The facts about colorectal cancer

Colorectal cancer is the third most diagnosed cancer type, responsible for 11% of all cancer mortality, with more than 140,000 new cases diagnosed in the United States each year, according to the American Cancer Society. Yet it's easily treated and curable in the early stages. We give you the information you need to know about this type of cancer, including what to teach your patients and how to advocate for screening.

By Pamela Walden, BSN, RN, OCN
Staff Nurse • Bone Marrow Transplant Unit • VA Medical Center • Nashville, Tenn.

The author has disclosed that she has no significant relationships with or financial interest in any commercial companies that pertain to this educational activity.

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Mr. W is a healthy, active man at the peak of his professional life who's looking forward to an equally active retirement. When undergoing a computed tomography (CT) scan for back pain, a large tumor is discovered in his cecum and he's diagnosed with colorectal cancer. As you discuss his treatment plan, Mr. W asks you several questions, including "How's colorectal cancer treated?"

In this article, we'll review colorectal cancer so that you can answer Mr. W's questions with clear and concise information to help him understand this disease and his treatment options. Although anal cancer is a distinct cancer type, we'll also consider it as we explore colorectal cancer. But, first, let's review the anatomy and physiology of the colon and rectum.

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The large intestine, or colon, is about 5 feet in length, as opposed to the approximately 20 feet of the small intestine. It begins at the cecum and continues through the rectum (see *Picturing the large intestine*). The colon consists of the following:

- ascending (right)
- transverse (middle)
- descending (left)
- sigmoid (lower).

The ascending colon begins at the cecum at the point where the small bowel empties into the colon. The transverse colon goes from right to left at the top of the colon circuit. The descending colon goes down the left side from the transverse colon to the sigmoid colon. The sigmoid colon is the S-shaped portion that connects to the rectum.

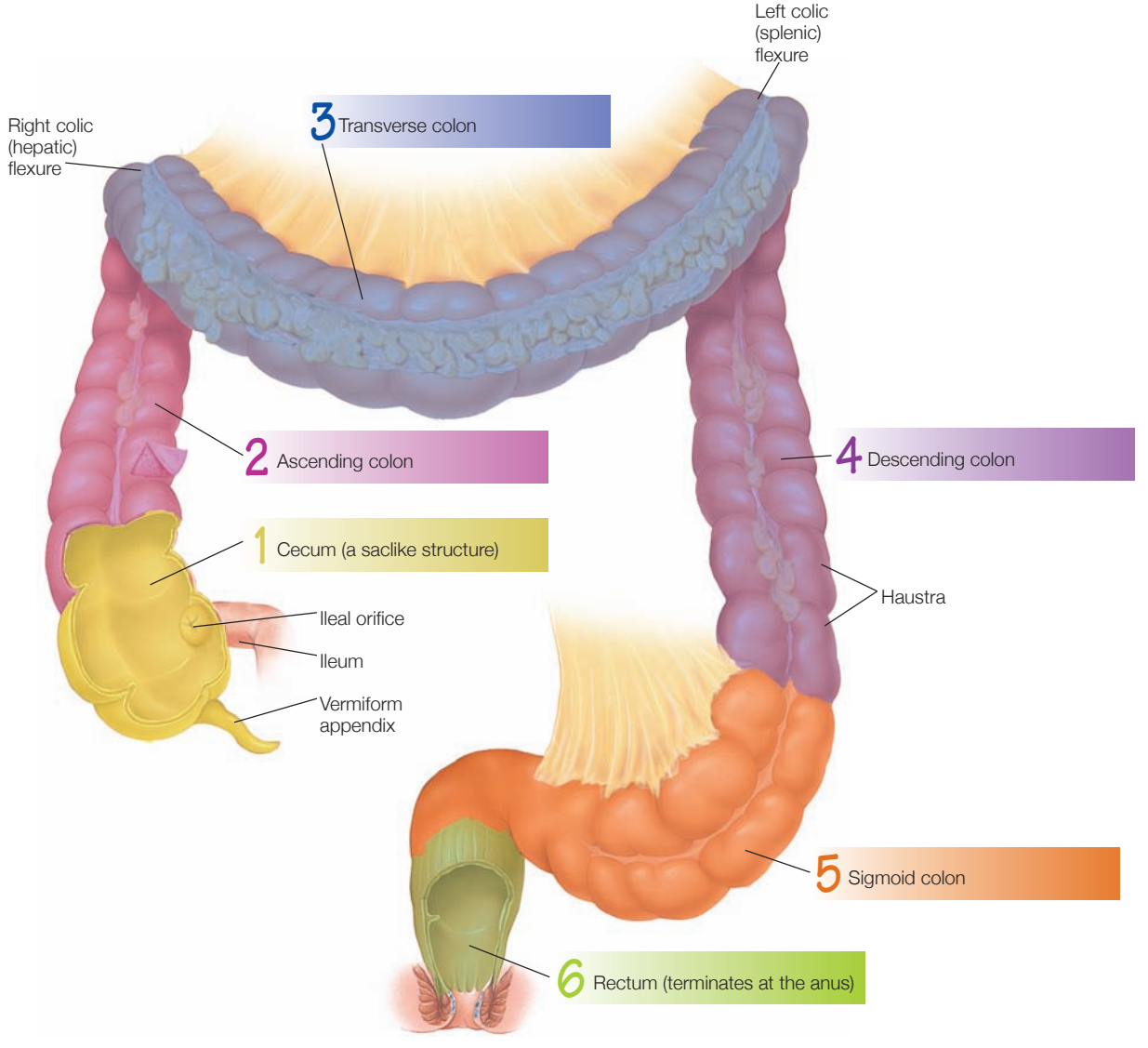
The rectum extends for about 8 inches from the sigmoid colon to the anus, and it contains the transitional zone between keratinized and nonkeratinized stratified squamous cell epithelium. The anus is the opening at the end of the circuit, encompassing the last 4 to 6 cm of the gastrointestinal (GI) tract.

