

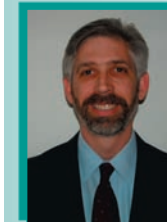
Dear Colleague,

In this issue of the Sleep HealthCenters Newsletter, we feature an article by Geoffrey Gilmartin, MD, Medical Director of the Sleep HealthCenter Affiliated with Beth Israel Deaconess Medical Center, on the increase in perioperative risk caused by obstructive sleep apnea (OSA). Unrecognized and untreated OSA increases the likelihood of serious complications. Dr. Gilmartin discusses how OSA increases perioperative risk, how to identify those patients at risk and what steps to take to reduce those risks. He also reviews the new JCAHO patient safety recommendations related to OSA and surgery.

Sleep HealthCenters celebrated National Sleep Awareness week by holding several public education events. These events provided the public with information on sleep and sleep disorders and helped raise community awareness on the importance of getting a good night's sleep. We conducted these events in association with many of our affiliate institutions and they were all very successful.

In the CEO Corner, Paul Valentine discusses many of the ongoing Sleep HealthCenters' activities, including the success of our technologist training course – the Accredited Sleep Technologist Education Program (A-STEP), and our well-attended CPAP Support Group meetings. We hold these meetings quarterly in different locations around the Boston area to provide patients with valuable information and a place to meet with other CPAP users.

If you have any questions about sleep disorders, our services, our affiliations or our locations, please feel free to contact us.



Sincerely,

Lawrence J. Epstein, MD
Medical Director
Sleep HealthCenters, LLC


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Sleep and Surgery/Anesthesia

Geoffrey Gilmartin, MD

Medical Director, Sleep HealthCenter Affiliated with Beth Israel Deaconess Medical Center. Board Certified in Internal Medicine, Pulmonary Disease, Critical Care Medicine and Sleep Medicine. Instructor in Medicine, Harvard Medical School.



The approach to perioperative assessment and management of sleep disordered breathing is, once considered, so obviously important that one wonders why it has received such little attention to date. Sedative medications, analgesics and the residual effects of anesthetic agents in the perioperative period serve to worsen obstructive sleep apnea (OSA). Lack of recognition or treatment of OSA during this time period predisposes the patient to increased risk for substantial complications, well above that experienced by patients without OSA, regardless of the nature of the surgical procedure. A selected review of the available literature on the scope of this problem, the mechanisms by which this occurs and the role of screening tests will be presented below, along with suggestions for future directions.

Scope of the Problem

This is difficult to define precisely, but some population estimates will help to frame the discussion. The best estimates of the prevalence of OSA come from studies with large numbers of patients and utilize the “gold standard” of in-lab polysomnography for diagnosis. These studies show us a remarkably high prevalence of OSA in the general population. Up to 20% of patients in these studies had mild OSA (AHI >5 events/hr) and 7% had moderate severity OSA (AHI >15 events/hr). Outpatient surgical volume for an average tertiary care center in Massachusetts is approximately 10-15,000 surgical cases per year. Using a reasonable estimate of 7% of this population having moderately severe OSA, that leaves approximately 1000 patients at risk for increased morbidity related to OSA in the perioperative period, at a **single** medical center in a **single** year. The number of patients at risk across medical centers and across time is obviously much greater. This estimate is only for outpatient surgical procedures. In addition, any procedure (colonoscopy, for example) that involves conscious sedation would also be expected to hold increased risk for patients with OSA, as the mechanisms by which upper airway patency is compromised are relevant in these settings, as well. Given this large population of patients at risk, organized screening for OSA would seem to be indicated.

Perioperative Risk – Mechanisms

The mechanisms by which patients with OSA are placed at increased risk for perioperative complications are the same mechanisms that determine the presence or absence of the disease. As noted above, sedatives, analgesics and anesthetic agents all may contribute to decreased muscle tone, which, at the level of the upper airway, promotes significant narrowing and the development of airflow obstruction. In addition, the very mechanisms by which this airflow obstruction is reversed – chemosensor activation and arousal – are blunted by the medications commonly used in the perioperative setting. So, it is by a worsening of airway obstruction and decreasing the patient's capacity to recognize and reverse that obstruction, that OSA is likely to be manifested, and indeed increased in severity, during the perioperative period. Furthermore, I would suggest that these mechanisms are relevant in the generation of increased risk for patients with OSA undergoing any procedure, even nonoperative procedures, where sedating medications will be used.

Perioperative Risk – Consequences

The available literature considering the consequences of untreated OSA in the perioperative period is extensive and consistent – patients with OSA who are either untreated or undiagnosed at the time of surgery are at increased risk for significant complications. Furthermore, treatment of OSA in the perioperative period substantially reduces those risks. The majority of evidence is based on retrospective case-control studies, which although having some methodological limitations, provide insight into the issues at hand.

