How Do I Screen For Colorectal Cancer?

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To be presented at the University of Toronto's
Primary Care Today sessions (October 3, 2003)

The Canadian Cancer Society estimates that in 2003, 18,000 Canadians (9,800 men, 8,300 women) will be diagnosed with colorectal cancer and 8,300 (4,400 men, 3,800 women) will die from it. Colorectal cancer is the second leading cause of death from cancer in Canada.[1] Despite these numbers, researchers from the Centers for Disease Control and Prevention reported that only 20.6% of persons eligible for fecal occult blood testing (FOBT) actually completed this screening test.[1]

Colorectal cancer is ideal for screening because it is a common disease, it has a detectable preclinical stage (adenoma), and there is evidence that early detection and removal of adenomas results in prevention of the disease.

The case of Emily

Emily, 58, has been perfectly healthy. Her last annual exam was eight months ago and no abnormalities were found. She began having a change in her bowel habit three months ago, with no episodes of rectal bleeding. There is no family history of colonic polyps or colorectal cancer. She was investigated by a colonoscopy and found to have an adenocarcinoma in the mid-descending colon.

For a followup on Emily, go to page 72.

What are the current recommendations?

The Canadian Task Force on Preventive Health Care suggests there is good evidence for annual or biennial FOBT for asymptomatic people over 50. Also, those patients with a personal or family history of colorectal polyps or cancer should be screened at an earlier age. The Agency for Healthcare Research and Quality in the U.S. recommends five different screening strategies for asymptomatic patients over 50 (Table 1).

There is a growing trend to make colonoscopy the gold standard of all screening techniques. To evaluate and compare screening alternatives, the following aspects of each technique need to be assessed:

1. Sensitivity and specificity;
2. Compliance;
3. Safety; and
4. Cost.

How do the different screening tests compare?

FOBT

There have been three randomized, controlled trials of FOBT, one in the U.S.[2] and two in Europe.[3,4] These trials demonstrate a 15% to 33% reduction in mortality from colorectal cancer.

There are, however, several significant disadvantages of FOBT. Lieberman assessed the sensitivity of FOBT using colonoscopy as the gold standard and found only 23.9% of patients with advanced colorectal neoplasia had a positive FOBT.[5] In an attempt to improve sensitivity, the University of Minnesota Study suggested using rehydrated FOBT, but this lowered the test's specificity.

Compliance has also been a problem with FOBT. In 1999, a surveyed population of patients who had completed a FOBT showed a compliance rate of only 20.6%, as reported by the Centers for Disease Control and Prevention.

With a migrating patient population, consistent annual or biennial FOBT is difficult to achieve. Therefore, the low sensitivity and specificity, poor compliance, and the ultimate need for colonoscopy for positive findings are significant disadvantages of FOBT.

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Table 1
Five screening strategies for asymptomatic patients over 50

1. Annual FOBT
2. FS every five years
3. Annual FOBT with FS every five years
4. Double-contrast barium enema every five to 10 years
5. Colonoscopy every 10 years

FOBT: Fecal occult blood testing
FS: Flexible sigmoidoscopy

A followup on Emily

Emily had a preoperative computed tomography scan, which did not demonstrate metastasis. She underwent a colon resection with primary anastomosis. The pathology report indicated clear margins, but full thickness involvement of the colon, with three of 20 nodes containing a tumour. She subsequently underwent adjuvant chemotherapy for six months, and remains well two years following treatment. She asks now, could this have been prevented?

Flexible sigmoidoscopy

Although there are no randomized, controlled trials to demonstrate a reduction in mortality with flexible sigmoidoscopy (FS), there are case-control studies which show an 85% to 90% reduction in mortality due to distal colorectal cancer.[6]

The major disadvantage of FS is its inability to detect proximal adenomas and cancers. Many have equated the efficacy of FS to be equal to performing a unilateral mammogram. In addition, because it is performed without sedation, compliance is often a problem. Although it can be performed by family physicians, most family physicians do not perform these FS because of lack of training and the cost of the equipment.

FOBT and FS

The combination of these two screening techniques does detect a greater number of colorectal neoplasms, but when compared to colonoscopy, 24% of advanced colorectal neoplasms are missed.[5]

Barium enema

The National Polyp Study found that an air contrast barium enema detected only 48% of adenomas greater than 1 cm.[7] Therefore, the technique suffers from low sensitivity and the need to evaluate positive results by colonoscopy.

