

Virtual colonoscopy was sensitive and specific for detecting colorectal polyps and cancer

Fenlon HM, Nunes DP, Schroy PC 3d, et al. A comparison of virtual and conventional colonoscopy for the detection of colorectal polyps. *N Engl J Med.* 1999 Nov 11;341:1496-503.

QUESTION

In adults at high risk for colorectal neoplasia, does virtual colonoscopy detect colorectal polyps accurately?

DESIGN

Blinded comparison of virtual colonoscopy with conventional colonoscopy.

SETTING

A medical center in Boston, Massachusetts, USA.

PARTICIPANTS

100 adults who were 50 to 77 years of age (mean age 62 y, 60% men) and at high risk for colorectal neoplasia (≥ 50 y of age with a history of adenomatous polyps, recent sigmoidoscopic evidence of ≥ 1 polyp, a positive finding on fecal occult-blood testing, or a history of colorectal cancer in ≥ 1 first-degree relatives). Exclusion criteria were evidence of large-bowel obstruction or ischemia; colonic biopsy or polypectomy in the previous 14 days; retained barium on a scout film; colostomy; allergy to glucagon; known glucagonoma, insulinoma, or pheochromocytoma; or pregnancy.

DESCRIPTION OF TEST AND DIAGNOSTIC STANDARD

Virtual colonoscopy was done immediately before conventional colonoscopy. A rectal tube was inserted, and the colon was insufflated with air to the maximal level tolerated by the patient. To minimize smooth-muscle spasm and peristalsis and to reduce discomfort, glucagon, 1 mg, was given intravenously before thin-section, helical computed tomography. Conventional colonoscopy, the diagnostic standard, was done by using a standard endoscope.

MAIN OUTCOME MEASURES

Sensitivity and specificity for detecting colorectal polyps.

MAIN RESULTS

115 polyps were found in 49 patients, and 101 polyps were removed successfully for histologic analysis. Sensitivity, specificity, and likelihood ratios are shown in the

Table. Virtual colonoscopy detected 71% (95% CI 62% to 79%) of 115 polyps, and more large polyps than small polyps were detected (sensitivity 91%, CI 71% to 99% for ≥ 10 -mm polyps; 83%, CI 67% to 93% for 6- to 9-mm polyps; and 55%, CI 40% to 68% for 1- to 5-mm polyps). The 3 carcinomas found by conventional colonoscopy were also detected by virtual colonoscopy. 19 false-positive findings of polyps and no false-positive findings of cancer were identified by virtual colonoscopy.

CONCLUSION

In adults at high risk for colorectal neoplasia, virtual colonoscopy was sensitive and specific for detecting polyps and cancer.

Source of funding: In part, Radiological Society of North America.

For correspondence: Dr. M.A. Barish, Department of Radiology, Boston University School of Medicine, Boston Medical Center, Boston, MA 02118, USA. FAX 617-638-6616.

Test characteristics of virtual colonoscopy for detecting colorectal polyps*

Sensitivity (95% CI)	Specificity (CI)	+LR	-LR
82% (69 to 92)	84% (70 to 93)	5.0	0.2

*Abbreviations defined in Glossary; LRs and CI calculated from data in article.

COMMENTARY

Screening with currently available tests—fecal occult blood or sigmoidoscopy—reduces mortality from colorectal cancer by about one third (1). Much greater success seems possible, though, because colorectal cancer develops slowly in most cases from adenomatous polyps throughout the colon. Interest is growing in screening colonoscopy, even though it is expensive and not entirely safe. Would virtual colonoscopy be a better option?

The study by Fenlon and colleagues provides the best available description of the performance of virtual colonoscopy. The test detected 91% of large (≥ 1 cm) polyps, the ones most likely to progress to cancer, but 19 false-positive findings were seen in 100 patients, which is a much higher rate than that seen with conventional colonoscopy. These rates could be somewhat misleading because of chance (only 22 patients had large polyps) or because the diagnostic standard, colonoscopy, is itself imperfect (e.g., some of the reported false-positive results may have actually been true positives).

With this report, virtual colonoscopy is one step closer to becoming a legitimate choice for screening. But we need to know more about its accuracy in average-risk persons, its acceptability (given the rigors of bowel preparation and cramping during the procedure), and its cost. If the test characteristics of virtual colonoscopy compare favorably with conventional colonoscopy, should we begin using it? Or should we wait for the results of randomized controlled trials with death from colorectal cancer as an outcome, which would take many years to complete? That depends on how we choose to balance pragmatism against scientific rigor.

*Robert H. Fletcher, MD
Harvard Medical School and Harvard Pilgrim Health Care
Boston, Massachusetts, USA*

Reference

1. Winawer SJ, Fletcher RH, Miller L, et al. Colorectal cancer screening: clinical guidelines and rationale. *Gastroenterology.* 1997;112:594-642. Errata. 1997;112:1060; 1998;114:625.