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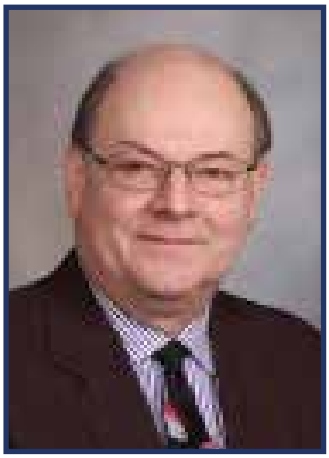
Message from the President



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Commentary on recent SASM Board Meeting Highlights and Sleep Medicine Position Papers from the President of SASM

SASM Board Meeting Highlights

The launch of the Chinese New Year on February 8th heralds in the year of the fire monkey with many ongoing SASM activities important to the membership. In addition, there are some recent Academy of Sleep Medicine position papers that have pertinent implications for the approach to treatment in hospitalized patients with obstructive sleep medicine that I would like to briefly draw your attention to. Like the monkey, your Board Members hope to foster some of this animal's attributes and favorable traits, including being smart, cheerful, vigilant, flexible and energetic while avoiding the other well-known monkey business or character flaw of frequent naughtiness.

The February 3d Board Meeting provided updates to many active projects. The membership will be pleased to know that our financial position is strong guided this year under the able leadership of Dr. Dennis Auckley, and the membership has swelled with to levels over 1,000 thanks to the aggressive efforts of Chair, Dr. Stavros Memtsoudis, and Co-Chair, Dr. Babak Mokhlesi. As with any organization, our financial stability and long-term integrity is fundamentally dependent on a strong and active membership, so we ask all of you to carry the SASM torch and encourage your colleagues to come to our Annual Meeting, which we hope sparks a strong interest in joining our Society.

Our Society has been partnering with the Anesthesia Quality Institute to further expand our now active Obstructive Sleep Apnea Death and Near Miss Registry, with the goal to identify perioperative recurring patterns or themes underlying death or adverse events suspected to be related to obstructive sleep apnea with the ultimate aim of risk prevention and improved patient safety. More information can be found on our website home page and case report instructions and forms are available on the OSA Death and Near Miss

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Editor's File

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Amid the chaotic weather that this spring has thrown at us, we have a truly momentous year unfolding for our community. This summer, the Society of Anesthesia and Sleep Medicine Guideline on Preoperative Screening and Assessment of Patients with Sleep Disordered Breathing will be published, marking an important landmark in our efforts to simplify the challenge of managing patients with suspected or known OSA, treated or otherwise. The task of marshalling the forces (aka herding the cats) was handled brilliantly primarily by Dr. Frances Chung to perfection, and I believe this guideline will prove greater worth to clinicians than existing ones in literature.

This edition also marks the first time we have invited experts to share scientific material on our industry partners' products. The WatchPAT brings unique advantages to the field of sleep monitoring, and could play a more important role in the perioperative arena in the coming years. Also included in this edition, are articles describing the interactions between opioid analgesics and OSA, pediatric adenotonsilectomy and literature updates.

Happy Reading!

Registry website at **http://depts.washington.edu/asaccp/projects/obstructive-sleep-apnea-osa-death-near-miss-registry.** We hope to soon have a user-friendly IRB template to allow easy submission to local research Boards and further encourage new submissions to facilitate the completion of the initial registry.

Chair, Dr. Girish Joshi, and his Conference and Education Committee are nearing completion of our preliminary Annual Meeting program for 2016 and we expect another exciting meeting this year in Chicago, Illinois. The Clinical Committee has submitted the first of our SASM clinical guidelines and this will soon be published in the high profile journal, Anesthesia and Analgesia. Several other committees also identified on our website are very active and we encourage members to seek out the chair and co-chairs of these committees if interested in more active participation.

Recent Sleep Medicine Position Papers

Telemedicine has gained a stronghold in clinical medicine in many different fields to provide care in under-served areas, as well as to facilitate access to consultation in high volume delayed specialty appointment areas. Sleep medicine fulfills such a need and interested practitioners hoped that telemedicine could promote care models, whereby sleep specialists, patients, primary care providers, and allied team members improve the process of healthcare delivery in a high quality and expeditious manner, (*Singh J et al, American Academy of Sleep Medicine (AASM)* position paper for the use of telemedicine for the diagnosis and treatment of sleep disorders. *(J Clin Sleep Med 2015; 11(10):1187–1198).* Although not intended to represent an AASM guideline or consensus statement, several salient features to guide deployment of this practice were promulgated in this article. The taskforce recommended that clinical care standards should simulate live office visits, but clinical judgment should guide the extent of applications in the diagnosis and treatment of individual patients with sleep disorders. This means that the roles, expectations, and responsibilities of both patients and providers will need to be defined with appropriate technical standards. It must be obvious how telemedicine may become especially useful in the evaluation and management of peri-operative situations for patients with previous, new, or even suspected sleep apnea. This report serves nicely to provoke exploration into this avenue of care by identifying important issues and offers some useful recommendations for SASM members to consider.

It has been no surprise to care providers of CPAP therapy to hospitalized patients with obstructive sleep apnea that those apparently in need of treatment, especially in the immediate post-operative period, can be resistant to CPAP use. The role of alternative therapies has been pondered and explored, including use of oral appliances. Although the peri-operative issue was not specifically addressed, the AASM recently published a position paper that firstly recommended that sleep physicians prescribe oral appliances as a standard of care for patients with obstructive sleep apnea who are intolerant of CPAP therapy or prefer alternate therapy, *(Ramar K et al. Clinical practice guideline for the treatment of obstructive sleep apnea and snoring with oral appliance therapy: an update for 2015. J Clin Sleep Med 2015; 11(7):773–827).* It is easy to understand why this area needs to be examined in the near future to clarify whether or not there is a viable role for oral appliance treatment for patients with significant OSA in the peri-operative arena.

We on the Executive Committee and SASM Board of Directors look forward to the upcoming year of activities and service to our members. As always, we remain open to your comments and requests and hope the year of the monkey brings prosperity to you and our Society. ❖

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A User's Review of WatchPAT Unified Home Sleep Testing Device

I am honored to be invited to share my clinical experience using WatchPAT™, an FDA approved home sleep testing device, with the SASM. As a 25-year Fellowship trained sleep medicine physician, with a neurology background, I recently introduced WatchPAT Unified to my practice. Frankly, not having brain waves, airflow, or classic respiratory effort, was a paradigm shift that initially made me insecure, despite validation studies.

However, I have come to appreciate the benefits and utility of this device.

