

POPULATION-BASED COLORECTAL CANCER SCREENING

An overview of Ontario's program

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Top-line summary

Too many Canadians are diagnosed with advanced colorectal cancer. Evidence for the effectiveness of screening for preventing deaths from this important malignancy has been available since the 1990s, yet rates of screening remain at 20% or less in most parts of Canada. Screening rates for breast and cervical cancer are much higher, thanks to concerted efforts by governments, the medical establishment and advocacy groups. Ontario was the first of several Canadian provinces to announce plans to implement population-based screening to redress this low rate, with the launch of the Ontario Colorectal Cancer Screening Program. Successful implementation of this ambitious program will require a strong team effort. Other provinces are at various stages in development of screening programs.

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Colorectal cancer (CRC) is the second most common cause of cancer deaths in Ontario, after lung cancer. A estimated 7800 Ontario men and women will be diagnosed with CRC in 2007, and 3250 will die from this disease.¹

KEY RISK FACTORS

Age, sex and family history are the main risk factors. The incidence of CRC increases with age, beginning around age 40, and the rise becomes steeper after age 50.² The age-standardized incidence of CRC is higher in Ontario men, with 60 per 100,000, compared with women, 41 per 100,000.¹ Although the age-adjusted incidence rates in women lag those in men by about a decade, because women live longer than men the life-time risk for developing CRC in men is only slightly higher (1/15 or 6.7%) than it is in women (1/16 or 6.1%).

About 75% of individuals with a new diagnosis of CRC have no known family history, while 15% to 20% of individuals have one or more first-degree relatives (parent, sibling or child) affected.² Those with a family history but without a specific hereditary genetic syndrome have at least twice the risk of CRC compared with those without such a history.³ The 2 most common hereditary genetic syndromes — familial adenomatous polyposis (FAP) and hereditary nonpolyposis colon cancer (HNPCC) — account for about 1% and 5% of new diagnoses of CRC, respectively.²

CRC SCREENING

The 3 screening methods that have received the most attention — and have the most evidence to support their use

— are fecal occult blood test (FOBT), flexible sigmoidoscopy and colonoscopy. The evidence continues to evolve for CT colonography (or “virtual colonoscopy”) and stool DNA testing, and these are not covered in this article.

Randomized controlled trials (RCTs) of annual or biennial screening with FOBT have clearly demonstrated reductions in CRC mortality ranging from 13% to 33%.⁴⁻⁶ FOBT is the only screening method with “Level A” or RCT evidence to support its use. Individuals with a positive FOBT must have a followup colonoscopy. Most research has been done using the traditional guaiac method of FOBT. A newer method specific for human hemoglobin, the immunochemical method, is the subject of investigation and is in use in some countries.

Retrospective case-control studies of flexible sigmoidoscopy have shown a reduction in mortality of 60% from CRC in the area of the colon examined, with a protective effect lasting up to 10 years.⁷

No published large-scale RCTs have compared screening colonoscopy with other methods. The observational National Polyp Study showed a reduction in CRC incidence of 76% to 90% ($p < 0.001$) following colonoscopy and polypectomy compared to the incidence computed for the general population and to estimates obtained from historical comparison groups.⁸

PROTOCOLS & PRACTICES

Based on the evidence summarized above, in 2001 the Canadian Task Force on Preventive Health Care endorsed CRC screening for men and women at average risk (50 years or older, with no symptoms and no family history of the disease) with FOBT (Level A; good evidence to recommend) and/or periodic flexible sigmoidoscopy (Level B; fair evidence to use). The Task Force did not endorse colonoscopy (Level C; not enough evidence to promote or deter use).⁹

Despite these recommendations, the rates of CRC screening in Ontario and in the rest of Canada remain dismally low. An Ontario study conducted in 1995–2001 showed that fewer than 20% of people in the target population had undergone screening of any kind.¹⁰ A more recent study that analyzed 2003 data from the Canadian Community Health Survey confirmed this low screening rate.¹¹

ONTARIO'S CRC SCREENING PROGRAM

On January 23, 2007 the Ontario Minister of Health announced spending of \$193 million over 5 years to implement an organized province-wide CRC screening program. The program is based on FOBT for those at average risk and colonoscopy for those at increased risk because of a family history of one or more first-degree relatives with the disease. Ontario was the first province to announce a CRC screening plan.

