

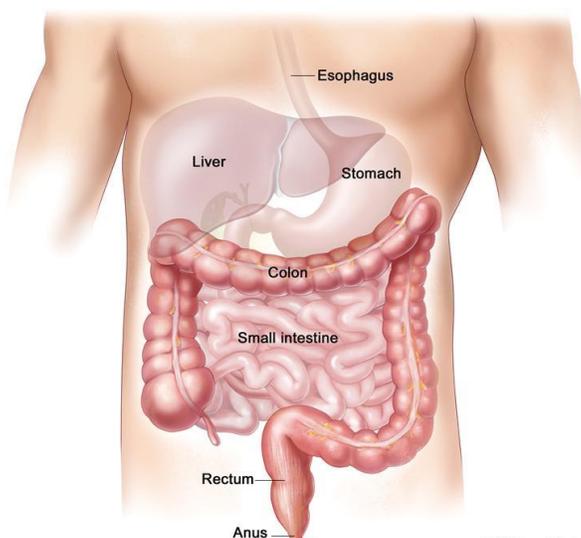
# Colorectal Cancer

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*This guide* provides an overview of the disease: how it starts, its risk factors, symptoms, diagnosis, and treatment options. Knowing more about the disease can help you cope better, take informed decisions, and make the course of treatment as manageable as possible.

## What is colorectal cancer and how does it start?

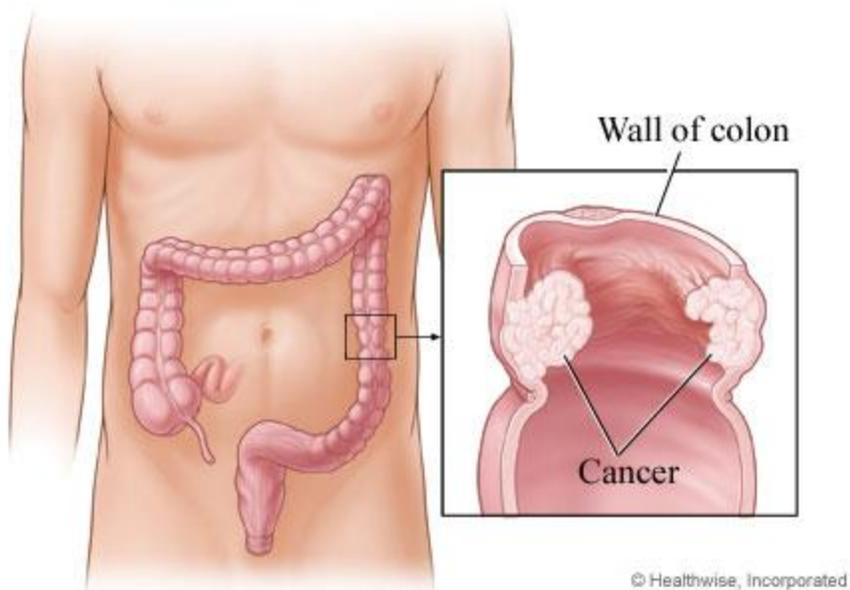
- The colon and rectum are part of the digestive system. They form a long muscular tube in the lower part of the digestive system called the large intestine: almost 1.5 meters long, the colon is the longer part while the rectum is the last end.
- The digestive system changes food into smaller parts that the body uses for as energy.
- Food passes from the stomach into the small intestine then the large intestine.
- The colon removes water and nutrients from food and changes the unused rest into waste, stool, which passes from the colon into the rectum and out of the body through the anus.



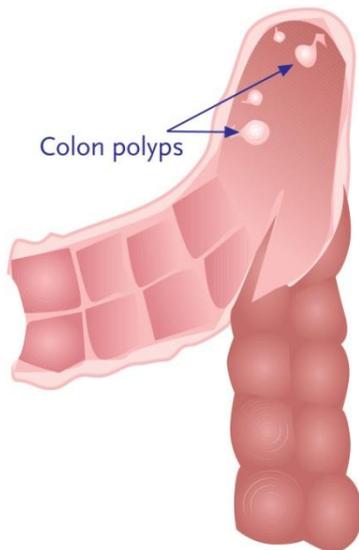
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[www.cancer.gov](http://www.cancer.gov)

