Colorectal Cancer Prevention and Early Detection

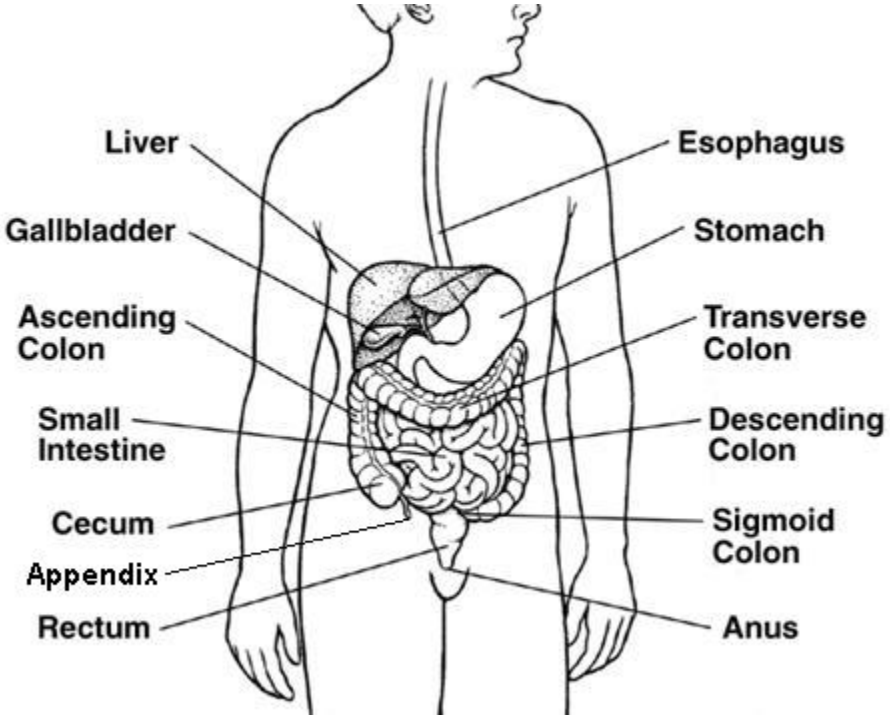
What is colorectal cancer?

Colorectal cancer is a term used to refer to cancer that develops in the colon or the rectum. These cancers are sometimes referred to separately as colon cancer or rectal cancer, depending on where they start. Colon cancer and rectal cancer have many features in common, which is why they are discussed together in this document.

The normal digestive system

The colon and rectum are parts of the digestive system, which is also called the *gastrointestinal (GI) system*. The first part of the digestive system processes food for energy, while the last part (the colon and rectum) absorbs fluid to form solid waste (fecal matter or stool) that then leaves the body.

To understand colorectal cancer, it helps to have some basic knowledge about the normal structure and function of the digestive system (see picture).



After food is chewed and swallowed, it travels through the esophagus to the stomach. There, it is partly broken down and then sent to the small intestine, also known as the small bowel. It is called *small* because it is narrower than the large intestine (colon and rectum), but actually the small intestine is the longest segment of the digestive system – about 20 feet. The small intestine continues breaking down the food and absorbs most of the nutrients.

The small intestine joins the large intestine (or large bowel) in the right lower abdomen. Most of the large intestine is made up of the colon, a muscular tube about 5 feet long. The colon absorbs water and salt from the food matter and serves as a storage place for waste matter.

The colon has 4 sections:

- The first section is called the *ascending colon*. It starts with a small pouch (the cecum) where the small bowel attaches to the colon and extends upward on the right side of the abdomen. The cecum is also where the appendix attaches to the colon.
- The second section is called the *transverse colon* since it goes across the body from the right to the left side in the upper abdomen.
- The third section, the *descending colon*, continues downward on the left side.
- The fourth and last section is known as the *sigmoid colon* because of its “S” or “sigmoid” shape.

The waste matter that is left after going through the colon is known as *feces* or *stool*. It goes into the rectum, the final 6 inches of the digestive system, where it is stored until it passes out of the body through the anus.

Abnormal growths in the colon or rectum

Most colorectal cancers develop slowly over several years. Before a cancer develops, a growth of tissue or tumor usually begins as a non-cancerous polyp on the inner lining of the colon or rectum. A tumor is abnormal tissue and can be benign (not cancer) or malignant (cancer). A polyp is a benign, non-cancerous tumor. Some polyps can change into cancer, but not all do. The chance of changing into a cancer depends upon the kind of polyp. The 2 main kinds of polyps are:

- **Adenomatous polyps (adenomas)** are polyps that have the potential to change into cancer. Because of this, adenomas are called a pre-cancerous condition.
- **Hyperplastic polyps and inflammatory polyps**, in general, are not pre-cancerous. But some doctors think that some hyperplastic polyps can become pre-cancerous or might be a sign of having a greater risk of developing adenomas and cancer, particularly when these polyps grow in the ascending colon.

Another kind of pre-cancerous condition is called *dysplasia*. Dysplasia is an area in the lining of the colon or rectum where the cells look abnormal (but not like true cancer cells) when seen under a microscope. These cells can change into cancer over time. Dysplasia is usually seen in people who have had diseases such as ulcerative colitis or Crohn’s disease for many years. Both ulcerative colitis and Crohn’s disease cause chronic inflammation of the colon.

Start and spread of colorectal cancer

If cancer forms within a polyp, it can eventually begin to grow into the wall of the colon or rectum. When cancer cells are in the wall, they can then grow into blood vessels or lymph vessels. Lymph vessels are thin, tiny channels that carry away waste and fluid. They first drain into nearby lymph nodes, which are bean-sized structures that help fight infections. Once cancer cells spread into blood or lymph vessels, they can travel to nearby lymph nodes or to distant parts of the body, such as the liver. Cancer spread to distant parts of the body is called *metastasis*.

Importance of colorectal cancer screening

Regular colorectal cancer screening or testing is one of the most powerful weapons for preventing colorectal cancer. Excluding skin cancers, colorectal cancer is the third most common cancer diagnosed in both men and women in the United States. Overall, the lifetime risk for developing colorectal cancer is about 1 in 20 (5%).

Colorectal cancer is the third leading cause of cancer-related deaths in the United States when men and women are considered separately, and the second leading cause when both sexes are combined.

The incidence rate (the number of cases per 100,000 people per year) of colorectal cancer has been dropping for about the last 20 years. This is thought to be in large part due to screening (looking for cancer in people who have no symptoms of the disease). Colorectal screening tests can also find polyps, which can be removed before they can develop into cancers.

It can take many years (as many as 10 to 15) for a polyp to develop into colorectal cancer. Regular screening can prevent many cases of colorectal cancer altogether by finding and removing certain types of polyps before they have the chance to turn into cancer. Screening can also find colorectal cancer early, when it is highly curable.

The relative 5-year survival rate for colorectal cancer when diagnosed at an early stage before it has spread is about 90%. But only about 4 out of 10 colorectal cancers are found at that early stage. When cancer has spread outside the colon, survival rates are lower.

(The 5-year observed survival rate refers to the percentage of patients who live *at least* 5 years after their cancer is diagnosed; it includes people with colorectal cancer who may die of other causes, such as heart disease. Five-year *relative* survival rates assume that some people will die of other causes and compare the observed survival with that expected for people without the cancer. This is a better way to see the impact of the cancer on survival.)

Not only does colorectal cancer screening save lives, but it also is cost effective. Studies have shown that the cost-effectiveness of colorectal screening is consistent with many other kinds of preventive services and is lower than some common interventions. It is much less expensive to remove a polyp during screening than to try to treat advanced colorectal cancer. With sharp cost increases possible as new treatments become standards of care, screening is likely to become even more cost effective.

Unfortunately, only about half of people eligible for colorectal cancer screening, get the tests that they should. This may be due to lack of public and health professional awareness of screening options, financial barriers, and inadequate health insurance coverage and/or benefits.

See the section “Colorectal cancer screening tests” for more information about the tests used to screen for colorectal cancer. The section “American Cancer Society recommendations for colorectal cancer early detection” has our guidelines for using these tests to find colorectal cancer and polyps..

Risk factors for colorectal cancer

A risk factor is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for lung cancer, as well as many others.

But risk factors don't tell us everything. Having a risk factor, or even several risk factors, does not mean that you will get the disease. And some people who get the disease may not have any known risk factors. Even if a person with colorectal cancer has a risk factor, it's often very hard to know how much that risk factor might have contributed to the cancer.

