We created the Colorectal Cancer Kit to highlight the key principles for you as you manage the cancer decision-making process. In it, you will find tools designed to present you with insightful information you as a patient or caregiver will find helpful in your own search for the best cancer treatment available.

Undoubtedly, many unfamiliar issues surface after a cancer diagnosis—questions and concerns you never imagined you would have to face. It’s OK to feel overwhelmed, angry or upset. Your situation requires you to make a multitude of tough decisions, often immediately. But you do have the power to make sharp, informed decisions. You have the power to take charge of your situation—but to do so, you need to sort through all of the emotions—yours and your loved ones’—assess all of the facts and identify a solution to help you get back on track.

As you flip through the following pages, you will find five sections. “Understanding Colorectal Cancer,” “Overview of Treatment Options,” “Questions to Ask Your Doctor,” “Selecting Your Treatment Hospital,” and, most importantly, the final piece entitled the “Decision Manual.”

The Decision Manual is a worksheet we offer you, to help you gain control and take a more active role in the decision-making process. It requires you to begin asking questions—hard questions—that ask what you are looking for in a hospital and a physician, the goals and expectations you bring to the treatment process and the steps you need to take to make your goals a reality. If this sounds different to you, it’s because it is different! We believe you must be a key player and a decision-maker.

At the very least, the Colorectal Cancer Kit contains useful information about hospitals, treatment options and questions you may use to assess the doctors and hospitals you visit throughout this experience. We wish you the best on your journey ahead and would be happy to hear from you if we can be of service in any way.
UNDERSTANDING COLORECTAL CANCER

According to the American Cancer Society, cancers of the colon and rectum—commonly referred to as colorectal cancer—represent the third most common form of cancer diagnosed in the United States. Understanding colorectal cancer requires you to become familiar with some basic information regarding how and why this disease develops in the body. Like all cancers, colorectal cancer originates at the cellular level. Your body consists of countless numbers of cells. Generating new cells to replace old or damaged cells allows the body to continually restore itself through this natural maintenance process. But sometimes, normal cells change and begin growing and dividing at uncontrollable rates. This uncontrolled cellular growth is called cancer.

THE COLON AND RECTUM: AN OVERVIEW

To provide some perspective on how and why colorectal cancer develops, it may be helpful to first gain insight into the anatomy, or the structure, of the colon and rectum. Commonly referred to as the large intestine, the colon occupies a portion of the abdominal area. The rectum, located at the far end of the colon, resides in the area below the hipbones commonly called the pelvis.

Situated between the small intestine and the rectum, the six-foot-long colon looks roughly like an upside down letter “U.” Four distinct segments comprise the colon: the ascending colon, the transverse colon, the descending colon and the sigmoid colon. The ascending colon extends vertically on the right side of the abdomen where it bends at a point just below the liver. Because of its proximity to the liver, this bend in the colon is called the hepatic flexure. The next horizontal section, known as the transverse colon crosses below the stomach before bending a second time on the left side of the abdomen at the splenic flexure. As it extends downward, the descending colon meets the “S”-curved sigmoid colon before finally joining the rectum.

During the digestive process, the colon receives any remaining indigestible material from the small intestine. Before this waste material passes out of the body, the colon absorbs any excess water from the waste prior to pushing the now solid waste, called stool, into the rectum. The rectum typically spans eight-to-ten inches in length and is responsible for collecting and storing waste. The presence of stool in the rectum triggers the natural feelings associated with the need to have a bowel movement. At the time of the bowel movement, the rectum passes the stool out of the body through the anus.

Hopefully, this information presents you with a clear vision of the organs this disease affects. Once you feel confident with your understanding of how the colon and rectum operate, you may begin to assess the environmental, genetic and lifestyle risk factors associated with colorectal cancer.
COLORECTAL CANCER RISK FACTORS

Six factors increase a person’s colorectal cancer risk—**age, diet, bowel habits, genetic disorders, lifestyle, and personal medical history**. What follows is a brief description of each risk factor. While the six risk factors do not provide absolute evidence to decipher exactly when or if a person will develop colorectal cancer, population studies illustrate a strong link between each risk factor and increased risk for disease.

**Age** - As a person ages, the immune system diminishes, reducing its ability to recognize, attack and kill damaged or abnormal cells. Left untouched, these abnormal cells can take root and multiply, resulting in cancer. In colorectal cancer, the *incidence*, or the rate at which the disease is diagnosed significantly increases in both men and women over age 50.

