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## Evolving Standards for Anesthesia During Advanced GI Endoscopic Procedures

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Patients undergo over 11 million colonoscopies, >6 million upper gastrointestinal (GI) endoscopy procedures, 180,000 upper endoscopic ultrasound examinations, and close to 500,000 endoscopic retrograde cholangiopancreatography (ERCP) interventions each year in the United States.<sup>1</sup> Total expenditures for GI diseases exceed \$136 billion per annum and continue to increase annually.<sup>1</sup> Anesthesia care is increasingly required during these procedures as patients present with a host of significant medical comorbidities, advanced frailty, and decreased physiological reserves. Moreover, patients now often undergo increasingly complex and extensive interventional procedures as they simultaneously present with more advanced disease. Thus, it is not surprising that the authors of the current Pro/Con debate article in this issue of the *Anesthesia & Analgesia* present 2 opposing perspectives regarding current anesthetic recommendations for GI endoscopy procedures.<sup>2</sup> While these authors practice in similarly impressive, high-performing high-volume procedural centers, they posit different anesthesia care recommendations for selected patients undergoing GI endoscopy procedures. Clinicians will surely ponder their own choice of the “best anesthetic” in these situations for these challenging patients.

Why the ambiguity? The practice of medicine often varies when medical science lacks validated outcome data, and a standard of care remains undefined. This variability is usually the consequence of patient comorbidities, inconsistencies of practitioner skills and experience, evolving procedural needs, inconsistent resources, and even variation of the physical facilities (operating room, procedural area, GI suite, inpatient versus outpatient setting, etc). Moreover, to conduct an optimal, safe, and efficient anesthetic, anesthesia professionals must also understand the unique challenges and requirements of the GI proceduralist. Indeed, historically, endoscopists often utilized moderate sedation (the so-called endoscopist-directed sedation [EDS] model) for virtually all cases, including patients with significant comorbidities and even those undergoing complex interventions such as ERCP. This EDS model was chosen, in part due to limited access to advanced anesthesia services and providers and the key requirement for rapid turnover between cases. Thus, this bedside “conscious sedation” approach remained the norm

throughout much of the 1990s. But, the landscape has changed significantly in the last 2 decades, with the widespread utilization of intravenous propofol and the increased availability of anesthesia professionals to facilitate efficient, safe, deep sedation, or even general anesthesia as needed, on a routine basis. Endoscopists recognize the utility and benefits of deep sedation provided by anesthesia professionals, as this approach decreases failed interventions, improves the patient experience and satisfaction, and optimizes postprocedure recovery from sedation—all while ensuring patient safety.<sup>3</sup> Thus, the EDS model has markedly diminished, and there are fewer advocates for this approach within the gastroenterology community in the current era. Moreover, as procedures of even greater complexity and duration are performed, such as advanced ERCP and third-space endoscopy, general anesthesia is often required to ensure a secure airway and a stable, motionless surgical field for ease and safety of distal cannulation.<sup>4</sup>

Determining the level of sedation appropriate for a particular endoscopic intervention involves a complex assessment of patient and procedure characteristics against the backdrop of available resources and operational requirements. On the one hand, a growing number of GI endoscopists now offer minimal or even no sedation options for basic colonoscopy in healthy, fit, and motivated patients. Expert techniques, such as water exchange, minimize discomfort, and this approach can even avoid typical postsedation restrictions.<sup>5</sup> The current nature of endoscopy centers, with the first patient-physician encounter occurring mere minutes before a scheduled procedure, further intensifies the selection of appropriate sedation goals. An advanced scheduling team typically includes knowledgeable health care providers to aid in these initial triage decisions; however, other units have moved toward deep sedation as the standard—a one-size-fits-all patients approach. General anesthesia is then reserved for a handful of patients falling outside the criteria deemed optimal for a busy ambulatory care center.

For patients receiving deep sedation via monitored anesthesia care (MAC) or general anesthesia, good practice involves early preprocedure communication between the endoscopist and anesthesia professional regarding the appropriateness of the selected

anesthetic as well as the position of the patient. Position is 1 key variable, as patients positioned in either the prone position as with ERCP or the lateral position as with most upper and lower endoscopy procedures have the added safety of airway anatomy and gravity promoting flow of regurgitated contents out of the mouth rather than into the trachea. Thus, patients requiring supine positioning may require conversion to general anesthesia and endotracheal intubation to avoid passive aspiration of foregut contents. Other patients deemed to be at high risk of aspiration or loss of the airway should prompt either a step up to general anesthesia or consideration of a step down to a less intense level of sedation. In addition, patients with prior esophageal surgery (eg, Ivor-Lewis esophagectomy) will require special precautions, a secure airway, and general anesthesia for virtually all GI interventions. While general anesthesia allows for the broadest range of interventional options, this should not be the default position, as it accrues greater expense, time, resources, and likelihood of greater hemodynamic instability and potential oral trauma compared to deep sedation.

Today, at least in the western hemisphere, high-functioning endoscopy units use deep sedation (MAC) for the vast majority of patients, with general anesthesia reserved for select patients that require scheduling within a hospital setting. The added expense and the use of resources required for general anesthesia are justified by the improved safety, experience, efficiency, and outcomes. Thus, we believe that deep sedation (MAC) or general anesthesia will soon become a virtual standard of care for patients having complex upper endoscopy procedures with procedural interventions. We hope readers enjoy this debate article within the *Journal* as it further explores 2 very different perspectives on the optimal anesthetic for upper GI endoscopy and ERCP procedures. In addition to all the factors cited above, the potential for adverse patient events, with the potential of medicolegal liability, undoubtedly contributes to this decision-making process.<sup>6</sup> Indeed, litigation has increased commensurate with the increased intensity of GI interventions and the demands of efficient throughput of an often elderly, frail patient population. Injuries range from minor dental injuries and aspiration pneumonia to cardiac arrhythmias and adverse respi-

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## Communication Between GI Proceduralist and Anesthesia Professional is Paramount Prior to Procedure

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ratory events resulting in brain damage or even death.<sup>6,7</sup> Tort claims usually involve allegations of inappropriate patient selection, inadequate patient assessment or preparation, and over-sedation in those without a secured airway.<sup>6,7</sup> Indeed, most experienced clinicians are aware of at least 1 endoscopy case performed under moderate/deep sedation or general anesthetic that "went badly" and resulted in significant patient injury or death. We suspect that the erudite discussion from our expert authors will assist clinicians in optimizing their future anesthetic choices during endoscopy procedures. As with so many other clinical situations, there is rarely, if ever, an absolute approach that can be recommended, mandated, or applied to all patients in all settings.

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