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| <b>Title</b>        | Colon Cancer: Screening and Treatment |
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| <b>Contact Hour</b> | 1                                     |

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## Purpose

The purpose of this article is to discuss colon cancer and give the participant a basic background of the importance of early screening tests which can prevent colorectal cancer. Treatment options such as colonoscopy and surgical intervention will be discussed and reasons given for each.

## Objectives

1. Identify the causes of colorectal cancer and address the patient at risk.
  2. List the types of screening modalities for colorectal cancer
  3. Identify the stages of colorectal cancer and the treatment options for each.
  4. Review colonoscopy and the types of surgical intervention for colorectal cancer.
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## Statistical Review:

As of May 31, 2008, statistics show Colorectal Cancer (CRC) is the third most common cancer. It is estimated that 148,810 men and women (77,250 men and 71,560 women) will be diagnosed with and 49,960 men and women will die of CRC in 2008. It is the third leading cause of cancer deaths in women, and the second leading cause of cancer deaths in men. It accounts for approximately 10% of cancer deaths overall, with approximately one in three people who develop the disease dying. In 2005, the median age at diagnosis for CRC was 71, with the median age at death of 75. CRC is a common, lethal, and often preventable disease if adenomas, found during colonoscopy are removed.(1. See Notes)

The colon (a long, muscular tube, called the large bowel/large intestines) is part of the digestive system where the waste material is stored. The colon consists of the ascending, transverse, descending, and sigmoid colon ending in the rectum which is adjacent to the anus. Tumors of the colon usually begin as benign polyps which given time can become cancerous. Most all cancers of the large intestine and rectum are adenocarcinomas. CRC usually begins as a buttonlike swelling on the surface of the intestinal or rectal lining or on a polyp. As the cancer grows, it begins to invade the wall of the intestines or rectum and then spread to adjacent structures or lymph nodes. Because blood from the wall of the intestines and much of the rectum is carried to the liver, colorectal cancer usually spreads or metastasizes to the liver soon after spreading to the lymph nodes.(2 See Notes) Highly preventable thru early screening and detection, colorectal cancer is the third most frequently diagnosed cancer and the second leading cause of cancer deaths in men and women in the United States.(3 See Notes)

Sequentially, most colorectal cancers arise from adenomatous polyps that progress from small to large (>1.0cm) polyps, and then to dysplasia and cancer. This progression from adenoma to carcinoma is believed to take at least 10 years. Although, the time progression is not precisely known because usually polyps are removed upon colonoscopy. Most colorectal polyps are either

adenomatous or hyperplastic.

**Adenomas:** Two thirds of colorectal polyps are adenomas. They are found in 25% of colonoscopies performed in people age 50 or younger and in 50% of people age 70 or younger. Polyps larger than 1.0 cm are more likely to progress to cancer. Adenomas are a collection of growths of glandular origin. They can grow from many organs including the colon. They are benign. However, over time they may progress to become malignant, at which point they are called **adenocarcinomas**. The "mass effect" of adenomas creates potential health problems by compressing other structures and by producing large amounts of hormones in an unregulated, nonfeedback-dependent manner (paraneoplastic syndrome).(4 See Notes)

The histopathology of adenoma: Adenoma is a benign epithelial tumor arising in epithelium of mucosa (stomach, small intestine, and bowel), glands (endocrine and exocrine), and ducts. Adenomas of the colon are quite prevalent. They are found at colonoscopy and removed because of their tendency to become malignant and lead to colon cancer. In hollow organs (digestive tract), the adenoma grows upwards into the lumen – adenomatous polyp or polypoid adenoma. Depending on the type of the insertion base, an adenoma may be described as a pedunculated lobular head (with a long slender stalk, covered by normal mucosa) or sessile (broad base – no stalk).(5 IBID)

**Hyperplastic Polyps:** These account for most of the remaining polyps. They are typically small and distal and generally not premalignant. However, there are reports of sporadic cancers arising from hyperplastic polyps; and a rare syndrome (hyperplastic polyposis) which may be associated with an increased risk of CRC.