**Diet** - Diet, too, plays a role in colorectal cancer risk. Studies link a diet high in saturated fats—particularly fats derived from red meat—to a greater frequency of colorectal cancer.

**Bowel Habits** - A person’s bowel habits, or the length of time the stool sits in the colon, may contribute to cancer risk.

**Genetic Disorders** - Some people carry a genetic predisposition for developing colorectal cancer. Up to 10% of all colorectal cancer cases result from a genetic disorder—a condition that arises as a result of an error in a person’s DNA sequence. Two genetic disorders commonly linked to colorectal cancer include:

- **Hereditary Non-Polyposis Colon Cancer (HNPCC)** - HNPCC represents the most common form of hereditary colon cancer. A person carrying the HNPCC gene mutation carries an 80% chance of developing colorectal cancer at some point during his or her lifetime.

- **Inflammatory Bowel Disease (IBD)** - IBD encompasses a number of inflammatory disorders that affect the digestive tract. Although IBD can affect the entire digestive tract, the disease typically arises in the lining of the colon and rectum. Two inflammatory disorders commonly associated with IBD are *ulcerative colitis* and *Crohn’s disease*.

**Lifestyle** - Experts link a lack of exercise with a 32% greater risk of developing colorectal cancer during a person’s life. Smoking also plays a role in colorectal cancer risk. A study released by the American Cancer Society in 2001 links 12% of all colorectal cancer deaths to cigarette smoking. Apart from smoking, alcohol consumption can also contribute to colorectal cancer.

**Personal Medical History** - A person who fought colorectal cancer in the past carries an increased risk of experiencing a *recurrence*, or a return, of the disease. Similarly, any person with a personal history of cancer—regardless of the disease type—faces an increased risk for developing colorectal cancer.

Risk factors provide a series of *general* guideposts you may utilize to assess some of the *contributing factors* behind the onset of this disease. Experts develop risk factors based upon studies of *large segments* of the general population. Since each person’s body presents such a unique set of variables, it is inaccurate to flag one or more of these risk factors as “the reason” cancer developed in the body.

A medical specialist, such as a Gastroenterologist, can perform an in-depth assessment of your situation. The Gastroenterologist plays a large role in diagnosing and staging colorectal cancer. If you have questions about any of these risk factors, review this listing with your Gastroenterologist.
A colorectal cancer diagnosis may leave you with many unanswered questions. Uncovering some of these answers begins by learning the specific details of the diagnosis you receive. The term “colorectal cancer” represents a general classification used to refer to cancers of the colon and/or rectum. Your Gastroenterologist will work closely with an Oncologist—a medical doctor who specializes in diagnosing and treating cancer—to identify the primary tumor, or the specific site in the body, responsible for producing cancerous cells.

In colorectal cancer, abnormal changes can occur in the cells that line the surface of the colon and/or rectum. These changes result in two scenarios: 1) the colon and rectum do not properly shed old, damaged cells from the colorectal walls; 2) cell growth in the colon and rectum outpaces the body’s demand, or need, for new cells. As abnormal cells continue to accumulate along the surface lining of the colon and/or rectum, tiny bumps of tissue, called polyps, begin to form. These polyps initially take root along the outermost layer of the smooth, pink colon wall, called the mucosa. When a polyp grows, its fleshy mass extends outward from the colon wall into the hollow portion of the tube-shaped colon. The hollow portion of the colon is called the lumen.

Typically, colon and rectal polyps take one of two shapes—sessile or pedunculated. The sessile polyp, characterized by its broad, flat base and slightly rounded, button-shaped face, looks much like a red pimple protruding from the wall of the colon or rectum. Opposite of the sessile polyp, the pedunculated polyp assumes a broccoli-like form, with the base of its thin stalk extending from the colon wall. Capping the stalk is the polyp’s mushroom-shaped head.

Not all polyps present a definitive threat for developing into cancerous tumors. As polyps grow in size, the likelihood of malignancy increases. A polyp two-tenths of an inch in diameter carries only a one percent chance of developing into colorectal cancer, whereas a polyp three-quarters of an inch in diameter can result in malignancy in one out of every two cases.

