

# Sedation and Analgesia in Transportation of Acutely and Critically Ill Patients



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## KEYWORDS

- Sedation • Analgesia • Transport • Intensive care • Guidelines • Critical care
- Agitation • Pain

## KEY POINTS

- Maintaining adequate sedation and analgesia in critically ill patients throughout transport poses unique challenges and potential threats to patient and provider safety, requiring coordination, planning, and forethought.
- Selection and dosing of sedation and analgesia should be based on situation and patient conditions and ideally titrated to effective response without adversely affecting vital signs (VSs).
- Use of sedation and analgesia scoring is recommended as an objective tool to achieve more consistent levels of therapeutic sedation and analgesia.
- Development and implementation of regional clinical practice guidelines would be helpful to maintain consistent sedation/analgesia and patient safety throughout transport.

## INTRODUCTION

Sedation and analgesia for critically ill patients should not be unnecessarily interrupted during transport; however, many variables, such as patient instability and inadequate provider training, may increase the risk for this occurrence.<sup>1</sup> Evidence-based research toward best practices is scarce in this subject area, leaving health care providers to extrapolate primarily from recommendations intended for the ICU. Some of the more helpful recent developments are proposed clinical practice guidelines and

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This article is an update of an article previously published in *Critical Care Nursing Clinics of North America*, Volume 17, Issue 3, September 2005.

The authors have nothing to disclose and no conflicts of interest.

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Crit Care Nurs Clin N Am 28 (2016) 137–154

<http://dx.doi.org/10.1016/j.cnc.2016.02.004>

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checklists for planning and documentation of patient condition while off the unit for procedures.<sup>2,3</sup> Although this is a step in the right direction, best practice recommendations are still needed to guide both in-hospital and out-of-hospital transports of critically ill patients currently managed with medication as needed, restraint orders, and limited manpower and resources.

Appropriately medicated ICU patients benefit via reduced myocardial oxygen demand, decreased work of breathing, and reduced metabolic and hormonal responses to acute and critical illness.<sup>4</sup> Pursuit of optimal sedation and analgesia in transport is necessary to assure there are no gaps in the integrated, interdisciplinary approach currently recommended to provide physical and psychological comfort to critically ill patients to improve outcomes.<sup>5,6</sup>

#### Case review

A 68-year-old male patient in cardiac arrest was resuscitated at a small community hospital and transfer was arranged to a facility with interventional cardiac catheterization laboratory and critical care services. According to staff, the patient was combative after resuscitation and given 2 mg of lorazepam (Ativan) and 50- $\mu$ g and 100- $\mu$ g doses of fentanyl (Sublimaze) with little change neurologically. Intubation became necessary for airway protection. On the flight team's arrival, the second intubation attempt was in progress. Neuromuscular blockers (NMBs) given prior to intubation included 2 doses of succinylcholine (Anectine) and a single dose of vecuronium (Norcuron). Sedation had not been given recently and the patient's VSs were now blood pressure (BP) 190/120 mm Hg, heart rate (HR) 105 beats per minute, and oxygen saturations 86% with assisted ventilations. Additional sedation was provided by the transport team, including the recommended intubating dose of ketamine (Ketalar) at 1.5 mg/kg. The team successfully intubated the patient; however, he developed postsedation hypotension, requiring additional fluids and a vasopressor to keep BP above 90 mm Hg during transport.

This vignette highlights several important points in the management of sedation and analgesia (pain control) in transport:

- First, adequate sedation and analgesia must be in effect during uncomfortable procedures, such as intubation. These needs are not met by NMBs (paralytics) like succinylcholine (Anectine) and vecuronium (Norcuron).
- Second, nursing staff should be aware of onset and duration of the sedatives and analgesics administered and assess for signs of returning awareness and pain (ie, hypertension and tachycardia). In this case, the patient's BP indicated awareness, anxiety, and/or pain that he could not express because of the paralytic agents in his system.
- Individual response to sedation/analgesia may vary depending on many factors, including cardiac output, chronic tolerance, liver and kidney dysfunction, and drug-drug interactions. The addition of a single dose of ketamine provided both sedation and pain control, a double benefit unique to ketamine. This patient developed hypotension, an unusual occurrence in the use of ketamine for normotensive or hypertensive patients. Ketamine dosing was subsequently found to require scaled decreases in states of lower perfusion, such as cardiogenic shock and hypovolemic shock, and protocols were appropriately changed.<sup>7,8</sup> This recommendation is similar to other sedation/analgesia agents, most of which require decreased dosing in low perfusion states.<sup>1</sup>

This article describes common challenges in keeping critically ill patients sedated and treated for pain during various phases of transport. Care is taken to emphasize the difference between sedatives, analgesics, and NMBs, the latter frequently

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