

RI ACEP  
Clinical Policies Committee

Position Paper on the Use of Propofol in the ED  
12/15/2014

The modern day practice of emergency medicine requires a practitioner to be skilled in procedural sedation in a variety of ED presentations; fracture reduction, laceration repair, joint dislocation/reduction require procedural sedation to be performed successfully and to minimize patient discomfort while prioritizing safety and efficacy. Sedation is necessary to alleviate pain, anxiety and suffering for patients during these medical procedures.

The board certified emergency medicine physician has significant training both in the management of pediatric and adult airways. The ED physician has expertise in critical care skills, including advanced airway management, cardiovascular and ventilator resuscitation techniques and analgesia, as these are all core competencies in emergency medicine residency training. The ED physician is comfortable and competent to provide accessory respiratory support as well advanced interventions to stabilize airway emergencies.

Emergency Department physicians also possess significant knowledge/comfort with the pharmacodynamics of key agents used in procedural sedation; ketamine, propofol, midazolam and other commonly used procedural agents.

The American College of Emergency Physicians 2014 document “Clinical Policy: Procedural Sedation and Analgesia in the Emergency Department” answers the question of: In patients undergoing procedural sedation and analgesia in the emergency department, can propofol be safely administered?

- Level A: propofol can be safely administered to children and adults for procedural sedation and analgesia in the ED.
- Level B: A combination of propofol and ketamine can be safely administered to children and adults for procedural sedation and analgesia.

There has been a growing body of evidence that ketamine, midazolam, fentanyl, propofol, and etomidate that significantly adds to the depth of understanding of these agents' use in the ED. 1, 2,3,4,5,6,7,8,9,10,11, 12, 13, 14, 15, 16-43. The use of short acting sedative agents such as propofol, a short acting hypnotic, for the ED procedural sedation and analgesia has gained widespread acceptance. Brief-acting sedative agents confer shorter periods of impaired levels of consciousness and subsequently less risk for adverse respiratory events. 17,26-33,30 An additional benefit to shorter periods of patient impaired consciousness is a reduction of patient monitoring time that allows reduced allocations of intense patient monitoring periods by medical and nursing staff. Propofol is an agent that has attracted a great deal of attention by investigators and publications for the past decade. The risks cited with propofol use are mainly that of hypotension and respiratory depression. The mechanism of action for propofol has not been well defined however the hemodynamic effects are generally more pronounced than those of other intravenous anesthetic agents. Arterial hypotension, with readings decreased by as much as 30% or more, has been reported, possibly due to inhibition of sympathetic vasoconstrictor nerve activity. Hypotensive effects are generally proportional to dose and rate of administration of propofol, and may be potentiated by opioid analgesics. Propofol is a respiratory depressant, frequently producing apnea that may persist for longer than 60 seconds, depending on factors such as premedication, rate of administration, dose administered, and presence of hyperventilation or hyperoxia.

Despite these known pharmacologic risks multiple studies have demonstrated findings that support and strengthen the use of propofol for both adult and pediatric patients. 6, 8, 9, 12, 13, 14, 17-24, 38, 43. These investigations include a Class I study, 15, 2 Class II studies, 21, 38 and multiple Class III investigations 12, 19, 20. The patient population across studies reporting use of propofol as a procedural sedation and analgesia agent in the ED setting is currently well in excess of 26, 0000. 13, 17, 18

Safe and effective sedation and analgesia in the ED is a critical skill that is core to the practice of emergency medicine. The use of propofol for procedural sedation in the ED is the standard of care and should be available for use in all Emergency Departments across Rhode Island. Successful performance requires recognition of not only pitfalls associated with the medication, but also consideration for the complexity of patients' underlying physiology and illness or injury, which is a skill ED providers possess. Emergency physicians are qualified to manage sedation requirements across all ages, involving a broad range of complicated patients presentations. It is clear that in typical ED populations, sedation with propofol is both safe and effective and provides increased patient comfort and ease of procedural performance.