Apart from the size of the polyp, it’s also important to gauge the polyp’s cell type. When studied under a microscope, the tissue structure of a polyp reveals whether the growth displays hyperplastic or adenomatous qualities. Hyperplastic polyps represent a group of non-cancerous growths encompassing 20% of all colorectal polyps. Opposite the hyperplastic polyp is the adenomatous polyp. Adenomatous polyps may not necessarily contain cancerous cells at the time of discovery; however, this type of polyp does contain cells known to present pre-cancerous traits when viewed under a microscope. And, in some cases, an adenomatous polyp already contains cancerous cells.

Talking to a doctor about something as serious as cancer can be intimidating, especially if you feel overwhelmed or upset about confronting the disease. Weaving an understanding of your particular type of colorectal cancer, together with knowledge of how and why the disease developed in your body, can equip you with a greater sense of control when interacting with physicians.

AN IMPORTANT NOTE ON COLORECTAL CANCER STAGING

Deciding upon a course of treatment may be the hardest, yet most important life choice a person makes during this time. Making educated treatment decisions begins by learning about the stage, or progression, of colorectal cancer in the body. A properly staged colorectal cancer, backed by second or third opinions from a different Gastroenterologist, presents you with a more clear-cut picture of where the cancer exists in your body—the first important step you can take in determining the best treatment options available to help you beat colorectal cancer.
Since the stage of the disease plays such a large role in shaping both the type of treatment and the number of potential treatment options you may choose from, it is critical for you to understand the latest methods for accurately staging colorectal cancer.

The American Joint Commission on Cancer (AJCC), in collaboration with the International Union Against Cancer (IUAC), recommend the **TNM System** to stage cancer. TNM stands for “Tumor,” “Node” and “Metastasis.” Properly staging colorectal cancer requires the know-how of a Pathologist—a doctor with special training and expertise in analyzing human cell structure. Using a microscope, the Pathologist closely examines your tissue samples, documenting cell structure, tumor size and evidence of lymph node involvement.

Before handing this *pathologic information* to the Oncologist, the Pathologist assigns a tumor **Grade (G)**. The tumor grade reflects the *appearance* of the cancer cells under the microscope. A cancer cell that appears very similar to a normal, healthy cell is said to be *well-differentiated (G1)*. In contrast, a *poorly or undifferentiated (G4)* cancer cell might have an altogether different size, shape or appearance than a normal cell. As a result, these poorly differentiated or undifferentiated cancer cells cannot complete the normal functions of a healthy cell. More aggressive tumors generally contain a high number of poorly differentiated cancer cells.

Combining this pathologic information with data obtained from surgery and other scans, helps the Oncologist determine the overall progression, or *stage*, of cancer in your body. Inserting the information reflecting Tumor, Node, Metastasis and Grade into a comparative table helps your Oncologist consolidate this information into a Roman numeral that indicates the extent of your disease. The Roman numerals 0, I, II, III and IV represent the various stages of cancer, with Stages 0 and I representing *early stage* cancers and Stages III and IV representing *late stage* cancers. Different stages of cancer call for different treatments.

### DIAGNOSTIC TESTING FOR COLORECTAL CANCER

If you’ve been diagnosed with colorectal cancer, one of the most important steps you can take today is to educate your family about the importance of colorectal screening. A listing of the tools needed to diagnose and stage colorectal cancer follows:

- **Physical Exam** - A physical exam consists of a one-on-one examination between the patient and physician. Throughout the exam, the physician will ask questions designed to clarify your current level of health and identify any symptoms and/or risk factors pointing to potential areas requiring further examination. These questions present the doctor with a person's *case history*.
- **Digital Rectal Exam (DRE)** - A digital rectal exam allows your physician to manually feel for any abnormal *polyps*, or growths, that may exist on the surface lining of the *rectum* within reach of the examining finger.
- **Diagnostic Tests** - Diagnostic tests provide images of the human body utilizing x-rays, magnets, radioisotopes, special video equipment or actual tissue samples to present physicians with an “inside” view of the colon and rectum.
  - **Fecal Occult Blood Test (FOBT)** - A Fecal Occult Blood Test studies a stool sample for evidence of *hidden*, or *occult*, blood. Minute traces of blood in the stool can serve as a primary indication of a polyp or tumor.