Researchers have found several risk factors that may increase a person's chance of developing colorectal polyps or colorectal cancer.

Lifestyle-related factors

Several lifestyle-related factors have been linked to colorectal cancer. In fact, the links between diet, weight, and exercise and colorectal cancer risk are some of the strongest for any type of cancer.

Certain types of diets

A diet that is high in red meats (such as beef, pork, lamb, or liver) and processed meats (hot dogs and some luncheon meats) can increase colorectal cancer risk. Cooking meat at very high temperatures (frying, broiling, or grilling) creates chemicals that might increase cancer risk, although it's not clear how much this might contribute to an increase in colorectal cancer risk. Diets high in vegetables, fruits, and whole grains have been linked with a decreased risk of colorectal cancer, but fiber supplements do not seem to help. Whether other dietary components (like certain types of fats) affect colorectal cancer risk is not clear.

Physical inactivity

If you are not physically active, you have a greater chance of developing colorectal cancer. Increasing activity may help reduce your risk.

Obesity

If you are very overweight, your risk of developing and dying from colorectal cancer is increased. Obesity raises the risk of colon cancer in both men and women, but the link seems to be stronger in men.

Smoking

Long-term smokers are more likely than non-smokers to develop and die from colorectal cancer. Smoking is a well-known cause of lung cancer, but it is also linked to other cancers, like colorectal. If you smoke, you can learn about stopping in our *Guide to Quitting Smoking*

Heavy alcohol use

Colorectal cancer has been linked to the heavy use of alcohol. Limiting alcohol use to no more than 2 drinks a day for men and 1 drink a day for women could have many health benefits, including a lower risk of colorectal cancer.

Other risk factors

Age

Younger adults can develop colorectal cancer, but the chances increase markedly after age 50; about 9 out of 10 people diagnosed with colorectal cancer are at least 50 years old.

Personal history of colorectal polyps or colorectal cancer

If you have a history of adenomatous polyps (adenomas) in the colon or rectum, you are at increased risk of developing colorectal cancer. This is especially true if the polyps are large or if there are many of them. Other types of polyps, like hyperplastic polyps, do not increase your risk of colorectal cancer.

If you have had colorectal cancer, even though it has been completely removed, you are more likely to develop new cancers in other areas of the colon and rectum. The chances of this happening are greater if you first had colorectal cancer when you were younger.

Personal history of inflammatory bowel disease

Inflammatory bowel disease (IBD), which includes *ulcerative colitis* and *Crohn's disease*, is a condition in which the colon is inflamed over a long period of time. People who have had IBD for many years often develop dysplasia. Dysplasia is a term used to describe cells in the lining of the colon or rectum that look abnormal (but not like true cancer cells) when seen under a microscope. These cells can change into cancer over time.

If you have IBD, your risk of developing colorectal cancer is increased, and you may need to be screened more frequently.

Inflammatory bowel disease is different from *irritable bowel syndrome (IBS),* which does not carry an increased risk for colorectal cancer.

Family history of colorectal cancer or adenomatous polyps

Most colorectal cancers occur in people without a family history of colorectal cancer. Still, as many as 1 in 5 people who develop colorectal cancer have other family members who have been affected by this disease.

Those with a history of colorectal cancer in one or more first-degree relatives (parents, siblings, or children) are at increased risk. The risk is about doubled in those with a single affected first-degree relative. It is even higher if the first-degree relative was diagnosed when they were younger than 45, or if more than one first-degree relative is affected.

The reasons for the increased risk are not clear in all cases. Cancers can “run in the family” because of inherited genes, shared environmental factors, or some combination of these.

Having family members who have had adenomatous polyps is also linked to a higher risk of colon cancer. (Adenomatous polyps are the kind of polyps that can become cancerous.)

People with a family history of adenomatous polyps or colorectal cancer should talk with their doctor about screening before age 50. If you have had adenomatous polyps or colorectal cancer, it’s important to tell your close relatives so that they can pass along that information to their doctors and start having screening at the right age.

Inherited syndromes

About 5% to 10% of people who develop colorectal cancer have inherited gene defects (mutations) that can cause family cancer syndromes and lead to them getting the disease. These syndromes often lead to cancer that occurs at a younger age than is usual. They are also linked to other cancers besides colorectal cancer. Some of these syndromes are also linked to polyps. Identifying families with these inherited syndromes is important because then doctors can recommend specific steps for them, such as screening and other preventive measures, at an early age.

The 2 most common inherited syndromes linked with colorectal cancers are familial adenomatous polyposis (FAP) and hereditary non-polyposis colorectal cancer (HNPCC), but other rarer syndromes can also increase colorectal cancer risk.

Familial adenomatous polyposis (FAP): FAP is caused by changes (mutations) in the *APC* gene that a person inherits from his or her parents. About 1% of all colorectal cancers are caused by FAP.

In the most common type of FAP, people develop hundreds or thousands of polyps in their colon and rectum, usually beginning in their teens or early adulthood. Cancer usually develops in 1 or more of these polyps as early as age 20. By age 40, almost all people with this disorder will have developed colon cancer if the colon hasn’t been removed to prevent it. Polyps that can turn into cancer can also develop in the stomach and small intestine. In a less common subtype of this

disorder called *attenuated FAP*, patients have fewer polyps (less than 100) and colorectal cancer tends to occur at a later age.

Gardner syndrome is a type of FAP that also leads to benign (non-cancerous) tumors of the skin, soft connective tissue, and bones.

Hereditary non-polyposis colon cancer (HNPCC): HNPCC, also known as *Lynch syndrome*, accounts for about 2% to 4% of all colorectal cancers. In most cases, this disorder is caused by an inherited defect in either the gene *MLH1* or the gene *MSH2*, but other genes can also cause HNPCC. Most of the genes involved normally help repair DNA damage.

The cancers in this syndrome also develop when people are relatively young. People with HNPCC can have polyps, but they only have a few, not hundreds as in FAP. The lifetime risk of colorectal cancer in people with this condition may be as high as 80%.

Women with this condition also have a very high risk of developing cancer of the endometrium (lining of the uterus). Other cancers linked with HNPCC include cancer of the ovary, stomach, small bowel, pancreas, kidney, brain, ureters (tubes that carry urine from the kidneys to the bladder), and bile duct.

For more information on HNPCC, see the section “Can colorectal cancer be prevented?”

Turcot syndrome: This is a rare inherited condition in which people are at increased risk of adenomatous polyps and colorectal cancer, as well as brain tumors. There are actually 2 types of Turcot syndrome:

- One can be caused by gene changes similar to those seen in FAP, in which cases the brain tumors are medulloblastomas.
- The other can also be caused by gene changes similar to those seen in HNPCC, in which cases the brain tumors are glioblastomas.

Peutz-Jeghers syndrome: People with this rare inherited condition tend to have freckles around the mouth (and sometimes on their hands and feet) and a special type of polyp (called *hamartoma*) in their digestive tracts. They are at a greatly increased risk for colorectal cancer, as well as several other cancers, which usually appear at a younger age than usual. This syndrome is caused by mutations in the gene *STK1*.

MUTYH-associated polyposis: People with this syndrome develop colon polyps which will become cancerous if the colon is not removed. They also have an increased risk of cancers of the small intestine, skin, ovary, and bladder. This syndrome is caused by mutations in the gene *MUTYH*.

Information on risk assessment, and genetic counseling and testing for some of these syndromes can be found in the section “Can colorectal cancer be prevented?”

Racial and ethnic background

African Americans have the highest colorectal cancer incidence and mortality rates of all racial groups in the United States. The reasons for this are not yet understood.

Jews of Eastern European descent (Ashkenazi Jews) have one of the highest colorectal cancer risks of any ethnic group in the world. Several gene mutations leading to an increased risk of colorectal cancer have been found in this group. The most common of these DNA changes, called the *I1307K APC mutation*, is present in about 6% of American Jews.

Type 2 diabetes

People with type 2 (usually non-insulin dependent) diabetes have an increased risk of developing colorectal cancer. Both type 2 diabetes and colorectal cancer share some of the same risk factors (such as excess weight). But even after taking these factors into account, people with type 2 diabetes still have an increased risk. They also tend to have a less favorable prognosis (outlook) after diagnosis.