- Colon cancer and rectal cancer are both commonly referred to as colorectal cancers.
- These cancers often start in a polyp: extra tissue that grows in the outer lining of the colon wall called the epithelium layer. Cancer that grows from the epithelium is called adenocarcinoma.
- But not all polyps become cancerous; some can grow into the disease.
- Polyps can be removed before any cancer starts
- If a polyp has cancer, you can be cured if the disease has not spread far.
- Polyps can be small and might not cause many symptoms: regular screening tests to prevent cancer are recommended as a result to find polyps before they can become colon cancer.
- If any family member has had colon cancer your chances of getting cancer are slightly higher.
- Recommended screening for colorectal cancer should start at age 50, and younger for people who are at a higher risk
- Colon cancer starts when: normal healthy cells in the colon become abnormal because of damage or mutations in the genes, which carry information on the role of cells. This causes abnormal cells to start to grow and multiply uncontrollably, forming a mass called a tumor. A tumor can be benign –non cancerous- or malignant –cancerous and can spread to other areas-.
- These cells can invade and attack normal tissues nearby and also spread to other parts of the body.
- Polyps can grow through the colon wall and spread to other surrounding organs and form new tumors: to the liver, lung or peritoneum, this is called metastasis.
- People who smoke run a slightly higher risk for colon cancer: Current and former smokers are more likely to develop and not recover from colon cancer than non-smokers. This risk increases with the amount of time and number cigarettes smoked



[www.myhealth.alberta.ca](http://www.myhealth.alberta.ca)



[cancercare.ns.ca](http://cancercare.ns.ca)

## What causes colorectal cancer?

In most cases the exact cause of colon cancer is not known. But these factors increase the risk of developing colorectal cancer:

- Being older: Colon cancer is more frequent the older people age, it is more common to happen after age 50



(source: ncppresbytery.org)

- Colon polyps: Polyps can be of different shape size and have different looking cells. They can be mushroom-shaped, flat or receded inside the wall of the colon.  
Risk for cancer developing in the polyp depends on type of polyp:
  - Hyperplastic polyps: Their cells grow fast in the last part of the colon and rarely become cancer
  - Adenomatous polyps: Their cells do not look like normal colon cells, most common type of polyp, most do not become cancer but most cancers start as adenomatous polyps, the risk for cancer forming in adenomas is higher if: more than 3 are found, their width is wider than that of a battery, and they have a rough structure like that of a cauliflower (called villous adenomas). **Having had adenomatous polyps puts you at risk for cancer.**
  - Inflammatory polyps: Grow usually after an episode of inflammatory bowel disease: don't usually become cancer.

- Inflammatory bowel disease: Chronic sufferers from inflammatory bowel disease have a higher risk for colon cancer: such as ulcerative colitis and Crohn's disease, but inflammatory polyps don't usually become diseased.
- Previous cancer:
  - Having had colon cancer previously puts you at risk of getting colon cancer again: the disease has a chance of returning: if you have had surgery and colon cancer removed, the likelihood of forming new growths is higher than someone who has not had the disease.
  - Having some other types of cancers might put you at higher risk of developing colon cancer: because of a similar genetic predisposition that causes these diseases: associated with colon cancer are: endometrial, uterine, pancreatic and ovarian cancer.
  - Radiation for a previous cancer: Radiation aimed at the colon to treat a previous other cancers might increase colon cancer risk
- Family history of colon cancer or colon polyps:
  - If any close relative like a parent, sibling or child has had the disease, you are more likely to get the disease.
  - This risk is higher if your relative has had colon cancer at a young age or more than one family member was affected.
  - It might not only be due to an inherited predisposition for colon cancer but might also come about from a shared damaging environment diet or lifestyle factor (like smoking).
- Genetic conditions:
  - Inherited gene mutations that increase the risk for colon cancer can be passed through families, but they are only associated with a small number of colon cancers: they increase the risk without predicting cancer will happen for sure.
  - These can be detected with genetic testing.
  - Most common inherited conditions are: Lynch syndrome can lead to colon cancer before age 50, and rare conditions like: familial adenomatous polyposis can cause colon cancer before age 40 (causes many polyps to form in the colorectum) and another rare condition causing polyposis MYH-associated polyposis (causes many of polyps to form).
  - Presence of acquired genetic mutations, such as a KRAS gene mutation, not inherited from a family member. These mutations increase the chances of cancer forming.

