We have written this guide for people who have been diagnosed with colorectal cancer as well as for people with general questions about the disease. A diagnosis of cancer can be devastating. We hope that this guide provides you with useful information and support during this stressful time. We encourage you to take an active role in your treatment and in your recovery. Feel free to share this guide with your friends and family. It may answer some of their questions too.

This guide is the result of the work of many dedicated nurses, doctors, pharmacists and patients. We thank them for their valuable input and tremendous help.
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Glossary

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introduction

Colon cancer, bowel cancer and rectal cancer – these are probably words that you never thought you’d hear. Shock, fear or anger are normal reactions. It takes time to understand what is going on and what it all means.
The colon and rectum are areas of the body that no one really talks about. You may feel embarrassed and awkward, but remember you are not alone.

Living with cancer has been compared to a journey or travelling into unknown territory. Once you learn more, you may feel as though you have regained some control. This guide is designed to be a road map for people who have been diagnosed with colorectal cancer – cancers of the colon and rectum. Written with the help of healthcare professionals and people with colorectal cancer, we hope it provides you with some valuable information for your journey.

This guide contains information about the digestive system, diagnosis and treatment of colorectal cancer, as well as suggestions about how to cope with your treatment and life beyond it. Share it with your friends, family or anyone who is interested in colorectal cancer. It may help answer some of their questions too.

While this guide cannot supply you with all the answers, we trust it will provide you with some. Also, we hope it will encourage you to discuss your questions with your healthcare team. Never be afraid to ask for more information. To remind you of important questions to ask, checklists are provided at the end of each section.

You’ll find that you may need to learn a new language for this journey so, at the back of this guide, there is a glossary to help you understand some of the new words and terms you may encounter.

Take heart in knowing that this is not a journey you are taking alone. Colorectal cancer is the second most commonly diagnosed cancer in Canada; it is the fourth most commonly occurring tumour but the second most common cause of death. The Canadian Cancer Society estimates that 22,200 new cases will be diagnosed in 2011 and 8,900 people will die as a result of colorectal cancer.1

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While the risk of Canadians developing colon cancer or dying from colon cancer has declined over the past 15 years, the total number of Canadians affected by colorectal cancer continues to rise because of the aging as well as growing population in Canada.

The good news is that, with advances in treatment and screening, the chances of a cure are high if colorectal cancer is caught early. If caught early, 90 per cent of cases can be successfully cured.

You are strongly encouraged to take someone with you to your medical appointments as there may be too much information for you to remember. A second set of ears and someone taking notes can go a long way in helping you understand all the facts.

Other sources of support are the various professionals who will make up your healthcare team. You may get tired of explaining what is going on to so many new people. You may be intimidated by the team approach. Treating cancer is complex and a cancer diagnosis will affect more than your colon or rectum. It can be stressful from a physical, emotional, spiritual, practical and financial point of view. The members of your healthcare team are all experts in their fields – they want to help you to live your life. Take advantage of their expertise and experience. No question is ever too silly or trivial.

In the next section, we briefly describe the members of the team you may meet. Keep in mind that hospitals and medical practice can vary across the country. You may meet different professionals during your treatment. The list of professionals in this guide (see page 11) is intended to be a general introduction.
Your healthcare team

A **gastroenterologist** is a medical doctor who specializes in diseases of the gastrointestinal tract: the esophagus, stomach, small intestine and large intestine. A gastroenterologist may perform your colonoscopy or sigmoidoscopy (see page 24; diagnostic imaging tests are discussed on page 27).

A **pathologist** is a medical doctor who specializes in diagnosing disease by studying tissue and cells under a microscope. A pathologist determines what type of cancer cells make up the cancerous tissue (e.g., adenocarcinoma) and provides some of the information needed for your healthcare team to stage your disease.

A **surgeon** is a medical doctor who is able to remove the cancer. The surgeon may be a general surgeon or a surgical oncologist, depending upon where you receive your treatment.

A **medical oncologist** is a medical doctor who specializes in the treatment of cancer using medications (e.g., chemotherapy, hormone therapy, biologic or targeted treatments).

A **radiation oncologist** is a medical doctor who specializes in prescribing radiation to treat cancer (the way radiation therapy is given is discussed on page 68).

Your **general practitioner** or **family doctor** will still be involved in your care and will be kept up-to-date on your progress by your oncologist. Although your general practitioner will be aware of your cancer, your oncology team will usually manage your treatment for you.

A **general practitioner in oncology (GPO)** is a family doctor who has received extra training in oncology to provide primary healthcare, including tasks customarily performed by your oncologist. This may include ordering chemotherapy (under the direction of your cancer specialist) and managing the symptoms and side effects of treatment.
An **oncology nurse** is a registered nurse who specializes in treating and caring for people with cancer and their families. You may see an oncology nurse if you are referred to an oncology unit in your local hospital, a cancer centre or satellite clinic for additional therapy, such as chemotherapy, radiation therapy or biologic therapy.

An **advanced oncology nurse practitioner** is an advanced practice nurse who provides specialized cancer care, including many tasks customarily performed by a physician. This may include managing the symptoms and side effects of treatment, counselling you about coping strategies, teaching self-care skills and monitoring your response to treatment.

A **pharmacist** is a specially trained healthcare worker who prepares, dispenses and monitors medications. A pharmacist who works in cancer care has specialized knowledge about the medications you will take as part of your treatment. Pharmacists offer advice to patients and staff about dosage, interactions, adverse effects, administration and appropriate use of medications. They can also answer questions about paying for your drugs (if this is an issue).

A **radiation technician** or **radiotherapist** performs diagnostic imaging examinations and administers radiation therapy treatments.

A **radiologist** is a medical doctor who is trained to diagnose disease by using imaging techniques such as x-ray, ultrasound, computerized tomography (CT) scanning, magnetic resonance imaging (MRI), radioisotope (nuclear medicine) scanning or positron emission tomography (PET) scanning.

A **registered dietitian** is an expert in the field of food and nutrition. A dietitian can help ensure you are eating properly when you may not be feeling hungry, offer suggestions about meals while you are recovering from surgery or help you maintain your energy levels during your treatment.
A clinical psychologist can help you and your family with the social and psychological impact of cancer. The psychologist can offer counselling either on an individual basis or in a group.

Social workers are available to offer support to you and your family. They can help you cope when you feel isolated or lonely, or they can ensure you have the financial resources you need.

A clinical trials nurse is a specially trained registered nurse who is involved in your care if you are participating in a clinical trial (e.g., a clinical investigation to test a new treatment). A clinical trials nurse organizes and records details about treatments, blood work and x-rays, and may arrange for follow-up appointments. This nurse can help you understand the treatment and provide support.

A medication funding coordinator can help you determine what drug coverage is available to help pay for your treatment.

Volunteers and support groups can help you deal with the practical side of treatment, like driving you to your appointments. Support groups can connect you to other patients who have or have had colorectal cancer. Talking to someone “who has been there” can often help you deal with the stress of your diagnosis and treatment.

“I felt that my team was listening to me – my oncologist, my own GP, and the surgeon… I was given good information and I could contact them when I had concerns. The cancer clinic was 24/7, so you could call them, too. I knew they were there and that was really important. With some of the side effects, you just don’t know what you are going through. I was glad that they were there to support me.” – Muriel, colorectal cancer patient
understanding colorectal cancer

To better understand colorectal cancer, you need to know how the colon, rectum and digestive system work.
The Digestive System

Everyone eats. It’s the way the body takes in the nutrients it needs to function. Not everything we eat is needed by the body. Your digestive system takes what you eat and absorbs the fats, proteins, sugars, vitamins and minerals your body needs. It expels what’s left.

The digestive system starts at the mouth and ends with the rectum. Once food or liquid is swallowed, it travels down the esophagus and into the stomach. In the stomach and small intestine, the food is mixed with the digestive juices and enzymes (supplied by the liver and pancreas) that break the food down into smaller parts so the body can absorb the vitamins, minerals, proteins, carbohydrates and fats.
Figure 1: The digestive system
The large intestine (the bowel) is the next stop in the digestive process. It is made up of two parts: the colon (a 1.5 metre-long tube [five feet]) and the rectum (the last six to eight inches [15 to 20 cm] of the large intestine before the anus). The colon is divided into four parts that move from the lower right quadrant of your abdomen (see Figures 1 and 2), up across the area under your ribs, down the left side of the abdomen, and then into the pelvic area to connect with your rectum. The sigmoid colon and the rectum store the feces (stool) until you are ready to have a bowel movement. Waste leaves the body by way of the anus.
As the residual material moves through the large intestine, water is absorbed to make the stool more solid. The colon uses its layers of muscle to push the material through its length. In all, the colon is made up of four layers (see Figure 3):

1. The inside lining (mucosa);
2. The layer between the inside lining and the muscle layers (submucosa);
3. The muscle layers (muscularis);
4. The outer lining (serosa).

Within the mesentery (an outer fatty layer of tissue), lymph nodes are found. These nodes act as filters in the lymph system, which is a series of tubes that move fluid and cells around the body.
Colorectal Cancer

Cancer is the uncontrolled growth of abnormal (i.e., not typical) cells. This growth can lead to the destruction of healthy tissue and normal cells. Colorectal cancer is any cancer that occurs in the large intestine (either the colon or rectum). Although there are different types of colorectal cancer, this guide focuses on adenocarcinomas (they make up over 90 per cent of colorectal cancer cases). An adenocarcinoma is a cancerous tumour that affects a gland.

Your body tries to maintain a balance by constantly making millions of cells to replace the cells that have died because of damage or age. Cancer can interfere with this balance. If a cell develops a change (mutation), it can make more cells than it needs to replace the dying cells. The out-of-control cells can form a mass of tissue called a tumour. Tumours may be benign (non-cancerous) or malignant (cancerous). If a tumour is cancerous, the tumour is able to invade nearby tissues and spread beyond where it started growing; for example, moving from the colon to the liver. When a cancerous tumour has spread, it has “metastasized.”

Nearly all colorectal cancers (99 per cent) start as polyps, which are benign tumours of the inner lining of the bowel. These polyps can grow over time and about one in 20 polyps may change into cancers, often over many years (see Figure 4). That’s why early detection is so important. If these growths are caught early, they can be removed before cancer develops or before it spreads.

You may ask what causes a polyp to become cancerous. Most often changes occur to the instructions that tell the cell when to die or divide. These changes (mutations) occur in the cell’s genetic material – the DNA.
Symptoms of Colorectal Cancer

Some colorectal cancers do not cause symptoms. Others result in blood in the stool or a change in bowel habit (e.g., diarrhea, constipation, a feeling that the bowel is not completely emptying, stools that are narrower than usual). Other symptoms include general abdominal discomfort, vomiting, fatigue and weight loss with no known reason.

Screening for colorectal cancer allows for the early detection of cancer when it is highly curable as well as the detection of growths (polyps) that might eventually become cancer. You should discuss your diagnosis and the importance of screening with your family. Please see Appendix 1 for more information on screening.
Possible Signs of Colorectal Cancer

Remember that these symptoms may be associated with other conditions. It is a good idea to have the symptom(s) investigated.

- Blood in the stool (it can be either bright red or dark in colour)
- A change in normal bowel habits (diarrhea or constipation, or both) that lasts more than a few days
- A persistent sensation that you need to move your bowels but with the ability to pass only a little stool
- A feeling that the bowel isn’t completely empty
- Stools that are narrower than usual
- Cramping, either frequent or constant, or abdominal discomfort such as bloating or fullness that lasts more than a few days
- Constant fatigue
- Unexplained weight loss
- Pale skin color (this may be related to anemia, a decrease in the number of red blood cells that leads to fatigue because you have less circulating oxygen)
Causes and Risk Factors

When people are diagnosed with cancer, they often wonder if something they did caused it. Doctors don’t know exactly what causes colorectal cancer, but some things definitely increase the risk of developing it. The risk of developing colorectal cancer increases with age, particularly in those aged 50 years and older. Although most people who are diagnosed are over the age of 70 years, it doesn’t mean that people who are younger don’t get the disease. A person’s risk for developing colorectal cancer also increases if there is a family member (mother, father or siblings) with colorectal cancer.

About 10 per cent of colorectal cancers are found in people with a hereditary condition that makes them more likely to develop colorectal cancer. These conditions include familial adenomatous polyposis (FAP) and hereditary non-polyposis colon cancer (HNPCC or Lynch syndrome). If you are related to someone with these hereditary conditions, you should be tested to see if you inherited this genetic trait and should be followed appropriately.

People in other high-risk groups make up another 25 per cent of colorectal cancers diagnosed. These high-risk groups include people who have had colorectal cancer or adenomas (benign polyps) before, people with a close relative (i.e., first-degree relative such as a mother, father or siblings) who have colorectal cancer or adenomas, and people with a previous history of cancer of the ovary, endometrium (lining of the uterus) or breast.
For people with no connection to someone who has had colorectal cancer, some additional risk factors are:

- A history of ulcerative colitis or Crohn’s disease;
- A diet high in red meat and low in fruits and vegetables;
- Obesity;
- Lack of exercise;
- Drinking alcohol;
- Smoking.

Let your family know that you have been diagnosed with colorectal cancer so they know they may be at higher risk. Caught at an early stage, colorectal cancer is highly curable. Inform them about the symptoms and the importance of screening. Suggest that your family members discuss your diagnosis with their family doctor.
important tests

The tests used to find colorectal cancer may be temporarily uncomfortable and the preparation for them unpleasant. Let’s put the discomfort and unpleasantness in perspective: Are they worth risking your life over?
Tests for Colorectal Cancer

**Digital rectal examination (DRE):** This is a test where your doctor or nurse practitioner inserts a lubricated gloved finger through the anus and into the rectum to feel for any abnormalities.

**Fecal occult blood test (FOBT)/Immunochemical-based fecal occult blood testing (iFOBT):** FOBT looks for blood hidden (occult) in your stool. Three separate stool samples are collected. The samples are then tested to find out if there is blood present. If blood is detected, it doesn’t necessarily mean that you have colorectal cancer. Blood in the stool may be caused by hemorrhoids, stomach ulcers and other conditions. If blood is detected, you may need to have other tests to find out what’s causing the bleeding.

FOBT test is recommended often in Canada as a regular screening test after the age of 50 years (or earlier for people who are at a higher risk for colorectal cancer). It is suggested that people over the age of 50 years have this test done at least every two years, even if they have no other risk factors.

iFOBT is another type of FOBT that uses antibodies to check for blood in the stool. One example of the iFOBT is the AutoFIT (FOBT-CHEK®oc), an automated version of iFOBT. While similar to FOBT, iFOBT/AutoFIT uses a different technology to detect the presence of bleeding. This may be a more accurate way to test for blood in the stools than the traditional FOBT test.

“What I did as soon as I realized that I was seeing many different doctors and that some were asking me questions, I got a binder, a little loose-leaf binder, and I started writing down everything. It has been invaluable when I’ve been seeing doctors. Every process of my medical care, I’ve been writing down who I saw, what I was treated with and what my symptoms were, everything.”

– Muriel, colorectal cancer patient
**Double contrast barium enema:** To do this special type of x-ray, a white substance (barium) is inserted into the colon. The barium coats the wall of the colon and rectum to show if there are any abnormalities present. Air is also inserted into the colon to provide the radiologist with a better picture of the area. The radiologist or x-ray technician will have you change positions to get the best possible pictures. You will then be asked to empty your bowel and more images will be taken.

For the test to provide the best images, you will need to empty your bowels before the procedure. Your doctor, nurse or x-ray department will give you instructions. Generally, you will have to take a laxative or other medication and you may be asked to start a clear liquid diet the day before the test is done.

**Sigmoidoscopy or flexible sigmoidoscopy:** During this test, a lubricated flexible tube with a light is gently inserted through your anus. The doctor can then see any polyps, tumours, or other problems in the rectum or sigmoid colon. You will be given instructions on how to empty your bowels before the test to ensure the best results. If polyps are discovered, you will need to undergo a colonoscopy to look for other polyps.
**Colonoscopy:** A colonoscopy is similar to a sigmoidoscopy but it allows the doctor to look in both the rectum and the entire colon. Any polyps found during a colonoscopy can be removed and studied by the pathologist. Because this test is more involved, you will be sedated during the procedure. You will be provided with specific instructions on how to completely empty your colon to ensure a clear view.

**CT colonography (virtual colonoscopy):** With this test, special x-ray equipment is used to produce pictures of the colon and the rectum. These pictures are then assembled by a computer into detailed images that can show polyps and other abnormalities. As this test is less invasive than the standard colonoscopy and sedation is not needed, the virtual colonoscopy may cause less discomfort as well as take less time to perform.

**Biopsy:** A biopsy samples a piece of tissue. A pathologist studies it under a microscope to see if cancer is present. With colorectal cancer, tissue and polyps can be removed from the colon and rectum during a colonoscopy or sigmoidoscopy. This is the only fail-safe way to diagnose cancer.

