Table of Contents

May 2010

Cardiovascular Anesthesiology

Anesthetic Pharmacology

Technology, Computing, and Simulation

- Ruth Fanning,
- Steven K. Howard,
- M. Frances Davies,
- and David M. Gaba

Anesth Analg May 2010 110:1292-1296

静脉内多泵输注误差与输注系统的机械顺应性之间的关系

(周姝婧　译　陈杰　校)

Technical Communication: The Link Between Intravenous Multiple Pump Flow Errors and Infusion System Mechanical Compliance

- Robert S. Murphy and
- Steven J. Wilcox

Anesth Analg May 2010 110:1297-1302; published ahead of print March 23, 2010

Patient Safety

医务工作者和高危病人间对天然橡胶胶乳敏感症的遗传素质存在差异

(黄丽娜 译 马皓琳 李士通 校)

Genetic Predisposition to Natural Rubber Latex Allergy Differs Between Health Care Workers and High-Risk Patients

- Constance L. Monitto,
- Robert G. Hamilton,
- Eric Levey,
- Anne E. Jedlicka,
- Amanda Dziedzic,
- John P. Gearhart,
- Simeon A. Boyadjiev,
- and Robert H. Brown

Anesth Analg May 2010 110:1310-1317

快速程序性诱导及插管：目前争议

(陈毓雯　译　陈杰　校)

Review Article: Rapid Sequence Induction and Intubation: Current Controversy

- Mohammad El-Orbany and
- Lois A. Connolly

Anesth Analg May 2010 110:1318-1325; published ahead of print March 17, 2010

Critical Care Trauma and Resuscitation

心脏骤停后治疗性低体温时的麻醉与镇痛方案：一个系统回顾

(黄剑译 薛张纲校)

Anesthesia and Analgesia Protocol During Therapeutic Hypothermia After Cardiac Arrest: A Systematic Review

- Carlos Chamorro,
- Jose M. Borrallo,
- Miguel A. Romera,
- Jose A. Silva,
- and Bárbara Balandín

Anesth Analg May 2010 110:1328-1335

轻度低温在气栓导致急性肺损伤中的作用

(王海涛 译 马皓琳 李士通 校)

The Role of Mild Hypothermia in Air Embolism–Induced Acute Lung Injury

- Chung-Kan Peng,
- Kun-Lun Huang,
- Chin-Pyng Wu,
- Min-Hui Li,
- Hen-I Lin,
- Ching-Wang Hsu,
- Shih-Hung Tsai,
- and Shi-Jye Chu

Anesth Analg May 2010 110:1336-1342

原发性肺癌术后肺部并发症的临床预测规则

(陈毓雯　译　陈杰　校)

A Clinical Prediction Rule for Pulmonary Complications After Thoracic Surgery for Primary Lung Cancer

- David Amar,
- Daisy Munoz,
- Weiji Shi,
- Hao Zhang,
- and Howard T. Thaler

Anesth Analg May 2010 110:1343-1348; published ahead of print October 27, 2009

经M型超声评价膈肌运动用于预测上腹部手术后肺功能障碍的发生

(李莹译 薛张纲校)

An Evaluation of Diaphragmatic Movement by M-Mode Sonography as a Predictor of Pulmonary Dysfunction After Upper Abdominal Surgery

- Soo Hwan Kim,
- Sungwon Na,
- Jin-Sub Choi,
- Se Hee Na,
- Seokyung Shin,
- and Shin Ok Koh

Anesth Analg May 2010 110:1349-1354

烧伤病人中烟碱型乙酰胆碱受体基因的表达发生改变

(刘伍 译 马皓琳 李士通 校)

Nicotinic Acetylcholine Receptor Gene Expression Is Altered in Burn Patients

- Walid A. Osta,
- Mohamed A. El-Osta,
- Eric A. Pezhman,
- Robert A. Raad,
- Kris Ferguson,
- George M. Mckelvey,
- Harold M. Marsh,
- Michael White,
- and Samuel Perov