- Tobacco smoking: Smoking cigarettes, pipes, argileh or cigars now or in the past increases the risk for colorectal cancer. The earlier in life one starts to smoke, the more often one smokes, and the more years a person smokes the higher the risk, this also applies to second hand smoke: the more you are exposed to second hand smoke the higher the risk gets for cancer.
- Obesity: People who are obese might have a higher chance of getting colon cancer; obesity also affects chances of surviving from the disease.
- Diabetes: People who are diabetic might be at an increased risk of getting colon cancer
- Alcohol: Heavy drinkers run a higher risk for disease. Recommended amount is no more than 2 drinks a day for men and 1 drink a day for women.
- Diet: A diet high in animal fat, rich in red and processed meats and low in calcium and folic acid might be linked with an increased colon cancer risk.
- Sedentary lifestyle: Lack of enough activity raises the likelihood of getting colon cancer

## What are symptoms of colorectal cancer?

- Colon cancer and polyps usually do not cause signs or symptoms in early stages, symptoms typically start happening when the polyp is bigger
- Symptoms depend on where the tumor is in the colon, its size and where the disease has spread
- Symptoms might be caused by another health issue or cancer and include:
  - Persistent change in bowel habits:
    - Diarrhea or constipation
    - Feeling the bowel does not empty completely
    - Blood in the stool
    - Stool that is more liquid or narrower than normal
  - Continued pain or discomfort in the abdomen, feeling bloated, having cramps or gas
  - Weight loss with no explanation
  - Weakness and fatigue despite good sleep
  - Nausea or vomiting

If you have any of these symptoms like blood in your stool, continued change in bowel habits or others that persist you should consult a physician.

## How can I prepare for appointments & tests?

Knowing that you have colorectal cancer can be overwhelming. You might need to know a lot of information. It is helpful to prepare for your doctor's appointments. (Blue box)

Here are some tips to get ready:

- Write down symptoms you are having: Their start date, frequency and severity
- Write down key personal information or medical history that might be relevant: recent life changes, medical history of disease, any diagnosis of bowel disease or procedures you have had and any relevant family history.
- List all the medications you are taking
- Gather medical records: If you have any imaging or laboratory tests done at a different medical center, bring all the results with you to your appointment.
- Write down questions you would want to ask your doctor:
  - When will the results be ready?
  - Will I need any additional testing?
  - How is my smoking history related to colorectal cancer? Will I benefit if I quit smoking now?
  - What is causing my symptoms? How can they be relieved?
  - Where is the disease located exactly?
  - At which stage is my colorectal cancer?
  - When is my next follow-up visit?
  - What are my treatment options and their side effects?
  - When do I need to start treatment?
  - How long will it last?
  - Where will I receive treatment?
  - Will I be able to go back home or do I have to stay at the Medical Center?
  - Will treatment affect my daily life?
  - When would I be able to practice normal activities?
  - How often will I need checkups after treatment?
  - What can I do to stop my cancer from recurring?

- Have a relative or close friend accompany you during appointments to help you remember the questions you want to ask and the discussion.

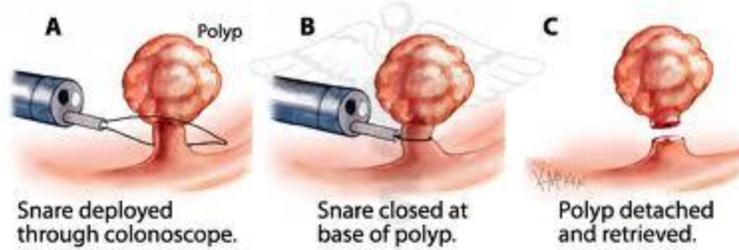
## How is colorectal cancer diagnosed?

Tests that might be used to find and diagnose colon cancer include:

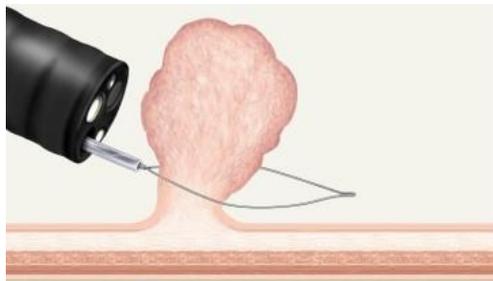
- Physical exam and medical history: An exam to check any signs of disease, if organs are of normal size cause, cause pain to the touch, presence of lumps or anything that seems unusual. Taking a history of symptoms, medical conditions and treatments you have had, family's medical history and other risk factors for colon cancer.
- Rectal exam: A digital rectal exam to check for lumps or any abnormal areas in the rectum.
- Laboratory tests: Complete blood test and chemistry. These tests help find out if organs are working properly or if disease has spread, when it has it can cause abnormal levels of chemicals in the blood, for example increase the level of a substance called the carcinoembryonic antigen level. These tests might help physicians decide for further testing.
- Fecal blood test: Examining if there is any trace of blood in the stools, as the tumor might bleed.
- Imaging tests: To check if the disease has spread to other areas of the body. A CT scan for detailed images of areas inside the body from different angles is most often used for colon cancer; chest and abdominal CTs might be done. Other tests such as MRI might be suggested depending on each disease case.