Interestingly, the screening rates for CRC in the United States are generally below national targets. Despite evidence that suggests early screening reduces the risk of colon cancer deaths, data from 2006 indicates that 60.8% of adults over age 50 had received appropriate screening. These rates are higher in adults who are insured, better educated, non-Hispanic, or have a usual source of medical care.

Lifetime risk, based on rates from 2003-2005, (5.29%) or 1 in 19 men and women will be diagnosed with colorectal cancer in their lifetime. The probability of developing colon and rectal cancer is 2.14% in men and 1.58% in women between ages 50 and 70.

**At Risk Patients:** Risk increases with age. Most cases occur in the 60 to 70 year old age group. Risk factors include:

1. People with a family history of colorectal cancer.
2. A family history of polyps.
3. Ulcerative colitis or Crohn's disease. This risk is related to the person's age when the disease developed and the length of time the person has had the disease.
4. Diet – Although controversial, people at high risk tend to consume a high-fat, low-fiber diet.
5. Exposure to industrial cancer-causing (carcinogens), air and water pollution are possible risks.
6. Hereditary Nonpolyposis Colorectal Carcinoma (HNPCC). This is an inherited gene mutation that causes cancer in 70% to 80% of the people with that mutation. People at risk often develop colorectal cancer before age 50.
7. Smoking – 40% more women smokers and 30% more male smokers are more likely to die from colorectal cancer than non-smoker counterparts.
8. Physical inactivity.
9. Low selenium

Possible causes:

1. Excessive alcohol intake.
2. Exposure to the human papilloma virus (HPV).
3. Exogenous estrogens such as hormone replacement therapy (HRT), tamoxifen, or oral contraceptives.

**Symptoms:** Although not usually associated with symptoms, colorectal polyps can present with the following:

1. Rectal Bleeding, bloody stools, abdominal pain and fatigue.
2. A change in bowel habits – diarrhea, constipation.
3. If a polyp is big enough to cause a bowel obstruction, there may be nausea, vomiting and severe constipation.
4. In familial adenomatous polyposis, where patients develop hundreds to thousands of polyps, the polyps may bleed which leads to blood in stools. Even if the blood is not visible, it still is possible for the patient to develop anemia and iron deficiency. If the polyps become malignant, the patient may show signs of weight loss, altered bowel habits. Metastatic disease may present to the liver and elsewhere.(6 See Notes)

**Screening:** In the United States, Colonoscopy along with Fecal Occult Blood Test and Sigmoidoscopy are the preferred screening options. However, other screening options such as double contrast barium enema (DCBE) and virtual colonoscopy are used as needed.

1. Digital Rectal Exam (DRE) – The physician inserts a lubricated gloved finger into the rectum to feel for abnormal areas. This only detects tumors large enough to be felt in the distal rectum. However, it is useful as an initial screening test.
2. Fecal Occult Blood Test (FOBT) – A test for blood in the stool, either guaiac based (chemical test) or immunochemical.
3. Endoscopy – (a) Sigmoidoscopy – A rigid cylindrical lighted “scope” is inserted into the rectum and lower colon to check for polyps and other abnormalities. (b) Colonoscopy – a smaller diameter/longer flexible lighted scope is inserted into the rectum and allows the physician to view the entire colon. Polyps and other abnormalities can be seen and removed during the procedure.

Besides double contrast barium enema and virtual colonoscopy, other diagnostic tools include:

1. Standard computed axial tomography (CAT) scan – used to determine the degree of cancer spread.
2. Blood Tests – Carcinoembryonic antigen (CEA) – can give an indication of tumor load and indicate metastasis.
3. Genetic counseling and genetic testing for families who may have HNPCC.
4. Whole-Body Positron emission tomography (PET) imaging is a cost-effective way to differentiate resectable versus non-resectable disease.
5. Stool DNA testing – an emerging technology in screening for colorectal cancer. Pre-malignant adenomas and cancers shed DNA markers from their cells which are not degraded during the digestive process and remain stable in the stool.(7 See Notes)

**Staging:** Staging for Colorectal Cancer is performed for diagnostic and research purposes, as well as to determine the best method of treatment. The system for staging is dependent on the extent of local invasion, the degree of lymph node involvement, and whether there is distant metastasis.

