




ON THE COVER:

We continue our end-of-the-year special focus on an institution which has developed and maintained research excellence in the specialty. This year a majority of the December issue comes from the department of anesthesiology and critical care at Pitié-Salpêtrière in Paris, France, an institution which celebrated 400 years of patient care this year.

THIS MONTH IN ANESTHESIOLOGY

9A

EDITORIAL VIEWS

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Contribution of the Pitié-Salpêtrière Hospital to French Anesthesiology 1147
Pierre Coriat
- 
Do We Need to Monitor Cardiac Output during Major Surgery? 1151
Jean-Louis Vincent and David Fagnoul
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Erythrocyte Transfusion: Remedy or Poison? 1153
Yannick Le Manach and Summer Syed
- Internet Use during Anesthesia Care: Does It Matter?** 1156
Karen B. Domino and Daniel I. Sessler
- Understanding the Erythrocyte Storage Lesion** 1159
Gregory J. Kato
- Lactate Clearance in the Acutely Traumatized Patient** 1162
Alan E. Jones


PERIOPERATIVE MEDICINE

- 
Can Changes in Arterial Pressure be Used to Detect Changes in Cardiac Output during Volume Expansion in the Perioperative Period? 1165
Yannick Le Manach, Christoph K. Hofer, Jean-Jacques Lehot, Benoît Vallet, Jean Pierre Goarin, Benoît Tavernier, and Maxime Cannesson

Volume expansion–induced changes in arterial pressure are related to volume expansion–induced changes in cardiac output. However, only changes in pulse pressure variations accurately detect volume expansion–induced changes in cardiac output and have potential clinical applicability.

◆ Refers to This Month in Anesthesiology

◆ Refers to Editorial Views

 This article is from or about Pitié-Salpêtrière

 See Supplemental Digital Content

 CME Article

- ◆  **Relationship of Erythrocyte Transfusion with Short- and Long-term Mortality in a Population-based Surgical Cohort** 1175
Keyvan Karkouti, Thérèse A. Stukel, W. Scott Beattie, Susie Elsaadany, Rachel Berger, and Duminda N. Wijeyesundera
 The association of erythrocyte transfusion with mortality differed significantly when comparing hospitals with differing transfusion rates, as opposed to comparing transfused *versus* nontransfused patients. This discrepancy raises questions about the relationship between transfusion and mortality. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*
- ◆ **Intraoperative Non-Record-keeping Usage of Anesthesia Information Management System Workstations and Associated Hemodynamic Variability and Aberrancies** 1184
David B. Wax, Hung-Mo Lin, and David L. Reich
 Anesthesia providers spent sizable portions of case time performing non-record-keeping applications on anesthesia information management system workstations. This use, however, was not independently associated with greater hemodynamic variability or aberrancies in patients during maintenance of anesthesia.
- ◆ **Inhaled Nitric Oxide Attenuates the Adverse Effects of Transfusing Stored Syngeneic Erythrocytes in Mice with Endothelial Dysfunction after Hemorrhagic Shock** 1190
Chong Lei, Binglan Yu, Mohd Shahid, Arkadi Beloiartsev, Kenneth D. Bloch, and Warren M. Zapol
 Resuscitation from hemorrhagic shock with stored erythrocytes is worse than resuscitation with fresh erythrocytes. Endothelial dysfunction exacerbates and inhaled nitric oxide ameliorates the adverse effects of murine resuscitation with stored erythrocytes.
-  ◆ **Impact of Perioperative Bleeding on the Protective Effect of β -Blockers during Infrarenal Aortic Reconstruction** 1203
Yannick Le Manach, Gary S. Collins, Cristina Ibanez, Jean Pierre Goarin, Pierre Coriat, Julien Gaudric, Bruno Riou, and Paul Landais
 Use of β -blockers was associated with a reduced frequency of postoperative myocardial necrosis. In case of severe bleeding, increased frequency of multiple organ dysfunction syndrome and death were observed.
-  **Interaction of Metabolic and Respiratory Acidosis with α and β -adrenoceptor Stimulation in Rat Myocardium** 1212
Matthieu Biais, Romain Jouffroy, Aude Carillion, Sarah Feldman, Aude Jobart-Malfait, Bruno Riou, and Julien Amour
 Acute respiratory acidosis induced more pronounced negative inotropic effects than acute metabolic acidosis did, related to greater decrease in intracellular pH. The inotropic response to β -adrenoceptor stimulation was impaired only in metabolic acidosis.
-  **Prediction of Difficult Tracheal Intubation: Time for a Paradigm Change** 1223
Olivier Langeron, Philippe Cuvillon, Cristina Ibanez-Esteve, François Lenfant, Bruno Riou, and Yannick Le Manach
 Predicting difficult tracheal intubation is difficult because of the poor predictive capacity of individual signs and scores. Computer-assisted models using interactions among variables enable an accurate prediction with few patients in the inconclusive zone.
-  **Residual Neuromuscular Blockade Affects Postoperative Pulmonary Function** 1234
Gopalaiah Venkatesh Kumar, Anita Pramod Nair, Hanuman Srinivasa Murthy, Koppa Ramegowda Jalaja, Karnate Ramachandra, and Gundappa Parameshwara
 Residual neuromuscular block causes reduction in postoperative forced vital capacity and peak expiratory flow, indicating impaired respiratory muscle function. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*
- Differences in microRNA Changes of Healthy Rat Liver between Sevoflurane and Propofol Anesthesia** 1245
Masashi Ishikawa, Shunsuke Tanaka, Masae Arai, Yuuki Genda, and Atsuhiko Sakamoto
 microRNA mediates posttranscriptional regulation of gene expression. The results of this study showed that anesthetic agents caused many microRNA expression changes and that the expression pattern was distinct for each anesthetic agent.

