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#Reference From NCCN Guidelines

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# 1

## Colon cancer basics

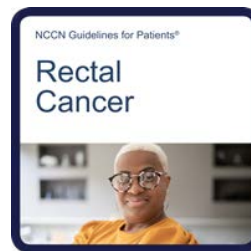
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**Colon cancer is common and treatable. Many cancers that start in the colon can be cured, especially when found early.**

The term colorectal cancer is used to describe cancers that form in either the colon or rectum. While these cancers are similar, their treatment is different. The focus of this guide is colon cancer. For information on rectal cancer treatment, see the *NCCN Guidelines for Patients: Rectal Cancer* at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.

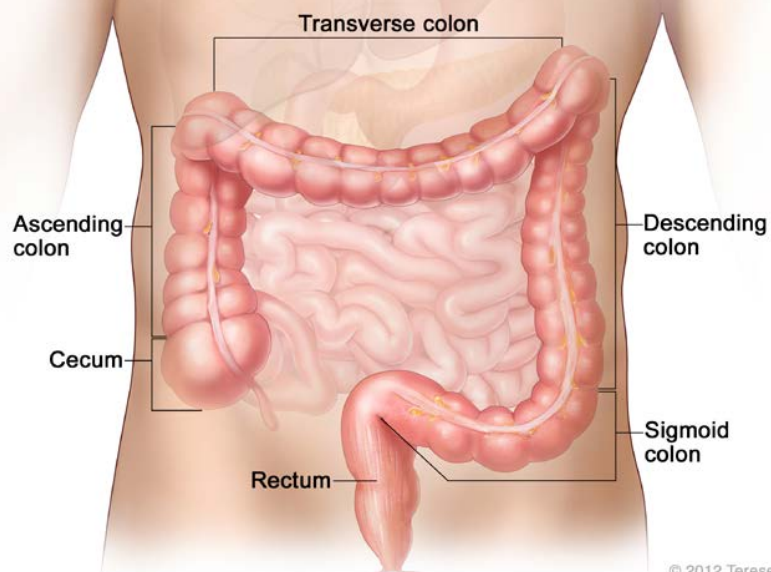
## The colon

The colon makes up most of the large intestine (bowel). In the colon water is absorbed from eaten food, turning it into feces or stool. After leaving the colon, stool moves into the rectum. The rectum is the last 6 inches or so of the large bowel. Stool is held here until it leaves the body through an opening called the anus.



### The colon

**The start of the colon is a pouch called the cecum. Sticking out from the cecum is the appendix. This skinny tube is about the size of a finger and is closed at one end. The rest of the colon has 4 main sections: the ascending, transverse, descending, and sigmoid colon.**



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## Polyps

Polyps are non-cancerous growths that form on the inner lining of the colon and rectum. The most common type is called an adenoma. While it may take many years, adenomas can become invasive colon cancer. Cancer that forms in an adenoma is called an adenocarcinoma. This is the most common type of colon cancer. Polyps that rarely turn into cancer include hyperplastic and inflammatory polyps.

While most polyps do not become cancer, almost all colon cancers start in a polyp. Removing polyps can prevent cancer before it starts. Most can be removed during a colonoscopy using a minor surgical procedure called a polypectomy. Polyps can also be tested to make sure that cancer has not already started to develop.

For more information, see the *NCCN Guidelines for Patients: Colorectal Cancer Screening* at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



## Key points

This guide discusses the following key topics about colon cancer diagnosis and treatment.

### Testing and treatment planning

- Testing the tumor for a biomarker (feature) called mismatch repair deficiency (dMMR)
- Treatment planning based on mismatch repair status and results of other testing

### Non-metastatic cancer

- Treatment for polyps with cancer
- Colectomy (surgery) for non-metastatic colon cancer
- Chemotherapy after colectomy (for all stage 3 cancers and some stage 2 cancers)

### Metastatic cancer

- Expanded biomarker testing to identify targetable features of the cancer
- The use of local therapies to treat liver and lung tumors
- Systemic therapy for metastatic cancer

### Survivorship

- Help for long-term side effects
- Maintaining healthy habits
- Resources

# 2

## Testing and treatment planning

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**This chapter describes testing and other care needed to create your treatment plan. All colon cancers should be tested for mutations (changes) in genes that fix damaged DNA, called mismatch repair (MMR) genes.**

Most colon cancers are found during colonoscopy. It is common to have another colonoscopy to thoroughly examine the colon and look for other possible areas of cancer. This is called a diagnostic colonoscopy.

## Mismatch repair testing

**Mismatch repair (MMR) or microsatellite instability (MSI) testing is recommended for everyone diagnosed with colon cancer.** This feature of some colon cancers is a type of biomarker. Biomarkers are targetable changes of a cancer that help guide your treatment.

Testing involves analyzing a piece of the colon tumor in a lab. Depending on the method used, an abnormal result is called either microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR). Tumors that do not have these changes are referred to as microsatellite stable (MSS) or mismatch repair proficient (pMMR).

If the cancer is dMMR/MSI-H, you will also be tested for an inherited condition called Lynch syndrome, described next.

## Family health history

Your doctor will ask about the health history of your biological (related by blood) family members. Those with a first-degree relative with colorectal cancer are more likely to have this cancer compared to the average person.

Most colon cancers occur for unknown reasons. While rare, some people are born with a disorder that makes them more likely to get colon and other cancers. These are called inherited cancer syndromes. Two such conditions include Lynch syndrome and familial adenomatous polyposis (FAP).

People born with Lynch syndrome are at high risk of developing colon, endometrial, and ovarian cancers. Lynch syndrome is caused by inherited mutations of the MMR genes. For cancers found to have the dMMR/MSI-H biomarker, testing for Lynch syndrome is recommended.

FAP causes hundreds to thousands of polyps to form in the colon and rectum. The polyps start as benign growths, but over time can become invasive colon cancer. Cancer often develops by age 50 in people with classic FAP. A milder form (attenuated FAP) causes fewer polyps and usually starts later in life.

If an inherited syndrome is suspected, your doctor will refer you to a genetic counselor. This expert can speak with you and your family about testing for syndromes related to colon cancer. To be tested, you must provide a sample of blood or saliva. A pathologist tests the sample for gene mutations that cause these syndromes. It is important to meet with a genetic counselor before having any genetic testing.

## Blood tests

The following tests are not used alone to diagnose colon cancer, but abnormal results may signal health problems.

### Complete blood count

Cancer and other health problems can cause low or high blood cell counts. A complete blood count (CBC) measures the number of white blood cells, red blood cells, and platelets in a blood sample. White blood cells help the body to fight infection. Red blood cells carry oxygen throughout the body. Platelets help wounds heal by forming blood clots.

### Chemistry profile

Also known as a comprehensive metabolic panel (CMP), this group of tests provides information about how well your kidneys, liver, and other organs are working.

### CEA blood test

Carcinoembryonic antigen (CEA) is a protein found in blood. The level of CEA is often higher than normal in people with colon cancer, especially if the cancer has spread to other organs.

Monitoring CEA can be helpful even when the cancer is only in the colon and the level is normal, because the level will rise if the cancer later spreads to other organs. However, monitoring CEA is not helpful for everyone, even if the cancer has spread. People who are pregnant and those who smoke may have higher CEA levels.



**I was diagnosed in the ER at age 44, 58 days after my wedding, and I faced biases and unexpected challenges. I had to fight to get care because I was dismissed for more than a year for so many different reasons. My journey taught me this: never give up, explore every reasonable option, and prioritize your mental health. Your life is the only one you have, so be true to yourself. Before any diagnosis, put on your life jacket first—take care of yourself. Get screened, know your family history. When facing colorectal cancer, the best care begins with self-care."**

### ctDNA

There is growing interest in circulating tumor DNA (ctDNA) testing for people with early-stage colon cancer. Also called a liquid biopsy, this test looks for small pieces of DNA released by tumor cells into the blood. It can detect microscopic disease that may remain in the body after colectomy. This information may be helpful in predicting the risk of the cancer returning or other outcomes. But more information is needed, and at this time ctDNA testing is only recommended as part of a clinical trial.



## Imaging

Imaging tests can show areas of cancer inside the body. A radiologist interprets the images and conveys the results to your oncologist. Your care team will tell you how to prepare for your scans. If you get nervous in tight spaces, let them know. You may be offered a type of medicine called a sedative to help you relax.

### CT

Computed tomography (CT) is the main imaging test used to see colon cancer in the body. During the scan you will lie face-up on a table that moves through a tunnel-like machine. You will be able to hear and speak with a technician at all times.

A substance called contrast is used to make the pictures clearer. It is injected into your vein and mixed with a liquid to drink. You may feel flushed or get hives. Some people have an

allergic reaction. Tell your doctor if you've had problems with contrast in the past.

### MRI

Magnetic resonance imaging (MRI) is not often used to plan treatment for colon cancer. Your doctor may order an MRI to get a better look at the liver or rectum, or if the CT scan results are unclear.

