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**Patient information: Screening for colon cancer**

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**INTRODUCTION** — Colorectal cancer (cancer of the large portion of the bowel [colon] or rectum) is a common, lethal, and preventable disease. Approximately one-third of people who develop it die of the disease, making it the second leading cause of cancer death. However, screening tests now make it possible to detect existing cancers at an early, treatable stage and even to prevent the development of colorectal cancer.

In contrast to some other cancers, such as prostate cancer, there is general agreement by experts that all adults undergo screening beginning at age 50, or even earlier for people who are at high risk for colorectal cancer. Several different tests are currently available and several new tests are being developed; all of these have advantages and disadvantages. The optimal screening test depends on each person's preferences. It is important to review each test's effectiveness, safety, convenience, and cost with your doctor. By working with your doctor, you can design the screening plan that is best for you.

**WHY IS SCREENING EFFECTIVE?** — Most colorectal cancers develop gradually over many years. They begin as small, benign tumors called adenomatous polyps. These polyps grow, develop precancerous changes, eventually become cancerous, and later spread and become incurable. This progression takes at least 10 years in most people.

The screening tests described below all work by detecting cancers at the polyp stage before they become cancerous, or by detecting cancers themselves while they are still curable. Regular screening for and removal of polyps can reduce a person's risk of developing colorectal cancer by up to 90 percent. In addition, early detection of cancers that are already present in the colon often allows for successful treatment.
WHO IS AT INCREASED RISK FOR COLORECTAL CANCER? — Several factors increase an individual’s risk of developing colorectal cancer. The presence of these factors will determine the age at which screening should begin, the frequency of screening, and the screening tests that are most appropriate.

**Family history of colorectal cancer** — The occurrence of colorectal cancer in a family member increases the risk of getting the cancer, especially if it is a first degree relative (a parent, brother or sister, or child), several family members are affected, or if the cancers have occurred at an early age (eg, before age 55 years).

**Familial adenomatous polyposis** — Familial adenomatous polyposis (FAP) is an inherited condition associated with an increased risk of colorectal cancer. Almost 100 percent of people with this condition will experience colorectal cancer during their lifetime, and most of these cancers occur before the age of 50 years. This condition is recognized by the occurrence of hundreds of polyps throughout the colon.

**Hereditary nonpolyposis colon cancer** — Hereditary nonpolyposis colon cancer (HNPCC) is another inherited condition associated with an increased risk of colorectal cancer. About 70 percent of people with HNPCC will experience colorectal cancer by the age of 65. Cancer also tends to occur at younger ages and in the part of the colon on the right side of the body (the ascending colon). This condition is recognized by the presence of a very strong family history: several family members from different generations affected, some of whom develop the cancer relatively early in life.

**Prior colorectal cancer or polyps** — People who have previously had colorectal cancer have an increased risk of developing a new colorectal cancer. People who have had adenomatous polyps before the age of 60 years are also at increased risk for colorectal cancer.

**Inflammatory bowel disease** — The risk of colorectal cancer is increased in people with either Crohn’s disease of the colon or ulcerative colitis. The risk increases as the amount of inflamed colon increases and as the duration of disease increases; pancolitis (inflammation of the entire colon) and colitis of 10 years’ duration or longer are associated with the greatest risk for colorectal cancer. Risk is not increased in irritable bowel disease.

**Other risk factors** — Other factors affect risk, but not so much as to change the approach to screening. Modifying the ones that can be changed can reduce your chances of getting colorectal cancer.

**Increasing age** — Although the average person has a 5 percent lifetime risk of developing colorectal cancer, 90 percent of these cancers occur in people older than 50 years of age.

**Race** — Black Americans have a higher risk of dying from colorectal cancer than white Americans. This risk is also high in native Alaskans and low in American Indians.

