APPROVED BY ANESTHESIOLOGY AND PERIOPERATIVE MEDICINE COUNCIL

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Take Back to Peter

MedStar Health

Anesthesia Clinical Practice Guideline for the Care of Patients with Diagnosed or Suspected Obstructive Sleep Apnea (OSA) or Other Reasons To Be At Risk of Postoperative Respiratory Depression

Disclaimer: A multidisciplinary team developed this guideline. It is a guide for patient care based upon best practices and evidenced-based medicine at the current time. When considering individual patient needs, alternative independent clinical assessments and judgments may be necessary. A clinical guideline reflects the state of current clinical knowledge, as published in literature, regarding the effectiveness and appropriateness of practices or procedures. The goal of a guideline is to describe a recommended course of action for a specific condition, procedure or patient population. A hospital may create a policy stating that the clinical guideline is to be followed. A hospital may also modify guidelines in accordance with its understanding of the science of medicine or its own determination of the best interest of its patients. Guidelines are periodically revised in accordance with new knowledge and recommendations that emerge as a result of continued research.

Subject: Perioperative Guideline for the Care of Patients with Diagnosed or Suspected Obstructive Sleep Apnea (OSA) or Other Reasons to Be at Risk of Postoperative Respiratory Depression.

Purpose: To identify and appropriately manage the care of patients with established or suspected OSA who are to receive sedation, analgesia or anesthesia or diagnostic or therapeutic procedure under the care of an anesthesiologist. This guideline includes patients with other risks of postoperative respiratory depression.

Scope: All adult inpatients and outpatients who present to a MedStar Health facility for anesthesia and surgery.

Background:

Obstructive sleep apnea is the most common breathing disorder during sleep. It is estimated that 2-9% of women and 4-26% of men between 30-60 years of age have OSA. Obstructive sleep apnea syndrome is characterized by witnessed episodes of apnea, nighttime choking or gasping, habitual loud snoring, frequent arousal during sleep, and excessive daytime sleepiness. Nearly 80% of men and over 90% of women with moderate to severe OSA are undiagnosed. Undiagnosed OSA has been associated with an increased incidence of postoperative complications and death. Undiagnosed/untreated OSA patients also have a greater incidence of difficult intubation, postoperative complications, admission to ICU and longer hospital stay. Major risk factors for OSA include obesity (BMI > 35 kg/m^2), neck circumference > 40 centimeters, male gender, and age >50 years.

Polysomnography remains the "gold standard" for diagnosing OSAS. However, limited access to sleep laboratories and practical application limit its utility in the preoperative setting. Accordingly, alternative methods to screen patients preoperatively for sleep-disordered breathing have been sought and developed. A method for screening patients for OSAS will be outlined in this guideline. The STOP questionnaire has been validated in surgical patients (Chung et al, Anesthesiology 108 (5): 812-830, 2008). This 4 question screening tool is highly predictive of the presence of moderate and severe OSA, especially when combined with BMI, age, neck circumference and gender (bang).

Definitions:

1. Apnea: defined as the absence of airflow at the mouth and nose for periods greater than ten (10) seconds.

2. Obstructive sleep apnea (American Academy of Sleep Medicine) as defined by polysomnography Apnea/hypopnea index > 5 with fragmented sleep and daytime sleepiness. Mild API 5-15, Moderate API 15-30, Severe API > 30.

3. Other reasons to be at risk of postoperative respiratory depression include COPD, asthma, smoking, severe congestive heart failure, chest disease and ischemic heart disease. Patients undergoing thoracic or upper abdominal surgery are at particular risk.

Pathophysiology of Postoperative Respiratory Depression:

1. Anesthesia and analgesia affect all patients with diagnosed and undiagnosed OSA or other risks of postoperative respiratory depression.