The **Duke System** classification (first proposed by Dr. Cuthbert E. Dukes in 1932) identifies the

stages as: (Dukes CE. The classification of cancer of the rectum. Journal of Pathological Bacteriology, 1932;35;323.)

- A. Tumor confined to the intestinal wall.
- B. Tumor invading through the intestinal wall.
- C. With lymph node(s) involvement – further subdivided into C1 lymph node involvement where the apical node is not involved and C2 where the apical lymph node is involved.
- D. With distant metastasis

The most common staging system is the **T**(umors)**N**(odes)**M**(etastases) System. The TNM assigns a number: (Wittekind, Ch; Sobin, L.H. (2002). TNM classification of malignant tumours. New York: Wiley-Liss. (SBN 0-471-22288-7.

## **TNM SYSTEM:**

1. T – The degree of invasion of the intestinal wall
  - o T0 – no evidence of Tumor
  - o Tis – cancer in situ (tumor present, but no invasion)
  - o T1 – invasion through submucosa into lamina propria (basement membrane invaded)
  - o T2 – invasion into the muscularis propria (i.e. proper muscle of the bowel wall)
  - o T3 – invasion through the subserosa
  - o T4 – invasion of surrounding structures (e.g. bladder) or with tumor cells on the free external surface of the bowel
2. N – the degree of lymphatic node involvement
  - o N0 – no lymph nodes involved
  - o N1 – one to three lymph nodes involved
  - o N2 – four or more lymph nodes involved
3. M – the degree of metastasis
  - o M0 – no metastasis
  - o M1 – metastasis present
 

“The stage of a cancer is usually quoted as a number, I, II, III, IV derived from the TNM value grouped by prognosis; a higher number indicates a more advanced cancer and likely a worse outcome.”(8 See Notes)

    - o Stage 0 – Tis, N0, M0
    - o Stage I – T1, N0, M0
    - o Stage IIA – T3, N0, M0
    - o Stage IIB – T4, N0, M0
    - o Stage IIIA – T1, N1, M0 – T2, N1, M0
    - o Stage IIIB – T3, N1, M0 – T4, N1, M0
    - o Stage IIIC – Any T, N2, M0
    - o Stage IV – Any T, Any N, M1

Treatment Options: Two of the most commonly acceptable treatment options for CRC available are Colonoscopy and Surgical Resection.

## **Colonoscopy:**

The advantages of colonoscopy are multiple. The American Cancer Society recommends screening for CRC begin at the age of 50 for people with average risk. Those at higher risk should begin screening at an earlier age. The American Cancer Society states that fewer than half of the people who are over 50 years old are screened for colorectal cancer. If everyone over the age of 50 were tested, tens of thousands of lives could be saved each year. Current standards recommend Colonoscopy be preformed at age 50 for average risk individuals and

every 10 years following, providing no abnormality is found.

As discussed earlier, there are several screening modalities for diagnosis of CRC. Colonoscopy enables the Endoscopist to view the colon; if polyps are present biopsies can be obtained and sent to pathology for definitive diagnosis. If tumors are encountered, the Endoscopist can leave a marker at the tumor site enabling the surgeon to find the tumor should open or laparoscopic resection be required. The American College of Gastroenterology considers colonoscopy the preferred screening test. Not without associated risk (possible perforation and major bleeding seen in 1 to 2 per 1000 colonoscopy procedures), many patients find the rigorous bowel preparation worse than the procedure. Colonoscopy is usually performed under I.V. Conscious Sedation. The patient must be accompanied home after the test and return to normal activities the next day.

The procedure: The day before the scheduled procedure, the patient takes a bowel prep such as OsmoPrep or HalfLytely which is prescribed by the physician performing the colonoscopy. On the day of the procedure, the patient is admitted to the Endoscopy Unit where an I.V. is started. Prior to the beginning of the procedure, the patient is sedated with a combination of anesthetic drugs given either by a qualified I.V. Sedation Nurse or an Anesthesia Provider. Once the desired level of sedation is obtained, the patient is turned (usually on his/her left side). The physician places a small flexible lighted scope into the patient's anus and gently moves the scope up through the colon. In order to properly visualize the lining of the colon, air is pumped thru the scope into the colon. This can cause mild discomfort such as abdominal cramping or pressure for the patient. The scope has a tiny camera at its tip which transmits images to an external monitor which allows the physician to look closely at the lining of the colon. The scope has other channels in which the physician can send instruments down thru the scope and remove polyps, take tissue samples, inject solutions or destroy (cauterize) tissue. The exam takes approximately 20 minutes to an hour.