**Physical examination:** It is important that your doctor and healthcare team know as much as possible about the state of your health before, during and after your treatment. A complete physical examination allows the doctor to:

- Ask you about any other symptoms;
- Obtain your general medical history;
- Look for any other abnormalities.
Improved Tests for Detection

**Stool DNA test or fecal DNA test:** The stool DNA test screens a stool sample for abnormal genetic material – called DNA – that may signal the presence of cancer or polyps in the colon. Colorectal cancer cells often contain DNA mutations (changes) in certain genes. This is a newer type of test and the best length of time to go between tests is not yet clear.

Other screening tests in development are:

**Blood tests:** Several types of blood tests are being evaluated for detecting signs of colorectal cancer and, in some cases, polyps. These tests differ in the markers they look for in the blood that are associated with colorectal cancer and polyps, i.e., genetic or chemical markers. Those who test positive for the markers must undergo a colonoscopy to determine if disease is present.

**Saliva test:** This test involves a simple saliva sample taken from the patient’s mouth and sent to a laboratory where it is analyzed for a genetic alteration associated with the likelihood of developing colorectal cancer. This test helps determine the chances of developing the disease during an individual’s entire lifetime.

**Capsule endoscopy:** With this test, the patient swallows a disposable capsule that contains a miniature video camera at each end that travels through the digestive tract. Special sensors are affixed to the patient’s abdomen and connected to a recording device worn on a belt around the waist. As the capsule travels through the digestive tract (which takes about 10 hours), it captures thousands of images and transmits them through the sensors to the recording device. After 10 hours, the patient returns the recording device to the doctor who downloads the images onto a computer for review in a moving video format. The pill passes naturally from the patient’s body in a bowel movement and does not need to be retrieved. A conventional colonoscopy is required if abnormalities are seen on the video.
Lab Tests (Blood Work)

Several types of blood tests are used to help diagnose cancer and monitor your health before, during and after treatment.

**Complete blood count (CBC):** This test takes a sample of your blood and determines the number of blood cells (red blood cells, white blood cells and platelets) your blood contains. This test is taken before you start each cycle of chemotherapy and periodically during your radiation treatment. The CBC gives your healthcare team information about whether you have enough white blood cells (infection fighting cells), platelets (blood clotting cells) and red blood cells (to carry oxygen in the circulation) to continue with your next round of treatment.

**Liver and renal function tests:** These blood tests measure chemicals in your blood to show how well your liver and kidneys are working.

**Carcinoembryonic antigen (CEA):** This test evaluates a tumour marker that is associated with colorectal cancer. An increased level of CEA in your blood may indicate the presence of colon cancer. Smoking, other cancers and other diseases (e.g., hepatitis, liver injury, gallbladder problems, bowel inflammation) may also increase your CEA level. Some patients with colorectal cancer do not have an increased level of CEA in their blood. This test is not used to screen for colorectal cancer but it helps detect a recurrence of your colorectal cancer.

Imaging Tests

**X-rays, CT scans, MRI scans, PET scans, bone scans and ultrasounds:**
These imaging tests allow your healthcare team to look inside your body to determine the location of the cancer and whether it has spread.

For a summary of the tests discussed in this section, see Table 1 in Appendix 1.
Discussion Checklist

Here are some questions you might want to ask your healthcare team. Don’t be afraid to ask them. You may also find that you think about questions after you’ve left your appointment or between appointments. Make a list of your questions and take it with you next time to jog your memory.

- What tests will be done? Why?
- How do I prepare for these tests? Do I need to change my diet or my usual medication schedule?
- What is involved in the test? Will it be uncomfortable or painful? Are there any risks involved?
- What are the side effects of the tests?
- Will someone need to come with me on the day of the test?
- Will I have a biopsy? If I have already had a biopsy to diagnose my cancer, will I have more biopsies? Why? Will the tissue be collected during my colonoscopy or during surgery?
- How long will this test take? Will I be awake? Will there be pain during and/or after?
- What do I need to do to prepare for these tests?
- How long will it take to get the results of the biopsy or any other tests? Who will give me my results?
- To whom do I speak about the results of my biopsy and my other tests?

For other questions you may want to ask your healthcare team, go to the Colorectal Cancer Association of Canada Web site www.colorectal-cancer.ca/extras/physician.
Tests after Colorectal Cancer Treatment

Once your treatment is completed, your healthcare team will need to follow your health to make sure the cancer does not return or, if it does, to catch it early so new treatment can be offered as quickly as possible. Consider follow-up as an opportunity to confirm that everything is going well.

Follow-up tests are the tests commonly used to screen for, and diagnose, colorectal cancer. We discuss the common scenario for follow-up testing in the section “Overview of the Treatment Options,” (see page 30).

“You are on a roller coaster. It’s now been 10 months… You are up and down, up and down all the time. The chemo and the surgery, and the ‘this’ and the ‘that’, and the tests. It’s a whole new way of life. It just changes everything. It changes your perspective; it changes your way of thinking.” – Wife of a colorectal cancer patient
overview of the treatment options

Now that your initial testing is over and your healthcare team has confirmed the diagnosis and determined the stage of your disease, your team will use this information to tailor the treatment to you. Do not be surprised if you meet another patient with colorectal cancer who has a different treatment plan as everyone’s treatment plan is designed for his or her individual needs.
Please discuss the treatment options with your healthcare team. It is important that you understand the recommended treatments, their possible results and complications, and the potential side effects. Unless you have an obstructed bowel or some other medical emergency, taking a few days to think about what you should do should not affect the outcome of your treatment.

The treatment for colorectal cancer has improved greatly in the past few years and new research is ongoing. If the cancer is caught early, there is a better chance of a cure. The cure rates for more advanced disease are also improving all the time.

Medical professionals may use the terms “local” and “systemic” treatment. A local treatment, like surgery or radiation therapy, focuses on the affected part of the body. Systemic treatments, like chemotherapy and biologic or targeted therapies, travel through the bloodstream to try to kill any cancer cells locally and in distant parts of the body.

“Adjuvant therapy” is another term that you may hear. It describes treatment that is given after you have had surgery to help increase the chances of destroying any cancer cells that may still be present in your body. “Neoadjuvant therapy” is therapy given before surgery. With rectal cancer, neoadjuvant radiation therapy or radiation therapy with chemotherapy may be given to shrink a tumour before a surgeon operates to remove it. Remember, neoadjuvant and adjuvant are simply terms that describe when you get therapy.

Other terms that you might hear include first-line, second-line or third-line therapy. These refer to systemic treatment (e.g., chemotherapy) when treating metastatic or advanced colorectal cancer. First-line is the initial treatment given to patients after their diagnosis that shows their cancer has been detected. Second- and third-line therapies are given after the preceding therapy or therapies fail, i.e., are no longer working.
“I just focused on what was the next process. From when I was diagnosed and from when I met the surgeon and then what the surgeon said medically to be done. Every step, I just concentrated on what we are doing next… that was my focus. And then once the surgeon identified that it was more serious than he thought, that it was a stage III and moving into the chemotherapy. And I just kept moving on.” – Muriel, colorectal cancer patient

Types of Therapy

Surgery

Surgery is the main treatment for colorectal cancer. Early colorectal cancer tends to grow slowly and remains in the same location; to stop it from spreading and prevent it from recurring, it should be removed. For some cancers, surgery may be the only treatment required. In cancers at more advanced stages, other therapies in addition to surgery may be required to remove the cancer completely and improve the chances of a cure. However, surgery may not be an option for all patients.

Chemotherapy

Although certain drugs can kill cancer cells, they can kill normal cells as well. Because chemotherapy travels throughout the body, it is called a systemic therapy. Chemotherapy may be given as neoadjuvant therapy, i.e., before surgery, as adjuvant therapy after surgery for colorectal cancer or as a palliative therapy for metastatic disease. Sometimes a combination of two or three drugs may be given.
**Biologic (or Targeted) Therapy**

Biologic therapy is another kind of systemic therapy that travels throughout the body to treat the cancer wherever it is. Biologic therapy uses agents that interfere with certain special characteristics of cancer cells. Biologic therapy is sometimes used alone or in combination with more traditional chemotherapy agents. Bevacizumab (AVASTIN®) is always given with chemotherapy but cetuximab (ERBITUX®) and panitumumab (VECTIBIX®) can be given on their own.

Unlike chemotherapy, most biologic therapies are intended to better target cancer cells; they affect the normal tissues to a lesser degree. Researchers are constantly trying new ways to use biologic therapies to treat cancers. Biologic therapies such as bevacizumab (AVASTIN), cetuximab (ERBITUX) and panitumumab (VECTIBIX) are currently being used in the treatment of colorectal cancer. You may also hear them referred to as monoclonal antibodies. This means that they are proteins with the ability to identify special characteristics of the cancer cells and to interfere with the cancer cells’ behaviour.

**Radiation Therapy (or Radiotherapy)**

Radiation therapy uses high-energy x-rays to kill cancer cells. Because it targets a specific part of the body to kill the cancer cells there, radiation is a local therapy. It is used to treat rectal cancer. Radiation therapy can be given as a neoadjuvant (i.e., before surgery) or adjuvant therapy (i.e., after surgery).

*TM of ImClone LLC*
Combination Therapy

Depending on your situation, your doctor may discuss using a combination of therapies. For example, you might receive both surgery and systemic therapy (chemotherapy and/or biologic therapy), surgery and radiation therapy, all three or just systemic therapy. See Table 3 in Appendix 3 for a description of the different combination therapies.

Clinical Trials

Research in colorectal cancer is constantly advancing as scientists and researchers look at new ways to prevent, detect and treat the disease. You may be interested in participating in a clinical trial.

Clinical trials are conducted to carefully evaluate the effectiveness and safety of new drugs, drug combinations or any new treatments.

Phase I clinical trials try to establish the safe dose of the drug, how the body uses the treatment and the best way to give the drug.

Phase II clinical trials study the effectiveness of the drug and whether it has the potential to help patients.

Phase III clinical trials test the drug’s potential to help in a large group of patients. The “new” treatment is often tested against the standard treatment. Patients who are interested and qualify for participation in a phase III study will be randomly selected to receive either the new treatment or the standard treatment. Even when the treatment period is over, patients are often monitored for a long time so researchers can see which treatment offers better long-term results and fewer side effects.
Phase IV clinical trials are conducted after a drug has been approved for use. They continue to collect additional information about a drug.

Clinical trials help doctors make decisions about which treatments are most effective and safe. A "standard of care" is established when clinical trials show that no other treatment works better or has fewer side effects. When standard treatments show no benefit, clinical trials may offer an alternative option with new experimental drugs. Often, because the treatment is new, less information on rare side effects or other problems may be available. Neither you nor your healthcare team will be able to predict if the new treatment will be effective for you. If you enter a trial, the risks will be explained to you. If you are considering entry into a clinical trial, the current standard treatment options will be discussed with you so you have all the information you need to make your decision.

You are under no obligation to participate in a clinical trial and deciding not to participate will not affect the therapy you will receive in its absence. If you do participate in a clinical trial, you can withdraw from the trial at any time.

If you are eligible to enter a clinical trial, your healthcare team will guide you through the process. However, remember not everyone is eligible to enter a clinical trial.

You can find out more about current clinical trials by asking your healthcare team.
Alternative Therapies

Herbal remedies, high-dose vitamins, and severe or strict diets are common examples of treatments called alternative therapies. Because alternative medicines are not always scientifically studied, it is often not known how they will react with your cancer therapy. The use of some of these therapies could interfere with your cancer therapy and may be harmful in combination with chemotherapy or reduce the effectiveness of chemotherapy. For this reason, it is suggested that you do not take any alternative medicines without first checking with your doctor, pharmacist or nurse.

Complementary Therapies

Therapies such as peer and group support, therapeutic touch, yoga, massage therapy, chiropractor visits, meditation and visualization exercises fall under this category. Complementary therapies can be used in conjunction with traditional cancer treatment and may help improve your sense of well-being and reduce stress. Before you have a complementary therapy, check with your healthcare team.

What about side effects?

With each treatment comes the possibility for some side effects. You may have heard some “horror stories” about cancer treatment. Fortunately, researchers have studied ways to minimize side effects and improve treatment. There are things that both you and your healthcare team can do to reduce the unpleasant aspects of your treatment. In the following sections, we discuss the side effects of each type of therapy and offer some suggestions that may help you deal with those side effects.
Follow-up Care

After you’ve completed your treatment, whether it be surgery or a combination of treatments, you’ll need to stay in touch with your healthcare team (this includes your family physician) to detect a recurrence of your cancer. Discuss any changes in your health with your healthcare team. If your colorectal cancer comes back, it will usually happen within the first three years after you have finished treatment. Monitoring your health during your cancer-free time may involve:

- Answering questions about how you feel;
- An assessment of your heart, lungs and abdomen to check for anything unusual, such as liver enlargement;
- A digital rectal exam;
- Routine colonoscopy;
- Blood tests.

Talk with a member of your healthcare team about how often you need to be seen.

A colonoscopy may be done to look for new polyps, usually about one year from your surgery. If nothing is detected at that time, it is recommended you have a colonoscopy repeated every three to five years to check for any polyps or cancer that may have returned. A CEA test, especially if you had a stage II or stage III cancer, may also be performed. An elevated level of CEA suggests that your cancer may have recurred and additional testing might be needed. Remember that CEA test results need to be interpreted with caution because the CEA level may be high for other reasons and a normal CEA does not rule out recurrence.
Your doctor will let you know about other tests (like CT scans, PET, PET/CT, for example). Some of these tests may be arranged by your family doctor’s office while others may be ordered through your oncologist’s office. Remember to stay in touch with your family doctor; he or she is responsible for your overall health.

You can help yourself by staying in good health, being active and recognizing symptoms of colorectal cancer (see the box on page 21). If you detect symptoms, talk to your doctor. This will help catch problems early.
Discussion Checklist

Here are some general questions about treatment. In the following sections, you will find more detailed descriptions of the treatments.

- Why do I need this type of therapy?
- What kinds of medications will I be taking? What kinds of side effects can I expect?
- What can I do to help prevent or minimize the side effects from my therapy?
- What is the treatment schedule? How long will I be on this treatment?
- What follow-up care do you recommend?
- Is there a clinical trial I can participate in?
- What kind of psychosocial support is available to me and my family as we go through the treatment?
primary treatment: surgery

Surgery is the primary treatment for colorectal cancer with the goal being to try and remove all of the cancerous tissue before it spreads. Of stage I colorectal cancers, over 90 per cent can be cured with surgery alone. With stage II cancers, about 75 per cent of colorectal cancers can be cured with surgery alone. Patients with stage II or III colorectal cancer who had surgery to remove all their disease and then received adjuvant chemotherapy had better survival than those who did not receive adjuvant chemotherapy.
Colon Cancer

Colon cancer tends to develop in a predictable way. It starts on the inside lining of the colon, grows through the wall of the colon to the lymph nodes and nearby organs, and then spreads to other organs (e.g., liver). This process can take years.

To increase the chances of a cure, your surgeon will remove the section of the colon that contains the cancer, along with some surrounding tissue (the mesentery – the fatty connective tissue that keeps the colon in place) that contains the nearby lymph nodes. This is called a partial resection or a partial colectomy. Most often, the two ends of the remaining colon are reattached. This is called an anastomosis. If the surgeon is unable to connect the two ends of the remaining colon, you may need a colostomy or ileostomy; this brings the intestine out of the abdomen (a stoma) to allow waste to pass into a pouch (an appliance). Your healthcare team will show you how to care for the stoma. The stoma may be temporary or permanent.

An ostomy is the creation of an artificial opening through which the last segment of the intestine discharges digestive waste material directly to the outside of the body through the skin. In the treatment of colorectal cancer, an ostomy may be necessary when the tumour is causing a blockage. It may be possible to reconnect the remaining sections of colon or rectum following removal of the tumour provided that enough of the rectum remains intact to preserve sphincter function.
Surgery generally takes between two and five hours, depending on the extent of the cancer. Your hospital stay will probably range from four to 10 days, with your overall recovery time generally lasting from four to six weeks. What happens in your case will depend on your overall health, the extent of the cancer, the location of the cancer in the colon and elsewhere, and other factors. Talk to your surgeon about what you can expect.

Laparoscopic-assisted colectomy is a newer approach to removing part of the colon and nearby lymph nodes and may be an option for some earlier stage cancers. Instead of making one long incision in the abdomen, the surgeon makes several smaller incisions. Special long instruments are inserted through these incisions to remove part of the colon and lymph nodes. One of the instruments has a small video camera on the end, which allows the surgeon to see inside the abdomen. Once the diseased part of the colon has been freed, one of the incisions is made larger to allow for its removal. Because the incisions are smaller than with an open colectomy, patients may recover slightly faster and have less pain than they do after standard colon surgery. Laparoscopic-assisted surgery is as likely to be curative as the standard approach for colon cancers but the surgeon requires special expertise in this field.

