

Colon and Rectal Cancer Treatment Guidelines for Patients

VERSION I MARCH 2000



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NCCN[®]

National Comprehensive
Cancer Network

Colon and Rectal Cancer Treatment Guidelines for Patients

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The mutual goal of the National Comprehensive Cancer Network® (NCCN®) and the American Cancer Society (ACS) partnership is to provide patients and the general public with state-of-the-art cancer treatment information in understandable language. This information, based on the NCCN's Clinical Practice Guidelines, is intended to assist you in the dialogue with your physician. These guidelines do not replace the expertise and clinical judgment of your physician. Each patient's situation must be evaluated individually. It is important to discuss the guidelines and all information regarding treatment options with your physician. To ensure that you have the most up-to-date version of the guidelines, consult the web sites of the ACS (www.cancer.org) or NCCN (www.nccn.org). You may also call the NCCN at 1-888-909-NCCN or the ACS at 1-800-ACS-2345 for the most recent information.

NCCN Clinical Practice Guidelines were developed by a diverse panel of experts. The guidelines are a statement of consensus of its authors regarding the scientific evidence and their views of currently accepted approaches to treatment. The NCCN guidelines are updated as new significant data becomes available. The Patient Information version will be updated accordingly and will be available on-line through the NCCN and the ACS web sites. To ensure you have the most recent version, you may contact the ACS or the NCCN.

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With this report, patients have their first access to information on the way colon and rectal cancer is treated at the nation's leading cancer centers. Originally devised for cancer specialists by the National Comprehensive Cancer Network (NCCN®), these treatment guidelines have now been translated for the lay public by the American Cancer Society (ACS). To obtain another copy of these guidelines as well as more information, call the ACS at 1-800-ACS-2345, or the NCCN at 1-888-909-NCCN, or visit these organizations' websites at www.cancer.org (ACS) and www.nccn.org (NCCN).

Since 1995, doctors have looked to the NCCN for advice on treating cancer. NCCN Clinical Practice Guidelines were developed by a diverse panel of experts from 17 of the nation's leading cancer centers. The guidelines are a statement of consensus of its authors regarding the scientific evidence and their views of currently accepted approaches to treatment. The NCCN guidelines are updated as new significant data become available. The Patient Information version will be updated accordingly and will be available on-line through the NCCN and the ACS web sites. To ensure you have the most recent version, you may contact the ACS or the NCCN.

For more than 85 years, the public has relied on the American Cancer Society for information about cancer. The Society's books and brochures provide comprehensive, current, and understandable information to hundreds of thousands of patients, their families and friends. This collaboration

between the NCCN and ACS provides an authoritative and understandable source of cancer treatment information for the layperson.

These patient guidelines will help you better understand your cancer treatment options. We urge you to discuss them with your physician and ask the following questions:

- Where is my cancer located?
- How far has my cancer spread? What are its T, N, M, and grouped stages? How do these stages influence my outlook for cure and survival and my treatment options?
- What treatment options do I have?
- What are the risks or side effects associated with each of my treatment options and how are they likely to affect my quality of life?
- What should I do to be ready for treatment, minimize side effects of treatment, and hasten my recovery?
- What rehabilitation and support services are available to me and my family?

In addition to these questions, be sure to write down some of your own. For instance, you might want more information about recovery times so you can plan your work schedule. Or, you may want to ask about clinical trials for which you may qualify.

MAKING DECISIONS ABOUT COLON AND RECTAL CANCER TREATMENT

Colon cancer and rectal cancer have many features in common. They are often considered together as *colorectal cancer*. They are being discussed together in some sections of this document. But, in other sections, colon and rectal cancers are discussed separately to reflect ways in which treatments differ.

Colorectal cancer is the third most common cancer (excluding skin cancer) of American men and women. The ACS estimates that about 93,800 new cases of colon cancer and 36,400 new cases of rectal cancer will be diagnosed in 2000. Colon cancer is expected to be responsible for about 47,700 deaths during 2000. About 8,600 people will die from rectal cancer during 2000.

Over 95% of colorectal cancers are *adenocarcinomas* (cancers of the glandular cells that line the inside of the colon and rectum). The information in this document refers to colorectal adenocarcinomas only. Gastrointestinal *carcinoid tumors* (tumors of hormone-producing cells of the digestive system), *gastrointestinal stromal tumors* (tumors of the connective tissue in the stomach and intestinal wall), and gastrointestinal *lymphomas* (cancers of the immune system cells in the stomach and intestines) are found less often in the colon and rectum. The treatment and prognosis for these rarer types of colorectal tumors differ from that of adenocarcinomas and are not covered in this document.

Although colorectal cancer is a serious disease, it is one that a multidisciplinary team of health care professionals can treat. The team of health care professionals may include a gastroenterologist, surgeon, radiation oncologist, medical oncologist, pathologist, nurse, social worker, radiologist and enterostomal therapist. This report is intended to help you understand the treatment options available to people with colon and rectal cancers so that you and your doctor can work together to identify which best meet your medical and personal needs.

On the following pages you'll find flow charts that doctors call "algorithms," "decision trees," or "clinical pathways." The charts represent different stages of colon or rectal cancer and each one shows how you and your doctor can arrive at the choices you need to make about your treatment.

To reach an informed decision you need to understand some of the medical terms your doctor uses. You may feel you're on familiar ground already, or perhaps you need to refer to the various sections listed on the front-page index. Not only will you find background information on colorectal cancer, but also explanations of colorectal cancer stages, work-up (evaluation), and treatments—all categories used in the flow charts. We've also provided a glossary of medical terms.

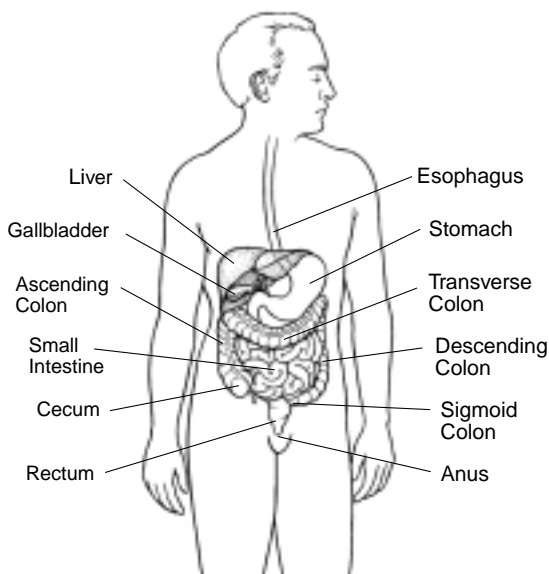
ABOUT THE COLON AND RECTUM

Understanding a little about the normal function and anatomy of the colon and rectum can help patients understand how colorectal

cancers spread and what tissues are removed by the operations we will discuss later in this document.

The colon and rectum are parts of the large intestine which is, in turn, a part of the digestive system. The digestive system processes food for energy and rids the body of solid waste matter. 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 called the small bowel. The small intestine continues breaking down the food and absorbs most of the nutrients. The small intestine joins the colon, a muscular tube about five feet long. The large intestine continues to absorb water and mineral nutrients from the food matter and stores waste matter, called *feces* or *stool*. The waste matter left after this process passes out of the body through the *anus*. The first 4½ feet or so of the large intestine is called the colon, and the remainder is the rectum. The colon has four sections. The small intestine is connected to the first of these, called the *ascending colon* because it extends upward on the right side of the abdomen. The part of the ascending colon that is connected to the small intestine is called the *cecum*. The second section is called the *transverse colon* since it goes across the body from the right to the left side. There it joins the third section, the *descending colon*, which continues downward on the left side. The fourth section is known as the *sigmoid colon* because of its S-shape. The sigmoid colon joins the *rectum*, which in turn joins the *anus*.

Each of these sections of the colon and rectum has several layers of tissue. Colorectal cancers start in the innermost layer and can grow through some or all of the other layers.



Organs of the Digestive System

Knowing a little about these layers is important, because the *stage* (extent of spread) of a colorectal cancer depends to a great degree on which of these layers it affects. This is discussed in the section of this document on staging.

Lymph is a clear fluid that contains tissue waste products and immune system cells. *Lymphatic vessels* carry this fluid to *lymph nodes* (small, bean-shaped collections of immune system cells important in fighting infections). Most lymphatic vessels of the colon or rectum lead to regional (nearby) lymph nodes. Cancer cells may enter lymph vessels and spread out along these vessels to reach lymph nodes, where they can continue to grow. If cancer cells have multiplied in these lymph nodes, they are more likely to have spread to other organs of the body as well.

Blood from arteries enters and nourishes the tissues of the wall of the colon and rectum (but normally does not enter the hollow part of the colon and rectum to mix with feces).

After flowing through these tissues, the blood flows into veins. Veins from the colon and rectum lead to the liver and eventually flow back to the heart. This pattern of blood flow is important, because cells may break off of a colorectal cancer, enter veins leaving these organs, and travel to the liver. This is why the liver is a common site for colorectal cancer to metastasize (spread) to.

KNOWN RISK FACTORS FOR COLON AND RECTAL CANCERS

A *risk factor* is anything that increases a person's chance of getting a disease such as cancer. Different cancers have different risk factors. For example, unprotected exposure to strong sunlight is a risk factor for skin cancer and smoking is a risk factor for cancers of the lungs, larynx, mouth, throat, esophagus, kidneys, bladder and several other organs. Researchers have identified several factors that increase a person's chance of developing colorectal cancer: People have control over some of these risk factors (unhealthy diet, alcohol abuse, not getting enough physical activity), and can lower their colorectal cancer risk by avoiding them. Other risk factors, such as having intestinal polyps, chronic inflammatory bowel disease, or a family history of colorectal cancer cannot be avoided. But, people with these unavoidable factors can lower their cancer risk.

Aging: About 90% of people found to have colorectal cancer are older than 50.

A diet mostly from animal sources: A diet that consists mostly of foods that are high in fat, especially from animal sources, can increase

the risk of colorectal cancer. Instead, the ACS recommends choosing most of your foods from plant sources and limiting intake of high-fat foods such as those from animal sources. The ACS also recommends eating at least five servings of fruits and vegetables every day and six servings of other foods from plant sources such as breads, cereals, grain products, rice, pasta, or beans.

Physical inactivity: A sedentary lifestyle without at least moderate physical activity is associated with an increased risk of colon cancer.

A personal history of intestinal polyps: Polyps are small outgrowths from the inner lining of the colon. Under the microscope, there are several types. Polyps themselves are benign. Some types of polyps, such as inflammatory polyps and hyperplastic polyps, do not increase the risk of colorectal cancer. Other types such as adenomatous polyps do increase the risk of colorectal cancer, especially if they are large or there are many of them.

Ulcerative colitis and Crohn's disease: These are the two main types of chronic inflammatory bowel disease. Ulcerative colitis is characterized by inflammation of the colon over a long period of time. Crohn's disease typically affects the small bowel, although the colon may also be affected. Ulcerative colitis and cases of Crohn's disease that affect the colon increase a person's risk of developing colon cancer, so starting colorectal cancer screening earlier and doing these tests more often is recommended.

Individuals with 8 or more years of *pancolitis* (inflammatory bowel disease affecting the entire colon) or 15 or more years of left-sided colitis are at an increased risk for colorectal cancer. Therefore, the NCCN recommends:

- Colonoscopy (see *Early Detection* section on page 10) every 1-2 years with biopsy to look for cancer or dysplasia (abnormal features in cells lining the colon and rectum that may develop into cancer).
- If a high-grade dysplasia or multiple areas of low-grade dysplasia are present, or if low-grade dysplasia is found in biopsies done over a period of time, *total abdominal colectomy* (removal of the entire colon) or *proctocolectomy* (removal of the entire colon and the rectum) are recommended.

Because recognizing dysplasia and classifying it as low- or high-grade is sometimes difficult, examination of biopsy samples from people with inflammatory bowel disease should be done by an experienced pathologist.

A family history of colorectal cancer: Relatives of colorectal cancer patients are also at increased risk for developing this disease. An individual with one immediate family member with colorectal cancer has a risk that is 1.5–2 times the normal risk. Some individuals have family histories that include many members with colorectal cancer. Some of these families may have a colorectal cancer syndrome such as familial adenomatous polyposis (FAP) or hereditary nonpolyposis colorectal cancer (HNPCC). Accurate identification of people with these syndromes is important because their doctors will recommend specific measures to prevent cancer or find it as early as possible, when treatment is most successful. The NCCN recommends that all people with colorectal cancer have evaluation of their family history of the disease. People with a family history suggesting a colorectal

cancer syndrome should be referred for genetic counseling and consideration of genetic testing.

Familial adenomatous polyposis (FAP): FAP is a hereditary condition that greatly increases a person's risk of developing colorectal cancer. People with this syndrome typically develop hundreds of polyps in the colon and rectum. Usually one or more of these polyps becomes cancerous if preventive surgery is not done.

For patients diagnosed with FAP, colectomy is recommended, usually by age 25, in order to prevent a colon cancer from developing. For surveillance following colectomy, the NCCN recommends:

- Sigmoidoscopy every 6 months for 3 years in patients whose rectum has not been removed,
- An upper endoscopy every 4 years, and a physical exam annually.

It is important to note the distinction between people who are actually diagnosed with FAP and young people who have a family history of FAP but have no intestinal symptoms and have not had any polyps diagnosed. The latter group can discuss genetic counseling and genetic testing with their physicians. If a person does not want to have genetic testing, NCCN recommends starting flexible sigmoidoscopy at puberty, and repeating this test:

- Every 12 months until the age of 24,
- Every 2 years until the age of 34,
- Every 3 years until the age of 44,
- Then every 3-5 years thereafter.

Hereditary nonpolyposis colon cancer (HNPCC) develops in people at a relatively young age without first having many polyps. Experts in colorectal cancer genetics have developed lists of criteria for determining whether a person with a family history of colorectal cancer has HNPCC. The most commonly used among these, called the Amsterdam criteria, requires the following: At least 3 relatives should have medically proven colorectal cancer, one of these should be a first-degree relative (parent, sibling, or child) to the other two, and FAP should be excluded. At least two successive generations should be affected. In one of the relatives, colorectal cancer should be diagnosed before age 50 years. Genetic testing is often useful in confirming that someone has HNPCC.

The NCCN recommends that people with HNPCC consider colonoscopy starting at age 25 or 5 years younger than the youngest age at diagnosis in the family, which ever comes first, and have colonoscopy every 1-2 years thereafter. In addition, women with HNPCC are also at increased risk of developing cancer of the uterus and should consider having *transvaginal ultrasound* (ultrasound exam in which the ultrasound probe is placed into the vagina) or *endometrial aspirate* (test to remove a small sample of tissue from inside the uterus) annually beginning at age 25-35 years.

LIFESTYLE CHOICES TO LOWER COLORECTAL CANCER RISK

People may be able to lower their risk of developing colorectal cancer by managing the risk factors that they can control, such as diet and physical activity. Limiting intake of high fat

foods, eating at least 5 servings of fruits and vegetables each day as well as plenty of whole grain foods, can lower risk.

Contact the ACS or NCCN for more information on colorectal cancer prevention and early detection.

PREVENTION AND EARLY DETECTION OF COLON AND RECTAL CANCER

Colon and rectal cancers develop slowly over a period of many years. Before a true cancer develops, there usually are precancerous changes in the lining of the colon or rectum. A colorectal *adenoma*, one form of colon polyp also known as an *adenomatous polyp*, is a benign tumor of glandular tissue that grows inward, into the hollow inner part of the colon or rectum. Although adenomas are noncancerous, they may eventually change into a cancer.

Unlike adenomatous polyps, colorectal cancers can grow inward toward the hollow part of the colon or rectum, and outward through the wall of these organs. If not treated, cells from the tumor may break away and spread through the bloodstream or lymph system to other parts of the body. There, they can form “colony” tumors. This process is called metastasis.

By finding and removing adenomas before they have a chance to develop into cancers, and by finding and removing early cancers before they have spread through the lymphatic vessels or bloodstream, many colorectal cancers can be either prevented or found early and cured.

Both the ACS and NCCN recommend routine colorectal cancer screening, beginning at age 50. Several tests are available to detect adenomas and early colorectal cancers in people without any colorectal symptoms. These include the fecal occult blood test, digital rectal examination, flexible sigmoidoscopy, colonoscopy, and double contrast barium enema.