### **Surgical Intervention:**

Surgical Intervention is dependent on the location of the tumor. Current statistics indicate primary outcomes are not different when a skilled surgeon (having performed 20 laparoscopic colectomies) performs Laparoscopic Colon Resection verses Open Colectomy. Less invasive, laparoscopic colon resection is performed in the Operating Room under general anesthesia. Patient position is relative to surgeon's preference and location of tumor.

Colon Resection, Sigmoid Colectomy, Low Anterior Colon Resection, Abdominal Perineal Resection are some of the procedures for CRC. Each procedure is associated with the usual risks of open surgery, such as bleeding, infection, anastomosis failure, wound dehiscence, as well as anesthetic complications. As with the less invasive laparoscopic colon resection, patient position is relative to the tumor location (type of procedure) and physician preference.

### **Prevention:**

Cancer of the colon, when found early, can be successfully treated and cured. Colon polyps are very common and most do not turn in to cancer. However, physicians cannot tell which polyps will become cancerous. Therefore, early screening and biopsy during colonoscopy, if suspicious areas are found, is important. According to the 2005 Dietary Guidelines, eating lots of fruits, vegetables, whole grains, lean meats, fish, poultry, cooked dry beans, nuts, seeds, and low-fat or nonfat dairy products helps prevent disease. Guidelines emphasize balancing food intake with appropriate exercise. Drinking in moderation and limiting foods high in salt, saturated fat, trans fat, cholesterol, and added sugar.

Summary: In summary, Colorectal Cancer, also known as colon cancer or large bowel cancer, is

the third most common form of cancer and the second leading cause of cancer related deaths in the Western World. Many colorectal cancers are thought to arise from benign adenomatous polyps in the colon which may develop into cancer over time. Early diagnosis and excisional biopsy thru colonoscopy of these polyps increases survival rates.

It is imperative for the Endoscopy Nurse and/or the Office Nurse to understand the associated risks involved with colorectal cancer, so they can inform their at risk patients of the importance of early diagnosis, treatment, and follow-up colonoscopy. Colonoscopy is not without risk. The Endoscopy nurse needs to explain to the patient the symptoms of complications such as excessive bleeding or signs of perforation (elevated temperature of 100F or higher and persistent abdominal pain).

The Operating Room nurse must understand the various types of surgical intervention for colon resection in order to better prepare for the procedure. The position of the patient is dependent on the location of the tumor and the type of anastomosis. Because colon resection can take up to approximately three hours, it is imperative for the operating room nurse to understand safe practice for patient position, paying particular attention to the patient's nerve pathways to prevent injury to nerves and bony prominences.

Depending on the type of resection, it is possible for the patient to have a temporary (or even a permanent) colostomy. Post-operative colostomy care is a major contributing factor toward patient wellness. Patient teaching as well as understanding the need for follow-up care is necessary to ensure positive outcomes.

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## Course Exam

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1. As of May 2008, statistics show Colorectal Cancer (CRC) is the third most common cancer.  
 True  False
2. CRC is the third leading cause of cancer deaths in women.  
 True  False
3. The colon is part of the digestive system where food is stored for further use.  
 True  False
4. Two thirds of colorectal polyps are adenomas.  
 True  False
5. Although usually benign, adenomas can progress to adenocarcinomas.  
 True  False
6. Patients at risk for colon cancer have a high selenium level.  
 True  False
7. Colonoscopy, along with Fecal Occult Blood Tests and Sigmoidoscopy are the preferred screening options for CRC.  
 True  False
8. Colonoscopy allows the physician to view only the lower part of the rectum.  
 True  False
9. Staging for CRC is performed for diagnostic and research, as well as to determine the best method of treatment.  
 True  False
10. If everyone over the age of 50 received colonoscopy, tens of thousands of lives could be saved yearly.  
 True  False