All portions of the GI tract work in harmony to process intake and expel waste. Billions of bacteria line the colon walls and contents to assist in these processes. Let's take a closer look at the functions of the intestinal tract.

The colon in 4-part harmony

Contents of the upper digestive system are moved through the upper GI tract and the small intestine to the colon by a coordinated symphony of movements

Picturing the large intestine



beginning with signals that originate from both the parasympathetic and sympathetic nervous systems. Chyme coming from the stomach stimulates movements that mix enzymes from the liver, pancreas, and intestinal glands. This churning motion brings the luminal contents in contact with the villi of the intestinal lining. Water and mucus are secreted, and mechanical and chemical digestion occur all along the GI tract.

Contents move forward through a rhythmic combination of propulsive movements called segmentation and peristalsis. These movements are both circular and longitudinal in action. Peristalsis continues to move these contents down through the cecum and into the large intestine (colon). The colon processes about 1 L of illeal contents per day. As the liquid contents enter and move through the ascending colon, fluids and electrolytes are removed, concentrating contents that become increasingly more solid until they reach the sigmoid colon. Here the solid contents are pushed into the rectum, where feces are stored until defecation.

The act of defecation is initiated when feces distend the rectal wall. The anal sphincter then relaxes and defecation can occur. The anal sphincter is controlled by conscious effort; a person can initiate or inhibit defecation. Obstruction, large tumors, and nerve damage can compromise normal rectal and anal function.

Presenting the polyp

Colorectal cancer begins with misshapen, clonal cells on the innermost lining of the colon lumen. These cells multiply, moving farther from normal cell shape and function, and they don't respond to signals for normal cell death. As the tumor grows and expands, it erodes the bowel layers. These painless tumors can become very large over time, and as they invade the lymphatic and vascular systems, they metastasize to far-reaching areas of the body. Tumors may present with cells that are well differentiated, moderately differentiated, or poorly differentiated (poorly differentiated tumor cells less resemble a normal cell in shape and function).