Getting an MRI is much like getting a CT scan. In some cases, the area of the body being imaged is placed within a narrowed coil device that looks like a brace. It covers your body from below your chest to the top of your legs. It sends and receives radio waves. Straps may be used to help you stay in place. An MRI may cause your body to feel warm. If MRI is being used to better see cancer near the rectum, an enema may be needed. Or a gel may be inserted into the rectum beforehand.

### CT scan

**CT with contrast is the main imaging test used to determine the extent of colon cancer in the body. CT takes many pictures of the inside of the body using x-rays. A computer combines the x-rays to make one detailed picture.**



## Fertility and family planning

For unknown reasons, colon cancer is being diagnosed more often in young adults. Some cancer treatments make it hard or impossible to have children. If you are interested in potentially having children in the future, tell your care team. They will discuss any fertility-related risks of your treatment plan with you. Some methods for preserving (keeping) fertility before cancer treatment are described below. Your doctor may refer you for counseling about fertility preservation options.

### Sperm banking

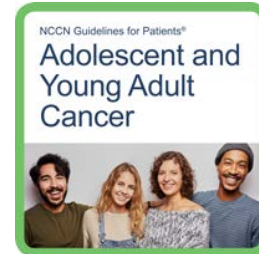
Sperm banking stores semen for later use by freezing it in liquid nitrogen. The medical term for this is semen cryopreservation.

### Egg freezing

Unfertilized eggs can be removed, frozen, and stored for later use. This is called egg freezing or oocyte cryopreservation.

### Ovarian tissue banking

This method involves removing part or all of an ovary and freezing the part that contains the eggs. The frozen tissue that contains the eggs can later be unfrozen and put back in the body.



**For more information on fertility and family planning, see the *NCCN Guidelines for Patients for Adolescent and Young Adult Cancer* at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.**

## Key points

### Mismatch repair testing

- All colon cancers should be tested for mismatch repair deficiency (dMMR) or high microsatellite instability (MSI-H).
- Testing for this biomarker involves analyzing a piece of the colon tumor in a lab.
- Cancers that do not have these biomarkers are called microsatellite stable (MSS) or mismatch repair proficient (pMMR).

### Family health history

- Inherited syndromes related to colon cancer include Lynch syndrome and familial adenomatous polyposis.
- Everyone with colon cancer should be asked about their family health history.

### Blood tests

- A complete blood count (CBC), chemistry profile, and carcinoembryonic antigen (CEA) test are recommended as part of initial testing.

### Imaging

- CT with contrast is the main imaging test used to determine the extent of colon cancer in the body.

### Fertility and family planning

- Young adults diagnosed with colon cancer should be counseled about fertility-

related risks of treatment and options for preserving fertility.



**Let us know what you think!**

Please take a moment to complete an online survey about the NCCN Guidelines for Patients.

[NCCN.org/patients/response](https://www.nccn.org/patients/response)

# 3

## Treatment for non-metastatic cancer

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**Colon cancer often forms in polyps on the lining of the colon, but can also form as lesions. This chapter explains treatment for cancer that has not spread to areas far from the colon.**

## Polyps with cancer

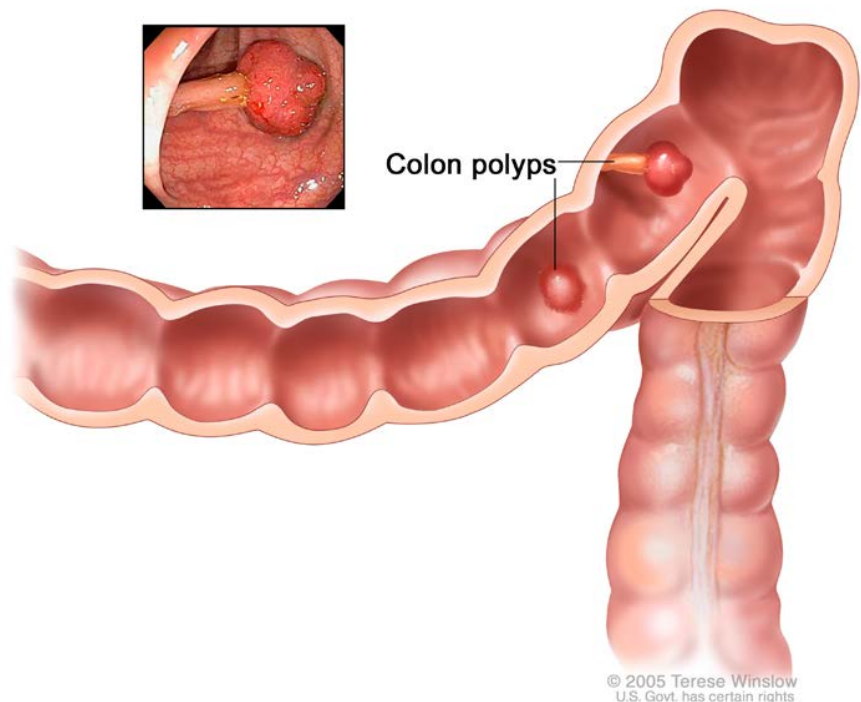
A polyp is an overgrowth of cells on the inner lining of the colon wall. The most common type is called an adenoma. While it may take many years, adenomas can become invasive colon cancer. Cancer that starts in an adenoma is called an adenocarcinoma.

There are 2 main shapes of polyps. Pedunculated polyps are shaped like mushrooms and stick out from the colon wall. They have a stalk and round top. Sessile polyps are flatter and do not have a stalk. A polyp in which cancer has just started to grow is called a malignant (cancerous) polyp.

Most polyps can be removed during a colonoscopy, using a minor surgical procedure called a polypectomy.

### Colon polyps

Polyps are growths on the inner lining of the bowel wall. Some look like mushrooms and stick out from the colon wall. These are called pedunculated polyps. Others are flatter and do not have a stalk. These are called sessile polyps.



Often, no further treatment is needed after a polypectomy. In other cases, surgery (resection) of a bigger piece of the colon is needed. This depends on:

- The size and shape of the polyp (pedunculated or sessile),
- The polypectomy results, and
- The results of testing the removed tissue.

Before deciding whether resection is needed after a polypectomy, your doctor will review the results of testing with you and discuss your options.

## Invasive cancer

For cancers not found early enough to be removed by polypectomy, colectomy (colon surgery) is needed. Surgery is only an option if the colon tumor can be completely removed. If you cannot have surgery first, see page 19.

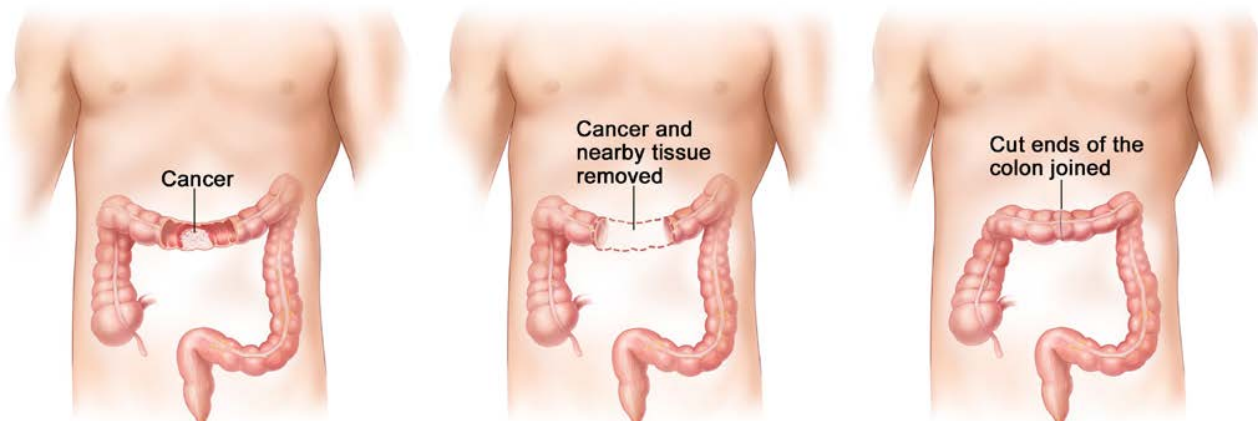
### Colectomy

A colectomy is a surgery that removes the part of the colon with cancer. After the cancerous part is removed, the two healthy ends of the remaining colon are sewn or stapled together. At least 12 lymph nodes near the tumor will be removed and tested for cancer, in addition to any nodes that look abnormal to the surgeon.

A colectomy can be done in two ways. The open method removes tumor tissue through a

### Colectomy

**Surgery for colon cancer is called colectomy. It involves removing the cancerous part of the colon. The two healthy ends of the remaining colon are then attached to each other.**



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large cut in your abdomen. The minimally invasive method involves making a few small cuts. Tools are inserted through the cuts to see and remove part of your colon.