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Sleep HealthCenters is a network of sleep medicine centers staffed by experts in the field of sleep medicine. Our integrated care system provides all the services needed to diagnose and treat patients with the entire array of sleep disorders including obstructive sleep apnea, insomnia, narcolepsy and restless legs syndrome.

In this issue of the Sleep HealthCenters Newsletter...

- ▶ Sleep and Surgery/Anesthesia by Geoffrey Gilmartin, MD
- ▶ CEO Corner:
 - Accredited Sleep Technologist Education Program Recap
 - Sleep HealthCenters welcomes Dr. Stephen LoVerme as Associate Medical Director of the Beverly Center and CPAP Counselor, Cindy Sullivan
 - Sleep HealthCenters celebrated National Sleep Awareness Week
 - Sleep Apnea Awareness and Support Group Meeting Update
- ▶ Research Activities

Massachusetts Affiliations: Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, Chadwick Medical Associates, Faulkner Hospital, Hallmark Health, McLean Hospital, New England Sinai Hospital, UMass Memorial Medical Group; *New York Affiliations:* Beth Israel Medical Center

Massachusetts Locations: Bedford, Beverly, Boston, Brighton, Framingham, Jamaica Plain, Medford, Stoughton, Weymouth, Worcester; *New York Locations:* Manhattan

For more information, please contact us at: 1-877-SLEEPHC (1-877-753-3742)
or visit our website at www.sleephealth.com.

Requisition forms are available on our website.



Sleep HealthCenters is pleased to welcome **Stephen R. LoVerme, Jr., MD**, as the Associate Medical Director of the Sleep HealthCenter in Beverly, Massachusetts.

Dr. LoVerme most recently was in private practice and is an active staff member at the Beverly Hospital. He is board certified in Sleep Medicine and Neurology and recent appointments include Medical Director of the Sleep Lab at Beverly Hospital and Chief of Stroke Services at Beverly Hospital.

Dr. LoVerme is also a member of the American Academy of Neurology, American Academy of Sleep Medicine, Massachusetts Neurological Association, Boston Society of Psychiatry and Neurology and the Society of Behavioral and Cognitive Neurology.

For more information about Dr. LoVerme or to schedule an appointment with him, please contact us at 877-753-3742 or visit our website at www.sleephealth.com.

(continued from page 1) Gupta and colleagues evaluated the impact of OSA on patients undergoing hip or knee replacement surgery. The study serves as an interesting reference point as the surgical procedure is independent of the upper airway. Patients with OSA were compared with matched controls without the disorder undergoing the same procedure. Considering only “serious complications” of unplanned ICU admissions, reintubations and cardiac events, there was a significant difference between the groups. There were serious complications in 24% of the patients with OSA, while only 9% of patients without OSA had serious complications. The reports available in the literature show that this important increase in complication rates in the postoperative period is significantly reduced in the setting of effective CPAP therapy for patients with known OSA. This reinforces the concept that the most important question related to this area is how to effectively identify patients with OSA so that interventions, which have been shown to be effective, can be implemented.

The most important consideration in the sleep apnea patient in the perioperative period is maintenance of a patent airway in the face of medication effects that serve to promote airway closure. Respiratory arrest is an all too frequent event in these patients and receives attention through frequent case reports in the literature.

Screening – Why Don’t We Screen All Preoperative Patients?

With recognition of the issue and a rough estimate of the magnitude and consequences of the problem, one then turns to the issue of screening patients preoperatively. Because a substantial number of patients with OSA remain undiagnosed, screening measures would be indicated. It is simply not enough to suggest that appropriate management of those patients with known OSA in the perioperative period will completely address the issue.

Screening tests are, by design, utilized in a large population of typically asymptomatic patients. The testing itself should be time efficient, convenient, cost-effective and have a very high sensitivity and specificity for the presence or absence of the disease suspected. If the screening test is positive, more should be done to evaluate and treat the disorder; if it is negative, the patient should be considered disease-free. A simple example is screening for hypertension by measuring blood pressure. Hypertension is

a disease usually without symptoms. The test (checking blood pressure) is time efficient, low cost and has excellent sensitivity and specificity for the presence of hypertension (i.e., if the reading is normal, you have a very high level of confidence that the patient does not have hypertension). Unfortunately, there is no ideal screening test for OSA.

