

# Video Capsule Endoscopy

## Technology, Reading, and Troubleshooting



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### KEYWORDS

- Video capsule endoscopy • Obscure gastrointestinal bleeding
- Small bowel bleeding • Technology • Reading • Contraindications • Preparation

### KEY POINTS

- Video capsule endoscopy can be performed in inpatients and outpatients, requires appropriate bowel preparation before the study, and can be administered via oral swallowing or endoscopic device placement into the small bowel based on outlined patient-dependent factors.
- Current commercially available video capsule endoscopy systems were reviewed and compared for individual features and attributes.
- Reading a video capsule endoscopy study should be done in a systematic manner, including identification of anatomic landmarks, calculation of small bowel transit time, objective assessment of the quality of bowel preparation, and detailed description of any abnormal findings.
- There are multiple contraindications and risks to video capsule endoscopy, which need to be carefully weighed with an appropriate informed consent process between patient and provider.

### INTRODUCTION

Video capsule endoscopy (VCE) has completed the endoscopic visualization of the entire luminal gastrointestinal tract. It has taken us on a “fantastic voyage,” which is improving with each technical advance. Knowledge of its indications, preparation, and contraindications will allow us to apply this endoscopic technology in a precise and accurate manner. This article focuses on preparation for VCE, currently available VCE technology, how to read a VCE study, and risks and contraindications to VCE.

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## VIDEO CAPSULE ENDOSCOPY: PREPARATION, ADMINISTRATION, AND COMPLETION

VCE can be performed in both inpatients and outpatients. Patients are generally recommended to remain on a clear liquid diet the day before VCE administration. A 2009 meta-analysis of 12 studies by Rokkas and colleagues<sup>1</sup> demonstrated the importance of bowel preparation in comparison to clear liquid diet to improve small bowel visualization quality and to increase the diagnostic yield of VCE examinations. Bowel preparation with 2 L of polyethylene glycol is common and provides relatively comparable preparation quality and diagnostic yield to a 4-L polyethylene glycol preparation.<sup>2</sup> Newer low-volume bowel preparations using MoviPrep or Pico-Salax have also been suggested to have comparable efficacy.<sup>3</sup> Simethicone may be administered before VCE to reduce the presence of bubbles in the small bowel.

Narcotics and other medications such as anticholinergics and antihistamines, which may cause gastroparesis, should be stopped if possible 2 to 3 days before VCE administration. Alternatively, patients can receive either metoclopramide 10 mg 3 times daily before meals or erythromycin 250 mg every 8 hours for 2 to 3 days before VCE administration; however, endoscopic placement may be needed given potential medication-induced gastroparesis. Cessation or dose reduction of anticoagulants, including warfarin or the novel anticoagulants, is not recommended before VCE administration, and diagnostic yield of VCE may actually be increased if bleeding is provoked during the study.<sup>4,5</sup>

VCE administration can be performed using 2 methods: swallowing the VCE by mouth or endoscopic deployment of the VCE into the small bowel. Oral VCE administration is more common, with obvious benefit by foregoing an additional invasive procedure with all associated risks, and marked cost savings of the endoscopic procedure and sedation. Following oral VCE administration, patients may ingest clear liquids 2 hours later and may have a light meal 4 hours after VCE administration. Failure to reach the cecum during the recorded time resulting in an incomplete study is estimated to occur in up to 19% to 27% of patients undergoing VCE via oral administration.<sup>6,7</sup> A portion of these patients may be able to achieve a complete VCE study with endoscopic deployment.

Endoscopic deployment should be considered in patients with known or anticipated difficulty of the VCE passing from the mouth to the small bowel in a safe and timely manner to enable maximal small bowel mucosal visualization and to ensure a complete capsule study. These factors include patients with known inability to swallow (oropharyngeal, esophageal, or both, such as after a cerebrovascular accident, musculoskeletal disorders, poor nutrition with undiagnosed dysphagia, and known dysphagia), gastroparesis, opioid usage with delayed gastric transit, hospitalized patients, especially those who are bedbound and patients in the intensive care unit, and those with prior capsule failing to reach the cecum. Although increasingly common, patients with prior bariatric or gastric surgery may satisfactorily undergo oral VCE administration with similar completion rates to the general population.<sup>8</sup>

Lack of physical activity such as in patients who are on strict bed rest is significantly associated with an incomplete VCE study compared with those who are ambulatory or with mild bed rest.<sup>9</sup> Real-time viewer features found on certain capsule devices may assist the endoscopist in the placement of the capsule device into the duodenum in particularly challenging cases.<sup>10</sup> Despite endoscopic placement, there still remains a subset of patients in whom VCE may be incomplete, perhaps due to underlying structural or motility disorders.<sup>11</sup> Importantly, endoscopic sedation with propofol on the same day as VCE increases small bowel transit time (SBTT), but does not affect VCE completion rates.<sup>12</sup>

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