SCREENING TESTS

Fecal occult blood test: The *fecal occult blood test* (FOBT) is used to find *occult* (hidden) blood in feces. Blood vessels at the surface of colorectal adenomas or cancers are often fragile and easily damaged by the passage of feces. The damaged vessels may release enough blood to change the color of the stool. More often, the damaged blood vessels release only a small amount of blood into the feces. This blood does not change the appearance of the stool, but may be detected by the FOBT. If this test is positive, additional testing is needed because colorectal cancer is not the only condition that can cause blood in the stool. A positive test does not necessarily indicate that a polyp or cancer is present. Other sources of bleeding such as hemorrhoids may be present. Blood from meat an individual ate can also cause a false-positive test. More importantly, the FOBT can miss some adenomas and cancers. That is why the ACS and NCCN do not recommend using the FOBT alone for colorectal cancer screening. The FOBT is often used in combination with the digital rectal examination (DRE) and flexible sigmoidoscopy.

Digital Rectal Examination (DRE): The doctor inserts a gloved finger into the rectum to feel for anything that is abnormal. This simple

test, which is not painful, can detect many rectal cancers. But, even the longest of fingers are far too short to examine the full length of the large intestine. For this reason, the ACS and NCCN recommend using this exam together with other tests and examinations, such as the FOBT and flexible sigmoidoscopy.

Flexible sigmoidoscopy: In this examination, a slender, flexible, hollow, lighted tube is placed into the rectum and advanced upwards. This allows the doctor to look at the inside of the rectum and the lower part of the colon, the sigmoid, for cancer or for polyps. The patient is given an *enema* (fluid inserted through the anus) before the procedure to remove feces from the rectum and lower colon so that any growths can be seen more clearly. This test may be somewhat uncomfortable, but it should not be painful. This test examines only the lower part of the colon. Within the United States, two-thirds of colorectal cancers occur within the reach of sigmoidoscope.

Colonoscopy: A *colonoscope* is a long, flexible, lighted tube about the thickness of a finger. It is inserted through the rectum up into the colon. A colonoscopy is longer than a sigmoidoscope, and allows the doctor, in most cases, to see the entire colon lining. The colonoscopy is connected to a video camera and video display monitor so the doctor can look closely at the inside of your colon. Before this test, you will be told how to cleanse your bowel the night before and the morning of the exam, using strong laxatives. This test lasts approximately 15–30 minutes and is generally not painful due to the administration of a mild sedative.

Barium enema with air contrast: For this test, also called a *double contrast barium enema* the patient is given barium sulfate, a chalky

substance used to partially fill and open up the colon. The barium sulfate is given through the anus. When the colon is about half-full of barium, the patient will be turned on the x-ray table so the barium spreads throughout the colon. Then air is inserted to cause the colon to expand. This allows good x-ray films to be taken. Before this test, you will be told how to cleanse your bowel the night before and the morning of the exam, using strong laxatives.

COLON AND RECTAL CANCER WORK-UP (EVALUATION)

INITIAL EVALUATION

If there is reason to suspect that you have colon or rectal cancer, the doctor will take a complete medical history and perform a physical exam. Also, one or more of the following tests will be done to find out if the disease is really present and to determine its stage (how far the cancer has spread).

History and Physical Exam: When your doctor “takes a history,” he or she will ask you a series of questions about your symptoms and risk factors. Some colorectal cancers may be found because of symptoms such as a change in bowel habits, blood in the stool, weakness or fatigue, abdominal pain, loss of appetite, nausea, weight loss, and straining during a bowel movement. Of course, many noncancerous conditions and some other cancers can cause one or more of these symptoms. But if these symptoms are present, medical evaluation is the only way to determine their cause so that

the most appropriate treatment can be chosen. A physical exam for patients suspected of having colorectal cancer will include a DRE, careful examination of the abdomen to feel for masses or enlarged organs, and a general survey of the rest of the body.

Colonoscopy: Although this test has already been discussed in the earlier section on early detection of colon and rectal cancer, colonoscopy is also an important part of the medical evaluation of people with symptoms of colorectal cancer.

Biopsy: If a mass or any other types of abnormal areas are seen through the flexible sigmoidoscope or through the colonoscope, a sample will be taken for examination under a microscope, to determine whether the abnormality is a cancer or some benign condition. Some abnormalities, such as small polyps, may be entirely removed through a scope. If the abnormal area is larger, a biopsy (small tissue sample) is taken. The biopsy sample is usually about $\frac{1}{8}$ inch across, and is removed with instruments that are operated through the scope. If you have questions about pathology results or any other aspect of the diagnostic process, do not hesitate to ask your doctor. You can obtain a pathology review by having microscope slides containing thin slices of your tissue specimen sent to a consulting pathologist at an NCCN center or other laboratory recommended by your doctor.

Blood counts and blood chemistry: A *complete blood count* (CBC) determines whether the patient’s blood has the correct number of various cell types. A test for hemoglobin, the oxygen-carrying pigment of red blood cells, is also part of the CBC. A low hemoglobin level may suggest ongoing loss of

blood cells, possibly due to bleeding from the surface of a cancer. Doctors repeat this test regularly in patients treated with chemotherapy, because these drugs temporarily affect blood-forming cells of the bone marrow. Spread of cancer to the liver and bones may cause certain chemical abnormalities in the blood. To detect these changes, physicians perform *blood chemistry tests*.

Carcinoembryonic antigen blood test: *Carcinoembryonic antigen* (CEA) is a substance produced by cells of most colon and rectal cancers and released into the bloodstream. The CEA blood test is most often used with other tests for follow-up of patients who already have had colorectal cancer and have been treated. CEA may be useful to provide an early warning of a cancer that has returned. CEA may be present in the blood of some people without colon or rectal cancer. Often these people have ulcerative colitis, non-cancerous tumors of the intestines, or some types of liver disease or chronic lung disease. Smoking can also cause an increase in CEA levels. Because the CEA level in the blood can be high for reasons other than cancer, or it may be normal in a person who has cancer, it is not used as a method for finding cancer in people who have never had a cancer and appear to be healthy. However, this test is useful for follow-up after treatment. After successful treatment, blood CEA levels should return to normal. If follow-up tests detect a steady increase in levels, additional testing is recommended to find out if the cancer has recurred (come back).

Ultrasound: This imaging test uses a device called a transducer that produces sound

waves, which are reflected by tissues of nearby organs. The pattern of sound wave echoes is detected by the transducer and analyzed by a computer to create an image of these tissues and organs. Since normal tissues and tumors reflect sound waves differently, ultrasound is sometimes used to find masses that indicate local or distant spread of cancer. Two special types of ultrasound examinations are used in evaluation of people with colon and rectal cancer. *Endorectal ultrasound* uses a special transducer that can be inserted directly into the rectum. This test is used to see how far a rectal cancer may have penetrated and whether it has spread to nearby organs or tissues. *Intraoperative ultrasound* is done after the surgeon has opened the abdominal cavity. The transducer can be placed against the surface of the liver, making this test very useful in detecting metastases of colorectal cancer to the liver.

Computed tomography: Commonly referred to as a CT or CAT scan, this test uses a rotating x-ray beam to create a series of pictures of the body from many angles. A computer combines the information from these pictures, producing a detailed cross-sectional image. *Contrast material* is usually injected into a vein before CT scanning to help produce clearer pictures. Spread of colorectal cancer to internal organs such as the liver, lungs, or elsewhere in the abdomen can often be detected by a CT scan. *Spiral CT* uses a special scanner that can provide greater detail and is sometimes useful in finding metastases from colorectal cancer. For *spiral CT with portography*, contrast material is injected into veins that lead to the liver, to help find metastases from colorectal cancer to that organ.

Chest x-ray: This familiar imaging test can often detect the spread of colorectal cancer to the lungs.

EVALUATION FOR METASTASIS

In addition to the tests listed above, if your physician suspects that your cancer has spread beyond the colon, the following tests may be ordered:

CT-guided needle biopsy: For this test, the patient remains on the CT scanning table, while a radiologist advances a biopsy needle toward the location of the mass. CT scans are repeated until the doctors are confident that the needle is within the mass. A fine needle biopsy sample (tiny fragment of tissue) or a core needle biopsy sample (a thin cylinder of tissue about $\frac{1}{2}$ inch long and less than $\frac{1}{8}$ inch in diameter) is removed and examined under a microscope.

Magnetic resonance imaging: Like computed tomography, magnetic resonance imaging (MRI) displays a cross-section of the body. However, MRI uses powerful magnetic fields instead of radiation. The procedure can present cross-sectional views from several angles and is useful in locating metastases from colorectal cancer that are sometimes hard to see on standard x-rays and CT scans.

Positron emission tomography: Positron emission tomography (PET) uses *glucose* (a form of sugar) that contains a radioactive atom. The substance emits tiny subatomic particles called positrons. A special camera records the precise location of the positrons as they leave the body. Cells of the body absorb varying amounts of the radioactive sugar, depending on their rate of metabolism. Unlike

most other imaging tests, which provide views of the shape and size of internal structures only, PET scanning also provides information about their metabolic activity. Since the metabolism of cancers differs from that of normal tissues, PET is sometimes useful in identifying cancers and determining how far they may have spread. But, PET scans are not routinely ordered, and their role in colorectal cancer is still under investigation.

Angiography: For this test, a *cannula* (tube) is inserted into a blood vessel and maneuvered until it reaches the area to be studied. Contrast dye is injected rapidly and a series of x-ray images is then taken. When the pictures are complete, the cannula is removed. Angiography is occasionally used to show surgeons the location of blood vessels next to a liver metastasis from colorectal cancer, so that an operation can be planned to minimize blood loss.

Consultation with an enterostomal therapist: NCCN guidelines recommend that people with rectal cancer be referred to an *enterostomal therapist* (a health care professional, often a nurse, trained to help people with their colostomies) as part of their initial work-up. The enterostomal therapist can address concerns about how a *colostomy* might affect their daily activities. A colostomy is an opening in the abdomen for getting rid of body wastes. Discussing these issues shortly after diagnosis can help patients make informed decisions about treatment options, some of which may involve a colostomy. Consultation with an enterostomal therapist is also recommended for the relatively small number of people with colon cancer that require a temporary or permanent colostomy. If a colorectal cancer

patient's surgical treatment requires a colostomy, the enterostomal therapist will provide information and training on care of the colostomy.

COLON AND RECTAL CANCER STAGES

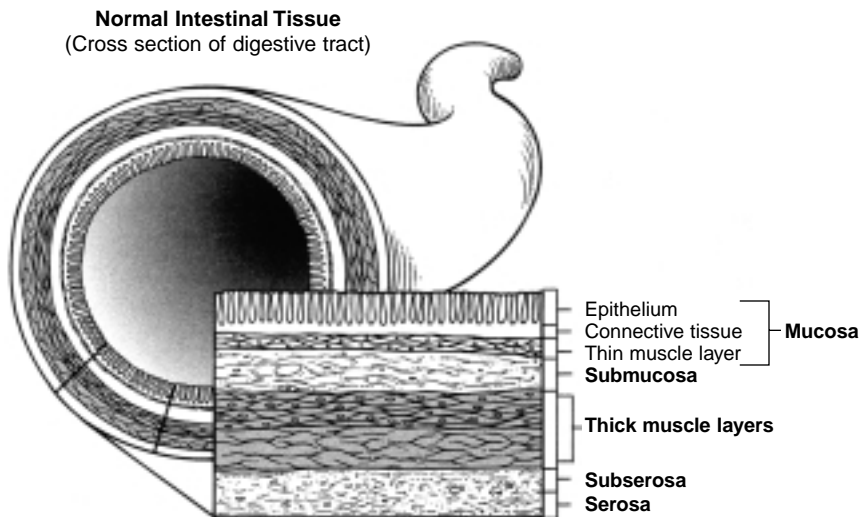
Staging is a process that tells the doctor how widespread the cancer may be, that is whether the cancer has spread and how far. The stage of a cancer is one of the most important factors in selecting treatment options. If you have any questions about your stage, ask your doctor to explain the extent of your disease.

A *staging system* is a standardized way in which the cancer care team describes the extent to which a cancer has spread. Staging systems for colorectal cancer include the Dukes, Astler-Coller and AJCC/TNM systems. This section concentrates on American Joint Committee on Cancer (AJCC) system, also

called the TNM system. All three systems describe the spread of the cancer in relation to the layers of the wall of the colon or rectum, nearby lymph nodes, other organs next to the colon and rectum, and organs farther away.

In addition, there are two types of AJCC stages. The *clinical* stage is based on physical examination and some imaging studies done before surgery. The clinical stage is used to determine which, if any, operations should be done for people with colorectal cancer. After colorectal surgery, the *pathologic* stage is determined by examination of the tissue that has been removed. The pathologic stage is used to determine which patients with colon and rectal cancer should be treated with adjuvant therapy and, if so, exactly what treatment is recommended.

The TNM System describes the extent of the primary Tumor (T), the absence or presence of metastasis to nearby lymph Nodes (N), and the absence or presence of distant Metastasis (M).



The layers of the colon wall

T CATEGORIES FOR COLORECTAL CANCER

T stages of colorectal cancer describe the extent of spread through the layers that form the wall of the colon and rectum. These layers, from the inner to the outer, include the *mucosa* (the lining), the *muscularis mucosae* (a thin layer of muscle tissue beneath the mucosa), the *submucosa* (connective tissue beneath this thin muscle layer), the *muscularis propria* (a thick layer of muscle that contracts to force the contents of the intestines along), the *subserosa* (a thin layer of connective tissue), and the *serosa* (a thin layer that covers the outer surface of some parts of the large intestine.

Tx: No description of the tumor's extent is possible because of incomplete information.

Tis: The cancer is in the earliest stage. It has not grown beyond the mucosa (inner layer) of the colon or rectum. This stage is also known as carcinoma in situ or intramucosal carcinoma.

T1: The cancer has grown through the mucosa and the next layer, the muscularis mucosae, and extends into the submucosa.

T2: The cancer has grown through the mucosa, the muscularis mucosae, the submucosa, and extends into the muscularis propria

T3: The cancer has grown through mucosa, the muscularis mucosae, the submucosa, and completely through the muscularis propria. It has spread to the

subserosa but not to any neighboring organs or tissues.

T4: The cancer has spread completely through the wall of the colon or rectum into nearby tissues or organs.

N CATEGORIES FOR COLORECTAL CANCER

Nx: No description of lymph node involvement is possible because of incomplete information

N0: No lymph node involvement

N1: Cancer cells found in 1 to 3 regional lymph nodes

N2: Cancer cells found in 4 or more regional lymph nodes

M CATEGORIES FOR COLORECTAL CANCER

Mx: No description of distant spread is possible because of incomplete information

M0: No distant spread

M1: Distant spread is present

Stage grouping: Once a patient's T, N, and M categories have been determined, this information is combined in a process called *stage grouping* to determine the stage, expressed in Roman numerals from stage I (the least

advanced stage) to stage IV (the most advanced stage). The following table illustrates how TNM categories are grouped together into stages.

- Stage 0: Tis, N0, M0
- Stage I: T1, N0, M0
T2, N0, M0
- Stage II: T3, N0, M0
T4, N0, M0
- Stage III: Any T, N1, M0
Any T, N2, M0
- Stage IV: Any T, Any N, M1

The Dukes system uses letters A through C, and the Astler-Coller system uses A through D. If your stage is reported in either of these systems, this table can be used to find the matching AJCC/TNM stage:

AJCC/TNM	Dukes	Astler-Coller
O	-	-
I	A	A, B1
II	B	B2, B3
III	C	C1, C2, C3
IV	-	D

TYPES OF TREATMENT FOR COLON AND RECTAL CANCERS

The three main types of treatment for colon and rectal cancer are surgery, radiation therapy,

and chemotherapy. Depending on the stage of the cancer, two or even three of these types of treatment may be combined at the same time or after one another.

After your cancer has been found and staged, your doctor will recommend one or more treatment options. It is important to take time and think about all of the choices. You may want to ask for a second opinion. This can provide more information and help you feel more confident about the treatment plan you choose.