WatchPAT is a novel portable sleep-testing device that uses peripheral arterial tonometry detection in the fingertip as a surrogate signal for respiratory effort. The premise is detection of alpha adrenergic sympathetic autonomic activity. As the nervous system is "aroused" by breathing struggles, the elevated sympathetic tone causes vasoconstriction, which attenuates the PAT signal. PAT sensitively detects these autonomic arousals based on the pattern of the peripheral arterial tonometry waveforms in conjunction with oxygen desaturation levels. It is a well validated instrument which has been shown to have a high correlation with the results of gold standard laboratory attended polysomnograms based on a meta analysis study, with RDI correlation 0. 879 (95% Cl 0.849–0.904; P <0.001) and AHI correlation 0.889 (95% Cl 0.857–0.920 p < 0.001) [(1)]

Essentially, the WatchPAT provides six channels of data, which exceed the number of channels required for "level III" home sleep testing devices. The device provides PAT signal, oximetry, actigraphy, heart rate, position, and decibels of snoring. It yields a user-friendly summary report that shows timeline data, similar to an all night trend from a polysomnogram. What is fairly unique among home sleep testing devices, is the algorithm detecting sleep versus wake, as well as identifying sleep stages as light sleep (roughly equivalent to stage I and 2), deep sleep (roughly equivalent to stage III or slow-wave sleep), and stage REM. The estimation of total sleep time is a huge asset, allowing a significantly more accurate determination of AHI/RDI in contrast to devices which only provide the total recording time. For instance, in someone with insomnia, the diagnosis of sleep apnea may be missed or minimized without knowledge of the actual sleep time, due to diluting a small number of respiratory events when divided by a large time denominator. This would also have implications for testing in

inpatient settings, where sleep wake patterns are notoriously disrupted.

The measurement and summary display of snoring decibels is a unique feature, not even available with laboratory attended studies. It is interesting and informative to review with patients the correlation between their snoring intensity and their position. One caveat is that the device can pick up ambient sound so people should be advised to turn off televisions, and sleep separately, if there is a snoring bed partner.

Accurate position detection is important, as those with purely positional sleep apnea can be offered treatment using one of a variety of commercial positioning devices, some of which have become quite sophisticated. I find the position sensor to be quite accurate. Some other home testing units place it on the head, which can diverge from the position of the trunk. Others place it on belts, which can shift position.

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In this case, position sensor is securely pasted on the sternum

Another practical feature is the simplicity of use for the patient, as well as for the provider. The device requires placement of a wristband similar to a wristwatch, a finger probe (the finger is inserted into a cup like device), and a small flat circular sensor pasted onto the sternum. The low profile equipment allows people to sleep comfortably in all positions, including prone. It was remarkable to see so much prone sleep, since lab tests and most other home sleep testing devices have protuberant boxes that essentially inhibit the prone position. With the recent advent of the "all in one" unified finger probe, almost all patients can succeed with the test. Itamar also provides a 24-hour phone line for patient support.

Dramatically quicker turn-around time has been another appreciated feature. Patients can pick up the device one day and bring it back the next day, at which time they can have their follow up appointment for results and recommendations. This is faster than the time it usually takes to merely schedule a laboratory study. This is time saving, cost effective, and allows initiation of treatment much sooner than with labor-intensive laboratory studies. Quick turnaround would also likely be relevant in facilitating pre-operative evaluations.

The objective standardized scoring algorithm is an appreciated feature. For those who have interpreted hand scored polysomnograms, you are aware that the potential for inter–score variability is a real problem. Scoring 1,000 page sleep studies 30 seconds at a time for sleep staging and arousals, and then re-scoring them for respiratory and other events, is mind numbing for staff. It is also tedious for interpreting physicians responsible for verifying and editing the manually scored data. Having standardized scoring algorithms eliminates human bias and ensures that apples will be compared to apples with subsequent re-testing.

Another benefit of WatchPat is that is can be used to assess treatment while using positive airway pressure therapy. Since there is no nasal or oral airflow sensor, a mask can be worn.

The graphic summary report is colorful and intuitively easy to understand by the patient. It facilitates an engaging interaction with the patient when reviewing the results.

There are some important caveats to keep in mind when selecting patients. First is that use of alpha 1 or alpha 2 antagonists is a contra-indication, as they blunt the autonomic activity that produces the PAT signal (fingertip vasculature is under alpha adrenergic control). These include BPH and HTN medications such as doxazosin, silodosin, prazosin, tamsulosin, alfuzosin, and terazosin. Intermittent or paroxysmal atrial fibrillation is acceptable, as the algorithm discards unusable time, and the report indicates the total valid time upon which the findings were based.

Another caveat is that the WatchPAT does not yet differentiate central from obstructive sleep apneas. Therefore, pre-selection of patients is important. If a patient has low cardiac output, or central apnea is suspected for other reasons, a study device utilizing effort belts would be indicated. That being said, WatchPAT would still screen and detect the presence of unspecified respiratory events, which could later be clarified with follow up testing.

In the event of negative findings in a patient with high pre-test probability for OSA, follow up polysomnography is suggested.

In summary, WatchPAT Unified is a sophisticated, patient and physician friendly FDA approved device that I have enjoyed incorporating into my outpatient sleep medicine practice. Current guidelines for home sleep testing from the American Academy of Sleep Medicine include interpretation by sleep Board certified physicians. With the above caveats in mind, WatchPAT would likely have high utility in the pre-anesthesia assessment arena as well. ❖

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Going Beyond Adenotonsillectomy in Pediatric Obstructive Sleep Apnea Patients

Obstructive Sleep Apnea (OSA) increases the risk of postoperative respiratory complications in children. A major issue continues to be recognition of sleep disordered breathing (SDB) and specifically obstructive sleep apnea (OSA) in children undergoing surgical procedures, which is in part due to evolving standards in the diagnosis, evaluation and treatment of these conditions. While 80% of the over 500,000 adenotonsillectomies performed yearly in United States are for treatment of SDB or OSA [1], the cure rate is unknown, with as many as 25% having persistent OSA following surgery. [2,3] Risk factors for persisting OSA following adenotonsillectomy (AT) have been identified and include obesity, age > 7 years, African-American ethnicity, preoperative diagnosis of severe OSA, asthma, male sex, narrow mandible, craniofacial anomalies, neuromuscular disorders and persisting tonsillar hypertrophy and SDB symptoms. [3-7] The pediatric anesthesiologist may be required to provide anesthesia for a diagnostic MRI, bronchoscopy or upper airway endoscopy to determine the level(s) of residual airway obstruction after surgery. Residual OSA after AT should be considered in any child with these risk factors.

As a result of the under diagnosis of OSA and the suboptimal cure rates following AT, many children have general anesthetics prior to or even after recognition of the problem, leaving them vulnerable to postoperative respiratory complications. It is unclear how many children annually undergo general anesthesia with an OSA diagnosis or have at least undergone screening for it. Pediatric anesthesiologists are asked more and more to anesthetize children for various procedures. At Nationwide Children's hospital, nearly 5,000 remote radiology and 3,000 dental procedures are performed annually under general anesthesia and the numbers continue to climb. However, they perform less than 3,000 Sleep Polysomographys (PSGs) a year to diagnose OSA. They report approximately 1% unanticipated admissions yearly (300-400 patients/year), with almost 20% due to respiratory complications. It is unclear how many of these could have been due to undiagnosed OSA.