The American Cancer Society and several other medical organizations recommend people with an increased colorectal cancer risk based on certain risk factors start screening earlier than people at average risk. For more information, speak with your doctor and refer to the tables in the section “American Cancer Society recommendations for colorectal cancer early detection.”

Factors with less clear effects on colorectal cancer risk

Night shift work

Results of one study suggested working a night shift at least 3 nights a month for at least 15 years may increase the risk of colorectal cancer in women. The study authors suggested this might be due to changes in levels of melatonin (a hormone that responds to changes in light) in the body. More research is needed to confirm or refute this finding.

Previous treatment for certain cancers

Some studies have found that men who survive testicular cancer seem to have a higher rate of colorectal cancer and some other cancers. This might be due to the treatments they have received.

Several studies have suggested that men who received radiation therapy to treat prostate cancer may have a higher risk of rectal cancer, because the rectum receives some radiation during treatment. Most of these studies are based on men treated in the 1980s and 1990s, and the effect of more modern radiation methods on rectal cancer risk is not clear. There are many possible side effects of prostate cancer treatment that men should consider when making treatment

decisions. Some doctors recommend that the risk of rectal cancer be considered as one of those possible side effects.

Can colorectal cancer be prevented?

Even though we don't know the exact cause of most colorectal cancers, it is possible to prevent many of them.

Screening

Regular colorectal cancer screening is one of the most powerful weapons for preventing colorectal cancer. Screening is the process of looking for cancer or pre-cancer in people who have no symptoms of the disease.

From the time the first abnormal cells start to grow into polyps, it usually takes about 10 to 15 years for them to develop into colorectal cancer. Regular screening can, in many cases, prevent colorectal cancer altogether. This is because most polyps can be found and removed before they turn into cancer. Screening can also find colorectal cancer early, when it is highly curable.

People who have no identified risk factors (other than age) should begin regular screening at age 50. Those who have a family history or other risk factors for colorectal polyps or cancer, such as inflammatory bowel disease, should talk with their doctor about starting screening at a younger age, about getting screened more frequently, and about which tests are best for them. (See our screening guidelines in the section “American Cancer Society recommendations for colorectal cancer early detection.”)

Genetic testing, screening, and treatment for those with a strong family history

If you have a strong family history of colorectal polyps or cancer, you should talk with your doctor about it. While cancer in close (first-degree) relatives such as parents, brothers, and sisters is most concerning, cancer in more distant relatives can also be important. Having 2 or more relatives with colorectal cancer is more concerning than having one relative. It is also more concerning if your relatives were diagnosed with cancer at a younger than usual age, while less concerning if they were diagnosed at an advanced age. You might benefit from genetic counseling to review your family medical tree to see how likely it is that you have a family cancer syndrome. The counselor can also help you decide if gene testing is right for you. People who have an abnormal gene can take steps to prevent colon cancer, such as getting screened at an early age or even having surgery.

Before getting genetic testing, it's important to know ahead of time what the results may or may not tell you about your risk. Genetic testing is not perfect, and for some people the tests may not be able to provide solid answers. This is why meeting with a genetic counselor or cancer genetics

professional is crucial in deciding if testing should be done. More about this can be found in our document *Genetic Testing: What You Need to Know*.

Genetic tests can help determine if members of certain families have inherited a high risk for developing colorectal cancer due to family cancer syndromes such as familial adenomatous polyposis (FAP) or hereditary non-polyposis colorectal cancer (HNPCC). Without genetic testing, all members of a family known to have an inherited form of colorectal cancer should start screening at an early age, and get screened frequently. If genetic testing is done for a known mutation within a family, those members who are found not to have the mutated gene may be able to be screened at the same age and frequency as people at average risk.

Testing for hereditary non-polyposis colorectal cancer (HNPCC)

HNPCC increases the risk of colorectal cancer, as well as cancer of the uterus (endometrium), ovary, stomach, small bowel, pancreas, kidney, brain, ureters (tubes that carry urine from the kidneys to the bladder), and bile duct. Doctors have found that many families with HNPCC tend to have certain characteristics which are known as the *Amsterdam criteria*:

- At least 3 relatives have colorectal cancer.
- One should be a first-degree relative (parent, sibling, or child) of the other 2 relatives.
- At least 2 successive generations are involved.
- At least 1 relative had their cancer when they were younger than age 50.

If these apply to your family, then you might want to seek genetic counseling, even if you don’t have cancer. But even if your family history satisfies the Amsterdam criteria, it doesn't always mean you have HNPCC. Only about half of families who meet the Amsterdam criteria have HNPCC. The other half do not, and although their colorectal cancer rate is about twice as high as normal, it is not as high as that of people with HNPCC. On the other hand, many families with HNPCC do not meet the Amsterdam criteria.

A second set of criteria, called the *revised Bethesda guidelines*, can be used to determine whether a person with colorectal cancer should have his or her cancer tested for genetic changes that are seen with HNPCC (these are called *microsatellite instability* or *MSI*). These criteria include at least one of the following:

- The person is younger than 50 years.
- The person has or had a second colorectal cancer or another cancer (endometrial, stomach, pancreas, small intestine, ovary, kidney, brain, ureters, or bile duct) that is associated with HNPCC.
- The person is younger than 60 years and the cancer has certain characteristics seen with HNPCC when viewed under the microscope or with other lab tests.

- The person has a first-degree relative younger than 50 who was diagnosed with colorectal cancer or another cancer often seen in HNPCC carriers (endometrial, stomach, pancreas, small intestine, ovary, kidney, brain, ureters, or bile duct).
- The person has 2 or more first- or second-degree relatives who had colorectal cancer or another HNPCC-related cancer at any age (second-degree relatives include uncles, aunts, grandparents, nieces, nephews and grandchildren).

If a person with colorectal cancer has any of the Bethesda criteria, testing for MSI may be advised. If MSI is found, the doctor will recommend that the patient be tested for a HNPCC-associated gene mutation. It is important to realize that most people who meet the Bethesda criteria do not have HNPCC, and you can have HNPCC and not meet any of the criteria listed. Not all doctors use the Bethesda guidelines to decide who should have MSI testing. In fact, some experts recommend that all colorectal cancers be tested for MSI. Most doctors recommend genetic testing for HNPCC for anyone whose cancer tests positive for MSI.

Even if you don't have cancer, your doctor may suspect that HNPCC runs in your family based on cases of colorectal cancer and other cancers associated with this syndrome in your relatives. In that case, your doctor may recommend genetic counseling to evaluate your risk.

The lifetime risk of colorectal cancer for people with an HNPCC mutation may be as high as 80%. In families known to carry an HNPCC gene mutation, doctors recommend that family members who have tested positive for the mutation and those who have not been tested should start colonoscopy screening during their early 20s to remove any polyps and find any cancers at the earliest possible stage (see the section "Can colorectal polyps and cancer be found early?"). People known to carry one of the gene mutations may also be offered the option of removal of most of the colon.

Familial adenomatous polyposis (FAP)

FAP causes many (often more than a hundred) polyps in the colon. This leads to the development of colorectal cancer. Because FAP causes polyps and cancer earlier than the usual age to begin colorectal cancer screening, sometimes FAP isn't diagnosed until the colon is examined in someone who has cancer. If FAP is found in one patient, doctors will recommend that his or her close relatives (brothers, sisters, children) be tested. FAP may also be suspected if a patient is found to have many polyps during a colonoscopy that was done because of problems like rectal bleeding or anemia.

Genetic counseling and testing is available for those who may have FAP based on their personal or family history. Their lifetime risk of developing colorectal cancer is near 100%, and in most cases it develops before the age of 40. People who test positive for the gene change linked to FAP should start colonoscopy during their teens (see the section "Can colorectal polyps and cancer be found early?"). Most doctors recommend they have their colon removed when they are in their 20s to prevent cancer from developing.

Diet, exercise, and body weight

You can lower your risk of developing colorectal cancer by managing the risk factors that you can control, like diet and physical activity.

Most studies have found that being overweight or obese increases the risk of colorectal cancer in both men and women, but the link seems to be stronger in men. Having more belly fat (that is, a larger waistline) has also been linked to colorectal cancer.

Overall, diets that are high in vegetables, fruits, and whole grains (and low in red and processed meats) have been linked with lower colorectal cancer risk, although it's not exactly clear which factors are important. Many studies have found a link between red meat or processed meat intake and increased colorectal cancer risk.