A pathologist will examine the tissue removed to ensure that the cancer has been removed. The pathologist will check the “margin” – the distance between the cancer and the edge of healthy tissue removed. A wide margin of healthy tissue usually indicates that the cancer has been removed completely from the colon. If cancer cells are present at a margin, then further surgery may be needed. Table 1 and Figure 1 in Appendix 2 show the treatment approaches as well as the clinical care pathways for colon cancer.
Rectal Cancer

With rectal cancer, because there are so many other structures in the pelvis (e.g., uterus, ovaries, bladder, vagina, prostate) the surgery may be more complex. Some rectal cancers can grow very near the muscles that support the anus. Your doctor will balance removal of the cancer with an attempt to preserve the function of the anus and nearby structures, and to minimize the chances of complications like impotence, sexual dysfunction and bladder problems. In some cases, the best option may be for a patient to have a colostomy if too much of the muscle surrounding the anus needs to be removed. When the cancer is very close to the anus, a colostomy will be recommended. Table 1 and Figure 2 in Appendix 2 show the treatment approaches as well as the clinical care pathways for rectal cancer.

Radiation and/or chemotherapy are usually used before surgery in rectal cancer to shrink rectal tumours, allow for a better resection, i.e., the removal by surgery of diseased tissue, and reduce some of the known side effects. Studies have shown that these therapies can be given after surgery to increase the chances that all cancer cells have been killed.

When some people think of colorectal cancer, they often assume it requires a colostomy. In reality, only a small percentage of colorectal surgeries result in a colostomy.
The Complications of Surgery

After surgery, you will need time to recover. While there may be some discomfort, there are ways to keep pain under control. The potential for complications is fairly low and will be balanced against the risk that the cancer will spread.

We’ve listed some of the more common complications. Make sure you discuss them with your healthcare team.

**Blood Loss**

Sometimes blood loss is more than anticipated and you may require a blood transfusion. Ask your doctor whether you could consider donating blood ahead of time. However, there may not be time to do this before the surgery or if you are already anemic, that is to say your red blood cell count is below normal levels. In some centres, using your own blood may not be an option.

**Risk of Infection**

With any surgical procedure, there is a risk of infection. This is a particular concern with abdominal surgery. To help prevent infection, you may be given antibiotics to take before and/or after the procedure. You should find out what signs to look for that might indicate infection.

**Anastomotic Leak**

The rejoined ends of the colon (the anastomosis) may leak fluid into the abdomen. This can cause pain and infection and may cause a bowel obstruction and/or adhesions.
Discussion Checklist

Check off the items that you and your healthcare team have discussed. Add any other questions you may have.

- What are the risks and benefits of surgery?
- What kind of surgery will I have? What can you tell me about the procedure?
- What may happen if the situation becomes more complicated once the surgery starts?
- When will I find out the results of the surgery?
- How long will the operation take? Will I require more than one operation?
- What are the typical complications of this type of surgery?
- What should I watch for? Who and when should I call about anything that I notice?
- Are there any long-term side effects I should know about?
- Can I donate blood in advance?

“With the local surgery, it’s not bad. They basically remove a part of your intestine and that’s it. It’s important that after the surgery you take good care of yourself and follow doctor’s orders. Honestly, my husband was back to his old self within a month. And when he started the chemotherapy, he started it very well because he was in shape.” – Wife of a colorectal patient
Once your diagnosis is confirmed, the next step is to find out exactly where the cancer is located – on the inner surface of the colon only, through the wall of the colon only, through the wall of the colon and into the lymph nodes, or in other local or distant parts of the body. This process is called staging. This information can only be obtained once you’ve undergone surgery.
Once determined, the stage of the cancer helps your healthcare team decide what type of treatment you should receive. You may have surgery (surgery is an option if your tumour is considered to be resectable, i.e., can be removed by surgery), chemotherapy, biologic or targeted therapy, radiation therapy or a combination of these treatments. Biologic or targeted therapy is a type of treatment that uses drugs or other substances to identify and attack specific parts of cancer cells, which make them different from normal cells with less chance of harming the normal cells. With colorectal cancer, staging is often done after the polyp or tumour and surrounding tissue (collected during surgery or biopsy) have been studied by a pathologist to see what type of cancer cells are present (e.g., adenocarcinoma).

The most commonly used staging system is the “TNM” system. It establishes the depth of penetration into the bowel wall (“Tumour stage”), whether there are lymph nodes involved or not (“Lymph Node stage”) and whether the cancer has spread to other parts of the body (“Metastasis stage”). Numbers are used to further explain each T-N-M category. For example, a cancer may be staged as $T_3N_0M_0$ – this means that the tumour has grown through the muscular wall of the colon ($T_3$) but that it has not involved any lymph nodes ($N_0$) or spread to another part of the body ($M_0$).

Table 1 provides a summary of all the stages. Figure 5 shows the different stages.
### Table 1: Simplified description of TNM staging system

<table>
<thead>
<tr>
<th>Stage</th>
<th>TNM</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Cancer cells on the inside surface of the colon or rectum (no invasion into the underlying tissues).</td>
</tr>
<tr>
<td>I</td>
<td>( T_{1-2}N_0M_0 )</td>
<td>Cancer cells on the lining surface of the colon or rectum and in the second layer (the submucosa) but not through the third layer of the colon or rectum (the muscularis).</td>
</tr>
<tr>
<td>II</td>
<td>( T_{3-4}N_0M_0 )</td>
<td>Cancer cells through the muscle layers of the colon or rectum but no cancer cells in the lymph nodes.</td>
</tr>
<tr>
<td>III</td>
<td>( T_{1-4}N_{1-2}M_0 )</td>
<td>Cancer cells in the regional lymph nodes, irrespective of the growth into the bowel wall.</td>
</tr>
<tr>
<td>IV</td>
<td>( T_{1-4}N_{0-2}M_1 )</td>
<td>Cancer cells in distant organs (e.g., liver, lungs), irrespective of the growth into the bowel wall or involvement of the regional lymph nodes.</td>
</tr>
</tbody>
</table>

Note: The numbers following the letters in the classification name provide further information about where the cancer cells have been found. For example, the numbers after the N indicate how many lymph nodes are cancerous and where they are located. The numbers after the T indicate the depth of invasion into the wall of the bowel. The numbers after the N or M indicate no spread (0) or spread to the regional lymph nodes or other parts of the body (1).
Over the next few pages, we describe each stage and the most commonly used treatments for that stage. Remember that everyone’s case is treated differently. For most colorectal cancers, the primary treatment is surgery to remove the cancer. If the cancer is more advanced, additional therapy with radiation or chemotherapy may be considered either before or following surgery. More details about the specific treatments are provided in later sections.

**Stage 0**

Stage 0 describes that cancer cells have been discovered but the cells remain on the lining of the colon or rectum. They have not begun to move into the wall of the colon or rectum. Stage 0 is often called cancer in situ, Latin for cancer “in place.”

**How is stage 0 colorectal cancer treated?**

To stop the cancer from spreading, the cancerous cells are removed during your diagnostic colonoscopy or sigmoidoscopy. If the polyps are large, you may have to have surgery to remove them – this is termed a “bowel resection.” It involves removing a section of your colon and reattaching the two ends.

**Stage I**

Stage I indicates that the cancer has grown beyond the inner lining of the colon or rectum and into the second layer (the submucosa) or third layer (the muscularis) of the colon or rectum, but not completely through the third layer.
How is stage I colorectal cancer treated?

Surgery to remove the cancerous area is the main treatment. Nine out of 10 patients with this stage of cancer are cured simply by removing it. No further treatment is generally required after surgery.

Stage II

Stage II indicates that the cancer has grown through the muscle layers of the colon or rectum. Sometimes it is still confined to the fatty tissues surrounding the bowel (T₃) but sometimes it has grown right into a nearby organ (T₄) like the bladder. No lymph nodes show signs of cancer and there is no spread to distant organs.

How is stage II colorectal cancer treated?

Again, surgery is the main treatment. The surgeon removes the cancerous area and surrounding tissues. If the cancer has grown into a nearby organ, that spot of cancer is also removed by surgery.

Chemotherapy is often but not always given in stage II cancer. Your physician will discuss the options with you based on the course of your disease.

Stage II rectal cancer treatment varies from one patient to another, but often includes neoadjuvant or adjuvant radiation and chemotherapy in addition to surgery. Chemotherapy and radiotherapy are often given before surgery to reduce the size of a tumour or to render surgery less complicated. Adjuvant therapy is given after surgery (or primary treatment) to aid in the killing of any
remaining cancer cells; adjuvant chemotherapy, biological therapy and radiation therapy are used in colorectal cancer treatment in an effort to eliminate all cancerous cells from the body, increasing the chances for a cure. Your healthcare team will decide which treatment plan is best for your type of cancer.

**Stage III**

Stage III colorectal cancer has spread through the colon or rectum wall and involves the nearby lymph nodes. The fewer lymph nodes that are involved, the better the prognosis, i.e., the prediction of how well you will do after the diagnosis.

**How is stage III colorectal cancer treated?**

Surgery to remove the cancer in the colon or rectum is often followed by adjuvant chemotherapy to try to kill any cancer cells that may be circulating in the body.

Typically, adjuvant chemotherapy is given for six months following surgery. The chemotherapy may include capecitabine (XELODA®) (pills) or 5-fluorouracil (5-FU) and leucovorin (intravenous medications) with or without oxaliplatin (ELOXATIN®) (intravenous medications). If oxaliplatin (ELOXATIN) is given with capecitabine (XELODA) it is called XELOX or CAPOX. If it is given with 5-fluorouracil, it is called FOLFOX.

Stage III rectal cancer treatment varies from one patient to another, but often includes adjuvant radiation and chemotherapy in addition to surgery. Your healthcare team will decide which treatment plan is best for your type of cancer.
Stage IV colorectal cancer has spread from the local area of the colon or rectum to distant organs in the body, such as the liver or lungs. This is referred to as metastatic disease.

How is stage IV cancer treated?

The aim of treatment with this stage is to:

- Control the cancer’s growth;
- Relieve any symptoms that it may be causing;
- Prolong life.

The primary cancer (the cancer in the colon or rectum) may be removed by surgery. Sometimes, surgery may also be used to remove cancer that has grown in other areas of the body (the secondary tumours). Radiation therapy may be used to relieve bleeding, obstruction or pain. Chemotherapy, possibly along with a biologic therapy, may be used to relieve your symptoms and prolong survival. You may want to consider entering a clinical trial testing new therapies. In some cases, radiation, chemotherapy and biologics may be used to reduce the size of the tumour leading to a chance for surgical removal and cure. See Tables 2 and 3 in Appendix 3 for more information on the different chemotherapy and biologic treatment options.
Discussion Checklist

Here are some questions you might have that concern staging. Don’t be afraid to ask them.

— What kind of colorectal cancer do I have? Where is it located?
— What stage is it?
— Has it spread?
— Do I need more tests to determine the stage?
— What is my prognosis?
— Can you tell me what other lab tests were done on the tumour tissue? What were the results?
— What kind of treatments should I be considering now? Why?
— How long is each treatment?
— Will it make a difference if I were to change my diet?
— Does my diagnosis mean that my blood relatives are at higher risk for colorectal cancer? Should they talk to their doctors about screening?
— Do I need to see any other doctors?
— How can I contact the members of my healthcare team?
— Can I safely delay my treatment while I think about your recommendations?
additional therapies: chemotherapy and radiation

Most patients with colorectal cancer will have surgery to remove the cancerous tissue. After surgery, additional therapies (chemotherapy and/or radiation therapy) are usually given to try to make sure any remaining cancer cells are killed. For some patients, surgery may not be possible. In these cases, chemotherapy and/or radiation will be the primary treatment for colorectal cancer.
Chemotherapy

Chemotherapy is medication used to kill fast-growing cells, including cancer cells. Chemotherapy may be used to prevent cancer from spreading to other areas of the body. It may affect other normal, fast-growing cells in your body, like those in your bone marrow, hair follicles, mouth and digestive system. The good news is that healthy cells recover quickly and cancer cells struggle to recover. Some of the new biologic drugs are targeted to cancer cells more specifically to minimize their effect on healthy cells.

Everyone’s experience is unique so it is difficult to predict how you might react to chemotherapy.

Early Stage Disease Setting: Adjuvant Chemotherapy

Colon Cancer

With colon cancer, chemotherapy is often given to patients after surgery with disease that has spread to the regional lymph nodes (stage III) and, sometimes, just through the muscle layers of the colon but not to the regional lymph nodes (stage II).

Your doctor may talk to you about two different kinds of regimens, depending on what is right for you. The standard of care is FOLFOX (5-fluorouracil plus oxaliplatin [ELOXATIN]). This regimen is given by infusion. The other option is capecitabine (XELODA), an oral form of 5-fluorouracil. Any of these treatments typically lasts about six months.
The primary medications used belong to a class of agents called fluoropyrimidines. 5-Fluorouracil and capecitabine (XELODA) are examples of fluoropyrimidines. 5-Fluorouracil is administered intravenously by a short infusion or by a longer continuous infusion, often used in combination with leucovorin. Leucovorin is a drug used in combination with 5-fluorouracil to enhance its effectiveness. An alternative to intravenous 5-fluorouracil is capecitabine (XELODA).

Treatment with any of these medications typically lasts about six months. Studies have shown that both 5-fluorouracil (with leucovorin) and capecitabine (XELODA) can improve a patient’s survival when given after surgical removal of stage III (and probably some stage II) colon cancers.

Chemotherapy is sometimes offered to people with stage II colon cancer if their type of cancer has features that suggest it might have a high risk of returning. Chemotherapy is routinely offered to people with stage III colon cancer because it improves their chances of long-term survival.

**Rectal Cancer**

With cancer of the rectum, adjuvant treatment is different. Chemotherapy is routinely offered to people with either stage II or III rectal cancer. If patients receive it after surgery, they are usually given chemotherapy (usually 5-fluorouracil or capecitabine [XELODA]), then chemotherapy along with radiation (over five or six weeks), and then a few more cycles of chemotherapy. This treatment lasts for about six months.

For most other patients, radiation (with or without chemotherapy) may be given before surgery (neoadjuvant therapy).

Talk to your healthcare team about what you can expect.
Advanced Stage Disease Setting: Palliative Therapy

When colorectal cancer has spread to other organs like the liver and the lungs (stage IV disease), chemotherapy may be offered to shrink a tumour before surgery (removal of the portion of liver that contains a metastasis, for example) – called neoadjuvant therapy. Chemotherapy can also be given to control the disease, improve or maintain the patient’s quality of life, and prolong life – palliative therapy. In some cases, the metastatic disease to the liver, and less often to the lung, can be completely removed with surgery; this may offer the chance of a cure. Chemotherapy can be given before such surgery (neoadjuvant therapy) to shrink the tumour and facilitate the procedure. Table 1 and Figure 3 in Appendix 2 show the treatment approaches as well as the clinical care pathway for stage IV disease.

How does chemotherapy work?

Chemotherapy works by stopping cancer cells from multiplying and causes cancer cell death.

Several chemotherapy medications are used today to treat colorectal cancer. Sometimes they are used alone; in many cases, combinations of drugs are used. For more information on the drugs and the combinations in which they may be used, see Table 3 in Appendix 3.
You can receive chemotherapy in a number of ways. The main methods include:

- Into a vein (intravenously or IV); that is, the medication is given through an IV line.

- By venous access device. This method is still considered intravenous but, instead of using an IV line, a small device (e.g., port [Port-a-Cath®], central line) is placed under the skin in the upper chest or in the forearm (e.g., PICC line [a peripherally inserted central catheter]).

- By mouth (orally); that is, the medication is a pill or capsule to swallow.
The Treatment Schedule

When, how and which treatment you should receive depends on the type of chemotherapy regimen you and your doctor decide is best for you. Standard adjuvant chemotherapy regimens usually last at least six months. Chemotherapy for patients with incurable disease often lasts longer. However, duration of therapy is variable. Each round of chemotherapy medication is called a "cycle," and this is made up of the time it takes to give the treatment plus the rest time before the next treatment. Your course of treatment will be made up of several cycles. For example, you may need to take your chemotherapy every two weeks over six months (about 24 weeks) or you may need to take it twice a day for two weeks in three-week cycles.

Ideally, it is best to maintain the recommended dose of medication while still allowing you to cope with the side effects and stay on your schedule. Your goal will be to follow the schedule you and your doctor develop, and take your chemotherapy medications on schedule. Sometimes, the healthcare team may delay your chemotherapy; for instance, if your white blood cell count is too low (this puts you at increased risk of infection). This delay is usually short and your treatment will be restarted when your blood cell count returns to normal.

Do not be surprised if you are asked to stay a little bit longer after you’ve received your first treatment. This lets the healthcare team watch how you react to the therapy. It is recommended that you bring a friend or family member to your first treatment so they also learn about the side effects of treatment and what signs to watch for. They can also help you by being an "extra set of ears" and by driving you home after your treatment. Some types of chemotherapy and supportive medications (to help reduce nausea and vomiting, for example) may make driving difficult.
The Side Effects of Chemotherapy

The side effects of chemotherapy can range from mild to severe. They depend on the type of chemotherapy you are taking and your reaction to the treatment. Your side effects may be different from someone else receiving the same drugs. Some side effects may happen the day of your treatment, while others may occur days or weeks following your chemotherapy.