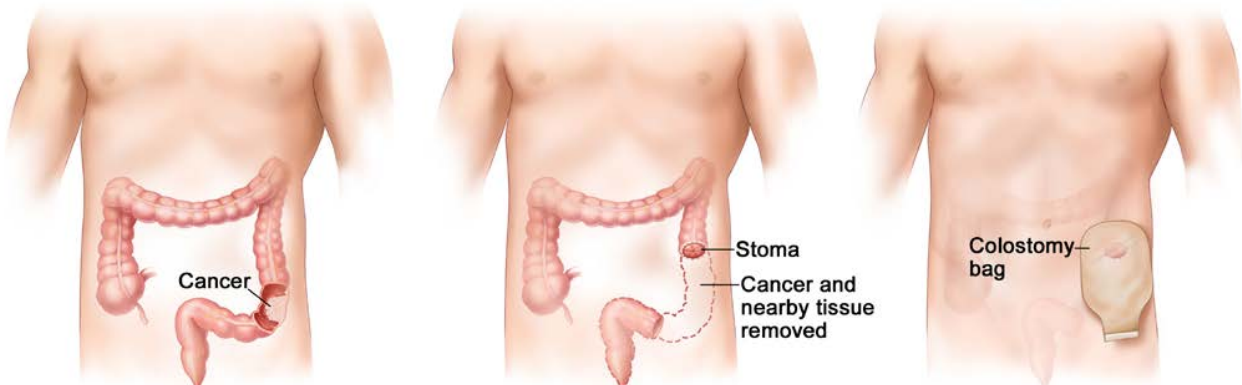
The tissue removed during surgery is sent to a pathologist. The pathologist determines how far the cancer has grown within the colon wall. They also test the removed lymph nodes for cancer. These results are used to assign the cancer a stage. The stage helps determine whether you need chemotherapy after surgery.

At the time of colectomy, some people may also have a procedure called a colostomy. This is done in cases where it may not be safe to reconnect the remaining sections of colon. In a colostomy, the remaining upper part of the colon is attached to an opening on the surface

of the abdomen. This opening is called a stoma. Stool exits the body through the stoma and enters a bag attached to the skin. This is typically only needed for a short time. For colon cancer surgery, the colostomy can often be reversed with another operation. Colostomy is also known as diversion because it diverts (redirects) the flow of stool.

## Colostomy

**If the two healthy ends of the remaining colon cannot be safely reconnected after the cancer is removed, a colostomy may be performed. A colostomy connects a part of the colon to the outside of the abdomen. This creates an opening in your abdomen that allows stool to pass through. For colon cancer surgery, it is rare for a colostomy not to be reversed with another operation.**



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## Bowel blockage

In rare cases, a tumor may grow so large that it blocks the flow of stool. There are several ways to deal with a blockage. One option is a colectomy that also unblocks the bowel. This is known as a one-stage colectomy.

A second option is colectomy with colostomy. This is typically only needed for a short time. Another possibility is that a colostomy may be done first, followed by a second surgery to remove the cancer.

Lastly, in rare cases, a mesh metal tube called a stent may be placed first, followed by a second surgery to remove the cancer. The stent keeps the colon open, allowing gas and stool to pass.

## Staging

The cancer stage describes the extent of cancer in the body. Having a general idea of the structure of the colon wall is helpful for understanding how colon cancer is staged.

The colon wall is made of layers of tissue. Cancer starts in the innermost layer that comes in contact with food. This layer is called the mucosa.

The next layer is the submucosa. It is made of connective tissue and contains mucus glands, blood and lymph vessels, and nerves. The submucosa is followed by a layer of muscle called the muscularis propria. The outer, fourth layer is called serosa (or adventitia).

If left untreated, cancer cells grow through the layers of the colon wall, towards the inside of the abdomen. The cancer can then invade structures or organs outside of the colon.



### Your care team will give you information on:

- How to prepare for surgery
- What to expect during and after surgery
- Recovery
- Possible short- and long-term side effects of colectomy, including:
  - Leaking from the spot where the colon was reconnected (anastomotic leak)
  - Changes in bowel habits
  - Bowel blocked by scar tissue
  - Organs pushing through tissues or muscles weakened by surgery (hernia)

Cancer cells can also break off from the colon tumor and travel through lymph or blood to nearby lymph nodes.

The American Joint Committee on Cancer (AJCC) tumor, node, metastasis (TNM) system is used to stage colon cancer. In the AJCC system, the following key pieces of information about the cancer are used to give it a stage:



- **T:** How far the tumor has grown into or through the colon wall
- **N:** Whether any lymph nodes have cancer
- **M:** Whether the cancer has spread to areas or organs outside the colon (metastasized)

The T, N, and M scores are combined to assign the cancer one of the following stages: 0, I (1), II (2), III (3), or IV (4). The stages are explained below.

### Stage 0

There are abnormal cells on the innermost layer of the colon wall. These abnormal cells may become cancer and spread into deeper layers of the colon wall. Stage 0 colon cancer is also called carcinoma in situ of the colon.

### Stage 1

The cancer has grown into either the second or third layer of the colon wall. There is no cancer in nearby lymph nodes or in areas outside the colon.

### Stage 2

The cancer has grown into, or beyond, the fourth layer of the colon wall. There is no cancer in nearby lymph nodes or in areas outside the colon.

### Stage 3

The cancer has spread from the colon to nearby lymph nodes or there are tumor deposits. Tumor deposits are small tumors in the fat around the colon.

### Stage 4

The cancer has spread to areas outside the colon and nearby lymph nodes. Colon cancer spreads most often to the liver and/or lungs.

## If you can't have surgery first

Having surgery first is not always an option. It may not be possible because of the location of the tumor, or because of other health problems. In this case, systemic therapy (chemotherapy or immunotherapy) is given first. Systemic therapy may also be given first for advanced cancers, or cancer that has spread to lymph nodes.

If this approach is planned, chemotherapy is recommended for pMMR/MSS cancers. Immunotherapy with a checkpoint inhibitor is preferred for dMMR/MSI-H cancers. Immunotherapy increases the activity of your immune system, improving your body's ability to find and destroy cancer cells.

Checkpoint inhibitors recommended for use before colectomy in dMMR/MSI-H cancers include:

- Pembrolizumab (Keytruda)
- Nivolumab (Opdivo) with or without ipilimumab (Yervoy)

Sometimes radiation therapy (alone or with chemotherapy) is given along with systemic therapy for unresectable cancers.

For more information on the side effects of checkpoint inhibitors, see the *NCCN Guidelines for Patients: Immunotherapy Side Effects: Immune Checkpoint Inhibitors* at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.

## Chemotherapy after surgery

Chemotherapy is the use of medicine to kill cancer cells. It is a type of systemic therapy. Chemotherapy is usually given intravenously. This means the medicine is slowly infused into the bloodstream through a vein. It travels through the bloodstream to reach cells throughout the body.

Chemotherapy is given in cycles of treatment days followed by days of rest. This allows your body to recover between cycles. Cycles vary in length depending on which drugs are used.

### Stage 1

Chemotherapy is not recommended after colectomy for stage 1 cancers.

### Stage 2

Chemotherapy is not recommended after colectomy for stage 2A and 2B dMMR/MSI-H cancers, but may be given for some stage 2C dMMR/MSI-H cancers.

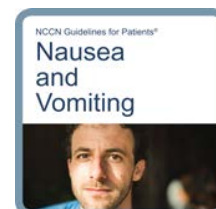
Chemotherapy is recommended after colectomy for **some** stage 2 pMMR/MSS cancers. It is most helpful for cancers with a high risk of recurrence (returning after treatment). Your doctor will consider the features and risk factors of the cancer to determine if recurrence is likely. If chemotherapy is planned, recommended regimens include capecitabine and 5-fluorouracil (5-FU)/leucovorin. These are given for 6 months. FOLFOX and CAPEOX are recommended options for high-risk cancers. FOLFOX is given for 6 months; CAPEOX for 3 months.

## Side effects

Systemic therapy kills both cancer cells and healthy cells. The damage to healthy cells can cause hair loss, cracked skin, mouth sores, and other side effects.

Managing side effects is a shared effort between you and your care team. It is important to speak up about bothersome side effects, such as nausea and vomiting. Ask about your options for managing or relieving the effects of treatment.

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



### Stage 3

Chemotherapy is recommended after colectomy for all stage 3 colon cancers. Preferred regimens include CAPEOX and FOLFOX. Other recommended options include capecitabine and 5-FU.

Chemotherapy is typically given for 3 to 6 months. The length of treatment depends on the regimen and the risk of recurrence.

## Surveillance

Follow-up testing is started when there are no signs of cancer after treatment. It can help find new cancer growth early.

