

Message from the President



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The headline event of the last month has been, of course, our second annual scientific meeting held in Washington on October 11th and 12th. Like the first society meeting in Chicago a year previously, it proved a great success both scientifically and socially. Again, it was characterised by excellent thought-provoking papers covering a range of clinical and basic aspects of the relationships between sleep and anesthesia. For all that electronic media has to offer, the opportunity to meet colleagues face to face remains a vital tool in sharing ideas, building relationships and establishing collaborations. The success of the meeting complements other achievements of the last year, our first full formal year of operation.

In the Annual Report I presented at the meeting, I referred to the challenges of founding a new society.

Translating the ideas first articulated at the Challenges in the Perioperative Management of OSA Patients Symposium, organized by Frances Chung and Terence Davidson in San Diego in 2010, into a functioning society requires effort and faith. We are well aware that there are many organizations competing for the attention of already busy and committed clinicians and scientists. We occupy a unique niche between the worlds of anesthesiology and sleep medicine and are well placed to facilitate exploration of the common ground between them. The success of our meetings reflects this, with the insights they provide into growing understanding of shared neurophysiological mechanisms and ventilatory concerns. However, to prosper we need to do more than simply meet to share information, we need a positive agenda to address important issues

identified by our group. There are number of ideas we intend to pursue over the next year. These include formalizing a database of peri-operative adverse outcomes related to sleep apnea based on cases accumulated to date, encouraging efforts to develop a sleep apnea perioperative outcomes registry with which to move forward, completing a sleep research agenda white paper to articulate gaps in knowledge and research priorities, developing a consensus statement regarding perioperative management of patents with sleep disordered breath-

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Editor's File

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SASM: A Great Start and An Ambitious Plan Ahead

The first anniversary of SASM was celebrated during the 2nd Annual Meeting in Washington, DC. As stated by SASM President, David Hillman, our association has potential for significant expansion in the future. Based upon the achievements in just one year, it is clear that the outlined future plans will come to fruition. Obviously, this success is due to the passion and hard work of the Officers, Board of Directors, Committee Chairs and most importantly the members of SASM, who have sacrificed their valuable time.

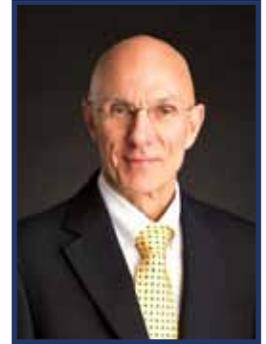
As reported by Dr. Hillman in his Annual Report, SASM has developed relationships with the community and the government. Ralph Lydic represented SSM at the National Sleep Awareness Round Table, a coalition of government, professional and voluntary organizations sponsored by the National Sleep Foundation (NSF) to increase awareness, promote informed policy and support research into, and clinical care of, sleep disorders. Also, SASM has submitted a manuscript on perioperative care of sleep apnea patients to the NSF newsletter, "Sleep Matters."

It is with great pride I report that one of our own, Ralph Lydic, PhD,

University of Michigan, received the 2012 American Society of Anesthesiologists Excellence in Research Award. Dr. Lydic is the founding member and serves on the Board of Directors of SASM. His research on neurophysiology, particularly the effects of sleep and anesthesia on respiration, is well recognized. We would like to extend our congratulations to Dr. Lydic for receiving this high honor.

In this issue, Frances Chung, SASM President-Elect, reports on the success of the 2nd SASM Annual Meeting held in Washington, DC. The conference directors, Frances Chung and Babak Mokhlesi, must be congratulated for organizing this excellent conference. It is obvious from the first two conferences that future SASM meetings will be informative and interactive. It is not surprising that the conference directors have already identified the theme for our next meeting. The topics for next year's meeting, particularly opioid-related respiratory depression, are rapidly expanding. The attendees will have the opportunity to review the significant basic science and clinical research that is being performed. In addition, experts will be presenting their critical analysis of available evidence that would be relevant

for scientists and clinicians alike. Please make plans to attend our next Annual Meeting in San Francisco on October 11, 2013.



Dr. Ralph Lydic

Also in this issue, Jean Wong, summarizes the presentations by Alan R. Schwartz on, "Pathogenesis of Upper Airway Obstruction During Sleep: Implications for Sedative Management" and Roop Kaw on the topic of, "Postoperative Complications and Challenges in Implementing a Perioperative OSA Protocol." In addition, Stavros Memtsoudis discusses the latest on perioperative pulmonary complications in patients with obstructive sleep apnea population. He has included some of the information from the abstract presented at this year's SASM Meeting.