Talk to your healthcare team about the kinds of side effects you can expect. Knowing this information ahead of time will help you prepare for what may happen.

The common side effects and how to manage them are described in the following pages. Remember, your team is there to help you adjust to and cope with any possible side effects. For more information on side effects associated with specific treatments, see Table 3 in Appendix 3.
**Nausea and Vomiting**

After your chemotherapy, you may experience a sick feeling in your stomach (nausea) or vomiting. For most people, these effects are usually seen in the first 24 to 48 hours. To help reduce these side effects, you may be given some medications to take before chemotherapy and then a prescription for medications to have at home following chemotherapy.

**How do I manage the nausea and vomiting?**

- Drink plenty of water – aim for at least eight to 10 glasses a day. Remember that anything with caffeine and alcohol in it can dehydrate you. Try to avoid these drinks.
- Take your anti-nausea and anti-vomiting drugs as prescribed. These medications work better if you take them when you first notice symptoms instead of when they are really bad.
- Eat small meals frequently.
- Try to eat a small meal or snack before you have chemotherapy.
- Avoid spicy foods and very hot, very cold or overly acidic foods.
- Avoid strong odours such as fish or perfume.
- Try relaxation, meditation and/or deep breathing techniques to help you relax when you feel sick.
- Talk to your doctor, nurse or pharmacist if the anti-nausea drugs that you are taking are not working. Other medications can be used instead.
Diarrhea

Some chemotherapy medications may upset the cells lining your digestive system and lead to diarrhea. This may leave you dehydrated and, possibly, with electrolyte imbalances. This usually begins five to 10 days after chemotherapy. When you have diarrhea, food moves through the digestive system too quickly, before the body can absorb the vitamins, minerals, energy-containing compounds and water it needs. Medications may be necessary. Talk to your healthcare team if you have diarrhea that lasts for more than 24 hours. Diarrhea is not merely a discomfort, it may make you very sick.

How can I manage diarrhea?

- Talk to your healthcare team about the possibility of diarrhea and whether you should take an anti-diarrheal medication such as loperamide (Imodium®) if it happens.
- Drink plenty of water – aim for at least eight to 10 glasses a day. Remember that anything with caffeine and alcohol in it can dehydrate you. Try to avoid these drinks.
- If you have diarrhea, stick to clear liquids that won’t upset the bowel and will be easily absorbed into the bloodstream. Clear juices, Jell-O®, flat ginger ale, Gatorade®, chicken broth or weak decaffeinated tea are good choices. These will allow the body to stock up on the water and electrolytes that have been lost.
- Return to a normal diet slowly – about 12 hours after the diarrhea has stopped. The “BRAT” diet is a good way to ease back into normal eating. It is made up of foods that are low in fibre and tend to bind up material in the colon. They are Bananas, Rice, Applesauce and decaffeinated Tea (or Toast).
- Avoid milk products, foods that produce gas, or foods that are spicy or fatty, or contain high amounts of fibre.
Diarrhea can irritate the skin around the anus. Be gentle when cleaning after a bowel movement. You may want to wash yourself with warm water or diaper wipes instead of using toilet paper. If the skin becomes really irritated, consider using a diaper rash ointment to protect the skin and help healing.

STOP TAKING ANY PILL CHEMOTHERAPY MEDICATIONS AND CALL YOUR ONCOLOGY HEALTHCARE TEAM IMMEDIATELY OR SEEK MEDICAL ATTENTION IF YOU EXPERIENCE:

- An extra four bowel movements a day or diarrhea at night;
- An increase in watery fluid in your colostomy bag;
- Any diarrhea in combination with nausea, vomiting or soreness of the mouth that affects your ability to drink enough fluids;
- Fever (greater than 38°C or 101°F).
Mouth Sores (Mucositis)

You may experience mouth sores or dry mouth, usually one to two weeks after your chemotherapy. Let your healthcare team know if you have any changes in your mouth, especially painful sores or white patches in your mouth and/or cracked lips. You may be prescribed some medication to help relieve the symptoms.

How do I manage mouth sores?

■ Rinse your mouth with a mixture made from one teaspoon of baking soda or salt and one litre of water four times a day or at least after meals.

■ Chew on ice chips if you have discomfort or pain. Some patients also find that frozen yogurt, ice milk, milkshakes, smoothies or frozen grapes help soothe the mouth. **HOWEVER, THIS SHOULD BE AVOIDED IF YOU ARE RECEIVING OXALIPLATIN (ELOXATIN) AS THE COLD CAN WORSEN THE NUMBNESS AND TINGLING YOU MAY EXPERIENCE.**

■ Try to eat soft bland foods like puddings, milkshakes and cream soups. Avoid spicy foods or foods that are either acidic or rough in texture.

■ Eat food that is at room temperature.

■ Do not use commercial mouthwashes that contain alcohol. Ask your doctor, nurse or pharmacist about a mouthwash or rinse that is good to use.

■ Use a soft toothbrush. If you experience bleeding from your gums when brushing, switch to a soft sponge. Remember, it’s important to keep your mouth clean.

■ Do not drink alcohol or smoke.

■ Talk to your doctor, pharmacist or nurse if you find it too painful to eat. You may want to talk to a dietitian about food choices, especially if you have no desire to eat.
Neuropathy

The development of neuropathy is associated with the use of oxaliplatin (ELOXATIN). Neuropathy is a problem with the nerves that carry information to and from the brain and spinal cord. It can produce pain, loss of sensation, tingling and numbness. There are two types of neuropathy: one that is induced by cold and usually occurs in the first 24 to 48 hours and the other that is painful persistent neuropathy and is not the result of cold. Neuropathy resulting from cold can involve the lips and jaw muscles as well as the laryngeal muscles (vocal cord muscles). With further cycles of chemotherapy, cold-induced neuropathy will last more than 48 hours. It is therefore important to avoid cold.

If painful neuropathy is present all the time, the oxaliplatin (ELOXATIN) should be reduced or stopped. The healing can take months. Medication such as gabapentin (Neurontin™) or pregabalin (Lyrica®) is sometimes given to help reduce the symptoms.

Neutropenia

Neutropenia is a decrease in the number of neutrophils (a type of white blood cell that your body makes to help fight bacterial infection) that may be caused by chemotherapy. Because white blood cells help fight infection, having too few can increase your risk of infection. To watch for this problem, you will have regular blood tests while on chemotherapy, usually before each cycle of treatment (or more often if you have a fever or your healthcare team feels you need them). The use of filgrastim (Neupogen®) and pegfilgrastim (Neulasta®) may be required to stimulate the white blood cell production in order to keep your chemotherapy cycles on schedule.
Infections

Chemotherapy affects fast-growing cells including your blood cells. If the number of white blood cells is too low, you may be at increased risk of infections. White blood cells are an important part of the immune system helping your body fight off bacteria. Signs of infection include fever (greater than 38°C or 101°F), chills, sore throat, rash, diarrhea, burning when you urinate, redness, swelling, or pain around a cut or sore. If you experience fever, chills or other signs of infection, **GO TO YOUR NEAREST EMERGENCY DEPARTMENT IMMEDIATELY**. Be sure to inform the staff at the Emergency Department that you are a cancer patient on chemotherapy. Sometimes, the only sign of an infection is a fever. It is important to seek medical attention if you have a fever. You may urgently need tests and, if necessary, antibiotics. Make sure you talk to your healthcare team about what you need to watch out for and what to do if you have signs of infection.

**How do I prevent infections?**

- Wash your hands with soap often – especially before and after meals, and after going to the washroom.
- Avoid contact with people who have colds or other contagious diseases, and crowded places.
- Keep your hands away from your mouth and face.
- Be careful to avoid cuts and scrapes. Do not tear or cut the cuticles of your nails – use a nail file if you need to trim your nails. Avoid sharp objects such as razors or knives; use an electric razor to shave. Wear shoes to protect your feet.
- Use gloves if you are gardening or cleaning up after children or animals.
- If you get cuts or scrapes, keep them clean.
- Use a soft toothbrush.
- Moisturize your skin with lotion or oil if it becomes dry or cracked.
- Avoid manicures and pedicures. Artificial nails are not recommended.

**Signs that you might have an infection:**

- Fever (greater than 38°C or 101°F);
- Chills or shakes;
- Sore throat, cough or sinus congestion;
- Diarrhea;
- Redness, swelling, or pain around a wound or your stoma (if you have a colostomy);
- Burning when you pass urine.

Remember, if you experience any signs of infection, **IMMEDIATELY** go to the nearest Emergency Department.
Thrombocytopenia

Chemotherapy can also lower the number of another type of blood cell called platelets. Platelets are blood cells that help form blood clots to control bleeding and bruising. Too few of these cells can lead to easy bruising or an increase in the risk of bleeding heavily. If this is a concern, you may receive a transfusion of platelets to correct the problem. Talk to your doctor or nurse about symptoms to look for and what to do if they happen.

Anemia

Anemia is a decrease in the number of red blood cells or a decrease in hemoglobin. Hemoglobin is a protein in red blood cells that carries oxygen to all parts of the body. If there are low levels in red blood cells and consequently hemoglobin, there is a reduction in the amount of oxygen that can be carried to the various body parts and tissues. Chemotherapy may cause mild-to-moderate anemia. If this happens, you may feel very tired due to a lack of circulating oxygen in your red blood cells. Ask your doctor about medications that can help your body make more red blood cells. Possible medications include iron replacement, erythropoietin (epoetin alfa [Eprex®] and darbepoetin [Aranesp®]). Infrequently, a blood transfusion may be prescribed if your red blood cells are very low.
Fatigue

Chemotherapy can cause tiredness or fatigue. This differs from patient to patient and with the kind of chemotherapy taken. You should feel a return of energy levels by the time your chemotherapy is over, but you may still feel some fatigue after your chemotherapy ends. Talk to your healthcare team about how you can deal with your fatigue.

How do I manage fatigue?

- Try to eat a balanced diet and do not skip meals. Some people find it helpful to “graze” (eat multiple small meals) throughout the day. You might find it helpful to talk to a dietitian.
- Get exercise and stay as active as you can. Some people need to take some time off work, while others can go on with their normal routine. It all depends on what is right for you.
- Cut back on high-stress activities.
- Have a brief nap but keep your longest sleep for the night.
- Keep track of your energy patterns. Do the things you really want when you have the most energy. Remember, you may not be able to do everything you normally do. Let other people help you.
- Drink at least eight to 10 glasses of water a day.
- Establishing a bedtime routine has been found to be helpful. For example, doing the same thing every night before going to bed may help ensure a good night’s rest.
- If you have difficulty sleeping, you may want to talk to your healthcare professional to see if a sleeping pill is an option.
Hand and Foot Skin Reactions

With some types of chemotherapy (e.g., capecitabine [XELODA]), the palms of your hands and the bottoms of your feet may tingle or become red, numb, painful or swollen. The skin may peel if you develop a rash. The skin may also become dry or itchy. These symptoms can become serious and lead to blisters, severe pain or ulcers that may interfere with your normal daily activities. If the skin breaks, infection can start. It is important if you have hand and/or feet reactions to tell your healthcare team. The sooner you seek medical attention, the sooner the reactions can be treated.

How do I prevent hand and foot skin reactions?

- Keep hands and feet clean. Use lukewarm water and gently pat to dry.
  - Avoid hot water.
- Avoid tight-fitting shoes or things that may rub or put pressure on your hands and feet.
- Keep hands and feet moisturized with a hypoallergenic thick cream (ask your healthcare team to make a recommendation).

How do I manage hand and foot skin reactions?

- Tell your healthcare team if you have any signs of hand or foot reactions.
- Your healthcare team may need to temporarily put your chemotherapy on hold or adjust the dose of your medications.
IF YOU HAVE ANY OF THESE SYMPTOMS ON THE PALMS OF YOUR HANDS OR BOTTOMS OF YOUR FEET, STOP TAKING THE MEDICATION AND CALL YOUR HEALTHCARE TEAM:

- Pain;
- Redness;
- Swelling;
- Ulcers or blisters;
- Numbness or tingling.

If caught early, most of these side effects usually improve within two to three days. If not, call your healthcare team again. After side effects have improved, your doctor will decide when your chemotherapy medication will start again.
**Constipation**

Some chemotherapy and supportive care medications may cause constipation or a change in your bowel habits. Drink plenty of fluids, keep active and take a mild stool softener, if necessary. If you find that constipation is a problem, talk to your doctor or nurse.

**Hair Loss**

Total hair loss (alopecia) rarely happens with colorectal cancer treatments when compared with other types of chemotherapy used to treat other cancers. In fact, not all chemotherapies and biologics will lead to hair loss. Hair loss happens because the chemotherapy may affect the cells that are responsible for hair growth. A few weeks after your chemotherapy, you may notice more hair on your pillow, in the shower or on your brush. Your scalp may become very tender. You may also lose hair in other places on your body, like your eyebrows, arms, legs and pubic area.

If you do lose your hair, this loss is only temporary. However, when your hair begins to grow in, you may find it is a little different than it used to be in that the colour or texture of your hair may have changed.
How do I manage hair loss?

To prepare for hair loss, you may want to:

■ Discuss which drugs you will be taking with your healthcare team to understand better if you may experience hair loss.

■ Buy or borrow a wig. There are many styles and options these days for patients undergoing chemotherapy. Ask your nurse or social worker for a suggestion about a store that will help you get the right fit. Shopping for a wig before you lose your hair lets you match your own hair colour and style to the wig.

■ If you have personal health insurance, you may be able to get financial coverage for a wig. Talk with your nurse or social worker if you need more information about coverage.

■ Avoid using dyes or perms while on chemotherapy and at least until your first hair cut after chemotherapy. The harsh chemicals can damage your hair further.

■ Try hats, caps or scarves to protect your head from the sun or cold.

■ You may want to prepare others, especially if you have younger children, for your hair loss by explaining in advance what may happen.

■ Cut your hair before you start losing it.

■ Talk to your healthcare team about how to care for your scalp if you lose your hair. Apply sunscreen and wear a hat if you are out in the sun.

■ Women can participate in the Look Good, Feel Better® program. Talk to your healthcare team about this program or call 1-800-914-5665.
Heartburn

If you have heartburn, talk to your nurse, doctor or pharmacist. Over-the-counter medications may relieve your heartburn. You may need a prescription for a stronger medication from your doctor or advance practice oncology nurse. But because certain medications may affect how chemotherapy treatment works, check with your healthcare team before taking anything.

How do I manage heartburn?

- Avoid spicy foods.
- Eat dry toast.
- Avoid milk as it may increase your heartburn.
- Sit up while eating and remain in a sitting or upright position for at least 15 minutes after eating.
- Raise the head of your bed to stop stomach acid from moving (“refluxing”) up into the esophagus.
- Talk to your nurse, doctor or pharmacist about possible medications that may help.
- Talk to a dietitian about food choices.
Things to watch for while on chemotherapy

Here are some key things to remember. They will help you prevent or manage side effects. Know when you need talk to your doctor, nurse or pharmacist.

- Fever. If you develop a temperature over 38°C or 101°F, go to the nearest Emergency Department. This may be a sign of a low white blood cell count and an infection. You may need antibiotics.

- Drink lots of liquids. Keep yourself hydrated, especially if you experience diarrhea or nausea. Call your doctor if you throw up, feel sick to your stomach or have diarrhea for more than 24 hours.

- Use a non-alcohol-based mouth rinse. Rinse your mouth out frequently with a mixture of baking soda or salt (one teaspoon) and warm water (one litre). This helps prevent infection – and painful sores – from forming in your mouth. Rinsing with club soda is another option. Your doctor, nurse or pharmacist may recommend a store-bought non-alcohol-based mouth rinse.

- Be alert for anything “different” or new. If you notice a change in how you feel (say, you develop a sore throat or diarrhea), call your healthcare team. They can help decide if you may need further help. Catch problems early. It is easier to treat something small before it becomes serious.

- Sun sensitivity. Some chemotherapy medications might increase your skin’s sensitivity to the sun. Be sure to wear protective sunscreen and wear clothing that covers your skin (including a hat) when you are out in the sun.
Discussion Checklist

Check off the items that you and your healthcare team have discussed. Add any other questions you may have.

___ Why do I need the treatment you are suggesting?

___ What are the risks and benefits of this treatment?

___ What kind(s) of chemotherapy medication(s) will I be taking? What can you tell me about the drugs? What are the typical side effects for this type of treatment? How can I manage them? Who and when should I call about any side effects I’m experiencing? What will happen if my side effects prevent me from taking the chemotherapy?