Studies show a lower risk of colorectal cancer and polyps with increasing levels of activity. Moderate activity on a regular basis lowers the risk, but vigorous activity may have an even greater benefit.

In recent years, some large studies have suggested that fiber in the diet, especially from whole grains, may lower colorectal cancer risk. Research in this area is still under way.

Several studies have found a higher risk of colorectal cancer with increased alcohol intake, especially among men.

At this time, the best advice about diet and activity to possibly reduce your risk of colorectal cancer is to:

- Increase the intensity and amount of physical activity.
- Limit intake of red and processed meats.
- Get the recommended levels of calcium and vitamin D (see below).
- Eat more vegetables and fruits.
- Avoid obesity and weight gain around the midsection.
- Avoid excess alcohol.

For more information about diet and physical activity, refer to our document *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

Vitamins, calcium, and magnesium

Some studies suggest that taking a daily multi-vitamin containing folic acid, or folate, may lower colorectal cancer risk, but not all studies have found this. In fact, some studies have hinted that folic acid might help existing tumors grow. More research is needed in this area.

Some studies have suggested that vitamin D, which you can get from sun exposure, in certain foods, or in a vitamin pill, can lower colorectal cancer risk. Because of concerns that excessive sun exposure can cause skin cancer, most experts do not recommend this as a way to lower colorectal cancer risk at this time.

Other studies suggest that increasing calcium intake may lower colorectal cancer risk. Calcium is important for a number of health reasons aside from possible effects on cancer risk. But because of the possible increased risk of prostate cancer in men with high calcium intake, the American Cancer Society does not recommend increasing calcium intake specifically to try to lower cancer risk.

Calcium and vitamin D may work together to reduce colorectal cancer risk, as vitamin D aids in the body's absorption of calcium. Still, not all studies have found that supplements of these nutrients reduce risk.

A few studies have looked at a possible link between a diet high in magnesium and reduced colorectal cancer risk. Some, but not all, of these studies have found a link, especially among women. More research is needed to determine if this link exists.

Nonsteroidal anti-inflammatory drugs

Many studies have found that people who regularly use aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin®, Advil®) and naproxen (Aleve®), have a lower risk of colorectal cancer and adenomatous polyps. Most of these studies looked at people who took these medicines for reasons such as to treat arthritis or prevent heart attacks. Other, stronger studies have provided evidence that aspirin can help prevent the growth of polyps in people who were previously treated for early stages of colorectal cancer or who previously had polyps removed.

But aspirin and other NSAIDs can cause serious or even life-threatening side effects such as bleeding from stomach irritation, which may outweigh the benefits of these medicines for the general public. For this reason, experts do not recommend NSAIDs as a cancer prevention strategy for people at average risk of developing colorectal cancer.

The value of these drugs for people at increased colorectal cancer risk is being actively studied. Celecoxib (Celebrex®) has been approved by the US Food and Drug Administration for reducing polyp formation in people with familial adenomatous polyposis (FAP). This drug may cause less bleeding in the stomach than other NSAIDs, but it may increase the risk of heart attacks and strokes.

Aspirin or other NSAIDs can have serious side effects, so check with your doctor before starting to take any of them on a regular basis.

Female hormones

Taking estrogen and progesterone after menopause (sometimes called *menopausal hormone therapy* or *combined hormone replacement therapy*) may reduce the risk of developing colorectal cancer in postmenopausal women, but cancers found in women taking these hormones after menopause may be at a more advanced stage. Taking estrogen and progesterone after menopause also lowers the risk of developing osteoporosis (bone thinning). But it can also increase a woman's risk of heart disease, blood clots, and cancers of the breast and lung.

The decision to use menopausal hormone therapy should be based on a careful discussion of the possible benefits and risks with your doctor.

Some studies have found that the use of oral contraceptives (birth control pills) may lower the risk of colorectal cancer in women. More research is needed to confirm this link.

Signs and symptoms of colorectal cancer

Early colorectal cancers may not cause any symptoms. This is why screening is recommended.

Colorectal cancer may cause one or more of these symptoms:

- A change in bowel habits, such as diarrhea, constipation, or narrowing of the stool, that lasts for more than a few days
- A feeling that you need to have a bowel movement that is not relieved by doing so
- Rectal bleeding
- Blood in the stool, which may cause the stool to look dark
- Cramping or abdominal (belly) pain
- Weakness and fatigue
- Unintended weight loss

Colorectal cancers can bleed. While sometimes the blood can be seen in the stool or make it look darker, often the stool looks normal. The blood loss can build up over time, though, and lead to low red blood cell counts (anemia). Sometimes the first sign of colorectal cancer is a blood test showing a low red blood cell count.

Most of these problems are more often caused by conditions other than colorectal cancer, such as infection, hemorrhoids, irritable bowel syndrome, or inflammatory bowel disease. Still, if you have any of these problems, it’s important to see your doctor right away so the cause can be found and treated, if needed.

Colorectal cancer screening tests

Screening is the process of looking for cancer in people who have no symptoms of the disease. Several different tests can be used to screen for colorectal cancers. These tests can be divided into:

- **Tests that can find both colorectal polyps and cancer:** These tests look at the structure of the colon itself to find any abnormal areas. This is done either with a scope inserted into the rectum or with special imaging (x-ray) tests. Polyps found before they become cancerous can be removed, so these tests may prevent colorectal cancer. Because of this, these tests are preferred if they are available and you are willing to have them.
- **Tests that mainly find cancer:** These involve testing the stool (feces) for signs that cancer may be present. These tests are less invasive and easier to have done, but they are less likely to detect polyps.

These tests as well as others can also be used when people have symptoms of colorectal cancer and other digestive diseases.

Tests that can find both colorectal polyps and cancer

Flexible sigmoidoscopy

During this test, the doctor looks at part of the colon and rectum with a sigmoidoscope – a flexible, lighted tube about the thickness of a finger with a small video camera on the end. It is inserted through the rectum and into the lower part of the colon. Images from the scope are viewed on a display monitor.

Using the sigmoidoscope, your doctor can view the inside of the rectum and part of the colon to detect (and possibly remove) any abnormality. Because the sigmoidoscope is only 60 centimeters (about 2 feet) long, the doctor is able to see the entire rectum but less than half of the colon with this procedure.

Before the test: Your colon and rectum must be empty and clean so your doctor can view the lining of the sigmoid colon and rectum. Your doctor will give you specific instructions to follow to clean them out. You may be asked to follow a special diet (such as drinking only clear liquids) for a day before the exam. You may also be asked to use enemas or to use strong laxatives to clean out your colon before the exam. Be sure to tell your doctor about any medicines you are taking, as you might need to change how you take them before the test.

During the test: A sigmoidoscopy usually takes 10 to 20 minutes. Most people do not need to be sedated for this test, but this may be an option you can discuss with your doctor. Sedation may make the test less uncomfortable, but you will need some time to recover from it and you'll need someone with you to take you home after the test.

You will probably be asked to lie on a table on your left side with your knees positioned near your chest. Your doctor may examine the rectum before inserting the sigmoidoscope by inserting a gloved, lubricated finger into the rectum. The sigmoidoscope is lubricated to make it easier to insert into the rectum. The scope may feel cold. The sigmoidoscope may stretch the wall of the colon, which may cause bowel spasms or lower abdominal pain. Air will be placed into the sigmoid colon through the sigmoidoscope so the doctor can see the walls of the colon better. During the procedure, you might feel pressure and slight cramping in your lower abdomen. To ease discomfort and the urge to have a bowel movement, it helps to breathe deeply and slowly through your mouth. You will feel better after the test once the air leaves your colon.

If a small polyp is found during the test your doctor may remove it with a small instrument passed through the scope. The polyp will be sent to a lab to be looked at by a pathologist. If a pre-cancerous polyp (an adenoma) or colorectal cancer is found during the test, you will need to have a colonoscopy later to look for polyps or cancer in the rest of the colon.

Possible complications and side effects: This test may be uncomfortable because of the air put into the colon, but it should not be painful. Be sure to let your doctor know if you feel pain during the procedure. You might see a small amount of blood in your first bowel movement after the test. Significant bleeding and puncture of the colon are possible complications, but they are very uncommon.

