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# ANESTHESIOLOGY

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**CLINICAL SCIENCE**

◆◆ A Dose-finding Study of Sugammadex for Reversal of Rocuronium in Cardiac Surgery Patients and Postoperative Monitoring for Recurrent Paralysis

T. A. Bowdle, K. J. Haththotuwegama, S. Jelacic, S. T. Nguyen, K. Togashi, K. E. Michaelsen ..... 6

The hypothesis that many patients would require less than the recommended dose of sugammadex, but that some would require more, and that recurrent paralysis would not occur was tested in a prospective dose-finding study of 97 cardiac surgery patients administered rocuronium in whom neuromuscular blockade was monitored using an electromyography-based twitch monitor. The sugammadex dose required for an individual patient could not be predicted with certainty based on the train-of-four twitch response immediately before reversal. Two patients had recurrent paralysis during the postoperative monitoring period. Quantitative twitch monitoring is essential to evaluate the effectiveness of reversal with sugammadex.

◆◆ Morphine and Hydromorphone Effects, Side Effects, and Variability: A Crossover Study in Human Volunteers

K. Meissner, A. Dahan, E. Olofson, C. Göpfert, J. Blood, J. Wieditz, E. D. Kharasch ..... 16

This meticulously performed comparative volunteer study examined the onset, depth, and duration of drug effects on analgesia, pupil diameter, expired carbon dioxide, and respiratory rate, along with measured arterial opioid concentrations. They showed that the relationship between analgesia and respiratory depression differed between the two drugs, with morphine having “less analgesia” for any given degree of respiratory depression as well as a delayed onset and longer duration of respiratory depression. The authors suggest that hydromorphone may, as a result, have advantages in the clinical setting.

◆◆ Patient and Process Outcomes among Pediatric Patients Undergoing Appendectomy during the COVID-19 Pandemic: An International Retrospective Cohort Study

C. T. Matava, N. T. G. Tighe, R. Baertschiger, R. T. Wilder, L. Correll, S. J. Staffa, D. Zurakowski, M. A. Kato, P. M. Meier, V. Raman, S. K. Reddy, R. A. Roque, M. B. Peterson, J. Zhong, T. Edala, T. J. Greer, B. S. von Ungern-Sternberg, J. Cravero, A. F. Simpaio, for the PEACOC Collaborators ..... 35

A total of 1,618 pediatric patients across 28 institutions undergoing appendectomy from April to May 2020 were age, sex, and American Society of Anesthesiologists Physical Status matched to 1,684 similar patients treated in April to May 2019. Overall, hospital length of stay was similar, demonstrating an average of 29 h during the pandemic cohort versus 28 h prepandemic cohort.

◆ Refers to This Month in ANESTHESIOLOGY

◆ Refers to Editorial

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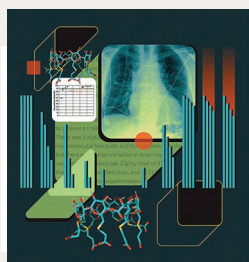
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**ON THE COVER:** The dose of sugammadex recommended by the manufacturer for reversal of rocuronium is 2 mg/kg when the train-of-four count is 2 or more, and 4 mg/kg when it is less than 2 but there is a posttetic count of at least 1. In this issue of ANESTHESIOLOGY, Bowdle *et al.* titrate sugammadex after cardiac surgery with the hypothesis that many patients would require less than the recommended dose of sugammadex, some patients would require more, and recurrent paralysis would not occur. In an accompanying editorial, Todd and Kopman review previous guidelines on the monitoring of neuromuscular blockade and how new observations affect patient care. Cover illustration: A. Johnson, Vivo Visuals Studio.

- Bowdle *et al.*: A Dose-finding Study of Sugammadex for Reversal of Rocuronium in Cardiac Surgery Patients and Postoperative Monitoring for Recurrent Paralysis, p. 6
- Todd and Kopman: Sugammadex Is Not a Silver Bullet: Caveats Regarding Unmonitored Reversal, p. 1

## BASIC SCIENCE

### ◆◇ Measures of Information Content during Anesthesia and Emergence in the *Caenorhabditis elegans* Nervous System

A. S. Chang, G. S. Wirak, D. Li, C. V. Gabel, C. W. Connor ..... 49

Measuring the entropy of calcium transients in simultaneously imaged neurons of *Caenorhabditis elegans* can evaluate how isoflurane anesthesia alters interneuronal information coupling. These investigations led to the construction of three novel entropy metrics: state decoupling, internal predictability, and system consistency. These new metrics proved to be more sensitive indicators for differentiating the awake state from isoflurane-anesthetized states in *C. elegans* than the standard metrics of mutual information and transfer entropy.

### ◇ TREK-1 and TREK-2 Knockout Mice Are Not Resistant to Halothane or Isoflurane

K. A. Spencer, C. B. Woods, H. M. Worstman, S. C. Johnson, J.-M. Ramirez, P. G. Morgan, M. M. Sedensky ..... 63

In mice, genetic deletion of TREK-1 and/or TREK-2 channels did not alter minimum alveolar concentration values of isoflurane or halothane. These observations suggest that TREK channels do not exclusively mediate anesthetic sensitivity in mice.

## Critical Care Medicine

### BASIC SCIENCE

### ◇ Hemostatic *In Vitro* Properties of Novel Plasma Supernatants Produced from Late-storage Low-titer Type O Whole Blood

E. P. Mihalko, A. J. Srinivasan, K. C. Rahn, J. N. Seheult, P. C. Spinella, A. P. Cap, D. J. Triulzi, M. H. Yazer, M. D. Neal, S. M. Shea ..... 77

Low-titer group O whole blood discarded plasma contained more residual platelets and microparticles and demonstrated greater thrombin generation than liquid plasma. As a result, this otherwise discarded product may provide an additional resource for plasma with comparable, if not enhanced, *in vitro* hemostatic efficacy to liquid plasma.

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## INSTRUCTIONS FOR AUTHORS

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