___ How often will I take chemotherapy? How many cycles of chemotherapy will I require?

___ How long will it take for me to know if the chemotherapy is working? Will I be able to tell?

___ Are there any long-term side effects I should know about?

___ Who can help me deal emotionally with the chemotherapy experience?

“The first thing is your approach to the chemotherapy. It has to be a very positive approach, saying that this chemotherapy is your friend and it is going to help you... There are a lot of important side effects with the chemotherapy, but I think you have to be very positive. Think: These side effects are very minor, they are only for a short period of time and it could help you. So if you look at chemotherapy from that aspect, it will help you surmount a lot.” – Pasquale, colorectal cancer patient
Radiation Therapy

Radiation therapy (also called “radiotherapy”) uses high-energy x-rays to kill cancer cells. Unlike chemotherapy (that affects the whole body), radiation therapy is considered a local therapy (since it targets only a specific part of your body). With new technology and equipment available, treatment is very targeted. This therapy may be used along with chemotherapy to eliminate any remaining cancer cells in other parts of your body. Research has shown that radiation therapy is effective for the treatment of rectal cancer. Radiation is aimed at the pelvic area where the cancer was located and is used in cases where the cancer has spread to the bone.

In rectal cancer, radiation may also be given before surgery, with or without chemotherapy. For some patients, giving radiation before surgery makes it easier to remove completely the cancer and may reduce the chances that a colostomy will be necessary.

How does radiation therapy work?

The radiation beam of the x-ray machine will direct the rays to the area of the cancer. The radiation oncologist will design a treatment plan specifically for you. Sometimes, the term “radiation field” is used to describe the general area that is being treated with radiation (irradiated). With colorectal cancer, radiation is aimed at the pelvis.

The rays will damage the cells in the targeted area so they eventually die. If there are healthy cells in the area they may die too; for this reason, radiation oncologists take great care to protect the healthy cells from the radiation beam. Normal healthy cells repair themselves from radiation damage more completely than cancer cells.
Before your first treatment, you will have a planning session with a radiation oncologist. During this session (or sessions), the radiation oncologist will determine exactly where the x-ray beam should be directed. He or she will likely use a CT scanner to obtain images of your pelvis and then tailor the radiation plan to you. Usually treatment will start about two weeks after the CT simulation. During the administration of radiation, you will lie down on a table under a machine. Your radiation therapist will ensure that the parts of your body that should not receive radiation are protected.

The Treatment Schedule

The schedule of your radiation treatment is specifically designed for you.

If your doctor recommends combination therapy (surgery, chemotherapy and radiation therapy), you may start radiation before or after surgery, and this may be with or without chemotherapy treatment.

Your radiation therapy will also depend on the amount of tissue being treated. Typically, your treatment is given five days a week over a period of one to six weeks.
The Side Effects of Radiation Therapy

Most side effects are specific to the area being treated, but fatigue is common. Here is a list of the most common side effects and how to manage them.

Fatigue

Feeling tired or out of energy is the most common side effect of radiation.

How do I manage fatigue?

- Try to eat a balanced diet and do not skip meals. Some people find it helpful to “graze” (eat multiple small meals) throughout the day.
- Get exercise and stay as active as you can. Some people need to take some time off work, while others can go on with their normal routine. It all depends on what is right for you.
- Cut back on high-stress activities.
- Have a brief nap but keep your longest sleep for the night.
- Keep track of your energy patterns. Do the things you really want when you have the most energy. Remember, you may not be able to do everything you normally do. Let other people help you.
- Drink at least eight to 10 glasses of water a day.
Skin Reactions

Your skin may become itchy, red, warm, dry and more sensitive. In fact, this irritation may resemble a sunburn: bright red and peeling initially with a tan that develops later. Typically, if you experience skin irritations, they will worsen within the first two weeks after radiation is finished. After that, they will gradually begin to heal. If your skin blisters and opens, talk to your doctor, nurse or pharmacist as soon as possible about what to do. Remember, an open sore can become infected. It is important that you avoid infection.

How do I manage skin reactions?

- Make sure your skin is sufficiently moisturized with a cream or lotion that your nurse, pharmacist or doctor recommends.
- Wear fabrics that breathe, e.g., cotton.
- Leave the affected area open to air when possible.
- Bathe or shower as you normally would, but avoid using soap in the areas receiving radiation; to dry yourself off, pat your skin with a towel.
- If skin is peeling or blistered, you might try a cortisone cream or aloe vera lotion. However, talk to your healthcare professional first who can make a recommendation.
- Keep the area protected from the sun.
Nausea and vomiting may also be a problem. To help reduce this side effect, you may be given some medication (an antiemetic) before and/or after your radiation therapy.

**How do I manage nausea and vomiting?**

- Drink plenty of water – aim for at least eight to 10 glasses a day. Remember that anything with caffeine and alcohol in it can dehydrate you. Try to avoid these drinks.
- Take your anti-nausea and anti-vomiting drugs as prescribed. These medications work better if you take them when you first notice symptoms instead of when they are really bad.
- Eat small meals frequently.
- Try to eat a small meal or snack before you have radiation.
- Avoid spicy foods and very hot, very cold or overly acidic foods.
- Avoid strong odours such as fish or perfume.
- Try relaxation, meditation and/or deep breathing techniques to help you relax when you feel sick.
- Talk to your doctor, nurse or pharmacist if the anti-nausea drugs that you are taking are not working. Other medications can be used instead.
Diarrhea

Radiation therapy to the abdomen may cause more frequent bowel movements, occasionally with diarrhea, abdominal cramping or rectal discomfort or pressure.

How can I manage diarrhea?

- Talk to your healthcare team about the possibility of diarrhea and whether you should take an anti-diarrheal medication such as loperamide (Imodium®) if it happens.
- Drink plenty of water – aim for at least eight to 10 glasses a day. Remember that anything with caffeine and alcohol in it can dehydrate you. Try to avoid these drinks.
- If you develop diarrhea, stick to clear liquids that won’t upset the bowel and will be easily absorbed into the bloodstream. Clear juices, Jell-O®, flat ginger ale, Gatorade®, chicken broth or weak decaffeinated tea are good choices. These will allow the body to stock up on the water and electrolytes that have been lost.
- Return to a normal diet slowly – about 12 hours after the diarrhea has stopped. The “BRAT” diet is a good way to ease back into normal eating. It is made up of foods that are low in fibre and tend to bind up material in the colon. They are Bananas, Rice, Applesauce and decaffeinated Tea (or Toast).
- Avoid milk products, foods that produce gas, or foods that are spicy or fatty, or contain high amounts of fibre.
- Diarrhea can irritate the skin around the anus. Be gentle when cleaning after a bowel movement. You may want to wash yourself with warm water or diaper wipes instead of using toilet paper. Do not use an ointment until you have spoken to your healthcare team.
Discussion Checklist

Check off the items that you and your healthcare team have discussed. Ask any other questions you may have.

- What is the goal of my radiation therapy?
- When will my radiation therapy begin?
- How will I feel during therapy?
- How will I know if treatment is successful?
- What can I do to take care of myself during therapy?
- How long will I have to protect my skin from the sun?
- What other side effects, besides skin reactions and fatigue, might occur with radiation therapy?
- Are there alternatives to radiation therapy?
- Who can help me get to my radiation appointments?
- Is there financial assistance available to me if I have to travel a distance for radiation treatment? Who can I talk to about this?
- Who can help me deal emotionally with the radiation experience?
- I live out of town. Are there places to stay when I am having radiation?
new and improved treatments

Researchers constantly test new drugs, combinations of treatments and surgery to try to find more effective cancer therapies.
Improved Tests for Detection and Monitoring

Despite all the attention and the benefits of early detection, the number of people who undergo regular screening for colorectal cancer is low. Researchers are trying to develop ways to look inside the colon without using a sigmoidoscope or colonoscope, and without the unpleasant preparation and procedure.

Improved Surgery

More and more surgery can be done with greater ease. Sometimes metastases in the lung, liver or abdominal cavity can be surgically removed. These situations allow some patients who would have previously been considered to have an incurable illness to have the cancer removed with the possibility of a cure.

The future offers a chance for great progress. We will learn how best to use new techniques and other new drugs to treat colorectal cancer more effectively. You may be asked to take part in a clinical trial evaluation of some of these new options.
Improved Combinations of Therapy

Research continues on different combinations of drug therapies, chemotherapy and radiation to try to improve cure rates. Work also continues on investigating different combinations of chemotherapy medications. Promising examples that have come out of this research include:

- **FOLFIRI**, a combination of 5-fluorouracil, leucovorin and irinotecan (CAMPTOSAR®);
- **FOLFOX**, a combination of 5-fluorouracil, leucovorin and oxaliplatin (ELOXATIN);
- **CAPOX** or **XELOX**, a combination of capecitabine (XELODA) and oxaliplatin (ELOXATIN);
- **XELIRI**, a combination of capecitabine (XELODA) and irinotecan (CAMPTOSAR).

Biological Therapies

Biological therapies target key biological steps required for cancer growth. The goal is to find ways to block these steps without damaging normal cells in the body. This is different from chemotherapy – chemotherapy affects any fast-growing cells in the body (this can be both cancer cells and normal cells).

There are two types of targeted therapy: small molecules (usually given orally as pills) or monoclonal antibodies (usually given intravenously). Both aim to disrupt the way the cancer cells grow.
Some of the new compounds include:

- **Bevacizumab (AVASTIN):** This is a monoclonal antibody (a specially made protein) that targets the vascular endothelial growth factor (VEGF), a substance that promotes the growth of new blood vessels (angiogenesis). This can prevent a tumour from building the blood supply it needs to “feed” it with the oxygen and nutrients that it needs to grow. The addition of bevacizumab (AVASTIN) to 5-fluorouracil-, capecitabine (XELODA)-, irinotecan (CAMPTOSAR)- or oxaliplatin (ELOXATIN)-containing chemotherapy can improve the benefits of the chemotherapy (to destroy cancer cells, delay the growth of the metastatic colorectal cancer and prolong life).

- **Cetuximab (ERBITUX) and panitumumab (VECTIBIX):** These are monoclonal antibodies that target the epidermal growth factor receptor (EGFR), an antenna on the cell surface that promotes cell growth and encourages cells to multiply. Cetuximab (ERBITUX) and panitumumab (VECTIBIX) can delay cancer growth after the chemotherapy has lost its effect or improve the results of the chemotherapy when added to the chemotherapy.

- **Small molecule inhibitors against specific tyrosine kinases:** Tyrosine kinases are key enzymes within cells. The small molecules can interfere with these enzyme pathways that promote cancer cell growth.
survivorship: living with colorectal cancer

While a diagnosis of cancer may be traumatic, it does not have to change your life. You can do various things to ensure you are not living your life for cancer.
You can control some aspects of this challenging journey. One of the keys to keeping colorectal cancer in perspective is learning how to manage the way it affects your physical and emotional life. Stay strong, both physically and mentally, and keep living your life while you are on treatment and beyond. Remember, there are many survivors.

You can rely on your family and friends, your healthcare team and others who have lived through this experience. Have someone come to medical appointments with you to help you make sense of what is happening. Keep a journal with appointments, tests and questions for your first visit with your healthcare professional. Take advantage of friends' offers to help you with day-to-day activities. Having someone help with your shopping or dropping off dinner can make a big difference.

On the following pages, you’ll find some facts and tips about keeping yourself healthy during your treatment and beyond.

**Physical Activity**

Staying physically active is good for you. Exercise is important; it can help raise your energy level, improve your overall emotional well-being and improve your chances of survival. But you do not need to train to run a marathon to receive the benefits. Activities as simple as walking or gardening can do the trick. Anything that gets you moving can give you a boost, increase your appetite and decrease your stress level. Group activities such as golfing or curling give you the added benefit of being with other people while staying active.

Listen to your body. Do what feels right. Exercise only if it feels right to you and rest often. You might want to ask your doctor or nurse for suggestions about what type of activity might be best for you.
“You need to lead a very active life. The more you stay idle, the more you have time to think and that’s not good. You have to stay very active. Be it with a sport, be it with a hobby, be it with a walk or being with friends. This is what helped a lot.” – Pasquale, colorectal cancer patient

Medications

Certain medications may interfere with your cancer treatment. Before you take any medication, check with your doctor, pharmacist or nurse to make sure it will not interact with your cancer treatment.

You may be on several different drugs as part of your cancer treatment. If there is ever a medical emergency, the medical staff will need to know what medications you are taking. Always having a list of the medications you are currently taking makes answering their questions a lot easier. Keep a credit-card-sized list in your wallet or purse, and update it as needed. Give a copy to the person who is likely to be with you at appointments or during emergencies.

Dental Health

If you need dental work completed, including a cleaning, let your dentist know that you have been receiving or are about to receive treatment for cancer. Also, let your doctor or nurse know that you are planning a dental appointment. Your dentist may want to have your blood counts checked before you proceed. If your blood counts are low, he or she may decide to delay your dental procedure.
Mental Health and Depression

Part of your physical well-being depends on your emotional well-being. When you feel mentally and emotionally healthy, you are better prepared to take on the challenges facing you. Living with cancer can be difficult emotionally. You may be thinking about life and death, or examining your relationships with the people around you. For some cancer patients, the emotional challenges of fighting cancer can lead to feelings of sadness or depression. You may feel depressed and may need to consult a psychologist or attend support groups to make you feel better. Concern and anxiety over the cancer can also trigger depression. The medications prescribed may cause mood swings.

If you are feeling down or overwhelmed, ask for help. Your support team knows that fighting cancer can be a tough emotional battle and they want to help.

“I heard that people will shy away when you have this kind of sickness [cancer], either because of ignorance of the subject or for other reasons. But with us, honestly, it was just the opposite. They have offered their help even more than they normally would.” – Wife of a colorectal cancer patient
Diet

You may find that your appetite changes during treatment. You may feel like eating more or less than before. Stress or the medications you are taking may be the cause. You may also notice a change in how some foods taste. Some chemotherapy patients find that some foods have a metallic taste.

Part of keeping healthy is eating a well-balanced diet. When you eat well, you will feel more energetic. This will give you the strength you need to cope. In addition, eating a well-balanced diet will help you maintain an ideal weight. If you are trying to lose weight, it is recommended that you wait until after you’ve finished cancer treatment. At that point, you should talk to your nurse or doctor about whether it is appropriate to start losing weight.

If you find that you are not as hungry as before, here are a few tips that might help you ensure that you have the energy you need:

- Eat multiple small meals throughout the day instead of three large meals. Whenever you are feeling hungry, eat something; keep healthy snacks available.
- To encourage your appetite, take a walk or do some exercise before your meal.
- Have a friend or family member prepare food for you ahead of time so you can have it ready in the fridge for when you are feeling hungry.
- Avoid coffee and tea. Drink milk, milkshakes, juice, smoothies, Boost® or Ensure®.
If you find that red meat has a bitter taste, you may want to try marinating (soaking) it in soy sauce, fruit juice or wine vinegar before cooking. Eating with plastic cutlery instead of metal cutlery may also help. If the bitter taste persists, or you don’t want to eat red meat, try eating other foods that are rich in protein: chicken, milk products, ham, eggs, fish, nuts, seeds, legumes, tofu or soy beverages are all good alternatives.

Consult one of the many cancer-related cookbooks available.

Ask your dietitian for recommendations.

If you find that you are hungrier than usual, talk to your doctor, nurse or dietitian about how you can control any potential weight gain.

**Appearance**

Some cancer treatments may make some patients feel less physically attractive. Fatigue, hair loss, skin problems or brittle nails seem to make things worse. The good news is that these side effects are often temporary and should resolve after your treatment is over. There are also ways to manage some of these changes. Ask your healthcare team about how to take care of your skin during cancer treatment.

Look Good, Feel Better® is a free national public service program that helps women with cancer learn how to cope with appearance-related side effects of their treatment. If you want to learn more about their beauty workshops and consultations, ask your healthcare team or call 1-800-914-5665.

If you are having chemotherapy, ask your doctor or nurse if the drugs you will be taking involve a risk of hair loss. If so, you may want to plan in advance what you want to do: some patients cover their heads with scarves, hats or wigs; others decide not to do anything at all. The choice is yours. You can read more about hair loss on page 64.
Sex and Sexuality

Your body will go through some changes during your treatment. Though these changes may not be visible, you may feel different. For some people, cancer treatment can be very stressful or tiring – they may not be as interested in sex. For others, their sexual drive may be the same as before cancer treatment. Still others may find that the experience has brought them closer to their partner. Just as your response to treatment is individual, your feelings towards sex are your own. If you are finding that your sexual drive is lower than usual, know that this is probably temporary. Whatever your situation, it is normal and you are still the same person as before.

In some cases, the surgery used to treat rectal and anal cancer carries the risk of sexual dysfunction; this may be temporary or permanent. Talk to your doctor if you have any questions or concerns.

Cancer treatment can take a particularly heavy toll on your body and it might take a little bit of time for you to feel “back to normal.” Talk to your partner and let him or her know how you’re feeling. Keeping the lines of communication open is very important, especially during this time.

Women may have a feeling of vaginal dryness, burning or itchiness from the chemotherapy or radiation. Using a personal lubricant may help you feel more comfortable, especially during sexual intercourse. It is a good idea to use a condom if engaging in sexual intercourse within 48 hours of receiving chemotherapy or while on chemotherapy that is infused over several days.