Postoperative sleep disturbances have been shown to have significant influence of surgical outcome. Shireen Ahmad discusses the factors that can influence postoperative sleep pattern. However, the therapeutic options in improving postoperative sleep patterns

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Frances Chung, MBBS, FRCPC
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Second SASM Annual Meeting: A Huge Success

The second SASM Annual Meeting was held from October 11th -12th at the Washington Hilton Hotel, Washington, DC, just before the American Society of Anesthesiologist Annual Meeting. The meeting provided a forum for discussions pertaining to the common grounds between obstructive sleep apnea, sleep and anesthesia. The goal was to promote excellence in patient care, research and education in anesthesia, sleep medicine and perioperative medicine.

The meeting was a great success with 183 registrants. The presentations were excellent and there were heated discussions during the question and answer period. We received a lot of positive feedback from the attendees regarding the excellent choice of topics and outstanding educational quality of the presentations. The handouts for all the presentations are now posted on the SASM web site, www.sasmhq.org

In addition, there were 13 exhibitors that provided information on new products related to anesthesia and sleep medicine. This year, SASM instituted a fun iPad giveaway. Registrants were required to obtain signatures from all the



“The meeting was a great success with 183 registrants.” - Frances Chung, MBBS, FRCPC, President-Elect, SASM

exhibitors to enter into a drawing to win an Apple iPad 3®. This resulted in tremendous interaction between the registrants and the exhibitors.

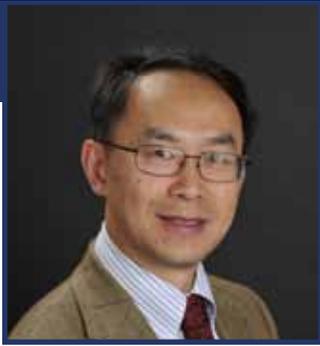
There were 31 scientific abstract presentations. Six research awards were given, four for clinical research and two for basic science research.

On Thursday evening, there was a social function that included a cash bar cocktail reception. It provided an opportunity for networking among SASM members and industry. This was followed by a special dinner for conference speakers

and SASM Gold Patrons. Nancy Collop, MD, Past President of the American Academy of Sleep Medicine, gave a stimulating and interesting talk on Sleep Medicine and Anesthesia. She emphasized that with increasing focus of the anesthesiology discipline on sleep and upper

airway, there are immense possibilities of collaboration and interaction between the two disciplines.

Next year the SASM Annual Meeting will be held in San Francisco on October 11, 2013 with afternoon workshops on October 10th followed by the SASM dinner. Please reserve this date now. We look forward to you joining us next year. ❖



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Report From the Abstract Subcommittee

There were 31 posters presented at the second SASM Annual Meeting held in Washington, DC. Of these, there were 4 basic science studies and 27 clinical studies. All submissions were reviewed and ranked by the Abstract Committee in blind fashion. Dr. David Hillman, the President of SASM, presented the awards to the best abstract winners. In addition, 1st place winners received \$250 and 2nd prize winners received \$200. All the winners presented their work as oral presentations at the meeting, which was followed by a dynamic and exciting question and answer session. We would like to thank the members of the abstract subcommittee for donating their valuable time in assessing and grading the submitted abstracts.

Best Basic Research Presentation

First Prize Winners:

Solt K, Van Dort CJ, Chemali JJ, Taylor NE, Brown EN:
Department of Anesthesia, Critical Care and Pain Medicine, Massachusetts General Hospital. Department of Anesthesia, Harvard Medical School. Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology
Title: Electrical Microstimulation of the Ventral Tegmental Area, Induces Emergence From General Anesthesia

Second Prize Winners:

Zhang H, Wheat H, Baghdoyan HA, Neubig RR, Shi XY, Lydic R:
Departments of Anesthesiology and Pharmacology, University of Michigan, Ann Arbor, MI, USA, Department of Anesthesiology, Changzheng Hospital, 2nd Military University, Shanghai, China.
Title: RGS Proteins Modulate Isoflurane-Induced Alterations in Sleep and Wakefulness