**Lifestyle factors** — Several lifestyle factors have been linked to the risk of colorectal cancer. Factors that appear to increase risk include:
• A diet high in fat and red meat and low in fiber
• A sedentary lifestyle
• Cigarette smoking

Factors that appear to decrease risk include:

• **Folic acid** supplements
• **Calcium supplements**
• **Aspirin, ibuprofen**, and related drugs (the evidence for these is not yet strong enough to recommend taking them for this purpose)

**SCREENING TESTS** — Four tests are currently available for colorectal cancer screening: the fecal occult blood test, sigmoidoscopy, barium enema, and colonoscopy. Some emerging tests may be used in the future.

**Fecal occult blood test** — Colorectal cancers (and, more rarely, polyps) often bleed, releasing microscopic amounts of blood into the stool. The blood is frequently not visible to the naked eye, requiring specialized tests for detection. The fecal occult blood test can be used to detect blood in the stool.

**Procedure** — This simple test is performed by putting small amounts of stool on chemically coated cards. Usually two samples from three consecutive stools are applied to the cards at home and returned to your doctor. The sample on the card is then treated with a clear solution that turns blue when blood is present.

Some simple dietary restrictions for two days prior to testing can improve the accuracy of the test. These include:

• Eliminate red meat, turnips, and horseradishes
• Avoid drugs that may irritate the stomach lining (such as aspirin, ibuprofen-like drugs)
• Do not take **vitamin C**
• Eat high-fiber foods

**Effectiveness** — The fecal occult blood test, when performed once every year, may reduce the risk of dying from colorectal cancer by up to one-third [1].

**Risks and disadvantages** — Because polyps seldom bleed, the fecal occult blood test is less likely to detect polyps than other screening tests (see below). In addition, only 2 to 5 percent of people with a positive test actually have colorectal cancer; thus, for every patient with cancer, 50 patients are unnecessarily distressed and undergo tests that eventually reveal no cancer. Following the procedures discussed above will reduce the chance of a false-positive test.
**Additional testing** — If a fecal occult blood test has a positive result, your doctor will recommend that the entire colon be examined, usually with colonoscopy.

**Sigmoidoscopy** — Sigmoidoscopy allows direct viewing of the lining of the rectum and the lower part of the colon (the descending colon). This area accounts for about one-half of the total area of the rectum and colon.

**Procedure** — During sigmoidoscopy, a thin, lighted tube is advanced along the rectum and the left-sided colon to check for polyps and cancer. Biopsies (small samples of tissue) can be removed during sigmoidoscopy. Preparation for sigmoidoscopy entails using an enema a few hours before the procedure. Sigmoidoscopy may be performed in a doctor's office; because this procedure produces only mild cramping, most people undergoing the procedure do not need sedative drugs and are able to return to work or other activities the same day.

**Effectiveness** — Physicians who perform sigmoidoscopy can identify polyps and cancers in the descending colon and rectum with a high degree of accuracy. Studies suggest that sigmoidoscopy, performed as infrequently as every five to ten years, reduces death from cancers in the upper half of the colon and rectum by 66 percent [2].

**Risks and disadvantages** — The risks of sigmoidoscopy are low. The procedure can create a small tear in the intestinal wall in about 2 per every 10,000 people; death from this complication is rare. A major disadvantage of sigmoidoscopy is that it cannot detect polyps or cancers located in the right side of the colon.

**Additional testing** — Certain changes in the left-sided colon increase the likelihood of polyps or cancer in the remaining part of the colon. Thus, if sigmoidoscopy reveals suspicious findings in the left-sided colon, such as many small polyps or polyps with certain microscopic features, your doctor may recommend colonoscopy to view the entire length of the colon.

**Combination of fecal occult blood test and sigmoidoscopy** — Combined screening with a fecal occult blood test and sigmoidoscopy is a common practice and may be more effective than screening with either test alone [3].

**Barium enema test** — A barium enema test provides a detailed x-ray picture of the rectum and the entire colon. Doctors usually recommend a specific type of test called a double-contrast barium enema.

**Procedure** — During a barium enema test, liquid barium is used to coat the inside of the colon. The barium outlines the profile of the colon on x-rays and can reveal structural abnormalities such as polyps and cancers. Preparation for a barium enema entails cleansing the colon with a saline laxative. People may experience mild cramping during the procedure, but sedative drugs are usually not necessary, and most people can return to work or other activities on the same day.