To ensure accuracy of the FOBT, your doctor may ask you to make a minor change to your diet two-to-three days before the actual test day. Foods containing animal blood, like red meat and blood-thinning medications like aspirin could inadvertently skew the test results. For this reason, it’s important to talk with your doctor to learn more about the specific dietary requirements for the FOBT.
- **Sigmoidoscopy** - Sigmoidoscopy utilizes a small camera attached to a thin, 25 inch-long flexible tube, called a *sigmoidoscope* to view the colon. The lubricated sigmoidoscope is slowly inserted into the rectum where it travels up the rectum and around the sigmoid colon before stopping at the top of the descending colon.

- **Double Contrast Barium Enema (DCBE)** - The process of introducing a liquid into the colon and rectum is called an *enema*. A double contrast barium enema, introduces a liquid contrast material, called *barium*, into the rectum and colon via a small tube inserted into the anus. Once inside the body, the white, chalky barium liquid conforms to the surface of the colon and rectum. Enhanced by the barium coating on the surface of the colon and rectum, an x-ray film highlights both the specific positioning of the organs, as well as any abnormalities such as polyps or tumors.

Apart from the barium contrast material, the Radiologist—a technician specially trained in administering diagnostic tests—will gradually introduce air into the colon. As the air pressure builds, it causes the walls of the colon and rectum to *distend*, or swell. Enlarging the colon and rectum with air provides a sharp, crisp x-ray image of the colon and rectum.

- **Colonoscopy** - Like sigmoidoscopy, colonoscopy utilizes a small camera attached to a thin, flexible tube, called a *colonoscope*, to provide the Gastroenterologist with video images of the colon wall. The colonoscope extends to a length of 60 inches, doubling the length of the scope used in a sigmoidoscopy. The extra length of the colonoscope allows the Gastroenterologist to explore the *entire* length of the colon and rectum without making a single incision into the abdomen.

A tiny light illuminates the *lumen*, or the hollow portion of the colon. The light allows the camera to transmit images of the colon walls and any abnormal growths or polyps—to a closed-circuit TV monitor where the Gastroenterologist may study the polyps.

If necessary, the sigmoidoscope can be equipped with a tiny *electro-cauterizing* wire loop. When placed around the base of the polyp, the Gastroenterologist introduces a small electrical current into the wire loop that simultaneously removes the polyp and *cauterizes*, or seals, the area to prevent bleeding. A suction pump captures the removed polyp, providing a tissue sample that can be studied under a microscope. Larger polyps that cannot be removed undergo biopsy.

You may receive a mild sedative to help you relax during the procedure.

- **Computerized Tomography (CT) Scans** - Computerized tomography scans utilize x-rays to create cross-sectional images of the body. Computerized tomography works by fusing x-ray technology with sophisticated computer imaging systems. Recent advances in CT scanning-speed and imaging capabilities produce precise four-dimensional images in a fraction of the time older CT machines require.

- **Positron Emission Tomography (PET) Scans** - Positron emission tomography differentiates normal cells from rapidly dividing cancer cells by measuring cellular *activity*. Injecting a small amount of a sugar-bound radioisotope into the patient's vein allows the PET scan to distinguish between normal and abnormal cellular activity by recording how the different cells burn sugar. Rapidly dividing cancer cells burn sugar at a faster rate than normal cells, distinguishing the cancer cells from healthy tissue.

PET scans enable doctors to identify distant metastatic cancer sites, providing patients and their physicians a level of information not achieved by CT scans or x-rays. Very few facilities offer this technology—you might wish to consider this when pursuing treatment options or second opinions.
○ **Virtual Colonoscopy** - Virtual colonoscopy is a research tool that allows Gastroenterologists to identify polyps without performing a traditional invasive colonoscopy. A specialized computer software program powers the virtual colonoscopy by interpreting images collected from advanced CT and MRI scans. The software then assembles these images into an electronically produced “virtual” image of the colon. Should the Gastroenterologist spot a polyp during virtual colonoscopy, a traditional colonoscopy is used to either remove or biopsy the growth for testing.