Epileptogenic Effect of Sevoflurane: Determination of the Minimal Alveolar Concentration of Sevoflurane Associated with Major Epileptoid Signs in Children

1253

Stephanie Gibert, Nada Sabourdin, Nicolas Louvet, Marie-Laure Moutard, Veronique Piat, Marie-Laurence Guye, Agnes Rigouzzo, and Isabelle Constant

This study determines with the up-and-down method the minimal alveolar concentration of sevoflurane at which electroencephalographic epileptoid signs occur in anesthetized children, in 100% oxygen, in 50% oxygen – 50% nitrous oxide, or after a bolus of alfentanil.

Xenon Neuroprotection in Experimental Stroke: Interactions with Hypothermia and Intracerebral Hemorrhage

1262

Siyuan P. Sheng, Beilei Lei, Michael L. James, Christopher D. Lascola, Talaignair N. Venkatraman, Jin Yong Jung, Mervyn Maze, Nicholas P. Franks, Robert D. Pearlstein, Huaxin Sheng, and David S. Warner

Postischemic xenon provided transient improvement in outcome from experimental focal ischemic stroke in rats. When combined with subtherapeutic hypothermia, benefit was sustained. Xenon alone decreased injury from intracerebral hemorrhage in mice.

CRITICAL CARE MEDICINE

Prognostic Significance of Blood Lactate and Lactate Clearance in Trauma Patients

1276

Marie-Alix Régnier, Mathieu Raux, Yannick Le Manach, Yves Asencio, Johann Gaillard, Catherine Devilliers, Olivier Langeron, Bruno Riou

Early (0–2 h) lactate clearance is a prognostic variable that provides additional information to initial blood lactate levels and scores and this information can be summarized using a categorical approach (–20%/h or lower, or not).

Elderly Age as a Prognostic Marker of 1-year Poor Outcome for Subarachnoid Hemorrhage Patients through Its Interaction with Admission Hydrocephalus

1289

Vincent Degos, Pierre-Antoine Gourraud, Virginie Trehel Tursis, Rachel Whelan, Chantal Colonne, Anne Marie Korinek, Frédéric Clarençon, Anne-Laure Boch, Aurélien Nouet, William L. Young, Christian C. Apfel, and Louis Puybasset

An increasing number of elderly patients are treated for aneurysmal subarachnoid hemorrhage. In this observational study, elderly age and admission hydrocephalus predicted 1-yr poor outcome but elderly age without hydrocephalus did not.


SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

Assessment of White Matter Injury and Outcome in Severe Brain Trauma: A Prospective Multicenter Cohort


1300

Damien Galanaud, Vincent Perlberg, Rajiv Gupta, Robert D. Stevens, Paola Sanchez, Eléonore Tollard, Nicolas Menjot de Champfleury, Julien Dinkel, Sébastien Faivre, Gustavo Soto-Ares, Benoît Veber, Vincent Cottenceau, Françoise Masson, Thomas Tourdias, Edith André, Gérard Audibert, Emmanuelle Schmitt, Danielle Ibarrola, Frédéric Daillier, Audrey Vanhauzenhuyse, Luaba Tshibanda, Jean-François Payen, Jean-François Lebas, Alexandre Krainik, Nicolas Bruder, Nadine Girard, Steven Laureys, Habib Benali, Louis Puybasset; for the Neuro Imaging for Coma Emergence and Recovery Consortium


Existing methods to predict recovery after severe traumatic brain injury (TBI) lack accuracy. White matter damage, a key feature of TBI, can be identified and quantified with a magnetic resonance imaging (MRI) sequence called diffusion tensor imaging (DTI). The aim of this study is to determine the prognostic value of quantitative DTI in TBI. In a multicenter study, patients who remained comatose at least 7 days after TBI underwent brain MRI, including DTI in 20 preselected white matter tracts. Patients were evaluated at 1 yr with a modified Glasgow Outcome Scale. The DTI score had a sensitivity of 64% and a specificity of 95% for the prediction of unfavorable outcome. On the validation database, the area under the receiver operating characteristic curve was 0.80. White matter assessment with quantitative DTI increases the accuracy of long-term outcome prediction when compared with the available clinical and radiographic score.

-  **Diffusion Tensor Imaging to Predict Long-term Outcome after Cardiac Arrest: A Bicentric Pilot Study** 1311
Charles-Edouard Luyt, Damien Galanaud, Vincent Perlberg, Audrey Vanhaudenhuyse, Robert D. Stevens, Rajiv Gupta, Hortense Besancenot, Alexandre Krainik, Gérard Audibert, Alain Combes, Jean Chastre, Habib Benali, Steven Laureys, Louis Puybasset, for the Neuro Imaging for Coma Emergence and Recovery Consortium

Diffusion tensor imaging is a promising tool to predict severe neurologic impairment in comatose survivors of cardiac arrest.


-  **Effects of Positive End-expiratory Pressure Titration and Recruitment Maneuver on Lung Inflammation and Hyperinflation in Experimental Acid Aspiration–induced Lung Injury** 1322
Aline M. Ambrosio, Rubin Luo, Denise T. Fantoni, Claudia Gutierrez, Qin Lu, Wen-Jie Gu, Denise A. Otsuki, Luiz M.S. Malbouisson, Jose O.C. Auler, Jr, Jean-Jacques Rouby, and the Experimental ARDS Study Group

Lung histology after positive end-expiratory pressure titration and recruitment maneuvers was studied in pigs with acid aspiration–induced lung injury. Positive end-expiratory pressure titration induced lung inflammation and hyperinflation whereas recruitment maneuvers had no additional effects.

-  **Efficacy of High-dose Nebulized Colistin in Ventilator-associated Pneumonia Caused by Multidrug-resistant *Pseudomonas aeruginosa* and *Acinetobacter baumannii*** 1335
Qin Lu, Rubin Luo, Liliane Bodin, Jianxin Yang, Noël Zahr, Alexandra Aubry, Jean-Louis Golmard, Jean-Jacques Rouby, and the Nebulized Antibiotics Study Group

Efficacy of high-dose nebulized colistin was studied in patients with ventilator-associated pneumonia caused by multidrug-resistant *Pseudomonas aeruginosa* and *Acinetobacter baumannii*. Nebulized colistin was noninferior to intravenous antibiotics for treating ventilator-associated pneumonia caused by susceptible strains.