Best Clinical Research Presentation

First Prize Winners:

Seet E, Chan M, Wang CY, Tam S, Chung F:
Department of Anesthesia, KhooTeckPuat Hospital, Singapore. Department of Anesthesia, The Chinese University of Hong Kong. Departments of Anaesthesia and Intensive Care, University of Malaya. Department of Anaesthesia, University of Toronto, Anesthesiology
Title: Design and Rational for the Postoperative Vascular Events in Unrecognized Obstructive Sleep Apnea Trial

Second Prize Winners (continued):

Brown D, Bolden N, Shetty PB, Auckley D:
Departments of Anesthesiology and Medicine, Division of Pulmonary, Critical Care and Sleep Medicine, MetroHealth Medical Center (MHMC) and Case Western Reserve University (CWRU), OH, USA. Department of Epidemiology and Biostatistics, Case Western Reserve University, OH, USA.
Title: Perioperative Complications in OSA Patients Undergoing Surgery: Does Postoperative Monitoring Correlate with Outcomes?

Second Prize Winners:

Ramachandran SK:
Department of Anesthesiology, University of Michigan Hospital, Ann Arbor, MI, USA
Title: Diabetes Mellitus May Increase Risk of Postoperative Respiratory Depression in Patients at Risk of Obstructive Sleep Apnea

Liao P, Chung F:
Department of Anesthesia, University Health Network, University of Toronto, Toronto, ON, Canada.
Title: Perioperative Auto-CPAP Treatment Improved Oxygen Saturation in Patients with Moderate to Severe OSA

2012 Annual Meeting Poster Winners

Best Basic Research Presentations:

First Place

Electrical Microstimulation of the Ventral Tegmental Area, Induces Emergence From General Anesthesia



Pictured left to right: Dr. Ken Solt accepting first place in best basic research abstract at the SASM Annual Meeting with Dr. David Hillman, President, SASM.

Second Place

RGS Proteins Modulate Isoflurane-Induced Alterations in Sleep and Wakefulness



Pictured left to right: Dr. Hao Zhang accepting second place in best basic research abstract at the SASM Annual Meeting with Dr. David Hillman, President, SASM.

Best Clinical Research Presentations:

First Place

Design and Rationale for the Postoperative Vascular Events in Unrecognized Obstructive Sleep Apnea Trial



Pictured left to right: Dr. Edwin Seet accepting first place in best clinical research abstract at the SASM Annual Meeting with Dr. David Hillman, President, SASM.

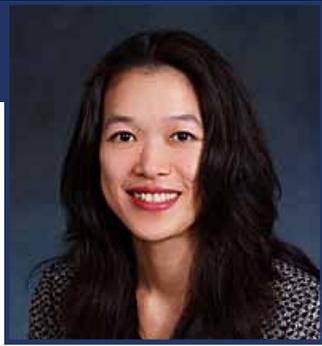
Second Place

Diabetes Mellitus May Increase Risk of Postoperative Respiratory Depression in Patients at Risk of Obstructive Sleep Apnea



Pictured left to right: Dr. Satya-Krishna Ramachandran accepting second place in best clinical research abstract at the SASM Annual Meeting with Dr. David Hillman, President, SASM.

More Poster Winner Photos on page 9!



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Reports From the SASM Second Annual Meeting, “Anesthesia and Sleep Medicine: What Every Health Professional Needs to Know” held in Washington, DC from October 11-12, 2012

Alan R. Schwartz, MD, Professor of Medicine at John Hopkins Sleep Disorders Center, Johns Hopkins School of Medicine, presented, “Pathogenesis of Upper Airway Obstruction During Sleep: Implications for Sedative Management” at the Society of Anesthesia and Sleep Medicine’s Second Annual Meeting.

Dr. Schwartz reviewed modeling upper airway obstruction during sleep and anesthesia, anatomic determinants of upper airway obstruction and upper airway neural control. He explained that upper airway function could be modeled as a simple collapsible conduit or Starling Resistor (Figure 1). Using this model, a collapsible segment is subject to the surrounding or critical pressure (P_{crit}) that determines its collapsibility. The upper airway collapses and flow limitation occurs on inspiration as the downstream (tracheal) pressure falls below P_{crit} . However, the flow-limited upper airway does not occlude. For occlusion of the upper airway to occur, the pressure upstream to the collapsible (flow-limiting) site must be lower than a critical tissue pressure sur-

rounding that site. He used changes in upstream and downstream water pressures in a waterfall as an analogy to changes in upper airway flow.