About 95% of colorectal cancer cases are caused by an adenomatous polyp—a growth or bump on the epithelial mucosa of the intestinal lining. Polyps can be raised, flat, benign, precancerous, or cancerous. The malignant progression of dysplasia, carcinoma in situ, cancer, and metastasis applies to polyps. By removing polyps early, the progression is interrupted.

The incidence of colorectal cancer varies by anatomic location (see *Types of colorectal cancer*):

- cecum, 8%
- ascending colon, 6%
- transverse colon, 11%
- descending colon, 5%
- sigmoid colon and rectum, 70% (this means that about 70% of colorectal cancers can be detected by scope).

Will the risk factors please stand up?

Risk factors that increase the likelihood of colorectal cancer in a particular patient include:

- ***age.*** Most cases of colorectal cancer are diagnosed between ages 60 and 79; the incidence is 50 times higher in people over age 60 than in younger people with similar risk factors.

• ***history.*** A history of adenomatous polyps of the colon or a history of breast, ovarian, or uterine cancer increases a person's risk of colorectal cancer.
• ***heredity.*** A person's risk increases two- to threefold if he or she has a first-degree relative who was diagnosed with colorectal cancer, particularly one who was diagnosed before age 40. People with multiple close relatives diagnosed with colorectal cancer or adenomatous polyps are also at increased risk.
• ***smoking.*** Cigarette smoking is linked to polyp formation.
• ***disease states.*** People with ulcerative colitis or Crohn disease are at increased risk for developing colorectal cancer.

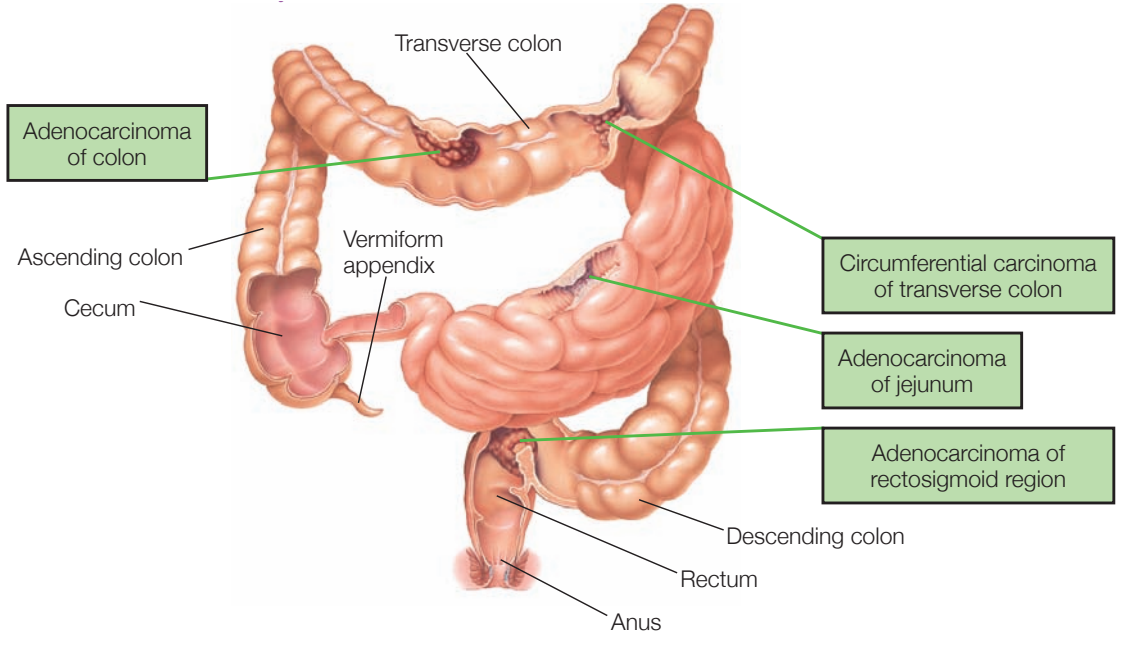
Other risk factors include a diet high in fat and red meat, heavy drinking, and a sedentary lifestyle.