Irregular menstrual cycles are another side effect of chemotherapy. Some women find that their menstrual periods stop altogether. Once chemotherapy stops, it is possible that regular menstrual periods may begin again. However, sometimes a patient’s periods do not resume (premature menopause).
If you have worries or concerns, talk to your healthcare team. They have helped many other people and will not be embarrassed by your questions. Remember, they are there to help.

**Pregnancy and Fertility**

For women, becoming pregnant during your cancer treatment is not recommended because the drugs or other treatments may harm the unborn child. If there is a chance that you may become pregnant, it is important to use some form of birth control. Talk to your doctor, pharmacist or nurse about the best birth control options for you and your partner.

If you are thinking of having children in the future, there are a few things you should know. The long-term effects of chemotherapy may include sterility or premature menopause. The risk of this happening varies with the type of chemotherapy you receive and your age. Talk to your doctor to find out more about your own risks and if you should consider sperm banking or egg harvesting.

**Sun Safety**

Chemotherapy and radiation make you more sensitive to the sun; therefore, it is important that you use sun protection. This includes using sunblock or sunscreen (minimum SPF 30), and wearing a wide-brimmed hat, long-sleeved tops, long pants and sunglasses. Be especially careful to protect yourself from the sun during radiation therapy and for six months following your therapy. The Canadian Cancer Society has excellent information on its Web site regarding sun protection in their SunSense Guidelines.
Work

How soon you feel ready to return to work is up to you. Some people can work during their treatment. Others may need to take time off. Others may not be able to return to work. Talk to your healthcare team about your options. If you are having chemotherapy, you may want to wait until you’ve finished one to two months of treatment to see how it affects you before making any decisions about work.

Talk to your social worker for guidance on how to access sick leave and disability, and for help filling out the necessary forms.

Remember, every patient has a different reaction to cancer treatment. Listen to your body and take enough time to recover. That way you will be in good shape when you return to work.

“My husband and I have focused our life. Knowing the cancer that I have has a very high percentage of recurrence within five years of surgery, we’ve changed our lifestyle. We moved our retirement up and we’ve done the things now that we were going to do seven years from now. We’ve just changed our whole life.”

– Muriel, colorectal cancer patient
Survivorship: Being Cancer-free

Being cancer-free describes the time when cancer is under control and the person is free from its signs and symptoms. Living seems like a victory but not a complete one. Having to deal with the uncertainty of cancer returning can be very stressful – no one wants to think they will have to fight cancer a second or third time. The most important thing you can do is to take care of yourself. Do what you can to live a healthy lifestyle and listen to your doctor’s advice about medical check-ups.

Part of feeling healthy is paying attention to any worries you have about cancer returning. You may want to talk to your social worker, psychologist, nurse or friends and family about these concerns. Talking to patients who “have been there” may help. Ask your doctor or nurse about getting in touch with a patient group or counsellor.

“It’s going to be a very quality time. It’s going to be with people I want to be with and I’m going to be doing things with people that I want to do things with. It’s going to be really important.” – Muriel, colorectal cancer patient
information and support

“If there were articles [on the Internet] that seemed relevant, I’d speak to the oncologist about them. And he’d really reassure me. He’d tell me that ‘this is fine’ and ‘this is not really the way it is.’” – Wife of a colorectal cancer patient
You may feel the need to learn as much as you can about colorectal cancer or you may just have some specific questions about your treatment. On the following pages, you will find some places to start your search. The list is not complete. We have listed some of the organizations and sources of information we have found helpful.

Keep in mind that while the Internet can be a great source of information, not all of the information is completely accurate, and nor can it replace the specific information and advice you receive from your healthcare team about your unique situation. Be sure to ask your healthcare team about any information that you find on the Internet.

Local support groups provide another great source of information and encouragement. Ask your healthcare team to recommend organizations in your community. Contact your local branch of the Canadian Cancer Society for more information. Ask for help at your local library reference desk. They may be able to put you in touch with resources in your community and help you with Internet searches.
Resources Available

Organizations

**Canadian Cancer Society**
A national organization with provincial divisions and local offices that can provide you with information pamphlets in a number of languages, including French and English, and help with the practical matters of treatment. It also offers the Reach to Recovery® support program.

*Cancer Information Service Line: 888-939-3333*

[www.cancer.ca](http://www.cancer.ca)

**Cancer Connection**
A telephone-based peer support service offered by the Canadian Cancer Society. It is available in English and French.

*Telephone: 800-263-6750*

**CancerNet**
This is an Internet-based information resource supported by the National Cancer Institute of the United States’ Department of Health and Human Services. It offers general information for patients and families, and discusses treatment options for different types of cancer. It is available in English and Spanish.


**National Coalition for Cancer Survivorship**
This is an American advocacy organization led by survivors that works exclusively on behalf of people with all types of cancer and their families. Available in English only.

[www.canceradvocacy.org](http://www.canceradvocacy.org)
Colorectal Cancer Association of Canada (CCAC)
The CCAC is a national, non-profit organization dedicated to promoting awareness and education regarding colorectal cancer. The CCAC provides support for patients and their families, and advocacy on their behalf. It is available in English and French.
Telephone: 416-920-4333; 514-875-7745
Toll free: 877-50-COLON (877-502-6566)
www.colorectal-cancer.ca

WellSpring
This is a network of centres providing emotional and psychological support to people and families coping with cancer in Ontario. It is available in English and Chinese.
Telephone: 877-499-9904
www.wellspring.ca

British Columbia Cancer Agency
The agency’s Web site provides facts on treatment and side effects for both patients and healthcare professionals. It is available in English only.
www.bccancer.bc.ca

Cancer Care Manitoba
This Web site provides information on cancer, treatment and side effects, as well as patient and family support services. It is available in English only.
www.cancercare.mb.ca

Cancer Care Ontario
The Cancer Care Ontario Web site provides facts and information on cancer, treatments and other resources for patients and family members. Resource materials are available in both English and French.
www.cancercare.on.ca
Health Canada On-line
The Health Canada Web site provides information from the Canadian government on cancer. It is available in English and French.
www.hc-sc.gc.ca/index-eng.php

Look Good, Feel Better®
This is a national program designed to help women cope with the changes in appearance that cancer treatment can bring. It is available in English and French.
Telephone: 800-914-5665
www.lgfb.ca

Hope and Cope
This group supports cancer patients and their families at the Montreal Jewish General Hospital. It is available in English and French.
Telephone: 514-340-8255
www.jgh.ca/en/HopeCope

American Cancer Society
The society provides information on cancer in English and Spanish. Some materials are available in Asian languages.
Telephone: 800-ACS-2345
www.cancer.org

National Colorectal Cancer Research Alliance
This American group provides information about colorectal cancer, supports research and promotes screening. It is available in English only.
www.nccra.org
Book


You can also visit your local hospital or community library to borrow books and videos on colorectal cancer.

Resource Available in French

Organization

La Fondation québécoise du cancer

A patient advocacy group based in Québec.

Telephone: 800-363-0063

www.fqc.qc.ca/

“Some of the information is devastating but it’s the reality of it. And we always [think] what if I had known, what should I have done. You have to go past the guilt and the self-recrimination. You have to go past that and live today. You have to decide this is where I’m at today and this is how we’re going to move on today.” – Muriel, colorectal cancer patient
appendices
Appendix 1

Screening Recommendations for Colorectal Cancer

Early detection and removal of pre-cancerous polyps can prevent colorectal cancer. Early detection of cancer increases the likelihood of a cure. To catch colorectal cancer early, it is recommended that certain groups of people undergo screening.

Research has shown that certain people have a higher risk of colorectal cancer. If you are 50 years or older, talk to your doctor or nurse about screening for colorectal cancer. People who are over 50 years of age and who have no other risk factors but age should be screened for colon cancer with an FOBT. If this test is positive, you will probably need to undergo a colonoscopy to determine whether the blood in your stool is being caused by colorectal cancer. See Table 1 (page 93) for more on tests.
People in other high-risk groups should consider screening before the age of 50 years. Studies have shown that people in high-risk groups make up 25 per cent of colorectal cancers that are diagnosed. These high-risk groups include:

- People who have a prior diagnosis of colorectal cancer or adenomas (non-cancerous tumours made up of cells that line the intestine);
- People with a close relative, i.e., first-degree relative (mother, father or siblings) who has had colorectal cancer or adenomas;
- People with a previous history of cancer of the ovary, endometrium (lining of the uterus) or breast.

Some risk factors for everyone are:

- A history of inflammatory bowel disease (e.g., ulcerative colitis, Crohn’s disease);
- A diet high in red meat and low in fruits and vegetables;
- Being overweight or obese;
- Lack of exercise;
- Drinking alcohol and smoking.

People in one of these higher-risk groups should talk to their doctor about what screening tests are best and at what age they should start having screening tests.

Remember, the earlier colorectal cancer is caught, the better. If you have been diagnosed with colorectal cancer, let your family know and discuss the benefits of screening with them.
Reducing the Risks

In addition to screening, there are things you can do that may reduce the risk of developing colorectal cancer:

- Eat lots of fruits, vegetables and high-fibre foods. Limit your consumption of red meat. Such diets have been shown to reduce the risk of colon cancer and many other types of cancers.
- Exercise regularly, at least three times a week.
- Try to stay close to your ideal weight. Obesity is also a risk factor for many other diseases, including heart disease and diabetes.
- Drink alcohol in moderation (two drinks or fewer per day).
- Quit smoking.
- Talk to your doctor or nurse for more information about reducing your risk of developing colorectal cancer.
Table 1: Investigations

<table>
<thead>
<tr>
<th>Test</th>
<th>CT scan (computed tomography scan)</th>
</tr>
</thead>
</table>

**What to Expect**

- This test uses x-rays to look inside your body (e.g., head, chest, abdomen, pelvis). It is used to help diagnose many abnormalities, both benign and malignant.
- You may be asked to drink a liquid contrast material 30 to 60 minutes before the test; this helps improve the quality of the pictures.
- Intravenous contrast will often be given through an arm vein; it also helps improve the quality of the pictures.
- Minor reactions (like itchiness, rash or nausea) occur in about one in 30 patients. Serious reactions (like shortness of breath) occur in one in 2,500 patients. Very severe reactions (like an irregular heart beat, kidney failure, convulsions or loss of consciousness) occur in one in 25,000 patients.
- You will be asked to lie still on your back while the machine scans your body. It will take about 20 minutes.

**Preparation Necessary**

- Unless you are a diabetic, you may need to fast for up to 12 hours before the test.
- Please tell your team if you could be pregnant.
- Only very small amounts of radiation are used.
### Table 1: Investigations (continued)

<table>
<thead>
<tr>
<th>Test</th>
<th>MRI scan (magnetic resonance imaging scan)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What to Expect</strong></td>
<td></td>
</tr>
<tr>
<td>• This test uses magnetic fields to look inside your body (e.g., head, liver, bone). It is used to help diagnose many abnormalities, both benign and malignant.</td>
<td></td>
</tr>
<tr>
<td>• Intravenous gadolinium may be given through an arm vein; it helps improve the quality of the pictures.</td>
<td></td>
</tr>
<tr>
<td>• You will be asked to lie still on your back while the machine scans your body. It will take 30 to 60 minutes.</td>
<td></td>
</tr>
<tr>
<td><strong>Preparation Necessary</strong></td>
<td></td>
</tr>
<tr>
<td>• Please tell your team if you have a pacemaker, a fear of closed-in places or metal in your body (e.g., bullet, aneurysm clips, implanted pumps, heart valve, internal hearing aid, orthopedic rods, screws and shrapnel).</td>
<td></td>
</tr>
<tr>
<td>• Please tell your team if you could be pregnant.</td>
<td></td>
</tr>
<tr>
<td>• You may need to wear earplugs because the machine can make a loud knocking sound.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>Ultrasound</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What to Expect</strong></td>
<td></td>
</tr>
<tr>
<td>• This test uses sound waves to look inside your body (e.g., liver). It can help distinguish between a cyst (a benign fluid-filled sac) and a tumour (a solid lump). It may also be used to guide a needle into an area for a biopsy or help identify a safe site to drain fluid out of your abdomen or chest.</td>
<td></td>
</tr>
<tr>
<td>• You will be asked to lie on your back. A gel will be squirted on your skin and then a hand-held scanning probe will be moved over the region that needs assessment. It will take approximately 30 to 45 minutes.</td>
<td></td>
</tr>
<tr>
<td><strong>Preparation Necessary</strong></td>
<td></td>
</tr>
<tr>
<td>Unless you are a diabetic, you may need to fast for up to 12 hours before the test. You may need to have a full bladder for the test so ask whether you can urinate. You will need to avoid chewing gum or drinking carbonated beverages (e.g., pop) before the test.</td>
<td></td>
</tr>
</tbody>
</table>
Table 1: Investigations (continued)

<table>
<thead>
<tr>
<th>Test</th>
<th>PET scan (positron emission tomography scan)</th>
</tr>
</thead>
</table>

**What to Expect**
- This test uses a radioactive tracer attached to sugar to identify where there is infection, injury or cancer in your body.
- You will have a small sample of blood drawn and then you will receive an injection of radioactive tracer into an arm vein. You will be asked to lie still on your back while the machine scans your body. It will take 30 to 60 minutes.

**Preparation Necessary**
- Unless you are a diabetic, you may need to fast for up to six hours before the test.
- Only very small amounts of radiation are used. It leaves your body within hours to a few days.
- Please tell your team if you could be pregnant.

<table>
<thead>
<tr>
<th>Test</th>
<th>PET-CT scan</th>
</tr>
</thead>
</table>

**What to Expect**
- This test combines two scanners:
  - PET to show the metabolism and function of the cells
  - CT to show the detailed anatomy.
- Provides information about the location, nature and extent of the lesion.

**Preparation Necessary**
- Unless you are a diabetic, you may need to fast for up to six hours before the test.
- Only very small amounts of radiation are used. It leaves your body within hours to a few days.
- Please tell your team if you could be pregnant.
### Table 1: Investigations (continued)

<table>
<thead>
<tr>
<th>Test</th>
<th>Bone scan (bone scintigraphy or nuclear medicine test)</th>
</tr>
</thead>
</table>

**What to Expect**
- This test uses a radioactive tracer to identify where there is infection, injury or cancer in the bones.
- You will receive an injection of a radioactive tracer into an arm vein. About two hours later, you will be asked to lie still on your back while the machine scans your body. It will take about 30 minutes.

**Preparation Necessary**
- No preparation is necessary.
- Only very small amounts of radiation are used. It leaves your body within hours or a few days.
- Please tell your team if you could be pregnant.

<table>
<thead>
<tr>
<th>Test</th>
<th>EUS (endoscopic ultrasound)</th>
</tr>
</thead>
</table>

**What to Expect**
This test is like a colonoscopy but, instead of having a camera at the end to look inside your bowel, it uses ultrasound to help detect how deep the cancer goes into the bowel wall and whether regional lymph nodes are enlarged or not. It also allows the doctor to obtain a biopsy of any abnormality.

**Preparation Necessary**
You will be provided with specific instructions on how to empty your colon completely to ensure a clear view.
Appendix 2

Treatment Approaches and Clinical Care Pathways

This section provides an overview of the approach for each stage of the disease (Table 1). Also provided in this section is a diagrammatic representation of the clinical care pathways for colon cancer, rectal cancer and metastatic disease (Figures 1, 2 and 3).

Table 1: Treatment Approaches

<table>
<thead>
<tr>
<th>Stage I</th>
<th>Intent of Treatment: Curative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon cancer: Surgery only</td>
<td></td>
</tr>
<tr>
<td>Rectal cancer: Surgery only</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage II</th>
<th>Intent of Treatment: Curative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon cancer: Surgery and, depending upon certain features, chemotherapy for six months</td>
<td></td>
</tr>
<tr>
<td>Rectal cancer: Surgery and radiotherapy and, depending upon certain features, chemotherapy for six months</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage III</th>
<th>Intent of Treatment: Curative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon cancer: Surgery and adjuvant chemotherapy for six months</td>
<td></td>
</tr>
<tr>
<td>Rectal cancer: Surgery, radiotherapy and chemotherapy for six months</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage IV</th>
<th>Intent of Treatment: Typically palliative but curative in certain situations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery, radiotherapy and/or chemotherapy with or without biologic (&quot;targeted&quot;) therapy are considered for healthy patients</td>
<td></td>
</tr>
<tr>
<td>Best supportive care is considered for patients who are too unwell or those who decide not to undergo surgery to receive chemotherapy</td>
<td></td>
</tr>
<tr>
<td>In certain circumstances, surgery to remove a metastasis may be possible</td>
<td></td>
</tr>
</tbody>
</table>
When the colorectal cancer has spread to places like the liver, lung or abdominal cavity, it often becomes an incurable (palliative) situation. However, there are some specific situations where the cancer is in a place that can still be surgically removed with the possibility of a cure. This procedure may be called a metastatectomy (surgical removal of the metastasis). These surgeries are often complex and can only be done by specialized surgeons.