The patient completes the FOBT at home on 2 samples from each of 3 spontaneously passed stools. If 1 or more stools test positive, colonoscopy is advised. If none of the stools test positive, the FOBT is repeated in 2 years. When guaiac-based FOBT is implemented in a program with repeat testing every 2 years, the FOBT detects approximately 46% of cancers.¹² The testing of a single stool specimen retrieved on the glove tip at digital rectal examination has inferior sensitivity for detecting CRC,¹³ and is not part of the Ontario program.

The participating laboratories will send the FOBT results to the primary care physicians and to Cancer Care Ontario's information management system. The primary care physicians will be responsible for referring people with at least 1 positive FOBT for colonoscopy. Those with a negative FOBT will receive a letter reminding them to repeat the FOBT in 2 years.

An important issue is ongoing surveillance after the initial colonoscopy when adenomatous polyps are found. Ontario's program will implement the guideline recently published by the U.S. Multi-Society Task Force on Colorectal Cancer.¹⁵ These recommendations indicate that at time of their baseline colonoscopy, patients can be stratified into those at lower risk or increased risk for subsequent advanced neoplasia. Those at increased risk have either 3 or more adenomas, high grade dysplasia, villous features, or an adenoma \geq 1 cm or larger, and they are advised to have a 3-year follow-up colonoscopy. People at lower risk, who have 1 or 2 < 1 cm tubular adenomas with no high-grade dysplasia, can have a followup colonoscopy in 5–10 years, and those with hyperplastic polyps only should have a 10-year followup evaluation — the same as average-risk persons.

COLONOSCOPY CAPACITY AND STANDARDS

In the first year of the program (April 2007–March 2008) \$11 million has been allocated to increase colonoscopy capacity, allowing for an additional 34,000 procedures in


54 Ontario hospitals. The participating hospitals are also implementing new colonoscopy standards developed by Cancer Care Ontario's Program in Evidence-Based Care,¹⁴ covering aspects related to the physician endoscopists, the hospitals and performance of the procedure itself. Physician endoscopist standards outline the experience and training required. Importantly, participating physicians must perform a minimum of 200 colonoscopies per year. Hospital standards include patient assessment prior to the procedure, infection control and monitoring during and after the administration of conscious sedation. Colonoscopy performance standards include targets for colonoscopy completion (\geq 95%) and complication rates. For example, the target perforation rate for screening colonoscopy must be \leq 1/2000 procedures.

The participating hospitals are reporting to Cancer Care Ontario on all colonoscopies performed. The monthly report includes volume performed, indication and wait time for each procedure, colonoscopy completion rates and complication rates. This information will be used to monitor key aspects of the program and to plan future colonoscopy capacity.

ROLE OF THE PRIMARY CARE PHYSICIAN

Primary care physicians will play a key role in delivering this program. One of the factors most strongly associated with cancer screening uptake is the recommendation of a primary care physician.¹⁶ The Ontario FOBT Pilot Study showed that participants were more likely than non-participants to have a primary care physician.¹⁷ Information kits, patient counselling materials, journal articles, regional forums and a multifaceted Continuing Medical Education program are being rolled out this fall and winter in partnership with the Ontario College of Family Physician and the Ontario Medical Association to raise primary physicians' awareness of the program. The Ministry of Health and Long-Term Care is working with the Ontario Medical Association to develop incentives for participating primary care physicians.

PUBLIC AWARENESS

Starting in spring 2008, the public awareness campaign will include television and print materials, and will set the stage for the launch of "branded" FOBT kits in April 2008. The kits will be available through primary care physicians' offices, and through pharmacies and Telehealth Ontario for people without a primary care physician. The program is putting a process in place in each region for followup of participants with a positive FOBT who do not have a primary care physician. 