**Effectiveness** — The barium enema test detects about one-half of large polyps and about 40 percent of all polyps in the colon and rectum [4]. Most experts suspect that the screening barium enema helps reduce the risk of dying from colorectal cancer, but this has not been definitively proven.
Risks and disadvantages — The barium enema test is relatively safe when compared with other screening tests for colorectal cancer.

Additional testing — If a barium enema test reveals an abnormality, your doctor may recommend colonoscopy or other tests.

Colonoscopy — Colonoscopy allows direct viewing of the lining of the rectum and the entire colon.

Procedure — During colonoscopy, a thin, lighted tube is used to directly view the lining of the rectum and the entire colon. This test can therefore detect polyps and cancers that are beyond the reach of the sigmoidoscope. Preparation for colonoscopy entails cleansing the colon with a saline laxative before the procedure. People are usually given a mild sedative drug during the procedure.

Effectiveness — Colonoscopy detects most small polyps and almost all large polyps and cancers \(^5\). Polyps and some cancers can be removed during this procedure.

Risks and disadvantages — The risks of colonoscopy are greater than those of other screening tests. Colonoscopy leads to serious bleeding or a tear of the intestinal wall in about 1 in 1,000 people. Because the procedure requires sedation, most people must be accompanied home after the procedure and are unable to return to work or other activities on the same day.

New tests — Several new screening tests for colorectal cancer are currently being developed and evaluated. These tests include improved fecal occult blood tests, fecal tests for genetic abnormalities linked to colorectal cancer, and a type of computed tomography (CT) scan called a virtual colonoscopy. These tests are still being studied, and their value is not yet well enough defined to be used for routine screening.

SCREENING PLANS — Different screening plans are recommended for people with an average risk of colorectal cancer and people with an increased risk of colorectal cancer.

Screening plans for people with an average risk of colorectal cancer — Doctors usually recommend that people with an average risk of colorectal cancer begin screening at age 50. No single screening test has been identified as the best test. You should discuss the available options with your doctor and design a screening plan that is best for you. The most important thing is that you follow through with the screening plan.

Some doctors recommend a fecal occult blood test once every year and a sigmoidoscopy once every 5 years; they may also recommend a combination of these screening tests. Other doctors recommend a barium enema test once every 5 years or colonoscopy once every 10 years.

If any of these screening tests has a positive result, your doctor will probably recommend more frequent examinations with colonoscopy; this is referred to as surveillance.
Screening plans for people with an increased risk of colorectal cancer — When compared to screening programs for people with an average risk, programs for people with an increased risk may entail screening at a younger age, more frequent screening, and the use of more sensitive screening tests (like colonoscopy). For people who have an increased risk of colorectal cancer, the optimal screening plan depends upon the cause of increased risk.

Family history of colorectal cancer — People who have a first degree relative (a parent, brother, sister, or child) who has experienced colorectal cancer or polyps at a young age (before the age of 60 years) should begin screening earlier, typically at age 40, or 10 years younger than the earliest diagnosis in their family, whichever comes first. People with a second-degree relative (grandparent, aunt, or uncle) or third-degree relative (great-grandparent or cousin) with colorectal cancer should be screened as average risk persons.

Familial adenomatous polyposis — People with a family history of FAP should consider genetic counseling and genetic testing to determine if they carry the affected gene. People who carry the gene or who do not know if they carry the gene should begin screening with sigmoidoscopy once every year, beginning at puberty. When this screening reveals many polyps, a person should begin to plan colectomy (surgical removal of the colon) with their doctor; this surgery is the only certain way to prevent colorectal cancer in people with FAP.

Hereditary nonpolyposis colon cancer — People with a family history of HNPCC should consider genetic counseling and genetic testing to determine if they carry the affected gene. People who carry the gene or who do not know if they carry the gene should be screened with colonoscopy or barium enema because HNPCC is associated with cancers of the right-sided colon. This screening should be scheduled once every one to two years between the ages of 20 and 30, and once every year after the age of 40. Because polyps can progress more rapidly to cancer in people with HNPCC, more frequent screening may also be recommended.