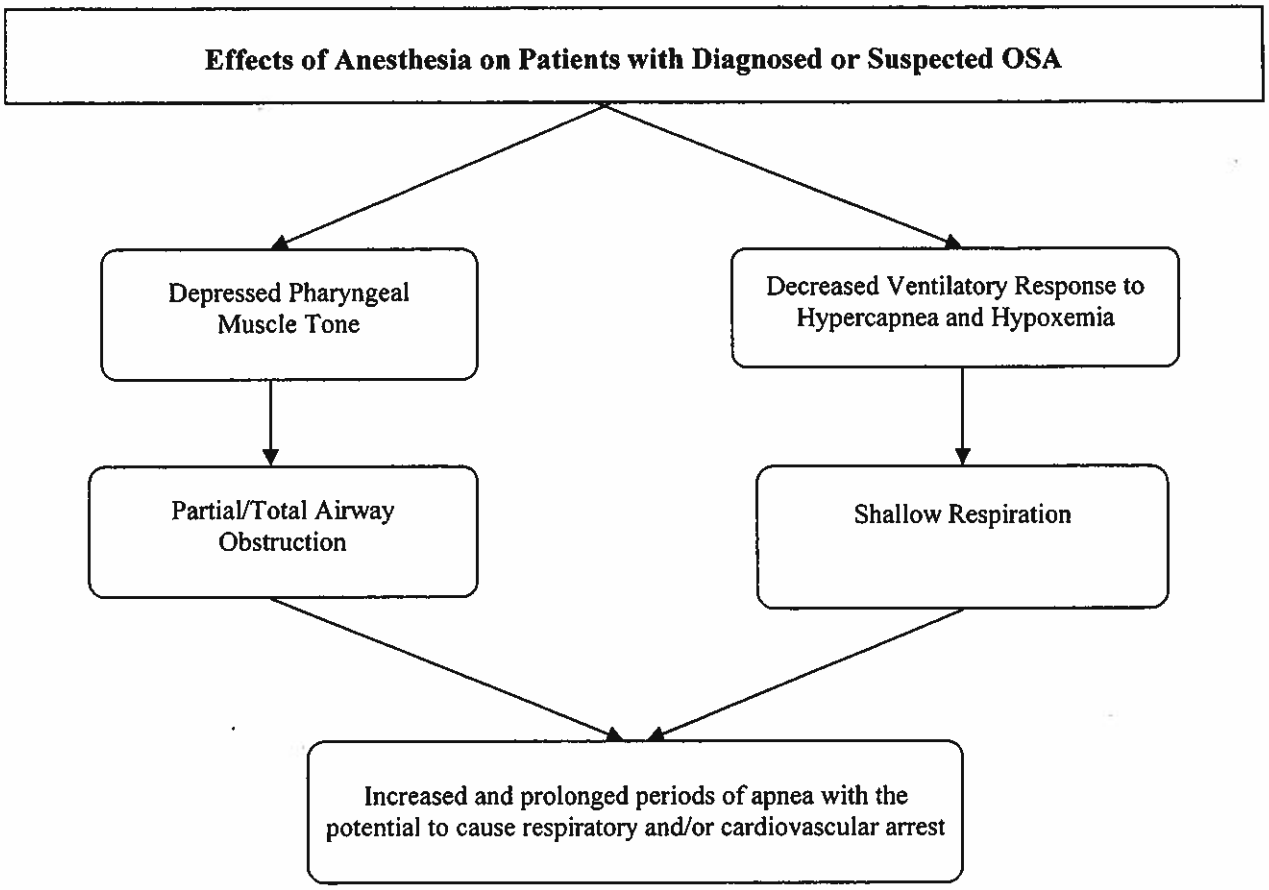
2. All anesthetic, opiate and sedative agents cause central nervous system (CNS) depression, which increases the tendency for upper airway collapse in all patients. In patients with OSA, or other risks of postoperative respiratory depression, the potential for upper airway collapse is exaggerated.

3. CNS depressants also alter the normal ventilatory response to hypercapnea and hypoxemia, which ends the apneic episode.

4. The arousal response to breathe is impaired (due to items two and three) which can lead to a prolonged and increased number of apneic periods, with the potential for respiratory and/or cardiac arrest.

5. Patients with OSA, or other risks of postoperative respiratory depression, may have a more difficult airway to manage in a crisis. In OSAS patients, difficult airway management can be due to tonsillar hypertrophy, increased tongue volume, nasal obstruction, narrow oropharynx and obesity.

6. Surgical stress and anesthesia both affect sleep architecture. Postoperatively, the effects of sleep fragmentation and sleep deprivation accumulate in all patients. Patients experience a rebound in rapid eye movement (REM) sleep in the late postoperative period (up to three days postoperatively). REM sleep is when apneic episodes are the most frequent and severe. Patients with known or suspected OSA are particularly vulnerable to respiratory and/or cardiac events during this period of REM sleep rebound.