SURGERY

Colon surgery: Surgery is the main treatment for colon cancer. The usual operation is called a *segmental resection* or *partial colectomy*. During this surgery, the cancer and a length of normal tissue on either side of the cancer as well as the nearby lymph nodes are removed. The remaining sections of the colon are then attached back together. This operation rarely causes any major permanent problems with digestive functions. Occasionally, a temporary colostomy may be needed. Even more rarely, a permanent colostomy may be needed. Patients can usually leave the hospital about 5–7 days after surgery and resume usual activities in 6 weeks. Of course, hospitalization and recovery times will depend on each patient’s specific medical condition.

It is sometimes possible to remove some very early colon cancers by surgery through a colonoscope. When this is done, the surgeon does not have to cut into the abdomen.

Some very advanced colon cancers can block flow of feces. When it is not possible to remove the cancer, the flow of feces can be diverted to a colostomy. This operation is called a *diverting colostomy*.

It is sometimes possible to remove segments of the colon and nearby lymph nodes through a laparoscope. This instrument is a long, lighted viewing tube through which the doctor can operate with special surgical instruments. The viewing tube and instruments are placed into the abdomen through several small surgical incisions. These incisions are usually shorter than one inch long and heal quickly. Although laparoscopic surgery has become an accepted option in gallbladder surgery and some gynecological operations, its use in removing a colon cancer is still considered experimental. The NCCN guidelines recommend *laparoscopic colectomy* only in the context of a clinical trial to learn more about its role in the treatment of colon cancer.

Rectal surgery: Several methods are used for removing or destroying rectal cancers. *Local* or *transanal resection* is an option for some people with stage I rectal cancer. It involves cutting through all layers of the rectum to remove invasive cancers as well as some surrounding normal rectal tissue. This procedure can be done through the anus without cutting through the abdomen. Because it removes a relatively small amount of tissue, patients can usually continue to eliminate waste as usual, without the need for a colostomy. Because complete removal of the cancer is so important, local resection is not an option for people whose cancers cannot be completely removed by that procedure. Doctors consider the cancer's size, its exact location within the rectum, and how far around the circumference of the rectum it extends in order to select which patients should have a local resection.

Many stage I and most stage II and stage III rectal cancers are removed by either *low anterior (LA) resection* or *abdominoperineal (AP) resection*. LA resection is used for cancers near the upper part of the rectum, close to where it connects with the sigmoid colon. After LA resection, the colon is attached to the anus and waste is eliminated in the usual way. AP resection is used for cancer in the lower part of the rectum, close to its outer connection to the anus. After AP resection, a permanent colostomy is needed. Some patients with stage IV rectal cancers will have to have a diverting colostomy. This operation does not remove a rectal cancer that is blocking fecal flow, but instead bypasses the blockage and diverts fecal flow to a colostomy. Photo-coagulation (heating the rectal tumor with a laser beam aimed through the anus) is another option for relieving or preventing rectal blockage in patients with stage IV cancer.

Surgical treatment of colorectal cancer metastases: For patients whose colorectal cancer has metastasized (spread) to a few areas in the liver, lungs, or elsewhere in the abdomen, removing or destroying these metastases can prevent some problems. Sometimes, treatment of metastases can help the patient to live longer. If only a small number of liver, lung, or abdominal metastases are present, they may be removed by surgery. Liver metastases may also be destroyed by *cryosurgery* (freezing the tumor), or by *radio frequency ablation* (heating them with microwaves). These methods do not require a surgical operation. The freezing probe or microwave probe is inserted through the skin and guided to the tumor by CT scans or ultrasound images.

RADIATION THERAPY

Radiation has a major role in the treatment of some rectal cancers. Radiation therapy uses high-energy x-rays or particles (such as protons or electrons) to kill cancer cells. In treating rectal cancer, radiation treatment can be delivered externally (external beam radiation), or through a tube directly into the rectum (endocavitary radiation). External radiation is generally delivered with a linear accelerator, daily Monday through Friday, for several weeks. This must be planned, using diagnostic x-ray machines, such as a simulator or a CT scanner. Endocavitary radiation is useful in early stage rectal cancer and uses low energy x-rays focussed directly on the cancer through the anus. Radiation can be delivered either preoperatively to cause tumor shrinkage to allow easier resection or to decrease the risk of complications, or postoperatively if there is a risk of recurrence in the tumor area. Fluorouracil (5-FU) is often delivered at the same time as radiation to make the radiation more effective. Studies have shown that for cases of rectal cancer, radiation in conjunction with surgery will often decrease the risk of recurrence.

CHEMOTHERAPY

Systemic chemotherapy uses anticancer drugs that are injected into a vein or taken by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment potentially useful for cancers that have metastasized (spread) beyond the organ they started in.

Fluorouracil (5-FU) is the chemotherapy drug most often used to treat colorectal cancer. It is

usually given together with other drugs, such as *leucovorin* that increase its effectiveness. 5-FU is also given with radiation therapy in order to increase the effectiveness of the radiation. 5-FU is usually slowly injected into a vein over about 5 minutes. If these injections are given for 5 days, no additional chemo-therapy is given for about 3 weeks while the patient recovers from the drug's side effects. Some physicians use a schedule of once weekly injections. This cycle is repeated for 6 to 8 months.

In some cases, 5-FU is given as a continuous infusion into a vein. The patient wears a small battery-operated pump that continuously releases 5-FU into an intravenous line. For patients with spread of colon or rectal cancer to their liver, 5-FU may be given directly into the artery that supplies blood to the liver. This approach to treatment of liver metastases is called *hepatic artery infusion*.

Irinotecan is another chemotherapy drug, which is often used for patients who are no longer responding to 5-FU therapy. It may be used alone, or combined with 5-FU.

ADJUVANT THERAPY AND NEOADJUVANT THERAPY

The terms adjuvant therapy and neoadjuvant therapy do not refer to a specific treatment. Rather they indicate how, when, and why certain treatments (radiation therapy and/or chemotherapy) are given. Not all patients with colorectal cancer receive neoadjuvant or adjuvant therapy.

Adjuvant therapy: After the initial surgery, the tissue that has been removed will be examined under a microscope to determine the cancer's pathologic stage (how far it has

spread). Imaging tests such as x-rays and CT scans will also help identify spread that has occurred beyond the tissues removed by surgery. If cancer is known to have spread beyond the tissues removed by surgery, adjuvant (additional) therapy, such as chemotherapy and/or radiation therapy, will be given to treat the remaining cancer. In other cases, no remaining cancer is apparent, but doctors believe it is possible that a few scattered cancer cells may remain in the patient's body. Even when too few cells are present to detect by currently available tests, and the doctors cannot be certain whether any cancer cells are really there, it is sometimes prudent to use adjuvant therapy anyway. If initial evaluation indicates that remaining cancer is unlikely and the risk of cancer returning is low, adjuvant therapy will not be given.

Neoadjuvant therapy: When chemotherapy and/or radiation therapy are given before surgery, they are called neoadjuvant therapy. Some patients who receive neoadjuvant therapy will also have adjuvant therapy after surgery. The purpose of neoadjuvant therapy is to shrink tumors so that they can be more completely removed by surgery.

TREATMENT OF PAIN AND OTHER SYMPTOMS

Most of this document discusses ways to remove or destroy colorectal cancer cells or to slow their growth. But it is important to realize that maintaining your quality of life is an important goal. Don't hesitate to discuss your symptoms or any other quality of life concerns with your cancer care team. There are effective and safe ways to treat pain, most other symp-

toms of colorectal cancer, and most of the side effects caused by colorectal cancer treatment.

ALTERNATIVE OR COMPLEMENTARY THERAPIES

If you are considering any unproven alternative or complementary treatments, it is best to discuss this openly with your cancer care team and request information from the ACS or the National Cancer Institute. Some unproven treatments can interfere with standard medical treatments or may cause serious side effects.

SIDE EFFECTS OF COLON AND RECTAL CANCER TREATMENTS

SURGERY

Colostomy: A colostomy is an opening in the front of the abdomen for elimination of feces. It is rarely used in surgical treatment of colon cancer. When it is required, the colostomy is usually temporary. After recovery from the operation to remove the colon cancer, the colon can be reconnected to route fecal flow to the anus and the colostomy is closed. Colostomy is used more often for rectal cancer than for colon cancer, although advances in chemotherapy and radiation therapy have reduced the need for this procedure. NCCN guidelines recommend that people who might need a colostomy be referred to an enterostomal therapist (a health care professional, often a nurse, trained to help people with their

colostomies). The enterostomal therapist will teach patients how to care for the colostomy, and can also help address any concerns about how the colostomy might affect their daily activities. The ACS and many cancer centers can refer patients with colostomies to support groups and other programs that provide additional information and support.

RADIATION

Side effects of radiation occur in the radiation field and may include skin irritation, nausea, diarrhea, rectal irritation, bladder irritation, and fatigue. These slowly build up during treatment and often disappear on completion of treatment. Long term effects such as scarring or bleeding are possible. This is called radiation proctitis or radiation colitis. Occasionally, chronic irritation of the rectum or bladder persist. Radiation treatment will sometimes increase the likelihood of surgical complications. These can be treated medically or surgically. The radiation oncologist plans the radiation with these complications in mind, working to avoid treatment of unnecessary tissues. If you have these or other side effects, talk to your doctor.

CHEMOTHERAPY

Chemotherapy drugs kill cancer cells but also damage some normal cells. Therefore, careful attention must be given to avoiding or minimizing side effects, which depend on the type of drugs, the amount taken, and the length of treatment. The major temporary side effects might include, loss of appetite, mouth sores and diarrhea or a rash on the patient's hands

and feet. Nausea and vomiting and hair loss occur infrequently. Because chemotherapy can damage the blood-producing cells of the bone marrow, patients may have low blood cell counts. This can result in an increased chance of infection (due to a shortage of white blood cells), bleeding or bruising after minor cuts or injuries (due to a shortage of blood platelets), and fatigue (due to low red blood cell counts).

Most side effects disappear once treatment is stopped. Hair will grow back after treatment ends, though it may look different. There are remedies for many of the temporary side effects of chemotherapy. For example, antiemetic drugs to prevent or reduce nausea and vomiting can be given.

BODY IMAGE AND SEXUALITY ISSUES

Surgery and radiation therapy may sometimes affect a person's feelings about their body, and may lead to specific physical problems that affect sexuality. Your cancer care team can help with these issues, so don't hesitate to share your concerns.

OTHER THINGS TO CONSIDER DURING AND AFTER TREATMENT

During and after treatment for your colon or rectal cancer you may be able to hasten your recovery and improve your quality of life by taking an active role. Learn about the benefits and disadvantages of each of your treatment options, and ask questions of your cancer care

team if there is anything you do not understand. Learn about and look out for side effects of treatment, and report these promptly to your cancer care team so that they can take steps to minimize them and shorten their duration.

Remember that your body is as unique as your personality and your fingerprints. Although understanding your cancer's stage and learning about the effectiveness of your treatment options can help predict what health problems you may face, no one can say precisely how you will respond to cancer or its treatment.

You may have special strengths such as a history of excellent nutrition and physical activity, a strong family support system, or a deep faith, and these strengths may make a difference in how you respond to cancer. There are also experienced professionals in mental health services, social work services and pastoral services who may assist you in coping with your illness.

You can also help in your own recovery from cancer by making healthy lifestyle choices. If you use tobacco, stop now. Quitting will improve your overall health and the full return of the sense of smell may help you enjoy a healthy diet during recovery. If you use alcohol,

limit how much you drink. Have no more than one or two drinks per day. Good nutrition can help you get better after treatment. Eat a nutritious and balanced diet, with plenty of fruits, vegetables, and whole grain foods. Ask your cancer care team if you may benefit from a special diet – they may have specific recommendations for people who have had radiation therapy, a colostomy, or other colorectal surgery.

If you are in treatment for cancer, be aware of the battle that is going on in your body. Radiation therapy and chemotherapy add to the fatigue caused by the disease itself. Give your body all the rest it needs so that you will feel better as time goes on. Exercise once you feel rested enough. Ask your cancer care team whether your cancer or its treatments might limit your exercise program or other activities.

A cancer diagnosis and its treatment is a major life challenge, with an impact on you and everyone who cares for you. Before you get to the point where you feel overwhelmed, consider attending a meeting of a local support group. If you need individual assistance in other ways, contact your hospital's social service department or the ACS for help in contacting counselors or other services.

ABOUT CLINICAL TRIALS

When studying promising new or experimental treatments, researchers want to know:

- Does this new type of treatment work better than other treatments already available?
- What side effects does the treatment cause?
- Do the benefits outweigh the risks, including side effects?
- Which patients will the treatment most likely help?

During your treatment for colorectal cancer, your doctor may suggest that you take part in a clinical trial of a new treatment. You should know that scientists only conduct clinical trials when they have reason to believe that the treatment under study may indeed be superior to other treatments. No one will receive a placebo (sugar pill) if a treatment is already available. During testing of a new drug that the Food and Drug Administration has not yet approved, some people will receive the standard treatment while others will get the experimental drug. A computer randomly assigns participants to each group. Whether the experimental treatment will work better than the standard treatment must be proved. The new therapy may have some

side effects, which your doctor will discuss with you before you enter the trial.

There are three phases of clinical trials in which treatments are studied before they are eligible for approval by the Food and Drug Administration. The purpose of a Phase I study is to find the best way to give a new treatment, and how much of it can be given safely. Physicians watch patients carefully for any side effects. While treatments tested in a Phase I study have been well tested in laboratory and animal studies, the side effects in patients are not completely predictable.

Phase II trials determine the effectiveness of a research treatment after safety has been evaluated in a Phase I trial. Doctors closely observe patients for an anti-cancer effect by carefully measuring cancer sites present at the beginning of the trial. In addition to monitoring patients for response, any side effects are carefully recorded and assessed.

Phase III trials require a large number of patients, sometimes thousands. A “control group” of patients may receive standard (the most accepted) treatment while another group, randomly assigned, may receive the treatment or drug under study. In this way researchers can compare the two to find out whether the new treatment is more beneficial to survival and quality of life. Doctors carefully monitor all patients in Phase III trials for side effects. The trial is discontinued if the side effects are too severe.

Taking part in any clinical trial is completely voluntary. Your doctors and nurses will explain the study to you in detail and will give you a form to read and sign. This informed consent document states that you understand the potential risks and want to participate. Even after you sign the form and the trial begins, you may leave the study at any time, for any reason. Participating in a clinical trial is an appropriate option patients at any stage of colorectal cancer. Taking part in the study

does not prevent you from getting other medical care you may need. But you should check with your health insurance company to find out whether it will cover the costs of your taking part in a clinical trial.

Participating in a clinical trial may help you directly, and it may help other people with colorectal cancer in the future. For these reasons, the NCCN and the ACS are committed to conducting clinical trials and helping people with cancer learn more about these studies.

Work-Up (Evaluation) and Treatment Guidelines

‘Decision Trees’

The ‘decision trees,’ or algorithms, on the following pages represent different stages of colorectal cancer. Each one shows you step-by-step how you and your doctor can arrive at the choices you need to make about your treatment.

Keep in mind, this information is not meant to be used without the expertise of your own physician who is familiar with your situation, medical history, and personal preferences.

Participating in a clinical trial is an appropriate option for people with any stage of colorectal cancer. Taking part in the study does not prevent you from getting other medical care you may need.

The NCCN guidelines are updated as new significant data becomes available. To ensure you have the most recent version, consult the web sites of the ACS (www.cancer.org) or NCCN (www.nccn.org). You may also call the NCCN at 1-888-909-NCCN or the ACS at 1-800-ACS-2345 for the most recent information on these guidelines or on cancer in general.

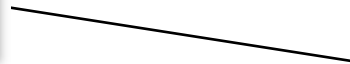
CLINICAL PRESENTATION

WORK-UP (EVALUATION)

Early cancer in an adenoma with a stalk and head (“mushroom-shaped”)



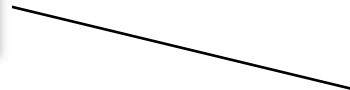
Pathology review
Colonoscopy



Early cancer in a sessile adenoma (without a stalk and head)



Pathology review
Colonoscopy



Cancer growing outward through the colon wall that has not blocked the flow of feces through the colon



Pathology review
Colonoscopy
Blood counts
Blood chemistry tests
CEA blood test
CT scan of abdomen and pelvis
Chest x-ray



Cancer growing into the center of the colon that is blocking the flow of feces (obstruction)



Pathology review
Colonoscopy, if possible
Blood counts
Blood chemistry tests
CEA blood test
CT scan of abdomen and pelvis
Chest x-ray



Keep in mind this information is not meant to be used without the expertise of your own physician who is familiar with your situation, medical history, and personal preferences.