### Stage 1

A colonoscopy is recommended 1 year after surgery for stage 1 cancers. If the results are normal, your next colonoscopy should be in 3 years, and then every 5 years. If a concerning or high-risk adenoma is found, your next colonoscopy will be needed within 1 year.

If you don't have any symptoms, other testing is not needed on a regular basis. Imaging

tests may be ordered if your doctor thinks the cancer may have come back or spread.

### Stages 2 and 3

In addition to colonoscopy, surveillance for stages 2 and 3 colon cancer includes physical exams, carcinoembryonic antigen (CEA) blood tests, and CT scans. The recommended schedule for surveillance testing is shown in **Guide 1**.

In addition to surveillance testing, a range of other care is important for cancer survivors. For more information, see *Chapter 5: Survivorship*.

### Guide 1 Stages 2 and 3 – Surveillance after treatment

#### Physical exam and CEA blood test

**First 2 years:** Every 3 to 6 months

**Next 3 years:** Every 6 months

#### CT of chest, abdomen, and pelvis

Every 6 to 12 months for 5 years

#### Colonoscopy

**You did not have a total colonoscopy at diagnosis:**

Colonoscopy is recommended 3 to 6 months after surgery.

**You had a total colonoscopy at diagnosis:**

Colonoscopy is recommended 1 year after surgery. If no advanced adenomas are found, repeat in 3 years. After that, repeat every 5 years.

## Key points

### Polyps with cancer

- No further treatment is needed for a malignant pedunculated polyp that was removed in one piece and found to be low risk.
- Malignant sessile polyps are more likely to return after polypectomy than pedunculated polyps. Surgery and observation are options for sessile polyps.

### Invasive cancer

- Colectomy is needed for cancer that is not found early enough to be removed by polypectomy. If surgery is not possible, systemic therapy is recommended.
- If the cancer is advanced or has spread to lymph nodes, chemotherapy or immunotherapy may be given before surgery.
- Chemotherapy is not recommended after surgery for stage 1 cancers.
- Chemotherapy is recommended after surgery for stage 2 pMMR/MSS cancers that are at high risk of recurrence.
- Chemotherapy is recommended after surgery for all stage 3 cancers.

### Surveillance

- Colonoscopies are used to check for recurrence after treatment for stage 1 colon cancer. You may also have physical exams and CEA blood tests.
- Surveillance for stages 2 and 3 colon cancer includes physical exams, CEA blood tests, colonoscopies, and CT scans.

# 4

## Treatment for metastatic cancer

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**Colon cancer spreads most often to the liver, sometimes to the lungs, and less often to the abdomen or other areas. Cancer that has metastasized by the time it is diagnosed is stage 4.**

## Biomarker testing

Biomarkers are targetable features of a cancer. They are often mutations (changes) in particular genes. When possible, biomarker testing is performed on a piece of tumor tissue removed during a biopsy or surgery. If this isn't possible, a sample of blood can be tested. All metastatic colon cancers should be tested for the following biomarkers:

- Mismatch repair deficiency/high microsatellite instability (dMMR/MSI-H) (if not already performed)
- *RAS* (*KRAS* and *NRAS*) mutations
- *BRAF* mutations
- HER2 amplification

Testing for many biomarkers at one time is called next-generation sequencing (NGS). NGS can find other, rare biomarkers for which targeted treatments may be available, including:

- *POLE/POLD1* mutations
- *RET* fusions
- *NTRK* fusions

## Local therapies

Your treatment options may include local therapies. These are treatments that target liver and lung tumors directly.

Some are interventional oncology/radiology techniques, also known as image-guided therapies. These techniques use imaging, such as ultrasound or computed tomography (CT), to deliver minimally invasive cancer treatments. Using imaging during the procedure allows your doctor to precisely target the tumor(s).

A team of experts can determine the best local therapy for your metastatic tumor(s). To learn if surgery or treatment with other local therapies is an option, your case should be evaluated by a multidisciplinary team of experts. The team should include a surgeon experienced in removing liver and lung tumors and an interventional oncologist/radiologist.

### Resection

Surgery to remove liver and/or lung tumors is called resection. Resection is often preferred for removing colon cancer that has spread to these organs.

Image-guided thermal ablation (described on the next page) may be used:

- With resection, if surgery is not expected to completely remove the tumors
- Instead of resection, if the tumors are small and can be completely destroyed

If a liver resection is needed, your liver may need to be enlarged first. This is done using a minimally invasive procedure called portal

vein embolization. An interventional radiologist inserts a catheter into certain veins in the liver. This blocks the blood vessel to the liver tumor, causing the healthy part of the liver to grow.

## Ablation

Image-guided thermal ablation destroys small liver or lung tumors. A specialized needle is placed directly into or next to the target tumor. This probe delivers targeted energy to the tumor while minimizing damage to surrounding normal tissue.

Radiofrequency and microwave ablation are commonly used methods that kill cancer cells using heat. Cold energy (cryoablation) is used sometimes, mostly for lung tumors. Less common types include irreversible electroporation (“nanoknife”) and laser ablation.

Thermal ablation may be used in addition to surgery, or alone for small tumors that can be fully removed. It will only be used if all visible areas of cancer can be destroyed. Ablation may be performed by either an interventional radiologist or a surgeon. Sometimes it can be done in a single session in the interventional radiology department.

## Liver-directed therapies

### Embolization

If the cancer has spread only (or mainly) to the liver, treatment with intra-arterial liver-directed therapies may be an option. These therapies may be considered for liver tumors that:

- Didn't improve (or stopped improving) with chemotherapy, and
- Cannot be resected or ablated.

Intra-arterial therapies treat liver tumors with chemotherapy beads (chemoembolization) or radioactive spheres (radioembolization). If radiation spheres are used, it is known as selective internal radiation therapy (SIRT) or transarterial hepatic radioembolization (TARE). These procedures are performed by interventional oncologists/radiologists.

A catheter is inserted into an artery in your leg or wrist and guided to the liver tumor(s). Once in place, the spheres or beads are injected into the blood vessel leading to the tumor. They collect inside the tumor and deliver radiation or chemotherapy, causing the cancer cells to die.

The chemotherapy beads can also work to starve the tumor by stopping its blood supply. The chemotherapy or radiation further damage the cancer cells and cause the tumor to shrink. When embolization with chemotherapy is not an option, small beads may be used to physically block blood supply to the tumor. This is called bland embolization.

### HAIC

Hepatic arterial infusion chemotherapy (HAIC) is chemotherapy given directly to the liver. It is often given in addition to standard intravenous chemotherapy. Using a port or pump that is



usually placed during surgery to remove liver tumors, the drugs are funneled directly into the artery leading to the liver. HAIC should only be performed by medical oncologists at treatment centers with experience in this method.

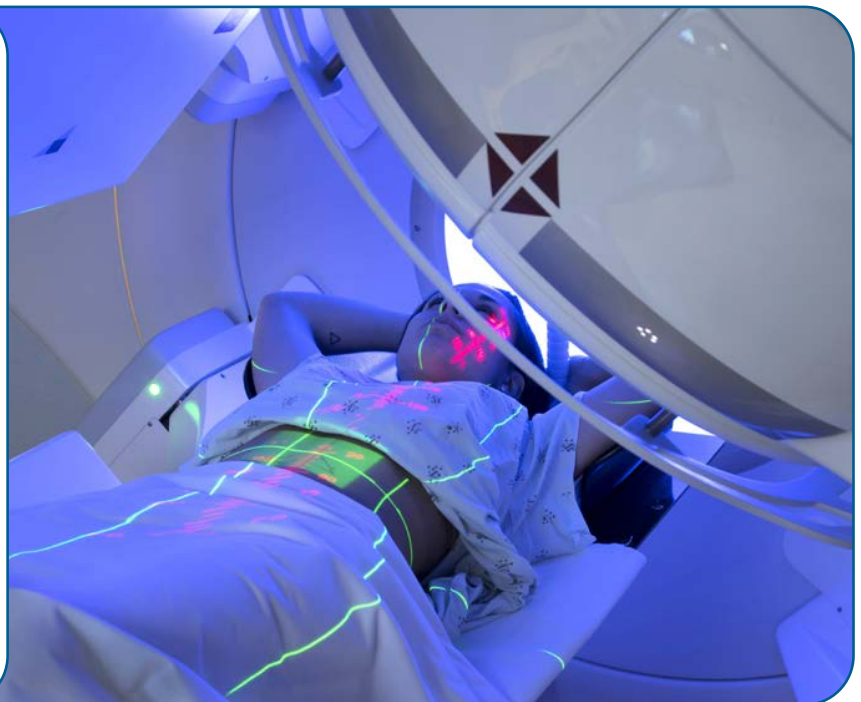
### **Stereotactic body radiation therapy**

Stereotactic body radiation therapy (SBRT) is a highly specialized type of external beam radiation therapy (EBRT). It may be used to treat colon cancer that has spread to the liver, lungs, or bone.