The only way to confirm that you have colon cancer is to test colon tissue and check if it has any cancer cells:

- Colonoscopy: The physician uses a colonoscope, a long flexible lighted tube with a lens, guided into the colon through the rectum, to examine it and remove any polyps or tissue samples and check for cancer. The scope sends an image of the inside of the colon to a video screen. Polyps can be removed using small tools inserted with the scope: this procedure is called endoscopic polypectomy. Some can be removed with a forceps or a snare and by using an electric current to limit bleeding. Rarely bleeding might happen or the intestinal wall might get torn.

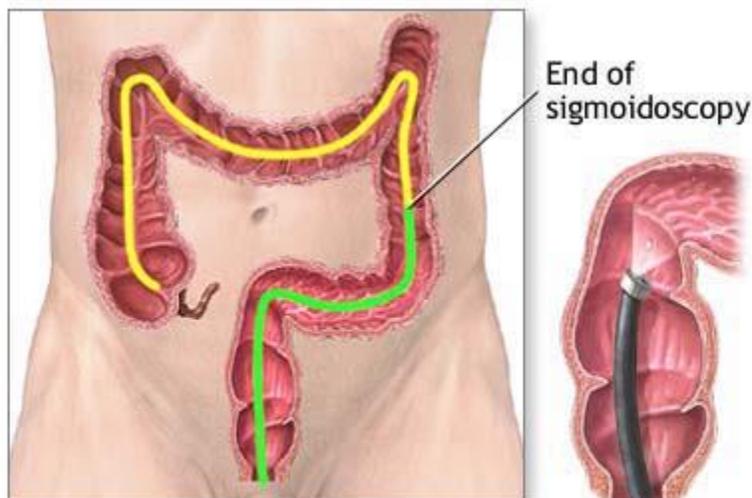


(colorectalsurgeonssydney.com.au)



(Olympus.nl)

- Sigmoidoscopy: If you have no history of polyps, this test might be done. A lighted thin tube with a lens called a sigmoidoscope is used to view inside just the lower part of the colon and rectum, any polyps found can be removed and checked for disease. This test takes less time than a colonoscopy.



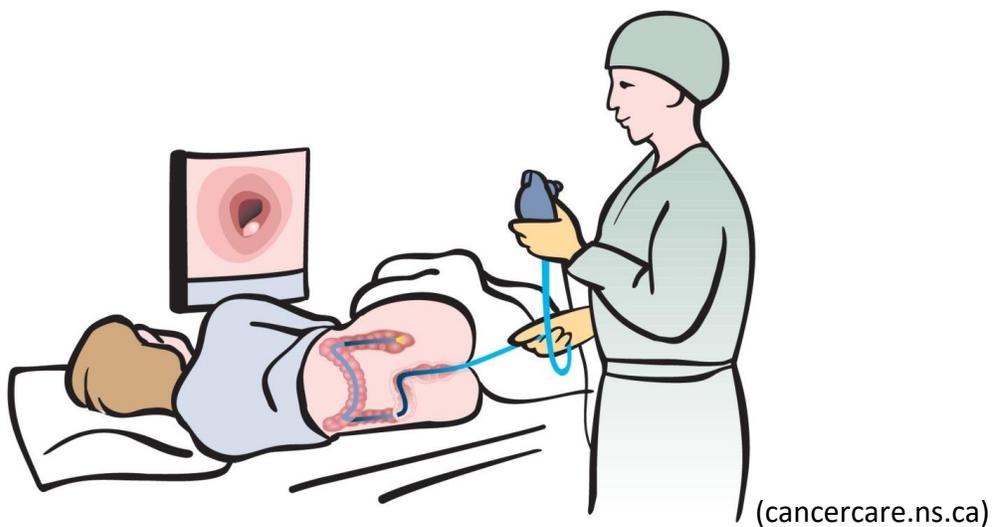
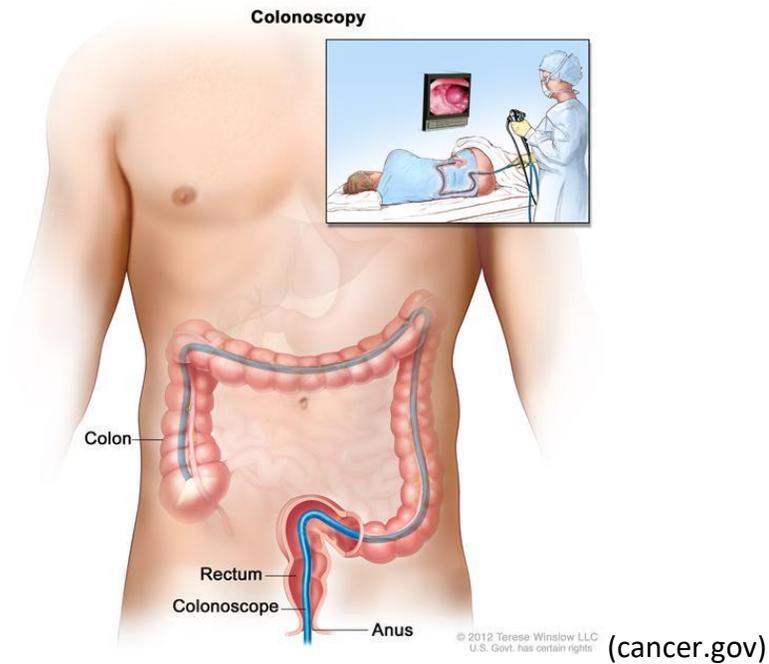
Colonoscopy examines the entire length of the colon; sigmoidoscopy examines only the lower third

