

# TABLE OF CONTENTS

# ANESTHESIOLOGY

Volume 138

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**This Month in ANESTHESIOLOGY.....A1**  
**Science, Medicine, and the Anesthesiologist.....A13**  
**Infographics in Anesthesiology .....A17**  
**Editorial**

- Monitoring Respiratory Effort and Lung-distending Pressure Noninvasively during Mechanical Ventilation: Ready for Prime Time**  
*J. Dianti, E. C. Goligher.....235*
- Paradox of Power: Dynamic Tools to Predict Respiratory Failure in Spontaneously Breathing Patients**  
*D. R. Calabrese, M. J. London.....238*

**Perioperative Medicine**

**CLINICAL SCIENCE**

- ◇ **Comparison of Contralateral Acceleromyography and Electromyography for Posttétanic Count Measurement**  
*H. Joo, S. Cho, J. W. Lee, W. J. Kim, H. J. Lee, J. H. Woo, G. Lee, H. J. Baik.....241*

The agreement of posttétanic counts monitored in contralateral arms by acceleromyography and electromyography was determined in 35 patients given 0.6 mg/kg rocuronium after induction of anesthesia and calibration of the monitors, with additional doses of 0.3 mg/kg if required. Seventy-three percent of 226 pairs of acceleromyography– and electromyography–posttétanic count measurements indicated the same neuromuscular blockade status (intense or deep block). Of 184 pairs of posttétanic counts of 15 or less, 42 (23%) acceleromyography–posttétanic counts were equal to electromyography–posttétanic counts, 93 (50%) were more than electromyography counts, and 49 (27%) were less than electromyography counts.

- ◇ **Respiratory Effects of Biased Ligand Oliceridine in Older Volunteers: A Pharmacokinetic–Pharmacodynamic Comparison with Morphine**  
*P. Simons, R. van der Schrier, M. van Lemmen, S. Jansen, K. W. K. Kuijpers, M. van Velzen, E. Sarton, T. Nicklas, C. Michalsky, M. A. Demitrack, M. Fossler, E. Olofson, M. Niesters, A. Dahan.....249*

The hypothesis that oliceridine and morphine differ in their pharmacodynamic behavior, measured as effect on ventilation at an extrapolated end-tidal  $P_{CO_2}$  of 55 mmHg ( $\dot{V}_{E55}$ ), was tested in a four-arm, double-blind, randomized crossover study of eighteen 56- to 87-yr-old male and female volunteers. The effect-site oliceridine concentration causing a 50% depression of  $\dot{V}_{E55}$  was 39% higher than that of morphine. The onset and offset of the respiratory effect of oliceridine was five times faster than that of morphine.

- ◇ **Extended-age Out-of-sample Validation of Risk Stratification Index 3.0 Models Using Commercial All-payer Claims**  
*S. Greenwald, G. F. Chamoun, N. G. Chamoun, D. Clain, Z. Hong, R. Jordan, P. J. Manberg, K. Maheshwari, D. I. Sessler.....264*

In two different statewide databases, Risk Stratification Index 3.0 models worked well in younger and healthier adults. **SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT**

**Critical Care Medicine**

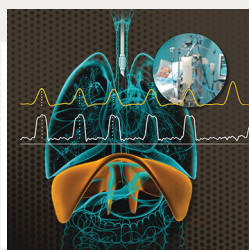
**CLINICAL SCIENCE**

- ◇ **Performance of Noninvasive Airway Occlusion Maneuvers to Assess Lung Stress and Diaphragm Effort in Mechanically Ventilated Critically Ill Patients**  
*H. J. de Vries, P. R. Tuinman, A. H. Jonkman, L. Liu, H. Qiu, A. R. J. Girbes, Y. Zhang, A. M. E. de Man, H.-J. de Grooth, L. Heunks.....274*

◇ Refers to This Month in ANESTHESIOLOGY  
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**ON THE COVER:** Monitoring and controlling lung stress and diaphragm effort has been hypothesized to limit lung injury and diaphragm injury. In this issue of ANESTHESIOLOGY, deVries *et al.* hypothesized that noninvasively measurable correlates would have strong discriminative performance in identifying extremes of lung stress and diaphragm effort. In an accompanying editorial, Dianti and Goligher examined the history of respiratory effort and proposed that these routine noninvasive measurements should become standard practice in the management of patients receiving mechanical ventilation. Cover illustration: A. Johnson, Vivo Visuals Studio.