#### References:

- (1) Godwin, SA, Caro DA, Wolf SJ et al. American College of Emergency Physicians. ACEP clinical policy: procedural sedation and analgesia in the emergency department. *Ann Emerg Med.* 2005; 45:177-196.
- (2) Green SM, Roback MG, Kennedy RM, et al. Clinical practice guideline for emergency department ketamine dissociative sedation: 2011 update. *Ann Emerg Med.* 2011;57:449-461.
- (3) Willman Ev, Andolfatto G. A prospective evaluation of “ketofol” (Ketamine/propofol combination) for procedural sedation and analgesia in the emergency department. *Ann Emerg Med.* 2007;49:23-30.
- (4) Andolfatto G, Willman E. A prospective case series of pediatric procedural sedation and analgesia in the emergency department using single-syringe
- (5) Andolfatto G, Willman E. A prospective case series of single-syringe ketamine-propofol-ketafol for emergency department procedural sedation and analgesia in adults. *Acad Emerg Med.* 2011;18:237-245.
- (6) David H, Shipp J. A randomized controlled trial of ketamine/propofol versus propofol alone for emergency department procedural sedation. *Ann Emerg Med.* 2011;57:435-441.
- (7) Shah A, Mosdosy G, McLeod S. et al. A blinded, randomized controlled trial to evaluate ketamine/propofol versus ketamine alone for procedural sedation in children. *Ann Emerg Med.* 2011;57:425-433.
- (8) Messenger DW, Murray HE, Dungey PE, et al. Subdissociative-dose ketamine versus fentanyl for analgesia during propofol procedural sedation: a randomized clinical trial. *Acad Emerg Med.* 2008;15:877-886.
- (9) Erden IA, Panmuk Ag, Akinici SB, et al. Comparison of propofol-fentanyl with propofol-fentanyl-ketamine combination in pediatric patients undergoing interventional radiology procedures. *Paediatr Anaesth.* 2009;19:500-506.
- (10) Donnelly RF, Willman E, Andolfatto G. Stability of ketamine-propofol mixtures for procedural sedation and analgesia in the emergency department. *Can J Hosp Pharm.* 2008;61:426-430.
- (11) Shariieff GQ, Trocinski DR, Kanegaye Jt, et al. Ketamine-propofol combination sedation for fracture reduction in the pediatric emergency department. *Pediatr Emerg Care.* 2007;23:881-884.
- (12) Bell A, Teston G, McNabb C, et al. Profiling adverse respiratory events and vomiting when using propofol for emergency department procedural sedation. *Emerg Med Australas.* 2007;19:405-410.

