

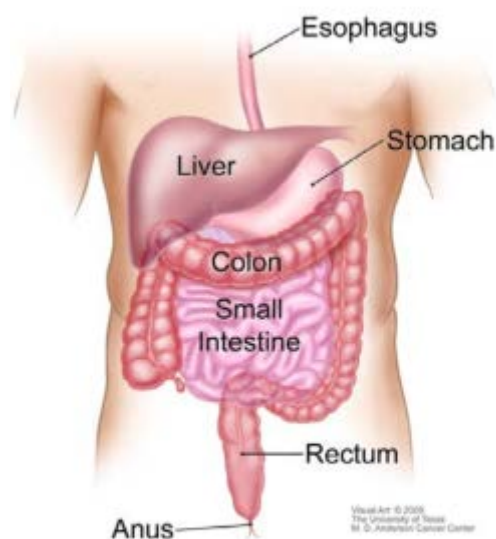
Colon Cancer

What is the colon?

The esophagus, stomach, small intestine, colon and rectum are part of the body's digestive system. See image. The digestive system absorbs nutrients from food and stores the resulting waste until it passes out of the body. The large bowel, called the colon and rectum, starts at the end of the small intestine, in the lower right part of the abdomen. It is about 5-6 feet in length. The large bowel is divided into 6 main segments. These segments include the cecum, right (or ascending) colon, transverse colon, left (or descending) colon, sigmoid colon and rectum. After the small intestine meets the cecum, the colon follows a horseshoe shape up the right side, across, then down the left side to the sigmoid colon.

The colon performs 5 main functions: absorption, secretion, motility (movement), formation and cleaning out body waste (stool). Undigested food enters your large intestine from your small intestine. The colon then reabsorbs water that is used in digestion and gets rid of undigested food and fiber. This causes food waste products to harden and form stool, which is then eliminated through bowel movements.

What are the colon's functions?



The colon and nearby organs

Types of Colon Cancer

Many kinds of cells make up all organs, like the colon. Cells are the basic unit of life. Normally, cells grow, divide and produce more cells. However, sometimes cells can grow abnormally –

they keep dividing when new cells are not needed. The mass of extra cells forms a growth or tumor. Tumors can be either benign (not cancerous) or malignant (cancerous). If left untreated, malignant tumors will often eventually spread to other organs and interfere with their function. Cancer that begins in the colon is called colon cancer. Most tumors in the colon begin when normal tissue in the colon wall forms a polyp. Polyps are benign growths on the inner wall of the colon. A specific type of polyp, called an adenoma, can turn into cancer. They are common in people over the age of 50 and vary in size and shape. The majority of colon cancers are adenocarcinomas, a specific type of cancerous tumor.

Familial Colon Cancer

Familial adenomatous polyposis (FAP) is a rare, inherited condition. In classic FAP, hundreds to thousands of polyps form in the colon and rectum. If not treated, virtually all affected patients will develop colorectal cancer by the age of 45. In a less severe form of FAP, patients can have less than one hundred adenomatous polyps.

FAP is caused by a mutation in the *APC* gene. It affects approximately 1 in 8,000 people, or 1% of colon cancers diagnosed in the United States. Children of affected persons have a 50% (1 in 2) risk of having FAP. Family members of persons with FAP should have genetic testing to determine if they also have the same abnormal gene.

Hereditary non-polyposis colorectal cancer (HNPCC) is another genetic syndrome caused by a mutation (or change) in one of several genes. HNPCC accounts for about 3-5% of all colorectal cancer. Persons affected by HNPCC, can develop a single or multiple colorectal cancers rather than numerous polyps, as in FAP.

Persons with the HNPCC gene mutations have an 80% lifetime risk of developing colorectal cancer. Testing a tumor sample for microsatellite instability (MSI) is one way to determine whether genetic testing for HNPCC is appropriate because individuals with HNPCC often have tumors that are positive for microsatellite instability. Approximately 90% of tumors from people with HNPCC show gene instability or absence of protein expression. (The DNA sequence is longer or shorter than normal.) Genetic testing is recommended for these people because children of parents with HNPCC have a 50% chance of developing HNPCC.

Symptoms

Some people with colon cancer have few to no symptoms. However, the most common symptoms include those listed below:

- A change in bowel habits, most commonly constipation
- Sometimes there is blood in the stool or dark-black stool if the cancer in the colon is bleeding. This bleeding from the tumor could also cause anemia, which is a decreased amount of red blood cells or oxygenated blood.
- If you have anemia, you may feel more tired, get short of breath easily, become pale or have a fast heartbeat.
- Stomach pain

After Diagnosis

After cancer is diagnosed, tests and exams are ordered to determine the extent of the cancer. This process is called staging. Staging determines whether the disease has spread to other

parts of the body. The tests and exams that are used to determine the stage are described next.