Inflammatory bowel disease — In people with Crohn’s disease of the colon or with ulcerative colitis, the optimal screening plan will depend on the amount of colon inflamed by the disease and the duration of the disease. Screening usually entails colonoscopy once every 1 to 2 years beginning after 8 years of disease in people with pancolitis (inflammation of the entire colon) or after 15 years in people with colitis only of the left-sided colon.

WHERE TO GET MORE INFORMATION — Your doctor is the best resource for finding out important information related to your particular case. Because every patient is different, it is important that your situation is evaluated by someone who knows you as a whole person.

This discussion will be updated as needed every four months on our web site (www.uptodate.com). Additional topics as well as selected discussions written for health care professionals are also available for those who would like more detailed information.

A number of other sites on the internet have information about issues related to screening for colon cancer. Information provided by the National Institutes of Health, national medical societies, and some other well-established organizations are often
reliable sources of information, although the frequency with which their information is updated is variable.

- The National Library of Medicine
  (http://www.nlm.nih.gov/medlineplus)
- National Cancer Institute
  (http://cancernet.nci.nih.gov/)
- The American Gastroenterological Association
  (http://www.gastro.org/)
- The American College of Gastroenterology
  (http://www.acg.gi.org/)
- American Cancer Society
  (http://www.cancer.org/)

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REFERENCES


BACKGROUND. Although tests for occult blood in the feces are widely used to screen for colorectal cancers, there is no conclusive evidence that they reduce mortality from this cause. We evaluated a fecal occult-blood test in a randomized trial and documented its effectiveness. METHODS. We randomly assigned 46,551 participants 50 to 80 years of age to screening for colorectal cancer once a year, to screening every two years, or to a control group. Participants who were screened submitted six guaiac-impregnated paper slides with two smears from each of three consecutive stools. About 83 percent of the slides were rehydrated. Participants who tested positive underwent a diagnostic evaluation that included colonoscopy. Vital status was ascertained for all study participants during 13 years of follow-up. A committee determined causes of death. A single pathologist determined the stage of each tissue specimen. Differences in mortality from colorectal cancer, the primary study end point, were monitored with the sequential log-rank statistic. RESULTS. The 13-year
cumulative mortality per 1000 from colorectal cancer was 5.88 in the annually screened group (95 percent confidence interval, 4.61 to 7.15), 8.33 in the biennially screened group (95 percent confidence interval, 6.82 to 9.84), and 8.83 in the control group (95 percent confidence interval, 7.26 to 10.40). The rate in the annually screened group, but not in the biennially screened group, was significantly lower than that in the control group. Reduced mortality in the annually screened group was accompanied by improved survival in those with colorectal cancer and a shift to detection at an earlier stage of cancer. CONCLUSIONS. Annual fecal occult-blood testing with rehydration of the samples decreased the 13-year cumulative mortality from colorectal cancer by 33 percent.

PMID- 8474513
TI - A case-control study of screening sigmoidoscopy and mortality from colorectal cancer.
AU - Selby JV; Friedman GD; Quesenberry CP Jr; Weiss NS

BACKGROUND. The efficacy of sigmoidoscopic screening in reducing mortality from colorectal cancer remains uncertain. A randomized trial would be ideal for clarifying this issue but is very difficult to conduct. Case-control studies provide an alternative method of estimating the efficacy of screening sigmoidoscopy.
METHODS. Using data on the 261 members of the Kaiser Permanente Medical Care Program who died of cancer of the rectum or distal colon from 1971 to 1988, we examined the use of screening by rigid sigmoidoscopy during the 10 years before the diagnosis and compared it with the use of screening in 868 control subjects matched with the case subjects for age and sex. RESULTS. Only 8.8 percent of the case subjects had undergone screening by sigmoidoscopy, as compared with 24.2 percent of the controls (matched odds ratio, 0.30; 95 percent confidence interval, 0.19 to 0.48). Adjustment for potential confounding factors increased the odds ratio to 0.41 (95 percent confidence interval, 0.25 to 0.69). The negative association was as strong when the most recent sigmoidoscopy was 9 to 10 years before diagnosis as it was when examinations were more recent. By contrast, for 268 subjects with fatal colon cancer above the reach of the sigmoidoscope and for 268 controls, the adjusted odds ratio was 0.96 (95 percent confidence interval, 0.61 to 1.50). The specificity of the negative association for cancer within the reach of the sigmoidoscope is consistent with a true efficacy of screening rather than a confounding by unmeasured selection factors. CONCLUSIONS. Screening by sigmoidoscopy can reduce mortality from cancer of the rectum and distal colon. A screening once every 10 years may be nearly as efficacious as more frequent screening.

