

CT Colonography (CTC) Update: September, 2008

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In order to aid decision-makers in applying the results of its reviews, ICER provides updates on new evidence during the first year after the release of a final appraisal document. An ICER update seeks to give perspective on new evidence in light of the original conclusions of the appraisal.

New Evidence

Results from the National CT Colonography Trial, conducted by the American College of Radiology Imaging Network (ACRIN), were published in the September 18, 2008 issue of the *New England Journal of Medicine*.¹ In the ACRIN study, the largest multicenter study of CTC published to date, over 2,500 asymptomatic patients were scheduled for optical colonoscopy at 15 clinical sites across the U.S. Patients first received CTC, followed by same-day colonoscopy in most cases. CTC sensitivity and specificity for detecting polyps ≥ 10 mm in size were 90% and 86%. As expected, sensitivity and specificity for polyps ≥ 6 mm were somewhat lower (78%, 88%). The range of sensitivity across individual radiologist interpreters was 67%-100%. Extracolonic findings were reported in 66% of the participants; 16% were deemed to require either additional evaluation or urgent care. No data on the subsequent outcomes or costs due to incidental findings were reported.

Another article in the same issue presents findings relevant to judgments about appropriate re-screening intervals by looking at data on the incidence of colorectal cancer among 1,256 patients with initial negative colonoscopy who were rescreened a mean of 5.3 years later.² The findings of this article suggest that the risk of colorectal cancer among these patients is extremely low (no cancers were found), and the incidence of noncancerous polyps is also low (1-2%).

Analysis

Incidental findings were an important issue within the ICER review and raised concerns among many members of the Evidence Review Group. It is therefore important to note that the rate of incidental findings requiring follow-up in the ACRIN study was more than twice as high as estimated from earlier evidence in the ICER review (16% vs. 6%).

As for diagnostic accuracy, the overall ACRIN sensitivity results are similar to the ICER pooled estimates for lesions ≥ 10 mm (90% vs. 92%) but are lower for lesions ≥ 6 mm (78% vs. 86%). The specificity results for lesions ≥ 10 mm in this study are lower than those from the ICER review (86% vs. 96%) but modestly higher when all lesions ≥ 6 mm are included (88% vs. 83%).

¹ Johnson CD, Chen M, Toledano AY, et al. Accuracy of CT colonography for detection of large adenomas and cancers. *N Engl J Med* 2008; 359:1207-17.

² Imperiale TF, Glowinski EA, Lin-Cooper C, et al. Five-year risk of colorectal neoplasia after negative screening colonoscopy. *N Engl J Med* 2008; 359:1218-24.

The diagnostic accuracy figures in the ACRIN study, as in others, may under-represent CTC accuracy in comparison to colonoscopy because previous series of repeat colonoscopy has found a miss rate of 2%-13% for the "gold standard" itself. The lower specificity results in this study may be due, as the authors point out, to the great emphasis placed on training interpreters to avoid missing lesions, resulting in more "overcalls." But a key new piece of evidence given in this study is the relatively broad range of performance across radiologists, all of whom received special training in CTC evaluation and/or had performed more than 500 interpretations. Evidence of this type was not available during the initial ICER review process. Decision-makers should consider whether the variability in performance demonstrated in the ACRIN study suggests that the actual performance in the general community is likely to be lower than that reported in this study.

Conclusion

An editorial accompanying both articles³ concludes that the findings summarized above strengthen the evidence base for a 5-10 year interval between colorectal cancer screening as well as the use of CTC as one approach to conducting such screening. Additional questions remain unanswered, such as the effects of a cumulative radiation dose from CTC tests every 5-10 years as well as the impact of extracolonic findings from CTC on net health benefits and cost-effectiveness within the population. It remains certain that CTC provides superior comparative clinical effectiveness compared to no colorectal cancer screening at all. In addition, when compared to other non-invasive methods, such as FOBT, CTC has superior test characteristics. The ACRIN study results are likely to disappoint some decision makers who wish to consider CTC primarily as replacement for optical colonoscopy as a primary screening methodology. As pointed out in the original ICER review, therefore, judgment of the evidence on CTC is largely dominated by assumptions about how it will be implemented in the health care system and its impact on overall population rates of screening for colorectal cancer.

³ Fletcher RH. Colorectal cancer screening on stronger footing. *N Engl J Med* 2008; 359:12.