We do know that there are risk factors for OSA that can be identified in any standard history and physical exam assessment of the preoperative patient. Specifically, snoring, witnessed apneas, disrupted sleep and/or excessive daytime somnolence are consistent with a diagnosis of OSA. In addition, increasing age, male gender, obesity, large neck circumference (>17” males; >16” females), tonsillar hypertrophy, crowded oropharynx (Mallampati grade 3-4) and retrognathia all are suggestive of significant OSA. These symptomatic patients, or patients with significant physical findings to suggest OSA, clearly deserve further evaluation of, and treatment for, OSA in the perioperative period.

The perhaps more important issue is how to evaluate patients who may remain “asymptomatic” from OSA or who do not have the “classic” findings to suggest OSA on physical exam – can we confidently conclude that they do not have OSA? In considering screening of patients for OSA preoperatively, this question will have to be definitively addressed, however, to this point it remains unanswered.

This issue has been receiving significant attention across the medical community. A 2006 Practice Guideline published by the American Society of Anesthesiologists recommends attempting to identify potential OSA patients during preoperative evaluations. Reducing post-operative complications due to OSA is an important component of the proposed JCAHO patient safety goals for 2008 (see box).

Conclusions

It is clear through both an understanding of the mechanisms of OSA, and the available literature, that the perioperative period is a time of increased risk for patients with OSA. Sedatives and analgesic medications all can serve to promote airway collapse in the setting of OSA, with significant morbidity associated with those events. CPAP, when utilized continuously and during all periods of sleep, can decrease the likelihood of these important events.

The issue that remains to be appropriately addressed is to define a clinical pathway to evaluate all patients who may be at risk. With no simple screening tool to evaluate all patients undergoing surgery at this time, attention must be paid to identifying patients at increased risk so that they undergo additional testing prior to surgical interventions or procedures that will involve sedating medications. Patients with physical findings to suggest the presence of OSA (obesity, increased neck circumference, narrow oropharynx, tonsillar hypertrophy, retrognathia) or a history consistent with OSA (snoring, witnessed apneas, disrupted sleep, daytime somnolence) should be considered for further testing prior to the intervention. Patients with known OSA should be maintained on CPAP throughout the perioperative period.

In the very near future, systems should and will have to be created to allow thorough and efficient support for the screening, testing and treatment of patients with suspected OSA prior to any medical or surgical intervention which involves centrally-acting sedative or analgesic agents. For now, primary care physicians referring patients to surgery, as well as surgeons and anesthesiologists, should include an assessment for sleep disordered breathing in their preoperative evaluations.

For a fully referenced version of this article, visit the Sleep HealthCenters website at www.sleephealth.com.

PROPOSED JCAHO SAFETY GOALS

Goal 17: Obstructive Sleep Apnea

Reduce the risk of post-operative complications for patients with obstructive sleep apnea.

Requirement 17A

The organization screens for obstructive sleep apnea (OSA) prior to surgical procedures involving the use of centrally-acting anesthetic and/or analgesic agents.

Rationale for Requirement 17A

OSA places patients at increased risk for post-operative respiratory complications after receiving a centrally acting anesthetic and/or analgesic agent. It is estimated that 80-90% of patients with OSA are undiagnosed. By screening patients for OSA, organizations will reduce the occurrence of perioperative respiratory complications in at-risk patients.

CASE STUDY

Mr. Summer’s path to treatment for sleep disordered breathing began with a visit to the emergency department for acute respiratory failure that occurred during the induction of sedation for an outpatient procedure. Mr. Summer is a 60-year-old gentleman with a history of hypertension and gastroesophageal reflux disease with Barrett’s esophagus, who was scheduled to undergo an elective endoscopic retrograde cholangiopancreatography (ERCP) to evaluate a newly recognized ampullary adenoma. At the time of his preoperative evaluation, he was felt to be in good physical condition and a safe candidate for the procedure.

Sedation for the procedure was induced with Versed, 3.5 mg, Fentanyl, 75 mg, and Phenergan, 25 mg. Shortly after the medications were given, the patient was noted to be apneic with oxyhemoglobin saturation dropping to a low of 77%. Bag ventilation was initiated, which increased saturation to 100%.



CEO Corner

Paul S. Valentine

President and
Chief Executive Officer

Sleep HealthCenters is thrilled to announce that our first Accredited Sleep Technologist Education Program (A-STEP) was a success. A-STEP is an 80-hour didactic course, the first of a two-step training initiative endorsed by the American Academy of Sleep Medicine (AASM). Because of the high level of interest, we scheduled our second class to take place March 26 to April 6, just two months after the first class. This program not only provides students with a comprehensive education, but also enables us to continually employ the most thoroughly trained sleep technologists in the industry. More than half of the January students were hired to work at Sleep HealthCenters.

