

Sleep Medicine and Anesthesia

A New Horizon for Anesthesiologists

IN October 2010 in San Diego, a group of anesthesiologists, sleep physicians, surgeons, emergency physicians, and basic scientists with an interest in sleep and anesthesia organized an American Society of Anesthesiologists pre-convention symposium on this fascinating topic. This provided the impetus to form the Society of Anesthesia and Sleep Medicine (SASM) to promote discussion, education, development of clinical standards, and research related to issues common to anesthesia and sleep.

The SASM objectives are to:

- Promote the cross-fertilization of ideas between anesthesiology and sleep medicine.
- Encourage clinical and epidemiologic studies determining the associations between sleep-disordered breathing and perioperative risk.
- Examine methods of minimizing perioperative risk of upper-airway obstruction or ventilatory insufficiency in predisposed individuals.
- Explore the use of noninvasive positive airway pressure therapies to prevent and treat perioperative upper-airway obstruction or hypoventilation.
- Stimulate research aiming to better understand the similarities and differences between sleep and anesthesia as well as their impact on physiologic control systems.

Anesthesiology has evolved from a specialty based on procedures to a broader-based discipline.¹ Anesthesiologists are involved in a wide range of perioperative duties and have an evolving role in the care of the surgical patient beyond the immediate perioperative period. The role of the anesthesiologist has changed from one of a physician primarily concerned with intraoperative care and postoperative pain management to one of a perioperative physician responsible for ensuring that patients with preexisting medical conditions are optimally managed perioperatively and beyond.² Anesthesiologists have much to offer in mitigating risk to patients during the vulnerable period of perioperative care. Sleep apnea exemplifies a condition that requires expert guidance through the perioperative journey from preadmission to discharge and beyond and illustrates the potential for this

broader perioperative role. Difficult airways have always been a prime concern of the anesthesiologist, and perioperative management of problems related to them is fundamental to anesthesiology practice.³⁻⁵

Sleep apnea is now regarded as common, underdiagnosed, and associated with substantial morbidity and increased risk of postoperative complications.⁶⁻¹⁴ In the early 1990s a major epidemiologic study showed that obstructive sleep apnea syndrome (obstructive sleep apnea with overt symptoms) was found to be present in 2% and 4% of middle-aged women and men, respectively.⁶ Subsequent epidemiologic studies have demonstrated a clear association between obstructive sleep apnea and the development of hypertension, coronary artery disease, heart failure, stroke, and metabolic syndrome.⁷⁻⁹ Obstructive sleep apnea remains underdiagnosed and may be first recognized in the perioperative setting. Given the significant morbidity associated with obstructive sleep apnea syndrome, it is incumbent on the anesthesiologist—the perioperative physician—to ensure that arrangements are made for appropriate diagnosis and treatment when such possibilities are raised.

Sleep medicine and anesthesiology both are concerned with the significant changes in autonomic control associated with the loss of waking consciousness.^{15,16} Sleep medicine is a relatively new and vibrant specialty¹⁷ with a solid foundation in neuroscience.¹⁸ Sleep medicine has been enriched by active involvement of basic scientists and by many clinical specialties, including pulmonology, neurology, internal medicine, psychiatry, and otorhinolaryngology. Why not anesthesiology as well? Anesthesiologists are in a unique position to identify patients with potential sleep-related breathing disorders, optimize their perioperative management, and contribute to their continuum of care.¹⁹⁻²⁵ We encourage anesthesiologists to embrace the role of perioperative sleep physician. Ample data now exist to support the view that anesthesiologists who understand sleep disorders will foster clinical practice, education, and research. We believe this is especially appropriate for a specialty in which airway management is such a fundamental concern.

A SASM steering committee has been formed [Norman Bolden, M.D. (secretary), Frances Chung, M.B.B.S. (vice chair), Matthias Eikermann, M.D., Peter Gay, M.D., David Hillman, M.B.B.S. (chair), Shiroh Isono, M.D., Yandong Jiang, M.D., Max Kelz, M.D., and Ralph Lydic, Ph.D.] to establish a database of interested clinicians and scientists,

Accepted for publication February 21, 2011. The authors are not supported by, nor maintain any financial interest in, any commercial activity that may be associated with the topic of this article.

Copyright © 2011, the American Society of Anesthesiologists, Inc. Lippincott Williams & Wilkins. Anesthesiology 2011; 114:1261-2

incorporate the Society, empanel a membership, and arrange for the election of a Board, which will then take over management. SASM is organizing another preconvention conference on October 14, 2011 at the American Society of Anesthesiologists meeting in Chicago. Anyone who wishes to consider joining the Society or attending the annual meeting is invited to contact its secretary, Dr. Norman Bolden, at nbolden@metrohealth.org. The SASM website is www.anesthesiandsleep.org. There is much work to be done, and we hope that many will choose to get involved in the Society's activities.

Frances Chung, M.D.,* **David Hillman, M.D.,†** **Ralph Lydic, Ph.D.‡** *Department of Anesthesiology, University Health Network, University of Toronto, Toronto, Ontario, Canada. frances.chung@uhn.on.ca. †Department of Pulmonary Physiology, Sir Charles Gairdner Hospital, Perth, Western Australia. ‡Department of Anesthesiology, University of Michigan, Ann Arbor, Michigan.