While PSG still continues to hold its place as gold standard for diagnosis of OSA in children [8], SDB is not easily defined by PSG. In the case where a child has no demonstrable OSA by PSG, payment will be declined for surgical intervention creating a disincentive for screening, which otherwise would be helpful in postoperative risk stratification. Caregiver reported daytime sleepiness and hyperactivity and the Connors abbreviated questionnaire (distractibility/attention/over activity) and Epworth sleepiness measures [9] may help identify at risk children. The 22-item sleep related breathing disorder scale, a subscale of the pediatric sleep questionnaire developed by Chevrin et al., has been validated in children, but is cumbersome and unwieldy to use in a clinic setting relegating its use in research settings. [10] Unfortunately, validation of pediatric sleep apnea questionnaires is lacking in a surgical setting. Promising alternatives to PSG include biological markers [11] and home-based single channel recordings (overnight pulse oximetry $\pm$ recording of airflow or ECG) and sleep studies (PSG or respiratory polygraphy). [12] Overnight pulse oximetry has been shown to be an effective and efficient means to predict OSA and provide postoperative risk stratification, but clinical uptake has been slow. [13] At the moment in the absence of PSG findings, it still appears to be incumbent on the surgeon to determine whether to proceed surgically based on clinical findings, which has been shown to over diagnose OSA. [14]

Unique structural and functional

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characteristics complicate the diagnosis of OSA in children. [15, 16] Using the Cine MRI, Donnelly and colleagues have defined potential areas of obstruction using alpha 2 agonists, where greater frequency and collapse were noted in patients with OSA in the naso and hypopharynx. [17] Adenoidal hypertrophy was associated with an adenoid tissue thickness of greater than 12mm causing obstruction in the nasopharynx. A diagnosis of lingual tonsil hypertrophy was noted if greater than 10mm in diameter and abutting both the posterior tongue and pharyngeal wall. Supraglottoplasty is increasingly being utilized to manage laryngomalacia associated OSA in infants. [18] Diagnostic MRI, sleep endoscopies or bronchoscopies are becoming more common to define the areas of dynamic obstruction. Anesthesiologists involved in these diagnostic studies describe the challenge of managing an actively obstructing child without airway instrumentation. [17]

As more children require general anesthesia for various procedures and diagnostic tests, the attending pediatric anesthesiologist needs to know whether the child has OSA or SDB for accurate postoperative risk stratification. Unfortunately, AT doesn't equal a cure. It is possible we are overlooking underlying OSA because the usual cues to be vigilant may not be as prominent in children undergoing non-otolaryngologic surgery. To better quantify this perceived problem, the jointly sponsored SASM and ASA closed claims project "OSA Death and Near Miss Registry" should expand its scope to include children. [19] A simple screening tool similar to the adult "STOP BANG" mnemonic needs to be developed for all children undergoing surgery or sedation outside of the operating room. In addition, it will be important to develop consensus guidelines for AT that identify effective and easily implemented OSA diagnostic/screening tools, incorporate criteria for mandatory PSG testing and indicate which children require an extended stay for observation and/or a specialized monitoring environment. Core outcome measures, including what constitutes a significant postoperative adverse respiratory event necessitating admission for further observation, need to be defined. Some have started to work on tools to predict postoperative respiratory complications and reduce unanticipated postoperative readmission. [20, 21] Data mining of increasingly sophisticated hospital electronic medical records and administrative databases will provide the numerical power to further these efforts and identify predictor candidates for OSA. It would appear that African-American ethnicity, asthma and morbid obesity complicated by metabolic syndrome are leading candidates to consider. Given that OSA may persist following AT and require additional diagnostic and/or therapeutic procedures, AT should be considered as being only a part of the pediatric OSA and SDB management spectrum and not just as the endpoint. ❖

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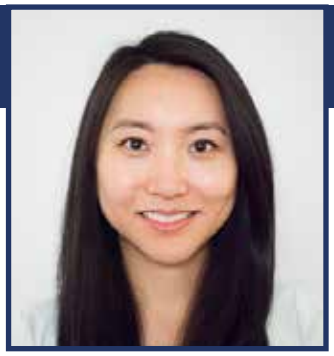

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Interactions Between Obstructive Sleep Apnea, Pain, and Opioids

Obstructive sleep apnea is characterized by repetitive partial or complete collapse of the airway during sleep, which leads to hypoxemia and/or hypercapnia with associated clinical signs of daytime sleepiness, loud snoring, witnessed breathing interruptions, or awakenings due to gasping or choking in the presence of at least five obstructive respiratory events per hour of sleep [1]. Postoperative analgesic management in these patients is challenging. Are patients with OSA more sensitive to the effects of opioids? Do they require higher or lower doses of opioids to treat postoperative pain, compared to non-OSA patients? A better understanding of these relationships may allow us to prevent opioid-related respiratory events and enhance perioperative safety in this patient population.

Opioid-Induced Ventilatory Depression

The incidence of opioid induced ventilator depression in the perioperative period occurs between 0.1 and 37% [2]. There is a delicate balance between achieving adequate analgesia, and causing potentially severe respiratory depression. Common conditions that could precipitate OIVI after receiving therapeutic doses of opioids include underlying diseases like renal failure, genetic polymorphisms involved in drug metabolism, and pharmacokinetic and pharmacodynamic interactions with other respiratory depressant agents [3]. Patient populations who are potentially at high risk for OIVI are the elderly, morbidly obese, and patients who suffer from sleep-disordered breathing and neuromuscular conditions. Pre-anesthesia assessment with tools to screen for OSA such as STOP-Bang questionnaire [4] should aim at characterization of these comorbid or high-risk conditions for OIVI. Although critical events related to OIVI are rare, the incidence of hypoxemia associated with opioid-based analgesia is high, ranging from 12.5-20% [7-9].

A recent prospective observational study reveals that desaturations are frequent and in some cases, persistent, in the first 48 hours postoperatively in a general surgical population: 21% of patients spent on average 10 min/hr or more with SpO_2 < 90% [10]. In two recent retrospective studies of surgical patients with life-threatening respiratory events during opioid-based analgesic therapy, OSA was associated with 33% and 40% of cases [11, 12]. Other predictors of worsening postoperative apnea hypopnea index (AHI) include pre-operative AHI, patient age, and 72-hour opioid dose [8], suggesting that surgical patients suffering from severe OSA and the elderly might be more vulnerable to OIVI.

Mechanisms of Apnea and Opioid Effects in OSA

Obstructive Sleep Apnea (OSA) is a disorder of ventilatory control. As a consequence, OSA severity is largely determined by the type and effectiveness of compensatory mechanisms that are engaged in response to airway obstruction. Pharyngeal dilator muscles receive input from at least three different types of sources: (a) central respiratory drive (i.e., rising $PaCO_2$ and declining PaO_2), (b) local negative airway pressure during inspiration (negative pressure reflex), and (c) wakefulness drive [13]. In OSA patients, the anatomically compromised airway, compounded by diminished pharyngeal dilator activity during sleep, undergoes repetitive, partial or complete, occlusion as a result of the negative inspiratory pressure exerted by the diaphragm. Airway obstruction is followed by a gradual rise in the contracting force of pharyngeal dilators. When the rising chemical drive (i.e. rising PaCO2 and diminishing PaO2) reaches a certain threshold, pharyngeal dilators are effectively recruited to open the airway and restore patency. Opioids further inhibit chemical,

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behavioral, and motor control of respiration, which may further raise arousal thresholds, prolong airway obstruction and precipitate hypoxemia [14,15].