PMID- 1736103

TI - Screening for colorectal cancer with fecal occult blood testing and sigmoidoscopy.
AU - Winawer SJ; Flehinger BJ; Schottenfeld D; Miller DG
BACKGROUND: The high incidence of and mortality from colorectal cancer (160,000 new cases and 60,000 deaths in the United States each year) are compelling public health concerns. Following the evolution of effective surgery for this disease since the 1960s, the focus has been on improving methods of detection and integrating them into effective screening programs. PURPOSE: This was the first study to evaluate the effectiveness, in a setting of comprehensive medical examinations, of using the fecal occult blood test in conjunction with sigmoidoscopy, rather than sigmoidoscopy alone, to screen for colorectal cancer. Our end points were extent of compliance with fecal occult blood test and sigmoidoscopy, numbers of cancers detected, and mortality rate. METHODS: From 1975 through 1979, a total of 21,756 patients (aged 40 and older) who presented at the Preventive Medicine Institute–Strang Clinic for routine medical examinations were enrolled by calendar period into study and control groups. Study patients were offered annually both rigid sigmoidoscopy examinations and fecal occult blood tests requiring two stool specimens per day for 3 days, while control patients were offered only annual sigmoidoscopy. The majority of fecal occult blood test cards were not rehydrated before assay. Patients with positive tests were referred for double-contrast barium enema and colonoscopy. Two distinct trials were carried out. Trial I was primarily a demonstration of feasibility of using the fecal occult blood test as a supplemental screening method. Of the 9277 participants, 7168 (77%) were assigned to the study group and offered the fecal occult blood test. In trial II, approximately half of the 12,479 patients were assigned to each group. Patients in both trials had follow-up through 1984. RESULTS: Compliance with the fecal occult blood test was initially high in both trials, but diminished such that only 56% of study patients in trial I and 20% of those in trial II returned for second tests. On the initial (prevalence) screen, a substantial number of early-stage cancers were detected by the fecal occult blood test, primarily in trial II. In trial II, survival probability was significantly greater (P < .001) in the study group than in the controls (70% versus 48%), and colorectal cancer mortality was lower (0.36 versus 0.63) with borderline significance (P = .053, one-sided). CONCLUSIONS AND IMPLICATIONS: The screening of average-risk individuals (aged 50 and older) for colorectal cancer through use of the fecal occult blood test in conjunction with sigmoidoscopy can increase the likelihood of early detection of this disease. This practice, coupled with prompt diagnostic work-up following positive tests, will result in treatment of earlier stage cancers and increased survival after treatment.

PMID- 8340943


BACKGROUND: After patients have undergone colonoscopic polypectomy, it is uncertain whether colonoscopic examination or a barium enema is the better method of surveillance. METHODS: As part of the National Polyp Study, we offered colonoscopic examination and double-contrast barium enema for surveillance to
patients with newly diagnosed adenomatous polyps. Although barium enema was performed first, the endoscopist did not know the results. RESULTS: A total of 973 patients underwent one or more colonoscopic examinations for surveillance. In the case of 580 of these patients, we performed 862 paired colonoscopic examinations and barium-enema examinations that met the requirements of the protocol. The findings on barium enema were positive in 222 (26 percent) of the paired examinations, including 139 of the 392 colonoscopic examinations in which one or more polyps were detected (rate of detection, 35 percent; 95 percent confidence interval, 31 to 40 percent). The proportion of examinations in which adenomatous polyps were detected by barium enema colonoscopy was significantly related to the size of the adenomas (P=0.009); the rate was 32 percent for colonoscopic examinations in which the largest adenomas detected were 0.5 cm or less, 53 percent for those in which the largest adenomas detected were 0.6 to 1.0 cm, and 48 percent for those in which the largest adenomas detected exceeded 1.0 cm. Among the 139 paired examinations with positive results on barium enema and negative results on colonoscopic examination in the same location, 19 additional polyps, 12 of which were adenomas, were detected on colonoscopic reexamination. CONCLUSIONS: In patients who have undergone colonoscopic polypectomy, colonoscopic examination is a more effective method of surveillance than double-contrast barium enema.