In SBRT, high doses of radiation are delivered to metastatic tumor(s) using very precise beams. The radiation comes from a large machine outside the body. The radiation passes through skin and other tissue to reach the tumor(s). Treatment with SBRT is typically complete in 5 or fewer sessions, called fractions.

#### **Stereotactic body radiation therapy (SBRT)**

**SBRT may be used to treat colon cancer that has spread to the liver, lungs, or bone. High doses of radiation are delivered to a metastatic site or sites using very precise beams. Treatment is typically given in 5 or fewer sessions.**





## Stage 4 cancer in the liver or lungs

When possible, surgery and systemic therapy is the recommended treatment approach for these cancers. The choice of systemic therapy (chemotherapy or immunotherapy) depends on the mismatch repair (MMR) status of the cancer.

Surgery involves colectomy to remove the colon tumor. The liver or lung tumors are resected when the colectomy is performed, or later as a separate surgery. If the metastatic tumors are small, removing or destroying them with local therapies may be an option—alone or with surgery.

### pMMR/MSS cancer

Your doctor may recommend 2 to 3 months of chemotherapy before, after, or between surgeries. This is **in addition to** the chemotherapy that is recommended for everyone after surgery, called adjuvant chemotherapy.

The goal of adjuvant chemotherapy is to kill any cancer cells that may remain in the body. Either FOLFOX or CAPEOX is preferred. Capecitabine and 5-FU/leucovorin are also options if needed. After chemotherapy, surveillance begins.

If all areas of **cancer cannot be removed with surgery and/or local therapies**, stage 4 colon cancer is treated with systemic therapy. Systemic therapy given first is called first-line therapy.

Recommended first-line regimens are listed below. The targeted therapy bevacizumab (Avastin) may be added to any of these regimens:

- FOLFIRI
- FOLFOX
- CAPEOX
- FOLFIRINOX

For some pMMR/MSS cancers, FOLFIRI or FOLFOX may be given with a targeted therapy—either panitumumab (Vectibix) or cetuximab (Erbix). These regimens are only recommended for tumors **without** *RAS* (*KRAS* or *NRAS*) or *BRAF* mutations.

While uncommon, systemic therapy may shrink the tumors enough to be removed with surgery and/or local therapies. After surgery, most people will have more systemic therapy. In some cases, observation or a short course of chemotherapy may be possible.

If the tumors do not become resectable during first-line therapy, systemic therapy is typically continued. The goal is to slow the growth and spread of the cancer.

If the cancer progresses, the regimen you receive next may be different from what you had before. The choice will depend on prior systemic therapy you've had and how well you are expected to tolerate certain regimens. Another important factor is whether the tumor has any biomarkers. Regimens targeting specific biomarkers are listed in **Guide 2** on the next page.

If the cancer progresses through all available regimens, recommended options if you are eligible include:

- Targeted therapy with fruquintinib (Fruzaqla)
- Chemotherapy with trifluridine and tipiracil (Lonsurf)
- Targeted therapy with regorafenib (Stivarga)

All are tablets taken by mouth. The targeted therapy bevacizumab may be given with Lonsurf.

### **dMMR/MSI-H or POLE/POLD1-mutated cancer**

The preferred treatment approach for resectable stage 4 dMMR/MSI-H or *POLE/POLD1*-mutated cancers is immunotherapy followed by surgery. Immunotherapy is only recommended if you haven't already had treatment with a checkpoint inhibitor. Recommended options include:

- Nivolumab (Opdivo), which may be given with ipilimumab (Yervoy)
- Pembrolizumab (Keytruda)
- Dostarlimab-gxly (Jemperli)

## **Guide 2**

### **Biomarker-based treatments for pMMR/MSS cancers**

<b><i>BRAF</i> V600E mutation</b>	Encorafenib + (cetuximab or panitumumab)
<b>HER2 amplification</b>	<ul style="list-style-type: none"> <li>• Trastuzumab (Herceptin) + pertuzumab, lapatinib, or tucatinib</li> <li>• Fam-trastuzumab deruxtecan-nxki (Enhertu)</li> </ul>
<b><i>KRAS</i> G12C mutation</b>	<ul style="list-style-type: none"> <li>• Sotorasib (Lumakras) + cetuximab or panitumumab</li> <li>• Adagrasib (Krasati) + cetuximab or panitumumab</li> </ul>
<b><i>NTRK</i> gene fusion</b>	<ul style="list-style-type: none"> <li>• Entrectinib (Rozlytrek)</li> <li>• Larotrectinib (Vitrakvi)</li> </ul>
<b><i>RET</i> gene fusion</b>	Selpercatinib (Retevmo)

Another recommended treatment approach for these cancers is surgery followed by chemotherapy. Either FOLFOX or CAPEOX is preferred. Capecitabine and 5-FU/leucovorin are also options if needed.

If all areas of cancer **cannot** be removed with surgery and/or local therapies, stage 4 colon cancer is treated with systemic therapy. If you are a candidate and haven't had immunotherapy, treatment with a checkpoint inhibitor is recommended. Your doctor will check the extent of the cancer every 2 to 3 months. Surgery may become possible. Or you may continue immunotherapy or switch to a different systemic therapy.

If you've already had immunotherapy, another type of systemic therapy is recommended.

## Stage 4 cancer in the abdomen

Some people with metastatic colon cancer will also form tumors in the layer of tissue that lines the abdomen, called the peritoneum. The peritoneum covers most of the abdominal organs.

In most cases, systemic therapy is given with the goal of relieving or preventing symptoms. The regimen you receive will depend on whether the tumor has any biomarkers and how well you are expected to tolerate certain systemic therapies.

Tumors growing in or around the bowel can block stool from moving and leaving the body. In this case, the bowel needs to be unblocked before starting systemic therapy. This is done using one of several surgical techniques, or with a mesh metal tube called a stent.

### Cytoreductive surgery and HIPEC

In a small number of people, cytoreductive surgery and/or hyperthermic intraperitoneal chemotherapy (HIPEC) may be treatment options. But research is needed on whether the benefits of these treatments outweigh the possible harms. They are only used in specialized centers and under certain circumstances.

Cytoreductive surgery involves surgically removing all visible tumors. If the tumor cannot be separated from the surface of an organ, the organ may also need to be removed. In HIPEC, a heated chemotherapy solution is put directly into the abdominal cavity through small tubes called catheters.

## Surveillance

Surveillance after treatment for stage 4 colon cancer includes:

- Colonoscopies
- Physical exams
- Carcinoembryonic antigen (CEA) blood tests
- Computed tomography (CT) scans

The recommended schedule for surveillance testing is shown in **Guide 3**.

In addition to surveillance testing, a range of other care is important for cancer survivors. For more information, see *Chapter 5: Survivorship*.



**It's OK to have bad days but don't let yourself stay there. A positive attitude goes a long way."**

### Guide 3

#### Surveillance after treatment for stage 4 colon cancer

<b>Physical exam and CEA blood test</b>	<p><b>First 2 years:</b> Every 3 to 6 months</p> <p><b>Next 3 years:</b> Every 6 months</p>
<b>CT of chest, abdomen, and pelvis</b>	<p><b>First 2 years:</b> Every 3 to 6 months</p> <p><b>Next 3 years:</b> Every 6 to 12 months</p>
<b>Colonoscopy</b>	<p><b>You did not have a total colonoscopy at diagnosis:</b> Colonoscopy is recommended 3 to 6 months after surgery.</p> <p><b>You had a total colonoscopy at diagnosis:</b> Colonoscopy is recommended 1 year after surgery. If no advanced adenomas are found, repeat in 3 years. After that, repeat every 5 years.</p>

## Distant recurrence

After treatment for non-metastatic colon cancer, the cancer may return and spread to the liver, lungs, or other areas. This is called a distant recurrence. Treatment with surgery and/or local therapies is recommended if all of the tumors can be totally removed. But, this is uncommon, and most distant recurrences are treated with systemic therapy.

Systemic therapy may shrink the tumors enough to be removed with surgery. If your doctor thinks this might be possible, the size of the tumors will be checked about every 2 months during systemic therapy. If the cancer does not become resectable, systemic therapy is typically continued. The goal is to slow the growth and spread of the cancer.

Specific recommendations are provided below according to the mismatch repair status of the cancer and whether resection is possible.

### Unresectable pMMR/MSS cancer

If you've had recent treatment with FOLFOX or CAPEOX, you should not have more chemotherapy that includes oxaliplatin. Oxaliplatin can cause serious nerve damage. Your options for systemic therapy will depend, in part, on whether the cancer has any biomarkers. Therapies targeting the biomarkers listed below are available:

- HER2 amplification
- *KRAS* G12C mutation
- *BRAF* mutations
- *NTRK* gene fusion
- *RET* gene fusion

For cancers without biomarkers, chemotherapy with FOLFIRI or irinotecan is a recommended first-line option. A biologic may be given with chemotherapy. Biologics include bevacizumab, ziv-aflibercept, ramucirumab, cetuximab, and panitumumab.

