

ARCHIVE NEWS RELEASE

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Computer-Aided Polyp Detection Software in Combination with Virtual Colonoscopy is as Effective as Traditional Optical Colonoscopy

Bethesda, Maryland — A study led by the National Institutes of Health Clinical Center finds that computer-aided detection (CAD) software in conjunction with a procedure commonly called virtual colonoscopy can deliver results comparable to conventional optical colonoscopy for detecting the most worrisome types of polyps.

The study is published in the December 2005 issue of the American Gastroenterological Association journal, *Gastroenterology*. The work also was presented November 29, 2005 at the annual meeting of the Radiological Society of North America.

Virtual colonoscopy (CT colonography) is a minimally invasive radiological procedure. The colon is viewed using a CT scan so there is no need for sedation or insertion of a colonoscope, but a full bowel prep still is required. Virtual colonoscopy is under investigation as a screening method for colorectal cancer, which is the second leading cause of cancer death in America.

“Proper screening can prevent colorectal cancer. It is important for the scientific and medical community to explore and perfect methods that may encourage more people to get checked,” says Ronald M. Summers, M.D., Ph.D., the lead author of the study. Dr. Summers is a senior investigator and staff radiologist at the NIH Clinical Center. He is the chief of the clinical image processing service and chief of the virtual endoscopy and computer-aided diagnosis laboratory in the Department of Radiology.

Virtual colonoscopy uses a CT scan to create two- and three-dimensional images of the colon. The process produces 600 to 1,000 images that are interpreted by a radiologist. Computer-aided detection software then serves as a second set of eyes and identifies sites that warrant closer inspection. The radiologist again reviews these sites to make the final diagnosis.

This study set out to assess the performance and sensitivity of CAD for virtual colonoscopy in a large screening group of patients with no symptoms of colorectal cancer.

After training the CAD system on the virtual colonoscopies of a separate group of 394 patients, Dr. Summers and his colleagues used the CAD system on 792 patients at three medical centers. In one day, the patients underwent both virtual colonoscopy and conventional optical colonoscopy which is considered the gold standard for screening. The procedures were done to detect adenomas, benign growths that may become cancerous if not removed.

When CAD was applied to each CT colonography scan, it detected 89.3 percent of patients having adenomas 10mm or larger, compared to 85.7 percent for conventional colonoscopy. CAD detected 85.4 percent of patients having adenomas 8mm or larger, compared to 89.6 percent for conventional colonoscopy. CAD’s false positive rates were 2.1 false positive detections per patient for polyps 10 mm or greater and 6.7 false positive detections per patient for polyps 8 mm or greater. A review of the false positives led the researchers to conclude that most would be easily identifiable as such.

CAD detected cancer in two patients while optical colonoscopy initially detected only one. The colonoscopist found the second cancer after getting word that virtual colonoscopy had detected an abnormality.

“The fact that this worked so well on a large number of patients indicates that this is a robust technique,” says Dr. Summers. “We believe it will work well in clinical practice, but more testing in the clinical environment still is needed.”

“Research into better ways to screen for and prevent disease is an important aspect of NIH’s clinical research mission,” says John I. Gallin, M.D., director of the NIH Clinical Center. “Studies like this demonstrate how collaboration enriches research. We appreciate the contribution of patients, who are our partners in research, and the teamwork of our colleagues.”

Screening patients came from National Naval Medical Center in Bethesda, Maryland, Walter Reed Army Medical Center in Washington, D.C. and San Diego Naval Medical Center.

This study was done in conjunction with researchers from the National Naval Medical Center, Walter Reed Army Medical Center and Uniformed Services University of the Health Sciences in Bethesda, Maryland. Jianhua Yao, Ph.D., Perry J. Pinkhardt, M.D., Marek Franaszek, Ph.D. Ingmar Bitter, Ph.D., Daniel Brickman, B.S., Vamsi Krishna, B.A., J. Richard Choi, ScD, M.D participated in the study.

The NIH Clinical Center is the clinical research hospital of the National Institutes of Health. Through clinical research, physicians and scientists translate laboratory discoveries into better treatments, therapies and interventions to improve the nation’s health.

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