

CAPNOGRAPHY IMPROVES DETECTION OF RESPIRATORY EVENTS DURING PROCEDURAL SEDATION: A META-ANALYSIS

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Introduction: The use of procedural sedation and analgesia (PSA) has increased in frequency and scope, including emergent settings inside and outside of the hospital. Although end-tidal CO₂ (EtCO₂) monitoring is routinely used during general anesthesia to monitor ventilatory status, this is not the case for PSA. Pulse oximetry and visual inspection, both with inherent limitations; represent the current standards of care for monitoring ventilatory status during PSA. EtCO₂ monitoring may be a preferable method for detecting alveolar hypoventilation and preventing hypoxemia during PSA but is not widely used in this setting. Our study objective was to determine if capnography in addition to standard monitoring improved detection of respiratory events compared to standard monitoring alone.

Materials and Methods: A literature search was conducted using the electronic databases PubMed, CINAHL, and Cochrane Library (Cochrane Reviews, CENTRAL) for studies published between 1995-2009 reporting adverse respiratory events during procedural sedation and analgesia with clearly defined EtCO₂ threshold, clear study design, p-value calculation, similar outcome and predictor variable definitions, and binary independent and dependent variable raw data. To limit threats from variations in practice, only reports of adults in the USA were included. Five such studies were evaluated independently. A meta-analysis of these studies was performed.

Results: During PSA, cases of respiratory depression were 17.6 times more likely to be detected if monitored by capnography, vs. cases not monitored by capnography (95% CI, 2.5-122.1; p<0.004).

Conclusion: This analysis quantitatively supports the presumption of clinicians administering PSA that EtCO₂ monitoring is more effective than traditional monitoring modalities for detecting respiratory depression.