



ON THE COVER:

This themed issue focuses on original investigation and commentary in the rapidly changing world of medical education. From medical student through continuing education during practice, new approaches are being implemented and new requirements are being applied, and this issue covers both of these in a comprehensive fashion. Whether you're a first-year resident or approaching retirement, there is something in this issue for you.

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◆ Refers to This Month in Anesthesiology

◆ Refers to Editorial Views

ME This is a Medical Education issue article

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- ME **“Masters of Anaesthesia”: M.S.A. Degrees during the 1893 World’s Fair from Chicago’s Post-Graduate School of Anaesthesia** 42
G.S. Bause

PERIOPERATIVE MEDICINE

- Despite Differences in Cytosolic Calcium Regulation, Lidocaine Toxicity Is Similar in Adult and Neonatal Rat Dorsal Root Ganglia *In Vitro*** 50
L.V. Doan, O. Eydlin, B. Piskoun, R.P. Kline, E. Recio-Pinto, A.D. Rosenberg, T.J.J. Blanck, and F. Xu

In a model of neuronal cultures of dorsal root ganglia neurons from postnatal day 7 and adult rats, lidocaine induced similar cytotoxic and apoptotic effects on neonatal and adult rat dorsal root ganglia neurons despite differences in their KCl-evoked calcium responses *in vitro*.

- Preoperative Thrombocytopenia and Postoperative Outcomes after Noncardiac Surgery** 62
L.G. Gance, N. Blumberg, M.P. Eaton, S.J. Lustik, T.M. Osler, R. Wissler, R. Zollo, M. Karcz, C. Feng, and A.W. Dick

Abnormal platelet counts were common, occurring in 1 of 14 patients. Patients with low platelet counts were more likely to require transfusion and more likely to die.

CRITICAL CARE MEDICINE

- Immobilization with Atrophy Induces *De Novo* Expression of Neuronal Nicotinic $\alpha 7$ Acetylcholine Receptors in Muscle Contributing to Neurotransmission** 76
S. Lee, H. Yang, T. Sasakawa, M.A.S. Khan, A. Khatri, M. Kaneki, and J.A.J. Martyn

After immobilization, immature nicotinic acetylcholine receptors (AChRs) did not contribute to neurotransmission, however, $\alpha 7$ AChRs were up-regulated and also contributed to neuromuscular transmission. Resistance to clinically used muscle relaxants seen with immobilization might be related to functional expression of insensitive $\alpha 7$ AChRs.

PAIN MEDICINE

- ME **Ultrasonography of the Cervical Spine: An *In Vitro* Anatomical Validation Model** 86
M. van Eerd, J. Patijn, J.M. Sieben, M. Sommer, J. Van Zundert, M. Van Kleef, and A. Lataster

An *in vitro* model was constructed and validated for ultrasound imaging of the cervical spine. Ultrasound images are provided for the key landmarks: mastoid process, transverse process of C1, tubercles of C6 and C7, and cervical laminae.
SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

<p>◆ CME ◆ Hamilton Acute Pain Service Safety Study: Using Root Cause Analysis to Reduce the Incidence of Adverse Events</p> <p><i>J.E. Paul, N. Buckley, R.F. McLean, K. Antoni, D. Musson, M. Kampf, D. Buckley, M. Marcoux, R. Frketich, L. Thabane, and J. Cheng</i></p>	<p>97</p>
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Comparing data from over 35,000 postoperative patients before and after a root cause analysis–led intervention showed a reduction by 1/3 in major adverse events, accompanied by an increase by 1/3 in the incidence of severe pain.

■ **EDUCATION**

IMAGES IN ANESTHESIOLOGY

<p>ME From Simulation to Separation Surgery: A Tale of Two Twins</p> <p><i>A.F. Simpao, R. Wong, T.J. Ferrara, H.L. Hedrick, A.J. Schwartz, T.L. Snyder, S.J. Tharakan, and P.D. Bailey, Jr.</i></p>	<p>110</p>
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ORIGINAL INVESTIGATIONS IN EDUCATION

<p>◆ ME Facilitation of Resident Scholarly Activity: Strategy and Outcome Analyses Using Historical Resident Cohorts and a Rank-to-Match Population</p> <p><i>T. Sakai, T.D. Emerick, D.G. Metro, R.M. Patel, S.C. Hirsch, D.G. Winger, and Y. Xu</i></p>	<p>111</p>
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Since 2006 the University of Pittsburgh instituted a series of initiatives regarding resident research, resulting in increased research involvement by faculty and productivity by residents in comparison to historical and matched controls.

