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Despite a stable surgical level of anesthesia and the absence of noxious stimuli, connectivity patterns are not static but rather fluctuate dynamically and nonrandomly over time. These results suggest that single or static connectivity patterns may not be able to discriminate levels of consciousness. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◆  **Dynamic Cortical Connectivity during General Anesthesia in Surgical Patients**  
*P. E. Vlisides, D. Li, M. Zierau, A. P. Lapointe, K. I. Ip, A. M. McKinney, G. A. Mashour* .....885

During anesthesia and surgery, cortical networks display a dynamic interplay among brain states, rather than a static equilibrium. These findings suggest that a single measure of connectivity may not be a reliable correlate of surgical anesthesia depth. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◆  **Changes in Whole Brain Dynamics and Connectivity Patterns during Sevoflurane- and Propofol-induced Unconsciousness Identified by Functional Magnetic Resonance Imaging**  
*D. Golkowski, S. K. Larroque, A. Vanhauzenhuysse, A. Plenevaux, M. Boly, C. Di Perri, A. Ranft, G. Schneider, S. Laureys, D. Jordan, V. Bonhomme, R. Ilg* .....898

In a volunteer functional magnetic resonance study, general anesthesia reduced activity within and among networks. Specific between-network connectivity is necessary for consciousness. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◆  **Adverse Events and Factors Associated with Potentially Avoidable Use of General Anesthesia in Cesarean Deliveries**  
 *J. Guglielminotti, R. Landau, G. Li* .....912

In New York State, 5.7% of cesarean sections without a clinical indication for general anesthesia are performed with general anesthesia. The use of potentially avoidable general anesthesia in these patients is associated with an increased risk of anesthesia-related complications, surgical site infection, and venous thromboembolism, but not death or cardiac arrest. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◇ Refers to This Month in ANESTHESIOLOGY

◆ Refers to Editorial Views

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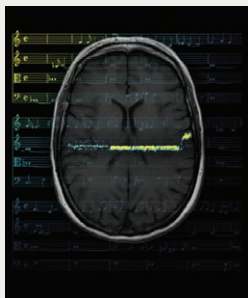
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**ON THE COVER:** Recent studies of anesthetic-induced unconsciousness have focused on functional brain connectivity patterns, but questions about the dynamic nature of these connectivity patterns remain unanswered. In this issue of ANESTHESIOLOGY, three original research articles examine dynamic cortical connectivity during general anesthesia in human volunteers and surgical patients, demonstrating that there is no single fixed state of cortical connectivity during general anesthesia. In an accompanying Editorial View, Sleight and Pullon compare the function of the conscious brain to that of an orchestra making music with an evolving balance of synchrony and syncopation, harmony and dissonance, regularity and surprise. Cover illustration: S. M. Jarret, M.F.A., C.M.I.

- Li *et al.*: Dynamic Cortical Connectivity during General Anesthesia in Healthy Volunteers, p. 870
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**Increased Reactivity of the Mesolimbic Reward System after Ketamine Injection in Patients with Treatment-resistant Major Depressive Disorder**

V. Sterpenich, S. Vidal, J. Hofmeister, G. Michalopoulos, V. Bancila, D. Warrot, A. Dayer, M. Desseilles, J.-M. Aubry, M. Kosel, S. Schwartz, L. Vutskits.....923

As expected, ketamine administration led to an improvement in mood and global vigilance. The improvement in mood was accompanied by an increased recruitment of the orbitofrontal cortex, ventral striatum, medial substantial nigra and ventral tegmental area, structures that are part of the reward circuitry. Responses in the mesolimbic structures (amygdala, medial substantial nigra and ventral tegmental area, orbitofrontal cortex) to negative stimuli were decreased after ketamine administration. The data are consistent with the premise that ketamine induces sustained changes in the mesolimbic neural circuits to reset pathological reward and emotional processing.

 **Opioid Sensitivity in Children with and without Obstructive Sleep Apnea**

M. C. Montana, L. Juriga, A. Sharma, E. D. Kharasch.....936


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 **Nasopharyngeal Tube Effects on Breathing during Sedation for Dental Procedures: A Randomized Controlled Trial**

Y. Kohzuka, S. Isono, S. Ohara, K. Kawabata, A. Kitamura, T. Suzuki, F. R. Almeida, Y. Sato, T. Iijima.....946

Apnea and hypopnea occur frequently during dental procedures under sedation. The majority of the events are not detectable with pulse oximetry. Insertion of a nasal tube with small diameter does not reduce the incidence of apnea/hypopnea.

 **Intravenous Lidocaine Does Not Improve Neurologic Outcomes after Cardiac Surgery: A Randomized Controlled Trial**

 R. Y. Klinger, M. Cooter, T. Bisanar, N. Terrando, M. Berger, M. V. Podgoreanu, M. Stafford-Smith, M. F. Newman, J. P. Mathew, for the Neurologic Outcomes Research Group of the Duke Heart Center.....958

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V. G. Nasr, S. J. Staffa, D. Zurakowski, J. A. DiNardo, D. Faraoni.....971

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**BASIC SCIENCE**

 **Disruption of Rapid Eye Movement Sleep Homeostasis in Adolescent Rats after Neonatal Anesthesia**

N. Lunardi, R. Sica, N. Atluri, K. A. Salvati, C. Keller, M. P. Beenhakker, H. P. Goodkin, Z. Zuo.....981

Anesthesia with isoflurane, nitrous oxide, and midazolam on postnatal day 7 is associated with alterations in sleep architecture three weeks later in adolescent rats. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

**Breathing under Anesthesia: A Key Role for the Retrotrapezoid Nucleus Revealed by Conditional *Phox2b* Mutant Mice**

T. Bourgeois, M. Ringot, N. Ramanantsoa, B. Matrot, S. Dauger, C. Delclaux, J. Gallego .....995

Ketamine, propofol, and fentanyl caused lethal respiratory failure in most mice with selective genetic loss of retrotrapezoid nucleus neurons, at doses that were safe in their wild type littermates.

**Pain Medicine**

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**Extrafascicular and Intraperineural, but No Endoneural, Spread after Deliberate Intraneural Injections in a Cadaveric Study**

M. A. Reina, X. Sala-Blanch, E. Monzó, O. C. Nin, P. E. Bigeleisen, A. P. Boezaart .....1007

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 **Activating  $\alpha 4\beta 2$  Nicotinic Acetylcholine Receptors Alleviates Fentanyl-induced Respiratory Depression in Rats**

J. Ren, X. Ding, J. J. Greer .....1017

The nonselective nicotinic acetylcholine receptor agonist nicotine and the  $\alpha 4\beta 2$  nicotinic acetylcholine receptor agonist A85380, but not the  $\alpha 7$  nicotinic acetylcholine receptor agonist PNU282987, reversed respiratory depression induced by activation of  $\mu$ -opioid receptors in rats both *in vitro* and *in vivo*. Coadministration of A85380 with fentanyl not only markedly reduced respiratory depression and apneas but also enhanced the fentanyl-induced analgesia.

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*A. F. Arriaga, R. E. Sweeney, J. T. Clapp, M. Muralidharan, R. C. Burson II, E. K. B. Gordon, S. A. Falk, D. Y. Baranov, L. A. Fleisher*.....1039

Failure to debrief after critical events is common among anesthesia trainees and likely anesthesia teams. Communication breakdowns are associated with a high rate of the failure to debrief. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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*L. J. Voss, P. S. García, H. Hentschke, M. I. Banks* .....1049

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- ◆ **Respiratory Physiology for the Anesthesiologist**  
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