Anesth Analg May 2010 110:1355-1359; published ahead of print March 19, 2010

阻塞性睡眠呼吸障碍的病态肥胖病人行腔镜下减肥手术拔管后即刻予以无创通气可改善肺功能

(张婷译　陈杰校)

Noninvasive Ventilation Immediately After Extubation Improves Lung Function in Morbidly Obese Patients with Obstructive Sleep Apnea Undergoing Laparoscopic Bariatric Surgery

- Patrick J. Neligan,
- Guarav Malhotra,
- Michael Fraser,
- Noel Williams,
- Eric P. Greenblatt,

- Maurizio Cereda,
- and E. Andrew Ochroch

Anesth Analg May 2010 110:1360-1365

Obstetric Anesthesiology

全国大样本产妇产后出血的流行病学

(姚敏敏译 薛张纲校)

The Epidemiology of Postpartum Hemorrhage in a Large, Nationwide Sample of Deliveries

- Brian T. Bateman,
- Mitchell F. Berman,
- Laura E. Riley,
- and Lisa R. Leffert

Anesth Analg May 2010 110:1368-1373; published ahead of print March 17, 2010

Pediatric Anesthesiology

心脏病患儿麻醉相关心脏停搏：来自儿科围术期心脏停搏(POCA)登记处的数据

(唐李隽 译 马皓琳 李士通 校)

Anesthesia-Related Cardiac Arrest in Children with Heart Disease: Data from the Pediatric Perioperative Cardiac Arrest (POCA) Registry

- Chandra Ramamoorthy,
- Charles M. Haberkern,
- Sanjay M. Bhananker,
- Karen B. Domino,
- Karen L. Posner,
- John S. Campos,
- and Jeffrey P. Morray

Anesth Analg May 2010 110:1376-1382; published ahead of print January 26, 2010

心内直视手术后，右旋美托咪定在婴儿中的群体药代动力学

(张婷译　陈杰校)

Population Pharmacokinetics of Dexmedetomidine in Infants After Open Heart Surgery

- Felice Su,
- Susan C. Nicolson,
- Marc R. Gastonguay,

- Jeffrey S. Barrett,
- Peter C. Adamson,
- David S. Kang,
- Rodolfo I. Godinez,
- and Athena F. Zuppa

Anesth Analg May 2010 110:1383-1392

加巴喷丁在儿科脊柱融合手术病人中的应用：一项随机、双盲、对照研究

(俞佳译 薛张纲校)

Gabapentin Use in Pediatric Spinal Fusion Patients: A Randomized, Double-Blind, Controlled Trial

- Lynn M. Rusy,
- Keri R. Hainsworth,
- Tom J. Nelson,
- Michelle L. Czarnecki,
- J. Channing Tassone,
- John G. Thometz,
- Roger M. Lyon,
- Richard J. Berens,
- and Steven J. Weisman

Anesth Analg May 2010 110:1393-1398

用于儿科医疗操作的氧化亚氮镇静水平

(徐妍君 译　马皓琳 李士通 校)

Level of Sedation with Nitrous Oxide for Pediatric Medical Procedures

- Judith L. Zier,
- Rod Tarrago,
- and Meixia Liu

Anesth Analg May 2010 110:1399-1405; published ahead of print March 17, 2010

Neuroscience in Anesthesiology and Perioperative Medicine

腺苷诱导脑血流停止应用于颅内动脉瘤夹闭术：量效数据以及安全性

(黄丹译　陈杰校)

Adenosine-Induced Flow Arrest to Facilitate Intracranial Aneurysm Clip Ligation: Dose-Response Data and Safety Profile

- John F. Bebawy,
- Dhanesh K. Gupta,
- Bernard R. Bendok,
- Laura B. Hemmer,
- Carine Zeeni,
- Michael J. Avram,
- H. Hunt Batjer,
- and Antoun Koht

Anesth Analg May 2010 110:1406-1411

在局灶性脑缺血大鼠中，异氟醚预处理对脑血流、毛细管渗透率和耗氧量的影响
(陈珺珺译 薛张纲校)