We are pleased to welcome Stephen LoVerme, MD, as the new Associate Medical Director of our Beverly center. He is board certified in Sleep Medicine and Neurology and recent appointments include Director of the Sleep Lab and Chief of Stroke Services at Beverly Hospital. We also welcome a new CPAP Counselor, Cindy Sullivan, CRT, RCP, to our staff. Cindy brings with her seven years of homecare experience working with CPAP, BiPAP and home ventilators. She will be based in our Brighton center.

National Sleep Awareness Week (NSAW) occurred three weeks earlier this year due to

He was given Narcan, 400 mcg IM, and Flumazenil, 200 mg IV, to counter the effect of the sedatives. Spontaneous breathing returned and he was transferred to the emergency room for further observation. His blood pressure and pulse were maintained throughout the episode.

Upon further questioning, Mr. Summer was found to have a long history of loud snoring and his wife noted witnessing stopping breathing episodes and loud gasping with arousals in his sleep. He admitted to mild sleepiness upon awakening if he does not get adequate sleep and prominent mid-afternoon sleepiness between 2:30 and 3:00 p.m. He denied any difficulty driving, no falling asleep at inappropriate times and had an Epworth Sleepiness Scale score in the normal range at 6/24. His sleep schedule was fairly regular – in bed between 11:30 p.m. and 12:30 a.m., asleep within 15 minutes, one short nighttime awakening and up between 6:30 and 7:00 a.m. On physical exam, he was overweight

the change in conversion to Daylight Saving Time, when we lose an hour of sleep. In an effort to raise public awareness while supporting this year’s NSAW theme – Sleep: As important as diet and exercise, only easier! – Sleep HealthCenters held public educational events. We would like to express our gratitude to our lecturers and affiliates for working with us to coordinate these events. Our participating affiliates included Beth Israel Medical Center in New York, Brigham and Women’s Hospital, Faulkner Hospital and New England Sinai Hospital.

Finally, our CPAP Sleep Apnea Awareness and Support Group meetings have continued to be well attended. Our most recent support group was held on April 10 at New England Sinai Hospital and featured a talk given by Dr. Alexander White, Medical Director, Sleep HealthCenter affiliated with New England Sinai Hospital. The support groups are intended for CPAP patients, their families and support persons to learn about their condition, the risks associated with it and to talk with others who suffer from apnea while taking a look at the latest equipment. We look forward to continuing our support group meetings throughout the region. Please direct your patients to view our website for the latest information on our support group meetings and education information.

Thank you for allowing us to play a role in the care of your patients. Please contact us if there is anything we can do for you.

with a Mallampati grade IV airway that was crowded by a low, soft palate, narrow pharyngeal outlet, and grade 0 tonsils.

Because of this history, the patient was referred for an overnight polysomnogram that revealed significant obstructive sleep apnea (OSA). His Apnea-Hypopnea Index (AHI) was 52.2 events per hour. The obstructive events began even during drowsiness and were most severe while asleep on his back, with oxyhemoglobin desaturation as low as 85%. CPAP at 12 cm of H₂O pressure eliminated the OSA.

CPAP therapy was initiated at home and, after he demonstrated resolution of symptoms with good compliance to CPAP, he returned for a repeat attempt at ERCP. The procedure was performed with the use of the patient’s home CPAP in the perioperative period and was completed without adverse events.

Research Activities

Sleep HealthCenters is proud to work with some of the premier sleep researchers in the country. The following research studies are currently underway in conjunction with our partners:

Apnea Positive Pressure Long-Term Efficacy Study (APPLES) The Sleep HealthCenter associated with Brigham and Women’s Hospital is conducting a NIH-funded study that examines the long-term effects on quality of life, neurocognitive function, sleepiness and mood by using Continuous Positive Airway Pressure (CPAP) to treat sleep apnea.

Sleep and Menopause This unique study concentrates on understanding the role that hot flashes and sleep disruption play in the effect of estrogen replacement therapy on mood in perimenopausal and postmenopausal women.

Operation Healthy Sleep This innovative research project is funded by the National Institute of Justice and is designed to examine and evaluate the impact of sleep disorders and treatment of sleep disorders on the safety, health and performance of Massachusetts State Police and the City of Philadelphia Police.

Restless Legs Syndrome The Sleep HealthCenter associated with Brigham and Women’s Hospital is conducting two new research studies on treatments for Restless Legs Syndrome (uncomfortable sensations in the legs accompanied by the urge to move, which generally start during periods of rest and are worse at night).

Portable Monitoring for Sleep Apnea Sleep HealthCenters is evaluating several portable monitors which will eventually be used in the patient’s home to diagnose obstructive sleep apnea. During the course of the study, the monitor will be assessed for efficacy in the sleep laboratory and in the patient’s home; the patient will evaluate the monitor’s comfort and ease of use.