Figure 1

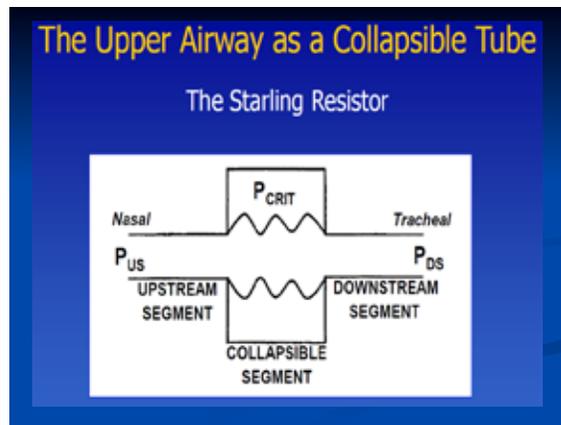
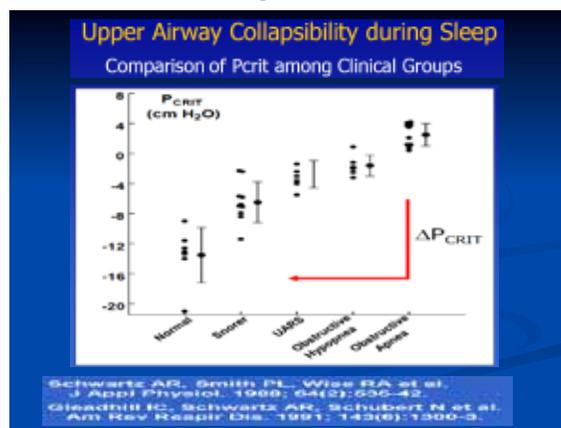


Figure 2



Therefore, a decrease in upstream pressure below the P_{crit} or an increase in the P_{crit} above atmospheric pressure leads to obstructive apneic

episodes in patients with obstructive sleep apnea (OSA).

Dr. Schwartz emphasized that investigators have shown that quantitative differences in critical pressures, reflecting differences in pharyngeal collapsibility distinguish groups with varying degrees of upper airway obstruction clinically between health (normal breathing) and disease (OSA) (Figure 2). He explained that increases in pharyngeal collapsibility are related to structural alterations in pharyngeal anatomy and/or disturbances in neuromuscular control. Obesity, male sex, positional maneuvers such as mouth opening, mandibular retrusion, neck flexion and the supine position all increase passive P_{crit} . Abnormal neuromuscular responses, i.e. a loss in tonic (expiratory) pharyngeal neuromuscular activity, lead to a primary defect in upper airway neuromuscular control in patients with OSA.

He summarized his presentation by stating that OSA is caused by increases in upper airway collapsibility during sleep, which is produced by alterations in upper airway anatomy and disturbances in neuromuscular control. As the effects

“Reports” continued on next page

of sedation and anesthesia mimic sleep and can predispose to upper airway obstruction, he stressed that patients who are at risk for developing airway obstruction during the perioperative period need to be identified and monitored to prevent potentially devastating consequences.

Roop Kaw, MD, Associate Professor of Medicine, Departments of Hospital Medicine and Outcomes Research, Anesthesiology, Cleveland Clinic, Cleveland, OH, presented “Postoperative Complications and Challenges in Implementing a Perioperative OSA Protocol.”

Dr. Kaw began by reviewing recent evidence that perioperative complications are increased in patients with OSA undergoing elective, non-cardiac surgery. He presented recently published data in *Chest* (2012; 141:436-41) and *British Journal of Anaesthesia* (2012) showing patients with OSA at

a higher risk for postoperative respiratory failure. He discussed some of the challenges associated with preoperative screening for OSA including: many providers feeling that preoperative PSG is not necessary, surgeons not wanting to delay surgery for want of preoperative PSG, the lack of a perfect preoperative screening tool and very few programs measuring neck circumference during a preoperative visit. He also discussed the controversy of screening for OSA and preoperative risk assessment in the absence of clear evidence and strategic resources for which patients with OSA to monitor postoperatively and the best way to and how long to monitor them.