Colonoscopy

For this test, the doctor looks at the entire length of the colon and rectum with a colonoscope, a thin, flexible, lighted tube with a small video camera on the end. It is basically a longer version of a sigmoidoscope. It is inserted through the anus and into the rectum and colon. Special instruments can be passed through the colonoscope to biopsy (sample) or remove any suspicious-looking areas such as polyps, if needed.

Colonoscopy may be done in a hospital outpatient department, in a clinic, or in a doctor’s office.

Before the test: Be sure your doctor knows about any medicines you are taking, as you might need to change how you take them before the test. The colon and rectum must be empty and clean so your doctor can see their inner linings during the test. This can be done many ways, but the most common involves drinking 2 to 4 quarts of a salty liquid laxative the evening before and the morning of the procedure. This leads to spending much of the night before and the morning of the procedure in the bathroom.

Your doctor will give you specific instructions. It is important to read these carefully a few days ahead of time, since you may need to shop for special supplies and get laxatives from a pharmacy. If you are not sure about any of the instructions, call the doctor’s office and go over them step by step with the nurse.

You might be given other instructions as well. Your doctor may tell you to stop eating food and drink only clear liquids (water, apple or white grape juice, and any gelatin except red or purple)

for at least a day before the exam. Plain tea or coffee with sugar is usually okay, but no milk or creamer is allowed. Clear broth, ginger ale, and most soft drinks or sports drinks are usually allowed unless they have red or purple food colorings, which could be mistaken for blood in the colon.

You will probably also be told not to eat or drink anything after midnight the night before your test. If you normally take prescription medicines in the mornings, talk with your doctor or nurse about how to manage them for the day.

Because a sedative is used during the test, you will need to arrange for someone you know to take you home from the test (not just a cab).

During the test: The test itself usually takes about 30 minutes, but it may take longer if a polyp is found and removed. Before the colonoscopy begins, you will be given a sedating medicine (into a vein) to make you feel comfortable and sleepy during the procedure. For most people, this medicine leads to them being unaware of what is going on and unable to remember the procedure afterward. You will wake up after the test is over, but might not be fully awake until later in the day.

During the procedure, you will be asked to lie on your side with your knees flexed and a drape will cover you. Your blood pressure, heart rate, and breathing rate will be monitored during and after the test.

Your doctor might insert a gloved finger into the rectum to examine it before inserting the colonoscope. The colonoscope is lubricated so it can be easily inserted into the rectum. Once in the rectum, the colonoscope is passed all the way to the beginning of the colon, called the cecum. If you are awake, you may feel an urge to have a bowel movement when the colonoscope is inserted or pushed further up the colon. To ease any discomfort it may help to breathe deeply and slowly through your mouth. The doctor injects air into the colon through the colonoscope to make it easier to see the lining of the colon and use the instruments to perform the test.

The doctor will look at the inner walls of the colon as he or she slowly withdraws the colonoscope. If a small polyp is found, the doctor may remove it. Some small polyps may eventually become cancerous. For this reason, they are usually removed. This is usually done by passing a wire loop through the colonoscope to cut the polyp from the wall of the colon with an electrical current. The polyp can then be sent to a lab to be checked under a microscope to see if it has any areas that have changed into cancer.

If your doctor sees a larger polyp or tumor or anything else abnormal, a biopsy may be done. For this procedure, a small piece of tissue is taken out through the colonoscope. The tissue is looked at under a microscope to determine if it is a cancer, a benign (non-cancerous) growth, or a result of inflammation.

Possible side effects and complications: The bowel preparation before the test is unpleasant. The test itself may be uncomfortable, but the sedative usually helps with this, and most people

feel normal once the effects of the sedative wear off. Because air is pumped into the colon during the test, people sometimes feel bloated, have gas pains, or have cramping for a while after the test until the air is passed out.

Some people may have low blood pressure or changes in heart rhythms due to the sedation during the test, although these are rarely serious.

If a polyp is removed or a biopsy is done during the colonoscopy, you may notice some blood in your stool for a day or 2 after the test. Significant bleeding is uncommon, but in rare cases, there is serious bleeding that requires treatment or can even be life-threatening.

Colonoscopy is a safe procedure, but on rare occasions the colonoscope can puncture the wall of the colon or rectum. This is called a *perforation*. Symptoms include severe abdominal (belly) pain, nausea, and vomiting. This can be a serious (or even life-threatening) complication, as it can lead to a serious abdominal (belly) infection. The hole may need to be repaired with surgery. Talk to your doctor about the risk of this complication.

You can read more about colonoscopy and sigmoidoscopy in our document *Frequently Asked Questions About Colonoscopy and Sigmoidoscopy.*

Double-contrast barium enema

The double-contrast barium enema (DCBE) is also called an *air-contrast barium enema* or a *barium enema with air contrast*. It may also be referred to as a *lower GI series*. It is basically a type of x-ray test. Barium sulfate, which is a chalky liquid, and air are used to outline the inner part of the colon and rectum to look for abnormal areas on x-rays. If suspicious areas are seen on this test, a colonoscopy will be needed to explore them further.

Before the test: As with colonoscopy, it is very important that the colon and rectum are empty and clean so your doctor can see them during the test. Your doctor will give you specific instructions on preparing for the test. Be sure to follow them. For example, you may be asked to clean your bowel the night before with laxatives and/or take enemas the morning of the exam. You will probably be asked to follow a clear liquid diet for a day or 2 before the procedure. You may also be told to avoid eating or drinking dairy products the day before the test, and to not eat or drink anything after midnight on the night before the procedure.

During the test: The procedure takes about 30 to 45 minutes, and it does not require sedation. For this test, you lie on a table on your side in an x-ray room. A small, flexible tube is inserted into the rectum, and barium sulfate is pumped in to partially fill and open up the colon. When the colon is about half-full of barium, you are turned on the x-ray table so the barium spreads throughout the colon. Then air is pumped into the colon through the same tube to make it expand. This may cause some cramping and discomfort, and you may feel the urge to have a bowel movement.

X-ray pictures of the lining of your colon are then taken, allowing the doctor to look for polyps or cancers. You may be asked to change positions so that different views of the colon and rectum can be seen on the x-rays.

If polyps or other suspicious areas are seen on this test, you will probably need a colonoscopy to remove them or to explore them fully.

Possible side effects and complications: You may have bloating or cramping after the test, and will likely feel the need to empty your bowels soon after the test is done. The barium can cause constipation for a few days, and your stool may appear grey or white until the barium leaves the body. There is a very small risk that inflating the colon with air could injure or puncture the colon, but this risk is thought to be much less than with colonoscopy. Like other x-ray tests, this test also exposes you to a small amount of radiation.

CT colonography (virtual colonoscopy)

This test is an advanced type of computed tomography (CT or CAT) scan of the colon and rectum. A CT scan is an x-ray test that produces detailed cross-sectional images of your body. Instead of taking one picture, like a regular x-ray, a CT scanner takes many pictures as it rotates around you while you lie on a table. A computer then combines these pictures into images of slices of the part of your body being studied.

For CT colonography, special computer programs create both 2-dimensional x-ray pictures and a 3-dimensional “fly-through” view of the inside of the colon and rectum, which lets the doctor look for polyps or cancer.

This test may be especially useful for some people who can’t have or don’t want to have more invasive tests such as colonoscopy. It can be done fairly quickly and does not require sedation. But even though this test is not invasive like colonoscopy, it still requires the same type of bowel preparation and uses a tube placed in the rectum (similar to the tube used for barium enema) to fill the colon with air. Another possible drawback is that if polyps or other suspicious areas are seen on this test, a colonoscopy will still probably be needed to remove them or to explore them fully.

Before the test: It is important that the colon and rectum are emptied before this test to provide the best images, so the preparation for this test is similar to that for a colonoscopy. You will probably be told to follow a clear liquid diet for a day or 2 before the test. There are a number of ways to clean the colon before the procedure. Often, the evening before the procedure, you drink 2 to 4 quarts of a salty liquid laxative solution. This often results in spending much of the night before the procedure in the bathroom. The morning of the procedure, sometimes more liquid needs to be drunk or enemas need to be used to make sure the bowels are empty.

During the test: This test is done in a special room with a CT scanner, and takes about 10 minutes. You may be asked to drink a contrast solution before the test to help “tag” any remaining stool in the colon or rectum, which helps the doctor when looking at the test images.