Intermittent Hypoxia, Pain and Opioid Effects

Two distinct pathophysiological components of OSA, namely sleep disruption and nocturnal intermittent hypoxemia appear to enhance pain directly or via inflammatory pathways [16, 17]. Sleep deprivation and/or sleep fragmentation enhance pain sensitivity and spontaneous reporting, possibly by increasing the expression of hyperalgesic inflammatory mediators [18], or by acting on central pain-modulatory networks. Patients suffering from insomnia demonstrate hyperalgesia, and insomnia symptoms predicted intensity and chronicity of pain in hospitalized burn patients [19].

Also, intermittent hypoxia significantly increased pain reporting from subjects suffering from OSA, independently of the effects of sleep fragmentation and systemic inflammation [20]. More specifically, a decrease in the nocturnal nadir SaO_2 from 92 to 75% approximately doubled the odds for reporting pain in this population. Consistent with these observations, treatment of OSA with Continuous Positive Airway Pressure (CPAP) decreased the sensitivity to painful stimuli in adults [21].

Hypoxemia may also play a role in determining sensitivity to the effect of opioids. Several pediatric studies demonstrate lower opioid requirements after adenotonsillectomy in children with lower preoperative nocturnal oxygen saturations [22]. A possible mechanism is up-regulation of μ-opioid receptors induced by intermittent hypoxia demonstrated experimentally in the developing rat [23] and hence it might be responsible for an increased sensitivity to the analgesic and respiratory effects of opioids [24]. In adult volunteers suffering from OSA, both nocturnal nadir SaO_2 and serum markers of hypoxia, were significantly associated with increased sensitivity to the analgesic effect of remifentanil [25, 26]. The increased sensitivity to effects of opioids may play a role in OIVD in patients with OSA.

Opioids and Sleep

Opioids impair basic sleep-wake mechanisms by inhibiting central cholinergic and adenosinergic transmission. These neurochemical effects result in inhibition of Rapid Eye Movement (REM) sleep, overall sleep disruption, and decreased sleep consolidation, which in turn can promote sleepiness and hyperalgesia in humans [27].

Dr. Chung and colleagues have demonstrated severe sleep disturbances, including decreased slow wave and REM sleep in the first postoperative night, for both OSA and non-OSA patients, followed by a gradual recovery of normal sleep in the subsequent days. Patients with OSA presented with increased apnea and more arterial desaturation on the third postoperative night [9]. This latter finding may have been confounded by the weaning of supplemental oxygen on the third postoperative day, as results of a recent closed claims analysis of fatal and life threatening opioid-induced respiratory events indicate the first 24 hours postoperatively as the period presenting the highest risk for such morbidity [12].

Conclusion

Both intermittent hypoxia and sleep disruption enhance pain, and intermittent hypoxia may also potentiate opioid analgesic responses by activating major inflammatory pathways. Certain subsets of patients with obstructive sleep apnea, characterized by low chemoreflex responsiveness and high arousal thresholds, may be more susceptible to opioid-induced ventilatory impairment. Pediatric patients with OSA have lower opioid requirements with adenotonsillectomy. Reduced postoperative opioid consumption was also shown in bariatric patients suffering from sleep-disordered breathing. Awareness of the various factors affecting pain and/or opioid analgesia in OSA patients will enhance our ability to predict opioid pharmacology and improve perioperative safety in this population. ❖

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Susana Vacas, MD, PhD
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Latest Literature Updates and Featured Article

Featured Article

Contributor: Kimmo Murto

Neck Circumference Percentile: A Screening Tool for Pediatric Obstructive Sleep Apnea

Katz S, Murto K, Barrowman N, Clarke J, Hoey L, Momoli F, Laberge R, Vaccani JP.

Pediatr Pulmonol. 2015 Feb;50(2):196-201.

Adults with large neck circumference (NC) are more likely to develop obstructive sleep apnea (OSA), especially in males. As NC changes with age and sex, no reference ranges for NC existed, until now. Investigators at the Children's Hospital of Eastern Ontario have developed reference ranges – a new pediatric growth curve – to measure and track NC for children between the ages 6–17 years old. Their new study, published in *Pediatric Pulmonology,* reports NC data on 245 children aged 6–17 years presenting for polysomnography, in whom NC reference ranges were applied, to test the association between NC > 95th percentile and OSA.

The study found that in children, NC measuring > 95th percentile for age and sex is associated with increased risk of OSA. When examined by sex, the association was significant in males aged 12 or older, but not in females. Body Mass Index (BMI), did not did not predict OSA in this group.

In older males, as in adults, neck size is a predictor of OSA. This suggests that as in adults, it is not just overall obesity, but body fat distribution centrally (in the trunk and neck) that predicts risk of OSA.

http://www.ncbi.nlm.nih.gov/pubmed/24574055

Literature Updates

Contributors:

Adult Section: *Jean Wong, MD, Meghan Kirksey, MD, PhD, Kimmo Murto, MD, FRCPC*

Pediatric Section: *Kimmo Murto, MD, FRCPC*

Basic Research: *Philip Kurien, MD*

CLINICAL ADULT:

CPAP in the Perioperative Setting: Evidence of Support

Chung F, Nagappa M, Singh M, Mokhlesi B.

Chest 2016; 149; 586-97.

In this review, the authors examine the evidence for the use of CPAP in the preoperative and postoperative periods in surgical patients with diagnosed and undiagnosed OSA. Barriers to diagnosing and treating OSA in the perioperative setting are examined. Identifying which surgical patients with OSA are at increased risk, and which patients may benefit from CPAP are reviewed.

http://www.ncbi.nlm.nih.gov/pubmed/26469321

Impact of Different Nasal Masks on CPAP Therapy for Obstructive Sleep Apnea: A Randomized Comparative Trial

Neuzeret PC, Morin L.

Clin Respir J 2016 Jan 18

In this randomized controlled trial, the authors compared the impact of different nasal masks for CPAP in patients with newly-diagnosed OSA. Patients were randomized to receive CPAP with ResMed Mirage FX® (MFX) or control mask (Fisher & Paykel Zest®, HC407® or Philips EasyLife®. Mask acceptance rate was higher in the MFX vs. control group. CPAP compliance was higher and nasal mask issue-related Home Care Provider visits were lower in the MFX group. There were less failures due to mask discomfort or unintentional leakage in the MFX group.

http://www.ncbi.nlm.nih.gov/pubmed/26780403

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Development and Validation of a Morphologic Obstructive Sleep Apnea Prediction Score: The DES-OSA Score

Deflandre E, Degey S, Brichant J-F, Poirrier R, Bonhomme V.

Anesth Analg 2016; 122:363-72.

The authors developed and validated a new clinical score to predict OSA based on morphologic characteristics only. The DES-OSA Score consists of 5 variables: Mallampati score, distance between the thyroid and chin, BMI, neck circumference and sex. These variables were weighted by 1, 2 or 3 points. A score of >5, 6, and 7 were associated with increased probability of mild, moderate or severe OSA.

http://www.ncbi.nlm.nih.gov/pubmed/26599791

Biomarkers Associated with Obstructive Sleep Apnea and Morbidities: A Scoping Review

De Luca Canto G, Pachêco-Pereira C, Aydinoz S, Major PW, Flores-Mir C, Gozal D.

