This Month in ANESTHESIOLOGY

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Science, Medicine, and the Anesthesiologist

Infographics in Anesthesiology

Editorial

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Environmental Footprint of Anesthesia: More than Inhaled Anesthetics!

P. P. Pandharipande, E. L. Whitlock, C. G. Hughes

Baseline Vulnerabilities May Play a Larger Role than Depth of Anesthesia or Sedation in Postoperative Delirium

P. P. Pandharipande, E. L. Whitlock, C. G. Hughes

Pursuing the Importance of Postoperative Atelectasis

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Preoperative Chronic Opioid Trajectories: A Change (in Any Direction) Would Do You Good?

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The Big Match: Lung Ventilation and Blood Flow during Inhalational Anesthesia and Recovery—Is There a Winning Combination?

P. J. Peyton, R. R. Kennedy

Special Articles

Elastomeric Respirators for COVID-19 and the Next Respiratory Virus Pandemic: Essential Design Elements


Respirators provide reliable protection from airborne respiratory pathogens. Reusable elastomeric respirators offer potential advantages compared to disposable filtering facepiece respirators. Development of improved elastomeric respirators should be an international public health priority.

CLINICAL SCIENCE

Carbon Footprint of General, Regional, and Combined Anesthesia for Total Knee Replacements

F. McGain, N. Sheridan, K. Wickramarathe, S. Yates, B. Chan, S. McAlister

The carbon footprint in carbon dioxide equivalent emissions associated with general anesthesia (n = 9), spinal anesthesia (n = 10), and combined (general and spinal) anesthesia (n = 10) for total knee replacement surgery in Melbourne, Australia, were similar. Single-use equipment, electricity for the patient air warmer, and pharmaceuticals were major sources of carbon dioxide equivalent emissions across all anesthetics. Sevoflurane was a significant source of the carbon dioxide equivalent emissions of both general anesthesia and combined anesthesia. Washing and sterilizing reusable items contributed substantially to the carbon dioxide equivalent emissions of both spinal and combined anesthesia. Oxygen use was an important contributor to the carbon footprint of spinal anesthesia.

ON THE COVER: Health care itself contributes to climate change. Anesthesia is a “carbon hotspot,” yet few data exist to compare anesthetic choices. In this issue of ANESTHESIOLOGY, McGain et al. examined the carbon dioxide equivalent emissions associated with general anesthesia, spinal anesthesia, and combined (general and spinal anesthesia) during a total knee replacement. In an accompanying editorial, Struys and Eckelman discuss how practicing anesthesiologists can lower the environmental footprint of anesthesia. Cover Design: A. Johnson, Vivo Visuals Studio. Cover Image: “This is the waste of one operation… my operation” by Dutch spacial artist Maria Koijck, created with waste generated during her own surgery. Cover Photograph: Eva Glasbeek, published with permission from the artist.

- McGain et al.: Carbon Footprint of General, Regional, and Combined Anesthesia for Total Knee Replacements
- Struys and Eckelman: Environmental Footprint of Anesthesia: More than Inhaled Anesthetics!
Preoperative Opioid Utilization Patterns and Postoperative Opioid Utilization: A Retrospective Cohort Study

C. A. Rishel, M. S. Angst, E. C. Sun

This prospective single-center trial randomized patients undergoing spine surgery to spine anesthesia with targeted sedation to Bispectral Index greater than 60 to 70 versus general anesthesia without Bispectral Index guidance. There was no difference in the incidence of postoperative delirium between randomized groups in the trial. Future studies are needed to determine whether these findings can be replicated at other centers and whether the results differ by cognitive status. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

Pressure Support versus Spontaneous Ventilation during Anesthetic Emergence—Effect on Postoperative Atelectasis: A Randomized Controlled Trial


A randomized trial in patients undergoing laparoscopic colectomy or robot-assisted prostatectomy compared pressure support ventilation to spontaneous ventilation with intermittent manual assistance during anesthetic emergence. The outcome was atelectasis in the postanesthesia recovery unit, using lung ultrasound. The incidence of atelectasis was significantly lower and the PaO₂ was significantly higher with pressure support ventilation; however, in the 48-h postoperative observation period, the incidence of oxygen saturation measured by pulse oximetry less than 92% was not different between groups. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

Preoperative Opioid Utilization Patterns and Postoperative Opioid Utilization: A Retrospective Cohort Study

C. A. Rishel, M. S. Angst, E. C. Sun

In a national claims database of 57,000 chronic opioid users undergoing common surgical procedures, 41, 22, and 37%, respectively, had stable, decreasing, or increasing preoperative opioid utilization (more than 20% change). After adjustment for potential confounders, 96, 89, and 94% of patients with stable, decreasing, or increasing preoperative opioid use utilized opioids (prescriptions filled) between postoperative days 91 and 365. All three groups had similar average daily oral morphine milligram equivalent utilization. Changes in preoperative opioid utilization were not associated with clinically significant differences in postoperative opioid utilization. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT
Patients receiving apixaban had significantly lower mortality compared to matched controls (34% [117 of 347] vs. 25% [87 of 347]), aspirin (26% [121 of 473] vs. 30% [140 of 473]), or enoxaparin (37% [133 of 360] vs. 30% [140 of 360]). Propensity score–matching analyses demonstrated lower mortality for patients receiving apixaban (27% [96 of 360] vs. 30% [140 of 360]), aspirin (26% [121 of 473] vs. 30% [140 of 473]), or enoxaparin (25% [87 of 347] vs. 34% [117 of 347]) compared to matched controls.

In a retrospective cohort consisting of 2,070 critically ill COVID-19 patients treated in six hospitals, multivariable regression analysis showed lower in-hospital mortality associated with apixaban, aspirin, or enoxaparin treatment. Propensity score–matching analyses demonstrated lower mortality for patients receiving apixaban (27% [96 of 360] vs. 37% [113 of 360]), aspirin (26% [121 of 473] vs. 30% [140 of 473]), or enoxaparin (25% [87 of 347] vs. 34% [117 of 347]) compared to matched controls.

More than 350 study participants undergoing mastectomy were randomized to either paravertebral blocks with ropivacaine or saline injections. Both groups received multimodal analgesia. Although paravertebral block using ropivacaine had a small analgesic effect in the immediate postoperative period, no differences in pain 3, 6, and 12 months after surgery were detected.

Data from the PAIN OUT registry involving more than 11,000 patients undergoing spinal surgery, joint replacement, and laparoscopic cholecystectomy were used in a retrospective cohort analysis. Pain reported postoperative day 1 declined slightly with age. Severe postoperative pain was prevalent regardless of age or surgical type.

Healthcare-associated infections contribute to morbidity, mortality, and increased cost in intensive care unit patients. Understanding evidence-based prevention strategies can help to optimize patient outcomes.

Multicomponent interventions are effective in preventing postoperative delirium, and work is ongoing to determine whether they can be effective in preventing other postoperative neurocognitive disorders. Interventions optimizing sleep, pain, and cognition are essential components for clinicians to include in strategies to maximize the recovery of body and mind of vulnerable patients.

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