PMID- 10852998


BACKGROUND & AIMS: The miss rate of colonoscopy for neoplasms is poorly understood. The aim of this study was to determine the miss rate of colonoscopy by same day back-to-back colonoscopies. METHODS: Two consecutive same day colonoscopies were performed in 183 patients. The patients were randomized to undergo the second colonoscopy by the same or a different endoscopist and in the same or different position. RESULTS: The overall miss rate for adenomas was 24%, 27% for adenomas < or = 5 mm, 13% for adenomas 6-9 mm, and 6% for adenomas > or = 1 cm. Patients with two or more adenomas at the first examination were more likely than patients with no or one adenoma detected at the first examination to have one or more adenomas at the second examination (odds ratio, 3.3; 95% confidence interval, 1.69-6.46). Right colon adenomas were missed more often (27%) than left colon adenomas (21%), but the difference was not significant. There was evidence of variation in sensitivity between endoscopists, but significant miss rates for small adenomas were found among essentially all endoscopists. CONCLUSIONS: Using current colonoscopic technology, there are significant miss rates for adenomas < 1 cm even with meticulous colonoscopy. Miss rates are low for adenomas > or = 1 cm. The results suggest the need for improvements in colonoscopic technology.

PMID- 8978338
THE SIGNIFICANCE OF POLYPS — The presence of polyps in the colon raises many questions for patients. What is the significance of finding a polyp? Does this mean that I have, or will develop, colon cancer? Will finding a polyp require colon surgery?

Some types of polyps (the ones known as "adenomas") have the potential to turn into colon cancer while others (such as "hyperplastic" or "inflammatory" polyps) have virtually no chance to develop into a cancer. You should not worry if polyps are found on your examination since:

- Polyps are common (they occur in 30-50 percent of adults)
- Not all polyps will become cancers.
- It takes many years for a polyp to turn into a cancer.
- Polyps can be completely and safely removed.

It is very important that you follow-up with your doctor, since the best course of action for you depends on the type, size, and location of the polyps and the way in which they were removed. Most people who have had adenomas removed will require repeated examinations in the future to be sure that all the adenomas have been found and to remove new adenomas if they have developed.

WHAT CAUSES POLYPS? — Polyps are very common in men and women of all races who live in industrialized countries, which suggests that dietary and environmental factors are important in their development. Although the exact dietary and environmental factors are not completely understood, some of the known risk factors appear to be:

- A high fat diet
• A diet high in red meat
• A low fiber diet
• Cigarette smoking
• Increasing age

On the other hand, aspirin and other NSAIDs, folic acid, and calcium intake appear to protect against colon cancer.

Colorectal cancer is uncommon before age 40. Ninety percent of cases occur after age 50, with men and women being equally affected; therefore, screening for polyps usually begins at 50 for both sexes. It takes approximately 10 years in the average person for a small polyp to grow and become a cancerous polyp.

Polyps and colon cancer tend to run in families, which suggests that genetic factors are also important in their development. Intensive research on the genetic basis of colon cancer is ongoing. It is very important that you tell your doctor if there is a history of colon polyps, colon cancer, or other forms of cancer in your family, particularly if cancers developed at an early age or multiple, different types of cancers developed. You may also be at increased risk if your close relatives have been diagnosed with colon polyps, colon cancer, or other forms of cancer. As a general rule, screening for colon cancer begins at an earlier age in people with a family history of cancer or polyps. These issues should be discussed with your doctor.