Sleep Med. 2015 Mar;16(3):347-57.

Of the potentially promising morbidity biomarkers, plasma IL-6 and high sensitivity C-reactive protein appear to exhibit a favorable profile, and may discriminate OSA patients with and without morbidities in both adults and children.

http://www.ncbi.nlm.nih.gov/pubmed/25747333

Diagnostic Capability of Biological Markers in Assessment of Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis

De Luca Canto G, Pachêco-Pereira C, Aydinoz S, Major PW, Flores-Mir C, Gozal D.

J Clin Sleep Med. 2015 Jan 15;11(1):27-36

Kallikrein-1, uromodulin, urocotin-3, and orosomucoid-1 when combined have enough accuracy to be an OSA diagnostic test in children. IL-6 and IL-10 plasma levels have potential to be good biomarkers in identifying or excluding the presence of OSA in adults.

http://www.ncbi.nlm.nih.gov/pubmed/25325575

The Association Between Nocturnal Cardiac Arrhythmias and **Sleep** Disordered Breathing: The DREAM Study

Selim BJ, Koo BB, Qin L, Jeon S, Won C, Redeker NS, Lampert RJ, Concato JP, Bravata DM, Ferguson J, Strohl K, Bennett A, Zinchuk A, Yaggi HK.

J Clin Sleep Med. J Clin Sleep Med. 2016 Feb 29

697 veterans with suspected sleep disordered breathing were observed for nocturnal arrhythmias during polysomnography. After controlling for age, sex, BMI, and cardiovascular disease, moderate to severe sleep disordered breathing was associated with a two-fold increased risk of nocturnal arrhythmias. Frequency of hypoxic events was positively associated with arrhythmia risk.

http://www.ncbi.nlm.nih.gov/pubmed/26951420

Genome-Wide Association Analysis Identifies Novel Loci for Chronotype in 100,420 Individuals from the UK Biobank

Lane JM, Vlasac I, Anderson SG, Kyle SD, Dixon WG, Bechtold DA, Gill S, Little MA, Luik A, Loudon A, Emsley R, Scheer FA, Lawlor DA, Redline S, Ray DW, Rutter MK, Saxena R.

Nat Commun. 2016 Mar 9;7:10889.

Using the UK Biobank, genome-wide associations were identified linking sleep-time preference (chronotype) to genes and genetic variants related to circadian rhythm and previously uncharacterized pathways that may relate to circadian rhythm and light sensing. Central nervous system, ocular, and fear-response pathways were implicated. Correlations were noted potentially linking the genetics of chronotype to schizophrenia, educational attainment, and BMI.

http://www.ncbi.nlm.nih.gov/pubmed/26955885

Changes in First Postoperative Night Bispectral Index After Daytime Sedation Induced by Dexmedetomidine or Midazolam Under Regional Anesthesia: A Randomized Controlled Trial

Tan WF1, Miao EY, Jin F, Ma H, Lu HW.

Reg Anesth Pain Med. 2016 Mar

1.111 elderly male patients undergoing TURP under spinal anesthesia were randomized to no sedation, sedation with midazolam, or sedation with dexmedetomidine. Intraoperative sedation and postoperative sleep were measured

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using BIS monitor. Sleep efficiency following surgery was found to be lowest in the dexmedetomidine group and sleep duration was approximately 240 minutes longer in the midazolam group compared to those who had been sedated with dexmedetomidine.

http://www.ncbi.nlm.nih.gov/pubmed/26928796

Clinical Pediatric

Perioperative Respiratory Complications Following Awake and Deep Extubation in Children Undergoing Adenotonsillectomy

Baijal RG, Bidani SA, Minard CG, Watcha MF.

Paediatr Anaesth. 2015 Apr;25(4):392-9.

There was no difference in the incidence of perioperative respiratory complications in children undergoing a T&A following an awake vs deep extubation. Only weight ≤14 kg was associated with increased perioperative respiratory complications.

http://www.ncbi.nlm.nih.gov/pubmed/25370474

The Conundrum of Primary Snoring in Children: What Are We Missing in Regards to Cognitive and Behavioural Morbidity?

Biggs SN, Nixon GM, Horne RS.

Sleep Med Rev. 2014 Dec;18(6):463-75.

Historically, PS has been considered benign, however there is growing evidence that children with PS exhibit cognitive and behavioural deficits equivalent to children with OSA.

http://www.ncbi.nlm.nih.gov/pubmed/25060969

Obstructive Sleep Apnoea in Craniofacial Microsomia: A Systematic Review

Caron CJ, Pluijmers BI, Joosten KF, Mathijssen IM, van der Schroeff MP, Dunaway DJ, Wolvius EB, Koudstaal MJ.

Int J Oral Maxillofac Surg. 2015 May;44(5):592-8.

According to the literature, OSA is related to CFM. However, as there have been no prospective studies and few studies have presented objective measurements, no definitive conclusions can be drawn.

http://www.ncbi.nlm.nih.gov/pubmed/25769220

Characteristics of Children Under Two Years of Age Undergoing Tonsillectomy for Upper Airway Obstruction

Côté V, Ruiz AG, Perkins J, Sillau S, Friedman NR.

Int J Pediatr Otorhinolaryngol. 2015 Jun;79(6):903-8.

In children under 2 years, ethnicity seems to be a predictor of OSA severity. African-American, prematurity, daycare and Down syndrome patients were significantly more represented in our study population. PSG is more likely to be requested for syndromic children.

http://www.ncbi.nlm.nih.gov/pubmed/25912628

Adenotonsillectomy Complications: A Meta-Analysis

De Luca Canto G, Pachêco-Pereira C, Aydinoz S, Bhattacharjee R, Tan HL, Kheirandish-Gozal L, Flores-Mir C, Gozal D.

Pediatrics. 2015 Oct;136(4):702-18.

The most frequent early complications after AT are respiratory compromise and secondary hemorrhage. Based on the current limited evidence, children with OSA appear to have more respiratory complications. Conversely, hemorrhage appears to be more frequent in children without OSA.

http://www.ncbi.nlm.nih.gov/pubmed/26391937

Basic Research

Chronic Intermittent Hypoxia Alters Local Respiratory Circuit Function at the Level of the preBötzinger Complex

Garcia AJ 3rd, Zanella S, Dashevskiy T, Khan SA, Khuu MA, Prabhakar NR, Ramirez JM.

Front Neurosci. 2016 Feb 4;10:4.