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(nytimes.com)

- Other colon biopsies: During a colonoscopy other samples of the colon might be removed besides the polyp, part of the nearby colon wall might be taken from people with high risk for cancer; this is done with forceps or a needle biopsy.

- Contrast barium enema: A series of x-ray images are done by giving an enema solution that fills the colon with fluid and air to enlarge it, done sometimes when a colonoscopy is not possible.
- CT colonography: Called virtual colonoscopy: Combining various CT images of your colon to create a detailed picture. Done when a colonoscopy is not possible.



## How is colorectal cancer staged?

Staging tests find out the stage of colon cancer disease and help decide which treatment is better and include:

- CT scan: Type of x-ray that creates a 3 dimensional image of areas inside the body by taking detailed images from different angles using an x-ray, finds out if disease has spread to other parts of the body, abdominal and chest CT scans might be done
- MRI (magnetic resonance imaging): Test that creates more detailed images of areas inside the body by using radio waves and magnets, helpful in checking if there is any disease in the chest. Sometimes a dye might be injected for better detail. Different imaging of the body for more details and checking any tumor spread. Might be done **after treatment to check treatment worked or disease has spread.**
- PET scan: A rotating scanner takes detailed images of areas inside the body, while an injected sugary fluid highlights cancerous cells that absorb sugar more than normal ones. This helps find out small areas of disease.
- Chest x-ray: X-ray of bones and organs inside the chest.
- Surgery: Removing the tumor and checking where it has spread through the colon.
- Lymph node biopsy: Removing a lymph node to examine it for cancer cells
- Pathology: Studying whether cancer cells are found in the tissue removed and the type of cancer cells under a microscope: how different they are compared to normal cells, how far into the colon and closeby tissues the tumor has grown, examining whether cancer is present in lymph nodes or if it has spread to further organs.
- Complete blood count: Measuring white red blood cells and platelets
- Carcinoembryonic antigen (CEA) assay: A test that measures the level of this substance in the blood, when higher than normal it can be a sign of colon cancer
- The wall of the colon has 5 layers:
  - The mucosa: Direct contact with food stuff consists of three layers: the epithelium, lamina propria connective tissue & muscularis mucosae muscle tissue
  - Submucosa: Blood, lymph vessels & connective tissue
  - Muscularis propria: Muscle layer that helps move food through the colon
  - Subserosa: Connective tissue
  - Serosa: Most outer part makes up fluid to help the colon move around other organs.

**Stage 0:** Cancer has grown through the lining mucosa of the colorectum but has not spread beyond the muscle layer in the mucosa

**Stage I:** Tumor has invaded more deeply the inside wall of the colon, it is in the submucosa or might have spread into the muscle layer of colon or rectum

