

## **Perioperative Anesthetic Management of the OSA Patient**

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### **Introduction**

OSA is caused by repetitive partial or complete obstruction of the upper airway, characterized by episodes of breathing cessation during sleep, lasting more than 10 seconds. This in turn causes repetitive arousals from sleep to restore airway patency, which may result in daytime hypersomnolence, or other psychological disturbances associated with disrupted sleep. The reported prevalence of OSA varies widely depending on its definition, method of diagnosis, and population demographics. From estimations in the general population, moderately severe OSA with an apnea-hypopnea index (AHI) of greater than 15 episodes per hour is present in 11.4% of men and 4.7% of women.

### **OSA-Associated Morbidity**

Untreated OSA patients frequently have associated comorbidities. These consist of cardiovascular disease (heart failure, hypertension, and arrhythmias), cerebrovascular disease, metabolic syndrome, and obesity.

### **Diagnosis**

Recent Canadian guidelines stipulated OSA diagnostic criteria as having daytime sleepiness, or at least 2 other symptoms of OSA, with an AHI of 5 or more on the Polysomnography (Fleetham 2006). However routine screening using polysomnography is hindered because it is resource and time-intensive, posing a burden on the health care system. Therefore the use of a practical screening tool is highly recommended.

### **Screening**

Several questionnaire-based screening tools have been successfully developed, for example the Berlin Questionnaire, and the ASA OSA 16-item checklist (Gross et al 2006). More recently, a concise clinical screening tool for anesthesiologist was developed – STOP questionnaire (Chung et al 2008), and the STOP – Bang questionnaire. The later has a sensitivity of 92.9% at AHI cutoffs of greater than 15 (Chung et al 2008).

### **Perioperative Management**

Preoperative CPAP has the potential of reducing cardiac rhythm abnormalities, stabilizing variability of blood pressure, and improving the hemodynamic profile.

Upper airway abnormalities, which predispose to OSA, share a similar etiological pathway with difficult airways. OSA therefore is a risk factor for difficult endotracheal intubation. The corollary is also true and patients with difficult intubations have a higher risk of being diagnosed with OSA.

OSA patients are sensitive to the respiratory depressant effects of sedatives, opioids, and inhaled anesthetics; because of the propensity of airway collapse and sleep deprivation. Therefore avoidance or minimization of the use of longer acting anesthetic drugs should be recommended. The use of multimodal analgesic adjuncts and regional techniques - which have an opioid-sparing effects, have been advocated.

The anesthesiologist should be meticulous to ensure that tracheal extubation is done only after the patient is fully conscious, full reversal of neuromuscular blockade verified, and airway patency confirmed. Patients should be placed in a semi-upright position for extubation and recovery, and

the use of non-supine position later. Controversy exists as to whether OSA patients should be done on an ambulatory basis. Postoperative continuous oximetry should be used in patients with increased perioperative risk from OSA. In addition, postoperative CPAP should be advised.

### **Conclusion**

Anesthesia and sleep are intimately related; and they have similar influence on the susceptible patient with abnormal skeletal or neuromuscular characteristics. Behavior of an OSA patient during sleep can predict the patient's performance under general anesthesia, in particular alerting the anesthesiologist of the potential of a difficult tracheal intubation. Screening, vigilance, and implementation of evidence-based clinical practices (Chung et al 2008) may ameliorate the morbidity associated with OSA patients (Table).

### **References**

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**Table: Perioperative Anesthetic Management of the OSA Patient**

Phase	Anesthetic Concern	Principles of Management
Preoperative Period		
	Cardiac arrhythmias and unstable hemodynamic profile	Indirect evidence advocating the usefulness of CPAP to reduce cardiac arrhythmias, stabilize variable blood pressure, and decrease myocardial oxygen consumption.
	Multisystemic comorbidities	Preoperative risk stratification and patient optimization. Individualized intraoperative anesthetic management tailored to comorbidities.
	Sedative premedication	Alpha-2 adrenergic agonist (clonidine, dexmedetomidine) premedication may reduce intraoperative anesthetic requirements and have an opioid-sparing effect
	OSA risk stratification, evaluation and optimization	Preoperative anesthesia consult for symptom evaluation, airway assessment, PSG if indicated, and anesthesia management plan formulation.
Intraoperative Period		
	Difficult intubation (8X more prevalent)	“Sniffing” position using ramp from scapula to head. Adequate preoxygenation. ASA Difficult Airway Algorithm.
	Opioid-related respiratory depression	Opioid avoidance or minimization. Use of short-acting narcotics (remifentanyl). Regional analgesia (peripheral nerve and neuroaxial blocks). Multimodal analgesia (NSAIDs, acetaminophen, tramadol, ketamine, gabapentin, transcranial magnetic stimulation).
	Carry-over sedation effects from longer-acting intravenous sedatives and inhaled anesthetic agents	Use of propofol maintenance of anesthesia. Use of insoluble potent anesthetic agents (desflurane).
	Excessive sedation in monitored anesthetic care	Use of capnography for intraoperative monitoring.
Reversal of Anesthesia		
	Post-extubation airway obstruction and desaturations	Verification of full reversal of neuromuscular blockade. Ensure patient fully conscious and cooperative prior to extubation. Semi-upright posture for recovery.
Immediate Postoperative Period		
	Postoperative critical respiratory event in high risk patient (severe OSA, upper airway surgery)	Continuous oximetry monitoring. High-dependency unit or ICU care. Postoperative CPAP if no contraindications.
	Suitability for day-case surgery	Lithotripsy, superficial or minor orthopedic surgeries using local or regional techniques may be considered for ambulatory surgery. Transfer arrangement to in-patient facility should be available.