Participating in a clinical trial is an appropriate option for people with any stage of colorectal cancer. Taking part in the study does not prevent you from getting other medical care you may need.

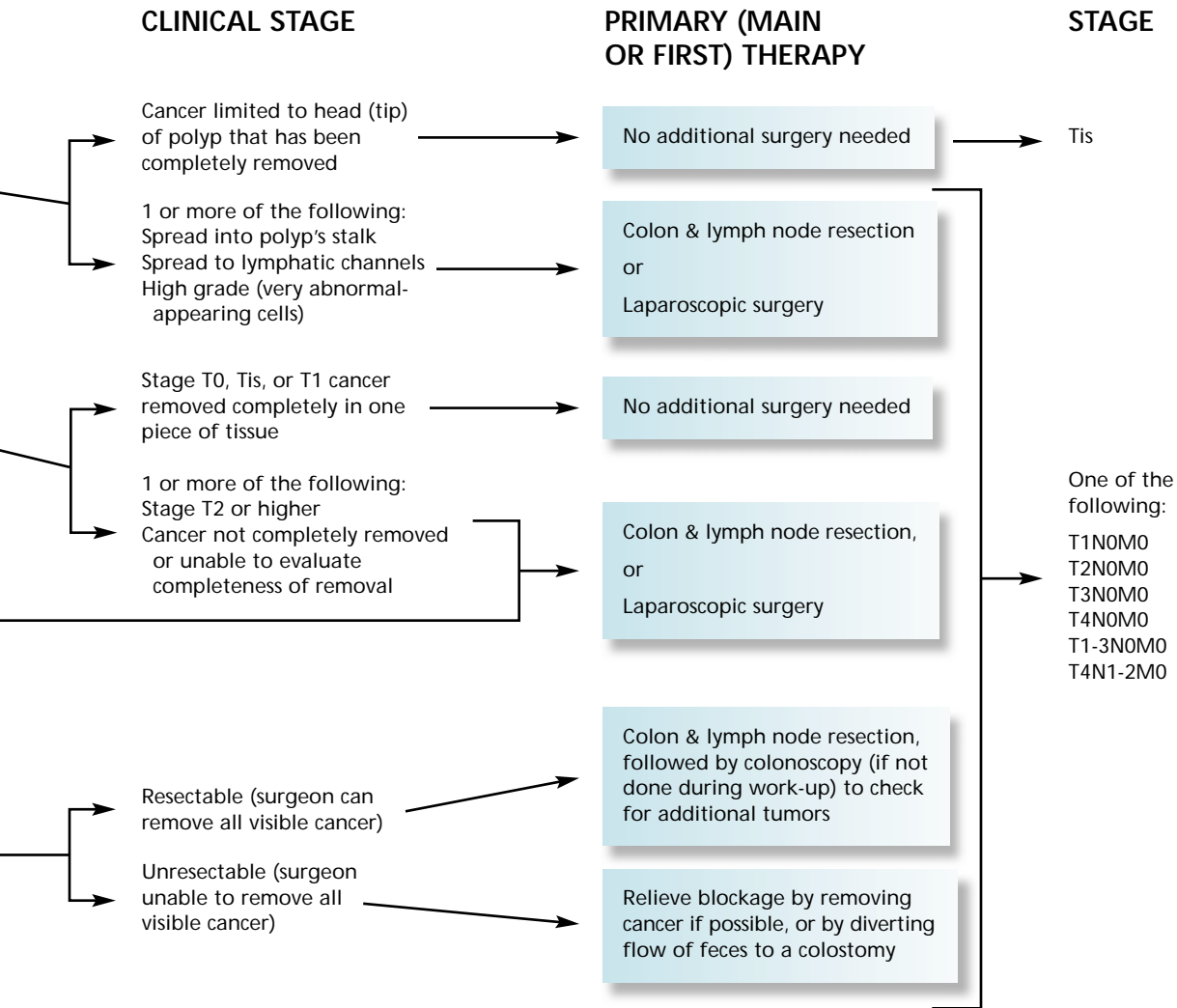
PRIMARY THERAPY FOR COLON CANCER

Selecting treatment for patients with colon cancer involves considering many factors. These factors are considered in a stepwise manner, starting with the clinical presentation

(the doctor’s initial impression of the patient’s medical situation).

For early cancers, the work-up consists of a pathology review and colonoscopy. For a patient

Decision Tree for Colon Cancer–Primary Therapy



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whose clinical presentation suggests a more advanced cancer, in addition to the pathology review and colonoscopy, more tests will be done to determine the extent the cancer has

spread. These include blood tests, CT scans of the abdomen and pelvis, and a chest x-ray.

Sometimes a patient is thought to have an adenomatous polyp of the colon (a benign

mushroom-shaped growth of glandular tissue). Only after the growth is removed and analyzed under a microscope can the doctors see that part of what was thought to be a benign growth has started to turn cancerous. If the cancerous part of the growth has been completely removed and was limited to the head of the polyp (the part that resembles the cap of a mushroom) no additional treatment is needed. If it appears that the cancer cells are spreading along the stalk of the polyp, to lymphatic channels, or if the cancer cells are high grade (highly abnormal in appearance, suggesting

spread is likely to have occurred but might have been missed when the specimen was examined), then removal of additional colon tissue and lymph nodes is recommended.

If the adenomatous growth does not have a distinct stalk, but rather a broad base, it is called a sessile adenoma. If doctors are confident that the part of the sessile adenoma that has become cancerous was completely removed, no additional treatment is needed. But, if there is a chance that some cancer was left behind, removal of additional colon tissue and lymph nodes is recommended.

NOTES

Decision Tree for Colon Cancer–Primary Therapy (continued)

If a cancer invades the wall of the colon, removal of a segment of colon containing the cancer and some nearby lymph nodes is the recommended treatment. Laparoscopic surgery is an option for removing a segment of the colon and nearby lymph nodes but it is still considered an investigational procedure. Therefore it should only be done in the context of a clinical trial that will help doctors learn more about the value of this procedure.

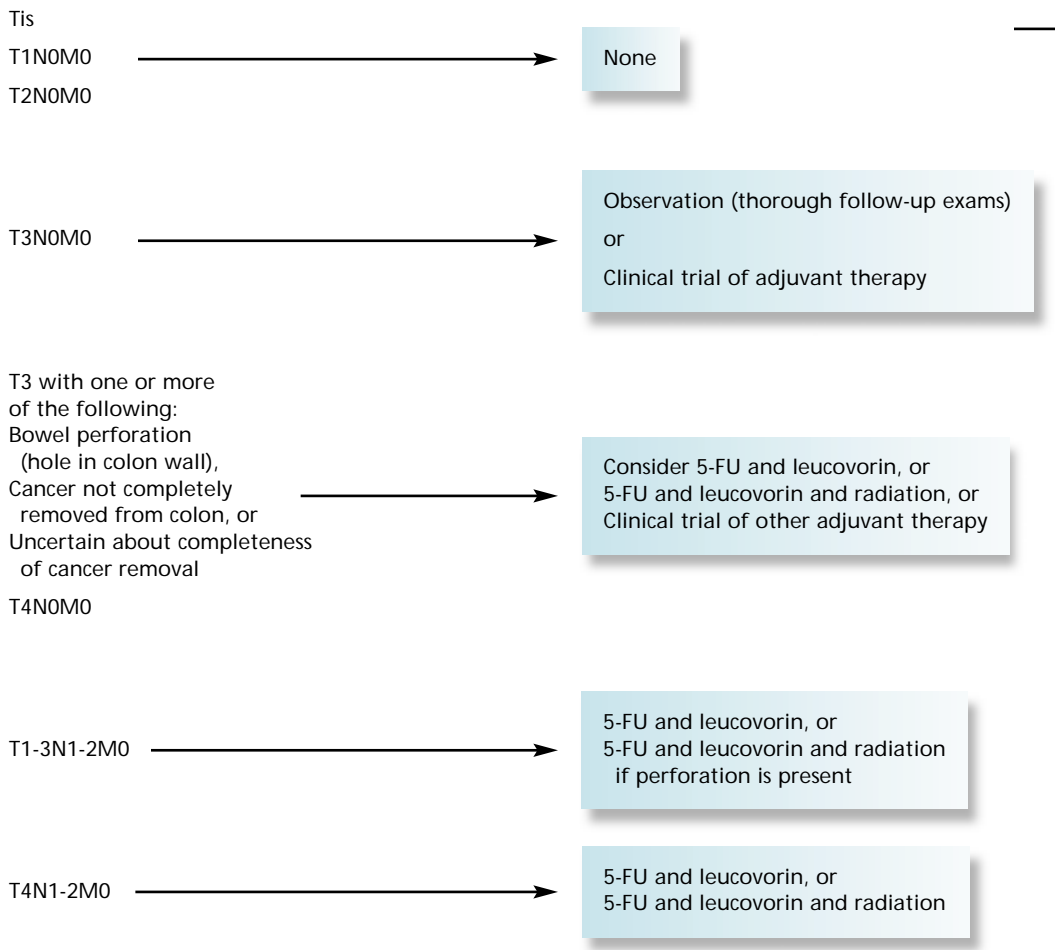
If a large cancer growing inward to the center of the colon is blocking the flow of feces, and has spread too extensively to be

completely removed, the main goal of surgery will be to relieve the blockage of fecal flow. This may involve removing a short segment of colon including the cancer and reattaching the ends. Rarely the surgeon will leave the cancer intact and divert the flow of feces to a colostomy. If colonoscopy could not be done (because the tumor blocked passage of the colonoscope) during the patient's initial work-up, it will need to be done after the colon and lymph node resection. The colonoscopy is necessary to make sure the patient doesn't have another cancer elsewhere in the colon or rectum.

NOTES

PATHOLOGIC STAGE

**ADJUVANT
(ADDITIONAL) THERAPY**



Keep in mind this information is not meant to be used without the expertise of your own physician who is familiar with your situation, medical history, and personal preferences.

Participating in a clinical trial is an appropriate option for people at any stage of colorectal cancer.

Taking part in the study does not prevent you from getting other medical care you may need.

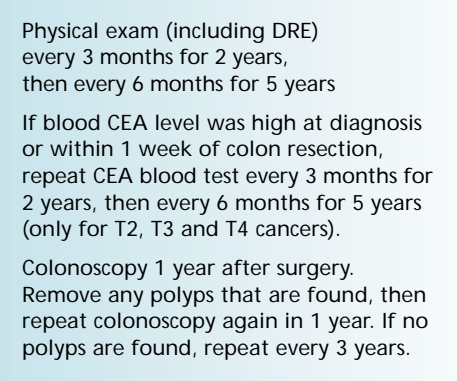
ADJUVANT TREATMENT OF COLON CANCER

Tis, T1N0M0, T2N0M0: Because the initial evaluation indicates that the risk of cancer remaining or returning after surgery is low, adjuvant therapy (additional treatment) is not given.

T3N0M0: People with T3N0M0 colon cancer have tumors that have spread through the muscle of the wall, but not to the surrounding lymph nodes. For most cases,

Decision Tree for Colon Cancer–Adjuvant Therapy

FOLLOW-UP TESTS AND EXAMINATIONS



Physical exam (including DRE)
every 3 months for 2 years,
then every 6 months for 5 years

If blood CEA level was high at diagnosis
or within 1 week of colon resection,
repeat CEA blood test every 3 months for
2 years, then every 6 months for 5 years
(only for T2, T3 and T4 cancers).

Colonoscopy 1 year after surgery.
Remove any polyps that are found, then
repeat colonoscopy again in 1 year. If no
polyps are found, repeat every 3 years.

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adjuvant therapy is not indicated. In some instances, however, the tumor has other features (bowel perforation, positive margins, or uncertainty regarding completeness of cancer

removal) which make the likeliness of recurrence greater, therefore adjuvant chemotherapy with or without radiation may be given.

T4N0M0 cancers: For patients with stage T4N0M0 cancers, adjuvant therapy consisting of fluorouracil (5-FU) and leucovorin, or a combination of 5-FU and leucovorin plus radiation therapy, or clinical trials can be considered options for treatment.

T1-3N1-2M0, T4N1-2M0: Patients whose tumors have spread to surrounding lymph nodes have a greater chance of having their tumors recur. Studies have shown that administering adjuvant chemotherapy can lower the risk by half. The options for patients who need

adjuvant therapy are 5-FU and leucovorin or a combination of 5-FU and leucovorin plus radiation therapy.

Follow-up tests and examinations for colon cancer: After initial surgical and, in some cases, adjuvant treatments are finished, follow-up tests are routinely done. The purpose of these tests is to find colorectal cancer that has recurred (come back) as soon as possible, when further treatments are most likely to be helpful. Since people cured of one colorectal cancer are at increased risk for developing a

NOTES

Decision Tree for Colon Cancer–Adjuvant Therapy (continued)

second one, early detection of second cancers is another goal of follow-up testing. Unlike recurrence, in which cancer cells remaining after treatment form additional tumors, second cancers develop from previously benign areas of the colon or rectum. Selection of follow-up tests is based on the stage of the cancer, which reflects its likelihood of recurring and spreading further. The side effects of the initial treatment are also monitored.

The digital rectal examination and colonoscopy are used to detect local recurrences or

new cancers. The carcinoembryonic antigen (CEA) blood test, described in the section on evaluation, is often useful in detecting recurrent cancer. However, some rare colorectal cancers do not produce enough CEA to cause elevations in blood levels. The use of routine CT scans has not been shown to be useful in finding recurrent disease at a stage that is more treatable than disease found by physical exam and CEA monitoring. Therefore, the use of this imaging test generally occurs if an abnormality is found on exam or blood testing.

NOTES

CLINICAL PRESENTATION

WORK-UP (EVALUATION)

Colon cancer with proven or suspected distant spread (any T, any N, M1)



Colonoscopy
 Blood counts
 Blood chemical tests
 CEA blood test
 CT scan of abdomen and pelvis
 Chest x-ray
 Needle biopsy of suspected metastasis

If liver is the only area of suspected spread, consider extra imaging tests of liver (spiral CT & portography, MRI, laparoscopy, angiogram, PET scan, ultrasound done during surgery)

Keep in mind this information is not meant to be used without the expertise of your own physician who is familiar with your situation, medical history, and personal preferences.

Participating in a clinical trial is an appropriate option for people at any stage of colorectal cancer. Taking part in the study does not prevent you from getting other medical care you may need.

COLON CANCER WITH PROVEN OR SUSPECTED DISTANT METASTASES

Any T, any N, M1: Selecting treatment for patients with proven or suspected distant spread of colon cancer involves considering many factors. These factors are considered in a stepwise manner, starting with the clinical presentation (the doctor’s initial impression of the patient’s medical situation).

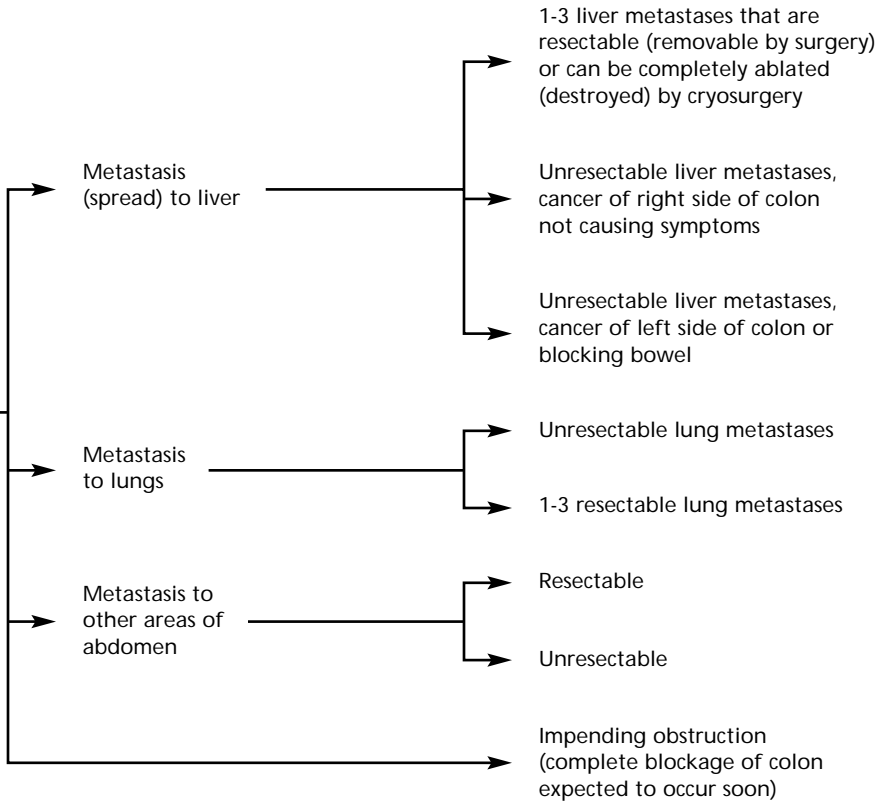
For patients whose clinical presentation suggests that their colon cancer has spread to

distant organs, work-up will include pathology review and colonoscopy, as well as additional tests. These tests include blood work, CT scans of the abdomen and pelvis, a chest x-ray, and a needle biopsy of suspected metastasis. If the liver is the only area of suspected distant spread, more imaging tests may need to be done such as spiral CT and portography, MRI, laparoscopy, an angiogram and a PET scan.