Most instances of colorectal and anal cancer are spontaneous, not inherited errors in DNA. Only 5% to 6% of cases are related to inherited genetic causes, according to the National Cancer Institute. The two most common autosomal dominant disorders are familial adenomatous polyposis (FAP) and hereditary nonpolyposis (HNPCC) or Lynch syndrome. FAP is a syndrome that causes thousands of polyps at an early age. It carries a nearly 100% risk of colorectal cancer by age 40 if not screened for regularly and treated early. HNPCC also causes polyps but they're less in number than FAP. The risk of colorectal cancer for patients with HNPCC who aren't regularly screened is nearly 80%, but those who are monitored can have all occurrences treated by removing polyps early.

Symptoms late in the game

Although colorectal cancer is curable in its early stages, symptoms usually begin late in the disease process. Symptoms will vary depending on the size, type, and location of the tumor.

Types of colon cancer



Tumors on the right side of the abdomen tend to grow outward from the original location. Because these tumors are less likely to block the lumen, obstruction is less likely to be a symptom. Symptoms of right-sided lesions may include dull pain that radiates to the back, dark blood in the stool, or palpable masses. Patients with right-sided lesions don't display changes in bowel habits because of the liquid nature of the colon contents at this time.

Conversely, tumors on the left side of the abdomen tend to grow into the lumen and are more likely to cause obstruction. Along with symptoms of obstruction such as constipation, diarrhea, and narrow diameter stools, symptoms of left-sided lesions may include rectal bleeding; anemia; black, tarry stools; bloating; and abdominal discomfort.

Urgent! Screening ahead

Colonoscopy remains the gold standard for colorectal cancer screening. It's easily completed and very effective in identifying suspicious polyps in the colon. When small polyps are discovered during a colonoscopy, they can be removed during the same procedure. The American College of Gastroenterology recommends colonoscopy beginning at age 50 and continuing every 10 years until age 75 for all persons who have a negative history for cancer, no familial syndromes, and no other risk factors. Earlier screening (beginning at age 45) is recommended for Black Americans due to a higher incidence of colorectal cancer. Screening is also recommended earlier for people with certain risk factors such as heavy smoking and obesity.

Other screening options include sigmoidoscopy, performed with fecal occult blood testing, every 3 years. Sigmoidoscopy doesn't penetrate as far into the colon as colonoscopy, but preparation is generally less rigorous and biopsies and excisions are still possible with this procedure. A digital rectal exam may also be performed or a double-contrast barium enema ordered. CT scanning isn't considered sensitive enough for screening but as in the case of Mr. W, colorectal cancer may be found during tests performed for other reasons.

Although colorectal cancer screening is accurate and safe, Americans aren't being screened in high numbers. Many cases of colorectal cancer are found accidentally, as in the case of our patient Mr. W, or are found only when a patient is symptomatic. Remember that screening methods only work when they're used—encourage your patients to be screened regularly.

Taking the stage

The American Joint Commission on Cancer TNM (tumor, nodes, metastases) staging system is most commonly used for colorectal cancer. Staging ranges from Stage 0, carcinoma in situ, to Stage IV, with distant metastases present. Stage 0 (carcinoma in situ) is defined as abnormal cells that are localized to the mucosa. However, this stage may involve large tumors. Stage I involves an invasive tumor extending through the muscularis mucosa to the submucosa or muscularis propria (outer muscle layer). Stage II is an invasive tumor that extends to the outermost layers of the colon or rectum. Stage III is defined as metastasis to lymph nodes, and Stage IV is distant metastases. Common sites for colorectal metastases are the liver and the lungs.