- **Complete Blood Count (CBC)** - A complete blood count calculates the quantity, type and form of red blood cells, white blood cells and platelets in the circulating bloodstream. The following section highlights the eight tests that make up a CBC analysis:
  - **White Blood Cell (WBC) Count** - White blood cells help your body fight infections. A white blood cell count measures the number of WBCs present in a one-microliter drop of blood. A “normal” white blood cell count may range from 4,100 to 10,900 WBCs per microliter of blood. Exercise habits, stress level and disease status can fluctuate these numbers.
  - **White Blood Cell Differential** - A white blood cell differential measures the percentage of the five major types of WBCs—neutrophils, lymphocytes, monocytes, eosinophils and basophils—present in a one-microliter drop of blood. The percentages represent the volume of a specific type of WBC in the blood sample. Neutrophils represent the bulk of the WBC army, comprising 50 to 60% of the body's total number of WBCs.
  - **Red Blood Cell (RBC) Count** - Red blood cells help your body transport oxygen from the lungs throughout the rest of the body. A red blood cell count measures the number of RBCs present in a one-microliter drop of blood. Red blood cell counts vary with a patient's age and sex. Men typically exhibit from 4.5 to 6.2 million RBCs per microliter of blood, whereas women normally range from 4.2 to 5.4 million RBCs per microliter of blood.
  - **Hematocrit (HCT) Assay** - Hematocrit assay measures the percentage of RBCs present in a one-microliter drop of blood. The percentage represents the volume of RBCs in the blood sample.
  - **Hemoglobin (Hgb) Testing** - Hemoglobin is an iron-rich protein in the red blood cells that binds to and carries oxygen. Hemoglobin testing assesses the body's ability to effectively transport oxygen from the lungs throughout the body by measuring the level of hemoglobin per deciliter (100 milliliters) of blood.
  - **Platelet Count** - Platelets help your body prevent bleeding or bruising. A platelet count measures the number of platelets, or thrombocytes, present in a one-microliter drop of blood. A “normal” platelet count may range from 150,000 to 400,000 platelets per microliter of blood.

The “normal” level of hemoglobin varies between men and women. Generally, men register 14 to 18 grams of hemoglobin per deciliter of blood; women usually measure between 12 to 16 grams of hemoglobin per deciliter of blood.

- **Red Blood Cell Indices** - Red blood cell indices (plural for “index”) reflect three core measurements indicative of RBC functionality:
  - Mean Corpuscular Volume (MCV) measures the size of the red blood cells in the sample.
  - Mean Corpuscular Hemoglobin (MCH) measures the hemoglobin content present in the average RBC.
  - Mean Corpuscular Hemoglobin Concentration (MCHC) measures the average concentration of hemoglobin in the red blood cells.

- **Blood Morphology and Staining** - Blood morphology and staining illustrates cell shape and structure, as well as the appearance of the nucleus under a microscope. Applying a special stain to the blood sample allows the doctor to note abnormalities or deficiencies exhibited by the cells.
• **Carcinoembryonic Antigen (CEA) Testing** - CEA testing assays, or measures, a blood sample for the presence of carcinoembryonic antigen (CEA). Normally, the blood of a healthy adult contains only a low level of CEA. Studies show heavy smokers and people diagnosed with colorectal or pancreatic cancers, exhibit unusual levels of CEA in their bloodstreams.

CEA testing is **NOT** used to diagnose colorectal cancer; rather, this measurement helps your Gastroenterologist and Pathologist more thoroughly understand the overall involvement of the disease in the body after the diagnosis is officially confirmed.

Upon completing treatment, your doctor may recommend using a CEA test to monitor the success of a particular form of therapy. Decreasing CEA levels indicate the current course of treatment is working; should CEA levels gradually increase after successful treatment ends, this can be a sign of recurrent cancer. Talk to your Gastroenterologist to learn more about how CEA testing may work for your situation.

### OVERVIEW of TREATMENT OPTIONS

Today, more than ever, patients have access to an array of colorectal cancer treatment options. The sheer number of available options makes understanding the basic treatments an extremely important component of your decision-making process. Exploring this wide range of treatment options requires a general understanding of three traditional treatment modalities—surgery, radiation therapy and chemotherapy. New, emerging therapies constitute a fourth group of therapies you may examine prior to selecting a treatment option that's right for you.

Here is some basic information about the four treatment categories. Keep in mind, selecting a treatment is not only important but a highly personal decision. Colorectal cancer takes years to develop from a single cell into its present state. Taking extra time to review treatment options with family members or other close friends may help you feel more comfortable and confident before proceeding with treatment.

• **Surgery** - Surgery is the oldest and the most common form of colorectal cancer treatment. Nearly sixty percent of all cancer patients undergo some form of surgical treatment. Surgery is often used in conjunction with radiation therapy and/or chemotherapy. Before pursuing surgical treatment, patients should always obtain a second medical opinion from a different specialist. Surgery is permanent—therefore, it is critical for care providers to conduct thorough laboratory and diagnostic work to ensure the cancer is confined to the surgical area.

