



CLINICAL PRACTICE GUIDELINE: Synopsis Capnography during Procedural Sedation/ Analgesia

Clinical Question:

Does use of capnography in patients receiving procedural sedation/analgesia in the emergency department improve outcomes (through earlier detection of adverse events such as hypoventilation and apnea) as compared to monitoring the patient by use of only vital signs, pulse oximetry, and clinical assessment?

Problem:

Medication administration and patient monitoring are routine practices for emergency nurses during procedural sedation and analgesia (PSA) in the emergency department (ED). Adverse events associated with sedation are usually related to airway or respiratory complications. The use of vital signs and pulse oximetry (SpO₂) alone, to detect hypoventilation during sedation/analgesia, may delay immediate recognition and necessary interventions. Additionally, the common use of supplemental oxygen before and during sedation can also contribute to unrecognized hypoventilation or apnea. Patients with an increased oxygen reserve, due to use of supplemental oxygen, take longer to register a decreased SpO₂ reading even after prolonged periods of apnea or upper airway obstruction (Waugh, Epps, & Khodneva, 2011).

Capnography, which displays a continuous exhaled end-tidal carbon dioxide (ETCO₂) value and/or waveform, has been shown to detect hypoventilation before changes in vital signs, SpO₂, or clinicians' observations (Anderson, Junkins, Pribble, & Guether, 2007; Hart, Berns, Houck, & Boenning, 1997; Waugh et al., 2011; Pino, 2007; Yldizdaş, D., Yapcoğlu, H., & Yılmaz, 2004; Lightdale, Goldmann, Feldman, Newburg, & DiNardo, 2006; Krauss & Hess, 2007; Schlag et al., 2013; Friedrich-Rust et al., 2014). Also, unlike SpO₂, measurement of ETCO₂ is less likely to be affected by patient movement or low peripheral perfusion states (Krauss & Hess, 2007). Multiple professional organizations and studies support the use of capnography as the preferred method to detect hypoventilation during procedural sedation (American Academy of Pediatrics [AAP] & American Academy of Pediatric Dentistry [AAPD], 2011; Gilboy & Hawkins, 2006; Green, 2007; Hertzog & Havidich, 2007; Godwin et al., 2014).

Description of Decision Options / Interventions and the Level of Recommendation:

Capnography Use during Procedural Sedation/Analgesia	Capnography is a useful technique for detecting respiratory depression during and after PSA.	B
	ETCO ₂ is a more sensitive indicator of respiratory depression than SpO ₂ or clinician assessment during PSA, as well as in the recovery phase.	B
	More studies are needed to support that using capnography during PSA directly improves patient outcomes.	B

Level A (High)	Based on consistent and good quality of evidence; has relevance and applicability to emergency nursing practice.
Level B (Moderate)	There are some minor inconsistencies in quality evidence; has relevance and applicability to emergency nursing practice.
Level C (Weak)	There is limited or low-quality patient-oriented evidence; has relevance and applicability to emergency nursing practice.
Not Recommended	Based upon current evidence.
I/E:	Insufficient evidence upon which to make a recommendation.
N/E:	No evidence upon which to make a recommendation.

For more information on this topic, please go to: <http://bit.ly/2vC0IbQ>