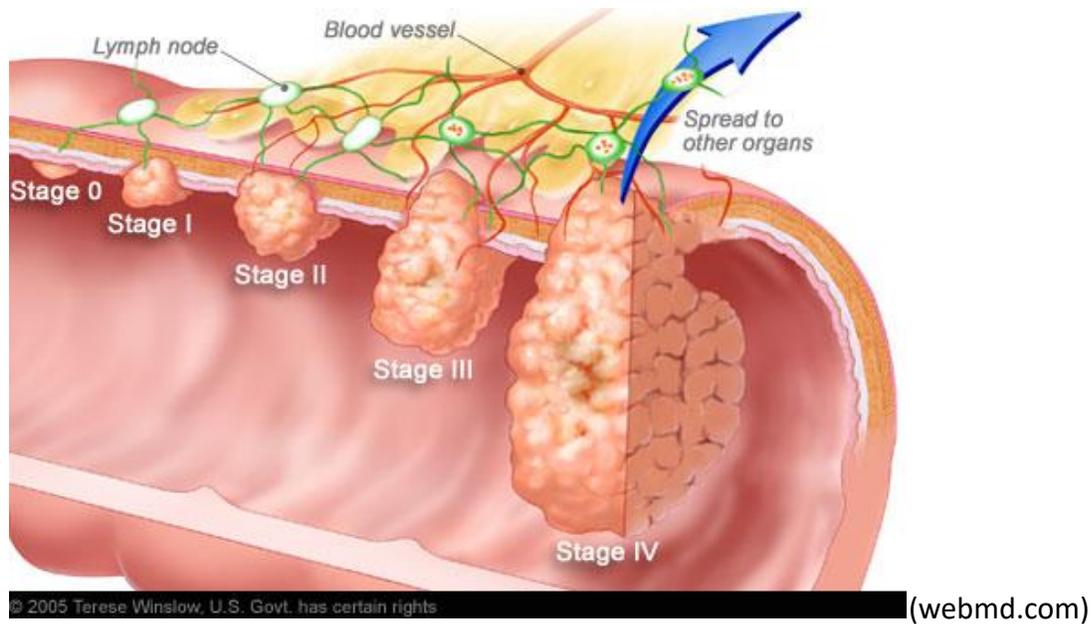
**Stage II:** Tumor has grown more deeply into the serosa the outermost layer of the colon wall, or has spread through the serosa or grown out of the colon wall to nearby organs. Tumor is not spread to lymph nodes

**Stage III:** Tumor has grown beyond the muscle wall of the colon, or outermost layer of the colon wall, to further tissues and has spread to lymph nodes and might have spread to nearby organs or visceral peritoneum

**Stage IV:** Tumor has grown to other parts of the body such as the liver, ovary or lungs



(source: [beasurvivor-colorectal.com](http://beasurvivor-colorectal.com))



## How is colorectal cancer treated?

Treatment depends on:

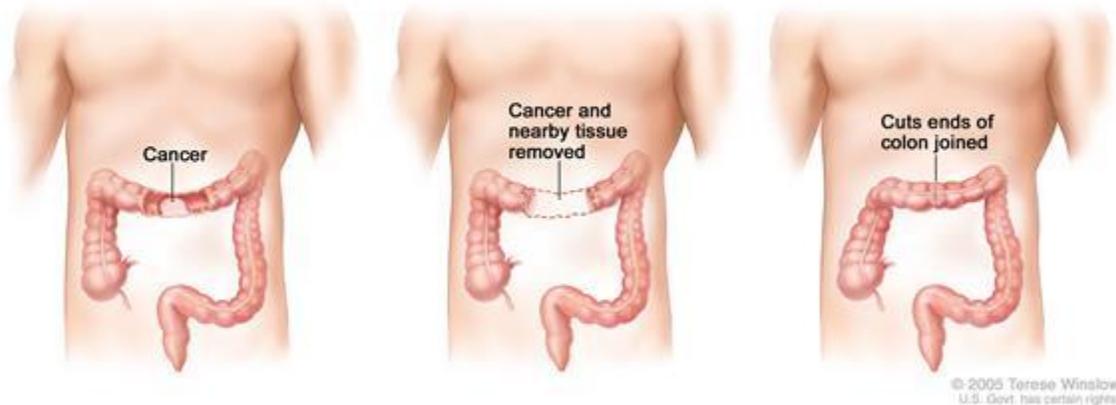
- Age, overall health and medical history
- The stage and type of cancer
- The main treatment for early colon cancer is to remove the tumor by surgery
- Lymph nodes that have or are suspected to have disease are also removed
- Chemotherapy or targeted therapy might be given after surgery to prevent cancer from coming back
- When surgery is not possible chemotherapy & targeted therapy are given
- Treatment might involve one or more procedure

### **Surgery:**

- Surgery is the main treatment used to try to cure colon cancer
- Different methods are used to remove a lung tumor depending on the stage of cancer and how much of the colon is removed:
- Local excision: When found at an early stage the tumor can be removed without having to reach the abdominal wall, a colonoscope tube with tools is inserted through the rectum to remove the growth out. If the growth is in a polyp the excision is called polypectomy.

- Colectomy: If the tumor is bigger, surgery to remove the part of the colon with cancer is done called a colectomy. Some surrounding healthy tissue might also be removed; the remaining ends of the colon are then joined together.  
Colectomy is done either through:
  - An open surgery: A large incision in your abdomen
  - A laparoscopic surgery: Smalls incisions in your abdomen, a laparoscope, a special lens, to view the colon and other instruments are inserted to remove the tumor.
- To allow the colon to heal a colostomy or an opening to the outside of the body might be done for bowel to pass, with a bag is placed around it. This might be temporary or permanent if a large part of the colon was removed and it is not possible to join the two ends of the colon together.