The Effects of Isoflurane Pretreatment on Cerebral Blood Flow, Capillary Permeability, and Oxygen Consumption in Focal Cerebral Ischemia in Rats

- Oak Z. Chi,
- Christine Hunter,
- Xia Liu,
- and Harvey R. Weiss

Anesth Analg May 2010 110:1412-1418; published ahead of print March 19, 2010

脑内出血的紧急处理：一项临床综述
(龚寅 译 马皓琳 李士通 校)

Review Article: The Acute Management of Intracerebral Hemorrhage: A Clinical Review

- Justine Elliott and
- Martin Smith

Anesth Analg May 2010 110:1419-1427; published ahead of print March 23, 2010

Economics, Education, and Policy

异氟醚和地氟醚、七氟醚麻醉拔管时间的平均值以及变异度对比：**meta**分析
(黄丹译　陈杰校)

Brief-Report: Meta-Analysis of Average and Variability of Time to Extubation Comparing Isoflurane with Desflurane or Isoflurane with Sevoflurane

- Andrew Agoliati,
- Franklin Dexter,
- Jason Lok,

- Danielle Masursky,
- Muhammad F. Sarwar,
- Sarah B. Stuart,
- Emine O. Bayman,
- and Richard H. Epstein

Anesth Analg May 2010 110:1433-1439

General Article

肾移植术中输注大量晶体液时机对早期移植肾功能的影响

(张钊译 薛张纲校)

The Impact of Timing of Maximal Crystalloid Hydration on Early Graft Function During Kidney Transplantation

- Mahmoud M. Othman,
- Ahmed Z. Ismael,
- and Golinar E. Hammouda

Anesth Analg May 2010 110:1440-1446

Analgesia

Pain Medicine

在健康志愿者中用定量感觉检测来观察双侧针刺镇痛

(滕凌雅 译 马皓琳 李士通 校)

Bilateral Acupuncture Analgesia Observed by Quantitative Sensory Testing in Healthy Volunteers

- Philip M. Lang,
- Johanna Stoer,
- Gabriel M. Schober,
- Joseph F. Audette,
- and Dominik Irnich

Anesth Analg May 2010 110:1448-1456; published ahead of print March 17, 2010

利多卡因滴眼液有助减少带状疱疹后眼部神经痛

(赵嫣红译 陈杰校)

Lidocaine Eye Drops Attenuate Pain Associated with Ophthalmic Postherpetic Neuralgia

- Akifumi Kanai,

- Takashi Okamoto,
- Kaoruko Suzuki,
- Yuriko Niki,
- and Hirotsugu Okamoto

Anesth Analg May 2010 110:1457-1460; published ahead of print March 17, 2010

简要报道：荧光透视引导下穿透椎板和椎板间腰部硬膜外注射类固醇时管内注射的发生率

(朱兰芳译，薛张纲校)

Brief Reports: Incidence of Intradiscal Injection During Lumbar Fluoroscopically Guided Transforaminal and Interlaminar Epidural Steroid Injections

- Kenneth D. Candido,
- Jeffrey A. Katz,
- Mariadas Chinthagada,
- Robert A. McCarthy,
- and Nebojsa Nick Knezevic

Anesth Analg May 2010 110:1464-1467

Pain Mechanisms

成纤维细胞生长因子和胰岛素样生长因子挽救丁卡因所致损伤后的感觉神经元生长锥塌缩

(江继宏 译 马皓琳 李士通 校)

Fibroblast Growth Factor and Insulin-Like Growth Factor Rescue Growth Cones of Sensory Neurites from Collapse After Tetracaine-Induced Injury

- Tomoko Seki,
- Ashraf Abdel Nazeer,
- Ken-ichi Sekimoto,
- Yao Guao,
- Wael Al-jahdari,
- and Shigeru Saito

Anesth Analg May 2010 110:1468-1472

Regional Anesthesia

麻醉下机械通气的幼猪应用两种不同脂肪乳剂逆转布比卡因引起的心脏电生理变化

(赵嫣红译　陈杰校)

