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

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

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The project was part of the 2018 Inova Evidence-Based Practice Fellowship Program.

Intervention-Improvement Methods

Educational Intervention
- Literature Review
- Staff Education
- Patient Education
- PACU Audit Tool

Assessment Intervention
- OSA Screening Tool
- STOP-BANG (SB)

Equipment Intervention
- Capnography
- ETCO2 on all screened OSA Patients

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 ≥ 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.

Hypoxemia Events Identified by Capnography vs. Assessment (n= 124)

Capnography
Assessment

OSA Staff Alert Sign

Capnography in Action

Patient Safety

Safety Always

References


Acknowledgements: A special thanks to our patient advocate, and the staff of Tower PACU, Women’s Hospital Surgery Center, and Professional Services Building Surgical Center for implementing this project. And for support from Dr. Steven Lussos, MD, Dr. Radhika Garg, MD, Ellen Makar, DNP, RN-BC, Jean Johnson, MSN, RN, Mark Shawky, MHA, and Huan-Ju Shih, LSSGB.