

Colorectal Cancer Screening

“What are my options?”

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There are presently four well-accepted ways to screen for colorectal cancer:

1. Fecal occult blood testing (FOBT)
2. Flexible sigmoidoscopy (FS)
3. Air contrast barium enema (ACBE)
4. Colonoscopy

Why is colorectal cancer well-suited for screening?

Colorectal cancer is the fourth most common cancer affecting Canadians, and the second most common cause of cancer-related death. It occurs roughly equally in men and women, and the lifetime probability of developing colorectal cancer is estimated to be 6%, of which about half will die of the disease.¹

Colorectal cancer is particularly well-suited for screening because:

1. There is a good understanding of the sequence whereby an adenomatous polyp evolves into cancer.
2. There is a long latency period between the development of a polyp and invasive cancer.
3. There are a number of acceptable and safe screening tests.

John's case

John, 48, has had no significant medical illnesses. He presents complaining of pruritus. During his visit, he mentions that one of his 55-year-old colleagues was recently diagnosed with colon cancer. He requests to be screened to reassure himself and his family, but denies having any symptoms.



- Is it reasonable to screen John for colorectal cancer?
- If so, what method of screening is appropriate?
- Knowing that John's father had died from colon cancer at 82, would the screening decision be any different?

For a followup on John, see page 72.

4. Advancements in endoscopic interventions allow us not only to diagnose early, but also to prevent cancer.
5. There are well-known risk groups on whom screening can be focused.

What are the risks?

There are three risk categories for colorectal cancer (Table 1).

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Table 1

Descriptions of risk levels

High risk	People with long-standing IBD, family history of familial adenomatous polyposis, or hereditary nonpolyposis colorectal cancer.
Increased risk	People with a first-degree relative under age 60 who has had earlier colorectal cancer or adenomatous polyps, or people with two or more first-degree relatives at any age who have had colorectal cancer or adenomatous polyps. Also, people with a personal history of colorectal cancer or adenomatous polyps.
Average risk	People who have no known risk factors. In other words, those who are not at high or increased risk.

IBD: Irritable bowel syndrome

High-risk individuals account for approximately 7% to 10% of colorectal cancer cases in North America. These patients should all be referred to specialists for evaluation and regular colonoscopy.

Increased-risk individuals have roughly double the average risk, and make up around 15% to 20% of colorectal cancer cases. Most of these patients have had first-degree relatives with the disease, and it is generally agreed they should undergo screening by colonoscopy starting 10 to 15 years before the index case was diagnosed. People who have had previous polyps or cancer should also undergo routine followup surveillance/screening.²

Average-risk individuals represent the majority of colorectal cancer cases (70% to 75%). However, because most of society is at average risk, screening this group would involve considerable expense. Moreover, exactly how to screen them remains controversial.

What tests can be done?

DRE

Digital rectal examination (DRE) is often mentioned as the first screening test for colorectal cancer. Most experts, however, would agree that, although DRE is a valuable and necessary component of a complete physical exam, its value as a screening test is negligible.

FOBT

FOBT is the least invasive way to screen for colorectal cancer. It involves the testing of two samples from three consecutive stools for occult blood. Patients must abstain from red meat, certain vegetables and fruits (melons, radishes, turnips, beets, horseradish), vitamin

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Table 2

Options for colorectal cancer screening

	<u>Pros</u>	<u>Cons</u>
FOBT	Cheap; easy; level 1 evidence; non-invasive	Poor patient compliance; false positives (specificity 90%); false negatives (specificity 38-92%)
FS	Easy; level 3 evidence; direct visualization of part of colon; enema prep usually adequate	Expensive to buy and maintain scope; misses a significant number of proximal lesions; patient discomfort
ACBE	Well-established; good for cancers and large polyps	Misses small polyps, poor visualization of sigmoid, requires a full bowel preparation
Colonoscopy	Direct visualization; therapeutic potential (<i>i.e.</i> , remove polyps); best sensitivity and specificity	Expensive; requires full bowel preparation; invasive; risk of perforation/bleeding

FOBT: Fecal occult blood testing
 FS: Flexible sigmoidoscopy
 ACBE: Air contrast barium enema

C, and non-steroidal anti-inflammatory drugs for at least 72 hours prior to the test. The accuracy of FOBT may also be compromised by the presence of anorectal disorders, such as hemorrhoids or fissures.

Three randomized, prospective studies have demonstrated a 15% to 33% decrease in colorectal cancer-related deaths when FOBT is used properly.³⁻⁵ In the Minnesota study, 46,551 people were followed over 13 years. It was concluded that 339 people needed to be screened annually for 13 years to prevent one death from colorectal cancer.³

FOBT is the recommended test of the Canadian Cancer Society.