■ CLASSIC PAPERS REVISITED

-  **Why Question Established Practice?** 1348
Francis M. James III

This article is a revisiting of original material published as: James FM III, Griess FC, Kemp RA: An evaluation of vasopressor therapy for maternal hypotension during spinal anesthesia. *ANESTHESIOLOGY* 1970; 33:25-34. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

■ EDUCATION

IMAGES IN ANESTHESIOLOGY

-  **Liver Contusion after Spine Fusion Surgery in Prone Position** 1352
David Cortier, Hugues Pascal-Mouscellard, and Armelle Nicolas-Robin

- Cephalad Migration of Pediatric Caudal Epidural Catheters Associated with Change from Prone to Supine Position** 1353
Allan F. Simpao, Harshad G. Gurnaney, Alan Jay Schwartz, Lynne G. Maxwell, and Mohamed A. Rehman

- Battery Ingestion Resulting in an Aortoesophageal Fistula** 1354
Sarah Jean Pae, Sara Helen Habte, John Joseph McCloskey, and Alan Jay Schwartz

ANESTHESIA LITERATURE REVIEW 1355

CLINICAL CONCEPTS AND COMMENTARY

- Lüer's Lure: From an International Standards Perspective** 1358
Debra R. Milamed, Karen Brown, and Edward Murphy

More than 200 deaths attributable to Luer-related misconnections have been reported. A redesign of Luer small-bore connectors is essential. The authors describe the international collaboration and regulatory aspects required for redesign and standardization.

This review describes advantages and limits of different experimental models of pneumonia. It reports experimental data concerning the use of nebulized antibiotics and draw lessons for clinical use in patients with ventilator-associated pneumonia.

MIND TO MIND

Claire Poinsoot and Sophie Mayer

Maurice S. Albin

David A. August

CASE REPORT

John E. Fiadjo, Paul Stricker, Harshad Gurnaney, Akira Nishisaki, Anna Rabinowitz, Avraham Gurwitz, John J. McCloskey, and Arjunan Ganesh

SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

CORRESPONDENCE

Lene Krenk and Henrik Kehlet

In Reply

Madan M. Kwatra, Richard E. Moon, William D. White, Paula T. Trzepacz, and Sarah K. Rivelli

Andrey B. Petrenko, Misako Takamatsu, and Hiroshi Baba

In Reply

Ken Solt, Jessica J. Chemali, Christa J. Van Dort, and Emery N. Brown

Annelies T. Moerman and Stefan G. De Hert

In Reply

Kyung Y. Yoo, Hyejin Jeong, and JongUn Lee

Howard D. Palte and Steven Gayer

In Reply

Clément Dubost, Agnès Le Gouez, Viridiana Jouffroy, Sandrine Roger-Christoph, Dan Benhamou, Frédéric J. Mercier, and Thomas Geeraerts

Updated Pain Guidelines: What Is New?

Henrik Kehlet

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In Reply

Michael A. Ashburn, Jeffrey L. Apfelbaum, Richard T. Connis, David G. Nickinovich,
on behalf of the American Society of Anesthesiologists Task Force on Acute Pain Management
in the Perioperative Setting

Can Propofol Mimic Alcohol-related Pain in Patients with Hodgkin Lymphoma?

Omar Shakil, Jayant S. Jainandunsing, Jeniffer Gerstle, Stephanie B. Jones,
and Feroze Mahmood

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ANESTHESIOLOGY REFLECTIONS FROM THE PIERRE VIARS MUSEUM

Epidural Anesthesia at the Pitié-Salpêtrière Hospital: From Fernand Cathelin (1901) to Jeanne Seebacher (1974)

Jean-Bernard Cazalà

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Ombrédanne Inhaler 1908–1982(?)

Jean-Bernard Cazalà

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The Henry and Jouvet Transfusion Apparatus 1934

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Radium and Thorium Applications for the General Public: Unexpected Consequences of the Discovery from Pierre and Marie Curie

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Paul Bert: From Physiology to Barometric Pressure

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Musicotherapy in Anesthesia: Maxime Drossner, 1901

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