References

1. Rock P: The future of ANESTHESIOLOGY is perioperative medicine. *Anesthesiol Clin North Am* 2000; 18:495-513
2. White PF, Kehlet H, Neal JM, Schricker T, Carr DB, Carli F, Fast-Track Surgery Study Group: The role of the anesthesiologist in fast-track surgery: From multimodal analgesia to perioperative medical care. *Anesth Analg* 2007; 104:1380-96
3. Eastwood PR, Szollosi I, Platt PR, Hillman DR: Comparison of upper airway collapse during general anaesthesia and sleep. *Lancet* 2002; 359:1207-9
4. Hiremath AS, Hillman DR, James AL, Noffsinger WJ, Platt PR, Singer SL: Relationship between difficult tracheal intubation and obstructive sleep apnoea. *Br J Anaesth* 1998; 80:606-11
5. Chung F, Yegneswaran B, Herrera F, Shenderey A, Shapiro CM: Patients with difficult intubation may need referral to sleep clinics. *Anesth Analg* 2008; 107:915-20
6. Young T, Palta M, Dempsey J, Skatrud J, Weber S, Badr S: The occurrence of sleep-disordered breathing among middle-aged adults. *N Engl J Med* 1993; 328:1230-5
7. Peppard PE, Young T, Palta M, Skatrud J: Prospective study of the association between sleep-disordered breathing and hypertension. *N Engl J Med* 2000; 342:1378-84
8. Nieto FJ, Young TB, Lind BK, Shahar E, Samet JM, Redline S, D'Agostino RB, Newman AB, Lebowitz MD, Pickering TG: Association of sleep-disordered breathing, sleep apnea, and hypertension in a large community-based study. *Sleep Heart Health Study JAMA* 2000; 283:1829-36
9. Shahar E, Whitney CW, Redline S, Lee ET, Newman AB, Javier Nieto F, O'Connor GT, Boland LL, Schwartz JE, Samet JM: Sleep-disordered breathing and cardiovascular disease: Cross-sectional results of the Sleep Heart Health Study. *Am J Respir Crit Care Med* 2001; 163:19-25
10. Gupta RM, Parvizi J, Hanssen AD, Gay PC: Postoperative complications in patients with obstructive sleep apnea syndrome undergoing hip or knee replacement: A case-control study. *Mayo Clin Proc* 2001; 76:897-905
11. Liao P, Yegneswaran B, Vairavanathan S, Zilberman P, Chung F: Postoperative complications in patients with obstructive sleep apnea: A retrospective matched cohort study. *Can J Anaesth* 2009; 56:819-28
12. Kaw R, Michota F, Jaffer A, Ghamande S, Auckley D, Golish J: Unrecognized sleep apnea in the surgical patient: Implications for the perioperative setting. *Chest* 2006; 129:198-205
13. Chung SA, Yuan H, Chung F: A systemic review of obstructive sleep apnea and its implications for anesthesiologists. *Anesth Analg* 2008; 107:1543-63
14. Memtsoudis S, Liu SS, Ma Y, Chiu YL, Walz JM, Gaber-Baylis LK, Mazumdar M: Perioperative pulmonary outcomes in patients with sleep apnea after noncardiac surgery. *Anesth Analg* 2011; 112:113-21
15. Mashour GA: Integrating the science of consciousness and anesthesia. *Anesth Analg* 2006; 103:975-82
16. Brown EN, Lydic R, Schiff ND: General anesthesia, sleep, and coma. *N Engl J Med* 2010; 363:2638-50
17. Kryger M, Roth T, Dement WC: Principles and Practice of Sleep Medicine, 5th edition. New York, Elsevier Saunders, 2010
18. Steriade M, McCarley RW: Brain Control of Wakefulness and Sleep, 2nd edition. New York, Plenum Press, 2005
19. Seet E, Chung F: Management of sleep apnea in adults-functional algorithms for the perioperative period: Continuing professional development. *Can J Anaesth* 2010; 57: 849-64
20. Gross JB, Bachenberg KL, Benumof JL, Caplan RA, Connis RT, Cote CJ, Nickinovich DG, Prachand V, Ward DS, Weaver EM, Ydens L, Yu S: Practice guidelines for the perioperative management of patients with obstructive sleep apnea: A report by the American Society of Anesthesiologists Task Force on Perioperative Management of patients with obstructive sleep apnea. *ANESTHESIOLOGY* 2006; 104:1081-93: quiz 1117-8
21. Eastwood PR, Malhotra A, Palmer LJ, Kezirian EJ, Horner RL, Ip MS, Thurnheer R, Antic NA, Hillman DR: Obstructive sleep apnoea: From pathogenesis to treatment: Current controversies and future directions. *Respirology* 2010; 15: 587-95
22. Adesanya AO, Lee W, Greilich NB, Joshi GP: Perioperative management of obstructive sleep apnea. *Chest* 2010; 138: 1489-98
23. Chung F, Liao P, Sun Y, Amirshahi B, Fazel H, Shapiro CM, Elsaid H: Perioperative practical experiences in using a level 2 portable polysomnography. *Sleep Breath* 2010; [Epub ahead of print]
24. Chung F, Yegneswaran B, Liao P, Chung SA, Vairavanathan S, Islam S, Khajehdehi A, Shapiro CM: STOP questionnaire: A tool to screen patients for obstructive sleep apnea. *ANESTHESIOLOGY* 2008; 108:812-21
25. Ramachandran S, Josephs L: A meta-analysis of clinical screening tests for obstructive sleep apnea. *ANESTHESIOLOGY* 2009; 110:928-39