- deVries *et al.*: Performance of Noninvasive Airway Occlusion Maneuvers to Assess Lung Stress and Diaphragm Effort in Mechanically Ventilated Critically Ill Patients, p. 274
- Dianti and Goligher: Monitoring Respiratory Effort and Lung-distending Pressure Noninvasively during Mechanical Ventilation: Ready for Prime Time, p. 235

A secondary analysis of two previous studies evaluated the ability of two transient inspiratory airway occlusion maneuvers (Pocc, the total drop in airway pressure during an occlusion, and PO.1, the drop in the first 100 ms) obtained from the mechanical ventilator to predict either diaphragm effort or lung stress. Neither PO.1 nor Pocc should be used to predict exact values for diaphragm effort or lung distending pressure. However, both maneuvers can reliably identify patients with low or high extremes in diaphragm effort and lung stress, where Pocc outperforms PO.1 based on the areas under the receiver operating characteristic curves. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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**Mechanical Power Ratio and Respiratory Treatment Escalation in COVID-19 Pneumonia: A Secondary Analysis of a Prospectively Enrolled Cohort**  


*S. Gattarello, S. Coppola, E. Chiodaroli, T. Pozzi, L. Camporota, L. Saager, D. Chiumello, L. Gattinoni* .....289

Despite similar spontaneous tidal volumes, escalated patients had higher respiratory rate, minute ventilation, pleural pressure, and mechanical power ratios. Mechanical power, its ratio with the expected baseline value, and the pressure-rate index had the greatest associations with treatment escalation. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- 

**Predicting Intensive Care Delirium with Machine Learning: Model Development and External Validation**  
*K. D. Gong, R. Lu, T. S. Bergamaschi, A. Sanyal, J. Guo, H. B. Kim, H. T. Nguyen, J. L. Greenstein, R. L. Winslow, R. D. Stevens*.....299


In a multicenter electronic health record database of 22,234 intensive care unit (ICU) patients from 2014 to 2015, delirium was identified using the Confusion Assessment Method for the ICU screen or Intensive Care Delirium Screening Checklist. Static and dynamic machine learning algorithms were trained, tested, and externally validated to predict the onset of delirium during the ICU stay. The static model using data from the first 24 h after ICU admission to predict delirium at any point during the ICU stay demonstrated higher discrimination compared with a widely cited reference model. The dynamic model was able to predict delirium up to 12 h in advance with reasonable discrimination and calibration. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

## Education

### CLASSIC PAPER REVISITED

- 
**Multidisciplinary Pain Management: A Tale of Two Outcomes**  
*S. H. Butler, J. D. Loeser* .....312

## IMAGES IN ANESTHESIOLOGY

- 
**Difficult Airway Management in Neonates: Fiberoptic Intubation via Laryngeal Mask Airway**  
*J. J. Thomas, M. Lingruen, A. Reddy, K. H. Chan* .....316

*SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

## REVIEW ARTICLE

- 

**Advanced Point-of-care Bedside Monitoring for Acute Respiratory Failure**  
*G. Cammarota, R. Simonte, F. Longhini, S. Spadaro, L. Vetrugno, E. De Robertis* .....317

Advanced respiratory monitoring involves several mini- or noninvasive tools, applicable at bedside, that have the potential to support clinicians in the management of acute respiratory failure toward the protection of the lung and respiratory muscles and the personalization of ventilatory strategy. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

## CORRESPONDENCE

- Hypotension and Cardiac Surgical Outcomes: Comment**  
*R. Descamps, A. Denisenko, M.-O. Fischer* .....335

- Hypotension and Cardiac Surgical Outcomes: Reply**  
*V. Rangasamy, M. A. de la Hoz, B. Subramaniam* .....336

- Alternative Sleep Apnea Treatment: Comment**  
*A. Roy, M. Mandal, P. Bhakta, B. O'Brien, A. M. Esquinas* .....337

- Alternative Sleep Apnea Treatment: Reply**  
*Y. Sakaguchi, N. Nozaki-Taguchi, S. Isono* .....338

## Reviews of Educational Materials

- We Are All Perfectly Fine: A Memoir of Love, Medicine and Healing**  
*K. E. McGoldrick* .....340

**Erratum** ..... 342

**Retraction** ..... 343

## Anesthesiology Reflections from the Wood Library-Museum

- Emanuel Papper's Ph.D.: Anesthesia's Romantic Ideals**  
*J. S. Moon* ..... 298

- Advertising McNeil's Pain Exterminator: A General for the Specific?**  
*M. L. Coleman and G. S. Bause* ..... 334

**Careers & Events** ..... A19

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