### Resection of the Colon with Anastomosis



(cancer.gov)

### Colostomy



### Lymph node surgery:

- Lymph nodes are also frequently removed during a colectomy to check for any disease.

## **Systemic therapy: Chemotherapy and targeted therapy**

Systemic therapy is medications given when a cancer is able to spread through the body. It is sometimes given after a surgery to prevent the disease from coming back or as a primary treatment if the disease is spread in the body.

### **Chemotherapy:**

- Medications that fight cancer cells. Chemotherapy attacks all cells that grow fast: normal and cancer cells.
- Chemotherapy medication is sometimes one drug or a combination of two or more medications together: this is called a chemotherapy regimen
- Chemotherapy drugs given through a vein in your arm in liquid form or orally in pill form with tablets to swallow
- Chemotherapy is given in cycles of treatment periods followed by a rest period, to allow the body to recover. The length of cycles depends on the type of drugs used.
- Chemotherapy for colon cancer may be given after surgery to get rid of any remaining cancer cells. Treatment given after the main surgery is called adjuvant therapy.
- This treatment might also be used before surgery to shrink the tumor: called neoadjuvant therapy.
- Chemotherapy is also used to shrink and slow the growth of cancer and relieve pain or other symptoms of colorectal cancer
- For people with rectal cancer chemotherapy might be used with radiotherapy
- Side effects of chemotherapy depend on drug type, dose and length of treatment

**Radiotherapy:** High energy rays to destroy cancer cells.

- It is not used very often for the treatment of colon cancer, more so for rectal cancer

- Radiotherapy might be used after surgery to destroy any cancer cells that are left, before surgery to help shrink the tumor or to relieve pain and other symptoms of colorectal cancer
- It might be given with chemotherapy after surgery to prevent rectal cancer from coming back.
- Radiation can be given from the outside or internally by delivering radiation inside your body through catheters placed directly at the tumor.

**Targeted therapy:** Is a new cancer treatment that uses medications that help attack cancer cells without harming normal cells; it affects normal cells less than chemotherapy.

- Used alone or in combination with chemotherapy
- Types of therapies used include drugs: Avastin, erbitux, vectibix, stivarga.
- These medications stop the growth and spread of cancer cells.
- Side effects depend on the drug and dose and might include: intestinal issues, slow wound healing, bleeding diarrhea, nausea, skin rash and sore eyes.

## What does recovery from colorectal cancer depend on?

Every person is different and will respond differently to treatment for colorectal cancer.

These factors affect recovery from disease:

- How early the disease was found: Colorectal cancer is most treatable when the disease is found early
- How deep the tumor has grown in the colon
- Stage of the cancer: if disease has spread to lymph nodes or other organs
- If the tumor can be properly removed in surgery
- Presence of acquired genetic mutations, such as a KRAS gene mutation, not inherited from a family member. These mutations affect response to treatment.

## What follow-up care should I expect?

Follow-up cancer tests might include:

- Physical exam: rectal exam and medical history
- Lab tests: Blood in stool test, CEA carcinoembryonic antigen level test
- Colonoscopy
- X-ray
- CT scans

## What could be helpful for coping and support?

The health care team as well as the palliative and supportive care team are here to help you during and after treatment. These tips can help you manage the course of the disease, treatment, and follow up.

- **Learn about the disease:** It is very important to know enough information about lung cancer, its treatment options, and the possible side effects to set your expectations and manage the course of disease. It will also help in taking essential decisions more easily.
- **Talk to your doctor and nurses:** Voice any of your concerns and talk about what you are experiencing. Do not wait until you feel you are overwhelmed.
- **Share your concerns with others:** Try to keep a good support network around you to share your concerns. Sharing concerns or questions related to the disease and treatment with your significant others might be of great help in coping with lung cancer. Patients who are going through the same experience can be of great support as well.
- **Keep a schedule of your appointments and tests:** Ask your doctor about the expected schedule of appointments and tests you need to go through. Keep a good record of your treatment course and plan, along with test results and your list of medications
- **Stay active:** Having colorectal cancer does not mean you cannot continue doing the things you normally like to do. If you feel well enough, stay active as much as you can. Try to get enough rest and sleep. Balance between rest and activities. Practicing your regular activities will help you stay connected to your normal life, maintain a sense of normalcy, and have a break from treatment.
- **Exercise:** Exercise can help you feel better, have more energy, rebuild strength, and improve your appetite. It can help relieve cancer-related fatigue. Any type of exercise, no matter how long it is can be good. If you have been inactive, you can start slowly and build up your activity level. It is recommended to walk for 15 to 30 minutes every day even if you are using oxygen. This will improve your heart and lung function. Talk to your doctor before starting any type of exercise.