You will be asked to lie on a thin table that is part of the CT scanner, and will have a small, flexible tube inserted into your rectum. Air is pumped through the tube into the colon to expand it to provide better images. The table then slides into the CT scanner, and you will be asked to hold your breath while the scan takes place. You will likely have 2 scans: one while you are lying on your back and one while you are on your stomach. Each scan typically takes only about 10 to 15 seconds.

Possible side effects and complications: There are usually very few side effects after CT colonography. You may feel bloated or have cramps because of the air in the colon, but this should go away once the air passes from the body. There is a very small risk that inflating the colon with air could injure or puncture the colon, but this risk is thought to be much less than with colonoscopy. Like other types of CT scans, this test also exposes you to a small amount of radiation.

Tests that mainly find colorectal cancer

These tests look at the stool for signs of cancer. Most people find these tests to be easier because they are not invasive and can often be done at home. But these tests aren't as good as the ones described that find polyps. A positive result on one of these screening tests will probably require a more invasive test such as colonoscopy.

Guaiac-based fecal occult blood test

One way to find for colorectal cancer is to look for blood that can't be seen with the naked eye (occult blood) in feces (stool). The idea behind this test is that blood vessels at the surface of larger colorectal polyps or cancers are often fragile and easily damaged by the passage of feces. The damaged vessels usually release a small amount of blood into the feces, but only rarely is there enough bleeding for blood to be visible in the stool.

The guaiac-based fecal occult blood test (gFOBT) detects blood in the stool through a chemical reaction. This test cannot tell if the blood is from the colon or from other parts of the digestive tract (such as the stomach). If this test is positive, a colonoscopy will be needed to find the reason for the bleeding. Although cancers and polyps can cause blood in the stool, other causes of bleeding can occur, such as ulcers, hemorrhoids, diverticulosis (tiny pouches that form at weak spots in the colon wall), or inflammatory bowel disease (colitis).

Over time, this test has improved so that it is more likely to find colorectal cancer if it is present. The American Cancer Society recommends the more modern version of this test for screening, called “highly-sensitive.”

This screening test is done with a kit that you can use in the privacy of your own home that allows you to check more than one stool sample. *A FOBT done during a digital rectal exam in the doctor's office is not sufficient for screening* (it only checks one stool sample). Also, unlike some other tests (like colonoscopy), this one must be repeated every year.

People having this test will receive a kit with instructions from their doctor's office or clinic. The kit will explain how to take a stool or feces sample at home (usually specimens from 3 consecutive bowel movements that are smeared onto small squares of paper). The kit should then be returned to the doctor's office or medical lab (usually within 2 weeks) for testing.

Before the test: Some foods or drugs can affect the test result, so your doctor may suggest that you avoid the following before this test:

- Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil), naproxen (Aleve), or aspirin (more than 1 adult aspirin per day), for 7 days before testing. (They can cause bleeding, which can lead to a false-positive result.) Acetaminophen (Tylenol) can be taken as needed.
- Vitamin C in excess of 250 mg daily from either supplements or citrus fruits and juices for 3 days before testing. (This can affect the chemicals in the test and make the result negative, even when blood is present.)
- Red meats (beef, lamb, or liver) for 3 days before testing. (Components of blood in the meat may cause a positive test result)

Some people who are given the test never do it or don't give it to their doctor because they worry that something they ate may interfere with the test. For this reason, many doctors tell their patients it isn't essential to follow any restrictions in their diet. The most important thing is to get the test done. People should try to avoid taking aspirin or related drugs for minor aches. But if you take these medicines daily for heart problems or other conditions, don't stop them for this test without talking to your doctor first.

Collecting the samples: Have all of your supplies ready and in one place. Supplies will include a test kit, test cards, either a brush or wooden applicator, and a mailing envelope. The kit will give you detailed instructions on how to collect the specimen. The instructions below can be used as a guide, but your kit instructions might be a little different. Always follow the instructions on your kit.

- You will need to collect a sample from your bowel movement. You can place a sheet of plastic wrap or paper loosely across the toilet bowl to catch the stool or you can use a dry container to collect the stool. Do not let the stool specimen mix with urine. After you obtain a sample, you can flush the remaining stool down the toilet.
- Use a wooden applicator or a brush to smear a thin film of the stool sample onto one of the slots in the test card or slide.
- Next, collect a specimen from a different area of the same stool and smear a thin film of the sample onto the other slot in the test card or slide.
- Close the slots and put your name and the date on the test kit. Store the kit overnight in a paper envelope to allow it time to dry.

- Repeat the test on your next 2 bowel movements if instructed. Most tests require collecting more than one sample from different bowel movements. This improves the accuracy of the test because many cancers don't bleed all of the time, and blood may not be present in all stool samples.
- Place the test kit in the mailing pouch provided and return it to your doctor or lab as soon as possible (but within 14 days of taking the first sample).

If this test finds blood, a colonoscopy will be needed to look for the source. It is not sufficient to simply repeat the FOBT or follow up with other types of tests.

Fecal immunochemical test

The fecal immunochemical test (FIT), also called an *immunochemical fecal occult blood test* (iFOBT), tests for occult (hidden) blood in the stool in a different way than a guaiac-based test. This test reacts to part of the human hemoglobin protein, which is found in red blood cells.

Early versions of this test were not as good at finding colorectal cancers. Versions that the American Cancer Society recommends for screening, called “highly-sensitive,” have been around for at least 10 years.

The FIT is done essentially the same way as the FOBT, but some people may find it easier to use because there are no drug or dietary restrictions (vitamins or foods do not affect the FIT) and sample collection may take less effort. This test is also less likely to react to bleeding from parts of the upper digestive tract, such as the stomach.

Like the FOBT, the FIT may not detect a tumor that is not bleeding, so multiple stool samples should be tested. And if the results are positive for hidden blood, a colonoscopy is required to investigate further. To be beneficial the test must be repeated every year.

Collecting the samples: Have all of your supplies ready and in one place. Supplies will include a test kit, test cards, long brushes, waste bags, and a mailing envelope. The kit will give you detailed instructions on how to collect the specimen. The instructions below can be used as a guide, but the instructions on your kit might be a little different. Always follow the instructions on your kit.

- Flush the toilet before your bowel movement. After you go, place used toilet paper in the waste bag from the kit, not in the toilet.
- Brush the surface of the stool with one of the brushes, then dip the brush in the toilet water. Dab the end of the brush onto one of the slots in the test card or slide.
- Close the slot and put your name and the date on the test kit.
- Repeat the test on your next bowel movement if instructed. Most tests require collecting more than one sample from different bowel movements. This improves the accuracy of the

test because many cancers don't bleed all of the time, and blood may not be present in all stool samples.

- Place the test kit in the mailing envelope provided and return it to your doctor or lab as soon as possible (but within 14 days of taking the first sample).

Stool DNA test

A stool DNA test looks for certain abnormal sections of DNA (genetic material) from cancer or polyp cells. Colorectal cancer cells often contain DNA mutations (changes) in certain genes. Cells from colorectal cancers or polyps with these mutations are often shed into the stool, where tests may be able to detect them. Cologuard™, the test currently available, also tests for blood in the stool.

Collecting the samples: You will receive a kit in the mail to collect your stool samples. It will contain a sample container, a bracket for holding the container in the toilet, a bottle of liquid preservative, a tube, labels, and a shipping box. The kit contains detailed instructions on how to collect the samples. The instructions below can be used as a guide.

- Place the bracket under the toilet seat and then put the toilet seat down.
- Remove the lid from the sample container and place it in the bracket (in the toilet).
- Sit on the toilet and try to have a bowel movement into the container. Try to keep urine from going in the container.
- When your bowel movement is complete, stand up and remove the container from the toilet (you can discard the bracket). Do not put toilet paper in the container.
- Remove the cap from the tube that was included in the kit and pull the probe (like a stick) from the tube.
- Scrape the stool in the container with the probe so that stool gets on the end.
- Put the probe back in the tube and screw the cap shut.
- Open the bottle of liquid preservative and pour all of the liquid over the stool in the container.
- Put the lid on the sample container and screw it down tight.
- Label the samples and ship them according to the instructions in the kit. The samples should shipped within a day of collection.

What are some of the pros and cons of these screening tests?