For example, a hepatobiliary surgeon (a medical doctor who has special training in surgery on the liver and bile ducts) may be able to remove a portion of your liver. A thoracic surgeon (a medical doctor who has special training in surgery on the lung and chest) may be able to remove a portion of your lung. A surgical oncologist might be able to peel away cancer that has spread to the lining of the abdominal cavity (the peritoneum); this procedure is called cytoreductive surgery and is often followed by hyperthermic intra-peritoneal chemotherapy (“HIPEC” – a treatment where warmed chemotherapy is placed in the abdominal cavity for a period of time after the peritoneum is surgically stripped away).

A radiologist (a doctor who has specialized training in interpreting ultrasounds) may be able to place a special probe through your skin and into the liver to burn a spot of cancer. This is called radiofrequency ablation (RFA).

Your healthcare team will try to identify these specific situations and discuss your best treatment with a multidisciplinary team (a team of healthcare professionals with different expertise on the diagnosis and treatment of cancer). Sometimes chemotherapy (with or without biological therapy) will be given first to try to reduce the size of cancer before a surgeon attempts surgical removal.
Figure 1: Clinical Care Pathways for Colon Cancer

- Adenocarcinoma of Colon
- No Evidence of Metastatic Disease
- Stage I
- Stage II (without high-risk features)
- Stage II (with high-risk features)
- Stage III
- CT Chest Abdomen/Pelvis
- Surveillance
- Surveillance
- Adjuvant Chemotherapy
- Adjuvant Chemotherapy
- Remove Cancer
- Surveillance
Figure 2: Clinical Care Pathways for Rectal Cancer

- **Colonoscopy**
  - **Adenocarcinoma of Rectum**
  - **CT Chest/Abdomen/Pelvis**
  - **No Evidence of Metastasis**

- **Stage I**
  - **Surgical Removal**

- **Stage II and Stage III**
  - **Radiation with or without Chemotherapy Before Surgery**
  - **Surgical Removal**
  - **Radiation After Surgery (if not done before)**
  - **Consider Adjuvant Chemotherapy and Surveillance**

**No Evidence of Metastatic Disease**
- **MRI or Endoscopic Ultrasound**
**Figure 3: Clinical Care Pathway for Metastatic Disease**

<table>
<thead>
<tr>
<th>Presence of Metastatic Disease</th>
<th>Stage IV (resectable)</th>
<th>Stage IV (marginally resectable)</th>
<th>Stage IV (unresectable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multidisciplinary Assessment</td>
<td>Metastatectomy/HiPEC</td>
<td>Pre-operative Chemotherapy</td>
<td>End-of-Life Care</td>
</tr>
<tr>
<td>Consider “Adjuvant” Chemotherapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td>Consider “Adjuvant” Chemotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td>Metastatectomy</td>
<td>Palliative Chemotherapy</td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td></td>
<td>Remove, Stent or Bypass</td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td></td>
<td>End-of-Life Care</td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3

Examples of Drugs and Drug Regimens for the Treatment of Colorectal Cancer

Table 1 gives a quick description of some drugs used to treat colorectal cancer and Table 2 lists examples of chemotherapy regimens in combination with biologics. More information on common chemotherapy options is provided in Table 3. Table 4 has additional information on biologic therapies.

Because of the large number of drugs used to treat cancer and the new ones being developed all the time, it is impossible to provide a list of all of the available drugs. Always ask your doctor, pharmacist or nurse if you have any questions about the drugs you will be receiving or the side effects of your treatment. Make sure you know when you need to contact your healthcare team about any side effects you may experience.
Table 1: Examples of chemotherapy medications used to treat colorectal cancer

<table>
<thead>
<tr>
<th>Name</th>
<th>Trade Name</th>
<th>How Administered</th>
<th>Used to treat</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-Fluorouracil or 5-FU</td>
<td>FLUOROURACIL INJECTION</td>
<td>Intravenously</td>
<td>Adjuvant chemotherapy in stage II and stage III disease and treatment of metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Calcium folinate, folinic acid or leucovorin</td>
<td>LEUCOVORIN CALCIUM INJECTION</td>
<td>Intravenously</td>
<td>Administered with 5-fluorouracil to make it more effective</td>
</tr>
<tr>
<td>Capecitabine</td>
<td>XELODA®</td>
<td>By mouth</td>
<td>Adjuvant chemotherapy in stage II and stage III disease and treatment of metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Irinotecan or CPT-11</td>
<td>CAMPTOSAR®</td>
<td>Intravenously</td>
<td>Metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Oxaliplatin</td>
<td>ELOXATIN®</td>
<td>Intravenously</td>
<td>Adjuvant chemotherapy in stage II and stage III disease and treatment of metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Raltitrexed</td>
<td>TOMUDEX®</td>
<td>Intravenously</td>
<td>Metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Bevacizumab</td>
<td>AVASTIN®</td>
<td>Intravenously</td>
<td>Metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Cetuximab</td>
<td>ERBITUX®</td>
<td>Intravenously</td>
<td>Metastatic disease (stage IV)</td>
</tr>
<tr>
<td>Panitumumab</td>
<td>VECTIBIX®</td>
<td>Intravenously</td>
<td>Metastatic disease (stage IV)</td>
</tr>
</tbody>
</table>

*TM of ImClone LLC
ADRUCIL® is a registered trademark of Pfizer Canada Inc. AVASTIN® is a registered trademark of of Genentech, Inc., used under licence. CAMPTOSAR® is a registered trademark of Pfizer Canada Inc. ELOXATIN® is a registered trademark of sanofi-aventis. TOMUDEX® is a registered trademark of AstraZeneca Canada Inc. VECTIBIX® is a registered trademark of Amgen Canada Inc. XELODA® is a registered trademark of Hoffmann-La Roche Limited.
### Table 2: Examples of regimens combining biologic therapy and chemotherapy medications for the treatment of colorectal cancer

<table>
<thead>
<tr>
<th>Biologic therapy</th>
<th>Used in combination with chemotherapy medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bevacizumab (AVASTIN)</td>
<td>Capecitabine (XELODA) or 5-fluorouracil and leucovorin plus irinotecan (CAMPTOSAR)</td>
</tr>
<tr>
<td>Bevacizumab (AVASTIN)</td>
<td>Capecitabine (XELODA) or 5-fluorouracil and leucovorin plus oxaliplatin (ELOXATIN)</td>
</tr>
<tr>
<td>Cetuximab (ERBITUX)</td>
<td>Irinotecan (CAMPTOSAR)</td>
</tr>
</tbody>
</table>

These are just some of the possible combinations of biologic therapy and chemotherapy medications. Your doctor can tell you about other possible combinations.
**Table 3: Common Chemotherapy Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>FOLFIRI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical Schedule</strong></td>
<td>Repeated every two weeks</td>
</tr>
<tr>
<td><strong>Component(s)</strong></td>
<td><strong>Typical Method of Administration</strong></td>
</tr>
<tr>
<td>Irinotecan (CAMPTOSAR)</td>
<td>This chemotherapy drug is given intravenously over two hours while you are in the Medical Daycare Unit. This unit may also be called the Ambulatory Oncology Clinic.</td>
</tr>
<tr>
<td>Leucovorin</td>
<td>This vitamin is given intravenously over two hours while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic). It helps the 5-fluorouracil work better.</td>
</tr>
<tr>
<td>5-Fluorouracil</td>
<td>This chemotherapy drug is given intravenously as a short infusion while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic). Afterwards, you will be connected to a pump to take home. This pump then gives the remainder of the drug over 46 hours through a vascular access device.*</td>
</tr>
<tr>
<td><strong>Potential Side Effects</strong></td>
<td>- Nausea, vomiting, mouth sores, diarrhea and fatigue</td>
</tr>
<tr>
<td></td>
<td>- Decrease in your white blood cell count (ability to fight infection)</td>
</tr>
<tr>
<td></td>
<td>- Hair loss</td>
</tr>
</tbody>
</table>

*Across Canada, there are differences in vascular access devices. It could be a central venous catheter (CVC or central line), peripherally inserted central catheter (PICC line), or port. Your healthcare team will describe which option is available in your region.
Table 3: Common Chemotherapy Options (continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Typical Schedule</th>
<th>Component(s)</th>
<th>Typical Method of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOLFOX</strong></td>
<td></td>
<td><strong>Oxaliplatin (ELOXATIN)</strong></td>
<td>This chemotherapy drug is given intravenously over two hours while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic).</td>
</tr>
<tr>
<td><strong>Typical Schedule</strong></td>
<td>Repeated every two weeks</td>
<td><strong>Leucovorin</strong></td>
<td>This vitamin is given intravenously over two hours while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic). It helps the 5-fluorouracil work better.</td>
</tr>
<tr>
<td><strong>Component(s)</strong></td>
<td></td>
<td><strong>5-Fluorouracil</strong></td>
<td>This chemotherapy drug is given intravenously as a short infusion while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic). Afterwards, you will be connected to a pump to take home. This pump then gives the remainder of the drug over 46 hours through a vascular access device.*</td>
</tr>
</tbody>
</table>
| **Potential Side Effects** |                        |                              | • Nausea, vomiting, mouth sores, diarrhea and fatigue  
• Decrease in your white blood cell count (ability to fight infection)  
• Numbness and tingling in your fingers and toes, or around your lips and throat (it is often made worse by the cold) |

*Across Canada, there are differences in vascular access devices. It could be a central venous catheter (CVC or central line), peripherally inserted central catheter (PICC line), or port. Your healthcare team will describe which option is available in your region.
## Table 3: Common Chemotherapy Options (continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>CAPOX (also called XELOX)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical Schedule</strong></td>
<td>Repeated every three weeks</td>
</tr>
<tr>
<td><strong>Component(s)</strong></td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td><strong>Capecitabine (XELODA)</strong></td>
<td>This chemotherapy drug is given as pills to take by mouth twice a day for 14 days.</td>
</tr>
<tr>
<td><strong>Oxaliplatin (ELOXATIN)</strong></td>
<td>This chemotherapy drug is given intravenously over two hours while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic).</td>
</tr>
<tr>
<td><strong>Potential Side Effects</strong></td>
<td>Nausea, vomiting, mouth sores, diarrhea and fatigue</td>
</tr>
<tr>
<td></td>
<td>Decrease in your white blood cell count (ability to fight infection)</td>
</tr>
<tr>
<td></td>
<td>Numbness and tingling in your fingers and toes, or around your lips and throat (it is often made worse by the cold)</td>
</tr>
<tr>
<td></td>
<td>Red and tender palms and soles</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option</th>
<th>Capecitabine (XELODA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical Schedule</strong></td>
<td>Repeated every three weeks</td>
</tr>
<tr>
<td><strong>Component(s)</strong></td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td><strong>Capecitabine (XELODA)</strong></td>
<td>This chemotherapy drug is given as pills to take by mouth twice a day for 14 days.</td>
</tr>
<tr>
<td><strong>Potential Side Effects</strong></td>
<td>Nausea, vomiting, mouth sores, diarrhea and fatigue</td>
</tr>
<tr>
<td></td>
<td>Decrease in your white blood cell count (ability to fight infection)</td>
</tr>
<tr>
<td></td>
<td>Red and tender palms and soles (hand-foot syndrome)</td>
</tr>
</tbody>
</table>
**Table 3: Common Chemotherapy Options (continued)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Irinotecan (CAMPTOSAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Schedule</td>
<td>Repeated every three weeks</td>
</tr>
<tr>
<td>Component(s)</td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td><strong>Irinotecan (CAMPTOSAR)</strong></td>
<td>This chemotherapy drug is given intravenously over two hours while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic).</td>
</tr>
</tbody>
</table>
| Potential Side Effects | ▪ Nausea, vomiting, mouth sores, diarrhea and fatigue  
                        ▪ Decrease in your white blood cell count (ability to fight infection)  
                        ▪ Hair loss |

<table>
<thead>
<tr>
<th>Option</th>
<th>Raltitrexed (TOMUDEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Schedule</td>
<td>Repeated every three or four weeks</td>
</tr>
<tr>
<td>Component(s)</td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td><strong>Raltitrexed (TOMUDEX)</strong></td>
<td>This chemotherapy drug is given intravenously over 15 minutes while you are in the Medical Daycare Unit (or Ambulatory Oncology Clinic).</td>
</tr>
</tbody>
</table>
| Potential Side Effects | ▪ Nausea, vomiting, mouth sores and fatigue  
                        ▪ Decrease in your platelets (ability to clot blood)  
                        ▪ Rash |
Table 4: Biologic ("Targeted") Therapy

<table>
<thead>
<tr>
<th>Option</th>
<th>Bevacizumab (AVASTIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Schedule</td>
<td>Repeated with chemotherapy every two or three weeks</td>
</tr>
<tr>
<td>Component(s)</td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td>Bevacizumab (AVASTIN)</td>
<td>This drug is a protein that prevents a colorectal cancer from building the blood supply it needs to grow. It is given intravenously for up to 90 minutes. It may be added to chemotherapy (such as FOLFIRI, FOLFOX, CAPOX and capecitabine [XELODA]).</td>
</tr>
</tbody>
</table>
| Potential Side Effects | - High blood pressure  
- Bleeding and blood clots (occasionally heart attacks or strokes)  
- Passage of protein through kidneys  
- Wound healing complications |

<table>
<thead>
<tr>
<th>Option</th>
<th>Panitumumab (VECTIBIX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Schedule</td>
<td>Repeated every two weeks</td>
</tr>
<tr>
<td>Component(s)</td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td>Panitumumab (VECTIBIX)</td>
<td>This drug is a protein that turns off colorectal cancer cell growth. It only works if your colorectal cancer shows &quot;K-ras wild-type.&quot; It is given intravenously over one hour.</td>
</tr>
</tbody>
</table>
| Potential Side Effects | - Skin redness or dryness, or rash (looks like pimples)  
- Nail or hair changes  
- Diarrhea  
- Low magnesium or calcium levels  
- Fatigue  
- Allergic reactions, shortness of breath or cough (rare) |
Table 4: Biologic ("Targeted") Therapy (continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Cetuximab (ERBITUX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Schedule</td>
<td>Repeated every week</td>
</tr>
<tr>
<td>Component(s)</td>
<td>Typical Method of Administration</td>
</tr>
<tr>
<td>Cetuximab (ERBITUX)</td>
<td>This drug is a protein that turns off colorectal cancer cell growth. It only works if your colorectal cancer shows “K-ras wild-type.” It is given intravenously over one hour.</td>
</tr>
</tbody>
</table>

Potential Side Effects
- Skin redness or dryness, or rash (looks like pimples)
- Nail or hair changes
- Diarrhea
- Low magnesium or calcium levels
- Fatigue
- Allergic reactions, shortness of breath, or cough (rare)

“I referred my daughters to the information that I was getting so that they could read about it, so that they could learn about it. Because it is a genetic disease, my daughters are perhaps prone to it. I didn’t know this until I started reading everything on it. I want them to be as informed as possible, so that they can make sure that they aren’t going to face what I was facing.”

– Muriel, colorectal cancer patient
glossary

Not all the terms noted in the glossary are used in the booklet; however, you may come across them during the course of your treatment.
Absolute neutrophil count: A measure of the number of neutrophils (a type of white blood cell) in the blood that is used to determine if you are at risk of infection and if your chemotherapy should be delayed or the dose reduced.

Abdomen: The area of the body between the chest and the hips. It contains the stomach, small and large intestines, liver, spleen, pancreas and many other organs.

Adenocarcinoma: A cancerous tumour affecting a gland.

Adenoma: A benign tumour with a structure resembling a gland or a tumour that starts in a gland. Polyps found in the colon are considered to be a type of adenoma.

Adjuvant therapy: Therapy given in addition to the main treatment for cancer. In the case of colorectal cancer, surgery is usually the primary treatment. An example of adjuvant therapy would be giving chemotherapy after surgery for colon cancer.

Advanced oncology nurse practitioner: An advanced practice nurse who provides specialized cancer care, including many tasks customarily performed by a physician.

Alopecia: Loss of hair from the scalp and/or body. Hair loss is usually temporary and may be partial or total depending on the person, the drug and the dose.

Alternative therapies: A broad range of treatments, including herbal remedies, vitamin supplements, strict or severe diets, ozone injections and heat therapy. Because many of these alternative therapies have not been studied to determine their effectiveness or their potential interaction with other therapies, it is important that you consult your doctor, pharmacist or nurse before trying any of them.
Anastomosis: Joining of the two parts of the colon after removal of cancerous tissue.

Anemia: Term used to describe a reduction of hemoglobin (the measure of your red blood cell count) below normal levels.

Antibiotic: Medication that fights bacterial infections.

Antibody: Special type of protein made by the body’s immune system. It disarms or destroys a specific foreign agent (called an antigen) when it appears in the body.

Antiemetic: Medication that prevents or relieves nausea and vomiting.

Antigen: Foreign agent that stimulates the body’s immune system to produce antibodies against it. Examples include an organism (virus or bacteria), transplanted cell or chemical compound.

