Colonoscope

Health problem addressed
Colonoscopes are used for the removal of foreign bodies, excision of tumors or colorectal polyps (polypectomy), and control of hemorrhage. Routine colonoscopy is important in diagnosing intestinal cancer, the second leading cause of cancer deaths in the United States. These endoscopic procedures reduce the need for invasive surgical diagnostic and therapeutic procedures.

Product description
These devices consist of a proximal housing, a flexible insertion tube, and an “umbilical cord” connecting the light source and the proximal housing. The proximal housing, which is designed to be held in one hand, typically includes the eyepiece (fiberoptic models only), controls for distal tip (bending section) angulation and suction, and the working channel port. Colonoscopes have several hollow channels for suction, water and air delivery, and insertion of accessory instruments and cannulae. The distal tip of video colonoscopes includes a charge-coupled device (CCD) that serves as a small camera and electronically transmits the image from the CCD to an external video-processing unit.

Principles of operation
Video colonoscope insertion tubes contains a fiberoptic light bundle, which transmits light from the light source to the tip of the endoscope. Each fiberoptic bundle consists of thousands of individual glass fibers coated with glass causing internal reflections that allow light transmission through the fiber even when it is flexed. The light is used to illuminate the field of view in the patient’s colon. Video images are detected by the CCD and are then transmitted to the video processor and then display monitors or recording devices.

Operating steps
The patient typically lies on his or her side on a procedure table. Patients typically will require anesthesia or conscious sedation before insertion of the colonoscope. The colonoscope is inserted into the colon via the rectum by a gastroenterologist. Video images are typically viewed throughout the procedure on a video monitor. These images can then be recorded, printed, stored on digital media, or transmitted to another location for simultaneous viewing. The gastroenterologist manipulates the direction of the device using controls on the colonoscope control housing.

Reported problems
Although rare, trauma to the colon and adjacent organs during colonoscopy can result in complications such as bleeding, peritonitis, and appendicitis. ECRI Institute has received reports of difficulty in inserting forceps through the instrument channel of contorted colonoscopes, causing delays in procedures. Problems have occurred related to blockage of the air channel from inadequately rinsed disinfectant or retrograde flow of protein material into the channel during a procedure. Also, patient infection is a common mainly from improper cleaning and disinfection procedures.