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Table 3

Recommendations for screening increased-risk and average-risk individuals

	Canadian Cancer Society recommendations	American Cancer Society recommendations
Average-risk individuals	FOBT every 2 years, starting at 50	<ul style="list-style-type: none"> • FOBT annually starting at 50 • FS every 5 years starting at 50 • FOBT annually and FS every 5 years starting at 50 • ACBE every 5 years starting at 50 • Colonoscopy every 10 years starting at 50
Increased-risk individuals	No official recommendations; patients should discuss an individual plan of surveillance with their doctor	<ul style="list-style-type: none"> • Patients with previous colorectal cancer/adenomatous polyps should undergo regular colonoscopy for surveillance. • Patients with a family history of colorectal cancer should undergo colonoscopy starting 10-15 years before the index case was diagnosed.

FOBT: Fecal occult blood testing
FS: Flexible sigmoidoscopy
ACBE: Air contrast barium enema

A followup on John

Because John is an average-risk individual, it is reasonable to screen him.

The Canadian Cancer Society recommends fecal occult blood testing, but I would offer him a flexible sigmoidoscopy and air contrast barium enema. If he specifically requested colonoscopy, I would agree to do it after explaining to him the risks, benefits, and alternatives.

According to the data we have at present, the fact that his father died at 82 from colorectal cancer would not change John's risk category, though, in reality, it would incline most specialists to consider colonoscopy first.

FS

FS directly visualizes the rectum and sigmoid colon. There are several case-controlled studies which demonstrate approximately a 50% decrease in colorectal cancer mortality from cancer within the reach of the sigmoidoscope.^{6,7}

Until recently, it was believed that although FS only visualizes the distal one-third of the colon, most significant lesions were within its reach. This belief has been shattered with the publication of two studies which suggest that up to 50% of people with significant proximal lesions will not have anything of significance within the reach of the sigmoidoscope.^{8,9}

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ACBE

ACBE is the test of choice when colonoscopy is unsuccessful. Although there have been no randomized prospective studies for its use as a screening test, models suggest that if carried out every five years on patients starting at age 50, it would lead to a decrease in cancer deaths from colorectal cancer by almost 66%.

Colonoscopy

Colonoscopy is, without question, the gold standard for screening the colon and rectum. There are no randomized prospective trials completed as of yet, but by extrapolation from the sigmoidoscopy literature, colonoscopy would likely reduce the mortality from colorectal cancer by up to 70%, if started at age 50 and carried out every 10 years.² It is also the test of choice for screening individuals at increased risk, and is used for patients who have any abnormality on other screening tests. It allows for therapeutic removal of polyps, and is highly sensitive and specific for polyps and cancers.

There are benefits and risks to each test (Table 2). Some experts and organizations suggest combining tests, such as FOBT and FS, or ACBE and FS to improve sensitivity and specificity (Table 3).

What are the new technologies?

There are a several new technologies receiving attention as potential screening tests for colorectal cancer.



Take-home message

What is the best option for colorectal cancer screening?

- Four main tests are available: FOBT, FS, ACBE, and colonoscopy.
- Of the four tests, colonoscopy is the gold standard, but carries risk and is expensive.
- A combination of ACBE and FS is recommended, with colonoscopy performed only if the patient is at increased risk, or to confirm a diagnosis.
- Colonoscopy can also be used to remove polyps before cancer can develop.

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Computed tomography (CT) colonography allows for a three-dimensional reconstruction of the colon. Because it is expensive, requires a full bowel preparation, and still has significant false positives, I think it is unlikely that it will replace the other tests.

Some other possible screening tests, including capsule video endoscopy and stool tests for DNA mutations/molecular markers, show promise, but are still experimental. Because of its excellent accuracy and therapeutic potential, colonoscopy will likely remain the gold standard for many years to come.

Who should be screened, and how?

The question family physicians must address is how to screen their patients for colorectal cancer. Increased-risk and high-risk patients need to be referred to a specialist for colonoscopy. Average-risk patients, however, remain a conundrum.

We are faced with the dilemma of a relatively cheap, safe, mediocre test (FOBT) versus an expensive, slightly risky, excellent test (colonoscopy). One of the problems with all other screening tests is that if any of them are positive, a colonoscopy is still the next step to confirm diagnosis and clear the remainder



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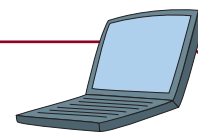
of the colon. Therefore, there is a tendency to try to cut out the middle steps and use colonoscopy directly, but this would be enormously expensive.

Screening for colorectal cancer raises many challenging public policy questions about how we wish to distribute our limited resources. **D**

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