Rare genetic diseases associated with multiple colon polyps and early colon cancer (called "familial adenomatous polyposis") have been identified. A number of other genetic mutations have been found that are associated with an increased risk of developing polyps and colon cancer. Most common is Hereditary Non-Polyposis Colon Cancer (HNPCC), which also results in a high risk of colon cancer, often beginning in the 20s and 30s, but without an unusual number of polyps. Testing for these genes may have a role in families with unusual rates of colorectal cancer, but not in the general population.

**HOW ARE POLYPS FOUND?** — Polyps are usually found on flexible sigmoidoscopy or colonoscopy examinations—either screening examinations or part of a diagnostic evaluation of a positive stool blood test. They can also be detected on a barium enema x-ray, although small polyps are less often seen on x-ray and they cannot be removed with x-ray. Colonoscopy is the most effective examination because it gives direct visualization of the entire colon and allows the doctor to remove polyps for laboratory analysis.

**WHAT DO POLYPS LOOK LIKE?** — During colonoscopy, your doctor inserts a very thin flexible tube with a light source and small camera into the large intestine (colon) and examines the lining of the colon. The inside of the colon is a tube-like structure with a flat surface with curved folds. A polyp appears like a lump that protrudes into the inside of the colon. The tissue covering a polyp may look the same as normal colon tissue, or, there may be tissue changes ranging from subtle color changes to ulceration and bleeding. Some polyps have a flat base (called "sessile") and others extend out on a stalk ("pedunculated").
WHY REMOVE POLYPS? — Colorectal cancer is the second leading cause of cancer deaths in the United States, accounting for 14 percent of cancer deaths. Colorectal cancer is preventable if precancerous polyps (ie, adenomas) are detected and removed before they become malignant. Over time, some small polyps can change their tissue structure and grow in size to become cancerous polyps. Polyps are removed when they are found on colonoscopy to eliminate the potential for them to become malignant.

DO POLYPS CAUSE SYMPTOMS? — Polyps usually do not produce symptoms. They are most commonly detected during routine screening examinations (such as flexible sigmoidoscopy or colonoscopy). Uncommonly, polyps can cause visible blood in the stool if they ulcerate and bleed. Rarely, very large polyps can cause a blockage in the colon that will cause abdominal pain.

TYPES OF POLYPS — The two most common types of polyps found during colonoscopy are hyperplastic or adenomatous.

Other types of polyps can also be found in the colon, but are far less common and will not be discussed here.

Hyperplastic — Hyperplastic polyps are usually small, located in the end-portion of the colon (the rectum and sigmoid colon), have no potential to become malignant, and are of no clinical significance. Because they can not always be distinguished by their appearance from other types of polyps, they are often removed or biopsied for tissue analysis.

Adenomatous — Two-thirds of colon polyps are adenomas (hence the polyp is termed "adenomatous"). Most of these polyps do not develop into cancer but they do have the potential to become malignant. Adenomas are classified by their size, general appearance, and their specific features as seen under the microscope. As a general rule, the larger the adenoma, the more likely it is to eventually become a cancer. In addition, large adenomas may already have cancer contained within them. As a result, your doctor will usually try to biopsy (obtain a sample) or remove the polyp so that it can be examined under the microscope.

HOW ARE POLYPS REMOVED? — The medical term for removing polyps is "polypectomy." Most polypectomies can be accomplished through a colonoscope. Small polyps can be removed by an instrument called a biopsy forceps, which is inserted through the colonoscope and can be used to snip off small pieces of tissue. Larger polyps are usually removed by putting a noose, or snare, around the polyp base and burning through the tissue with electric cautery. Neither of these procedures is painful, and you will usually not be aware that they are being done. Rarely will a polyp be too large to remove by colonoscopy and require surgery for removal.

Polypectomy is very safe, but all procedures entail some risks, which you should discuss with your doctor. The most common complications of polypectomy include bleeding and perforation (creating a hole in the colon). Fortunately, although these are the most common complications of polypectomy, they are still infrequent. Bleeding can usually be controlled by colonoscopy, during which the bleeding site is cauterized, although surgery is sometimes required. Surgery is usually required for
perforation. Other complications have been described but occur much less frequently.