A brief listing of colorectal cancer surgical procedures follows:

- **Colon Resection (Colectomy)** - Colon resection is an inpatient procedure involving the surgical excision of the cancerous portion(s) of the colon. To ensure all of the cancerous tissue is removed, the Surgical Oncologist—a doctor with special training and expertise in performing cancer surgery—will also remove a small portion, or a margin, of healthy colon tissue.

When viewed under a microscope, the surgeon will classify the margin of healthy tissue in three ways:

1. **Negative Margin** - A negative margin means the cancer does not border the outer edge of the tissue sample. Surgical Oncologists typically prefer a 1 cm margin of healthy tissue between the cancer and the remaining colon.

2. **Positive Margin** - A positive margin means the cancerous growth exceeds, or extends beyond the outer edge of the tissue sample. Depending upon a patient’s condition and health status during surgery, the Surgical Oncologist will decide whether or not to remove additional colon tissue.
3. **Close Margin** - A close margin means the cancer exists *near the edge* of the tissue sample. The Surgical Oncologist may *resect*, or remove, additional healthy tissue before reconnecting the two segments of healthy colon tissue with special thread-like fibers called *sutures*.

Apart from removing a portion of the diseased colon, the Surgical Oncologist also removes a number of surrounding lymph nodes during the colectomy surgery. The lymph nodes are sent to the pathology laboratory where a Pathologist studies the lymph nodes under a microscope, and assesses the nodes for the presence of cancerous cells. This is a critical step to ensure the disease is properly *staged*.

- **Colostomy** - Colostomy is created as an *inpatient* procedure used to connect a segment of the colon to the skin of the abdomen. A severely diseased colon may warrant the removal of a large section of the organ. If the Surgical Oncologist cannot reconnect the healthy portions of the colon, an artificial opening, called a *stoma*, must be created in the lower abdomen to allow the body to eliminate waste.

- **Laparoscopic Colectomy** - Laparoscopic colectomy is an *inpatient* procedure that serves as an alternative surgical procedure to conventional colorectal cancer surgery. Laparoscopic colectomy employs a thin tube equipped with a camera, called a *laparoscope*, to provide the Surgical Oncologist with an *interior* view of the abdominal cavity. A small 1/2 inch-long incision made above the belly button provides an entry point for the laparoscope. After inserting the laparoscope, the Surgical Oncologist introduces carbon dioxide gas to inflate the abdomen, thereby enhancing the laparoscope’s field of vision prior to the operation. Inflating the abdomen permits the Surgical Oncologist to study both the colon and nearby organs such as the liver and lymph nodes for evidence of cancer.

With the abdominal cavity inflated, the Surgical Oncologist cuts a series of four or five strategically placed “keyhole” incisions around the abdominal cavity. Ranging in length from 5 to 10 millimeters, these tiny incisions provide vital access points for surgical instruments, allowing the Surgical Oncologist to complete the surgery without opening the abdominal wall. This reduces recovery time and minimizes the scarring and post-operative pain often associated with “open” colectomy surgery.

Laparoscopic colectomy requires the expertise of an experienced surgeon and it does not stand as an option for all colorectal cancer patients. Talk with your doctor to learn if laparoscopic surgery may serve as a potential treatment option for you.

- **Rectum Resection (Proctectomy)** - Rectum resection is an *inpatient* procedure involving the surgical *excision*, or removal, of the diseased portion(s) of the rectum. What follows is a brief description of the two forms of rectum resection commonly used for stage I, II and III rectal cancers:
  1. **Low Anterior Resection (LAR)** - Low anterior resection involves the surgical removal of cancers located in the *upper portion* of the rectum—the part of the rectum closest to the S-shaped *sigmoid* colon. After removing the diseased portion of the upper rectum, the Surgical Oncologist connects the sigmoid colon with the remaining healthy tissue located in the lower portion of the rectum. This connection allows solid waste, or *stool*, to pass out of the body through the anus.
  2. **Abdominoperineal Resection (APR)** - Abdominoperineal resection is reserved for cancers located in the *lower portion* of the rectum. Since APR requires the Surgical Oncologist to remove the section of the diseased rectum nearest the anus, some or all of the doughnut-shaped *sphincter muscle* may also be removed. Located just above the closure of the anus, the sphincter muscle is responsible for bowel control. When the sphincter muscle is removed, the Surgical Oncologist must create a new way for the body to excrete waste. Using a procedure called a *colostomy*, the Surgical Oncologist fashions an artificial opening, called a stoma, in the lower abdomen. Solid waste passes out of this opening into a special disposable bag.