Colorectal cancer is slow-growing from the beginning of the polyp, and because of this slow progression, there's more opportunity for early detection and treatment. Colorectal cancer is very curable in its early stages. The general 5-year survival rate by stage is:

- Stage I: 90% to 95%
- Stage II: 75% to 80%
- Stage III: 40% to 70%
- Stage IV: 5%.

Treatments on parade

In cancer treatment, there are many combinations of methods that are used for maximum effectiveness. These decisions are based on the condition of the patient, the nature and makeup of the tumor, the best treatment to effectively eradicate the cancer, and the treatment wishes of the patient. In colorectal cancer, the primary, secondary, or adjuvant treatment options are surgery, chemotherapy, and radiation, depending on the goals of treatment.

In 75% of colorectal cancer cases, tumor or polyp removal is the first order of business. The goal for surgical treatment is to remove the tumor, obtaining clean margins and clear lymph nodes. Three major surgeries for colorectal cancer are colon resection with anastomosis (connection), resection with colostomy, or abdominoperineal resection.

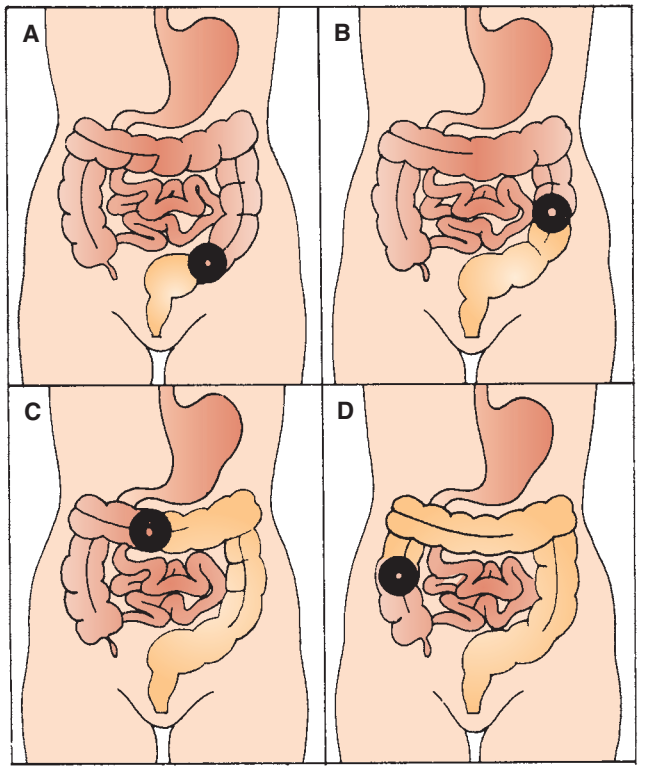
If a section of colon is removed, the remaining ends are reconnected if possible; if this isn't possible, the colon proceeds are diverted via a colostomy, which creates a stoma at the outside of the abdomen so that the contents empty into a collection bag. The consistency of the contents is determined by the location along the colon (see *Permanent colostomy placement*). The stoma may be permanent or temporary, depending on the treatment plan. Surgery can also be used as a strategy to debulk or remove large tumors to control pain and other symptoms.

Unless the patient presents with a bowel obstruction, prepping the colon for surgery involves a clear-liquid diet, laxatives, enemas, and oral antibiotics. The possible complications of colon surgery include infection, thrombophlebitis, hemorrhage, ileus (intestinal obstruction), and anastomotic leaks.

Surgical intervention provides a good cure rate for cancer in the early stages; however, for patients with Stages III and IV cancers or Stage II cancers with a high disease recurrence, chemotherapy is an important component of treatment. Individual chemotherapeutic agents are delivered in combination with each other and in pulsed doses to maximize efficacy and patient tolerance. There are a number of protocols that are used to treat localized and metastatic disease. One of the more exciting advances is treatment with monoclonal antibodies such as avastin and erbitux, used in combination to treat metastatic colorectal cancer.