### Resectable pMMR/MSS cancer

If you **have received** treatment with chemotherapy, one recommended option is resection (and/or treatment with local therapies) first, followed by either chemotherapy or observation. Observation is preferred for those who have already had treatment with oxaliplatin.

A second option is 2 to 3 months of chemotherapy first, followed by resection (and/or treatment with local therapies). More chemotherapy may follow.

If you **have not** had any chemotherapy, resection (and/or treatment with local therapies) is often performed first, followed by chemotherapy. FOLFOX and CAPEOX are preferred for chemotherapy. Capecitabine and 5-FU/leucovorin are also options if needed.

A second option for those who haven't had any chemotherapy is 2 to 3 months of chemotherapy first, followed by resection and/or treatment with local therapies. More chemotherapy may follow.

### **Unresectable dMMR/MSI-H or POLE/POLD1-mutated cancer**

If you are a candidate and haven't had immunotherapy, treatment with a checkpoint inhibitor is recommended. Your doctor will check the extent of the cancer every 2 to 3 months. Surgery may become possible. Or, you may continue immunotherapy or switch to a different systemic therapy.

If you've already had immunotherapy, another type of systemic therapy is recommended. This may be oxaliplatin-based chemotherapy such as FOLFOX or CAPEOX. Or, if the cancer has any other biomarkers, targeted therapy may be an option.

### **Resectable dMMR/MSI-H or POLE/POLD1-mutated cancer**

There are 2 options for treating resectable, distant recurrences of dMMR/MSI-H cancer. Local therapies may be used together with resection, or used alone for very small tumors.

If you **have not** had immunotherapy, recommended options include:

- Immunotherapy, followed by observation or resection
- Resection followed by chemotherapy

If you **have received** checkpoint inhibitor immunotherapy, one recommended option is resection first, followed by either chemotherapy or observation. Observation is recommended for those who have already had treatment with oxaliplatin.



**Supportive care is available for everyone with cancer. It isn't meant to treat the cancer, but rather to help with symptoms and make you more comfortable.**

A second option is 2 to 3 months of chemotherapy first, followed by resection. More chemotherapy may follow.

## Clinical trials

A clinical trial is a type of medical research study. After being developed and tested in a laboratory, 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. Treatment trials 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 long-term safety and benefit of an FDA-approved treatment.

### Who can enroll?

Every clinical trial has rules for joining, called eligibility criteria. The rules may be about age, cancer type and stage, treatment history, or general health. These requirements 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 group of experts called a research team. The research team 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 with family, friends, or others whom you trust. Keep in mind that you can leave and seek treatment outside of the clinical trial at any time.

### Start the conversation

Don't wait for your doctor to bring up clinical trials. Start the conversation and learn about all of your treatment options. If you find a study that you may be eligible for, ask your treatment team if you meet the requirements. Try not to be discouraged if you cannot join. New clinical trials are always becoming available.

## Frequently asked questions

There are many myths and misconceptions surrounding clinical trials. The possible benefits and risks are not well understood by many with cancer.

### Will I get a placebo?

Placebos (inactive versions of real medicines) are almost never used alone in cancer clinical trials. It is common to receive either a placebo with a standard treatment, or a new drug with a standard treatment. You will 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. You may, however, have costs indirectly related to the trial, such as the cost of transportation or child care due to extra appointments. During the trial, you will continue to receive standard cancer care. This care is billed to—and often covered by—insurance. You are responsible for copays and any costs for this care that are not covered by your insurance.



## Finding a clinical trial

### In the United States

#### NCCN Cancer Centers

[NCCN.org/cancercenters](https://www.nccn.org/cancercenters)

#### The National Cancer Institute (NCI)

[cancer.gov/about-cancer/treatment/clinical-trials/search](https://www.cancer.gov/about-cancer/treatment/clinical-trials/search)

### Worldwide

#### The U.S. National Library of Medicine (NLM)

[clinicaltrials.gov](https://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](https://www.cancer.gov/contact)



## Key points

### Biomarker testing

- Everyone with metastatic colon cancer should have biomarker tumor testing that includes dMMR/MSI-H (if not already done), *RAS* and *BRAF* mutations, and HER2 amplification.
- Next-generation sequencing (NGS) can find other rare biomarkers for which targeted treatments may be available, including: *POLE/POLD1* mutations; *RET* fusions; and *NTRK* fusions.

### Local therapies for liver and lung tumors

- Treatment options for metastatic colon cancer may include local therapies, such as image-guided thermal ablation and stereotactic body radiation therapy (SBRT).
- These treatments may be used in addition to or in place of surgery if all areas of cancer can be removed.
- To learn if surgery or treatment with other local therapies is an option, your case should be evaluated by a multidisciplinary team of experts.

### Stage 4 colon cancer

- When possible, treatment with surgery and systemic therapy is recommended. The choice of chemotherapy or immunotherapy depends on the mismatch repair status of the cancer.

- Stage 4 cancer that cannot be removed with surgery and/or local therapies is treated with systemic therapy.

- For colon cancer that has spread to the peritoneum, systemic therapy is usually given. The goal is to relieve or prevent symptoms.

### Distant recurrence

- The return and spread of stage 1, 2, or 3 colon cancer to areas far from the colon is called a distant recurrence.
- Most distant recurrences are treated with systemic therapy.

### Clinical trials

- Clinical trials provide access to investigational treatments that may, in time, be approved by the U.S. Food and Drug Administration (FDA).



**As the care partner for my stage IV husband, I would share that you must advocate for them. However, be respectful of their feelings and ensure you're communicating your research/questions with them. I always reviewed my list of questions and concerns with my husband on the way to our appointments in case I had something on my list that he might not want asked or answered."**

# 5

## Survivorship

- 36 Your primary care doctor
- 36 Help with side effects
- 37 Paying for care
- 38 Healthy habits
- 39 More information
- 39 Key points

**Survivorship focuses on the physical, emotional, and financial issues faced by cancer survivors. Managing the long-term side effects of cancer and its treatment, staying connected with your primary care doctor, and living a healthy lifestyle are important parts of survivorship.**

## Your primary care doctor

After finishing cancer treatment, your primary care doctor will play an important role in your care. Your oncologist (cancer doctor) and primary care physician (PCP) should work together to make sure you get the follow-up care you need. Ask your oncologist for a written survivorship care plan. Ideally, the plan will include:

- A summary of your cancer treatment history
- A description of possible late- and long-term side effects
- Recommendations for monitoring for the return of cancer
- Information on when your care will be transferred to your PCP
- Clear roles and responsibilities for your cancer doctor and your PCP
- Recommendations on your overall health and well-being

## Help with side effects

Colon cancer survivors may experience both short- and long-term health effects of cancer and its treatment. The effects depend in part on the treatment(s) received. Surgery, anti-cancer medicines, and radiation therapy all have unique potential side effects.

### Diarrhea or incontinence

Colon surgery can cause changes to your bowel habits. You may experience changes in the frequency or urgency of your bowel movements. Diarrhea refers to having frequent and watery bowel movements. Incontinence is the inability to control urination (urinary incontinence) or bowel movements (fecal incontinence). The following may help with these side effects:

- Anti-diarrhea medicines
- Changing your diet
- Strengthening your pelvic floor
- Wearing protective undergarments

### Nerve damage

The chemotherapy drug oxaliplatin can damage nerves in your fingers and toes. Symptoms include numbness, cramping, tingling, or pain in these areas. Acupuncture and heat may help. If you have painful nerve damage, a drug called duloxetine (Cymbalta) may help.

### Ostomy care

If you have an ostomy, you may want to join an ostomy support group. Another option is to

see a health care provider that specializes in ostomy care, such as an ostomy nurse.

People with ostomies can still live very active lifestyles. However, it's a good idea to talk to an ostomy professional before doing any intense physical activity.

## Paying for care

Cancer survivors face a unique financial burden. Paying for doctor visits, tests, and treatments can become unmanageable, especially for those with little or no health insurance. You may also have costs not directly related to treatment, such as travel expenses and the cost of childcare or missed work.

The term financial toxicity is used to describe the problems patients face related to the cost of medical care. Financial toxicity can affect your quality of life and access to needed health care. If you need help paying for your cancer care, financial assistance may be available. Talk with a patient navigator, your treatment team's social worker, and your hospital's financial services department. Some of the resources listed on page 46 contain helpful information on paying for cancer care.



**I am a stage III colon cancer survivor. I would recommend taking it one day at a time, 1 hour if necessary. Get a second opinion to feel confident in your treatment plan. Lastly, connect with others who have been where you are. Peer support (whether patient or caregiver) as you navigate your cancer journey is invaluable.”**

## Healthy habits

It is important to keep up with other aspects of your health after cancer treatment. Steps you can take to help prevent other health problems and to improve your quality of life are described next.

