

Non-anaesthesiologists administering propofol in the Singapore context

Dear Editor,

Propofol is a potent intravenous sedative-hypnotic agent. Its popularity for sedation has increased in the last 3 decades because of its smooth, rapid onset of action and fast post-procedural recovery.¹ Nonetheless, propofol depresses cardiorespiratory function and could result in life-threatening adverse effects.

A workgroup, mainly consisting of gastroenterologists and general surgeons, developed guidelines on the use of sedation during gastrointestinal endoscopy, published in the *Annals*.² A total of 16 statements were promulgated based on assessment of the quality of evidence and strength of recommendation.²

The Council of the College of Anaesthesiologists, Singapore and key opinion leaders are aware of multiple published professional guidelines and position statements on the issue of non-anaesthesiologist-administered propofol (NAAP). These vary considerably, garnering diverging opinions,³ with European anaesthesiologists putting forth their strong opinion on the matter.⁴ We agree with the astutely written editorial accompanying the guideline in the journal,⁵ and wish to highlight several considerations for NAAP in Singapore.

Pharmacokinetics, pharmacodynamics and side effects of propofol. The main pharmacodynamic adverse effects of propofol relate to derangement of cardiorespiratory physiology, comprising respiratory depression, upper airway obstruction, loss of protective airway reflexes, apnoea, hypotension and bradycardia. The practitioner administering propofol must be aware of synergistic pharmacodynamic interactions with concurrent benzodiazepine and opioid use. Propofol has a narrow therapeutic margin with propensity for rapid changes in anaesthesia depth, vis-à-vis an unintentional state of deep sedation or even general anaesthesia from moderate sedation, leading to cardiorespiratory compromise (Table 1). Unlike benzodiazepines and opioids, propofol lacks an

antagonist. Any cardiopulmonary depression from propofol will have to be actively managed until its effects have worn off. Therefore, the administration of propofol should be individualised and titrated by dedicated trained personnel not involved in carrying out the endoscopy procedure.

Personnel capable of administering propofol sedation. In view of the above characteristics of propofol, manufacturers suggest that its use be restricted. The product inserts state “DIPRIVAN Injectable Emulsion should be administered only by persons trained in the administration of general anaesthesia and not involved in the conduct of the surgical/diagnostic procedure”.¹

A systematic review by Dossa et al. of guidelines and position statements by professional associations noted that more than a dozen documents provided recommendations specific to propofol administration; however, the various guidelines differed substantially.³ Notably, the Gastroenterological Society of Australia and the British Society of Gastroenterology suggested that propofol administration be limited to anaesthesiologists or a second trained medical practitioner who is not the endoscopist.^{3,6} The systematic review did consistently find that when propofol sedation for gastrointestinal endoscopy is used, patient monitoring should be the sole responsibility of a trained individual.³

An anaesthesiologist’s presence during propofol sedation is recommended for patients with higher American Society of Anesthesiologists physical status, higher Mallampati class, suspected difficult airways, longer complex procedures, chronic narcotic use, and where there are concomitant higher risk medical conditions (e.g. obstructive sleep apnoea).³

American Society of Anesthesiologists (ASA), European Society of Anaesthesiology (ESA) and Royal College of Anaesthetists (London) position. It may be prudent to take reference from the major

Table 1. Sedation depth continuum

	Moderate sedation	Deep sedation	General anaesthesia
Purposeful response	To verbal or tactile stimulation	To painful stimulation	Unarousable
Airway	Maintained	Intervention may be needed	Intervention likely needed
Spontaneous breathing	Adequate	May be inadequate	Likely inadequate
Blood pressure	Likely maintained	Likely maintained	Likely affected

Anaesthesiology Societies in America, Europe, and the UK. ASA believes that “...non-anesthesia personnel who administer propofol should be qualified to rescue patients whose level of sedation becomes deeper than initially intended and who enter, if briefly, a state of general anesthesia.”⁷ ESA recommends that non-anaesthesiologists should not be allowed to administer propofol for procedural sedation.⁴ A joint position statement by the Royal College of Anaesthetists and British Society of Gastroenterology describes the role of anaesthesiologist-led deep sedation practices with a focus on propofol in endoscopy.⁸

Recommendations on training of non-anaesthesiologists administering propofol. The American Society for Gastrointestinal Endoscopy (ASGE) position statement stated that specialised training is required of individuals planning to administer propofol.⁹ We concur with Byrick and Pitt,¹⁰ adding that “the critical issue ... is not the administration of propofol by an anesthesiologist versus an endoscopist, but rather the capability of the physician administering propofol to manage its complications, the monitoring of the patient to detect complications and the resources to manage those complications”.⁷ ASA further states that the practitioner should have the training to identify and manage complications in a patient who inadvertently enters into a state of deep sedation or general anaesthesia.

Recommendations for NAAP in Singapore. Sedation practices and practitioners for gastrointestinal endoscopy vary considerably around the world; this reflects jurisdictional differences and contextual issues. We thank the workgroup for indicating that although there is moderate level of scientific evidence relating to the safe use of propofol by non-anaesthesiologists, the recommendation is nonetheless “weak” when considering contextual differences (availability of protocols, resources, specific training and accreditation) in Singapore compared to the specialised medical centres where these studies were conducted. Publication bias, indirectness and imprecision of the studies limit its applicability.

We recommend that non-anaesthesiologists using propofol for sedation should have additional training. A joint effort between the Residency Advisory Committees and the respective stakeholder Colleges and Chapters would be necessary to configure the appropriate training and accreditation standards for the safe use of propofol by non-anaesthesiologists.

Conclusion. Propofol administration has the propensity for unintentional deep sedation and general anaesthesia. The sedationist administering propofol should have the sole responsibility of administering the sedation and

monitoring the patient. They should be appropriately trained in resuscitation, and in managing the airway and cardiorespiratory complications. Globally, propofol-based sedation practices for gastrointestinal endoscopy vary significantly borne out of differences in training and staffing levels. Patient safety must always take precedence.

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