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Prospective Study of Propofol Sedation Practice for Outpatient Colonoscopy: Is It Sedation or General Anesthesia?

Tuan A. Trinh, M.D., Amy K. Mehta, M.D., Kristi M. Neitzel, M.D., Evan Fitchett, B.S., David A. Wyler, M.D., Michael E. Mahla, M.D., Marc C. Torjman, Ph.D., Victor M. Romo, M.D.

Thomas Jefferson University, Philadelphia, Pennsylvania, United States

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**Introduction:** Because of a favorable pharmacokinetic profile with rapid onset of action and short half-life (1), administration of propofol for moderate sedation is common practice during gastrointestinal (GI) endoscopic procedures including colonoscopy. However, the agent has a narrow therapeutic index. The level of sedation achieved can be variable given patient clinical factors, anesthesia provider practice, and GI practitioner skills. Moderate sedation as defined by the ASA is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. Although anesthesia providers plan for administering moderate sedation for these procedures, the level of sedation is not commonly quantified. This study investigated the degree of sedation with propofol in patients undergoing outpatient colonoscopy with processed EEG.

**Methods:** After IRB approval, 33 patients were enrolled in this prospective observational study. These patients underwent outpatient colonoscopy in the hospital's GI suites. Multiple practitioners in endoscopy and anesthesia provided care, assuring a broad sampling of sedation practices. Procedure sedation was provided with propofol administered to clinical effect by a certified registered nurse anesthetist under the supervision of an anesthesiologist. The degree of sedation was determined in real-time using the Patient State Index (PSi™), a value produced by the Masimo SedLine® (Masimo Corp. Irvine, CA) Brain Function Monitor (MSBFM). All personnel were blinded to the EEG quantified level of sedation except for a third party whose sole function was to monitor the MSBFM. Baseline PSi was collected prior to anesthesia induction and monitored through emergence. Data from the MSBFM was downloaded into Excel and analyzed using Systat ver 13. Data are presented as means ± 95% CI and medians with a p<0.05 set for statistical significance.

**Results:** Mean age and median ASA physical status of the study group were 51.6 years and 2.0, respectively. Of the 33 enrolled patients, all 33 (100%) reached PSi levels <50 which corresponds to a hypnotic level seen during general anesthesia. Ten of the 33 (30.3%) reached deep PSi levels (<25) corresponding to a hypnotic level seen during deep general anesthesia, with the EEG showing burst suppression. Overall, the percent of time patients had PSi = 25-50 was significantly higher (61.4%, CI: 54.2%-68.7%) than the percent of time PSi was >50 (35%, CI: 27.7%-42.2%) p<0.001.

Conclusion: Using processed EEG parameters, we examined the depth of sedation during colonoscopy in patients who were administered propofol with the clinical goal of moderate sedation. Even under the supervision of experienced anesthesiologists, every patient achieved levels of sedation seen during general anesthesia for significant portions of their procedure as measured by Psi. These data may provide a partial explanation for the anesthesia related complication rate during GI procedures reported by Cooper, et al 2013 (3) and Metzner et al 2009 (4).

#### References

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