

## **UC Irvine**

### **Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health**

#### **Title**

Ketamine as Monotherapy in Difficult Airways Is Not Ready for Prime Time

#### **Permalink**

<https://escholarship.org/uc/item/8vb0v6jg>

#### **Journal**

Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health, 20(6)

#### **ISSN**

1936-900X

#### **Authors**

Driver, Brian E  
Reardon, Robert F.  
Mosier, Jarrod

#### **Publication Date**

2019

#### **DOI**

10.5811/westjem.2019.8.43881

#### **Copyright Information**

Copyright 2019 by the author(s). This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

# Ketamine as Monotherapy in Difficult Airways Is Not Ready for Prime Time

Brian E. Driver, MD\*  
Robert F. Reardon, MD\*  
Jarrod Mosier, MD†

\*Hennepin County Medical Center, Department of Emergency Medicine, Minneapolis, Minnesota

†University of Arizona, Department of Emergency Medicine, Section of Pulmonary, Critical Care, Allergy, and Sleep, Department of Medicine, Tucson, Arizona

Section Editor: Christopher Tainter, MD

Submission history: Submitted May 28, 2019; Accepted August 6, 2019

Electronically published October 17, 2019

Full text available through open access at [http://escholarship.org/uc/uciem\\_westjem](http://escholarship.org/uc/uciem_westjem)

DOI: 10.5811/westjem.2019.8.43881

[West J Emerg Med. 2019;20(6)970-971.]

## To the Editor:

We appreciate the discussion outlined by Merelman et al. regarding the important role ketamine has in emergency airway management,<sup>1</sup> and agree with the sentiment that ketamine may be preferable to other agents in many different clinical scenarios. Based on our experience teaching and discussing emergency airway management with national experts, however, we believe a few points are more nuanced and warrant further discussion.

For patients with predicted intubation difficulty, the authors advocate sedation with ketamine and the use of a standard laryngoscope. While this technique may be appropriate in certain clinical scenarios, there is a dearth of evidence demonstrating its success or safety and we recommend further study before it is widely implemented. Intubation with ketamine alone, in the references cited, was successful in 21/31 (68%) cases.<sup>2,3</sup> Fiberoptic intubation success with ketamine monotherapy has also had low success rates.<sup>4</sup> Ketamine may dissociate the cortex from brainstem functions, but because brainstem reflexes remain intact, vomiting can still occur when the upper airway structures are stimulated. Emesis occurs in approximately 5-15% of ketamine administrations in adults,<sup>5</sup> which often leads to aspiration—the largest contributor to morbidity in airway management globally. Ideally, patients thought to be too difficult for neuromuscular blockade are managed with meticulous topical anesthesia and as little parenteral sedation or anxiolysis as feasible; sedation without dissociation or obtundation allows the patient to follow commands, which is advantageous during endoscopic intubation.

Although standard laryngoscopy is the most common emergency intubation technique, we strongly believe that flexible endoscopic intubation is an important skill within the procedural capability of emergency physicians. This has long been the gold standard method for patients deemed too risky for neuromuscular blockade. While video laryngoscopes have largely replaced

direct laryngoscopy, the utilization of flexible endoscopy has remained fairly constant.<sup>6</sup> Historically, the expense of flexible fiberoptic scopes and endoscopes hindered widespread access to these important devices; for this reason, many physicians have not received adequate training or ongoing practice, especially in departments that infrequently perform intubation. The advent of disposable endoscopes, now produced by multiple companies, should improve accessibility and affordability. Like any procedure, continual practice with a flexible endoscope is essential. This can be accomplished in many ways that should be feasible by all physicians. In our department we have practiced nasal intubation on each other, which has honed our topical anesthesia skills. Endoscopic evaluation of ED patients with severe sore throats, foreign body sensation, new hoarseness, and other conditions provides practice with endoscope controls; manikin-based practice is another option.

Ketamine, while uncommonly causing overt respiratory depression or apnea, frequently causes subclinical respiratory depression.<sup>7,8</sup> This is inconsequential in patients with normal respiratory effort (eg, procedural sedation of healthy patients), but it is important to consider when caring for critically ill patients. In our experience, when ketamine is administered to patients with high minute ventilation (eg, severe agitation and excited delirium, diabetic ketoacidosis, acute respiratory distress syndrome), they continue to breathe but with a significantly lower minute ventilation that sometimes does not meet their metabolic needs. We believe that patients with high respiratory effort who are deemed too risky for neuromuscular blockade should be managed either with a completely awake approach (ie, no slowing of respiration), or with rapid sequence intubation, which maximizes the chance of first-pass success and allows placement of a first-line backup device (eg, intubating laryngeal mask airway) should the first attempt fail. It may be preferable to cause apnea with neuromuscular blockade rather than risk a longer ketamine-

facilitated intubation attempt with relative hypoventilation. The worst possible circumstance when managing these patients is to have a patient who is not breathing adequately and also not relaxed enough to facilitate tube passage or allow placement of a modern extraglottic device.

Ketamine is an old drug that remains valuable in all phases of airway management. Before widespread use as a monotherapy for patients with difficult airways, however, it seems prudent to gather additional data to determine its success and safety profile relative to other approaches.

---

*Address for Correspondence:* Brian E. Driver, MD, Hennepin County Medical Center, Department of Emergency Medicine, 701 Park Ave, Mail Stop R2, Minneapolis, MN 55415. Email: briandriver@gmail.com.

*Conflicts of Interest:* By the *WestJEM* article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. No author has professional or financial relationships with any companies that are relevant to this study. There are no conflicts of interest or sources of funding to declare.

*Copyright:* © 2019 Driver et al. This is an open access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY 4.0) License. See: <http://creativecommons.org/licenses/by/4.0/>

---

## REFERENCES

1. Merelman AH, Perlmutter MC, and Strayer RJ. Alternatives to rapid sequence intubation: contemporary airway management with ketamine. *West J Emerg Med.* 2019;20(3):466-71.
2. Gofrit ON, Leibovici D, Shemer J, et al. Ketamine in the field: the use of ketamine for induction of anaesthesia before intubation in injured patients in the field. *Injury.* 1997;28(1):41-3.
3. Svenson JE and Abernathy MK. Ketamine for prehospital use: new look at an old drug. *Am J Emerg Med.* 2007;25(8):977-80.
4. Belda I, Cubas MG, Rivas E, et al. Remifentanyl target controlled infusion (TCI) vs ketamine or ketamine in combination with remifentanyl TCI for conscious sedation in awake fiberoptic intubation: a randomized controlled trial: 19AP1-5. *Eur J Anaesthesiol.* 2011;28:226.
5. Green SM, Roback MG, Kennedy RM, et al. Clinical practice guideline for emergency department ketamine dissociative sedation: 2011 update. *Ann Emerg Med.* 2011;57(5):449-61.
6. Hayden EM, Pallin DJ, Wilcox SR, et al. Emergency department adult fiberoptic intubations: incidence, indications, and implications for training. *Acad Emerg Med.* 2018;25(11):1263-7.
7. Miner JR, Moore JC, Austad EJ, et al. Randomized, double-blinded, clinical trial of propofol, 1:1 propofol/ketamine, and 4:1 propofol/ketamine for deep procedural sedation in the emergency department. *Ann Emerg Med.* 2015;65(5):479-88.e2.
8. 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(6):604-11.