- (13) Mallor MD, Baxter AL, Yanosky DJ, et al. Emergency physician-administered propofol sedation: a report of 25,433 sedation from the Pediatric Sedation Research Consortium. *Ann Emerg Med.* 2011;57:462-468.
- (14) Deitch K, Chudnofsky CR, Dominici P, et al. The utility of supplemental oxygen during emergency department procedural sedation and analgesia with midazolam and fentanyl: a randomized, controlled trial. *Ann Emerg Med.* 2007;49:1-8.
- (15) Sacchetti A, Senula G, Strickland J, et al. Procedural sedation in the community emergency department: initial results of the ProSCED registry. *Acad Emerg Med.* 2007;14:41-46.
- (16) Miner JR, Martel ML, Meyer M, et al. Procedural sedation of critically ill patients in the emergency department. *Acad Emerg Med.* 2005;12:124-128.
- (17) Miner JR, Burton JH. Clinical practice advisory: emergency department procedural sedation with propofol. *Ann Emerg Med.* 2007;50:182-187.
- (18) Burton JH, Miner JR, Shipley Er, et al. Propofol for emergency department procedural sedation and analgesia: a tale of three centers. *Acad Emerg Med.* 2006;13:24-30.
- (19) Kuypers MI, Menci F, Verhagen MF, et al. Safety and efficacy of procedural sedation with propofol in a country with a young emergency medicine training program. *Eur J Emerg Med.* 2011;18:162-167.
- (20) Senula G, Sacchetti A, Moore S, et al. Impact of additional of propofol to Ed formulary. *Am J Emerg Med.* 2010;28:880-883.
- (21) Miner JR, Gray RO, Stephens D, et al. Randomized clinical trial of propofol with and without alfentanil for deep procedural sedation in the emergency department. *Acad Emerg Med.* 2009;16:825-834.
- (22) Weaver CS, Hauter WE, Brizendine EJ, et al. Emergency department procedural sedation with propofol: is it safe? *J Emerg Med.* 2007;33:355-361.
- (23) Miner JR, Gray RO, Bahr J, et al. Randomized clinical trial of propofol versus ketamine for procedural sedation in the emergency department. *Acad Emerg Med.* 2010;17:604-611.
- (24) Phillips W, Anderson A, Rosengreen M, et al. Propofol versus propofol/ketamine for brief painful procedures in the emergency department: clinical and bispectral index scale comparison. *J Pain Palliat Care Pharmacother.* 2010;24:349-355.
- (25) McQueen A, Wright RO, Kido MM, et al. Procedural sedation and analgesia outcomes in children after discharge from the emergency department: ketamine versus fentanyl/midazolam. *Ann Emerg Med.* 2009;54:191-197.
- (26) Melendez E, Bachur R. Serious adverse events during procedural sedation with ketamine. *Pediatr Emerg Care.* 2009;54:191-197.
- (27) Green Sm, Roback MG, Krauss B, et al. Predictors of airway and respiratory adverse events with ketamine sedation in the emergency department: an individual-patient data meta-analysis of 8,282 children. *Ann Emerg Med.* 2009;54:158-168.
- (28) Green Sm, Roback MG, Krauss B, et al. Predictors of emesis and recovery agitation with emergency department ketamine sedation: an individual-patient data meta-analysis of 8,282 children. *Ann Emerg Med.* 2009;54:171-180.
- (29) Dilli D, Dallar Y, Sorgui NH. Intravenous ketamine plus midazolam vs. Intravenous ketamine for sedation in lumbar puncture: a randomized controlled trial. *Indian Pediatr.* 2008;45:899-904.
- (30) Vardy JM, Dignon J, Mukherjee N, et al. Audit of the safety and effectiveness of ketamine for procedural sedation in the emergency department. *Emerg Med J.* 2008;25:579-582.
- (31) Bleiberg AH, Slavaggio CA, Roy LC, et al. Low-dose ketamine: efficacy in pediatric sedation. *Pediatr Emerg Care.* 2007;23:158-162.
- (32) Green SM, Sherwin TS. Incidence and severity of recovery agitation after ketamine sedation young adults. *Am J Emerg Med.* 2005;25:498-501.
- (33) Newton A, Fitton L. Intravenous ketamine for adult procedural sedation in the emergency department: a prospective cohort study. *Emerg Med J.* 2008;25:498-501.
- (34) Strayer RJ, Nielson LS. Adverse events associated with ketamine for procedural sedation in adults. *Am J Emerg Med.* 2008;26:985-1028.

- (35) Langston WT, Wathen JE, Roback MG, et al. Effect of ondansetron on the incidence of vomiting associated with ketamine sedation in children: a double-blind, randomized, placebo-controlled trial. *Ann Emerg Med.* 2008;52:30-34.
- (36) Brown, L. Chistian-Kopp S, Sherwin TS, et al. Adjunctive atropine in unnecessary during ketamine sedation in children. *Acad Emerg Med.* 2008;15:314-318.
- (37) Heinz P, Geelhoed GC, Wee C, et al. Is atropine needed with ketamine sedation? A prospective, randomized, double blind study. *Emerg Med J.* 2006;23:206-209.
- (38) Miner JR, Danahy M, Moch A, et al. Randomized clinical trial of etomidate versus propofol for procedural sedation in the emergency department. *Ann Emerg med.* 2007;49:15-22.
- (39) Lee-Jayaram JJ, Green A, Siembieda J, et al. Ketamine/midazolam/versus etomidate/fentanyl: procedural sedation for pediatric orthopedic reductions. *Pediatr Emerg Care.* 2010;26:408-412.
- (40) Di Liddo L, D'Angelo A, Nguyen B, et al. Etomidate versus midazolam for procedural sedation in pediatric outpatients: a randomized controlled trial. *Ann Emerg Med.* 2006;48:433-440.
- (41) Cicero M, Graneto J. Etomidate for procedural sedation in the elderly: a retrospective comparison between ages groups. *Am J Emerg Med.* 2011;29:111-116.
- (42) Miner JR, Gray R, Delavari P, et al. Alfentanil for procedural sedation in the emergency department. *Ann Emerg Med.* 2011;57:117-121.
- (43) Dunn MJ, Mitchell R, De Souza C, et al. Evaluation of propofol and remifentanil for intravenous sedation for reducing shoulder dislocations in the emergency department. *Emerg Med J.* 2006;23:57-58.