When spread to distant organs is suspected or proven when a colon cancer is detected, but

Decision Tree for Colon Cancer with Metastases

FINDINGS



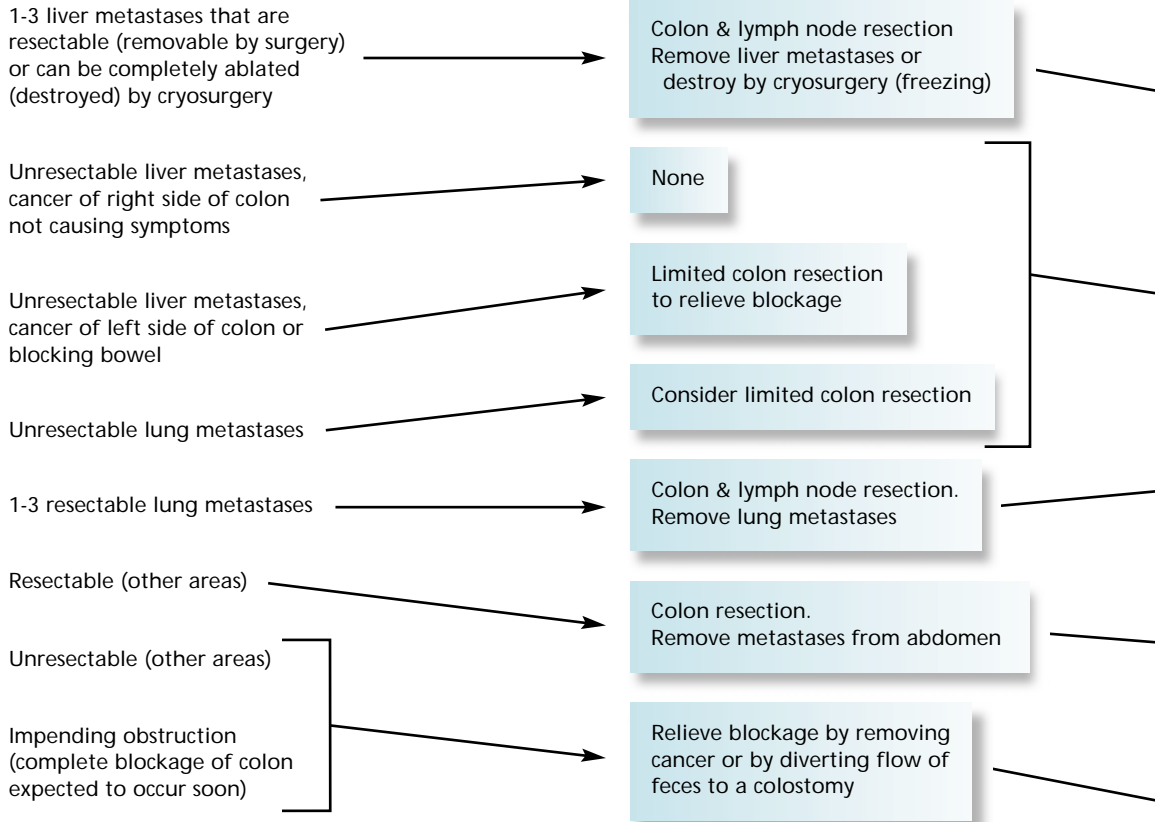
Continued on next pages

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before the colon and lymph node resection is done, the next step in evaluation is to determine whether the metastases can be resected (completely removed by surgery). This determination is based on the number of metastatic tumor nodules and their exact location. Intraoperative ultrasonography (ultrasound imaging done during surgery) can be used to detect liver metastases at the time of colon resection. One nodule or a few nodules of metastatic colorectal

cancer can often be removed from the liver, lungs, or abdomen. Ablation of metastases (destroying the tumor but not removing it) is another option, and can be accomplished by heating the tumors with focused radiofrequency waves or by freezing them with cryosurgery (a very low temperature needle precisely aimed into the tumor). More numerous metastases, or metastases involving certain critical parts of these organs may be impossible to remove

PRIMARY THERAPY



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Participating in a clinical trial is an appropriate option for people at any stage of colorectal cancer. Taking part in the study does not prevent you from getting other medical care you may need.

without severely damaging the organs they are found in. Whenever possible, removal of all visible cancer is the goal of surgery, since this offers the best chance for cure or long-term survival.

In order to prevent colon obstruction (blockage of fecal flow) the primary (original) colon tumor is usually removed, or fecal flow is diverted around it to a colostomy.

If cancer is known to have spread beyond the tissues removed by surgery, chemotherapy and/or radiation therapy will be given to treat the remaining cancer. Even when it appears that all of a patient’s metastases have been removed or destroyed by ablation, doctors know from experience that other metastases are probably present, even if they are too small to be seen by imaging tests or during surgery.

Decision Tree for Colon Cancer with Metastases (continued)

POST OPERATIVE/ ADJUVANT THERAPY

5-FU/leucovorin with additional chemotherapy directly into artery leading to liver, or 5-FU/leucovorin, or 5-FU given continuously into a vein, or 5-FU/leucovorin/irinotecan

Salvage therapy
Follow pathway for salvage therapy (see *Recurrence Work-up*, page 39)

5-FU/leucovorin, or 5-FU given continuously into a vein, or 5-FU/leucovorin/irinotecan

Observation (thorough follow-up exams), or 5-FU/leucovorin, or 5-FU given continuously into a vein, or 5-FU/leucovorin/irinotecan

Salvage therapy
follow pathway for salvage therapy (see *Recurrence Work-up*, page 39)

FOLLOW-UP TESTS AND EXAMINATIONS

Physical exam (including DRE) every 3 months for 2 years, then every 6 months for 5 years

If blood CEA level was high at diagnosis or within 1 week of colon resection, repeat CEA blood test every 3 months for 2 years, then every 6 months for 5 years (only for T2, T3 and T4 cancers)

Colonoscopy 1 year after surgery. Remove any polyps that are found, then repeat colonoscopy again in 1 year. If no polyps are found, repeat every 3 years

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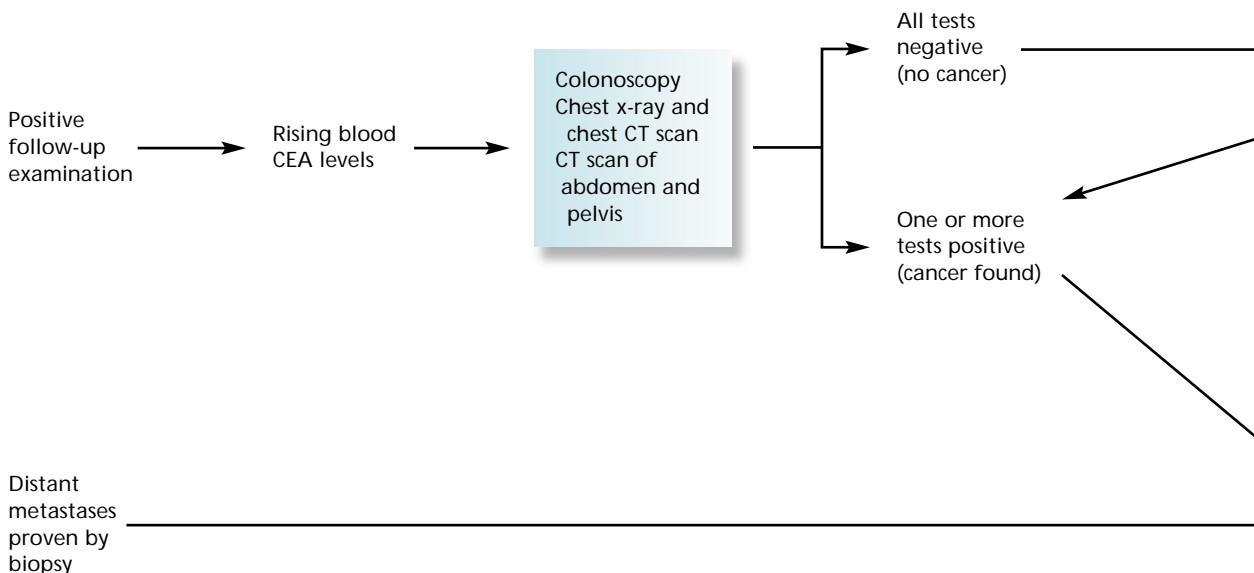
Therefore, these patients should also receive adjuvant chemotherapy. For patients whose metastases are unresectable, salvage therapy is given after colon surgery.

The digital rectal examination and colonoscopy are used to detect local recurrences or new cancers. The carcinoembryonic antigen (CEA) blood test, described in the section on evaluation, is often useful in detecting recurrent

cancer. However, some rare colorectal cancers do not produce enough CEA to cause elevations in blood levels. The use of routine CT scans has not been shown to be useful in finding recurrent disease at a stage that is more treatable than disease found by physical exam and CEA monitoring. Therefore, the use of this imaging test generally occurs if an abnormality is found on exam or blood testing.

CLINICAL PRESENTATION

RECURRENCE WORK-UP (Evaluation if cancer is suspected to have come back after treatment)



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RECURRENT COLON CANCER

CEA levels that rise steadily after initial treatment strongly suggest that a colorectal cancer is recurring, and indicates the need for a thorough search for the recurrent cancer. This search includes colonoscopy, x-rays, and CT scans. If no cancer is found, these tests are repeated at regular intervals. In some patients, a rising CEA may be present for months to years before clinical evidence (imaging test or physical exam results) of recurrent disease is

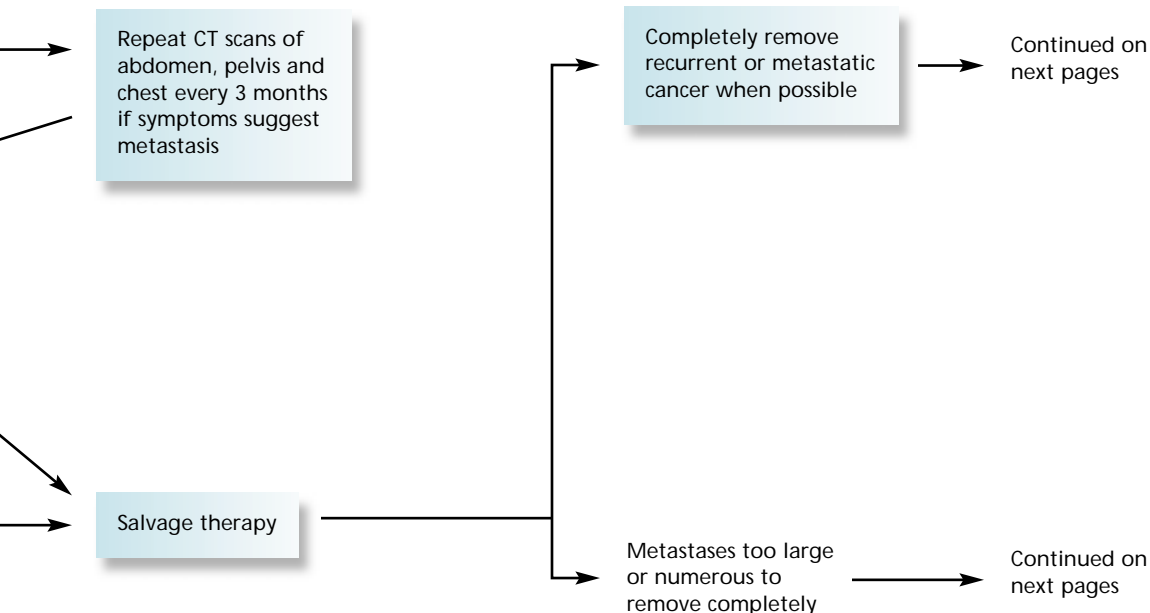
found. Patients are not given chemotherapy based on a rising CEA alone.

If masses likely to be recurrent cancer are detected by imaging tests, a biopsy may be done to be certain that the mass is due to cancer and not some other disease. In most cases this involves a needle biopsy procedure done using a CT scan for guidance. If recurrent cancer is proven by biopsy or if metastatic cancer is detected at the time of initial diagnosis, the treatment plan is referred to as “salvage therapy.” Recurrent cancer may be treated in two ways.

Decision Tree for Recurrent Colon Cancer

RECURRENCE WORK-UP (continued)

THERAPY



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In the first, the recurrent tumor can be completely removed surgically and long term remission is possible. In the second group, the tumor can not be totally removed and non-curative chemotherapy is used to control the recurrent disease. Complete removal of the recurrent or metastatic cancer may be considered when there are fewer than four metastases to the liver, and no metastases in other organs.

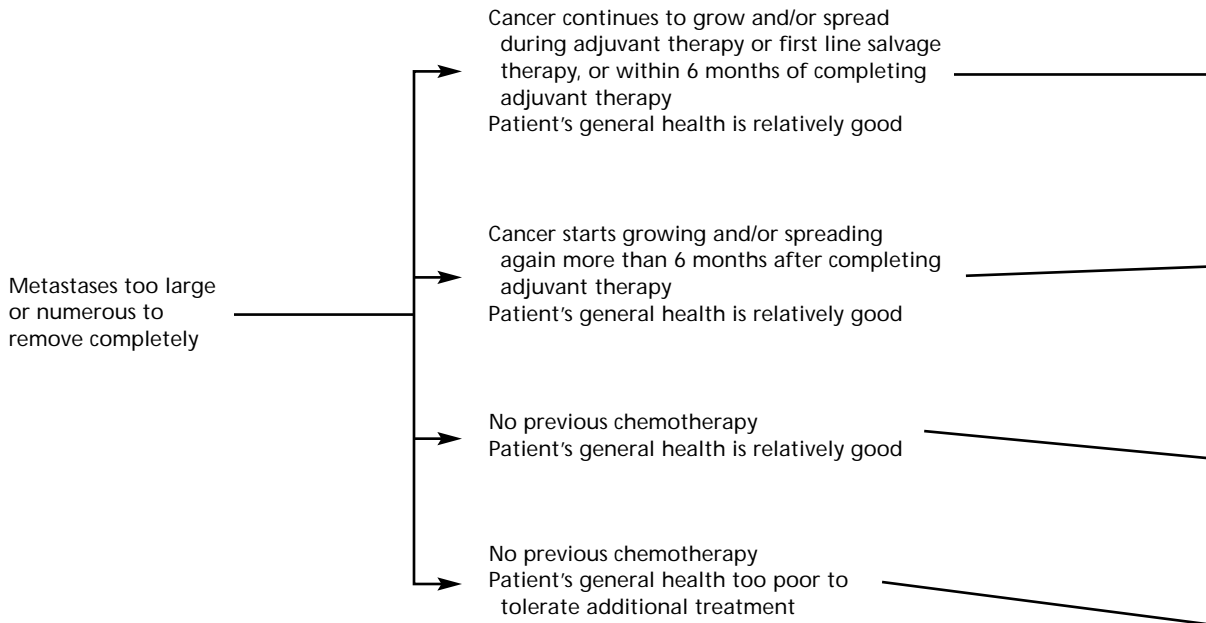
Even when it appears that all of a patient's recurrences have been removed or destroyed

by ablation, doctors know from experience that more recurrent tumors are probably present, even if they are too small to be seen by imaging tests or during surgery. Therefore, these patients should also receive adjuvant chemotherapy.

