Perioperative Obstructive Sleep Apnea Protocol (rev: 8/6/2014)

(based on "Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea: An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea." Anesthesiology 2014; 120(2):268-286)
Full text of article found at: http://www.asahq.org/Home/For-Members/Practice-Management/~/media/For%20Members/Practice%20Management/PracticeParameters/2014/Practice%20Guidelines%20for%20Perioperative%20Management%20of%20Patients%20With%20OSA.pdf

I. Patient Identification

a. For patients with a PACE appointment: Patients should be screened preoperatively to identify patients diagnosed with or at risk of having obstructive sleep apnea (OSA) during their pre-operative screening (PACE) appointment. Sample screening tools are attached as Tables 1-3, though locally-developed screening protocols may be used.
    i. Screening should include
        1. medical record review
        2. patient/ family interview and screening protocol
        3. physical examination (for in-person appointments)

b. Patients with previously-diagnosed OSA should be instructed to **bring their CPAP device** (if applicable) to the hospital on the day of surgery. The **pressure and supplemental oxygen** settings, if known, should be recorded.

c. For Patients with suspected OSA: The surgeon's office should be notified. These patients should be **scheduled earlier** in the day, if possible, and preparations should be made for **possible overnight observation**. The patient may then proceed to surgery with a presumptive diagnosis of OSA. However, the PACE clinic or anesthesia staff **may request** additional evaluation to characterize the severity of OSA based on clinical judgment.

d. Patient suitability criteria for each site is described in a separate PACE policy.

e. **All** patients (with or without PACE appointment) should also be assessed for OSA by an anesthesia provider (attending anesthesiologist, anesthesia resident, CRNA, SRNA, etc.) during their **pre-operative evaluation** prior to undergoing anesthesia.

I. Oxygenation

a. Patients should have baseline room air oxygen saturation (SpO2) recorded pre-operatively.

b. Supplemental oxygen will be administered to goal of oxygen saturation (SpO2) of **greater than or equal to 90%**, both while awake and asleep in PACU. Oxygen delivery will continue until the patient is able to maintain baseline room air SpO2 or SpO2 greater than 90%.

c. For patients using CPAP preoperatively: The anesthesia provider should consider ordering continuous positive airway pressure (CPAP) for patients with known or suspected OSA. The order should be entered in LLEAP. Initial CPAP settings should be at the **previously prescribed level** or, if unknown, may be initiated at **8-10 cm H_2O** and titrated until resolution of obstruction.

d. For patients not on CPAP preoperatively: Initiate CPAP at **8-10 cm H_2O** and titrate until resolution of obstruction. Titration should be done by respiratory therapist or PACU nurse in consultation with an anesthesia provider.
e. Clinical Engineering should be contacted to evaluate patients' home CPAP machines.

II. Pain Management

a. Opioids and sedative agents should be **avoided or minimized**, when possible.
b. Regional anesthesia, neuraxial analgesia, or non-opioid analgesics should be **considered** in order to reduce systemic opioid use.
c. Opioids **may be excluded** from neuraxial analgesia solutions at the discretion of the administering anesthesia provider.
d. **Exclusion** of basal infusions from parenteral patient-controlled analgesia should be considered.
e. Concurrent administration of sedative agents to patients who are receiving systemic opioids **should be avoided or minimized**.

III. Positioning

a. If not contraindicated, patients should be positioned in the **upright or lateral** position, rather than supine, in the postoperative period.

IV. Monitoring/Disposition

a. Outpatient Surgery
    i. Patients with OSA should not be discharged home until they:
        1. Can maintain a patent **airway**
        2. Maintain their baseline room air oxygen saturation **or** SpO2 greater than 90% without physical or verbal intervention for **30 consecutive minutes** following general anesthesia
        3. Have been observed in PACU for at least **one hour** following general anesthesia
    ii. If a desaturation occurs, then the patient should **not** be reassessed for discharge for **1 additional hour** following the desaturation. The patient may then be re-evaluated for the discharge criteria described in IV(a)(i) above.
    iii. Patients who are unable to satisfy discharge criteria following **two hours** of PACU time **may** be **considered** for overnight observation. This decision should be made by the attending anesthesiologist.
    iv. The attending anesthesiologist may **use their discretion** to alter the discharge timeline based on clinical and patient factors.
    v. Patients **not** undergoing general anesthesia may be discharged at any time when deemed fully recovered by an attending anesthesiologist or licensed anesthesia resident.
b. Surgery on patients with planned post-operative hospital stay
    i. Tables 1 and 2 describe a scoring system to assess post-operative risk of perioperative complications. A patient scoring 4 or greater is considered to be at increased risk and should be monitored with **continuous pulse oximetry** for **24-hours** after completion of an anesthetic.
    ii. Where available, respiratory acoustic monitoring (RAM) or waveform capnography (ETCO2) may be **considered**.

iii. Airway surgery or upper abdominal laparoscopic surgery on patients with OSA **should** be observed overnight. Tonsillectomy in children less than 3 years of age **should** be observed overnight.

iv. The attending anesthesiologist may **use their discretion** to alter the described timeframes based on clinical and patient factors.