Preoperative Evaluation:

1. All patients must undergo a preoperative history and physical. Evaluation for signs and symptoms suggestive of OSA, or other risks of postoperative respiratory depression, should occur. If the diagnosis of sleep apnea has already been made, the patient should be informed to bring his/her continuous positive airway pressure (CPAP) device or oral appliance to the hospital on the day of surgery if they use this treatment modality at home. If the results of a sleep study are available, they should be used to help guide the perioperative management of the patient.

   a) Clinical signs and symptoms suggesting OSA:
      - Loud, chronic snoring
      - Witnessed choking or gasping during sleep
      - Frequent nighttime arousal
      - Excessive daytime sleepiness
      - Chronic nasal obstruction
      - Morning headaches
      - Lethargy
      - Decreased libido
      - Memory loss
      - Unexplained, frequent nocturia
      - Morning sore throat/dry mouth

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b) Physical findings and clinical conditions associated with OSA:

- Large neck circumference (≥40 cm)
- Enlarged tonsils, uvula or palatal structures
- Narrowing of the posterior pharynx muscosa, often with reddening
- Skeletel deformities (e.g. small jaw, skull and pharynx abnormalities)
- Obesity (especially morbid obesity with BMI ≥ 35 kg/m^2)
- Hypertension
- Gastroesophageal reflux
- Cardiac arrythmias
- Coronary artery disease
- Diabetes
- Depression

Use of the STOP Questionnaire to Screen Patients for OSA:

2. All adult patients presenting for anesthesia and surgery will be screened for OSA using the STOP questionnaire. The STOP questionnaire consists of four yes/no questions.

1. **S**: Do you **Snore** loudly (louder than talking or loud enough to be heard through closed doors)?
2. **T**: Do you often feel **Tired**, fatigued, or sleepy during daytime?
3. **O**: Has anyone **Observed** you stop breathing during your sleep?
4. **P**: Do you have or are you being treated for high blood **Pressure**

High Risk: answering yes to two or more questions

Low Risk: Answering yes to less than two questions

Also ask/obtain the following information from the patient:

Height:

Weight:

5. BMI: (greater than 35 kg/m^2)

6. Age: (greater than 50 years?)

7. Neck circumference: (greater than 40 cm?)

8. Gender: (male?)

High Risk: answering yes to 3 or more items

Low Risk: answering yes to less than 3 items

The predictive value of the STOP questionnaire is improved if the additional information of BMI, age, neck circumference and gender (bang) is included as noted above. The risk of OSA and other information and findings will be placed on the Pre-Anesthesia Evaluation Form. A Sleep Medicine consult should be considered if OSA is suspected and not previously diagnosed. A preoperative sleep evaluation may lead to treatment such as CPAP which will decrease the risk of OSA in the postoperative period. If a decision is made to defer the sleep evaluation to the postoperative period, this decision should be made jointly by the attending surgeon and the consulting anesthesiologist. Patients at High Risk of OSA will be managed as if they have the condition.

The patient and his/her family as well as the surgeon should be informed of the potential implications of OSA on the patient's perioperative course. Treatment of OSA via CPAP, oral appliance, etc., should begin in the preoperative period and continue in the postoperative period unless contraindicated by the surgical procedure. Possible difficult airway management should be anticipated.

Day of Surgery Evaluation and Admission Procedure: (if preoperative evaluation was not performed in the Pre-Admission Testing Department)

a) All patients will be asked if they have a known history of sleep apnea, and if positive, will be asked if they brought their CPAP mask to the appropriate MedStar Health facility.

b) If patients provide a negative history of OSA, or other risks, they will be screened using the scoring system outlined on page 4.

c) For patients who carry a known diagnosis of OSA, or for screened patients who obtain a score placing them at risk for OSA, they will be labeled as High Risk.

d) Respiratory therapy will be contacted and informed that a patient with OSA will be having surgery and may need CPAP/Bi-PAP in the PACU and on the nursing unit.

e) The PACU will be notified to expect a patient with OSA who may need CPAP/BiPAP.

f) The anesthesia provider assigned to the case as well as the Anesthesia Coordinator will be informed by Pre-Op of the patient's OSA risk status.

