

## **Virtual Colonoscopy and Colorectal Cancer Screening** **Soumya Pandey, MD**

Colorectal cancer (CRC) is the third most common type of cancer and second leading cause of cancer death in the United States, accounting for approximately 9% of cancer deaths overall.<sup>1</sup> CRC is a rare diagnosis before age 40, but its incidence rises progressively thereafter. Most CRCs arise from adenomatous polyps, and the adenoma to carcinoma progression can take more than 10 years. This slow rate of malignant transformation and tumor progression thus allows prevention of cancer by early detection and removal of polyps. Despite the availability of multiple screening options, CRC remains a considerable cause of morbidity and mortality. Stool-based screening tests, such as fecal occult blood testing, are associated with low sensitivity and specificity. On the other hand, endoscopic screening options have a higher sensitivity and specificity but lack patient acceptance due to the pain and discomfort associated with these invasive procedures.

These shortcomings of available screening tests have driven the search for alternate strategies that are safe, cost-effective, and acceptable to patients. Virtual colonoscopy, first described by Vining in 1996,<sup>2</sup> is one such rapidly evolving, minimally invasive method for direct visualization of the colon. The entire colon is distended with air, and then several images are acquired either by magnetic resonance imaging (MRC/ magnetic resonance colonoscopy) or computed tomography (CTC/ computed tomography colonoscopy). The images are reconstructed and analyzed on a computer through specialized software.

The test has several advantages over conventional colonoscopy: It visualizes colonic lumen as well as the colonic wall, thus aiding in accurate localization of lesions. The entire colon can be visualized even in the presence of a stenotic lesion, unlike conventional colonoscopy. It also allows simultaneous assessment of other abdominal organs, which is particularly of value in assessing the liver in patients with colorectal cancer, and other disorders such as diverticular disease and inflammatory bowel disease. Although the test requires bowel preparation, there is no requirement for patient sedation and no procedural pain.

Virtual colonoscopy is not without drawbacks. For instance, an abnormal result needs to be followed by conventional colonoscopy for biopsy and /or excision, which may be difficult to coordinate resulting in patients undergoing bowel preparation twice or being lost to follow-up. Although the risk of radiation exposure with CTC is less than a barium enema, the cumulative radiation exposure risks with testing every five years, as currently recommended, are unknown. MRC is not associated with risk of radiation exposure, but it is contraindicated in patients with hip prosthesis and other metal implants. The methods of performing and interpreting the test also need to be standardized. Insurance coverage is also variable, and currently virtual colonoscopy is not covered under Medicare and Medicaid Services.

## **Guidelines and Recommendations**

The exact clinical utility and role of virtual colonoscopy is still being debated. Two different guidelines for its use have been issued: (1) US Multi-Society Task Force on Colorectal Cancer, American Cancer Society, and American College of Radiology recommend that it should be used for screening adults over 50 years of age who have an average risk for CRC and should be repeated every five years.<sup>3</sup> Further recommendations include the use of conventional colonoscopy if polyps >6mm are detected on virtual colonoscopy. (2) On the other side, the US Preventive Services Task Force does not support the role of virtual colonoscopy in screening.<sup>4</sup>

## **References**

1. Jemal A, Siegel R, Ward E, et al. Cancer statistics, 2008. *CA Cancer J Clin.* 2008;58(2):71–96.
2. Vining D. Virtual endoscopy: is it reality? *Radiology.* 1996;200(1):30–31.
3. Levin B, Lieberman DA, McFarland B, et al. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *Gastroenterology.* 2008;134:1570–95.
4. Screening for colorectal cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2008;149(9):627–637.