



ON THE COVER:

Best practices in diagnosis and medical management of obstructive sleep apnea in the perioperative period continue to rapidly evolve. In this issue we highlight this topic with a Practice Guidelines from the ASA and two original investigations on the topic.

- Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea: An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea, p. 268
- Chung *et al.*: Postoperative Changes in Sleep-disordered Breathing and Sleep Architecture in Patients with Obstructive Sleep Apnea, p. 287
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CME CME Article

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- ◇ **Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea: An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea** 268

The American Society of Anesthesiologists Committee on Standards and Practice Parameters and the Task Force on Perioperative Management of Obstructive Sleep Apnea presents an updated report of the Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

■ PERIOPERATIVE MEDICINE

CLINICAL SCIENCE

- ◇ **Postoperative Changes in Sleep-disordered Breathing and Sleep Architecture in Patients with Obstructive Sleep Apnea** 287

F. Chung, P. Liao, B. Yegneswaran, C.M. Shapiro, and W. Kang

In this prospective cohort study, both nonobstructive sleep apnea (n = 20) and obstructive sleep apnea (n = 38) patients suffered sleep disturbance particularly on postoperative night 1 and significantly increased frequencies of sleep-disordered breathing particularly on postoperative night 3.

- ◇ **Factors Associated with Postoperative Exacerbation of Sleep-disordered Breathing** 299

F. Chung, P. Liao, H. Elsaid, C.M. Shapiro, and W. Kang

Series of pre- and postoperative polysomnographic recordings in 376 adult patients undergoing various types of anesthesia and surgeries revealed that severity of preoperative sleep-disordered breathing, aging, and postoperative opioid dose are associated with postoperative sleep-disordered breathing severity.

- ◆ **Pharyngeal Function and Breathing Pattern during Partial Neuromuscular Block in the Elderly: Effects on Airway Protection** 312

A.I.H. Cedborg, E. Sundman, K. Bodén, H.W. Hedström, R. Kuylenstierna, O. Ekberg, and L.I. Eriksson

Incidence of swallowing dysfunction increased more than double during partial neuromuscular block in healthy elderly individuals without impairment of coordination between swallowing and breathing. Reduced upper esophageal sphincter tone did not recover even at the train-of-four ratio of 0.9.

- ◆ **Real-time Detection of Gastric Insufflation Related to Facemask Pressure-controlled Ventilation Using Ultrasonography of the Antrum and Epigastric Auscultation in Nonparalyzed Patients: A Prospective, Randomized, Double-blind Study** 326

L. Bouvet, M.L. Albert, C. Augris, E. Boselli, R. Ecochard, M. Rabilloud, D. Chassard, and B. Allaouchiche

In 67 anesthetized and nonparalyzed adult patients with nonobstructed upper airway, real-time ultrasonography of the antrum for the detection of gastric insufflation revealed that pressure-controlled ventilation with inspiratory pressure of 15 cm H₂O and zero positive end-expiratory pressure achieved lower occurrence of gastric insufflation with proper lung ventilation during anesthesia induction.

- Moderate Hyperventilation during Intravenous Anesthesia Increases Net Cerebral Lactate Efflux** 335

F. Grüne, S. Kazmaier, H. Sonntag, R.J. Stolker, and A. Weyland

In 30 patients scheduled for coronary surgery with fentanyl or midazolam anesthesia, mild hyperventilation (Paco₂, 30 mmHg) reduced cerebral blood flow by 60%, did not alter cerebral metabolic rate for oxygen or glucose, but increased net cerebral lactate efflux, consistent with partial impairment of cerebral aerobic metabolism.

Impact of Risk Assessments on Prophylactic Antiemetic Prescription and the Incidence of Postoperative Nausea and Vomiting: A Cluster-randomized Trial 343

T.H. Kappen, K.G.M. Moons, L. Wolfswinkel, C.J. Kalkman, Y. Vergouwe, and W.A. Klei

In a single-center, cluster-randomized trial (n = 12,032 patients, 79 anesthesiologists), implementation of a postoperative nausea and vomiting prediction model without specific treatment recommendation did not reduce the postoperative nausea and vomiting incidence (odds ratio, 0.97; 95% CI, 0.87–1.10).

Comparison of the Potency of Different Propofol Formulations: A Randomized, Double-blind Trial Using Closed-loop Administration 355

M. Le Guen, S. Grassin-Delyle, C. Cornet, A. Genty, T. Chazot, D. Dardelle, N. Liu, J. Dreyfus, J. Mazoit, P. Devillier, J. Alvarez, D.I. Sessler, and M. Fischler

The dose of Propoven® required for anesthetic induction was larger than that of either Diprivan® or Lipuro® when administered as a closed-loop infusion guided by bispectral index. Addition of lidocaine to the propofol formulations eliminated differences in pain severity at anesthetic induction and in total dose required to reach a predefined depth of sedation.

Restrictive Deferred Hydration Combined with Preemptive Norepinephrine Infusion during Radical Cystectomy Reduces Postoperative Complications and Hospitalization Time: A Randomized Clinical Trial 365

P.Y. Wuethrich, F.C. Burkhard, G.N. Thalmann, F. Stueber, and U.E. Studer

The incidence of major complications was significantly reduced, with a relative risk of 0.7 (95% CI, 0.55–0.88). The duration of hospitalization was also significantly reduced from a median of 17 to 15 days.

Population Pharmacokinetic Modeling of Hydromorphone in Cardiac Surgery Patients during Postoperative Pain Therapy 378

C. Jeleazcov, T.I. Saari, H. Ihmsen, J. Mell, K. Fröhlich, L. Krajinovic, J. Fechner, and J. Schüttler

Target-controlled infusions based on published hydromorphone pharmacokinetic parameters underestimated observed plasma concentrations in 49 cardiac surgery patients receiving hydromorphone for postoperative pain management. A new hydromorphone pharmacokinetic model with a smaller initial distribution volume and age-adjusted and body weight-adjusted pharmacokinetic parameters was developed, which may improve dosing in patients undergoing cardiac surgery.

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BASIC SCIENCE

Medial Septal Cholinergic Neurons Modulate Isoflurane Anesthesia 392

S.K. Tai, J. Ma, and L.S. Leung

Selective lesion of cholinergic medial septal neurons enhanced sensitivity to isoflurane and prolonged isoflurane anesthesia.

Neonatal Exposure to Sevoflurane in Mice Causes Deficits in Maternal Behavior Later in Adulthood 403

Y. Takaenoki, Y. Satoh, Y. Araki, M. Kodama, R. Yonamine, S. Yufune, and T. Kazama

Female mouse pups exposed to sevoflurane anesthesia exhibited deficits in classic maternal behaviors after delivery, an effect which was prevented by coadministration of the antioxidant, hydrogen gas with sevoflurane. Previous anesthesia exposure did not alter oxytocin or vasopressin release in the maternal mice after delivery.

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Regional Blood Acidification Enhances Extracorporeal Carbon Dioxide Removal: A 48-hour Animal Study 416

A. Zanella, P. Mangili, S. Redaelli, V. Scaravilli, M. Giani, D. Ferlicca, D. Scaccabarozzi, F. Pirrone, M. Albertini, N. Patroniti, and A. Pesenti

Lactic acid infusion enhances low-flow extracorporeal carbon dioxide removal; this system, therefore, may be of great utility in critically ill patients. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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Peripheral inflammation increases spinal levels of PGI₂, which in turn stimulates cyclic adenosine monophosphate production and glutamate release. Correspondingly, spinal neuron IP receptor blockade causes analgesia. These results provide a framework for understanding PGI₂ participation in spinal nociceptive signaling. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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