### Cancer screening and other care

Get screened for other types of cancer, such as breast, prostate, and skin cancer. Your primary care doctor can advise you on which screening tests you should have based on your age and risk level.

### Other health care

Get other recommended health care for your age, such as blood pressure screening, hepatitis C screening, and immunizations (like the flu shot).

### Diet and exercise

Try to exercise for at least 150 minutes per week. Alcohol may increase the risk of certain cancers. Drink little to no alcohol.

A low glycemic load (GL) diet may help prevent the return of colon cancer. Low GL foods cause a slower and smaller rise in blood sugar levels compared to other carbohydrate-containing foods. Talk to your doctor about a low glycemic load diet.

### Aspirin

Talk to your doctor about the possible risks and benefits of long-term aspirin therapy to help prevent the return of colorectal cancers.

### Quit smoking

If you smoke or vape, quit! Your doctor will be able to provide (or refer you for) counseling on how to stop smoking.

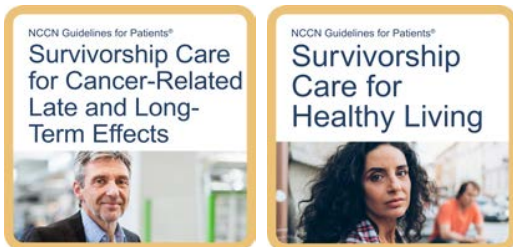
Experts recommend eating a diet that includes a lot of plant-based foods, such as vegetables, fruits, and whole grains.



## More information

For more information on cancer survivorship, the following are available at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines):

- *Survivorship Care for Healthy Living*
- *Survivorship Care for Cancer-Related Late and Long-Term Effects*



These resources address many topics relevant to cancer survivors, including:

- Anxiety, depression, and distress
- Fatigue
- Pain
- Sexual health
- Sleep problems
- Healthy lifestyles
- Immunizations
- Employment, insurance, and disability concerns

## Key points

- Survivorship focuses on the physical, emotional, and financial issues unique to cancer survivors.
- Ideally, your oncologist and primary care doctor will work together to provide the follow-up care you need.
- A survivorship care plan is helpful in transitioning your care to your primary care doctor.
- Healthy habits, including exercising and eating right, play an important role in helping to prevent other diseases and second cancers.

# 6

## Making treatment decisions

- 41 It's your choice
- 41 Questions to ask
- 46 Resources



**It's important to be comfortable with the cancer treatment you choose. This choice starts with having an open and honest conversation with your care team.**

## It's your choice

In shared decision-making, you and your care team share information, discuss the options, and agree on a treatment plan. It starts with an open and honest conversation between you and your care team.

Treatment decisions are very personal. What is important to you may not be important to someone else. Some things that may play a role in your decision-making:

- What you want and how that might differ from what others want
- Your religious and spiritual beliefs
- Your feelings about certain treatments
- Your feelings about pain or side effects
- Cost of treatment, travel to treatment centers, and time away from school or work
- Quality of life and length of life
- How active you are and the activities that are important to you

Think about what you want from treatment. Discuss openly the risks and benefits of specific treatments and procedures. Weigh options

and share concerns with your care team. If you take the time to build a relationship with your care team, it will help you feel supported when considering options and making treatment decisions.

## Second opinion

It is normal to want to start treatment as soon as possible. While cancer can't be ignored, there is time to have another doctor review your test results and suggest a treatment plan. This is called getting a second opinion, and it's a normal part of cancer care. Even doctors get second opinions!

Things you can do to prepare:

- Check with your insurance company about its rules on second opinions. There may be out-of-pocket costs to see doctors who are not part of your insurance plan.
- Make plans to have copies of all your records sent to the doctor you will see for your second opinion.

## Support groups

Many people diagnosed with cancer find support groups to be helpful. Support groups often include people at different stages of treatment. Some people may be newly diagnosed, while others may be finished with treatment. If your hospital or community doesn't have support groups for people with cancer, check out the websites listed in this book.

## Questions to ask

Possible questions to ask your care team are listed on the following pages. Feel free to use these questions or come up with your own.



## Questions about treatment

1. Do you consult NCCN recommendations when considering options?
2. Are you suggesting options other than what NCCN recommends? If yes, why?
3. Do your suggested options include clinical trials? Please explain why.
4. How do my age, health, and other factors affect my options?
5. What if I am pregnant, or planning to become pregnant in the future?
6. What are the benefits and risks of each option? Does any option offer a cure or long-term cancer control?
7. How much will treatment cost? What does my insurance cover?
8. How long do I have to decide about treatment?
9. Who can I call on weekends or non-office hours if I have an urgent problem with my cancer or my cancer treatment?
10. Can you give me a copy of my pathology report and other test results?

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## Questions about non-metastatic colon cancer

1. Is the cancer mismatch repair deficient (dMMR) or microsatellite instability-high (MSI-H)?
2. Am I a candidate for surgery (colectomy)? Why or why not?
3. How much of my colon will be removed? How many lymph nodes will be removed?
4. Will I need a colostomy? If so, will it be temporary?
5. Which side effects of surgery are most likely?
6. Am I a candidate for minimally invasive surgery?
7. Will I need chemotherapy or immunotherapy after surgery? For how long?
8. How do I prepare for surgery? Do I have to stop taking any of my medicines? Are there foods I will have to avoid?
9. When will I be able to return to my normal activities?
10. How likely is the cancer to return after treatment with surgery?

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## Questions about stage 4 colon cancer

1. Where has the cancer spread?
2. Am I a candidate for surgery? If not, is it possible that I'll become a candidate?
3. Does my cancer have any biomarkers? How does this affect my options?
4. What treatment will I have before, during, or after surgery?
5. Am I a candidate for treatment with local therapies? Did an interventional oncologist/radiologist review my case?
6. Which systemic therapy regimen do you recommend for me? Why?
7. How will you know if systemic therapy is working? What if it stops working?
8. What is my prognosis?
9. What can be done to prevent or relieve the side effects of treatment?
10. Am I a candidate for a clinical trial? Do you know of one I can join?

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## Questions about resources and support

1. Who can I talk to about help with housing, food, and other basic needs?
2. What help is available for transportation, childcare, and home care?
3. How much will I have to pay for treatment?
4. What help is available to pay for medicines and treatment?
5. What other services are available to me and my caregivers?
6. How can I connect with others and build a support system?
7. How can I find in-person or online support?
8. Who can help me with my concerns about missing work or school?
9. Who can I talk to if I don't feel safe at home, at work, or in my neighborhood?
10. How can I get help to stop smoking or vaping?

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## Resources

**Cancer Hope Network**  
[Cancerhopenetwork.org](https://cancerhopenetwork.org)

**Colorectal Cancer Alliance**  
[ccalliance.org](https://ccalliance.org)

**Fight Colorectal Cancer**  
[fightcolorectalcaner.org](https://fightcolorectalcaner.org)

**FORCE Facing Our Risk of Cancer Empowered**  
[facingourrisk.org](https://facingourrisk.org)

**Love Your Buns**  
[loveyourbuns.org](https://loveyourbuns.org)

**National Coalition for Cancer Survivorship**  
[canceradvocacy.org](https://canceradvocacy.org)

**Paltown**  
[Paltown.org](https://paltown.org)

**Triage Cancer**  
[Triagecancer.org](https://triagecancer.org)

**U.S. National Library of Medicine Clinical Trials Database**  
[clinicaltrials.gov](https://clinicaltrials.gov)



**share with us.**

Take our survey,  
and help make the  
NCCN Guidelines for Patients  
better for everyone!

[NCCN.org/patients/comments](https://NCCN.org/patients/comments)



## Words to know

### **ablation**

A type of local therapy used to destroy tumors in the liver or lungs. Also called image-guided thermal ablation.

### **adenocarcinoma**

Cancer in cells that line organs and make fluids or hormones. The most common type of colon cancer.

### **adenoma**

The most common type of colon polyp. Most likely to form cancer cells. Also called adenomatous polyps.

### **biomarkers**

Specific features of cancer cells used to guide treatment. Biomarkers are often mutations (changes) in the DNA of the cancer cells.

### **CAPEOX**

A chemotherapy regimen that includes capecitabine and oxaliplatin.

### **carcinoembryonic antigen (CEA)**

A protein that gets released by some tumors and can be detected in blood.

### **carcinoma in situ**

Abnormal cells on the innermost layer of the colon wall. These cells may become cancer and spread into deeper layers of the colon wall.

### **colectomy**

Surgery to remove a part of the colon.

### **colon**

The first and longest section of the large bowel. Unused food is turned into stool in the colon.

### **colonoscopy**

Insertion of a thin tool into the colon to view or remove tissue.

### **colostomy**

Surgery to connect a part of the colon to the outside of the abdomen and that allows stool to drain into a bag.

### **embolization**

Blockage of blood flow to a tumor with beads that emit either chemotherapy or radiation.

