

Obstructive Sleep Apnea

Intervention and Treatment for Surgical Patients at Risk

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Significance

There has been an increase in patient safety events related to the combination of Surgical Procedures, Obstructive Sleep Apnea (OSA) and High Dose Opioid use. A review of the current situation demonstrated inconsistent OSA screening processes, limited monitoring tools, and minimal treatment orders for high risk OSA patients. Beginning in March 2011, the Bone and Joint Center (B&J) at Grant Medical Center began a pilot with a revised screening tool and new treatment protocols. The results of this pilot have demonstrated zero Serious Safety Events and zero Codes at B&J.

Purpose

Purpose was to establish, develop and implement the following:

- 1) Screening process/tool for OSA surgical patients
- 2) Standard order set for patients with known/presumptive sleep disordered breathing/OSA
- 3) On-going monitoring of the patient to include end tidal CO₃ monitoring
- 4) Sleep disorder education sleep apnea, CPAP/BiPAP, end tidal CO₃

Strategy and Implementation

A pilot unit was identified to trial a new OSA Screening Tool, a new OSA at risk order set, and a tiered approach for treatment and monitoring. The tiered approach was implemented based on the patient's individual at risk score that is calculated by the Anesthesiologist. The Anesthesiologist then completes the order set for monitoring with end tidal CO₂ and/or CPAP as the risk score indicates. A dedicated Respiratory Therapist was also implemented to support the assessment, monitoring and treatment for these at risk patients.

Bone and Joint Pilot Data

Timeline: March 3, 2011 - April 1, 2011 198 patients included in data

Pilot Unit Considerations

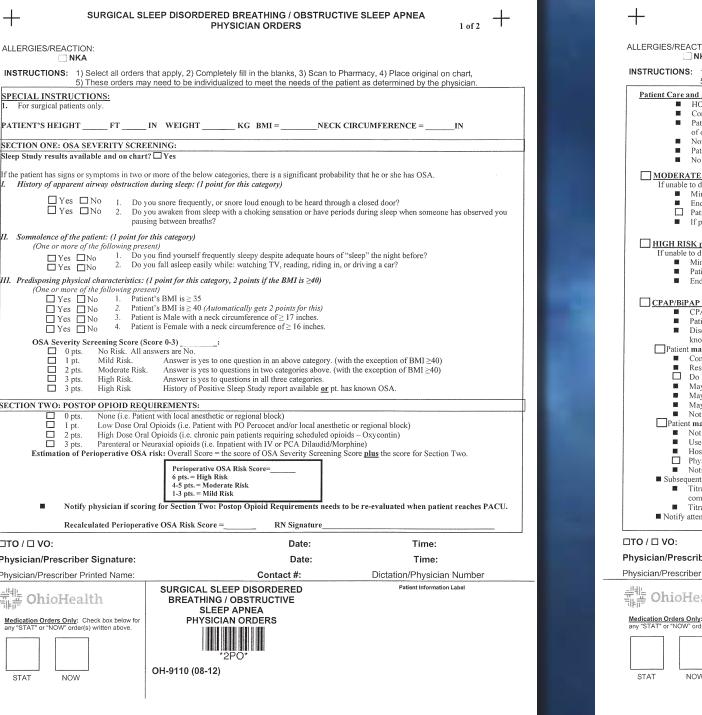
- Closed Unit for Staffing
- Primary RN model with 1:4 ratio
- High tenure staff/low turnover
- Modified Early Warning Score (MEWS)
 Implementation

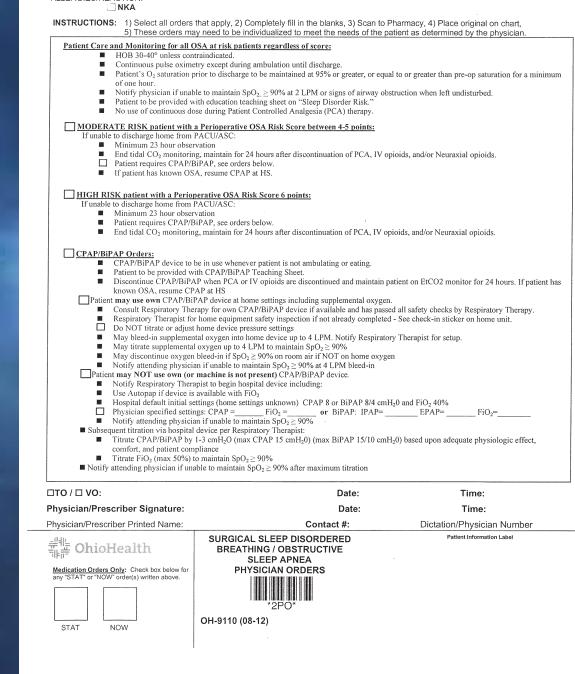
Pilot Description:

- New Screening Tool
- New Order Set
- Tiered approach for treatment and monitoring based on screening risk
 - End Tidal CO,
 - Continuous CPAP
- Dedicated RT staff to assist RN with order execution

Pilot Interventions

- 2 patients during the pilot study required additional medical interventions that were identified by:
 -End Tidal CO₃ alarms
- -End Haar CO₂ alarms
 -High Modified Early
- Warning Score (MEWS)
- Both patients had an otherwise uneventful post-op course and were discharged home
- These cases had the potential to have a different ending...





Pilot Assumptions vs. Reality

Methods	Assumption	Reality
OSA Screening High Risk	5-6 score	6 score
Surgery Type Correlation	High	Low
CPAP/BiPAP Volume	75%	30%
End Tidal CO ₂ Volume	40%	93%
Anesthesia Compliance	50%	92%
Associate Acceptance	50%	95%
Patient Compliance	50%	80%
Patient Satisfaction	Drop	Maintain
Additional RT FTE	3.0	3.0



Outcomes

Benefits of the new approach identified in the pilot were:

- 1) Early identification and intervention in Post Anesthesia Care Unit (PACU)
- 2) Improved interventions for patients at risk for OSA
- 3) Zero serious safety events and codes outside of critical care for this surgical population
- 4) Operational challenges mitigated
- 5) Decreased risk management and litigation
- 6) Patient compliance with end tidal CO2 and CPAP was above 90%

Challenges to be addressed in the future that were identified from the pilot included:

- 1) Increased expense for equipment (EtCO, and CPAP)
- 2) Increased expense for Respiratory Therapy staff
- 3) Culture acceptance of initiatives

Implications for Practice

- Pilot will be expanded to all surgical units at this campus and across the OhioHealth system
- Patient safety remains paramount and this practice provides the health care clinicans with another tool to promote patient safety.

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References

- Benumof, J. The New (Proposed) ASA OSA Guideline.
- 2. Bolden, N. et al. Avoiding adverse outcomes in patients with obstructive sleep apnea (OSA): Development and implementation of a perioperative OSA protocol. Journal of Clinical Anesthesia. 2009. 21(4). 286-293.
- 3. Frances, C. STOP Questionnaire. Anesthesiology. May 2008. 108(5). 812-821.
- 4. Gross, J.B., et al. Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea. Anesthesiology. May 2006. 104(5). 1081-1093
- 5. Tajender, S., et al. Obstructive Sleep Apnea Syndrome and Postoperative Complications. Archives of Otolaryngology Head and Neck Surgery. October 2010. 136(10). 1020-1024.