

New Findings about the Risks and Limitations of Colonoscopy Used in the Early Detection of Colorectal Cancer

Nancy Baxter and Linda Rabeneck

The Issue

Colonoscopy has established benefits for the detection and prevention of colorectal cancer, which is the second leading cause of cancer-related deaths in Canada and the United States. However, two recently published studies from scientists at the Institute for Clinical Evaluative Sciences (ICES) have found that the procedure has certain limitations (Baxter et al. 2009; Rabeneck et al. 2008). First, colonoscopy seems to be less effective at preventing cancer deaths from tumours that originate in the right side of the large bowel. Second, while the procedure is safe for many patients, certain people appear to be at increased risk for serious complications.

Colonoscopy is widely used to detect both colorectal cancer and adenomatous polyps, which may become malignant if left alone. During a complete colonoscopy, a physician – usually a gastroenterologist or general surgeon – inserts a long, flexible tube called a colonoscope through the patient’s rectum and along the length of the large bowel. The goal is to scan the entire colon for potentially cancerous or pre-cancerous growths. If such a polyp or lesion is detected, it can often be removed during the colonoscopy so that no additional procedures or surgery are needed.

The findings from the two new ICES studies, detailed below, are especially important given the widespread and increasing use of colonoscopy and the need to evaluate possible harms from and limitations of the procedure.

Study One: Colonoscopy Screening Is Less Likely to Prevent Deaths from Right-Sided Lesions

Key Findings

Colonoscopy appears to be less effective in reducing patients’ risk of dying from cancers that originate on the right side of the colon, according to a recently published study by Dr. Nancy Baxter, an ICES scientist who is also a colorectal surgeon and researcher at St. Michael’s Hospital in Toronto (Baxter et al. 2009).

Dr. Baxter and her colleagues reviewed the health records of more than 10,000 people aged 52–90 years who received

a diagnosis of colorectal cancer between 1996 and 2001 and who had died of the disease prior to 2003. These patients were compared with a control group from across Ontario who did not die of colorectal cancer during the study period. The health records of both groups were reviewed to determine how many people had undergone either a screening or diagnostic colonoscopy.

Previous colonoscopy was strongly associated with fewer deaths from left-sided colorectal cancer. However, the data showed that colonoscopy seemed to have almost no benefit in preventing deaths from right-sided colorectal cancer.

The researchers suggest several reasons why colonoscopy may be less effective in preventing deaths from right-sided colorectal cancer:

- Some colonoscopies that are considered “complete” may not have visualized the full length of the colon (i.e., polyps or suspicious lesions in the farthest portion of the bowel – the right side – might have been missed.)
- Bowel-preparation procedures, which involve using laxatives to purge the colon prior to screening, may be less effective at clearing the right side of the bowel. If so, existing polyps might be obscured by stool remaining in this portion of the colon.
- Right and left colonic cancers and polyps may differ biologically. Right-sided growths may be less likely to have a fleshy stalk and are occasionally flat, which makes them harder to identify and remove, or they may grow more rapidly.

Conclusions and Implications

While colonoscopy remains the gold standard for evaluation of the colon, Dr. Baxter’s study – which triggered media interest around the world – sheds new light on some of the real-world limitations of this practice for screening and prevention. The findings may suggest ways to improve the quality of the test and also encourage other researchers to explore what the differences are in cancer development between the right and left colon.

Study Two: Certain Patients Are at Greater Risk for Complications from Colonoscopy

Key Findings

A new study by ICES scientist Dr. Linda Rabeneck is the first large-scale investigation to explore the effects of so-called endoscopist factors – such as physician specialty and experience performing colonoscopy – on complication rates among Canadians undergoing colonoscopy (Rabeneck et al. 2008). Dr. Rabeneck and her colleagues analyzed the health system records of 97,091 persons aged 50–75 years who underwent an outpatient colonoscopy in one of four provinces (British Columbia, Alberta, Ontario and Nova Scotia) between April 2002 and March 2003. The researchers linked data from these patients with data on all individuals who were admitted to hospital with bleeding or perforation within 30 days following the colonoscopy. (Perforation is defined as a hole in bowel wall that can lead to potentially serious health problems, sometimes requiring corrective surgery.)

The pooled rate of colonoscopy-related bleeding among patients in the four provinces was 1.64 per 1,000 patients; the pooled rate of perforation was 0.85 per 1,000 patients. The mortality rate following colonoscopy (which could only be calculated for patients in Ontario) was 0.074 deaths per 1,000 patients (or approximately one death per 14,000).

The study found that older age, male sex, having a polypectomy (the removal of polyps identified during the colonoscopy procedure) and having the procedure done by a low-volume endoscopist were independently associated with colonoscopy-related bleeding and perforation. Patients whose colonoscopies were performed by the lowest-volume endoscopists (<300 procedures annually) had threefold higher odds of bleeding or perforation.

Conclusions and Implications

Until now, the most widely quoted complication rates for colonoscopy were from case series performed by expert endoscopists, says Dr. Rabeneck. The latest findings have important implications for outpatient colonoscopy practice and health policy. For example, patients need to be informed of the risks of the procedure, including the risk of death. Endoscopists need to be especially careful in performing polypectomies and in performing colonoscopy in older men. Finally, people should seek referrals to a high-volume practitioner to perform their colonoscopies.

Overall Conclusions

Should Canadians, who are being widely encouraged to undergo colonoscopy, be alarmed about the study findings? “Absolutely not,” say Drs. Baxter and Rabeneck. They agree that colonoscopy remains a critical tool in the prevention and early diagnosis of colorectal cancer.

But patients and doctors should be aware that this tool needs to be applied with thought and care because of its potential to do harm. Doctors and patients should be aware that the test does not confer 100% protection against colon cancer and that the procedure may have potentially serious risks for specific groups of patients. **HQ**

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