

CAPSULE ENDOSCOPY

Modern endoscopic techniques have revolutionized the diagnosis and treatment of diseases of the upper gastrointestinal tract and the colon. The last remaining frontier has been the small intestine.

The small intestine has been a difficult organ in which to make diagnoses and treat without performing surgery. Radiological procedures, specifically the upper GI series with small bowel follow-through, which involves following swallowed barium as it passes through the intestine with x-ray films, have been available for diagnosis, but these radiological procedures are time-consuming and are not accurate in identifying small tumors and other subtle abnormalities of the small intestine. One of the newer technologies that expands the diagnostic capabilities in the small intestine is *capsule endoscopy* also known as *small bowel wireless capsule endoscopy*.

What is capsule endoscopy?

Capsule endoscopy is a technology that uses a swallowed video capsule to take photographs of the inside of the esophagus, stomach, and small intestine. For capsule endoscopy, the intestines are first cleared of residual food and bacterial debris with the use of laxatives and/or purgatives very similar to those used before colonoscopy. A large capsule (the size of a very large pill) is swallowed by the patient. The capsule contains one or two video chips, a light bulb, a battery, and a radio transmitter. As the capsule travels through the esophagus, stomach, and small intestine, it takes photographs rapidly. The photographs are transmitted by the radio transmitter to a small receiver that is worn on the waist of the patient who is undergoing the capsule endoscopy. At the end of the procedure, approximately 8 hours later, the photographs are downloaded from the receiver into a computer, and the images are reviewed by a physician. The capsule is passed by the patient into the toilet and flushed away.

What are the limitations of capsule endoscopy?

While the capsule provides the best means of viewing the inside of the small intestine, there are many inherent limitations and problems with its use:

- The capsule does not allow for therapy if an abnormality is found
- Rapid transit of the capsule may cause blurred photographs and lead to missed lesions
- Incomplete examination due to failure of the capsule battery before passage into the colon
- Delayed passage of the capsule due to underlying conditions, such as diabetic gastroparesis
- If there are narrow areas due to scarring (strictures) or tumors in the small intestine, the capsule can get stuck in the narrow area and cause an obstruction of the intestine that requires surgical removal of the capsule. A small bowel series xray is often ordered before the capsule endoscopy to help rule out small bowel strictures.
- Reviewing the tens of thousands of photographs is very time consuming for the conscientious physician.

What type of diseases can be diagnosed with capsule endoscopy?

Some common examples of small intestine diseases diagnosed by capsule endoscopy include:

- Vascular abnormalities that have a tendency to bleed, such as angiodysplasias
- Small intestinal tumors such as polyps, lymphoma, carcinoid tumor, and small intestinal cancer
- Crohn's disease of the small intestine