Colonoscopy

A colonoscopy is a test that examines the entire colon using an instrument called a colonoscope. This is a flexible, lighted tube-like instrument with a camera at the end of it. The instrument is inserted through the anus/rectum and used to look at the inside of the colon.

Colon Biopsy

A biopsy is the removal of a tissue sample from the colon for careful review under a microscope to make a diagnosis. The biopsy can be performed during the colonoscopy.

Blood Tests

Blood tests are performed before, during and after cancer treatment. Testing can include a CEA (carcinoembryonic antigen) level, which is a value that is frequently elevated in patients with colon cancer. If this value is initially elevated at the time of diagnosis, changes in the CEA level during and after treatment can give an indication of whether or not the cancer responded well to treatment.

Computerized Tomography (CT) Scan

A CT scan, commonly referred to as a CAT scan, takes multiple highly detailed cross-sectional pictures of your organs.

Other tests may include a chest x-ray, PETCT (positron emission tomography combined with computerized tomography) scan or MRI (magnetic resonance imaging).

After testing is complete, your doctor will explain the status of your cancer to you in more detail. Your personal wishes and general health are important factors to consider when planning and deciding your treatment.

Staging

The stage of colon cancer is determined using the TNM staging system. T stands for tumor, N stands for lymph nodes and M stands for metastasis (spread of disease to other organs). It is based on radiology results, the findings of the surgeon at the time of surgery and the surgical pathology. Surgical pathology involves checking the removed tumor specimen by a pathologist. This doctor specializes in examining normal or diseased tissue by carefully looking at it with the naked eye and also examining it under a microscope. Your doctor needs to know the TNM stage of the cancer in order to plan the best treatment for you.

Colon cancer stages:

Stage I: The cancer has invaded into the innermost layers of the bowel wall.

Stage II: The cancer has invaded through the bowel wall but has not yet spread to the lymph nodes.

Stage III: The cancer has spread to nearby lymph nodes but not to other parts of the body.

Stage IV: The cancer has metastasized – spread to other organs in the body. The most common areas of colon cancer metastasis are the liver and lungs.

Treatment

Treatment may involve more than one type, such as surgery, chemotherapy and radiation

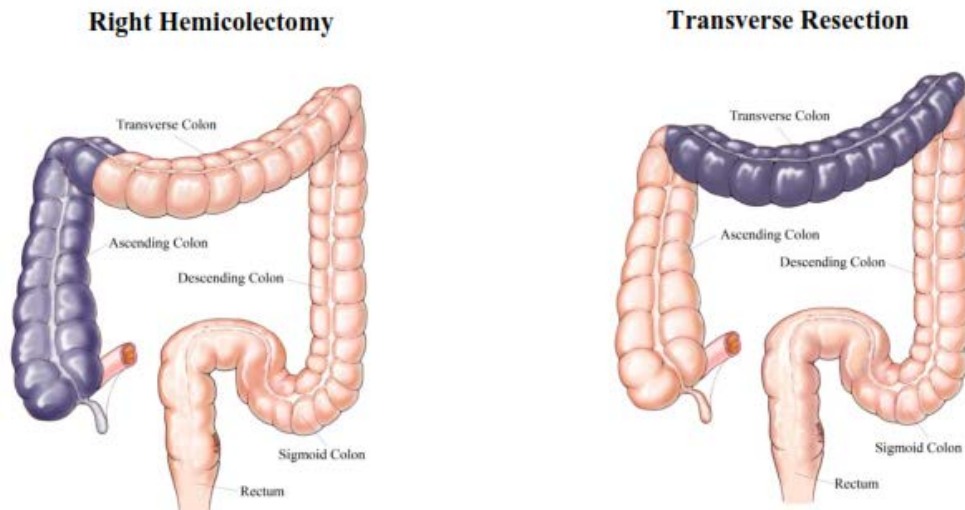
therapy. Treatment depends on the stage of cancer and the symptoms. In many cases, surgery will be the first treatment and may be the only one required if the cancer is stage I or II. In other cases, chemotherapy will be recommended before or after surgery or in place of surgery. In certain situations radiation may also be suggested.

Surgery

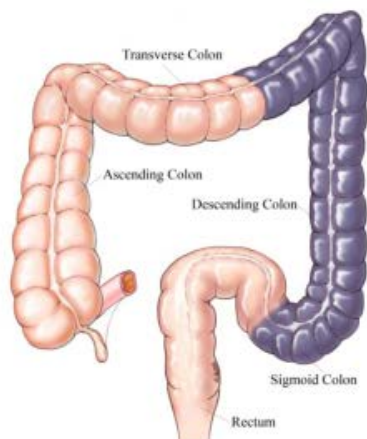
Surgery is the most common treatment for all colon cancer stages. During surgery, the cancer and a portion of healthy colon on either side of the cancer and nearby lymph nodes are removed.