<p>◆ ME Resident Characterization of Better-than- and Worse-than-Average Clinical Teaching</p> <p><i>B. Haydar, J. Charnin, T. Voepel-Lewis, and K. Baker</i></p>	<p>120</p>
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In a two-step process, comments from faculty evaluations over a 2-yr period at one institution were studied to identify themes associated with above- and below-average ratings by trainees. Thirteen themes were identified using trainee evaluations and these fell into four domains associated with outstanding teaching.

<p>◆ ME Simulation-based Assessment to Identify Critical Gaps in Safe Anesthesia Resident Performance</p> <p><i>R.H. Blum, J.R. Boulet, J.B. Cooper, and S.L. Muret-Wagstaff; for the Harvard Assessment of Anesthesia Resident Performance Research Group</i></p>	<p>129</p>
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A multiscenario, simulation-based performance assessment of 22 first-year residents and 8 fellows from two institutions showed high reliability, validity, and generalizability. A majority of trainees and faculty judged the assessment to be useful, realistic, and representative of critical skills required for safe practice.

<p>ME Building the Evidence on Simulation Validity: Comparison of Anesthesiologists' Communication Patterns in Real and Simulated Cases</p> <p><i>J. Weller, R. Henderson, C.S. Webster, B. Shulruf, J. Torrie, E. Davies, K. Henderson, C. Frampton, and A.F. Merry</i></p>	<p>142</p>
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In an evaluation of 20 anesthesiologists, communication pattern for routine cases was similar during simulation as during clinical care in the operating room, supporting the ecologic validity of simulation.

<p>ME Simulator Training Enhances Resident Performance in Transesophageal Echocardiography</p> <p><i>N.A. Ferrero, A.V. Bortsov, H. Arora, S.M. Martinelli, L.M. Kolarczyk, E.C. Teeter, D.A. Zvara, and P.A. Kumar</i></p>	<p>149</p>
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This study showed that mannequin-based transesophageal echocardiography simulation training was superior to conventional didactic training on acquisition of good-quality echocardiographic images in patients by residents in training.

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- ME** **Improving Faculty Feedback to Resident Trainees during a Simulated Case: A Randomized, Controlled Trial of an Educational Intervention** 160
R.D. Minehart, J. Rudolph, M.C.M. Pian-Smith, and D.B. Raemer

Training improved faculty ability to maintain a psychologically safe environment, explore the resident's frame of reference, and address professionalism along with technical issues.

- ME** **Automated Near–Real-time Clinical Performance Feedback for Anesthesiology Residents: One Piece of the Milestones Puzzle** 172
J.M. Ehrenfeld, M.D. McEvoy, W.R. Furman, D. Snyder, and W.S. Sandberg

An automated, near–real-time feedback system was generated from a perioperative information management system and refined using resident feedback. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- ME** **Performance Assessment in Airway Management Training for Nonanesthesiology Trainees: An Analysis of 4,282 Airway Procedures Performed at a Level-1 Trauma Center** 185
T.E. Grissom, J. Sappenfield, S.M. Galvagno, Jr., S.V. Cherry, Y.-C.C. Chang, and P.F. Hu

In a study of nearly 100 trainees undergoing a 4-week rotation, with over 4,200 airway procedures, first-attempt success at endotracheal intubation increased as a function of rotation week, as did self-reported laryngoscopic view.

REVIEW ARTICLE

- ME** **Designing and Implementing the Objective Structured Clinical Examination in Anesthesiology** 196
M.J. Hastie, J.L. Spellman, P.P. Pagano, J. Hastie, and B.J. Egan

This is a review of the history and current use of Objective Structured Clinical Examination, and challenges in design and implementation including the psychometrics of test design.

- ME** **Cognitive Processes in Anesthesiology Decision Making** 204
M.P. Stiegler and A. Tung

Errors in medical decisions may contribute significantly to adverse events. The authors review current knowledge of nonrational cognitive processes in human decision making, identify vulnerable anesthesia decisions, and suggest strategies for mitigating effects of these processes.

- ME** **Addressing the Mandate for Hand-off Education: A Focused Review and Recommendations for Anesthesia Resident Curriculum Development and Evaluation** 218
M.B. Lane-Fall, A.K. Brooks, S.A. Wilkins, J.J. Davis, and L.A. Riesenber

Hand-off and curriculum literature is reviewed to provide recommendations for anesthesia-specific resident hand-off curriculum and evaluation. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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