an appointment. She

was seen by Cleveland Clinic experts the following day. "I was so excited I didn't even have a chance to experience jetlag," she explains.

Ms. Swain met with James Merlino, MD, vice chairman of the Department of Colorectal Surgery, who confirmed a diagnosis of low rectal cancer. A few weeks later, she was undergoing the first of three surgeries: an excision for biopsy. Two additional surgeries soon followed: sphincter preserving proctectomy (removal of the rectum) and closure of diverting loop ileostomy.

"Quality of life is always better with sphincter preservation," Dr. Merlino says. "Self-esteem and body image are better."

Nearly a year after her surgeries, Ms. Swain is free of cancer and ready to return to missionary work. She credits the medical care she received at Cleveland Clinic, along with her faith, as to why she is living her life to the fullest.

Three surgeries notwithstanding, Ms. Swain describes her stay at Cleveland Clinic as an "awesome experience," in large part because of the caregivers who looked after her. "The journey is made easier when you have people so caring and so willing to take the time to explain everything to you," she says. "It takes the fear away."





**Ablation** – These approaches use extreme temperatures to destroy tumor cells. These treatments reduce the amount of liver tumor and can extend a patient's life and ease symptoms.

Types of ablation include:

- **Radiofrequency ablation** – uses a needle-like probe to deliver heat to the tumor
- **Cryotherapy** – uses a probe that is super-cooled using argon gas, causing tumor cell death
- **Microwave ablation** – uses microwave to deliver heat to the tumor
- **Irreversible electroporation** – uses electrical fields to cause cancer cells to die while protecting non-cellular structures such as blood vessels and bile ducts

## CHEMOEMBOLIZATION

Chemoembolization of the hepatic artery, the liver's main blood supplier, involves blocking the artery and injecting anticancer drugs between the blockage and the liver. The liver's arteries then deliver the drugs throughout the organ. Only a small amount of the drug reaches other parts of the body.

## RADIOEMBOLIZATION

This procedure uses radioactive (Y90) resin (SIR-Spheres®) or glass-based (TheraSphere®) particles that are delivered by catheter and provide a continuing radiation dose for approximately three and a half weeks to targeted tissues. While typically given as a third-line palliative treatment following first and second-line chemotherapy, Cleveland Clinic is participating in a study to see if it has any value earlier in treatment, in conjunction with second-line chemotherapy.

## Follow-up Care

Follow-up care for colon cancer (after treatment is complete) is important. The disease sometimes returns — even when the cancer seems to have been completely removed or destroyed — because undetected cancer cells remain in the body after treatment. Regularly scheduled checkups help ensure that any changes in health are noted. Checkups may involve a physical exam including a digital rectal exam, lab tests, colonoscopy, X-rays, CT scans and other tests. You should call your doctor if any health problems appear between scheduled checkups.

## Genetic Counseling

Hereditary cancer syndromes account for approximately 5 to 10 percent of colorectal cancer cases.

### What about my family's risk? Should I be concerned?

If your doctor suspects that the cause of your cancer is inherited or due to a specific genetic cause, he or she may recommend you see a genetic counselor for an evaluation. Genetic counselors can guide you through your diagnosis, provide education to help you better understand your condition, and identify risk to you and your family members. During a counseling session, they will:

- Obtain an extensive personal and family medical history
- Explain the natural history and inheritance of a hereditary colon cancer syndrome
- Discuss the testing process and options
- Evaluate the risks to other family members

Genetic counseling services are available at the Sanford R. Weiss, MD, Center for Hereditary Colorectal Neoplasia within Cleveland Clinic's Digestive Disease Institute and the Genomic Medicine Institute.





## Contacting Cleveland Clinic

To learn more about the services we offer or to schedule an appointment, please contact our representative in Turkey at +90.212.381.8748.

### Still Have Questions?

If you have additional questions after reviewing this guide, Cleveland Clinic's Cancer Answer Line can help. Two oncology clinical nurse specialists and their staff can provide information and answer questions about cancer. The Cancer Answer Line is operational 8 a.m. – 5 p.m., ET, Monday – Friday. Please call 001.216.444.7923 or toll-free 866.223.8100.

### Need a Second Opinion, but Cannot Travel to Cleveland?

Our **MyConsult** service offers secure online second opinions for patients who cannot travel to Cleveland. Through this service, patients enter detailed health information and mail pertinent test results to us. Cleveland Clinic experts then render an opinion that includes treatment options or alternatives and recommendations regarding future therapeutic considerations. To learn more about **MyConsult**, please visit [clevelandclinic.org/myconsult](https://clevelandclinic.org/myconsult).

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## How Patient Registries Help Improve Care for Future Patients

The Digestive Disease Institute is home to The David G. Jagelman Inherited Colorectal Cancer Registries. Its mission is to study the causes and prevention of inherited colorectal cancer, including Hereditary Non-polyposis Colorectal Cancer (HNPCC), Familial Adenomatous Polyposis (FAP), Peutz-Jegher's Syndrome (PJS) and Juvenile Polyposis (JP).

The David G. Jagelman Registries are among the largest in the world. Its staff members work with thousands of diagnosed and at-risk individuals to support them in their experiences. In addition, they work to educate the public on preventive measures that can lead to a healthy and full life. The registries are actively

involved in many research areas involving inherited colorectal cancer syndromes.

The David G. Jagelman Inherited Colorectal Cancer Registries are looking for patients who have three or more relatives with colorectal cancer, or at least two relatives with colorectal cancer and another relative with endometrial cancer.

The Jagelman Registries are part of the Sanford R. Weiss, MD, Center for Hereditary Colorectal Neoplasia, which is dedicated to advancing patient care, education and research for hereditary colon cancer.