Intraoperative Management:

a) When selecting intraoperative medications, the potential for postoperative respiratory compromise must be considered.

b) Regional anesthesia with minimal sedation or peripheral nerve blocks should be considered.

c) A secured airway is often preferable to moderate or deep sedation for patients with OSA undergoing procedures involving the upper airway (upper endoscopy, bronchoscopy, uvulopalatopharyngoplasty).

d) One should consider the use of CPAP or oral appliance during sedation for patients previously treated with these modalities.

e) Respiratory carbon dioxide monitoring should be considered during moderate or deep sedation in OSA patients.

f) Full reversal of neuromuscular blockade agents should occur and be verified before extubation.

g) Extubation should always occur when the patient is fully awake. Extubation should occur with the patient in the semiupright position.

h) Prophylactic insertion of a nasal trumpet prior to extubation may decrease the likelihood of apnea in the early postoperative period.

i) Use opiods cautiously. Regional analgesic techniques should be considered to reduce or eliminate the requirement for systemic opioids. Likewise, consideration should be given to reducing or eliminating opioids from neuraxial solutions given for anesthesia or postoperative analgesia. Non-steroidal anti-inflammatory agents (NSAIDS) should be considered, if appropriate, to reduce opioid requirements.

Postoperative Management:

Postoperative concerns in the management of patients with OSAS, or other risks of postoperative respiratory depression, include: *analgesia, oxygenation, patient positioning, and monitoring.*

Postoperative Analgesia

a) When possible, avoid intravenous or PCA continuous analgesia. ICU admission is required for all OSA patients receiving intravenous or epidural PCA opioids with a continuous component (basal rate).

b) Use of NSAIDs for pain management decreases the risk of postoperative apneic episodes.

c) Avoid the concurrent administration of narcotics, sedatives or hypnotics, as they increase the risk of respiratory depression, airway obstruction, and have a cumulative effect. If any of these agents must be used, careful attention is to be given to monitoring all doses administered to the patient.

Oxygenation

a) Supplemental oxygen should be administered continuously, but only until the patient is able to maintain his/her baseline oxygen saturation while breathing room air. Supplemental oxygen, particularly via face mask, may increase apneic periods and hinder the detection of hypoventilation by pulse oximetry.

b) Use CPAP/BiPAP if patient used it preoperatively.

Patient Positioning

All patients at increased risk for OSA should be placed in a non-supine, semiupright position throughout the recovery process.

Monitoring

Inpatients who are at increased risk of respiratory compromise from OSA, or other reasons to be at risk for postoperative respiratory depression, should have continuous pulse oximetry monitoring during and after discharge from the recovery room. Continuous monitoring may be provided in a

critical care or step-down unit, by telemetry on a hospital ward, or by a dedicated, appropriately trained professional observer in the patient's room. Continuous pulse oximetry monitoring should be maintained as long as the patient remains at increased risk, and particularly if a stable analgesic regimen has not been established or weaning of narcotics has not yet begun. Intermittent pulse oximetry or continuous bedside oximetry without continuous observation does not provide the same level of safety. If frequent or severe airway obstruction or hypoxemia occurs during postoperative monitoring, initiation of nasal CPAP or NIPPV should be considered.

Depending upon the availability of capnometry equipment, continuous monitoring of end-tidal CO_2 ($PETCO_2$) or transcutaneous CO_2 pressure ($PtcCO_2$) should also be considered to assess for apnea/hypercapnia. Capnography can identify airway compromise and hypoventilation earlier than pulse oximetry. Thus, capnography can serve as an early warning of impending hypoxemia.

The minimum requirement for monitoring of patients is continuous pulse oximetry.

Room air oxygen saturation should return to its baseline, and patients should not become hypoxemic or have development of clinical airway obstruction when left undisturbed in the recovery room or other area/unit. If this does occur, monitoring of patients with OSA should continue for a minimum of two (2) additional hours after the last episode of airway obstruction or hypoxemia, while breathing room air in an unstimulating environment, preferably while they seem to be asleep.

For obstructive sleep apnea patients receiving general anesthesia, a consideration should be given to admit to the hospital overnight with continuous pulse oximetry monitoring even if they are scheduled as "Same Day Surgery (SDS)" patients. Exceptions can be made for superficial, non-invasive or semi-invasive procedures, provided that narcotic doses are low, there is little to no postoperative pain, and respiratory recovery is complete. Examples of the types of procedures that might be excepted from overnight admission are inguinal hernia repair (without laparoscopy), diagnostic and interventional radiologic procedures, and endoscopic procedures.

Inpatient versus Outpatient Surgery Considerations:

Factors to consider when deciding if outpatient care is appropriate:

- Sleep apnea severity
- Anatomical abnormalities
- Coexisting diseases
- Type of surgery
- Type of anesthesia
- Postoperative opioid requirement
- Patient age
- Ability of patient to be observed post-discharge
- Emergency capabilities of the outpatient surgery site
- Discharge from the recovery area should not be considered until the patient is able to maintain his/her baseline oxygen saturation (while breathing room air in an unstimulating environment) for at least two (2) hours.

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