

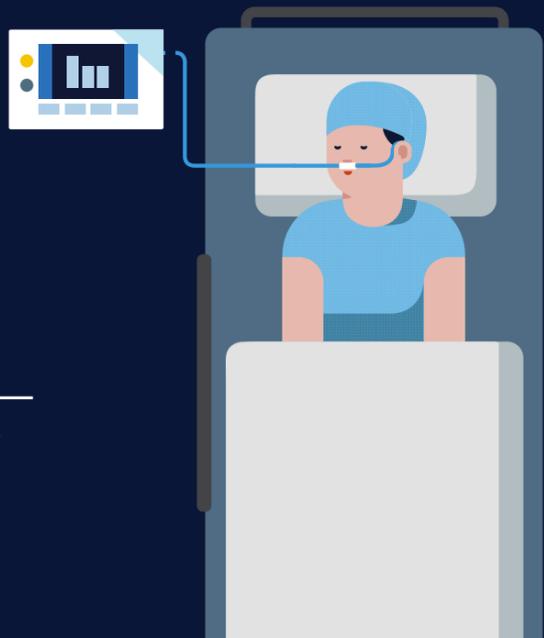
CAPNOGRAPHY MONITORING MAY IMPROVE PATIENT SAFETY DURING PROCEDURAL SEDATION^{1,2}

Respiratory compromise during procedural sedation and analgesia (PSA)[†] is:

- Frequent³
- Associated with additional cost⁴

That's not good for patients — or healthcare providers.

But capnography monitoring may help — improving patient safety during PSA by reducing the rate of sedation-related adverse respiratory events.



PSA patients are at higher risk for adverse respiratory events

~1/3
of PSA patients suffer an adverse respiratory event³

45%
of PSA sentinel events are hypoxia-related⁵

Mean cost of adverse respiratory events⁴:

Prolonged apnea

\$394

Mild desaturation

\$463

Severe desaturation

\$529

Monitoring SpO₂ alone may delay or fail to detect abnormal ventilation

1 out of 4 PSA patients who require bag mask valve ventilation have no drop in SpO₂⁵

Only 38% of hypoventilation or apnea episodes are detected by SpO₂⁷

90-second delay
in recognizing apnea with standard monitoring in patients receiving supplemental oxygen⁶

> 1/3
of non-OR anesthesia closed claims judged preventable with better monitoring⁸

[†] Defined as moderate or deep sedation performed by nonanesthesiologists in care areas including hospitals, freestanding clinics, and dental or other offices

Capnography monitoring may improve patient safety



For randomly selected GI patients undergoing propofol PSA, capnography monitoring resulted in:

26.88% decrease
in oxygen desaturation (SpO₂ ≤ 90%)⁹

52.56% decrease
in severe oxygen desaturation (SpO₂ ≤ 85%)⁹

34.92% decrease
in apnea (≥ 15 secs)¹⁰

~1/2 decreased odds
of requiring assisted ventilation with capnography-guided care¹

61% decreased odds
of naloxone or flumazenil use when capnography is used in outpatient GI endoscopy procedures²

1. Saunders R, Struys MMRF, Pollock RF, Mestek M, Lightdale JR. Patient safety during procedural sedation using capnography monitoring: a systematic review and meta-analysis. *BMJ open*. 2017;7(6):e013402.
2. Jopling MW, Qiu J. Capnography sensor use is associated with reduction of adverse outcomes during gastrointestinal endoscopic procedures with sedation administration. *BMC Anesthesiol*. 2017;17(1):157.
3. Yan JW, McLeod SL, Iansavitchene A. Ketamine-propofol versus propofol alone for procedural sedation in the emergency department: a systematic review and meta-analysis. *Acad Emerg Med*. 2015;22(9):1003–1013.
4. Saunders R, Davis J, Weissbrod R, Whitaker D, Kranke P, Lightdale J. Interventions and costs associated with SIVA-defined adverse events during procedural sedation in five countries. *United European Gastroenterol J*. 2017;5(5S):A228–A229.
5. Newstead B, Bradburn S, Appelboom A, et al. Propofol for adult procedural sedation in a UK emergency department: safety profile in 1008 cases. *Br J Anaesth*. 2013;111(4):651–655.
6. Keidan I, Gravenstein D, Berkenstadt H, Ziv A, Shavit I, Sidi A. Supplemental oxygen compromises the use of pulse oximetry for detection of apnea and hypoventilation during sedation in simulated pediatric patients. *Pediatrics*. 2008;122(2):293–298.

7. Cacho G, Pérez-Calle JL, Barbado A, Lledó JL, Ojea R, Fernández-Rodríguez CM. Capnography is superior to pulse oximetry for the detection of respiratory depression during colonoscopy. *Rev Esp Enferm Dig*. 2010;102(2):86–89.
8. Metzner J, Posner KL, Domino KB. The risk and safety of anesthesia at remote locations: the US closed claims analysis. *Curr Opin Anaesthesiol*. 2009;22(4):502–508.
9. Beitz A, Riphaut A, Meining A, et al. Capnographic monitoring reduces the incidence of arterial oxygen desaturation and hypoxemia during propofol sedation for colonoscopy: a randomized, controlled study (ColoCap Study). *Am J Gastroenterol*. 2012;107(8):1205–1212.
10. Qadeer MA, Vargo JJ, Dumot JA, et al. Capnographic monitoring of respiratory activity improves safety of sedation for endoscopic cholangiopancreatography and ultrasonography. *Gastroenterology*. 2009;136(5):1568–1576; quiz 1819–1520.