The preBotzinger complex in rats is a respiratory neuronal network driving inspiratory rhythm. Chronic intermittent hypoxia (as is the case in OSA) causes irregular firing of the preBotzinger complex. Dysrhythmia in the preBotzinger complex loosens the coupling of neuronal transmission with XIIn. Lipid peroxidation is increased in both the preBotzinger complex and XIIn as a result of chronic intermittent hypoxia. Treatment with antioxidant can reverse the

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instability in neuronal coupling caused by the exposure hypoxia. This work demonstrates the effect of hypoxia on rhythmic breathing in a salient neuronal network and provides a possible therapeutic strategy to re-establish rhythmic neuronal connectivity in this pathway.

http://www.ncbi.nlm.nih.gov/pubmed/26869872

Simulated Night Shift Disrupts Circadian Rhythms of Immune Functions in Humans

Marc Cuesta, Philippe Boudreau, Geneviève Dubeau-Laramée, Nicolas Cermakian and Diane B. Boivin

J Immunol 2016; 196:2466-2475

This work delineates the normal oscillation and responsiveness of circulating monocytes and T lymphocytes in ten human volunteers over circadian time. Under normal circadian parameters, bimodal cytokine secretion was observed with the night peak caused by an increased responsiveness of monocytes, and the day peak corresponding to a higher absolute number of monocytes. T lymphocytes demonstrated an evening peak caused by both higher cell count and responsiveness. When subjected to a night shift schedule (acute circadian disruption) monocyte and T cells circulating phase was not changed but the responsiveness of both cell types was advanced (earlier expression of cytokine) after stimulation. This suggests that acute changes in sleep-wake cycles alter the cell intrinsic responsiveness to stimulation whereas parameters governing circulation may lag behind.

http://www.ncbi.nlm.nih.gov/pubmed/26873990 ❖

If you are interested in becoming more involved in the Society of Anesthesia and Sleep Medicine, please send your C.V. to the SASM administrative office by emailing: info@sasmhq.org
For more information on committees, please visit: www.sasmhq.org/current-committee-membership

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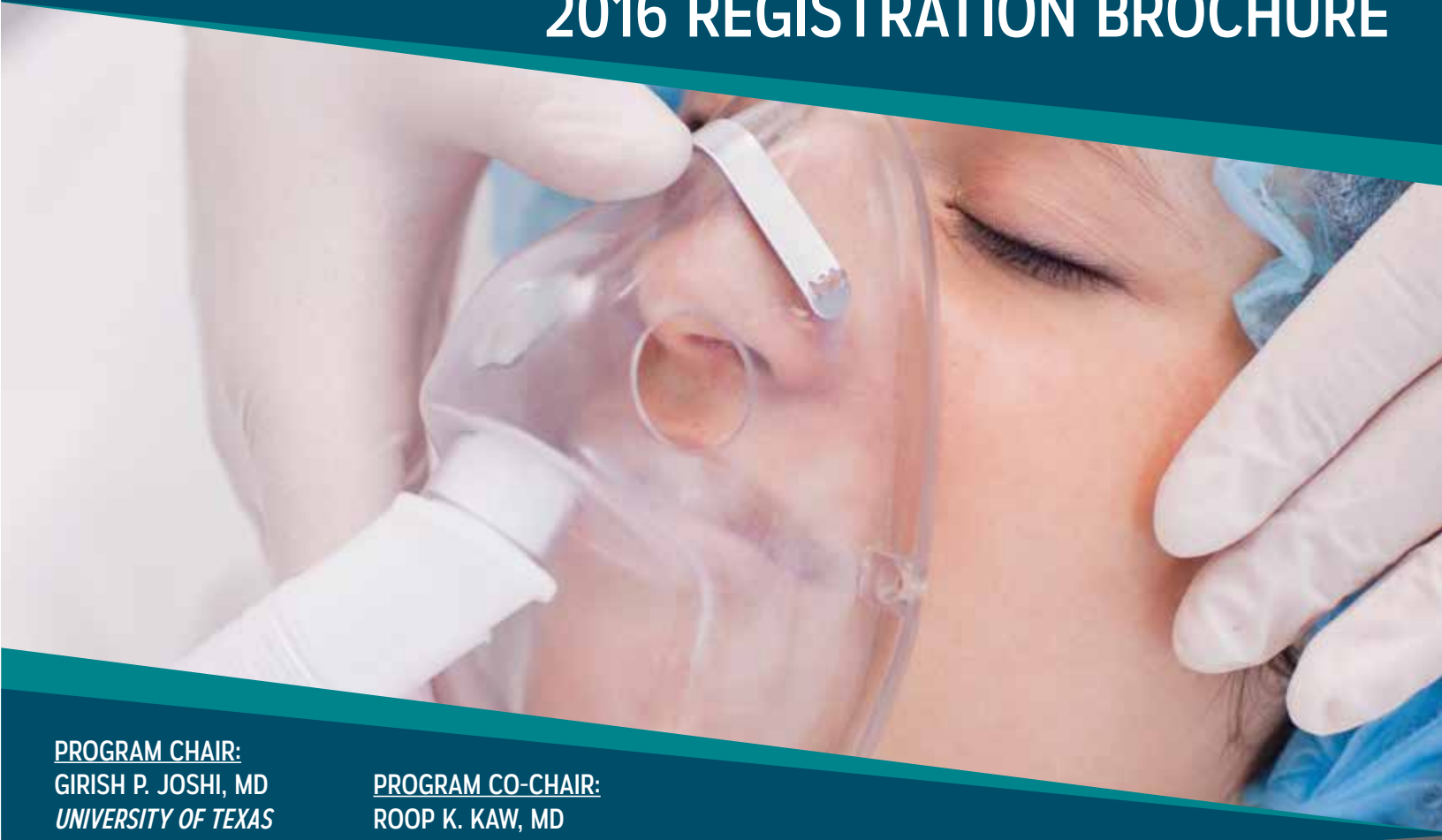
2016 REGISTRATION BROCHURE



PROGRAM CHAIR:
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PROGRAM CO-CHAIR:
ROOP K. KAW, MD
CLEVELAND CLINIC

SASM 6TH ANNUAL MEETING

OCTOBER 20-21, 2016
LOCATION TO BE ANNOUNCED
CHICAGO, IL

PERIOPERATIVE SLEEP-DISORDERED BREATHING: IT'S NOT JUST SLEEP APNEA

6737 W Washington St, Ste 4210 • Milwaukee, WI 53214
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ACCREDITATION INFORMATION

PROGRAM OBJECTIVE

The objective of this meeting is to provide a forum for discussions pertaining to the common grounds between sleep and anesthesia. The goal is to promote excellence in medical care, research and education in anesthesia, sleep medicine and perioperative medicine.

TARGET AUDIENCE

This conference is designed for anesthesiologists, critical care physicians, residents, fellows-in-training, general medicine physicians, pulmonary physicians, sleep medicine physicians, surgeons, scientists and allied health care professionals.

PRACTICE GAPS

The overall goal of SASM is to advance standards of care for clinical problems shared by anesthesiology and sleep medicine, including perioperative management of sleep disordered breathing (SDB), and to promote interdisciplinary communication, education and research in matters common to anesthesia and sleep.

