

FPIN's Clinical Inquiries

Clinical Inquiries provides answers to questions submitted by practicing family physicians to the Family Practice Inquiries Network (FPIN). Members of the network select questions based on their relevance to family medicine. Answers are drawn from an approved set of evidence-based resources and undergo peer review. The strength of recommendations and the level of evidence for individual studies are rated using criteria developed by the Evidence-Based Medicine Working Group (http://www.cebm.net/levels_of_evidence.asp).

This series of Clinical Inquiries is coordinated for American Family Physician by John Epling, M.D., State University of New York Upstate Medical University, Syracuse, N.Y. The complete database of evidence-based questions and answers is copyrighted by FPIN. If you are interested in submitting questions to be answered or writing answers for this series, go to <http://www.fpin.org> or contact CI2Editor@fpin.org.

Colorectal Cancer Screening

Clinical Question

To screen for colorectal cancer, is annual fecal occult blood testing (FOBT) just as good as flexible sigmoidoscopy?

Evidence-Based Answer

Yes. Both FOBT and flexible sigmoidoscopy are effective in screening for colorectal cancer. FOBT can reduce mortality from colorectal cancer. [Strength of recommendation: A, based on high-quality systematic reviews of randomized controlled trials (RCTs)] Flexible sigmoidoscopy has a higher diagnostic yield, but its effect on colorectal cancer mortality has been less rigorously demonstrated. [Strength of recommendation: B, based on high-quality systematic reviews of well-designed case-control studies]

Evidence Summary

A recent systematic review¹ of high-quality RCTs for the U.S. Preventive Services Task Force (USPSTF) found a disease-specific mortality reduction of 15 to 21 percent over eight to 18 years with a regimen of biennial, non-rehydrated FOBT. The absolute risk reduction was 1.1 to 4.6 per 1,000 person-years; if FOBT screening is offered to 10,000 persons and two thirds are tested at least once, approximately eight deaths from colorectal cancer can be prevented over 10 years. Subsequent reports show that these mortality reductions persist.^{2,3} These outcomes were reported from intention-to-treat analyses, and were observed even though screening compliance

was low (around 60 percent). Disease-specific mortality reductions were greater (around 30 percent) for patients who were more compliant with screening.

Sensitivity and specificity of a single-home FOBT are about 40 and 96 percent, respectively. Sensitivity improves when screening is performed regularly over several years. In the annual screening arm of the 13-year Minnesota trial,⁴ repeated annual screening found 92 percent of colorectal cancers.

Good case-control studies of flexible sigmoidoscopy suggest a mortality reduction of 59 percent (95 percent confidence interval [CI], 31 to 75 percent) for cancers within reach of the scope. The benefit would be smaller when considering all cancers. However, there are no convincing RCTs (a study design less subject to bias than case-control studies) that demonstrate mortality reduction. One small, Norwegian RCT cited in the USPSTF review followed patients for 13 years and reported a trend toward disease-specific mortality reduction in patients undergoing flexible sigmoidoscopy compared with patients who were not screened (relative risk: 0.50; 95 percent CI, 0.10 to 2.72). Two large RCTs comparing flexible sigmoidoscopy (once-in-a-lifetime in the United Kingdom, every five years in the United States) against no screening will report their initial results within the next four years.¹ Screening effectiveness and test characteristics for FOBT and flexible sigmoidoscopy are summarized in the accompanying table.

Characteristics of Screening Tests for Colorectal Cancer in Average-Risk Adults

Category	Screening strategy	
	Fecal occult blood test (samples from three consecutive stools)	Flexible sigmoidoscopy (one time)
Effectiveness in reducing mortality from colorectal cancer	Annual testing: colorectal cancer mortality reduction of 33% (95% CI, 7%, 49%)	Small RCT found non-significant trend toward reduced colorectal cancer mortality (RR: 0.50; 95% CI, 0.10, 2.72)
	Biennial: colorectal cancer mortality reduction of 18 to 21% (95% CI, 3%, 38%)	Case-control studies suggest 59% (95% CI, 31%, 75%) reduction in risk of colorectal cancer death for cancers within reach of scope
Ability to detect cancers	One-time sensitivity 30 to 40% for colorectal cancer Less sensitive for polyps A program of repeated annual testing	One-time screening detects 68 to 78% of advanced neoplasia (cancers and polyps that are large, villous, or dysplastic) found on complete colonoscopy

	can find 92% of cancers	
Likelihood of generating false-positive results	Positive predictive value for colorectal cancer: 5 to 15%	-
	85 to 90% false-positive results	
	5 to 10% of patients will require colonoscopy over 10 years of testing	
Adverse effects	No direct adverse effects known	< 1 in 10,000 perforation rate for diagnostic examinations; bleeding after 2.5% of diagnostic studies, 5.5% of procedures with polypectomy
	Complication during follow-up colonoscopy (perforation or bleeding) in 1 of 2,000 procedures	

C I = confidence interval; RCT = randomized controlled trial; RR = relative risk.

Adapted with permission from Pignone M, Rich M, Teutsch SM, Berg AO, Lohr KN. Screening for colorectal cancer in adults at average risk: a summary of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med* 2002;137:132-41.

Recommendations from Others

The U.S. Multi-society Task Force on Colorectal Cancer, convened by the Agency for Healthcare Research and Quality, recommends screening for colorectal cancer in all men and women 50 years of age and older (and younger for those persons with increased familial risk).⁵ Screening options include annual FOBT, flexible sigmoidoscopy every five years, FOBT plus flexible sigmoidoscopy, barium enema, or colonoscopy every 10 years. The USPSTF, American Academy of Family Physicians, American Cancer Society, the major U.S. gastroenterology societies, and the Canadian Task Force on Preventive Health Care are participating in the development of the guidelines.

Clinical Commentary

What is the best test for colorectal cancer screening? When only considering tests that are performed routinely in the primary care office, FOBT and flexible sigmoidoscopy are comparable, although the mortality benefit of FOBT is better established. While the use of optical colonoscopy, virtual colonoscopy, or molecular-based fecal tests is outside the scope of

this question, none has randomized controlled data with mortality as an outcome to support its use. It is important to remember that colorectal cancer is prevalent and preventable, but only a small number of Americans are being screened. Therefore, physicians should pick the screening tool they are most comfortable with and screen all patients as necessary.

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