You should follow your doctor's instructions carefully following polypectomy by not taking drugs known to promote bleeding (such as aspirin, Advil™, and other pain relievers, which are blood thinning medications). In addition, you should follow your doctor's instructions about finding out the results of the tissue analysis of your polyps and when a repeat examination should be performed.

**CAN POLYPS COME BACK?** — A person who has had an adenomatous polyp removed is at increased risk for developing more polyps, which will also most likely be adenomatous. There is a 25 to 30 percent chance that adenomas will be present on a repeat colonoscopy done three years after initial polypectomy. Some of these polyps were probably present on the original examination, but may have been too small to detect while others are new.

After polyps are removed, your doctor will recommend repeat colonoscopies for surveillance. The recommended interval between colonoscopies is usually three to five years, but depends upon several factors:

- Characteristics of the polyps seen under the microscope
- Number and size of the polyps
- How well cleaned out the colon was for the examination. A poorly prepared colon means that small to moderate size polyps could be missed by the examiner and may necessitate earlier reexamination.

**IS THERE ANY WAY I CAN BE SCREENED FOR POLYPS WITHOUT HAVING TO GO THROUGH ANOTHER COLONOSCOPY?** — Colonoscopy will remain the best examination for follow-up with patients who have had polyps removed. Although new technologies are being developed that show promise for detecting polyps (including molecular genetic tests and "virtual colonoscopy" using CT or MRI technology), colonoscopy will remain the most efficient means for the foreseeable future.

**WHAT CAN I DO TO REDUCE THE CHANCE OF GETTING MORE POLYPS OR COLON CANCER?** — The most important thing to do to reduce the likelihood of developing colon cancer is to follow your doctor's instructions regarding future screening examinations. People who undergo screening for colon cancer are much less likely to die from colon cancer.

Intensive research is ongoing to develop ways to prevent polyps and colon cancer with diet or with medications. A number of nutrients and medications have been identified that may reduce the risk of colon cancer. Guidelines issued by one of the major medical societies in the United States (the American College of Gastroenterology) suggest the following to prevent polyps:

- A diet that is low in fat and high in fruits, vegetables, and fiber
- Maintenance of normal body weight
- Avoidance of smoking and excessive alcohol use
Dietary supplementation with 3 g of **calcium carbonate**

Other measures may be effective, such as **aspirin** and other nonsteroidal antinflammatory drugs (NSAIDs), **folic acid** (a vitamin found in most multivitamins), or **selenium** supplementation.

**IMPLICATIONS FOR MY FAMILY** — First-degree relatives (a parent, brother, sister, or child) of a person who has been diagnosed with an adenomatous polyp (or colorectal cancer) at a young age (before the age of 50 years) are at increased risk for adenomatous polyps and colorectal cancer compared to the general population. Thus, it is important that the above family members should be made aware if you have been diagnosed with an adenoma (or colon cancer). While screening for polyps and cancer is recommended for all people at risk (typically beginning at age 50), those at increased risk should begin screening earlier, typically at age 40. Some conditions (such as "hereditary nonpolyposis colorectal cancer" and "familial adenomatous polyposis") are associated with an even higher risk of colonic polyps or cancer in family members, warranting a more aggressive approach to screening family members. You should discuss these issues with your doctor.

**WHERE TO GET MORE INFORMATION** — Your doctor is the best resource for finding out important information related to your particular case. Not all patients with polyps are alike, and it is important that your situation is evaluated by someone who knows you as a whole person.

This discussion will be updated as needed every four months on our web site [www.uptodate.com](http://www.uptodate.com). Additional topics as well as selected discussions written for health care professionals are also available for those who would like more detailed information.

A number of other sites on the internet have information about polyps. Information provided by the National Institutes of Health, national medical societies, and some other well-established organizations are often reliable sources of information, although the frequency with which their information is updated is variable.

- National Library of Medicine
- The American Gastroenterological Association
- The American College of Gastroenterology
- The American Society of Colon and Rectal Surgeon
  ([http://www.fascrs.org/](http://www.fascrs.org/))
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### REFERENCES