- **Get enough rest and sleep:** It is important to recover from treatment and helps you cope
- **Don't smoke:** Quitting smoking, tobacco arghileh or pipe improves your chances of treatment. Any smoking will prevent treatment from being as effective as it possibly can and will increase the likelihood of disease of returning. Ask your doctor for strategies to quit smoking and how to be referred to the stopping smoking clinic.
- **Avoid second-hand smoke:** If you live with someone who smokes ask them to stop, they should do so outside the house as a minimum precaution, also avoid areas and places where there's tobacco smoke including arghileh of course.
- **Eat healthy:** Take care of yourself by keeping a balanced diet that includes cereals, whole grains, vegetables, and fruits. Limit your intake of red and processed meat. Eating an appropriate amount of food and getting enough calories during and after treatment will help you maintain energy and feel better. It can also help you in maintaining a healthy weight during and after treatment. Maintaining good nutrition is important since treatment side effects can cause loss of appetite, fatigue and nausea. Please refer to the "Nutrition Tips for Cancer Patients" handout for more information.
- **Drink in moderation:** If you drink alcohol, limit your daily intake to one drink (for females) and two drinks (for males).

## What are screening tests for colorectal cancer?

Various screening tests help find out growths and cancer before any symptoms start. They are similar to tests used to diagnose colon cancer. Screening can save lives by detecting disease earlier when treatment can be most effective.

Screening should start at age 50 and younger for people who are at a higher risk:

- Tests can detect polyps and remove them before they grow into cancer.
- **Stool test:** Checking for any blood in the stools, as tumors might bleed.
- **Colonoscopy:** The most complete screening test. A colonoscope is used, a long lighted tube with a lens to check all the colon and rectum and remove any polyps if needed. It is inserted through the anus.
- **Sigmoidoscopy:** If you have no history of polyps, this test might be done. A lighted thin tube with a lens called a sigmoidoscope is used to check inside just the lower part colon and rectum, any polyps found can be removed. This test takes less time than a colonoscopy.

- **Contrast barium enema:** A series of x-ray images are done by giving an enema solution with fluid and air to enlarge the colon, done sometimes when a colonoscopy is not possible.
- **CT colonography:** Examining your colon and rectum by using images made by a CT scanner. The CT scan creates a 3 dimensional image of your abdominal areas by taking detailed pictures from different angles using an x-ray.
- **Rectal exam:** A digital rectal exam to check for abnormal areas in the lower part of the rectum.
- **Genetic testing:** Testing for changes in cells' genes, codes inside the cells containing information on what their role is in the body. Genetic risk conditions for colon cancer can be inherited from a family member or they can be acquired and can affect treatment.

Please refer to the [Screening for cancer hand-out](#) for more information on screening tests for colon cancer.

## What lifestyle factors can help prevent colorectal cancer?

These lifestyles factors are associated with colorectal cancer, and might be the strongest lifestyle influences to developing a type of cancer.

Please refer to the [Healthy Living Preventing Cancer hand-out](#) for more information.

- **Do not smoke any tobacco product:** Cigarettes, arghileh or pipe. Smoking is mostly known for causing lung cancer but it also a cause behind developing other cancers like colorectal cancer.
- **Improve your diet:** Take care of yourself by including in your diet a variety of fruits, vegetables and whole grains, to get as many nutrients, minerals, fiber and antioxidants that might help prevent cancer. Limit your intake of red meats and processed meats (hotdogs, cured meats) for less harmful animal fat.
- **Drink in moderation:** If you choose to drink alcohol, limit the amount of alcohol you drink to not more than one drink a day for women and two for men.
- **Exercise:** Physical inactivity increases the risk for disease. Try to get at least 30 minutes of exercise on most days. If you've been inactive, start slowly and build up gradually to 30 minutes. Also, talk to your doctor before starting any exercise program.

- **Keep a healthy weight:** Obesity is a risk factor for colorectal cancer. If you have a healthy weight, work to maintain your weight by combining a healthy diet with daily exercise. If you need to lose weight, ask your doctor about healthy ways to achieve your goal. Aim to lose weight slowly by increasing the amount of exercise you get and reducing the number of calories you eat.

*(Images included are for illustration purposes and could be modified)*

*References: NCCN, The Mayo clinic, National Cancer Institute, American cancer society, The Cleveland clinic.*