

Virtual Colonoscopy

National Digestive Diseases Information Clearinghouse



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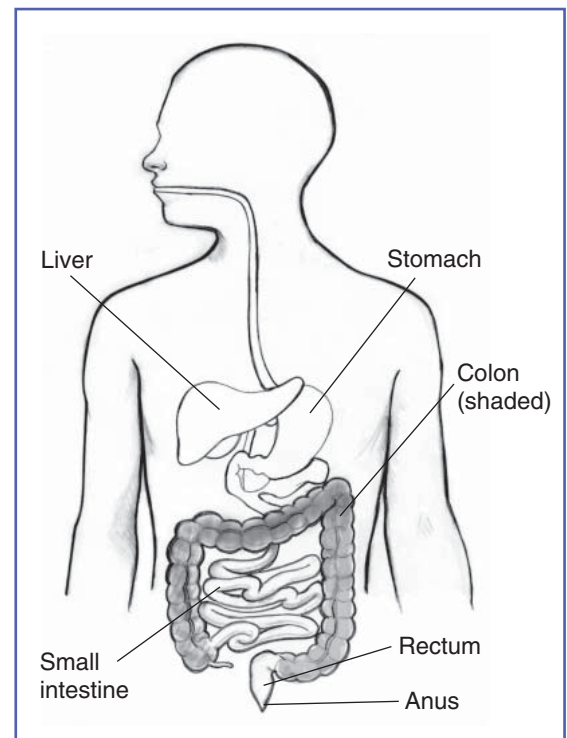
What is virtual colonoscopy?

Virtual colonoscopy is a procedure used to look for signs of pre-cancerous growths, called polyps; cancer; and other diseases of the large intestine. Images of the large intestine are taken using computerized tomography (CT) or, less often, magnetic resonance imaging (MRI). A computer puts the images together to create an animated, three-dimensional view of the inside of the large intestine.

What are the colon and rectum?

The colon and rectum are the two main parts of the large intestine. Although the colon is only one part of the large intestine, because most of the large intestine consists of colon, the two terms are often used interchangeably. The large intestine is also sometimes called the large bowel.

Digestive waste enters the colon from the small intestine as a semisolid. As waste moves toward the anus, the colon removes moisture and forms stool. The rectum is about 6 inches long and connects the colon to the anus. Stool leaves the body through the anus. Muscles and nerves in the rectum and anus control bowel movements.



The colon and rectum are the two main parts of the large intestine.

What is computerized tomography (CT)?

CT is a procedure that takes hundreds of cross-sectional x rays in a few seconds. Like putting together a loaf of bread from its many slices, a computer puts cross-sectional x-ray pictures together to form whole images of internal organs.

What is magnetic resonance imaging (MRI)?

MRI is similar to a CT, but it does not use x rays. Instead, MRI uses powerful magnets to send radio waves through the body to take hundreds of cross-sectional pictures. A computer then puts the pictures together to form whole images of internal organs.

How to Prepare for Virtual Colonoscopy

The doctor will provide instructions about how to prepare for virtual colonoscopy. The process is called bowel prep. The bowel prep for virtual colonoscopy is almost identical to the bowel prep for conventional colonoscopy. Generally, all solids must be emptied from the gastrointestinal (GI) tract by following a clear liquid diet for 1 to 3 days before the procedure. Acceptable liquids include

- fat-free bouillon or broth
- strained fruit juice
- water
- plain coffee
- plain tea
- sports drinks, such as Gatorade
- gelatin

A laxative will be required the night before virtual colonoscopy. A laxative is medicine that loosens stool and increases bowel movements. Laxatives are usually swallowed in pill form or as a powder dissolved in water.

After the bowel prep, patients undergoing CT drink a liquid called contrast media that causes the large intestine to appear very bright during CT. Contrast media helps the doctor identify abnormal tissues.

How is virtual colonoscopy performed?

Virtual colonoscopy is performed wherever the CT scanner or MRI unit is located—usually in the radiology department of a hospital or medical center. The procedure takes about 10 minutes and does not require sedation.

