LOS ANGELES

COLON AND RECTAL SURGICAL ASSOCIATES

Norman N. Hoffman M.D., Inc. | Gary H. Hoffman M.D. | Eiman Firoozmand M.D. | Liza M. Capiendo M.D.

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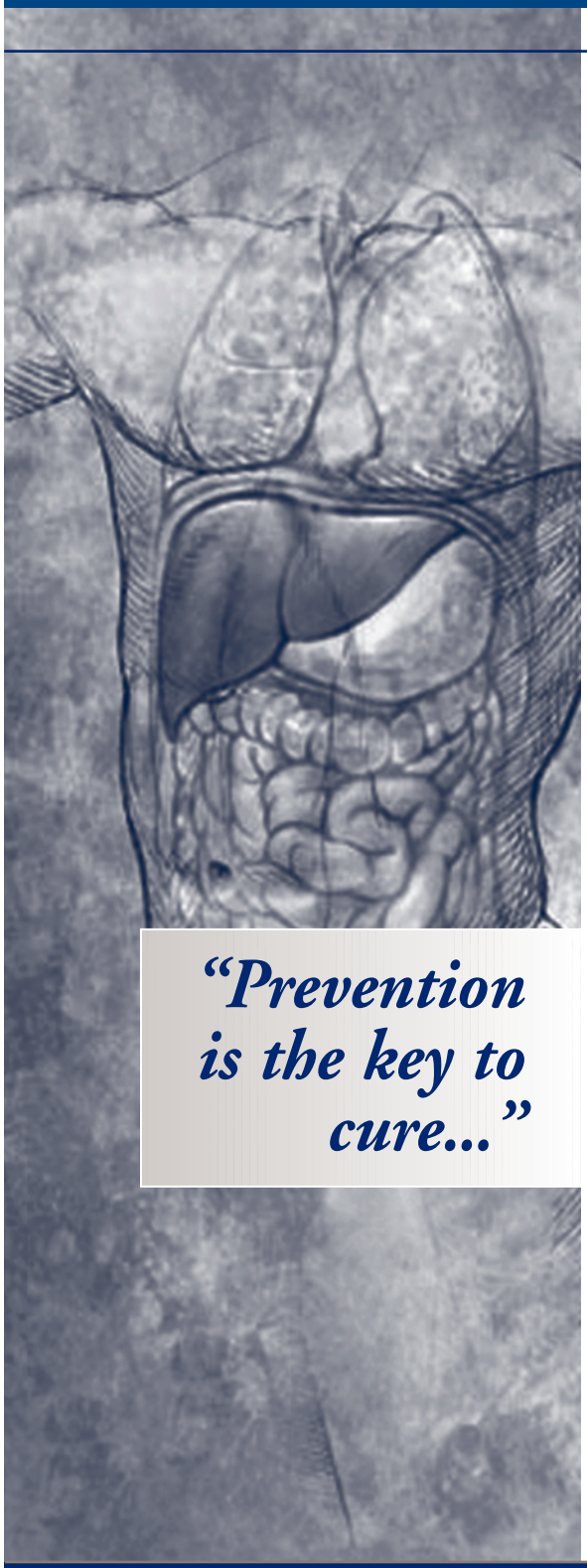


*"Prevention is the key to cure..."*

# Colorectal Cancer and Polyp Surveillance

## Prevention is the key to cure.

### THE PROBLEM

Approximately 150,000 new cases of colorectal cancer are diagnosed each year in the United States. It is the second leading cause of cancer mortality, resulting in almost 60,000 deaths every year.[1] Cancers of the colon and rectum most commonly develop from precursor adenomatous polyps that increase in size over time.[2,3] Early detection and removal of these premalignant polyps usually prevents them from developing into invasive cancer.[4,5] This is the rationale behind the colorectal cancer screening recommendations from the American Cancer Society.

### CURRENT SCREENING OPTIONS

Current screening options to evaluate the colon and rectum include a digital rectal exam with fecal occult blood testing, combined flexible sigmoidoscopy and an air contrast barium enema, fiberoptic colonoscopy and virtual colonoscopy. The limitation of the flexible sigmoidoscopy alone, centers around the inability of this procedure to examine a large portion of the colon. The limitations of an air contrast barium enema examination alone center around its decreased effectiveness at polyp detection when compared to colonoscopy,[6,7] and its difficulty in examining the sigmoid colon. Polyps cannot be removed and biopsies cannot be performed during a barium enema examination. Flexible sigmoidoscopy, when combined with a barium enema examination, has a somewhat increased ability to detect a larger number of colonic polyps. However, the sensitivity and specificity of the combined modalities still lag behind those of a colonoscopic examination. Additionally, the combined examinations may not allow for mucosal biopsies or polyp removal.