Radiation therapy is used as an adjuvant or palliative treatment, mostly for rectal cancer. Pre-op radiation may be used to decrease the tumor size, eradicate microscopic disease, and decrease the incidence of local recurrence. Post-op radiation is used for patients whose resection didn't result in

Permanent colostomy placement



The nature of the discharge varies with the site. Shaded areas show sections of bowel removed. With a sigmoid colostomy (A), the feces are solid. With a descending colostomy (B), the feces are semimushy. With a transverse colostomy (C), the feces are mushy. With an ascending colostomy (D), the feces are fluid.

clear margins or if portions of the tumor remain. Radiation can also be used as a palliative treatment to reduce tumor size in advanced cancer. Monitor for complications of abdominal radiation therapy, such as inflammation of the bladder or bowel, and ulceration or necrosis of the bowel.

Gold star patient teaching

Patients who are expecting a stoma may have additional questions about post-op care. The stoma site must be chosen with care with at least 3 inches of open skin for the appliance. Placement must also consider activities such as sitting, standing, sleeping, wearing clothing, and sexual activities. The colostomy patient will return from surgery with a urinary catheter and a nasogastric tube. The collection appliance will be glued to the skin of the abdomen. Teach your patients to observe the stoma and skin regularly and when changing or emptying collection bags. Instruct your patient to empty the collection pouch on a regular basis. See "Ostomy Care: Are You Prepared?" on page 46 of this issue for an overview of stoma care.

The stoma color should be a bright red, often described as the color of fresh beef. A healthy stoma is very vascular and the surface may bleed slightly when touched or cleaned. However, there should be no signs or symptoms of infection and the stoma must remain patent to allow good flow of fecal contents to the outside. If the stoma isn't bright red, isn't patent, or looks infected, teach your patient to immediately seek medical care. The skin surrounding the stoma should also remain intact and be free from excoriation and bleeding. A specially trained enterostomal nurse generally assists in determining the best products for each patient.

The body image changes from colorectal cancer treatment may be profound, and these changes and challenges can complicate treatment and recovery. Sexual function may be altered due to anatomic changes and adverse reactions to treatment. These issues must be addressed as part of a comprehensive treatment plan.

As for our patient, after his physician has released him, Mr. W will need to resume regular screening. Remember that patients who've undergone treatment for cancer have an increased chance of developing another cancer during their lifetime, so Mr. W should also follow other cancer screening recommendations, such as upper GI screening and skin inspections, as well. Here's your opportunity to shine by teaching Mr. W and his family the importance of screening. Mr. W will benefit from your expertise throughout this process.

did you know?

Anal cancer is rare and believed to be closely related to human papillomavirus (HPV) infection. It's detected through the same testing as colorectal cancer. Statistics for HPV-associated anal cancer include 1,600 new diagnoses in women and 900 in men annually in the United States, according to the CDC. The incidence of anal cancer is higher in White women and Black men.

Positive prognosis power up!

What do Sharon Osbourne, Darryl Strawberry, Michael Crichton, and Ruth Bader Ginsburg have in common? They're all colorectal cancer survivors. With good follow-up and chemotherapy, Mr. W will also have a positive prognosis. And with your excellent teaching, he'll understand his treatment and possibly become an advocate for his family and friends to get screened for colorectal cancer. ■

Learn more about it

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On the web

These online resources may be helpful to your patients and their families:

- **American Cancer Society:** http://www.cancer.org/cancer/colonandrectumcancer/overviewguide/colorectal-cancer-overview-what-is-colorectal-cancer
- **CDC:** http://www.cdc.gov/cancer/colorectal/
- **Mayo Clinic:** http://www.mayoclinic.com/health/colon-cancer/DS00035
- **MedlinePlus:** http://www.nlm.nih.gov/medlineplus/colorectalcancer.html
- **National Cancer Institute:** http://www.cancer.gov/cancertopics/types/colon-and-rectal.

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