

COLORECTAL CANCER DIAGNOSIS

Usually if a suspected colorectal cancer is found by any diagnostic test, it is biopsied during a colonoscopy. In a biopsy, the doctor removes a small piece of tissue with a special instrument passed through the scope. Although there may be some bleeding afterward, this usually stops after a short time. The biopsy specimen is sent to the lab where a pathologist, a doctor trained to diagnose cancer and other diseases in tissue samples, looks at the tissue under a microscope. While other tests may suggest that colorectal cancer is present, a biopsy is the only way to determine this for certain.

The diagnosis of colon polyps is important, since some may turn into colon cancer over time. While not every colon polyp turns to cancer, it is felt that almost every colon cancer begins as a small non-cancerous polyp. Fortunately, during colonoscopy these polyps can be identified and removed or destroyed – thus preventing a possible colon cancer. If a polyp is large enough, tissue can be retrieved and sent for biopsy to determine the exact type of polyp.

There are **6 types** of polyps that commonly occur within the colon and are diagnosed through a biopsy:

1. **Inflammatory** – This polyp is associated with ulcerative colitis or Crohn’s disease. It is often called a “pseudopolyp” or false polyp for it is not a true polyp, but just a reaction to chronic inflammation of the colon wall. It is not the type that turns into cancer.
2. **Hyperplastic** – A common type of polyp which is usually very small and often found in the rectum. They are considered to be low risk for cancer.
3. **Tubular Adenoma** – This is the most common type of polyp and the one referred to most often when a doctor speaks of colon polyps. About **70%** of polyps removed are of this type. Adenomas carry a definite cancer risk which increases as the polyp grows larger. Adenomatous polyps usually cause no symptoms, but if detected early, they can be removed during colonoscopy before any cancer cells form. Patients with a history of adenomatous polyps must be periodically reexamined.
4. **Tubulovillous Adenoma (TVA)** - is a type of polyp that grows in the colon. These adenomas may become malignant (cancerous). TVAs are considered to have a higher risk of malignant transformation than tubular adenomas.
5. **Villous adenoma** – Approximately **15%** of polyps removed are of this type. These are the most serious type of polyp with a very high cancer risk as they grow larger. Often these are sessile and not on a stem (i.e. “flat”) making removal problematic. Smaller ones can be removed in piecemeal fashion – sometimes over several colonoscopies. Larger sessile villous adenomas may require surgery for complete removal. However, villous adenomas are no more likely than tubular or tubulovillous adenomas to become cancerous if their sizes are all the same.

6. **Sessile Serrated Adenoma (SSA)** - As is evident from their name, sessile serrated adenomas have a serrated appearance and can be difficult to distinguish microscopically from hyperplastic polyps. Making this distinction is important, however, since SSAs have the potential to become cancers, while hyperplastic polyps do not.

Polyps that are removed during a colonoscopy are sent to the pathology lab to be examined and tested. Pathologists use a grading system to assess the severity of an individual cancer. This system is based on how closely the tumor cells resemble normal cells. As normal cells grow and develop they differentiate, which simply means that they become more specialized based on where they are in the body. Pathologists can view cells under the microscope and discern a difference between the different cells in the body, for example colon cells look distinctly different than liver cells, which look distinctly different than breast cells. Normal cells in different tissues of the body are considered to be fully differentiated, whereas cancer cells are not fully differentiated. If the cancer cells look very similar to normal cells and are grouped together in an organized fashion, they are called well differentiated.

Cancer cells fall into one of three categories:

Well Differentiated	cancer cells which appear to be most similar to normal cells
Moderately Differentiated	cancer cells which appear to be somewhat different than normal cells
Poorly Differentiated	cancer cells which appear very different than normal cells

Tests to Aid in the Diagnosis of Colorectal Cancer

If your doctor diagnoses colorectal cancer, you may need further tests to find out the position and size of the cancer, as well as determine the extent of your cancer. These tests may include:

A. Blood Tests

Complete Blood Count (CBC): A complete blood count may be ordered to determine if anemia (too few red blood cells) has developed. If a tumour bleeds for a prolonged period of time, anemia may develop. Blood tests measuring liver functions can also be prescribed in the event that colorectal cancer has spread to the liver which can then cause abnormalities of the liver, reflected in elevated liver enzymes.

Tumor Markers: Colorectal tumors sometimes produce substances such as carcinoembryonic antigen (CEA) and CA 19-9 that are released into the bloodstream. While CEA may not be

reliable for detecting early colorectal cancers, it is a useful tumor marker which can indicate the progress of your treatment. Levels of CEA are measured before treatment in order to provide your medical team with a baseline so that they can track your CEA throughout and following treatment. For surgery, CEA levels may be measured both before and after surgery to evaluate both the success of the surgery. The CEA should decrease when treatment is successful, however, in some cases chemotherapy and radiation therapy can cause a temporary rise in CEA due to the death of tumor cells and release of CEA into the blood stream. After surgery, with a curative resection of the cancer the CEA should return to normal in one to four months. Approximately 50% of patients with stage II and III cancers have elevated CEA levels.