He asserted that the severity of OSA diagnosed by PSG does not correlate with the occurrence of postoperative complications as shown by the literature to date.

Dr. Kaw stated that selected categories of high risk OSA patients with obesity-

hypoventilation syndrome, those with known CPAP titration failure or suspected complex sleep apnea, patients on chronic opioid treatment, those with documented ‘repetitive hypoxia’ or rapid cycling and patients undergoing Bariatric Surgery, should definitely be given a consideration for testing by PSG before surgery.

Dr. Kaw emphasized that any perioperative protocol for screening has more chances for success with a multi-specialty participation or “buy-in” for successful implementation. The importance of communication of the results of preoperative PSG or overnight desaturation to the surgical team was emphasized in order to implement postoperative recommendations.

Dr. Kaw concluded by indicating more research is needed to identify which patients with OSA need close postoperative monitoring and where and how long monitoring should be done. ❖

President’s Message continued from page 1

ing, producing teaching materials regarding sleep disordered breathing and perioperative considerations for the use of nursing and respiratory therapy staff and facilitating sleep training for anesthesiologists.

In parallel with these tasks we will continue our engagement with the wider medical and scientific community through publication, presentations and symposia. For example, we are currently planning symposia for the International Anesthesia Research Society (IARS) and 1st Asia Society of Sleep Medicine meetings next year. We also intend to continue our dialogue with leading professional organisations such as the IARS, American Society of An-

esthesiologists, American Thoracic Society, American Academy of Sleep Medicine and American Society of PeriAnesthesia Nurses and community based organizations such as the National Sleep Foundation.

This is an ambitious agenda for an as yet relatively small society. Fortunately, we are adequately financed with funds to invest in these matters, have a membership replete with relevant expertise, plans in place for the leadership transitions that will occur at our next annual meeting and have completed many of the organizational tasks necessary to create a structure with which to move forward. Importantly, we now have engaged a management organization

(Svinicki Association Management, Inc.) expert in providing administrative services to medical societies such as ours, removing much of the administrative burden borne to date by the Board and Executive Committee. This will both ensure that we can continue to service our members efficiently and release executive members for more creative roles in advancing this agenda. As I remarked in our recent Annual Report, establishment of an efficient administrative structure now allows us to move from a preoccupation with process, to creative roles in promoting education, research and clinical standards. In doing so we seek to broaden our membership and increase its level of engagement with these matters. ❖



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Complications In Patients with Obstructive Sleep Apnea: More Than Meets the Eye?

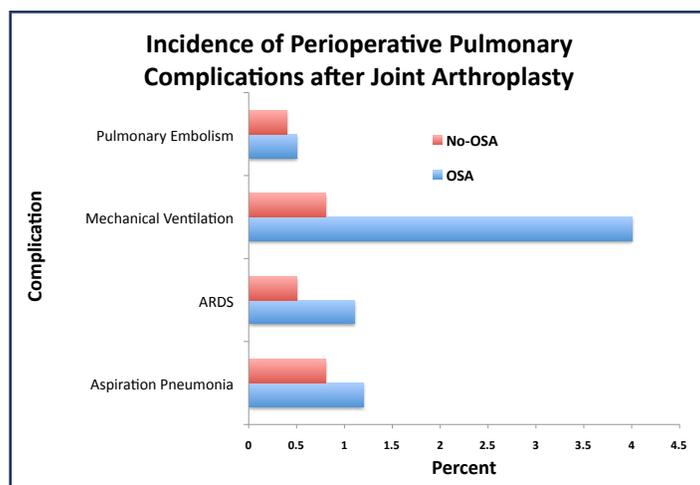
Adverse events affecting the pulmonary system remain one of the most common and significant complications in the perioperative period [1]. Patients with obstructive sleep apnea (OSA) represent an especially challenging patient population to the perioperative physician and may be at particularly high risk for pulmonary complications [2].

Studies have shown that OSA represents an independent risk factor for complications involving the lung. Gupta et al [3] and Kaw et al [4] showed that OSA was associated with significantly increased odds for respiratory failure, reintubation and intensive care admissions. Further, in a population-based study, patients with OSA developed pulmonary complications more frequently than their matched controls after orthopedic surgical procedures (Figure 1). In this study [2], OSA was also associated with significantly higher odds of developing pulmonary complications (adjusted odds ratio for aspiration pneumonia: 1.41 [1.35, 1.47]; for ARDS: 2.39 [2.28, 2.51]; for PE: OR 1.22 [1.15, 1.29]; for intubation/mechanical ventilation: 5.20 [5.05, 5.37]).