For patients whose recurrences or metastases are too large or numerous to remove completely, treatment options depend on whether they previously had any adjuvant therapy and, if so, how soon after completion of adjuvant therapy the recurrence was detected.

THERAPY (continued)

Completely remove recurrent or metastatic cancer when possible



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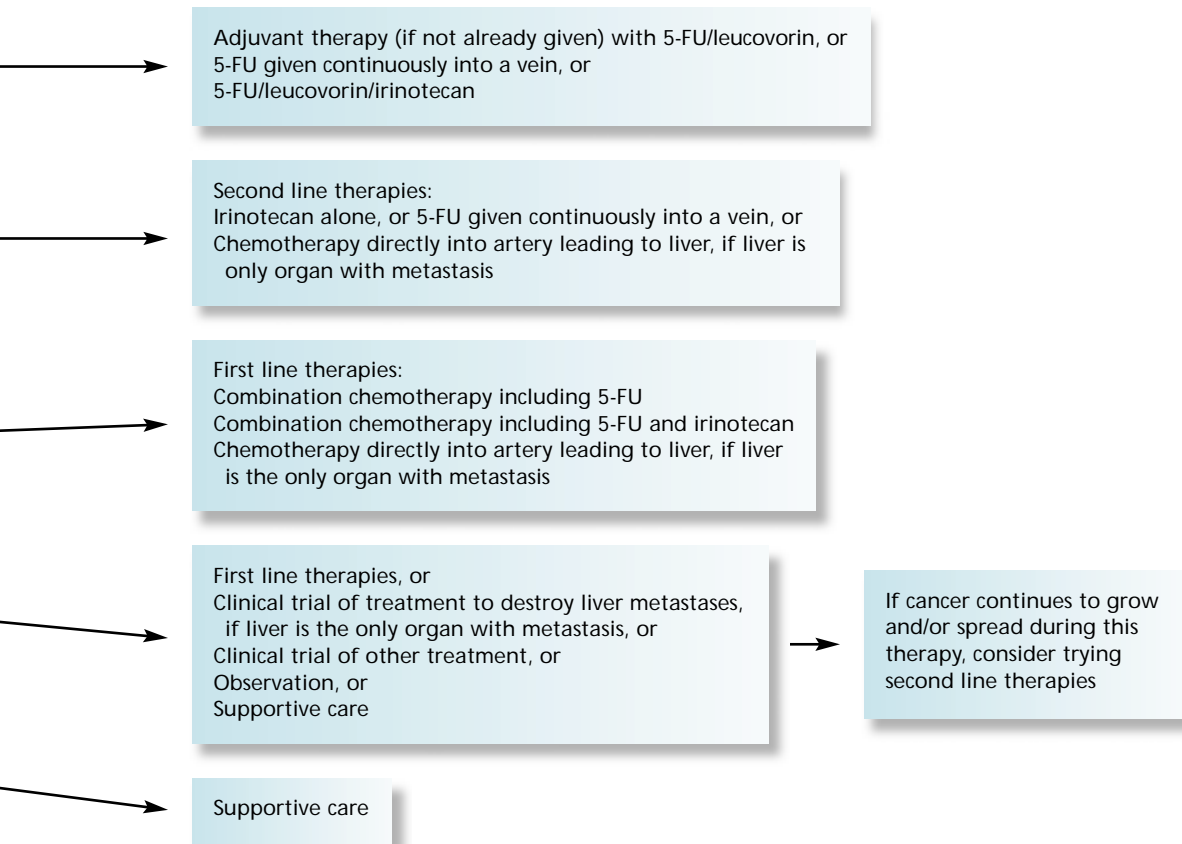
Participating in a clinical trial is an appropriate option for people with any stage of colorectal cancer. Taking part in the study does not prevent you from getting other medical care you may need.

For patients whose cancer progresses during adjuvant therapy or within 6 months of completing adjuvant therapy, and who are in good general health; second line salvage therapies such as irinotecan or 5-FU given by continuous infusion into a vein or given directly into the hepatic artery (the artery that supplies blood to the liver) are options.

For patients whose cancer progresses more than 6 months after completing adjuvant therapy and who are in good general health, first line therapies are given. These include 5-FU chemotherapy, or combination chemotherapy with 5-FU and irinotecan, or chemotherapy given directly into the hepatic vein, if the liver is the only organ with resectable metastases.

Decision Tree for Recurrent Colon Cancer (continued)

SALVAGE THERAPY OF RECURRENT OR METASTATIC CANCER



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For patients who have never had chemotherapy and are in good general health, first-line therapies, supportive care, or observation are all options. New forms of chemotherapy given into the artery leading to the liver, new techniques for ablation of liver metastases, new immunotherapy approaches, or other new

ways to treat colon cancer may be available through clinical trials, and may be an especially worthwhile option for these patients.

For patients who have never had chemotherapy and are in poor health, supportive care that focuses on relieving symptoms but is not expected to destroy the cancer is recommended.

CLINICAL PRESENTATION

**WORK-UP
(EVALUATION)**

**CLINICAL
STAGE**

Rectal cancers that can be removed by local excision (need all of the following features):
Involve less than 40% of rectal circumference
Smaller than 4 cm (about 1½ inch)
Moveable (not stuck to deep rectal tissues)
Less than 10 cm (about 4 inches) from anal opening
Stage T1 or T2

Pathology review
Blood counts
Blood chemistry tests
CEA blood test
Endorectal ultrasound
CT scan of abdomen and pelvis
Chest x-ray
Consultation with enterostomal therapist

T1N0M0

T2N0M0

T1 or T2 or T3 Rectal cancers that cannot be removed by local excision

Pathology review
Blood counts
Blood chemistry tests
CEA blood test
Endorectal ultrasound
CT scan of abdomen and pelvis
Chest x-ray
Consultation with enterostomal therapist

T1N0M0, or
T2N0M0

T1-2N1M0, or
T1-2N2M0, or
T3N0-2M0

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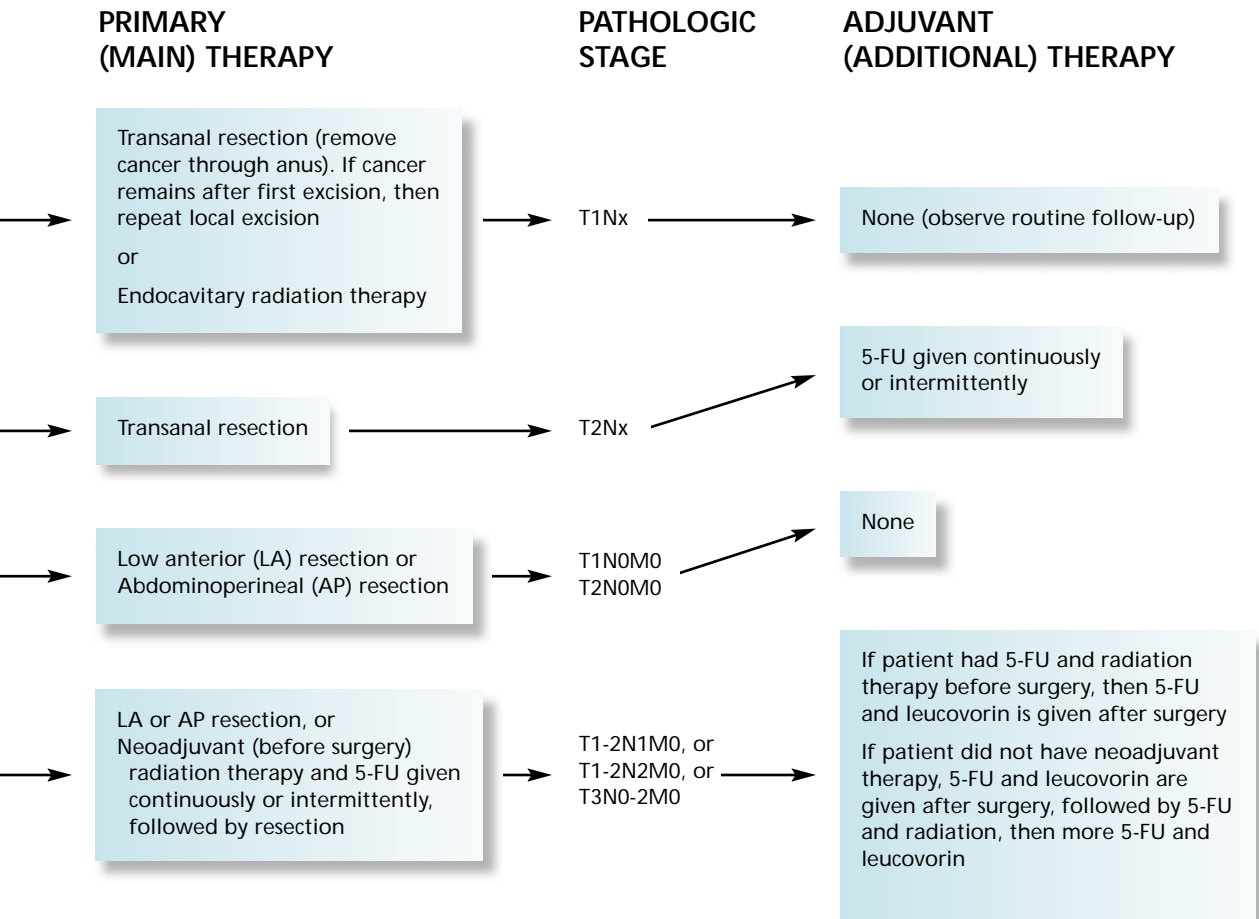
T1, T2, AND T3 RECTAL CANCER WITHOUT DISTANT METASTASIS

Selecting treatment for patients with rectal cancer involves considering many factors. These factors are considered in a stepwise manner, starting with the clinical presentation (the doctor’s initial impression of the patient’s

medical situation) and clinical stage (estimate of how far the cancer has spread based on physical examination and imaging test results).

The work-up (evaluation) for patients with T1, T2, or T3 rectal cancer consists of a

Decision Tree for T1, T2, and T3 Rectal Cancer without Distant Metastases



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pathology review, blood counts, blood chemistry tests, carcinoembryonic antigen (CEA) blood levels, CT scans of the abdomen and pelvis, a chest x-ray, and an endorectal ultrasound examination. NCCN guidelines also recom-

mend that people with rectal cancer be referred to an enterostomal therapist (a health care professional, often a nurse, trained to help people with their colostomies) as part of their initial work-up.

The cancer's clinical stage, its size, its exact location within the rectum, and what percentage of the circumference (perimeter) of the rectum it involves will determine whether local or transanal resection is an option for removing the cancer. The main advantage of this procedure is that it avoids the need for a colostomy. After local or transanal resection, careful microscopic examination of the tissue that has been removed is essential to determine whether the cancer has been completely removed. If cancer cells are present at the edge

of the tissue or very near to the edge, doctors say that there are positive margins or close margins. In either case, the surgeon may need to remove additional tissue by another local resection or by a low anterior (LA) or abdominoperineal (AP) resection. Endocavitary radiation therapy (given through the anus) is another sphincter-sparing option (that is, it avoids a colostomy) for some patients with T1 rectal cancer.

Depending on the exact location of their cancer within the rectum, patients with T3

NOTES

Decision Tree for T1, T2, and T3 Rectal Cancer without Distant Metastases (continued)

cancers, and those patients with T1 or T2 cancers who do not meet the requirements for local resection (described in the decision tree) will have LA resection or AP resections. Cancer in the upper part of the rectum can often be treated by LA resection. After this surgery, the patient can eliminate solid waste in the usual manner. For cancers of the lower part of the rectum near the sphincter (muscle responsible for bowel control), an AP resection may be needed, and waste is eliminated through a colostomy. Patients with tumors

extending through the rectal wall muscle (T3), or with spread to one or more lymph nodes receive adjuvant therapy with radiation and 5-FU given at the same time. This treatment may be given before (neoadjuvant) or after (adjuvant) the surgery. If the cancer has spread to lymph nodes, patients will also receive adjuvant therapy alone after the radiation.

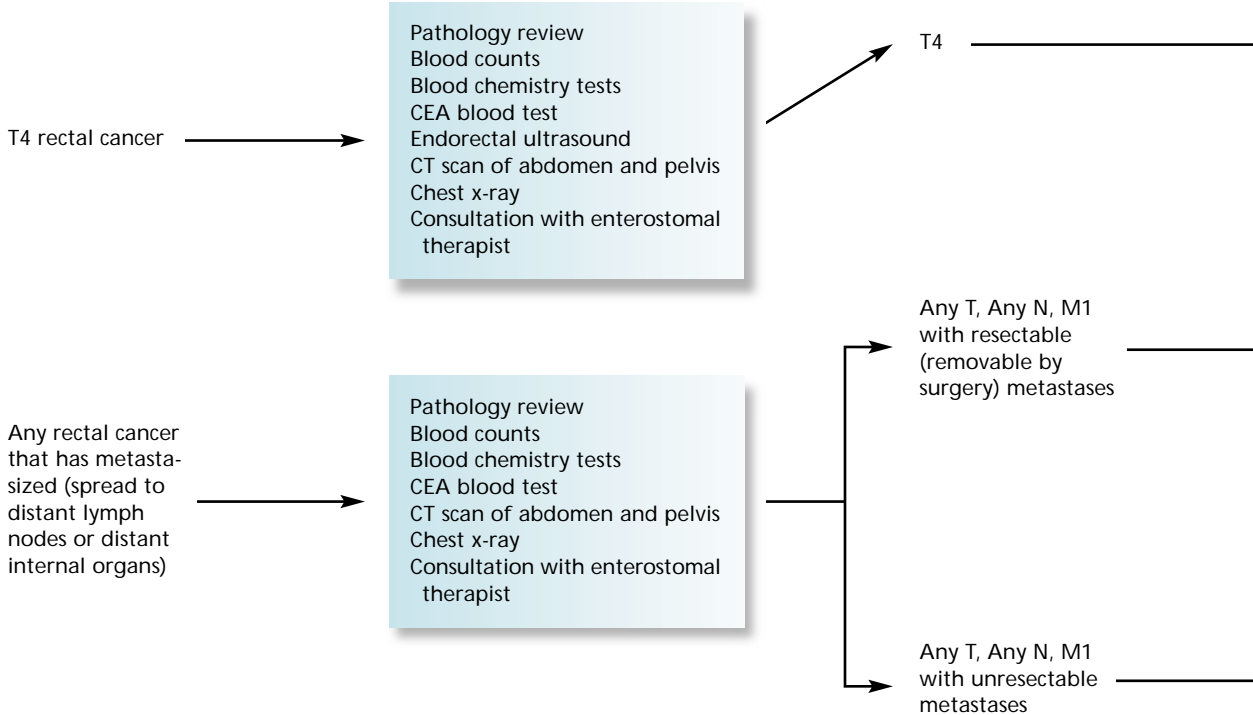
As noted in the decision tree, decisions regarding adjuvant (additional) chemotherapy and radiation therapy are based on the T category and the N category.