### COLONOSCOPY

Conventional colonoscopy is the current procedure of choice for colorectal inspection, allowing for the immediate removal of premalignant polyps. It has the disadvantages of requiring sedative and analgesic medication, and is associated with a small risk of injuring the colon during the procedure.[8] There is also evidence that in 5-10% of conventional colonoscopic examinations, the entire colon is not fully visualized.[9,10]

### VIRTUAL COLONOSCOPY– THE NEW KID ON THE BLOCK

Computed tomographic colonography (CT Colonography), or 'virtual colonoscopy', is a radiologic examination requiring a thin-section spiral CT scanner to generate cross-sectional images.

These images are reformatted in three dimensions to generate views of the colon resembling those obtained during conventional colonoscopy. The colon must be fully prepared with a mechanical bowel preparation prior to the exam, so that no residual fecal material remains. This is performed

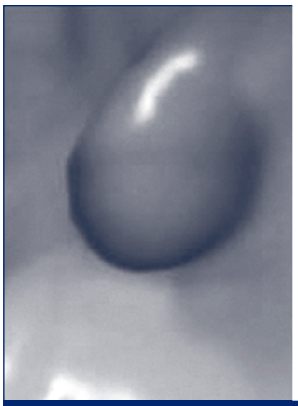
*continued on back...*

*...continued from front*

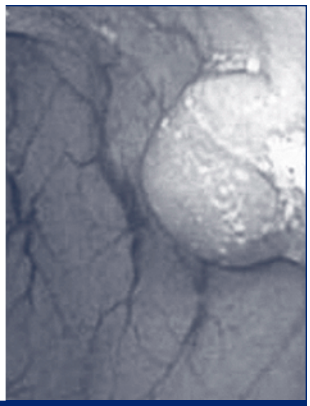
with a standard bowel preparation kit. The patient is then placed on the CT table and a flexible rubber catheter is placed into the rectum in order to insufflate and distend the colon with air. This allows for the normally collapsed colon to be more easily visualized. Once adequate distention is achieved, two sets of images are typically obtained; one in the supine position, and one in the prone position. The examination requires approximately three minutes to complete. The resulting prone and supine data sets allow for better differentiation between a polyp and colon residue. To reconstruct the colorectal anatomy, the two dimensional and three dimensional images are generated with the computer software. The final set of images are read and interpreted by colon and rectal surgeons, gastroenterologists or by specially trained radiologists.

## VIRTUAL COLONOSCOPY: THE GOOD

Despite efforts to screen patients effectively, colorectal cancer remains a highly prevalent disease. A possible reason for this may be related to patient reluctance to undergo "invasive" screening as currently recommended.[11] Patient reluctance to undergo colon screening might possibly diminish with this less invasive procedure, and thus, enable the medical community to more effectively screen the general population for colon and rectal polyps or malignancies. CT colonoscopy usually requires no sedation, and is performed relatively rapidly. Anticoagulants such as aspirin, Plavix® and Coumadin® need not be discontinued prior to the examination.



A small polyp seen with conventional colonoscopy.



The same polyp seen with virtual colonoscopy.

Numerous studies have compared conventional colonoscopy to CT colonoscopy. Overall, the CT colonoscopy was found to have a diagnostic sensitivity similar to conventional colonoscopy for polyps greater than 6.0mm in diameter. For polyps smaller than 6.0mm in diameter, the sensitivity of CT colonography decreased significantly, to the range of 25-50%.[12, 13]

## VIRTUAL COLONOSCOPY: THE NOT-SO-GOOD

If a polyp or other lesion is found, the patient must schedule a colonoscopy and undergo a repeat bowel preparation. Between fifteen and thirty percent of the general adult population is thought to have colon or rectal polyps and would require a subsequent colonoscopy.

Virtual colonoscopy is not recommended for use in patients who have had polyps removed previously and require follow up colonic screening. It does not allow for the examination and biopsy of the colonic surfaces to evaluate the colon for inflammatory bowel disease or other important conditions. Smaller polyps are difficult to detect using virtual colonoscopy.

Virtual Colonoscopy is associated with moderate amounts of diagnostic radiation exposure equaling approximately one half the dose of a double contrast barium enema.. Long term effects of lifetime cumulative doses of radiation are not yet completely known or understood.

Air insuflation during a virtual colonoscopy causes moderately severe abdominal cramping.

Insurance companies do not yet cover virtual colonoscopy as a screening tool.

## TOMORROW

Although not yet FDA approved, The PillCam™ Colon appears promising in colon cancer surveillance. The patient performs a complete bowel preparation and swallows a 31-by-11 millimeter camera-capsule. As it passes through the digestive tract, four images per second are recorded on a data recorder worn by the patient. The results are later interpreted by the physician. If polyps or lesions are found, a colonoscopy is performed.

Various other exams are being evaluated in our quest for early detection of polyps. These include fecal testing for polyp-specific proteins. An abnormal finding would lead to further colonic evaluation. Additionally, researchers are looking at DNA mutations in blood samples which could also be used for mass population screening. Neither of these exams are approved or available for clinical use.

## TODAY

Many technologies have been developed to screen for colonic polyps and cancers. However, in the early diagnosis of colorectal polyps or malignancies, conventional colonoscopy remains the procedure of choice. **Prevention is the key to cure.**

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