



ON THE COVER:

Both extraneuronal and intraneuronal sciatic nerve blocks at the popliteal fossa have been shown to be effective and to be associated with a small incidence of neuronal injury. In this issue of *ANESTHESIOLOGY*, Cappelleri *et al.* performed intraneuronal sciatic nerve blocks to determine the lowest effective local anesthetic dose and conducted follow-up clinical and neurophysiologic studies for 6 months. While intraneuronal injection produced reliable sciatic nerve blockade using small local anesthetic volumes, neurophysiologic changes persisted at 6 months, suggesting persistent neuronal injury. In an accompanying Editorial View, Vlassakov *et al.* question the wisdom of intentional intraneuronal injection as a strategy for reducing local anesthetic dose. Illustration by Annemarie Johnson, Vivo Visuals.

- Cappelleri *et al.*: Intraneural Ultrasound-guided Sciatic Nerve Block: Minimum Effective Volume and Electrophysiologic Effects, p. 241
- Vlassakov *et al.*: Intraneural Injection: Is the Jury Still Out? p. 221

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■ PERIOPERATIVE MEDICINE

CLINICAL SCIENCE



- ◆ ◆ **Intraneural Ultrasound-guided Sciatic Nerve Block: Minimum Effective Volume and Electrophysiologic Effects** 241

G. Cappelleri, A. L. Ambrosoli, M. Gemma, V. L. E. Cedrati, F. Bizzarri, and G. F. Danelli

The low volume intraneural injection of ropivacaine 1% provided complete sensory-motor nerve block. Reductions in action potential amplitudes lasting at least 6 months from the time of nerve block suggest that additional safety studies will be required.

- ◆ ◆ **Cost-benefit Analysis of Maintaining a Fully Stocked Malignant Hyperthermia Cart *versus* an Initial Dantrolene Treatment Dose for Maternity Units** 249

P. T. Ho, B. Carvalho, E. C. Sun, A. Macario, and E. T. Riley

Cost-benefit analysis showed that the costs associated with maintaining a malignant hyperthermia cart with a full dantrolene supply within 10 min of a maternity unit exceeded the benefits. Modeling suggested that a more cost-effective approach would be to keep just an initial dose of dantrolene on the maternity unit, with a central supply of dantrolene available within 30 min.

- ◆  **Combined Recirculatory-compartmental Population Pharmacokinetic Modeling of Arterial and Venous Plasma S(+) and R(–) Ketamine Concentrations** 260

T. K. Henthorn, M. J. Avram, A. Dahan, L. L. Gustafsson, J. Persson, T. C. Krejcie, and E. Olofson

A ketamine dataset with simultaneously collected arterial and venous blood samples was used to develop an intravascular mixing model that reconciled the divergent arterial and venous concentration *versus* time relationships during and after drug infusion. Higher arterial concentrations during drug infusion result from the contribution of both partially mixed drug from the upstream infusion and mixed recirculating drug. The partially mixed concentration is proportional to the ratio of the drug infusion rate and cardiac output. Higher postinfusion venous concentrations are due to contributions of drug eluting from tissue.

BASIC SCIENCE

- ◆ **Nuclear Spin Attenuates the Anesthetic Potency of Xenon Isotopes in Mice: Implications for the Mechanisms of Anesthesia and Consciousness** 271

N. Li, D. Lu, L. Yang, H. Tao, Y. Xu, C. Wang, L. Fu, H. Liu, Y. Chummum, and S. Zhang

The potency of two xenon isotopes with nuclear spin, xenon 129 and xenon 131, is less than the potency of two xenon isotopes, xenon 132 and xenon 134, that do not have nuclear spin. This difference in potency cannot be explained, either by differences in outer electron shells (there are none) or the variations in atomic mass. The results suggest that some of the effects of xenon on consciousness may be mediated by quantum mechanisms.

- ◆ ◆ **Ketamine Alters Hippocampal Cell Proliferation and Improves Learning in Mice after Traumatic Brain Injury** 278

A. J. Peters, L. E. Villasana, and E. Schnell

In mice subjected to traumatic brain injury, ketamine significantly increased hippocampal cell proliferation. Surprisingly, the increased proliferation was largely a product of increased microgliogenesis. Ketamine administration also improved behavioral function after injury. The demonstration that ketamine administration modulates the brain response after head injury suggests that ketamine may, at least in experimental models, also alter long-term behavioral outcomes.

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In an *in vivo* study of experimental sepsis, fluid resuscitation restored glomerular filtration, but recombinant atrial natriuretic peptide restored renal tubular flow and glomerular filtration.

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F. Song, J. Hou, Z. Chen, B. Cheng, R. Lei, P. Cui, Y. Sun, H. Wang, and X. Fang

In an *in vivo* mouse model of Gram-negative sepsis, deletion of the gene for sphingosine-1-phosphate receptor 2 (S1PR2) reduced pyroptosis, possibly by decreased activation of caspase-11, and increased survival. S1PR2 and caspase-11 may be testable targets in sepsis.

CLINICAL SCIENCE

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M. Taboada, P. Doldan, A. Calvo, X. Almeida, E. Ferreira, A. Baluja, A. Cariñena, P. Otero, V. Caruezo, A. Naveira, P. Otero, and J. Alvarez

In this observational study, 208 patients experienced direct laryngoscopy both in the intensive care unit and operating room during the perioperative period. Tracheal intubation was associated with worse intubation conditions and more complications in the intensive care unit compared with the operating room.

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J. Hermanides, B. A. Lemkes, J. M. Prins, M. W. Hollmann, and I. Terreehorst


A β -lactam allergy is the most common suspected in-hospital drug allergy. This article aims to provide a practical approach to a patient with presumed β -lactam allergy in the perioperative setting.

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R.-R. Ji, A. Nackley, Y. Huh, N. Terrando, and W. Maixner

This article describes how neuroinflammation, induced by various painful insults, drives central sensitization and leads to chronic and widespread pain.

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