Blood tests for these “tumor markers” are used most often with other tests for follow-up of patients who already have been treated for colorectal cancer. They may provide an early warning of a cancer that has returned. These tumor markers are not used to find cancer in people who have never had a cancer and appear to be healthy because the tests are not always accurate. Tumor marker levels can be normal in a person who has cancer and can be abnormal for reasons other than cancer. For example, higher levels may also be present in the blood of some people with ulcerative colitis, non-cancerous tumors of the intestines, of some types of liver disease or chronic lung disease. Smoking can also raise CEA levels.

B. Imaging Tests

Ultrasound: Ultrasound involves the use of sound waves and their echoes to produce a picture of internal organs or masses. A small microphone-like instrument called a transducer emits sound waves and picks up the echoes as they bounce off body tissues. The echoes are converted by a computer into a black and white image that is displayed on a computer screen. This test is painless and does not expose you to radiation. Abdominal ultrasound can be used to look for tumors in your **liver, gallbladder, pancreas** or even inside your abdomen, although it cannot look for tumors of the colon. During an abdominal ultrasound exam, the skin is first lubricated with gel while lying on a table and a technician moves the transducer over the skin overlying the part of your body being examined.

Two special types of ultrasound exams can be used to evaluate people with colon and rectal cancer.

- (i) **Endorectal Ultrasound** uses a special transducer that can be inserted directly into the rectum. This test is used to see how far through the wall a rectal cancer may have penetrated and whether it has spread to nearby lymph nodes or other organs.
- (ii) **Intraoperative Ultrasound** is performed after the surgeon has opened the abdominal cavity. The transducer can be placed against the surface of the liver, making this test very useful in detecting metastases of colorectal cancer to the liver.

Computed Tomography (CT) Scan: The CT scan is an x-ray test that produces detailed cross-sectional images of your body. Instead of taking one-picture, like a regular x-ray, a CT scanner takes many pictures as it rotates around you while you lie on a table. A computer then combines these pictures into images of slices of the part of your body being studied. Unlike a regular x-ray, a CT scan creates detailed images of the soft tissues in the body. This test can help tell if colon cancer has spread into your liver or other organs. After the first set of pictures is taken you may be asked to drink a contrast solution and/or receive an IV (intravenous) line through which a contrast dye is injected. This helps better outline structures in your body. A second set of pictures is then taken.

Magnetic Resonance Imaging (MRI) scan: Like CT scans, MRI scans provide detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed and then released in a pattern formed by the type of body tissue and by certain diseases. A computer translates the pattern into a very detailed image of parts of the body. A contrast material called gadolinium is often injected into a vein before the scan to better see details. MRI scans take longer than CT scans, up to an hour, while lying inside a narrow tube which may disturb those claustrophobic (fearful of enclosed spaces). While lying inside, patients are also bombarded with buzzing and clicking noises that can become uncomfortable. Depending upon the facility, headphones may be provided to block this out. MRI scans may diagnose abnormal areas in the liver that might be due to cancer spread and may also determine the extent of rectal cancers by using Endorectal MRI. In this test, a probe, called an Endorectal coil is placed inside the rectum for 30-45 minutes which can be uncomfortable but necessary to properly diagnose the extent of the cancer.

Positron Emission Tomography (PET) Scan: PET scans involve injecting a form of radioactive sugar (known as fluorodeoxyglucose or FDG) into the blood. The amount of radioactivity is very low. Because cancer cells in the body are growing rapidly, they absorb large amounts of the radioactive sugar. A special camera can then create a picture of areas of radioactivity in the body. The picture is not finely detailed like a CT or MRI scan, but it provides helpful information about the whole body. PET scans are now performed in conjunction with a CT scan at the same time (PET/CT scan). This allows the radiologist to compare areas of higher radioactivity on the PET with appearance of that area on the CT. A PET/CT may be useful if your doctor believes that colorectal cancer may have spread or returned after treatment but does not know where. PET/CT scans can be used instead of several different x-rays because they are able to scan the entire body.

Angiography: This test is used to help plan for surgery of the liver involving tumours that have originated from colorectal cancer. For an angiogram, a doctor inserts a very thin tube (called a catheter) into an artery, usually on the inner thigh (femoral artery). The catheter is threaded



through the artery until the tip is near the liver. Contrast dye is then injected rapidly, and a series of x-rays is taken. This can show surgeons the location of blood vessels next to any tumours in the liver, so that they can be removed without causing a lot of bleeding.

If your doctor finds something suspicious during a screening exam, or if you have any of the symptoms of colorectal cancer, you will likely need to undergo a diagnostic workup. A diagnosis of cancer can be extremely challenging, even when a full recovery is likely. It is, however, precisely at the time that the diagnosis is delivered that a patient is able to start taking the first step towards actively managing the disease and taking control of their life. Furthermore, no matter what their concerns or prognosis, colorectal cancer patients are not alone. Colorectal cancer support groups are available to offer emotional support as well as provide awareness in respect of the disease. To inquire about a colorectal cancer support group in your area, please visit the section entitled “**FIND SUPPORT**”.

Sources:

Mayo Clinic

<http://www.mayoclinic.com/health/colon-cancer/DS00035/DSECTION=tests%2Dand%2Ddiagnosis>

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Medicine Net

www.medicinenet.com/colon_cancer/page4.htm