- Patients will lie face up on a table.
- A thin tube will be inserted through the anus and into the rectum. For CT, carbon dioxide gas will be pumped through the tube to expand the large intestine for better viewing. For MRI, contrast media will be given rectally to expand the large intestine.
- The table will move through the CT scanner or MRI unit to produce a series of cross-sectional images of the colon.
- At various points during the procedure, the doctor may ask patients to hold their breath to steady the images.
- The procedure will be repeated while patients lie face down.

After the procedure, cross-sectional images taken by CT or MRI are processed to create three-dimensional, computer-generated images of the large intestine. A radiologist evaluates the results to identify any abnormalities. If abnormalities are found, conventional colonoscopy may be performed the same day or at a later time.

How is virtual colonoscopy different from conventional colonoscopy?

The main difference between virtual and conventional colonoscopy is how the doctor sees inside the colon. Conventional colonoscopy uses a long, lighted, flexible tube called a colonoscope to view the inside of the colon, whereas virtual colonoscopy uses CT or MRI.

For more information about conventional colonoscopy, see the *Colonoscopy* fact sheet from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK).

What are the advantages of virtual colonoscopy?

Virtual colonoscopy has several advantages over other procedures:

- Virtual colonoscopy does not require the insertion of a colonoscope into the entire length of the colon. Instead, a thin tube is inserted through the anus and into the rectum to expand the large intestine with air.
- No sedation is needed. A patient can return to usual activities or go home after the procedure without the aid of another person.
- Virtual colonoscopy provides clearer, more detailed images than a conventional x ray using a barium enema—sometimes called a lower GI series.

- Virtual colonoscopy takes less time than either conventional colonoscopy or a lower GI series.
- Virtual colonoscopy can see inside a colon that is narrowed due to inflammation or the presence of an abnormal growth.

What are the disadvantages of virtual colonoscopy?

Virtual colonoscopy has several disadvantages:

- As with conventional colonoscopy, virtual colonoscopy requires bowel prep and the insertion of a tube into the rectum for expanding the large intestine with gas or liquid.
- Virtual colonoscopy does not allow the doctor to remove tissue samples or polyps.
- Virtual colonoscopy does not detect pre-cancerous polyps smaller than 10 millimeters.
- Medicare and many health insurance plans do not pay for virtual colonoscopy cancer screening.
- Virtual colonoscopy is a newer technology and is not as widely available as conventional colonoscopy.

Points to Remember

- Virtual colonoscopy is a procedure used to look for signs of pre-cancerous growths, called polyps; cancer; and other diseases of the large intestine.
- All solids must be emptied from the gastrointestinal (GI) tract by following a clear liquid diet for 1 to 3 days before virtual colonoscopy.
- Virtual colonoscopy does not require insertion of a colonoscope or sedation.
- During virtual colonoscopy, a tube is inserted into the rectum to expand the large intestine with gas or liquid.
- Virtual colonoscopy does not allow the doctor to remove tissue samples or polyps.

Hope through Research

The NIDDK conducts and supports basic and clinical research into many digestive disorders. The NIDDK is finding new methods to automate the detection of colon polyps using virtual colonoscopy.

Participants in clinical trials can play a more active role in their own health care, gain access to new research treatments before they are widely available, and help others by contributing to medical research. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

Fact sheets about other diagnostic tests are available from the National Digestive Diseases Information Clearinghouse at www.digestive.niddk.nih.gov, including

- *Colonoscopy*
- *ERCP (Endoscopic Retrograde Cholangiopancreatography)*
- *Flexible Sigmoidoscopy*
- *Lower GI Series*
- *Liver Biopsy*
- *Upper GI Series*
- *Upper GI Endoscopy*

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You may also find additional information about this topic by

- searching the NIDDK Reference Collection at www.catalog.niddk.nih.gov/resources
- visiting MedlinePlus at www.medlineplus.gov

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Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This publication was reviewed by Michael Wallace, M.D., Mayo Clinic.

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