However, the mechanisms that lead to increased vulnerability among this patient group remain poorly understood. Despite the lack of clinical and laboratory explanations, population based data may provide some hypothetical insights. In this context, the orthopedic joint arthro-

plasty population may be of special interest as it accounts for over one million procedures annually, has an especially high incidence of OSA and represents a group with a fairly standardized surgical intervention.

While some pulmonary events such as aspiration pneumonias may be linked to relative dysfunction of the pharyngeal muscle in OSA patients, our group has hypothesized that the reasons for other complications such as ARDS may at least in part be linked to the relatively high rates of pulmonary hypertension found among patients with OSA [5]. Pulmonary hypertension is known to be associated right heart dysfunction as well as pulmonary inflammation [6]. Perioperative events such as hypoventilation and dose dependent exposure of the lung to intraoperative embolization of fat, marrow and cement debris resulting from intravasation during the implantation process of orthopedic prostheses may worsen these conditions [7, 8]. Indeed, population based data shows that patients with preexisting pulmonary hypertension suffer from significantly higher rates of mortality and lung injury, suggesting a lower capacity of the pulmonary system to deal with any perioperative insults [9]. Further, these associations challenge the current focus of interventions targeted to address primarily respiratory abnormalities in the OSA population perioperatively, when indeed other, often occult, comorbid conditions, such as pulmonary hypertension, diabetes and increased inflammatory states,



“Complications in Patients” continued on next page

may at least in part be the reason for increased perioperative complication rates seen in this patient population. Indeed, some preliminary data exploring the impact of a combination of OSA and other comorbidities on perioperative outcomes suggest a supra-additive effect.

In conclusion, while patients with OSA may suffer from pulmonary complications such as aspiration pneumonia due to the inherent pharyngeal anatomical and functional abnormalities associated with the disease, the high incidence and role of pulmonary hypertension in the development of perioperative pulmonary complications is a less well appreciated entity. Further research is necessary to study the association of pulmonary hypertension (and other comorbid diseases) and OSA in order to allow interventions to potentially decrease pulmonary and perhaps other complications. The perioperative evaluation

of OSA may need to be expanded from the usual focus on respiratory abnormalities to include effects on the cardiovascular and other organ systems in order to allow for better risk stratification of OSA patients.

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2012 Annual Meeting Poster Winners continued from page 5

Second Place

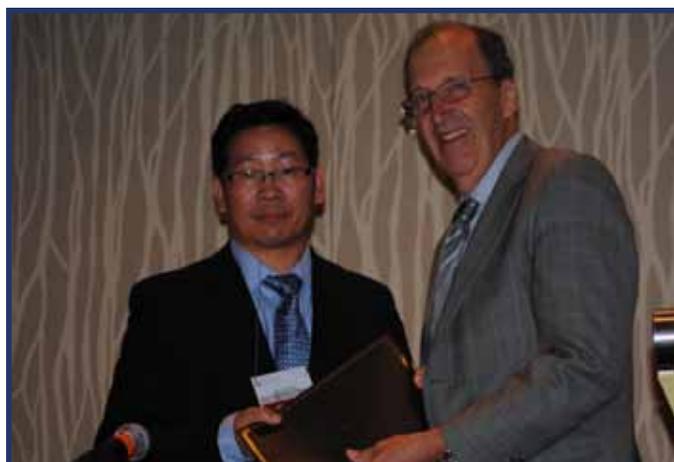
Perioperative Complications in OSA Patients Undergoing Surgery: Does Postoperative Monitoring Correlate with Outcomes?



Pictured left to right: Dr. Derek Brown accepting second place in best clinical research abstract at the SASM Annual Meeting with Dr. David Hillman, President, SASM.

Second Place

Perioperative Auto-CPAP Treatment Improved Oxygen Saturation in Patients with Moderate to Severe OSA



Pictured left to right: Dr. Pu Liao accepting second place in best clinical research abstract at the SASM Annual Meeting with Dr. David Hillman, President, SASM.