Test	Pros	Cons
Flexible sigmoidoscopy	Fairly quick and safe Usually doesn't require full bowel preparation Sedation usually not used Does not require a specialist Done every 5 years	Views only about a third of the colon Can miss small polyps Can't remove all polyps May be some discomfort Very small risk of bleeding, infection, or bowel tear Colonoscopy will be needed if abnormal
Colonoscopy	Can usually view entire colon Can biopsy and remove polyps Done every 10 years Can diagnose other diseases	Can miss small polyps Full bowel preparation needed More expensive on a one-time basis than other forms of testing Sedation of some kind is usually needed Will need someone to drive you home You may miss a day of work Small risk of bleeding, bowel tears, or infection
Double-contrast barium enema (DCBE)	Can usually view entire colon Relatively safe Done every 5 years No sedation needed	Can miss small polyps Full bowel preparation needed Some false positive test results Cannot remove polyps during testing Colonoscopy will be needed if abnormal
CT colonography (virtual colonoscopy)	Fairly quick and safe Can usually view entire colon Done every 5 years No sedation needed	Can miss small polyps Full bowel preparation needed Some false positive test results Cannot remove polyps during testing Colonoscopy will be needed if abnormal Still fairly new - may be insurance issues
Guaiac-based fecal occult blood test (gFOBT)	No direct risk to the colon No bowel preparation Sampling done at home Inexpensive	May miss many polyps and some cancers May produce false-positive test results May have pre-test dietary limitations Should be done every year

		Colonoscopy will be needed if abnormal
Fecal immunochemical test (FIT)	No direct risk to the colon No bowel preparation No pre-test dietary restrictions Sampling done at home Fairly inexpensive	May miss many polyps and some cancers May produce false-positive test results Should be done every year Colonoscopy will be needed if abnormal
Stool DNA test	No direct risk to the colon No bowel preparation No pre-test dietary restrictions Sampling done at home	May miss many polyps and some cancers May produce false-positive test results Should be done every 3 years Colonoscopy will be needed if abnormal

American Cancer Society recommendations for colorectal cancer early detection

People at average risk

The American Cancer Society believes that preventing colorectal cancer (and not just finding it early) should be a major reason for getting tested. Having their polyps found and removed keeps some people from getting colorectal cancer. Tests that have the best chance of finding both polyps and cancer are preferred if these tests are available to you and you are willing to have them.

Beginning at age 50, both men and women at *average risk* for developing colorectal cancer should use one of the screening tests below:

Tests that find polyps and cancer

- Flexible sigmoidoscopy every 5 years*
- Colonoscopy every 10 years
- Double-contrast barium enema every 5 years*
- CT colonography (virtual colonoscopy) every 5 years*

Tests that mainly find cancer

- Guaiac-based fecal occult blood test (gFOBT) every year*,**

- Fecal immunochemical test (FIT) every year*,**
- Stool DNA test (sDNA) every 3 years*

**Colonoscopy should be done if test results are positive.*

*** Highly-sensitive versions of these tests should be used with the take-home multiple sample method. An FOBT or FIT done during a digital rectal exam in the doctor's office is not adequate for screening.*

Is a rectal exam enough to screen for colorectal cancer?

In a digital rectal examination (DRE), a doctor examines your rectum with a lubricated, gloved finger. Although a DRE is often included as part of a routine physical exam, it is not recommended as a stand-alone test for colorectal cancer. This simple test, which is not usually painful, can detect masses in the anal canal or lower rectum. By itself, however, it is not a good test for detecting colorectal cancer because its reach is limited.

Doctors often find a small amount of stool in the rectum when doing a DRE. However, simply checking stool obtained this way for bleeding with an FOBT or FIT is not an acceptable method of screening for colorectal cancer. Research has shown that this type of stool exam will miss more than 90% of colon abnormalities, including most cancers.

People at increased or high risk

If you are at an increased or high risk of colorectal cancer, you should begin colorectal cancer screening before age 50 and/or be screened more often. The following conditions make your risk higher than average:

- A personal history of colorectal cancer or adenomatous polyps
- A personal history of inflammatory bowel disease (ulcerative colitis or Crohn's disease)
- A strong family history of colorectal cancer or polyps (see “Risk factors for colorectal cancer”)
- A known family history of a hereditary colorectal cancer syndrome such as familial adenomatous polyposis (FAP) or hereditary non-polyposis colon cancer (HNPCC)

The table below suggests screening guidelines for those with *increased or high risk* of colorectal cancer based on specific risk factors. Some people may have more than one risk factor. Refer to the table below and discuss these recommendations with your doctor. Based on your situation, your doctor can suggest the best screening option for you, as well as any changes in the schedule based on your individual risk.

American Cancer Society Guidelines on Screening and Surveillance for the Early Detection of Colorectal Adenomas and Cancer in People at Increased Risk or at High Risk			
INCREASED RISK – Patients With a History of Polyps on Prior Colonoscopy			
Risk Category	**When**	**Recommended Test(s)**	**Comment**
People with small rectal hyperplastic polyps	Same age as those at average risk	Colonoscopy, or other screening options at same intervals as for those at average risk	Those with hyperplastic polyposis syndrome are at increased risk for adenomatous polyps and cancer and should have more intensive follow-up.
People with 1 or 2 small (less than 1 cm) tubular adenomas with low-grade dysplasia	5 to 10 years after the polyps are removed	Colonoscopy	Time between tests should be based on other factors such as prior colonoscopy findings, family history, and patient and doctor preferences.
People with 3 to 10 adenomas, or a large (1 cm +) adenoma, or any adenomas with high-grade dysplasia or villous features	3 years after the polyps are removed	Colonoscopy	Adenomas must have been completely removed. If colonoscopy is normal or shows only 1 or 2 small tubular adenomas with low-grade dysplasia, future colonoscopies can be done every 5 years.
People with more than 10 adenomas on a single exam	Within 3 years after the polyps are removed	Colonoscopy	Doctor should consider possibility of genetic syndrome (such as FAP or HNPCC).
People with sessile adenomas that are removed in pieces	2 to 6 months after adenoma removal	Colonoscopy	If entire adenoma has been removed, further testing should be based on doctor's judgment.

INCREASED RISK – Patients With Colorectal Cancer			
Risk Category	**When to Begin**	**Recommended Test(s)**	**Comment**
People diagnosed with colon or rectal cancer	At time of colorectal surgery, or can be 3 to 6 months later if person doesn't have cancer spread that can't be removed	Colonoscopy to view entire colon and remove all polyps	If the tumor presses on the colon/rectum and prevents colonoscopy, CT colonoscopy (with IV contrast) or DCBE may be done to look at the rest of the colon.
People who have had colon or rectal cancer removed by surgery	Within 1 year after cancer resection (or 1 year after colonoscopy to make sure the rest of the colon/rectum was clear)	Colonoscopy	If normal, repeat exam in 3 years. If normal then, repeat exam every 5 years. Time between tests may be shorter if polyps are found or there is reason to suspect HNPCC. After low anterior resection for rectal cancer, exams of the rectum may be done every 3 to 6 months for the first 2 to 3 years to look for signs of recurrence.
INCREASED RISK – Patients With a Family History			
Risk Category	**Age to Begin**	**Recommended Test(s)**	**Comment**
Colorectal cancer or adenomatous polyps in any first-degree relative before age 60, or in 2 or more first-degree relatives at any	Age 40, or 10 years before the youngest case in the immediate family, whichever is earlier	Colonoscopy	Every 5 years.

age (if not a hereditary syndrome).			
Colorectal cancer or adenomatous polyps in any first-degree relative aged 60 or older, or in at least 2 second-degree relatives at any age	Age 40	Same options as for those at average risk.	Same intervals as for those at average risk.