Colonoscopy

There are a number of studies which suggest colonoscopy is the best screening tool. Colonoscopy is both diagnostic and therapeutic in that any precursors of malignancy (*i.e.*, adenomas) can be removed via this technique.

The National Polyp Study reported a 76% to 90% reduction in colorectal incidence in a cohort of patients undergoing colonoscopy and polypectomy compared with a reference population.[8] Inadomi and Sonnenberg, in their experimental model to assess life expectancy by screening, found life extension with colonoscopy to be three times longer than with FOBT.[9]

The major concerns expressed about widespread colonoscopy screening are compliance, cost-effectiveness, and the potential for complications. All screening techniques suffer from low patient compliance, but the longer interval sug-

gested between screening colonoscopies, as compared to other screening techniques, may improve compliance. In addition, discomfort during colonoscopy is usually minimal due to sedation. Therefore, patients find this screening tool acceptable and are, consequently, more compliant.

Sonnenberg[11] reported that colonoscopy performed every 10 years was the most cost-effective screening tool.

The other major concern about using colonoscopy as a primary screening test is its invasive nature and the risk of complications (in particular, perforation). In my personal series, this risk is 0.05% with no colonoscopy-related mortality. Therefore, colonoscopy is safe, with the rate of adverse effects being low.

What is the role of diet in reducing colorectal cancer risk?

Healthy eating is crucial in the fight towards reducing the risk of colorectal cancer. Cancer Care Ontario and the Canadian Cancer Society identified diet and nutrition, as well as healthy body weight as two of the Cancer 2020 prevention targets.[11] It is difficult to say if it is the individual components of the diet or the combination of the food items that contribute to risk reduction.

There are eight general eating principles to adhere to to reduce the risk of colorectal cancer (Table 2). A body mass index greater than the healthy range increases the risk of colorectal cancer; therefore, it is imperative that one achieves a healthy body weight through healthy eating and physical activity.[12,13]

A diet high in calcium results in an overall moderate decrease in risk for the development of colorectal cancer. In one study, patients who took calcium supplements decreased their risk of recurrence of any adenoma by 19% and there was a 24% decrease in the overall number of adenomas.[14]

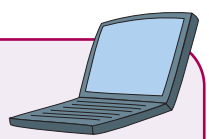
In terms of fibre, one recent study illustrated

Table 2

The main dietary principles to reduce the risk of colorectal cancer

1. Maintain a healthy body weight through healthy eating and physical activity
2. Consume 1,000 mg of calcium per day (for adults under 50); consume 1,200 mg of calcium per day (for adults over 50); done through a variety of low-fat dairy products
3. Include 25-35 g of fibre daily from a variety of sources
4. Consume 400 µg of folate per day, either through food sources or supplementation
5. Drink alcohol in moderation or not at all
6. Eat at least two fruits and three vegetables per day
7. Choose foods that are low in fat, especially saturated and trans fats; however, include omega-3 fatty acids
8. Limit the intake of red meat, processed meat, and charred meat

a 40% colorectal cancer risk reduction, while another illustrated a 27% risk reduction. In both these studies, the reduction was achieved by including a daily intake of approximately 30 g of fibre.[15,16] Folic acid has been proven to significantly reduce the risk of colorectal cancer in both men and women when a multivitamin (including folic acid) is taken for 15 years or more.[17,18] Dx



Surf your way to...

1. Cancer Care Ontario: *www.cancercare.on.ca*
2. The Canadian Cancer Society: *www.cancer.ca*
3. Life Screening Centres: *www.lifescreening.ca*
4. The American Cancer Society: *www.cancer.org*
5. The Colorectal Cancer Network: *www.colorectal-cancer.net*

Take-home message

How can risk be reduced?

- The reduction in risk of colorectal cancer should be a combination of screening for all standard risk patients (those over 50), with incorporation of the principles of healthy eating (Table 2).

What screening test should I use?

- Decisions about which screening test to use should be based on the sensitivity, specificity, cost-effectiveness, and related risks of the test.
- Although all screening techniques are effective, there is compelling evidence to consider colonoscopy as the gold standard.

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