NOTES

CLINICAL PRESENTATION

WORK-UP (EVALUATION)

CLINICAL STAGE



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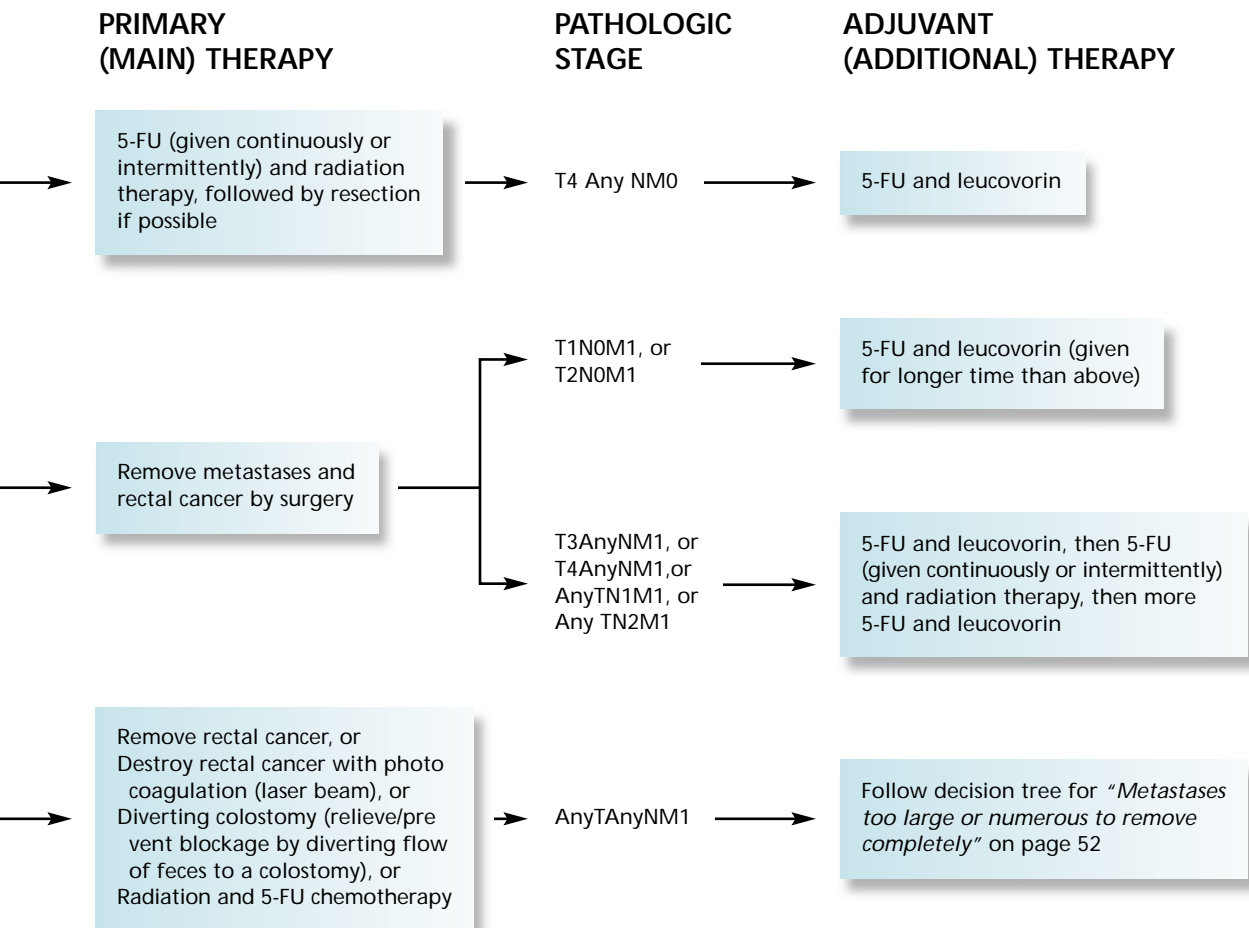
Participating in a clinical trial is an appropriate option for people with any stage of colorectal cancer. Taking part in the study does not prevent you from getting other medical care you may need.

T4 RECTAL CANCER AND T1-4 RECTAL CANCER WITH DISTANT METASTASIS

The initial work-up (evaluation) for patients in these categories is similar to that for patients with T1, T2, or T3 rectal cancer, and consists

of a pathology review, blood counts, blood chemistry tests, blood CEA levels, CT scans of the abdomen and pelvis, a chest x-ray, and an

Decision Tree for T4 and/or M1 Rectal Cancer



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endorectal ultrasound examination. NCCN guidelines also recommend that people with rectal cancer be referred to an enterostomal

therapist (a health care professional, often a nurse, trained to help people with their colostomies) as part of their initial work-up.

The guidelines recommend that people with T4 rectal cancers and no apparent distant metastases have neoadjuvant (before surgery) 5-FU chemotherapy and radiation therapy, followed by resection, if the cancer can be removed completely by surgery. Adjuvant chemotherapy (after surgery) with 5-FU and leucovorin is also recommended.

Treatment options for people whose colorectal cancer has spread to distant organs such as the lungs or liver (M1 cancers) depend on whether imaging tests suggest that the metastases can be removed completely by surgery. If so, removal of metastases is followed by adjuvant therapy. If the rectal tumor has not invaded the bowel wall very deeply (T1 or T2 tumors)

NOTES

Decision Tree for T1 and/or M1 Rectal Cancer (continued)

adjuvant chemotherapy consists of 5-FU and leucovorin. If the cancer invades more deeply (T3 or T4 tumors) adjuvant therapy involves 5-FU and leucovorin, then 5-FU and radiation therapy, then more 5-FU and leucovorin.

Patients with metastases that are unresectable (cannot be completely removed by surgery) have several options for treatment of the rectal tumor. It may be surgically removed,

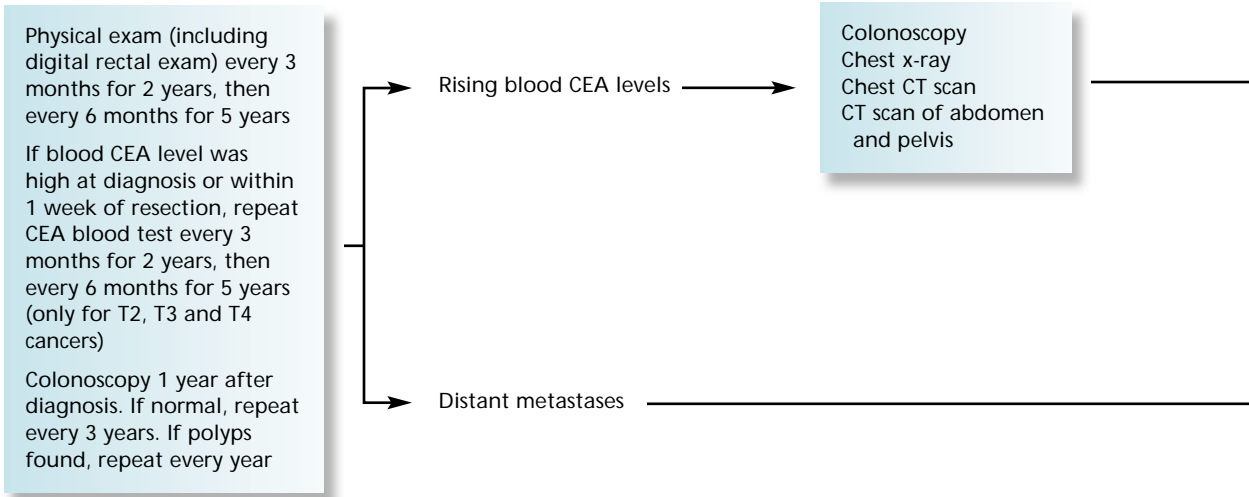
destroyed by photocoagulation (heating with a laser beam), bypassed by use of a diverting colostomy, or treated by radiation therapy together with 5-FU chemotherapy. After one of these treatments is given, the patient may also receive additional chemotherapy, according to the decision tree for “*Metastases too large or too numerous to remove completely,*” which is continued on pages 51 and 52.

NOTES

FOLLOW-UP TESTS AND EXAMINATIONS

RECURRENCE

**RECURRENCE WORK-UP
(Evaluation if cancer is suspected to have come back after treatment)**



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FOLLOW-UP FOR RECTAL CANCER RECURRENCE

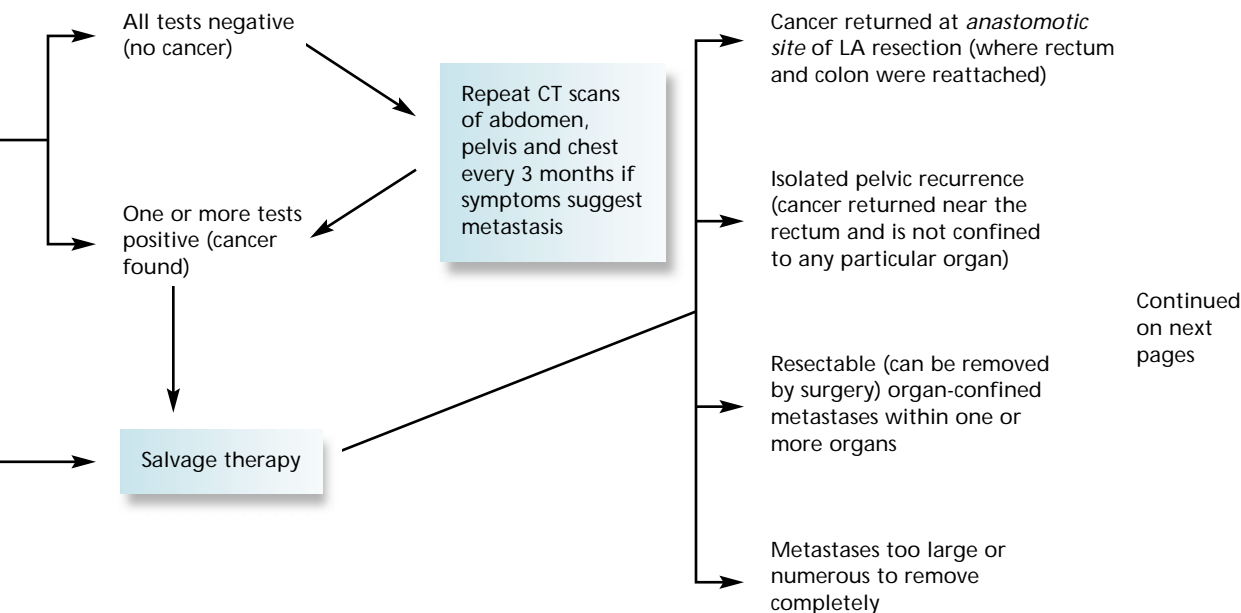
After initial surgery or radiation therapy and, in some cases, adjuvant treatments are finished, follow-up tests are routinely done. The purpose of these tests is to find rectal cancer that has recurred (come back) as soon as possible, when further treatments are most likely to be helpful. Since people cured of one rectal cancer are at increased risk for developing a second cancer of the rectum or colon, early detection of second cancers is another goal of

follow-up testing. Unlike recurrence, in which cancer cells remaining after treatment form additional tumors, second cancers develop from previously benign areas of the colon or rectum. The side effects of the initial treatment are also monitored.

The DRE and colonoscopy are used to detect local recurrences or new cancers, respectively. The CEA blood test, described in the section on evaluation, is often useful in detecting recurrent cancer. However, some rare colorectal cancers do not produce enough CEA to cause elevations in blood levels.

Decision Tree for Follow-up of Rectal Cancer Recurrence

RECURRENCE WORK-UP (continued)



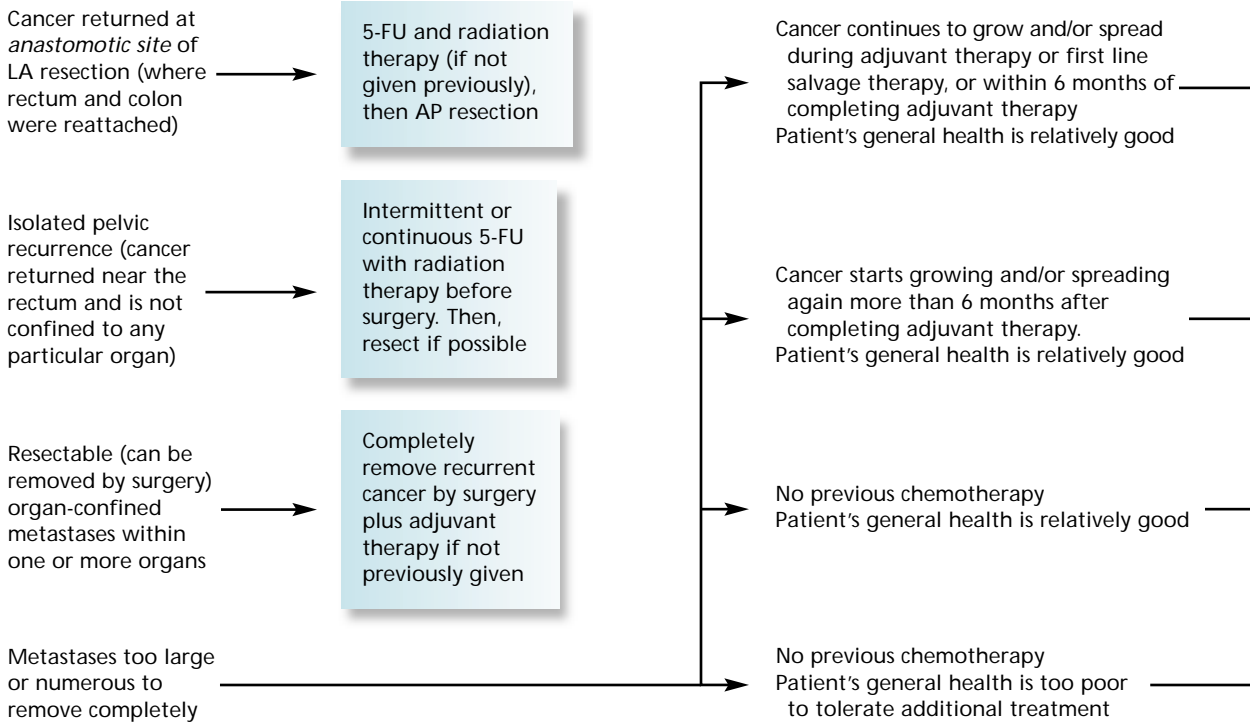
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Finding a mass by DRE or detecting steadily rising CEA levels strongly suggest that a rectal cancer is recurring, and indicate the need for a thorough search for the recurrent cancer. This search includes colonoscopy, chest x-rays, and CT scans of the chest, abdomen, and pelvis. If no cancer is found, these tests are repeated at regular intervals.

If a mass likely to be recurrent cancer is detected by imaging tests, a biopsy may be done to be certain that the mass is due to cancer and not some other type of disease. In most

cases this procedure is a needle biopsy done with CT guidance. If recurrent cancer is found by biopsy, or if metastatic cancer is detected at the time of initial diagnosis, the treatment options for patients in this situation are referred to as salvage therapy. Choosing a specific salvage therapy starts with learning the exact location, size, and number of metastases. The types of rectal cancer recurrences and their recommended salvage therapies are outlined in the “*Decision Tree for Rectal Cancer Salvage Therapy*” on page 52.

THERAPY OF RECURRENT RECTAL CANCER



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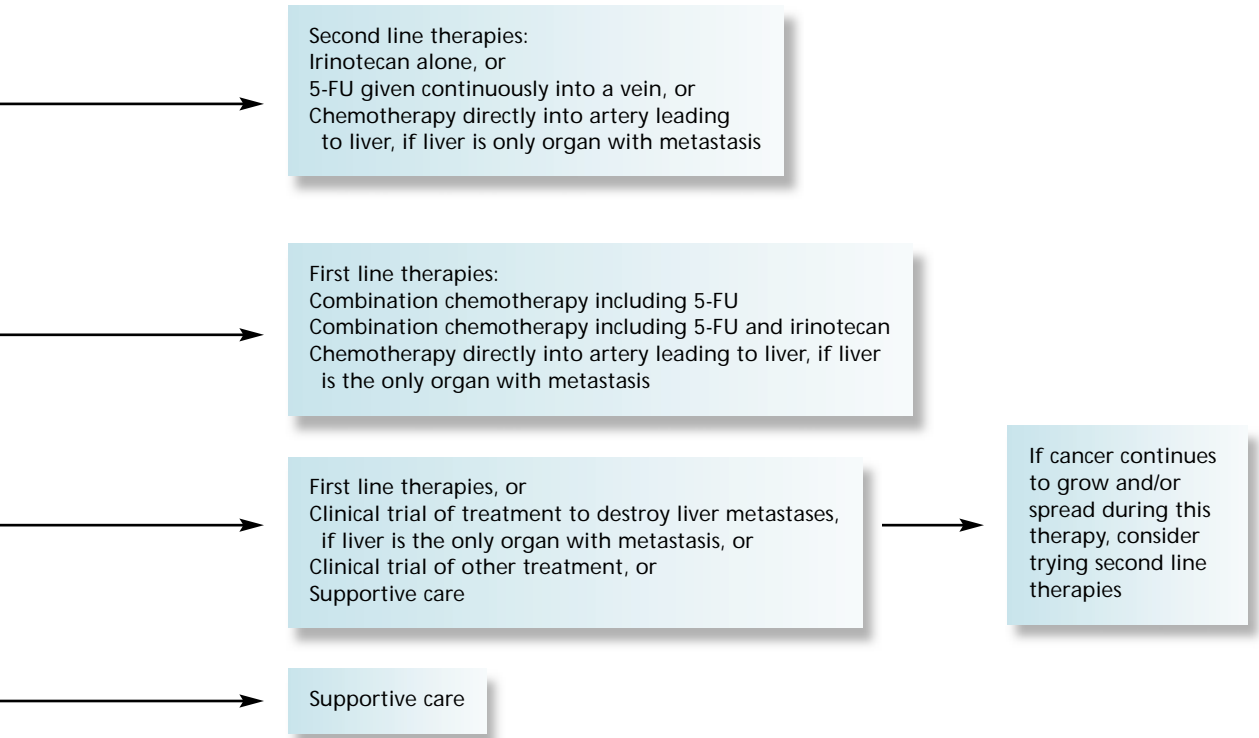
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SALVAGE THERAPY OF RECURRENT OR METASTATIC RECTAL CANCER

If recurrent cancer is proven by biopsy or if metastatic cancer is detected at the time of initial diagnosis, the treatment plan is referred to as salvage therapy.