To identify and address present clinical practice gaps, we propose to explore the following gaps existing today in care of patients with sleep-disordered breathing:

- Special challenges in perioperative management of restless leg syndrome, narcolepsy and insomnia
- Difficulty in recognition of sleep-disordered breathing in pregnant females; concerns regarding neuraxial opioids in pregnant patients undergoing labor or delivery; and PAP therapy in pregnant patients
- What's new on monitoring and devices

LEARNING OBJECTIVES

1. Discuss preoperative considerations and management in special situations like restless leg syndrome, narcolepsy and insomnia.
2. Explore alternative therapies to positive airway pressure and the changing landscape of non-invasive ventilation.
3. Discuss anesthetic risks for neuraxial opioids in parturients with sleep-disordered breathing undergoing labor epidural and/or cesarean section, as well as for parenteral opioids in non-obstetric surgery in the obstetric patient.
4. Examine European perspectives in management of sleep-disordered breathing.

ACCREDITATION STATEMENT

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of QuorumEDU and the Society of Anesthesia and Sleep Medicine (SASM). QuorumEDU is accredited by the ACCME to provide continuing medical education for physicians.

CREDIT DESIGNATION STATEMENT

QuorumEDU designates this live activity for a maximum of ***12.75 AMA PRA Category 1 Credits***™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

HOTEL INFORMATION

The SASM 6th Annual Meeting will be taking place at a location to be announced in Chicago, Illinois, from October 20-21, 2016. Starting in **June 2016,** please make your hotel reservations online through the American Society of Anesthesiologists (ASA) room block by visiting www.ASAhq.org. Be sure to book your room as soon as possible to ensure availability!

SCHEDULE OF EVENTS

THURSDAY, OCTOBER 20, 2016

1:00 – 1:05 pm	Welcome – 6th Annual Meeting Anniversary Highlights	*Girish P. Joshi, MD*
1:05 - 2:45 pm	Devices in Management of Sleep-Disordered Breathing Patients: Interfaces; *Moderator: Roop Kaw, MD*	
1:05 – 1:35 pm	CNEP Device	*Nicholas Hill, MD*
1:35 – 2:05 pm	Alternative Treatments to Positive Airway Pressure Therapy for OSA	*Peter Gay, MD*
2:05 – 2:35 pm	The Changing Landscape of NIV: Introducing Helmet Ventilation	*Bhakti Patel, MD*
2:35 – 2:45 pm	Panel Discussion	
2:45 – 3:15 pm	Coffee Break	
3:15 - 5:00 pm	Monitoring for Patients with Sleep-Disordered Breathing *Moderator: Frances Chung, MB BS*	
3:15 - 3:45 pm	Monitoring Other? Delirium, Mood and Pain Scales	*Pratik Pandharipande, MD*
3:45 - 4:15 pm	Update on Continuous Respiratory Monitoring Options for Low Acuity Settings	*Frank Overdyk, MSEE, MD*
4:15 - 4:45 pm	Monitoring and Troubleshooting Adherence to PAP Devices and Understanding Device Downloads	*Christine Won, MD*
4:45 - 5:00 pm	Panel Discussion	
5:30 - 6:30 pm	Welcome Reception	
6:00 - 8:00 pm	Dinner **Additional Fee Applies for Non-Gold Patron Members*	
6:00 - 6:05 pm	Welcome and Introductions	*Peter Gay, MD*
6:05 - 7:00 pm	The Patient Safety Movement Foundation	*Joe Kiani*
7:00 - 8:00 pm	Sleep and Patient Safety: Not So Strange Bedfellows	*Tim Morgenthaler, MD*

FRIDAY, OCTOBER 21, 2016

7:00 - 7:30 am	Registration and Continental Breakfast	
7:30 - 7:55 am	Annual General Meeting; Peter Gay, MD, SASM President	
8:00 - 10:00 am	Keynote Speakers and Special Topics *Moderator: Dennis Auckley, MD*	
8:00 – 8:05 am	Welcome - Overview	*Dennis Auckley, MD*
8:05 - 8:55 am	KEYNOTE SESSION: Sleep-Disordered Breathing and Safety in Hospitalized Patients	*Phyllis C. Zee, MD, PhD*
8:55 - 9:45 am	KEYNOTE SESSION: Obesity Hypoventilation Syndrome: The Big and the Breathless	*Babak Mokhlesi, MD*
9:45 - 10:00 am	Panel Discussion	
10:00 – 10:30 am	Refreshment Break and Poster Viewing	
10:30 - 12:15 pm	Sleep-Disordered Breathing in Pregnancy *Moderator: Alexandra S. Bullough, MBChB, FRCA, MD*	
10:30 - 11:00 am	Sleep-Disordered Breathing in Pregnancy: What's All the Fuss About?	*Judette Louis, MD, MPH*
11:00 - 11:30 am	Screening and Drugs: Like the TSA…	*Ellen Lockhart, MD*
11:30 - 12:00 pm	PAP Therapy in Pregnancy	*Louise O'Brien, PhD, MS*
12:00 - 12:15 pm	Panel Discussion	

SCHEDULE OF EVENTS *continued*

FRIDAY, OCTOBER 21, 2016 *continued*

12:15 - 1:15 pm	**Awards & Presentations Luncheon**	
	Moderators: Anthony Doufas, PhD and Roop Kaw, MD	
12:30 - 12:35 pm	**2016 Research Grant Award**	
	Moderators: Malin Jonsson Fagerlund, MD, PhD and Toby Weingarten, MD	
12:35 - 1:05 pm	**1st, 2nd and 3rd Place Best Scientific Abstract Awards**	
1:05 - 1:15 pm	**2015 Research Grant Recipient Presentation**	*Mandeep Singh, MD*
1:15 - 3:00 pm	**Perioperative Potpourri** ***Moderator: Peter Gay, MD***	
1:15 - 1:45 pm	**Patient with Restless Leg Syndrome: Perioperative Considerations**	*Lynn Marie Trotti, MD*
1:45 - 2:15 pm	**Patient with Narcolepsy: Perioperative Considerations**	*Mandeep Singh, MD*
2:15 - 2:45 pm	**Patient with Insomnia: Perioperative Considerations**	*Dennis Auckley, MD*
2:45 - 3:00 pm	**Panel Discussion**	
3:00 - 3:15 pm	**Refreshment Break and Poster Viewing**	
3:15 - 5:00 pm	**Perioperative Care of Patients with Sleep-Disordered Breathing: European Perspective; *Moderator: Stavros Memtsoudis, MD***	
3:15 - 3:45 pm	**Sleep-Disordered Breathing and Surgery of Colorectal Cancer**	*Karl Franklin, MD*
3:45 - 4:15 pm	**Managing Sleep-Disordered Breathing in the Perioperative Period: A Research Update**	*Malin Jonsson Fagerlund, MD, PhD*
4:15 - 4:45 pm	**Anxiety Free Operating Room: Implications for a Patient with Sleep-Disordered Breathing**	*Holger Sauer, MD*
4:45 - 5:00 pm	**Panel Discussion**	
5:00 pm	**Closing Remarks and i-Pad Giveaway**	*Girish P. Joshi, MD*

MEETING FACULTY

Dennis Auckley, MD
MetroHealth Medical Center/Case Western Reserve University

Alexandra S. Bullough, MBChB, FRCA, MD
Loyola University Medical Center

Frances Chung, MB BS
University of Toronto

Anthony Doufas, PhD
Stanford University School of Medicine

Malin Jonsson Fagerlund, MD, PhD
Karolinska University Hospital and Karolinska Institutet