Antimetabolite: An anticancer substance contained in chemotherapy medications. These substances are very much like substances needed by cells for normal growth. When present, the tumour cell uses the antimetabolite, which then interferes with the way the cell functions normally.

Assay: A test to determine the size, amount or characteristics of a sample, or a test designed to detect whether something is present or absent in a sample.
**B**

**B lymphocytes:** Lymphocytes (a type of white blood cell) that are responsible for the production of antibodies that help fight infection.

**Benign tumour:** Non-cancerous growth that does not spread to surrounding tissues and that rarely recurs after it has been completely removed.

**Bevacizumab (AVASTIN):** A monoclonal antibody against vascular endothelial growth factor (a biologic therapy) used to treat colorectal cancer.

**Biologic therapy:** A newer class of medications designed specifically to target cancer cell growth and activity. Monoclonal antibodies are an example.

**Biopsy:** A surgical procedure that involves removing a small piece of tissue or cells. The removed cells are then studied under a microscope by a pathologist to help make a diagnosis. The process of removing tissue or cells is known as “taking a biopsy.”

**Blood count:** The number of red blood cells, white blood cells and/or platelets in a sample of blood.

**Bolus:** The quick intravenous administration of a drug (instead of over a long period of time).

**Bone marrow:** The soft tissue and fluid found in the cavities of bones. Bone marrow contains stem cells, which produce different types of blood cells – red blood cells, white blood cells and platelets.

**Bowel:** Also called the large intestine, colon or rectum. It connects the small intestine to the anus. It is responsible for removing water from material as it passes through the digestive system.

**Bowel obstruction:** A situation where the intestine becomes blocked, preventing the movement of feces through the large intestine.
Carcinoembryonic antigen (CEA): A protein marker found in the bloodstream. An increased level of this compound may indicate colorectal cancer. It may also be increased in the presence of other cancers or diseases and in people who smoke.

CT scan (or CAT scan): A computerized tomography helps look inside your body to confirm if there is cancer in the liver, lungs, brain, bones or other parts of the body.

Calcium folinate: Also called folinic acid or calcium leucovorin. A drug that is used in combination with 5-fluorouracil to enhance its activity in the treatment of colorectal cancer.

Cancer: An uncontrolled abnormal growth of cells that can invade and destroy healthy tissues. Cancer is a general term used to name more than 100 diseases. While all cancers can spread to other parts of the body, not all do.

Cancer in situ: An early stage of cancer in which tumour cells have not yet invaded the surrounding tissues.

Capecitabine (XELODA): A chemotherapy used in the treatment of colorectal cancer. It is a medication taken by mouth and then changed in the body to 5-fluorouracil.

Carcinogen: Cancer-causing substance; for example, cigarette smoke.

Catheter (central line): A tube that is inserted into a part of your body. It is sometimes used in cancer treatment to make taking blood or giving medications easier.
Cell: The basic structure of living tissues. All plants and animals are made up of one or more cells. An amoeba, for example, is a one-cell organism. Human beings are made up of trillions of cells.

Central venous access device (CVAD): A catheter that is inserted into a vein in the body to deliver therapies into the bloodstream or withdraw blood for testing.

Cetuximab (ERBITUX): A monoclonal antibody against the epidermal growth factor receptor (a biologic therapy) used to treat colorectal cancer.

Chemotherapy: Medications with cancer-fighting abilities. Sometimes referred to as anticancer agents.

Chemotherapy cycle: The time it takes to give the chemotherapy treatment plus the rest time before the next treatment. Each round of chemotherapy medication is called a cycle.

Clinical trial: A research study (often to test new treatments). Strict rules are followed to make sure patients are well informed about the purpose, risks and benefits of any study before they agree to join a clinical trial.

Clinical trials nurse: A specially trained nurse who is involved in the care of patients who are participating in a clinical trial. A clinical trials nurse organizes and records treatments, blood work and x-rays, arranges for follow-up appointments, and provides information and support.

Colon: A muscular tube located in the abdomen that removes excess water from stool or feces before it exits from the body.

Colonoscopy: A procedure that uses a fibre-optic tube to look inside the colon.

Colorectal cancer: An abnormal growth of malignant cells in the colon or rectum.
Colostomy: The creation of an opening from the colon to the outside of the body to allow the elimination of feces. It may be either temporary or permanent.

Combination therapy: Use of two or more anticancer therapies to treat the cancer.

Complementary therapies: Complementary therapies can be used along with traditional cancer treatment and may help improve a patient’s sense of well-being and reduce stress. These therapies include peer and group support, therapeutic touch, yoga, massage therapy, chiropractor visits, meditation and visualization exercises.

Complete blood count (CBC): A blood test that measures the hemoglobin level (a protein in red blood cells that carries oxygen), total white blood cell count and platelet (cells that help blood form clots) count.

Dehydration: Excessive loss of water from the body. It may be caused by vomiting or diarrhea.

Diagnosis: Identification of a disease from signs, symptoms, laboratory tests, radiological results and physical findings.
**E**

**Epidermal growth factor receptor (EGFR):** A protein “antenna” found on the surface of many types of tumour cells that helps promote cancer cell growth and cell division.

**Enzymes:** Substances that promote specific chemical reactions; for example, the digestion of food in the intestine.

**Etiology:** Factors that cause disease.

**Excision:** Surgical removal of an organ or tissue.

---

**F**

**5-Fluorouracil (5-FU):** A chemotherapy medication commonly used to treat colorectal cancer.

**Familial adenomatous polyposis (FAP):** A rare inherited disease of the gastrointestinal system where thousands of polyps grow on the lining of the intestine. If the polyps are not removed, the patient may eventually develop cancer. Often doctors recommend a complete removal of the large intestine to prevent cancer from occurring.
**Febrile neutropenia:** A potentially life-threatening condition in which a fever develops in patients who have a low white blood cell count (specifically neutrophils). Fever indicates the presence of an infection that, in most cases, originates from bacteria that reside in the intestines, bladder or skin. Febrile neutropenia is a medical emergency and must be dealt with immediately. Any temperature over 101°F (Fahrenheit) or 38°C (Celsius) should be promptly reported to your healthcare team as an insufficient number of white blood cells makes it difficult to fight a bacterial infection.

**Feces:** Material expelled through the anus during bowel movements. It consists mostly of waste from food that has been eaten.

**Fibre-optic tube:** Used to transmit an image via a bundle of thin flexible glass or plastic fibres.

**Genes:** The biological units of heredity that transfer traits from cell to cell and from parents to child.

**General practitioner in oncology (GPO):** A family doctor who has received extra training in oncology to provide primary healthcare, including many tasks customarily performed by an oncologist.

**Granulocyte colony-stimulating factor (G-CSF):** Drug that stimulates the production of neutrophils (a type of white blood cell).
Hemoglobin: A protein in red blood cells that carries oxygen. Measuring hemoglobin levels can determine the presence of anemia.

Hereditary non-polyposis colorectal cancer (HNPCC): A hereditary condition (also known as Lynch syndrome) where polyps in the large intestine are more likely to develop into colorectal cancer and sometimes other cancers too. People in families with this condition should discuss early regular screening with their doctors.

Ileostomy: The creation of an opening from the ileum (end of the small bowel) to the outside of the body to allow the elimination of feces. It may be either temporary or permanent.

Immune system: The system in the body that defends against disease.

Immunology: The study of the body’s natural ability to defend itself against organisms or foreign substances.

Immunotherapy: Treatment that stimulates the body’s immune system to produce antibodies to fight disease.

Infection: Invasion of the body tissues by micro-organisms such as bacteria and viruses.

Infusion: A method of getting fluids (that may contain an anticancer drug) into the body through an intravenous line.
**Injection:** Use of a syringe and needle to introduce fluids into the body. Injections are given under the skin (subcutaneously), in a muscle (intramuscularly) or in a vein (intravenously).

**Intramuscular:** Injection of a drug into a muscle. The drug is then absorbed into the bloodstream.

**Intravenous:** Fluids or drugs administered directly into a vein. Commonly called IV. Many anticancer drugs are given by IV injection.

**Invasive cancer:** Cancer that has spread from its original location to nearby tissues or organs.

**Irinotecan (CAMPTOSAR):** A chemotherapy medication given by intravenous injection for the treatment of colorectal cancer.

**Irradiation:** Another term for radiation therapy. To irradiate is to give radiation therapy.

**Lactate dehydrogenase (LDH):** An enzyme that is present in most cell types that helps indicate cellular damage. Higher levels of lactate dehydrogenase signal aggressive tumours.

**Large intestine:** The final section of the digestive system, also called the colon. It comprises the cecum, the ascending colon, the transverse colon, the descending colon, the sigmoid colon and the rectum. The large intestine pushes food waste through these parts, removing excess water, and turning feces into semi-solid waste that can be expelled from the body.
**Local cancer:** Cancer that is confined entirely to the organ where the cancer began.

**Local treatment/therapy:** Treatment that targets cells in the tumour and the area close to it. Examples include radiation therapy and surgery.

**Localized:** Restricted to the site of origin without evidence of spread.

**Low anterior resection:** Name of a specific procedure to remove cancer from the rectum.

**Lymph:** Clear yellowish fluid that carries lymphocytes (a type of white blood cell), antibodies and nutrients throughout the body.

**Lymph nodes:** Bean-shaped glands that filter out impurities in lymphatic fluid. Cancer can become trapped in these filters.

**Lymphatic system:** System of vessels that carries lymph fluid between lymph nodes located throughout the body.

**Lymphocyte:** A type of white blood cell that plays a central role in the immune response.
**Magnetic resonance imaging (MRI):** A magnetic resonance imaging scan that uses a large magnet and a computer to develop images of the body, such as organs in the abdomen.

**Malignancy:** Tumour consisting of cancer cells. Cells from a malignant growth can break away and start secondary tumours (metastases) elsewhere in the body.

**Malignant:** Term meaning cancerous.

**Medical oncologist:** A medical doctor who specializes in drugs for the treatment of cancer with drugs.

**Metastasis (metastatic cancer):** Spread of cancer cells from the original tumour to other parts of the body by way of the lymph system or bloodstream.

**Monoclonal antibody:** Antibody of a single specific type produced by a family of cells (clone) derived from one parent cell. Monoclonal antibodies are designed to attack specific targets on cells to prevent the further spread of cancer.

**Mucositis:** Inflammation of the mucous membranes; for example, the lining of the mouth or throat.
Nausea: Feeling as though you need to vomit.

Neoadjuvant: Describes therapy or treatment given before primary therapy. For instance, radiation therapy or chemotherapy given to reduce the size of a tumour before surgery to remove the tumour.

Neuropathy: A problem with the nerves that carry information to and from the brain and spinal cord. It can result in pain, loss of sensation, tingling and numbness.

Neutropenia (neutropenic): Condition that describes an abnormal decrease in the level of neutrophils, a type of white blood cell in your body. This decrease of white blood cells can make your body more susceptible to infections. Neutropenia can be caused by chemotherapy, and may be treated with a granulocyte colony-stimulating factor medication, a drug that stimulates the production of neutrophils (a type of white blood cell).

Neutrophil: The most abundant type of white blood cell. It defends the body against infection. Neutrophils can be damaged by chemotherapy or other drugs.
O

**Oncogene:** An altered version of a normal gene that is involved in the control of cell growth and division.

**Oncologist:** A medical doctor who specializes in the diagnosis and treatment of cancer.

**Oncology:** The study and treatment of cancer.

**Oncology nurse:** A registered nurse who specializes in treating and caring for patients with cancer.

**Oxaliplatin (ELOXATIN):** A chemotherapy medication usually given in combination with other medications to treat colorectal cancer.

P

**Palliative therapy:** Treatment given to relieve the symptoms and reduce the suffering caused by cancer and other life-threatening diseases.

**Panitumumab (VECTIBIX):** A monoclonal antibody against the epidermal growth factor receptor (a biologic therapy) used to treat colorectal cancer.

**Pathologist:** A medical doctor who is trained in laboratory medicine and who examines tissues taken from biopsies to describe the type of cell making up the cancerous tissue.

**Pathology:** The study of changes to body tissues and fluids caused by disease.

**Pelvic examination:** Examination of the vagina, cervix, uterus and ovaries.
**Pelvic field:** Area of the body that includes the pelvis where radiation treatment may be given.

**Pelvis:** The region between the hips in the lower abdomen.

**Peripherally inserted central catheter (PICC):** A long flexible tube that is put into a vein in the arm that can be used for a long period of time to deliver treatments.

**Pharmacist:** A specially trained healthcare worker who prepares, dispenses and monitors drugs. He or she can give you expert advice on drug use and about any side effects that you may experience if you are taking drugs.

**Physiotherapy:** The use of exercises to help improve joint movement, reduce swelling and reduce pain associated with surgery. Conducted with the help of a physical therapist or physiotherapist.

**Platelets:** Cell fragments in the blood that form clots to help prevent bleeding or help stop bleeding after an injury.

**Polyp:** Benign tumours found on the inner lining of the bowel.

**Primary cancer:** Where the cancer started before it spread.

**Prognosis:** The prediction of how a patient will do after diagnosis.
**R**

**Radiation field:** The term used to describe the area of the body that will receive radiation treatment.

**Radiation oncologist:** A medical doctor who has had special training in using radiation to treat cancer.

**Radiation technologist:** Performs diagnostic imaging examinations and administers radiation therapy treatments.

**Radiation therapy (radiotherapy):** Use of gamma rays or high-energy x-rays to damage or destroy cancer cells.

**Radiologist:** Physician trained to diagnose disease by using x-ray, ultrasound, radioisotope scans, CT scans and MRI.

**Raltitrexed (TOMUDEX):** A chemotherapy medication given intravenously and used for the treatment of colorectal cancer.

**Rectum:** The last section of the large intestine that connects the sigmoid colon to the anus. It stores feces until they can be expelled from the body.

**Regimen:** A term used to describe the drugs, dosage, frequency, timing and total amounts of chemotherapy medications that a patient will receive.

**Registered dietitian:** A qualified expert in the field of food and nutrition. He or she provides people with nutritional assessments and counselling. He or she also turns scientific information about food and nutrition into practical advice people can use in their daily lives.

**Relapse:** The return of disease after being cancer-free.
Resection: The removal by surgery of diseased tissue.

Risk factors: Things that increase your chances of getting a disease. Risk factors can be environmental or hereditary.

Sexual dysfunction: Sex-related difficulty.

Side effects: Symptoms caused by certain drugs or treatments.

Sigmoid colon: A section of the large intestine that joins the descending colon to the rectum.

Sigmoidoscopy or flexible sigmoidoscopy: A flexible scope consisting of a hollow tube with a light that is inserted through the anus to look for polyps and other abnormalities in the rectum and sigmoid colon.

Staging: A method of classifying cancer according to the extent of its spread. It helps to determine treatment methods and predict the course of the disease.

Stem cell: Type of cell that is responsible for forming all kinds of cells.

Stoma: Opening in the abdomen that connects the colon to the outside of the body to allow for the passage of stool into an ostomy appliance (pouch).

Stomatitis: An inflammatory condition of the mouth.

Stool or feces: Solid waste from the digestive tract.

Subcutaneous: Injection of drugs by needle just below the skin.

Surgeon: A doctor who performs surgery.
**Surgical resection:** The removal of cancerous tissue and area of normal colon and lymph nodes near the cancer.

**Syringe:** A device that consists of a tube and a plunger. It is used to withdraw fluids from, or inject fluids into, the body.

**Systemic treatment:** A treatment using substances that travel through the bloodstream, reaching and affecting cells all over the body. Chemotherapy is an example of a systemic treatment.

**Targeted therapy:** A newer class of drugs designed specifically to target cancer cell growth and activity. Monoclonal antibodies are an example.

**Therapy:** The treatment of disease.

**Thrombocytopenia:** A condition that describes a drop in the platelet count below normal levels. Thrombocytopenia may lead to bleeding problems.

**Toxicity:** A negative side effect that results from the treatment’s damage to your body’s healthy cells.

**Tumour:** Mass of abnormally growing cells that serve no useful bodily function. Tumours can be either benign or malignant.

**Tumour bulk:** A term used to describe the actual amount of tumour present in your body.
U

**Ultrasound:** A diagnostic technique that uses sound waves to detect abnormal bodily structures. Sound waves are bounced off internal organs; a computer picks up their echoes, processes the information and forms a detailed picture of the area.

**Upper abdominal field:** The area in the upper abdomen that is treated by radiation therapy.

**Uterus:** Organ in females for nourishing the fetus during development before birth. Also called the womb.

V

**Vascular endothelial growth factor (VEGF):** A protein that binds to blood vessels and stimulates the formation of new blood vessels to supply tumours the oxygen and nutrients they need to grow.

**Venous access device (VAD):** A small device placed under the skin of the chest or forearm that allows medications to be injected directly into a vein and for blood to be drawn from the vein.

W

**White blood cells:** White blood cells are responsible for defending the body and fighting infection caused by bacteria and viruses. Chemotherapy often causes a reduction in the number of white blood cells, thus raising a patient’s risk of developing an infection. The decrease in white blood cells is called leucopenia.
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