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Other provincial programs

The information in the following summaries of the status of population-based CRC screening programs in other Canadian provinces was obtained with the assistance of Barry Stein, President of the Colorectal Cancer Association of Canada (CCAC, www.colorectal-cancer.ca).¹⁸

NOVA SCOTIA has committed to developing a program, and has funded a planning group headed by Medical Director Dr. Bernard Badley and Program Manager Erika Nicholson. The planning group is studying existing programs and consulting with stakeholders, and intends to submit a plan with budget by the end of 2007. The plan will involve FOBT and will address colonoscopy capacity issues and the need for colonoscopy standards.

In **NEW BRUNSWICK**, needs and infrastructure assessment for a CRC screening program is underway. The timeline for making recommendations is unknown, according to Dr. Eshwar Kumar, co-CEO of the New Brunswick Cancer Network, a division of the province's Department of Health.

The **QUÉBEC** government commissioned a report from the Institut national de santé public du Québec to examine the feasibility of implementing population-based screening. Meanwhile, according to Dr. Victor Plourde, President of the Association des gastro-entérologues du Québec, Québec physicians recognize that all forms of screening (FOBT, barium enema, virtual colonoscopy, colonoscopy and flexible sigmoidoscopy) are effective in reducing colorectal cancer deaths. A great deal of education is directed towards family physicians to encourage them to evaluate risk and promote screening of people at average and high risk, with the choice of method at the discretion of the individual practitioner.

The **MANITOBA** program, modeled after the United Kingdom's, is being rolled out gradually. In Phase I, now underway, FOBT kits are being sent out over a 1.5-year period to about 10% of people aged 50–74 with no other risk factors, unless they have had a colonoscopy within the last 5 years. About 20,000 kits will be mailed and another 5000 will be distributed via the breast cancer screening program already in operation. The FOBT is guaiac-based and will be processed at a central laboratory. Based on data from other jurisdictions, about half of people are expected to send in the FOBT kits.

Those with positive tests and their family physicians will be contacted, and either the family physician or the program will arrange for colonoscopy. The pilot phase is expected to highlight any logistical issues, including whether the increased number of colonoscopies overwhelms the system. Subsequent phases will extend FOBT to the entire at-risk population.

The **ALBERTA** Colorectal Cancer Screening Program is expected to be implemented late this year, with a goal of achieving screening of 67% of the target population in 5 years, according to Dr. Huiming Yang, Medical Lead of the program. As in other provinces, the target population is people aged 50–74 years, and the main screening modality will be FOBT, although physicians will be free to use other modalities. The program will include professional and public awareness campaigns. Initially, Albertans in the target age group will be encouraged to contact their family physicians or cancer-screening telephone help lines. In the next phase, invitation letters and test kits will be mailed directly to the target population. Full implementation will require a comprehensive information management system, still in development, to track screening tests and diagnostic followup results. All Regional Health Authorities are currently working to enhance their local capacity for CRC screening, including colonoscopy capacity, and will develop implementation strategies based on local capacity and needs. The program is funded by Alberta Health and Wellness and coordinated by the Alberta Cancer Board. Provincial program standards and guidelines will ensure adoption of best practices in all aspects of the screening program.

SASKATCHEWAN has established an internal committee to examine the issue, including colonoscopy capacity, and is expected to adopt an approach similar to Manitoba's program.

BRITISH COLUMBIA has a protocol for CRC screening that recommends sigmoidoscopy, colonoscopy, and FOBT, depending on risk category. According to Dr. Andrew Coldman, Provincial Leader for Population and Preventive Oncology at the British Columbia Cancer Agency, this protocol is gradually being implemented in a population-based CRC program. The initial phase will develop infrastructure and conduct screening in one Health Authority region, to be followed by other regions and then a province-wide roll-out.