If cancer returns at the anastomotic site (where the rectum and colon were attached following LA resection) and no metastases elsewhere are apparent, 5-FU and radiation

Decision Tree for Rectal Cancer Salvage Therapy



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therapy are given, followed by AP resection. Isolated pelvic recurrence means that cancer has returned near the rectum, is not confined to any particular organ, and has not spread to

distant organs in the abdomen (such as the liver) or chest (such as the lungs). These recurrences are treated by chemotherapy with 5-FU, followed by surgical resection, if possible.

Likewise, recurrences or metastases confined to one organ (such as the liver or lung) are removed by surgery, if possible.

Salvage chemotherapy is divided into first-line therapies and second-line therapies. The latter may be used if a rectal cancer continues to grow and spread during or shortly after adjuvant therapy, or if first-line therapies are not helping. These therapies are listed in the decision tree on pages 51–53.

For patients whose cancer continues to grow and spread during adjuvant therapy, or within 6 months of completing adjuvant therapy, and who are in good general health, second-line therapies are recommended.

For patients whose cancer continues to grow and spread more than 6 months after completing adjuvant therapy, and who are in good general health, first-line therapies are given.

NOTES

Decision Tree for Rectal Cancer Salvage Therapy (continued)

If a patient has never had chemotherapy and is in good general health, first-line therapies, a clinical trial of an investigational (experimental) treatment to destroy liver metastases (if the liver is the only affected organ), or clinical trials of other investigational treatments, or supportive care are all options. Supportive care focuses on relieving symptoms

but is not expected to destroy the cancer. If the cancer continues to grow and spread during these treatments, second-line therapies may be considered.

For patients who have never had chemotherapy and are in poor health, supportive care is recommended.

NOTES

G

ABDOMEN

The part of the body between the chest and the pelvis; it contains the stomach (with the lower part of the esophagus), small and large intestines, liver, gallbladder, spleen, pancreas, and bladder.

L

ADENOCARCINOMA

Cancer of the glandular cells, for example, those that line the inside of the colon and rectum.

O

ADENOMATOUS POLYPS
OR ADENOMA

A benign growth of glandular cells, for example, those that line the inside of the colon or rectum. There are three types of colorectal adenomas: tubular, villous, and tubervillous.

S

ADJUVANT THERAPY

Treatment used in addition to the main treatment. It usually refers to chemotherapy, radiation therapy, immunotherapy, or hormonal therapy added after surgery to increase the chances of curing the disease or keeping it in check.

S

ANASTOMOSIS OR
ANASTOMOTIC LINE

The site where two structures are surgically joined together. For example, after removal of a segment of colon containing a cancer, the ends of the colon are reconnected.

A

R

ANTIEMETIC

A drug that prevents or relieves nausea and vomiting, common side effects of chemotherapy.

Y

ANUS

The outlet of the digestive tract through which stool passes out of the body.

ASCENDING COLON

The first of the four sections of the colon. It extends upward on the right side of the abdomen and leads to the transverse colon.

BENIGN

Not cancer; not malignant.

BIOPSY

The removal of a sample of tissue to see whether cancer cells are present. There are several kinds of biopsies. In an endoscopic biopsy, a small sample of tissue is removed using instruments operated through a colonoscope.

BOWEL

The intestine.

CARCINOEMBRYONIC
ANTIGEN (CEA)

A substance normally found in fetal tissue. If found in an adult, it may suggest that a cancer, especially one starting in the digestive system, may be present. Tests for this substance may help in finding out if a colorectal cancer has recurred after treatment.

COLECTOMY

Surgical removal of all (total) or part (partial colectomy or hemicolectomy, for example) of the colon.

COLON

Part of the large intestine, the colon is a muscular tube about five feet long. It is further divided into four sections: the ascending, transverse, descending, and sigmoid colon. It continues the process of absorbing water and mineral nutrients from food.

COLONOSCOPY

A slender, flexible, hollow lighted tube about the thickness of a finger. It is

inserted through the rectum up into the colon. A colonoscope is much longer than a sigmoidoscope, and usually allows the doctor to see all of the colon's lining. The colonoscope is connected to a video camera and video display monitor so the doctor can look closely at the inside of the colon. If abnormalities are found, the doctor can take a biopsy (tissue sample) or remove polyps, using instruments operated through the colonoscope.

COLOSTOMY

An opening from the colon onto the skin of the abdomen for getting rid of body waste (stool). A colostomy is sometimes needed after surgery for cancer of the rectum. People with colon cancer sometimes have a temporary colostomy but they rarely need a permanent one.

COMPLEMENTARY THERAPY

Therapies used in addition to standard therapy. Some complementary therapies may help relieve certain symptoms of cancer, relieve side effects of standard cancer therapy, or improve a patient's sense of well-being. Patients considering use of any alternative or complementary therapy discuss this with their health care team. See also, alternative therapy.

DESCENDING COLON

The third section of the colon. It comes after the transverse colon, continues downward on the left side of the abdomen, and leads to the sigmoid colon.

DIGESTIVE SYSTEM

The digestive system, also called the gastrointestinal tract, or GI tract, processes food for energy and rids the body of solid waste matter.

ENDOCAVITARY RADIATION THERAPY

A type of radiation therapy for treating rectal cancer. The radiation beam is aimed through the anus, into the rectum.

ENTEROSTOMAL THERAPIST

A health professional, often a nurse, who teaches people how to care for ostomies (surgically created openings such as a colostomy) and other wounds.

EXTERNAL BEAM RADIATION

Radiation is focused from a source outside the body on the area affected by the cancer. It is much like getting a diagnostic x-ray, but for a longer time.

FAMILIAL ADENOMATOUS POLYPOSIS (FAP)

A hereditary condition that is a risk factor for colorectal cancer. People with this syndrome typically develop hundreds of polyps in the colon and rectum. Usually one or more of these polyps becomes cancerous if preventive surgery is not done.

FECAL OCCULT BLOOD TEST (FOBT)

A test for "hidden" blood in the stool. The presence of such blood could be a sign of cancer.

FECES

Solid waste matter; bowel movement or stool.

FINE NEEDLE ASPIRATION

In this procedure, a thin needle is used to draw up (aspirate) samples for examination under a microscope. Also called FNA. FNA is not generally used for biopsies of a colorectal tumor, but is often used to take samples of masses in the liver or other organs that might be colorectal cancer metastases.

GASTROENTEROLOGIST

A doctor who specializes in diseases of the digestive (gastrointestinal or GI) tract.

HEREDITARY NONPOLYPOSIS COLON CANCER (HNPCC)

People with this condition are at increased risk of developing colorectal cancer without first having many polyps.

IMMUNOTHERAPY

Treatments to help the immune system recognize and destroy cancer cells more effectively. These may include cancer vaccines and monoclonal antibody therapy.

INTESTINES

The digestive tract from the pylorus (lower end of the stomach) to the anus. It includes the small intestine and the large intestine, also called the small and large bowel, respectively.

INVESTIGATIONAL

Under study; often used to describe drugs used in clinical trials.

LAPAROSCOPE

A long, slender tube inserted into the abdomen through a very small incision. Surgeons with experience in laparoscopy can do some types of surgery for colorectal cancer using special surgical instruments operated through the laparoscope.

LAPAROSCOPY

Examination of the abdominal cavity with an instrument called a laparoscope.

LOWER GI SERIES

Series of x-rays taken after a barium enema is given.

LYMPHADENECTOMY

Surgical removal of lymph nodes. After removal, the lymph nodes are examined by microscope to see if cancer has spread.

LYMPH NODES

Small bean-sized collections of immune system cells that help fight infections and also have a role in fighting cancer. Also called lymph glands. Cancers of the colon and rectum may spread to regional (nearby) lymph nodes.

MARGIN

Edge of the tissue removed during surgery. A negative surgical margin is usually a sign that

no cancer was left behind near the area it was removed from. A negative surgical margin does not guarantee a cure because cancer cells may have spread to other areas of the body before surgery. A positive surgical margin indicates that cancer cells are found at the outer edge of the tissue removed and is usually a sign that some cancer remains in the body.

METASTASIS

The spread of cancer cells to distant areas of the body by way of the lymph system or bloodstream.

NEOADJUVANT THERAPY

Treatment given before radiation or surgery.

ONCOLOGY

The branch of medicine concerned with the diagnosis and treatment of cancer.

PALLIATIVE TREATMENT

Therapy that relieves symptoms, such as pain or blockage of fecal flow, but is not expected to cure the cancer. Its main purpose is to improve the patient's quality of life.

PATHOLOGIST

A physician who specializes in diagnosis and classification of diseases by laboratory tests such as examination of tissue and cells under a microscope. The pathologist determines whether a tumor is benign or cancerous, and, if cancerous, the exact cell type and grade.

POLYP

A benign growth commonly found in the rectum or the colon. Adenomatous polyps sometimes turn into cancer. Many other types of polyps (inflammatory polyps, hyperplastic polyps) do not.

POLYPECTOMY

Surgery to remove a polyp. This can often be done using instruments operated through a colonoscope.

PRIMARY SITE

The place where cancer begins. Primary cancer is usually named after the organ in which it starts. For example, cancer that starts in the colon is always colon cancer even if it metastasizes (spreads) to other organs such as liver or lungs.

PRIMARY TREATMENT

The main, and usually the first, treatment.

PROTOCOL

A formal outline or plan, such as a description of what treatments a patient will receive and exactly when each should be given. See also regimen.

RADIATION PROCTITIS

A possible side effect of radiation therapy. Problems can include pain, bowel frequency, bowel urgency, bleeding, chronic burning, or rectal leakage.

RADIOLOGIST

A doctor with special training in diagnosis of diseases by interpreting x-rays and other types of diagnostic imaging studies, for example, CT scans and magnetic resonance imaging.

RECTUM

The lower part of the large intestine, just above the anus.

RECURRENCE

Cancer that has come back after treatment. Local recurrence means that the cancer has come back at the same place as the original cancer. Regional recurrence means that the cancer has come back after treatment in the lymph nodes near the primary site. Distant recurrence is when cancer metastasizes after treatment to organs or tissues (such as the lungs, liver, bone marrow, or brain) farther from the original site than the regional lymph nodes.

REGIMEN

A strict, regulated plan (such as diet, exercise, or other activity) designed to reach certain goals. In cancer treatment, a plan to treat cancer. See also protocol.

RELAPSE

Reappearance of cancer after a disease-free period. See also recurrence.

RISK FACTOR

Anything that increases a person's chance of getting a disease such as cancer. Different cancers have different risk factors. For example, unprotected exposure to strong sunlight is a risk factor for skin cancer, smoking is a risk factor for cancers of the lung, mouth, larynx, and many other organs. Some risk factors, such as smoking or unhealthy diet, can be controlled. Others, like a person's age or family history, can't be changed.

SCREENING

The search for disease, such as cancer, in people without symptoms. For example, screening tests for early detection of colorectal cancer include digital rectal examination, fecal occult blood test, flexible sigmoidoscopy, colonoscopy, and double contrast barium enema.

SEGMENTAL RESECTION

In this surgery, the cancer and a length of normal tissue on either side of the cancer as well as the nearby lymph nodes are removed. The remaining sections of the colon are then attached back together.

SIDE EFFECTS

Unwanted effects of treatment, such as hair loss caused by chemotherapy and fatigue caused by radiation therapy.

SIGMOID COLON

The fourth section of the colon is known as the sigmoid colon because of its S-shape. The sigmoid colon joins the rectum, which in turn

joins the anus, or the opening where waste matter passes out of the body.

SIGMOIDOSCOPE

A slender, flexible, hollow, lighted tube about the thickness of a finger. It is inserted through the rectum up into the colon. This allows the doctor to look at the inside of the rectum and part of the colon for cancer or for polyps. This test may be somewhat uncomfortable, but it should not be painful.

SIMULATION

A process involving special x-ray pictures that are used to plan radiation treatment so that the area to be treated is precisely located and marked for treatment.

SMALL INTESTINE

The small intestine is the longest section of the GI tract. It breaks down food and absorbs most of the nutrients. The small intestine joins the colon.

STOOL

Solid waste matter; feces.

TRANSVERSE COLON

The second section of the colon, following the ascending colon and leading to the descending colon. It is called the transverse colon since it goes across the body to the left side.

TUMOR

An abnormal lump or mass of tissue. Tumors can be benign (not cancerous) or malignant (cancerous).

ULCERATIVE COLITIS

A type of inflammatory bowel disease. In this condition, the colon is inflamed over a long period of time. This increases a person's risk of developing colon cancer, so starting colorectal cancer screening earlier and doing these tests more often is recommended.

X-RAY

One form of radiation that can be used at low levels to produce an image of the body on film or at high levels to destroy cancer cells.

The *Colon and Rectal Cancer Treatment Guidelines for Patients* were developed by a diverse group of experts and were based on the NCCN clinical practice guidelines. These patient guidelines were translated, reviewed and published with help from the following individuals:

Al B. Benson III, MD
Robert H. Lurie
Comprehensive Cancer Center
of Northwestern University

Paul F. Engstrom, MD, FACP
Fox Chase Cancer Center

Ted Gansler, MD, MBA
American Cancer Society

Krystyna Kiel, MD
Robert H. Lurie
Comprehensive Cancer Center
of Northwestern University

Pamela McAllister, PhD
Colon Cancer Survivor

LaMar McGinnis, MD
American Cancer Society

John M. Skibber, MD
University of Texas
M.D. Anderson Cancer Center

Dia Taylor
National Comprehensive
Cancer Network

Rodger J. Winn, MD
National Comprehensive
Cancer Network

The NCCN Colon and Rectal Cancer Clinical Practice Guidelines were developed by the following NCCN Panel Members:

Al B. Benson III, MD
Robert H. Lurie
Comprehensive Cancer Center
of Northwestern University

Michael A. Choti, MD
Johns Hopkins Oncology Center

Alfred M. Cohen, MD, FACS
Memorial Sloan-Kettering
Cancer Center

James H. Doroshow, MD
City of Hope
National Medical Center

Paul F. Engstrom, MD, FACP
Fox Chase Cancer Center

Charles Fuchs, MD
Dana-Farber Cancer Institute

Phillip Gold, MD
University of Washington
Medical Center

Krystyna Kiel, MD
Robert H. Lurie
Comprehensive Cancer Center
of Northwestern University

Edward W. Martin Jr., MD
James Cancer Hospital & Solove
Research Institute
at the Ohio State University

Cornelius McGinn, MD
University of Michigan
Comprehensive Cancer Center

Nicholas J. Petrelli, MD
Roswell Park Cancer Institute

James A. Posey, MD
University of Alabama
at Birmingham
Comprehensive Cancer Center

John M. Skibber, MD
University of Texas
M.D. Anderson Cancer Center

Margaret Tempero, MD
UCSF Medical Center

Alan Venook, MD
UCSF Medical Center

Timothy J. Yeatman, MD, FACS
H. Lee Moffitt Cancer Center



National Comprehensive
Cancer Network

1-888-909-NCCN
www.nccn.org



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