

# Riding the (end) Tidal Wave to CO2 Monitoring: Using Capnography for Obstructive Sleep Apnea Following Anesthesia

## Background and Introduction

- Obstructive Sleep Apnea (OSA) is characterized by pauses in breathing during sleep and is exacerbated by anesthesia, sedation and analgesia in post surgical patients. Approximately 80-90% of patients undergoing elective surgery have undiagnosed OSA and have an increased risk of respiratory complications postoperatively (Latham, 2018).
- Capnography (ETCO2 monitoring) provides 'real time' observation of hypoventilation and apnea, hallmark symptoms of OSA. It also detects hypercarbia and hypoxemia 2-3 minutes before pulse oximetry (Godden, 2011).
- In November of 2017 the Post Anesthesia Care Units (PACU) at Inova Fairfax Medical Campus (IFMC) installed new equipment that allowed for ETCO2 monitoring. There was a lack of education as to the value of this new assessment tool, as a result, it was underutilized.

## PICO Question

In the adult, non-intubated patient with OSA, (PACU setting), will addition of ETCO2 monitoring result in reduced respiratory complications as evidenced by *Safety Always* events, and measured by a PACU audit tool?

## Project Objective

Improve patient safety and outcomes for OSA patients after anesthesia.

## Project Goals

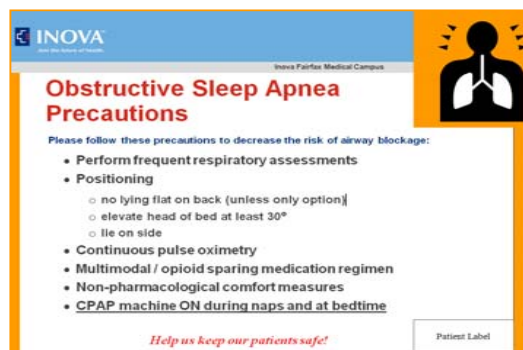
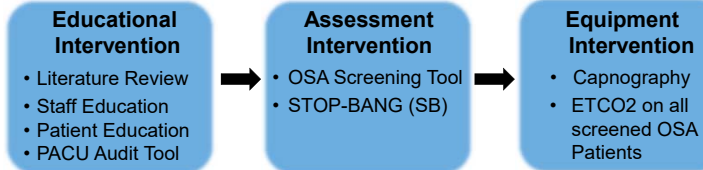
- By increasing staff awareness, previously undiagnosed, high-risk patients with OSA will be identified preoperatively using the STOP-BANG screening tool.
- The PACU RN will recognize hypoventilation via capnography and intervene to prevent respiratory complications.
- The American Society of PeriAnesthesia Nurses (ASPAN) Practice Recommendation #10: ETCO2 monitoring on patients with OSA will become a standard of practice in the PACUs.

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## Intervention-Improvement Methods



OSA Staff Alert Sign



Capnography in Action

## References

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## Improvements Achieved-Outcomes

- Data collection occurred over 10 weeks yielding 314 patients with OSA. Among these patients, 36% were identified as high risk (with a SB  $\geq$  5). Nurses used capnography on 76% of OSA patients and were able to readily identify hypoventilation (See Figure A) and intervene as needed.
- Respiratory complications associated with OSA occurred in 10.8% (n=34) of patients. Four patients required escalation of care to IMC/ICU units. They were all undiagnosed, high risk OSA (SB scores of 5-8) with BMIs > 35.
- Nurses gained understanding and confidence with analyzing capnography waveforms; utilizing critical thinking and application of this monitoring tool to patients beyond the OSA population. Additional PACUs adopted this intervention.

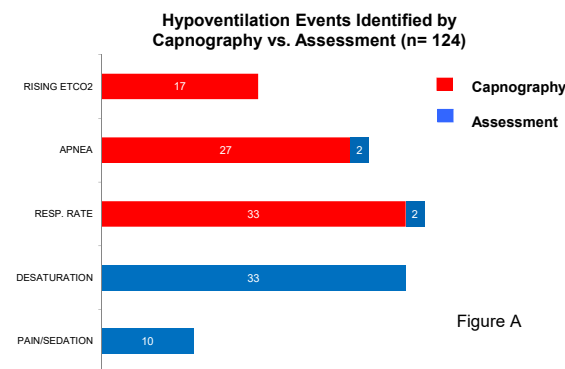


Figure A

## Recommendations

- Improve compliance for OSA screening in preoperative areas.
- Increase awareness related to high risk OSA and obesity as predictors of respiratory complications.
- Implement OSA screening and capnography for patients receiving anesthesia/sedation in procedural areas.

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