- **Laser Endoscopy** - Laser endoscopy stands as a treatment option for a person with an inoperable or extremely bulky rectal tumor. An inpatient procedure, laser endoscopy utilizes a thin, flexible tube called
an endoscope to deliver therapy. Packed with a powerful laser, a light and a tiny camera, the lubricated endoscope is inserted into the anus and properly positioned to provide the Surgical Oncologist with a clear view of the rectal tumor.

With the endoscope in place, the Surgical Oncologist targets the tumor and activates a high-energy laser beam to destroy or, in some cases, de-bulk the cancerous mass. The heat generated by the laser sterilizes and cauterizes, or seals the tumor site, thus minimizing the amount of post-operative bleeding.

- **Radiofrequency Ablation (RFA)** - Radiofrequency ablation leverages the power of microwave technology to destroy metastatic colorectal cancer. Since the blood supply from the diseased colon feeds into the liver before traveling into the lungs, these two organs are commonly affected by metastatic disease. RFA may be administered *through the skin* in what is called a *percutaneous* treatment, or during an open surgical procedure.

A special catheter, equipped with a tiny set of two-to-four retractable steel prongs serves as the treatment delivery mechanism. Once in place, the Surgical Oncologist engages the steel prongs from the tip of the catheter. High-energy microwaves transmitted from the prongs to the tumor super-heat the cancerous tissue, subsequently killing the cancerous cells.

- **Radiation Therapy** - Radiation therapy works by utilizing high-powered x-rays, gamma rays or electron beam radiation to target and destroy rapidly dividing cancerous cells located in a very specific, localized site of the body.

Recent technological advances in diagnostic imaging machinery allow *Radiation Oncologists*—doctors who specialize in the planning and delivery of radiation therapy—to map a cancerous site and deliver precise beams of radiation right where patients need it most. **Differences do exist in the quality of radiation equipment; therefore, patients should always look for a treatment facility with the latest diagnostic equipment and radiation machinery.** Radiation therapy is often used in conjunction with surgery and/or chemotherapy.

A brief listing of radiation therapy options follows:

- **3-D Conformal Radiation Therapy** - 3-D conformal radiation therapy is an *external* form of radiation therapy utilizing computed tomography (CT) planning to image and reconstruct the tumor and surrounding normal tissues in three dimensions using a computer program. This technology allows the radiation oncologist to *conform* the radiation beam(s) to specific target areas, such as the pelvis.

- **Intensity Modulated Radiation Therapy (IMRT)** - IMRT represents an advanced form of *external* 3-D conformal radiation therapy. Employing a powerful computer program to plan the precise dose of radiation in three dimensions, radiation oncologists may vary the *conformance* and *intensity* of ultra-thin radiation beams onto specific cancerous sites. Our cancer experts tell us they are able to use higher radiation doses than traditional methods would allow in these areas, and yet spare more of the surrounding healthy tissue, compared to standard radiation therapy.

- **Chemotherapy** - Chemotherapy is a broad term relating to a group of medications designed to damage a cancer cell's ability to grow. *Medical Oncologists*—doctors who specialize in treating cancer with different types of drugs and chemotherapy—oversee this aspect of cancer treatment. Patients may receive chemotherapy orally or through an intravenous (IV) administration. Chemotherapy may be administered throughout the treatment process. Sometimes, *neoadjuvant chemotherapy*—chemotherapy administered prior to a primary treatment like surgery—can increase the effectiveness of the primary treatment. Likewise, chemotherapy administered after a primary treatment, called *adjuvant chemotherapy*, can reduce the likelihood of tumor spread or cancer recurrence.
Unlike radiation therapy, conventional chemotherapy is a systemic treatment carried throughout the entire body by the bloodstream. New medications help to control side effects and, with the proper comprehensive team of experts, the side effects can usually be managed and minimized. Chemotherapy is often used in conjunction with surgery and/or radiation therapy.

Today, you and your doctors may choose from an array of chemotherapies. Each unique case requires the oncologist to identify the most effective form of chemotherapy available to treat your particular form of colorectal cancer.