The two ends of the bowel are then sewn or stapled together. This reconnection of the bowel is called an anastomosis. The type of surgery used is based on tumor location and size and is called a colon resection or partial colectomy. For example, if the cancer is in the right side of the colon, then a “right colon resection” or “right colectomy” is performed. For some cases, surgeons may offer laparoscopic surgery. This is a newer technique using specialized instruments, including a small video camera, which are inserted into the abdomen through very small cuts. Laparoscopic surgery is a less invasive procedure and often recovery is quicker, versus “open” colon resection, which is performed through a large cut on the abdomen.

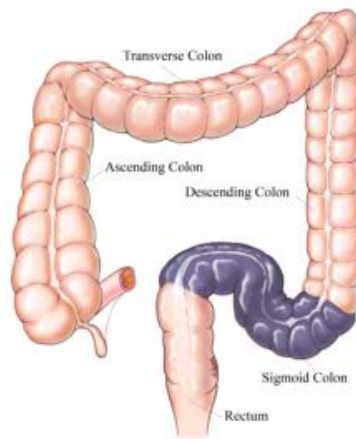
The types of colon cancer surgeries are shown in the images below. The shaded areas represent the portion of the colon that is removed during surgery. Your health care team will discuss your type of surgery in detail with you.



Left Hemicolectomy



Low Anterior Resection



Chemotherapy

Chemotherapy uses cancer-fighting medicines to kill cancer cells. They may be prescribed alone or in combination with other medicines and given intravenously (into a vein) or by mouth. Several types of chemotherapy medicines are used to treat colon cancer, but not all patients are treated with chemotherapy. Your doctor will recommend treatment based on the stage of the cancer. In general, stages III and IV cancers will require chemotherapy. Sometimes chemotherapy is recommended for stage II cancers with high risk features.

Chemotherapy may damage normal healthy cells along with the cancer cells. Because of this, most patients have some side effects. Side effects may include nausea, vomiting, appetite loss, diarrhea and mouth sores. There are, however, medicines available to help reduce discomfort from side effects. Tell your doctor about any side effects you have.

Chemotherapy can also affect bone marrow (which produces blood) by lowering your blood counts. This can result in an increased risk of infection, bleeding, bruising or fatigue. Therefore, your blood counts will be carefully monitored before each chemotherapy treatment.

Radiation Treatment

Radiation treatment uses high-energy x-rays to treat or control cancer. Radiation therapy is used infrequently to treat colon cancer. Radiation may be used to help treat symptoms if cancer has spread to other parts of the body and is causing discomfort or pain in a certain area. If your doctor believes you would benefit from radiation he or she will discuss this with you.

Clinical Trials

Clinical trials are always in progress to find new and better ways to treat colon cancer. New chemotherapy drugs and combinations are being studied in clinical trials as treatments for cancer that has spread and as a way to try to relieve symptoms. Your doctor will tell you if a clinical trial is an option for you.

After Treatment

Even if you have no evidence of disease after treatment, follow-up care is very important. It should be part of your medical routine for the rest of your life. This care will help protect you and allow for early detection if your cancer returns. Follow-up care is especially critical in the first 5 years following treatment, since colon cancer has the highest chance of coming back within the first 5 years. Follow-up care may include physical exams, blood tests, x-rays and colonoscopies. The frequency of your follow-up appointments and tests will depend on the stage of the cancer, how long you have been cancer free since treatment and your current medical status.

You can help yourself recover from cancer by making healthy lifestyle choices. Choose to eat a healthy diet rich in fruits, vegetables, whole grains and lean protein. Choose to exercise on a regular basis, but also allow yourself time to rest. Choose to quit smoking, limit alcohol intake and avoid drug use.

These choices will help you live a healthier life, and most importantly, make you feel better as a whole.

It is also important to maintain your overall health. Schedule appointments with your primary care provider for annual physical exams and routine screening tests. These may include cholesterol testing, heart checks, mammograms and pelvic exams for women or prostate exams for men.

Resources

The University of Texas MD Anderson Cancer Center Colon Cancer Page

<https://www.mdanderson.org/cancer-types/colon-cancer.html>

This site provides news and information on treatment, research, clinical trials, prevention, screening guidelines, community resources and more.

United Ostomy Associations of America, Inc.

800-826-0826

<https://www.ostomy.org/>

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