Shireen Ahmad, MD

Professor of Anesthesiology

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Postoperative Sleep Disturbances

Sleep is a naturally recurring state of reduced or absent consciousness and a lack of sensory functions and voluntary muscle activity. While the purpose and mechanisms of sleep are only partially understood, it is considered to have important restorative functions. There are profound sleep alterations following surgery. Postoperative sleep disturbances during the first postoperative week are characterized by suppression of rapid eye movement (REM) and slow wave sleep (SWS) stages followed by a rebound increase after healing occurs. Interestingly, similar sleep changes have also been reported in patients with ischemic stroke, myocardial infarction and congestive heart failure [1-3].

The type of surgery has a significant impact on the magnitude of these changes. Following herniorrhaphy there is a loss of SWS and REM sleep for the first two nights, while after open cholecystectomy and abdominal hysterectomy sleep disturbances persist for up to a week [4-6]. Laparoscopic surgery causes a slight change in SWS for the first night but no change in REM sleep [7]. After elective orthopedic, vascular and abdominal surgery, 23% of patients report reduced quality of sleep during their hospital stay and in 25% of these patients the

changes persisted for longer than two weeks [8]. Cardiac surgery patients, on the other hand, have decreased REM sleep and circadian sleep disturbance with large proportion of total daily sleep during the daytime for a week postoperatively [9]. Interestingly, in 62% of female cardiac patients alterations in sleep patterns may persist up to a month following discharge [10]. In the intensive care population, 56% of patients report reduced total sleep times during the first night [11]. The length of surgery also correlates with the duration of sleep disturbance and is probably a reflection of the magnitude of the surgical insult and corresponding inflammatory response [12, 13].

Anesthesia per se does not appear to have any influence on postoperative sleep disturbance [14], although many drugs administered during the perioperative period are known to alter sleep. Benzodiazepines and opioids result in a marked decrease of non-REM sleep [15]. Neostigmine increases REM sleep while atropine reduces it, as do dopamine agonists and α_2 agonists. Patients receiving regional anesthesia for minor surgical procedures have sleep disturbances similar to that with general anesthesia [4, 16]. There is a weak

correlation between postoperative pain and sleep disturbance, however, the opioid sparing analgesics may improve postoperative sleep suggesting that the cause of sleep disturbances is opioids rather than pain per se [17, 18].

Postoperative sleep disturbance has significant clinical implications. Sleep deprivation affects cognitive function and performance on psychometric tests [19]. In addition, sleep deprivation has been linked to the feeling of fatigue [20]. Furthermore, sleep deprivation has been shown to influence the immune system and wound healing. Deprivation of REM sleep results in irritability, confusion and anxiety, while SWS deprivation produces physical discomfort and depression. Deprivation of both REM and SWS sleep is associated with a significant increase or rebound during recovery.

Of note, REM sleep rebound, following the reduction of surgical inflammatory response, is associated with significant sympathetic activation that may result in hemodynamic instability, myocardial ischemia and infarction. In addition, rebound REM sleep may increase apneic episodes and concomitant hypoxemia in patients at

"Postoperative Sleep Disturbances" continued on next page

risk (e.g., obstructive sleep apnea), which may account for the observation that the majority of postoperative deaths occur at night [21, 22]. Therapeutic options for improving sleep patterns are limited. Drugs commonly used to induce sleep in hospitalized patients are benzodiazepines, which attenuate REM sleep and SWS. Newer sedatives, such as zopiclone and zolpidem, increase REM sleep and SWS in non-surgical patients, however, they have not been adequately assessed in the surgical population.

Overall, although postoperative sleep disturbances have a documented negative impact on postoperative outcome, research in the area is lacking.

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are limited. At the recent SASM Meeting in Washington DC, Mervyn Maze, Department of Anesthesia and Perioperative Care, Chair, University of California at San Francisco, CA, presented the recent evidence on pharmacologically induced sleep with GABAA receptor agonists such as benzodiazepines and propofol and

alpha-2 agonist, dexmedetomidine. He concluded that compared with GABAA agonists, dexmedetomidine provides more restorative sedation, however, definitive studies evaluating clinically relevant outcomes are lacking. The summaries of all the presentations are available on the SASM web site.

Finally, I would like to ask for your help in providing feedback that would assist us in improving the value of our newsletter. I would like to thank the members of the Newsletter Committee for their hard work. Without their commitment, it would not be possible to publish our newsletters. ❖



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