Determining the appropriate chemotherapy sometimes requires oncologists to test tissue samples for chemosensitivity or chemoresistance. Chemosensitivity and chemoresistance testing reveal how your cancer cells react to various chemotherapeutic agents prior to administering the actual dose. Information obtained via these two tests allow the Oncologist to select only those chemotherapeutic agent(s) showing positive results when delivered to your tissue samples.

Chemotherapy can also be delivered differently to enhance effectiveness:
- **Fractionated Dose Chemotherapy** - Fractionated dose chemotherapy utilizes a standard dose of chemotherapy and divides this standard dosage over a three-to-five day period. The smaller dosages minimize the side effects of this powerful medicine while maximizing the intensity of the treatment by exposing cancerous cells to chemotherapy for a longer period of time.

- **Emerging Therapies** - In the hands of a skilled physician, emerging therapies represent promising new treatment options available in select hospitals across the country. Immunotherapies, including Monoclonal Antibody Technology (MoAb), represent one prominent emerging therapy now available to people with colorectal cancer. Typically, you and your physicians may turn to an emerging therapy in three different situations: after exhausting all surgical, radiation and/or chemotherapy options; when your physician determines traditional therapies will no longer improve your condition; or when you may benefit from an emerging therapy used in conjunction with other conventional treatments.

A brief listing of emerging therapies follows:
- **Monoclonal Antibody Technology (MoAb)** - Monoclonal antibody technology represents one prominent immunotherapy aimed at leveraging the body's natural immune response to recognize, attack and kill cancer cells.

  Triggering this immune response requires the presence of a special protein called an antibody. Antibodies work like biological “fingerprints.” Upon detecting an antigen—a virus, a bacterium or a cancer cell—your immune system responds, deploying white blood cells, or lymphocytes, to mark the antigen with an antibody. The antibody clearly identifies the antigen as “FOREIGN” allowing the body to quickly and efficiently target and destroy the abnormality.

  Using a laboratory process, scientists can bioengineer large quantities of pre-programmed antibodies to recognize and bind to a specific antigen, like a cancer cell. These laboratory-produced monoclonal antibodies can be used alone, or in combination with other therapies to deliver drugs, toxins or radioactive material directly to the cancer cell.
Apart from the four main treatment modalities, some hospitals offer special services such as Guided Nutritional Support and Pain Management programs designed to enhance the effectiveness of a person’s therapy.

- **Guided Nutritional Support** - Guided Nutritional Support is a type of clinical nutrition program designed to accomplish three main objectives:
  1. **Address malnutrition** - Studies show fifty percent of people diagnosed with cancer have already lost weight at the time of diagnosis.
  2. **Prevent loss of lean muscle mass** - More than simply losing fat stores, people with cancer often lose lean muscle mass. Losing lean muscle can impact a person's ability to tolerate chemotherapy and may reduce the body's ability to eliminate the toxicities associated with powerful cancer therapies like chemotherapy and radiation.
  3. **Enhance strength and quality of life** - Length of hospital stay, response to chemotherapy, wound healing and immune function can be directly linked to a person's nutritional status.

Malnutrition and the loss of lean muscle mass associated with undernourishment account for more than one-third of the annual cancer deaths in the United States. To reverse this trend, the nation's leading healthcare standards-setting organization, the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO), recommends a team approach for administering nutritional support to people living with cancer.

Under JCAHO guidelines, a dietician, together with a nurse and an oncologist, should work collaboratively to ensure a person's nutritional needs are met. For people with colorectal cancer, decreasing the amount of animal protein and saturated fats in the diet and replacing these high-risk foods with sources of plant-based, colon cancer-fighting nutrients such as fiber, soy and carotenoid-containing foods like spinach and carrots can help change the chemical environment inside of the body where colorectal cancer develops.

- **Pain Management** - Pain Management is a specialized form of medicine that focuses upon alleviating pain, nausea or any number of other side effects you may experience during treatment. Few hospitals offer a dedicated Pain Management Department—but regardless of this trend, effectively managing any pain a person experiences during therapy is necessary for optimal treatment. Unmanaged pain can interfere with your sleep patterns, lower your appetite and alter your treatment schedule.

Ask your doctor to discuss the Pain Management programs available at your current hospital or at the hospital where you are considering receiving a second opinion consultation.