Karl Franklin, MD
Umea University

Bhargavi Gali, MD
Mayo Clinic

Peter Gay, MD
Mayo Clinic

Nicholas Hill, MD
Tufts Medical Center

Girish P. Joshi, MD
2016 Program Co-Chair
University of Texas Southwestern Medical Center

Roop Kaw, MD
2016 Program Co-Chair
Cleveland Clinic

Joe Kiani
Masimo

Ellen Lockhart, MD
Washington University School of Medicine

Judette Louis, MD, MPH
University of South Florida

Stavros Memtsoudis, MD
Weill Cornell Medical College

Babak Mokhlesi, MD
University of Chicago

Tim Morgenthaler, MD
Mayo Clinic

Louise O'Brien, PhD, MS
University of Michigan

Frank Overdyk, MSEE, MD
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Pratik Pandharipande, MD
Vanderbilt University Medical Center

Bhakti Patel, MD
University of Chicago

Holger Sauer, MD
Klinikum Westfalen

Mandeep Singh, MD
University of Toronto

Lynn Marie Trotti, MD
Emory University

Toby Weingarten, MD
Mayo Clinic

Christine Won, MD
Yale University

Phyllis C. Zee, MD, PhD
Northwestern University Feinberg School of Medicine

* Registration Form • Register Online at www.SASMhq.org *

Online registration accepted until Wednesday, October 12, 2016 – Limited onsite registration available

This is how your name will appear on your name badge. ***Required**

*FIRST NAME: *LAST NAME:

*COMPANY/AFFILIATION:

SPECIALTY: *PLEASE STATE YOUR HIGHEST DEGREE(S):

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WORK: ( ) – *EMAIL ADDRESS:

Special Needs: ❒ Dietary *(Please Specify)*

REGISTRATION: Please select one of the following registration options:

SASM Member:	**By 8/31/16**	**By 9/30/16**	**After 9/30/16**
❑ **SASM Member** (Physician/Scientist)	$250	$325	$375
❑ **SASM NEW Member** (Physician Scientist) ***Includes 50% Discount on Membership!***	$300	$375	$425
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❑ **Non-Member** (Physician/Scientist)	$325	$425	$475
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Other:	**By 8/31/16**	**By 9/30/16**	**After 9/30/16**
❑ **International** (Non-US/Canada based) Physician/Scientist	$175	$175	$175
❑ **Industry**	$575	$650	$700

ATTENDANCE: Please indicate whether you are attending the following events

❑ **Welcome Reception - $0** (Thursday, October 20, 2016 from 5:30-6:30 pm)

Dinner with Invited Speakers (Thursday, October 20, 2016 from 6:00-8:00 pm)

❑ **Yes, I will be attending the speaker dinner - $125** (I am NOT a Gold Patron Member)

❑ **Yes, I will be attending the speaker dinner - $0** (I am a Gold Patron Member)

MEMBERSHIP RENEWAL: Applicable to returning members only

❑ **I would like to renew my membership to SASM to receive a discount on my registration.**
(For more information on different membership categories, please visit www.SASMhq.org).

❑ Gold Patron - $250 ❑ Active - $100 ❑ Active (International) - $25 ❑ Associate - $50 ❑ Educational - $50

METHOD OF PAYMENT:

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Paper Registrations By Fax, Email or Mail
(SEE CONTACT INFORMATION BELOW)
If you are unable to register online, please fax, email or mail your paper registration form.

Online Registrations
Online registration will be accepted by visiting www.SASMhq.org until October 12, 2016. After October 12, 2016, limited onsite registration is available.

Registration Cancellation
All cancellations must be in writing and sent via U.S. mail, email or fax. Tuition for cancellations postmarked or date stamped before **October 12, 2016** will be completely refunded less an administrative fee of $25.00. **NO REFUNDS WILL BE MADE AFTER OCTOBER 12, 2016.**

Questions?

Society of Anesthesia and Sleep Medicine
6737 W Washington St
Ste 4210
Milwaukee, WI 53214
info@SASMhq.org
OFFICE: **414-389-8608**
FAX: **414-276-7704**

PLEASE NOTE: Registration is not complete until you receive a confirmation email for your registration. If you do not receive this email within 7-10 days of registration, please contact us at 414-389-8608.

It is recommended to bring your confirmation of registration with you to the conference.

Registration Fee Includes:

- ***12.75 AMA PRA Category 1 Credits™***
- Registration and course materials
- Reception, continental breakfast, breaks and lunch

SASM

SASM Membership Benefits at a Glance…

These are exciting times for SASM. While we are a new and growing organization, we feel our collaborative efforts will give rise to unlimited opportunities. You have the ability to make an impact from the very start. ***Please consider joining SASM today!***

The mission of SASM is to advance standards of care for clinical challenges shared by Anesthesiology and Sleep Medicine, including perioperative management of sleep disordered breathing, as well as to promote interdisciplinary communication, education and research in matters common to anesthesia and sleep.

Benefits of SASM Membership include:

- Significantly Reduced Registration Fees at SASM Sponsored Scientific Meetings
- SASM Newsletter
- *Full Voting Rights in Electing SASM Board of Directors and SASM Officers *(*Dependent on membership category)*
- Regular Receipt of "Literature Updates" and "Featured Articles," Allowing All Members to Stay Current on New Developments in theArea
- Enhances Your Network of Regional, National and International Colleagues
- Learn of Collaborative Research Projects
- Educational Material Posted on SASM Website for Members
- Access to a "Discussion Forum" to Evaluate and Discuss the Latest Research, Education and Clinical Practices Pertaining to OSA and Patients with Other Sleep-Disordered Breathing
- Get Advice and Counsel from Other Members Regarding Various Practice Paradigms

The easiest and quickest route to join as a member of SASM is to visit our website, www.SASMhq.org, and pay by credit card by clicking on the Membership Information tab. You can also mail check payment to our office at the address provided below.

SASM Classes of Membership:

❑ **Gold Patron Member - $250**
- Showing special support for SASM
- This donation is inclusive of annual membership and available for all classes of membership.

❑ **Active Member - $100**
- Physicians and Scientists. Active Members have voting rights, can hold office and serve on the Board of Directors.

❑ **Associate Member - $50**
- Non-Physicians and Non-Scientists. Associate Members do NOT have voting rights.

❑ **Educational Member - $50**
- Fellows, Residents, Medical Students or other undergraduates. Educational Members do NOT have voting rights.

Please consider joining as a "Gold Patron" for 2016-17

The additional donation beyond general membership will be used to promote scholarly activity in the area of anesthesia and sleep medicine and promote patient care programs in areas common to anesthesia and sleep medicine. Gold Patrons will be recognized on our website for their extraordinary support of SASM efforts and will be invited to special events highlighting the programs made possible with their donations, including a keynote speaker dinner at the Annual Meeting.

SASM
6737 W Washington Street, Suite 4210
Milwaukee, Wisconsin 53214

SASM is a 501(C)(3) non-profit organization. Membership dues may be deductible as a business expense. **SASM Tax ID number is 27–4613034**