### **external beam radiation therapy (EBRT)**

Treatment with high-energy rays received from a machine outside the body.

### **familial adenomatous polyposis (FAP)**

An inherited cancer syndrome that increases the risk of colon cancer.

### **FOLFIRI**

A chemotherapy regimen used for some advanced colon cancers. Includes leucovorin calcium, fluorouracil, and irinotecan.

### **FOLFIRINOX**

A chemotherapy regimen used for some advanced colon cancers. Includes leucovorin calcium (folinic acid), fluorouracil, irinotecan, and oxaliplatin.

### **FOLFOX**

A chemotherapy regimen that includes leucovorin calcium, fluorouracil, and oxaliplatin.

### **interventional oncology/radiology**

A medical specialty that uses imaging techniques to deliver minimally invasive cancer treatments.



**large intestine (bowel)**

A long tube-shaped organ that forms the last part of the digestive system. Includes the colon, rectum, and anus.

**lymph**

A clear fluid containing white blood cells.

**lymphadenectomy**

Surgery to remove lymph nodes.

**lymph node**

Small groups of special disease-fighting cells located throughout the body.

**metastasectomy**

Surgery to remove cancer that has spread far from the first tumor.

**metastasis**

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

**mismatch repair deficiency (dMMR)/high microsatellite instability (MSI-H)**

A biomarker (feature) of some colon cancers that is used to guide treatment. All colon cancers should be tested for this biomarker.

**mismatch repair proficient (pMMR)/microsatellite stable (MSS)**

Describes cancers that do not have the mismatch repair deficiency (dMMR) biomarker.

**pathologist**

A doctor who specializes in testing cells and tissue to find disease.

***POLE/POLD1* mutation**

A biomarker (feature) of some colon cancers. Recommended as part of comprehensive biomarker testing for metastatic colon cancer.

**polyp**

An overgrowth of cells on the inner lining of the colon wall. Pedunculated polyps are shaped

like mushrooms with a stalk. Sessile polyps are flat.

**portal vein embolization**

A minimally invasive procedure to enlarge the healthy part of the liver before a liver resection.

**recurrence**

The return of cancer after a cancer-free period.

**stereotactic body radiation therapy (SBRT)**

A specialized type of radiation therapy used to treat colon cancer that has spread to the liver, lungs, or bone.

**supportive care**

Treatment for the symptoms or health conditions caused by cancer or its treatment.

**unresectable**

Cancer that cannot be removed safely by surgery.

# NCCN Contributors

This patient guide is based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Colon Cancer, Version 1.2024 – January 29, 2024. It was adapted, reviewed, and published with help from the following people:

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# NCCN Cancer Centers

**Abramson Cancer Center**  
at the University of Pennsylvania  
Philadelphia, Pennsylvania  
800.789.7366 • [pennmedicine.org/cancer](http://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](http://uhhospitals.org/services/cancer-services)  
CC Taussig Cancer Institute  
866.223.8100 • [my.clevelandclinic.org/departments/cancer](http://my.clevelandclinic.org/departments/cancer)  
Case CCC  
216.844.8797 • [case.edu/cancer](http://case.edu/cancer)

**City of Hope National Medical Center**  
Duarte, California  
800.826.4673 • [cityofhope.org](http://cityofhope.org)

**Dana-Farber/Brigham and Women's Cancer Center |  
Mass General Cancer Center**  
Boston, Massachusetts  
617.732.5500 • [youhaveus.org](http://youhaveus.org)  
617.726.5130 • [massgeneral.org/cancer-center](http://massgeneral.org/cancer-center)

**Duke Cancer Institute**  
Durham, North Carolina  
888.275.3853 • [dukecancerinstitute.org](http://dukecancerinstitute.org)

**Fox Chase Cancer Center**  
Philadelphia, Pennsylvania  
888.369.2427 • [foxchase.org](http://foxchase.org)

**Fred & Pamela Buffett Cancer Center**  
Omaha, Nebraska  
402.559.5600 • [unmc.edu/cancercenter](http://unmc.edu/cancercenter)

**Fred Hutchinson Cancer Center**  
Seattle, Washington  
206.667.5000 • [fredhutch.org](http://fredhutch.org)

**Huntsman Cancer Institute at the University of Utah**  
Salt Lake City, Utah  
800.824.2073 • [healthcare.utah.edu/huntsmancancerinstitute](http://healthcare.utah.edu/huntsmancancerinstitute)

**Indiana University Melvin and Bren Simon  
Comprehensive Cancer Center**  
Indianapolis, Indiana  
888.600.4822 • [www.cancer.iu.edu](http://www.cancer.iu.edu)

**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](http://mayoclinic.org/cancercenter)

**Memorial Sloan Kettering Cancer Center**  
New York, New York  
800.525.2225 • [mskcc.org](http://mskcc.org)

**Moffitt Cancer Center**  
Tampa, Florida  
888.663.3488 • [moffitt.org](http://moffitt.org)

**O'Neal Comprehensive Cancer Center at UAB**  
Birmingham, Alabama  
800.822.0933 • [uab.edu/onealcancercenter](http://uab.edu/onealcancercenter)

**Robert H. Lurie Comprehensive Cancer Center  
of Northwestern University**  
Chicago, Illinois  
866.587.4322 • [cancer.northwestern.edu](http://cancer.northwestern.edu)

**Roswell Park Comprehensive Cancer Center**  
Buffalo, New York  
877.275.7724 • [roswellpark.org](http://roswellpark.org)

**Siteman Cancer Center at Barnes-Jewish Hospital  
and Washington University School of Medicine**  
St. Louis, Missouri  
800.600.3606 • [siteman.wustl.edu](http://siteman.wustl.edu)

**St. Jude Children's Research Hospital/  
The University of Tennessee Health Science Center**  
Memphis, Tennessee  
866.278.5833 • [stjude.org](http://stjude.org)  
901.448.5500 • [uthsc.edu](http://uthsc.edu)

**Stanford Cancer Institute**  
Stanford, California  
877.668.7535 • [cancer.stanford.edu](http://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](http://cancer.osu.edu)

**The Sidney Kimmel Comprehensive  
Cancer Center at Johns Hopkins**  
Baltimore, Maryland  
410.955.8964  
[www.hopkinskimmelcancercenter.org](http://www.hopkinskimmelcancercenter.org)

**The UChicago Medicine Comprehensive Cancer Center**  
Chicago, Illinois  
773.702.1000 • [uchicagomedicine.org/cancer](http://uchicagomedicine.org/cancer)

**The University of Texas MD Anderson Cancer Center**  
Houston, Texas  
844.269.5922 • [mdanderson.org](http://mdanderson.org)

**UC Davis Comprehensive Cancer Center**  
Sacramento, California  
916.734.5959 • 800.770.9261  
[health.ucdavis.edu/cancer](http://health.ucdavis.edu/cancer)

**UC San Diego Moores Cancer Center**  
La Jolla, California  
858.822.6100 • [cancer.ucsd.edu](http://cancer.ucsd.edu)

**UCLA Jonsson Comprehensive Cancer Center**  
Los Angeles, California  
310.825.5268 • [cancer.ucla.edu](http://cancer.ucla.edu)

**UCSF Helen Diller Family  
Comprehensive Cancer Center**  
San Francisco, California  
800.689.8273 • [cancer.ucsf.edu](http://cancer.ucsf.edu)

**University of Colorado Cancer Center**  
Aurora, Colorado  
720.848.0300 • [coloradocancercenter.org](http://coloradocancercenter.org)

**University of Michigan Rogel Cancer Center**  
Ann Arbor, Michigan  
800.865.1125 • [rogelcancercenter.org](http://rogelcancercenter.org)

**University of Wisconsin Carbone Cancer Center**  
Madison, Wisconsin  
608.265.1700 • [uwhealth.org/cancer](http://uwhealth.org/cancer)

UT Southwestern Simmons  
Comprehensive Cancer Center  
Dallas, Texas  
214.648.3111 • [utsouthwestern.edu/simmons](https://utsouthwestern.edu/simmons)

Vanderbilt-Ingram Cancer Center  
Nashville, Tennessee  
877.936.8422 • [vicc.org](https://vicc.org)

Yale Cancer Center/Smilow Cancer Hospital  
New Haven, Connecticut  
855.4.SMILOW • [yalecancercenter.org](https://yalecancercenter.org)



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**9 am to 10 am (Monday to Friday)**

**Nanavati Max Hospital (Vile Parle):**

**10 am to 12 pm (Monday to Saturday)**

**S. L. Raheja Hospital (Mahim):**

**12 pm to 4 pm (Monday to Saturday)**

**Suvarna Hospital (Borivali):**

**5 pm to 6 pm (Monday and Friday)**

**Sushrut Hospital (Chembur):**

**By appointment**

**Hinduja Hospital (Khar):**

**By appointment**

**Galaxy Healthcare (Borivali):**

**By appointment**



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