HIGH RISK			
Risk Category	**Age to Begin**	**Recommended Test(s)**	**Comment**
Familial adenomatous polyposis (FAP) diagnosed by genetic testing, or suspected FAP without genetic testing	Age 10 to 12	Yearly flexible sigmoidoscopy to look for signs of FAP; counseling to consider genetic testing if it hasn't been done	If genetic test is positive, removal of colon (colectomy) should be considered.
Hereditary non-polyposis colon cancer (HNPCC), or at increased risk of HNPCC based on family history without genetic testing	Age 20 to 25 years, or 10 years before the youngest case in the immediate family	Colonoscopy every 1 to 2 years; counseling to consider genetic testing if it hasn't been done	Genetic testing should be offered to first-degree relatives of people found to have HNPCC mutations by genetic tests. It should also be offered if 1 of the first 3 of the modified Bethesda criteria is met.1
Inflammatory bowel disease: -Chronic ulcerative colitis -Crohn's disease	Cancer risk begins to be significant 8 years after the onset of pancolitis (involvement of entire large intestine), or 12-15	Colonoscopy every 1 to 2 years with biopsies for dysplasia	These people are best referred to a center with experience in the surveillance and management of inflammatory bowel disease.

	years after the onset of left-sided colitis		

[1]*The Bethesda criteria can be found in the "Can colorectal cancer be prevented?" section*

Colorectal cancer screening – insurance coverage

The American Cancer Society believes that all people should have access to cancer screenings, without regard to health insurance coverage. Limitations on covered benefits should not block your ability to benefit from early detection of cancer. To that end, the Society supports policies that give all people access to and coverage of early detection screening for cancer. Such policies should be age - and risk-appropriate and based on current scientific evidence as outlined in the American Cancer Society's early detection guidelines.

Federal law

Coverage of colorectal cancer screening tests is required by the Affordable Care Act (ACA), but the ACA doesn't apply to health plans that were in place before it was passed (so-called "grandfathered plans"). You can find out your insurance plan's grandfathered status by contacting your health insurance company or your employer's human resources department. If your plan started on or after September 23, 2010, it's required to cover colonoscopies and other colorectal cancer screening tests. If a plan started before September 23, 2010, it may still have coverage requirements from state laws, which vary, and other federal laws.

Coverage by private health insurance

The Affordable Care Act requires coverage of colorectal cancer screening tests by health plans that started on or after September 23, 2010 (see "Federal law" section). Although many private insurance plans cover the costs for colonoscopy as a screening test, patients may be charged for some services. You may have to pay part of the costs of anesthesia, bowel prep kit, pathology costs, and a facility fee (where the procedure is performed). Patients should review their health insurance plan for specific details including if the doctor is within their insurance company's list of "in-network" providers. If the doctor is not considered in the plan's network, the patient may face significantly higher cost-sharing.

Colonoscopies that are done to evaluate specific problems, such as intestinal bleeding or anemia, are usually classified as *diagnostic* – and not screening – procedures. If that's the case, you may have to pay any required deductible and copay. The same is true if the colonoscopy was done

after a positive stool test (such as the FOBT or FIT) or an abnormal barium enema or colonography. Some insurance plans also consider a colonoscopy diagnostic if something is found (like a polyp) during the procedure that needs to be removed or biopsied.

Before you get a screening colonoscopy, ask your insurance company how much you should expect to pay for the exam. Find out if this amount could change based on findings during the procedure. This can help you avoid surprise costs. If you're hit with large bills afterward, you may be able to appeal the insurance company's decision. See *Health Insurance and Financial Assistance for the Patient with Cancer* for more information on this process.

Medicare coverage for colorectal cancer screening

Medicare covers an initial preventive physical exam for all new Medicare beneficiaries that must occur within one year of enrolling in Medicare. The "Welcome to Medicare" physical includes referrals for preventive services already covered under Medicare, including colon cancer screening tests.

If you've had Medicare Part B for longer than 12 months, a yearly "wellness" visit is covered without any cost. This visit is help to develop or update a personalized prevention help plan to prevent disease and disability. Your provider should discuss with you a screening schedule (like a checklist) for preventive services you should have, including colon cancer screening.

What colorectal cancer screening tests does Medicare cover?

Fecal occult blood test (FOBT) or **fecal immunochemical test** (FIT) every year for all Medicare beneficiaries 50 years and older.

Stool DNA test (Cologuard): Every 3 years for Medicare beneficiaries 50 to 85 years old who do not have symptoms of colorectal cancer and who do not have an increased risk of colorectal cancer.

Flexible sigmoidoscopy: Every 4 years for those 50 years and older, but not within 10 years of a previous colonoscopy.

Colonoscopy

- Every 2 years for those at high risk (regardless of age)
- Every 10 years for those who are at average risk
- 4 years after a flexible sigmoidoscopy

Double-contrast barium enema as an alternative if a doctor determines that its screening value is equal to or better than flexible sigmoidoscopy or colonoscopy:

- Once every 2 years for those at high risk and are 50 years and older
- Once every 4 years for those 50 years and older who are at average risk

At this time, Medicare does not cover the cost of virtual colonoscopy. If you have questions about your costs, including deductibles or co-pays, it is best to speak with your insurance company.

What would a Medicare beneficiary expect to pay for a colorectal cancer screening test?

- **FOBT/FIT:** Covered at no cost* for those age 50 years or older (no co-insurance or Part B deductible).
- **Stool DNA test (Cologuard):** Covered at no cost* for those age 50 to 85 as long as they are not at increased risk of colorectal cancer and don't have symptoms of colorectal cancer (no co-insurance or Part B deductible).
- **Flexible sigmoidoscopy:** Covered at no cost* for those age 50 or older (no co-insurance, co-payment, or Part B deductible) when the test is done for screening. If the test results in the biopsy or removal of a growth, it is no longer a "screening" test, and you will be charged co-insurance and/or a co-pay (although your deductible is waived).
- **Colonoscopy:** Covered at no cost* at any age (no co-insurance, co-payment, or Part B deductible) when the test is done for screening. If the test results in the biopsy or removal of a growth it is no longer a "screening" test, and you will be charged co-insurance and/or a co-pay (although you still don't have to pay the deductible).
- **Double-contrast barium enema:** Beneficiary pays 20% of the Medicare approved amount for the doctor services. If the test is done in an outpatient hospital department or ambulatory surgical center, the beneficiary also pays the hospital co-payment.

If you're getting a screening colonoscopy, be sure to find out how much you will have to pay for the exam. This can help you avoid surprise costs. Patients may still have to pay for the bowel or colon prep kit, anesthesia or sedation, pathology costs, and facility fee. Patients may receive one or more bills for different elements of the procedure from different practices and hospital providers. Tests including colonoscopy are not classified by Medicare as screening procedures if they are done to evaluate specific problems, such as belly (abdominal) pain, intestinal bleeding, or low red blood cell counts (anemia). If you are having a test for that reason, you may have to pay the usual deductible and copay.

**This service is covered at no cost as long as the doctor accepts assignment (the amount Medicare pays as the full payment). Doctors that do not accept assignment are required to tell you up front.*

Medicaid coverage for colorectal cancer screening

States are authorized to cover colorectal screening under their Medicaid programs. Unlike Medicare, however, there is no federal assurance that all state Medicaid programs must cover colorectal cancer screening in people without symptoms. Medicaid coverage for colorectal cancer screening varies by state. Some states cover fecal occult blood testing (FOBT), others cover colorectal cancer screening if a doctor determines the test to be medically necessary, and in some states, coverage varies according to which Medicaid managed care plan a person is enrolled in.

Additional resources

More information from your American Cancer Society

The following related information may also be helpful to you. These materials may be viewed on our website or ordered from our toll-free number, 1-800-227-2345.

Colorectal Cancer Overview (also available in Spanish)

Colorectal Cancer (also available in Spanish)

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order

National organizations and websites*

In addition to the American Cancer Society, other sources of patient information and support include:

American College of Gastroenterology
Website: www.acg.gi.org

American Gastroenterological Association
Website: www.gastro.org

American Society of Colon and Rectal Surgeons
Website: www.fascrs.org

C3: Colorectal Cancer Coalition
Toll-free number: 1-877-427-2111 (1-877-4CRC-111)
Website: www.fightcolorectalcancer.org

Centers for Medicare & Medicaid Services
Toll-free number: 1-800-633-4227 (1-800-MEDICARE)
Website: www.cms.hhs.gov

Colon Cancer Alliance
Toll-free number: 1-877-422-2030
Website: www.ccalliance.org

National Cancer Institute
Toll-free number: 1-800-422-6237 (1-800-4-CANCER); TYY: 1-800-332-8615
Website: www.cancer.gov

National Colorectal Cancer Research Alliance
Website: www.eifoundation.org/programs/eifs-national-colorectal-cancer-research-alliance

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at **1-800-227-2345** or visit www.cancer.org.

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Last Medical Review: 10/15/2014
Last Revised: 2/5/2015

For additional assistance please contact your American Cancer Society
1-800-227-2345 or www.cancer.org