Table 1. Identification and Assessment of OSA: Example

A. Clinical signs and symptoms suggesting the possibility of OSA

1. Predisposing physical characteristics
   - Adult patients: BMI 35 kg/m^2
   - Pediatric patients: 95th percentile for age and sex
   - Neck circumference 17 inches (men) or 16 inches (women)
   - Craniofacial abnormalities affecting the airway
   - Anatomical nasal obstruction
   - Tonsils nearly touching or touching in the midline
2. History of apparent airway obstruction during sleep

   Two or more of the following are present: (if patient lives alone or sleep is not observed by another person then only one condition needs to be present)
   - Loud snoring (loud enough to be heard through closed door)
   - Frequent snoring
   - Observed pauses in breathing during sleep
   - Awakens from sleep with choking sensation
   - Frequent arousals from sleep
   - Pediatric patients:
     - Intermittent vocalization during sleep
     - Parental report of restless sleep, difficulty breathing, or struggling respiratory efforts during sleep
     - Child with night terrors
     - Child sleeps in unusual positions
     - Child with new onset enuresis
3. Somnolence (one or more of the following is present)
   - Frequent daytime somnolence or fatigue despite adequate "sleep"
   - Falls asleep easily in a nonstimulating environment (*e.g.*, watching television, reading, riding in, or driving a car) despite adequate "sleep"
   - Pediatric patients: parent or teacher comments that child appears sleepy during the day, is easily distracted, is overly aggressive, is irritable, or has difficulty concentrating
   - Pediatric patients: child often difficult to arouse at usual awakening time

If a patient has signs or symptoms in two or more of the above categories, there is a significant probability that he or she has OSA. The severity of OSA may be determined by sleep study (see below). If a sleep study is not available, such patients should be treated as though they have moderate sleep apnea unless one or more of the signs or symptoms above is severely abnormal (*e.g.*, markedly increased BMI or neck circumference, respiratory pauses which are frightening to the observer, patient regularly falls asleep within minutes after being left unstimulated without another explanation) in which case they should be treated as though they have severe sleep apnea.

B. If a sleep study has been done, the results should be used to determine the perioperative anesthetic management of a patient. However, because sleep laboratories differ in their criteria for detecting episodes of apnea and hypopnea, the Task Force believes that the sleep laboratory's assessment (none, mild, moderate, or severe) should take precedence over the actual AHI. If the overall severity is not indicated, it may be determined by using the table below:

Severity of OSA	Adult AHI	Pediatric AHI
None	0–5	0
Mild OSA	6–20	1–5
Moderate OSA	21–40	6–10
Severe OSA	>40	>10

AHI = apnea–hypopnea index: the number of episodes of sleep-disordered breathing per hour; BMI = body mass index; OSA = obstructive sleep apnea.

Table 2. Scoring System for Perioperative Risk from OSA: Example*

A. Severity of sleep apnea based on sleep study (or clinical indicators if sleep study is not available)	
Point score: (0–3)†‡	
Severity of OSA (table 1)	Points
None	0
Mild	1
Moderate	2
Severe	3
B. Invasiveness of surgery and anesthesia	
Point score: (0–3)	
Type of surgery and anesthesia	Points
Superficial surgery under local or peripheral nerve block anesthesia without sedation	0
Superficial surgery with moderate sedation or general anesthesia	1
Peripheral surgery with spinal or epidural anesthesia (with no more than moderate sedation)	1
Peripheral surgery with general anesthesia	2
Airway surgery with moderate sedation	2
Major surgery, general anesthesia	3
Airway surgery, general anesthesia	3
C. Requirement for postoperative opioids	
Point score: (0–3)	
Opioid requirement	Points
None	0
Low-dose oral opioids	1
High-dose oral opioids, parenteral or neuraxial opioids	3
D. Estimation of perioperative risk:	
Overall point score: the score for A plus the greater of the score for either B or C: (0–6)§	

* A scoring system similar to the above may be used to estimate whether a patient is at increased perioperative risk of complications from OSA. This example, which has not been clinically validated, is meant only as a guide, and clinical judgment should be used to assess the risk of an individual patient. † One point may be subtracted if a patient has been on CPAP or NIPPV before surgery and will be using his or her appliance consistently during the postoperative period. ‡ One point should be added if a patient with mild or moderate OSA also has a resting $PaCO_2$ >50 mmHg. § Patients with score of 4 may be at increased perioperative risk from OSA; patients with a score of 5 or 6 may be at significantly increased perioperative risk from OSA.

CPAP = continuous positive airway pressure; NIPPV = noninvasive positive pressure ventilation; OSA = obstructive sleep apnea.

Table 3: STOP BANG Questionnaire

1. **S**noring: Do you snore loudly (louder than talking or loud enough to be heard through closed doors)? Yes No

2. **T**ired: Do you often feel tired, fatigued, or sleepy during daytime? Yes No

3. **O**bserved: Has anyone observed you stop breathing during your sleep? Yes No

4. Blood **p**ressure: Do you have or are you being treated for high blood pressure? Yes No

5. **B**MI: BMI more than 35 kg/m2? Yes No

6. **A**ge: Age over 50 yr old? Yes No

7. **N**eck circumference: Neck circumference greater than 40 cm? Yes No

8. **G**ender: Gender male? Yes No

Total number of "Yes" responses: _____

High risk of OSA: answering yes to three or more items

Low risk of OSA: answering yes to less than three items

Adapted from: STOP Questionnaire A Tool to Screen Patients for Obstructive Sleep Apnea Frances Chung, F.R.C.P.C.,* Balaji Yegneswaran, M.B.B.S.,† Pu Liao, M.D.,‡ Sharon A. Chung, Ph.D.,§ Santhira Vairavanathan, M.B.B.S.,_ Sazzadul Islam, M.Sc.,_ Ali Khajehdehi, M.D.,† Colin M. Shapiro, F.R.C.P.C.# Anesthesiology 2008; 108:812–21