Reversal of Bupivacaine-Induced Cardiac Electrophysiologic Changes by Two Lipid Emulsions in Anesthetized and Mechanically Ventilated Piglets

- Damien Candela,
- Guillaume Louart,
- Philippe-Jean Bousquet,
- Laurent Muller,
- Micheline Nguyen,
- Jean-Christophe Boyer,
- Pascale A. Fabbro Peray,
- Lucie Goret,
- Jacques Ripart,
- Jean-Yves Lefrant,
- and Jean E. de La Coussaye

Anesth Analg May 2010 110:1473-1479

使用超声引导和神经刺激器行锁骨下臂丛神经阻滞时穿刺位置的比较

(陈珺珺译 薛张纲校)

Selective Local Anesthetic Placement Using Ultrasound Guidance and Neurostimulation for Infraclavicular Brachial Plexus Block

- Clifford Bowens, Jr.,
- Rajnish K. Gupta,
- William T. O'Byrne,
- Jonathan S. Schildcrout,
- Yaping Shi,
- Jermel J. Hawkins,
- Damon R. Michaels,
- and James M. Berry

Anesth Analg May 2010 110:1480-1485

在足踝手术中 **0.5%**的左布比卡因在用**Labat**进路行坐骨神经阻滞后比相同剂量的罗哌卡因提供的镇痛时间长

(唐亮 译 马皓琳 李士通 校)

Levobupivacaine 0.5% Provides Longer Analgesia After Sciatic Nerve Block Using the Labat Approach Than the Same Dose of Ropivacaine in Foot and Ankle Surgery

- Roxane Fournier,
- Alexandre Faust,
- Olivier Chassot,
- and Zdravko Gamulin

Anesth Analg May 2010 110:1486-1489; published ahead of print March 19, 2010

肛肠手术中性别对于罗哌卡因骶管麻醉最小局麻浓度的影响

(怀晓蓉译　陈杰校)

The Effect of Sex on the Minimum Local Analgesic Concentration of Ropivacaine for Caudal Anesthesia in Anorectal Surgery

- Yuhong Li,
- Yujie Zhou,
- Hanjian Chen,
- and Zhiying Feng

Anesth Analg May 2010 110:1490-1493; published ahead of print March 19, 2010

通过核磁共振研究胸段脊椎管解剖

(陈珺珺译 薛张纲校)

Brief Report: The Anatomy of the Thoracic Spinal Canal Investigated with Magnetic Resonance Imaging

- Luiz Eduardo Imbelloni,
- Marcelo Bianco Quirici,
- Jose Roberto Ferraz Filho,
- José Antonio Cordeiro,
- and Eliana Marisa Ganem

Anesth Analg May 2010 110:1494-1495; published ahead of print March 19, 2010

The Open Mind

为肾上腺功能不全的外科患者围术期补充类固醇类药物

(杨秀娟 译 马皓琳 李士通校)

Cochrane Corner: Supplemental Perioperative Steroids for Surgical Patients with Adrenal Insufficiency

- Sin Leong Yong,
- Paul Marik,
- Marco Esposito,
- and Paul Coulthard

Anesth Analg May 2010 110:1506

围术期液体管理中高渗盐水的应用

(怀晓蓉译　陈杰校)

Cochrane Corner: Hypertonic Saline for Perioperative Fluid Management

- Vivian McAlister,
- Karen E. A. Burns,
- Tammy Znajda,
- and Brian Church

Anesth Analg May 2010 110:1506

使用医学模拟探查麻醉机管道供气交换中设备故障和人-机交互作用

Use of Medical Simulation to Explore Equipment Failures and Human-Machine Interactions in Anesthesia Machine Pipeline Supply Crossover

Seshadri C. Mudumbai, MD*†, Ruth Fanning, MBBCh, MRCPI, FFARCSI†, Steven K. Howard, MD*†, M. Frances Davies, PhD† and David M. Gaba, MD*†
From the *Veterans Administration Palo Alto Health Care System, Palo Alto; and † Stanford University School of Medicine, Stanford, California.
Anesth Analg 2010;110(5):1292-1296

背景：高保真度的医学模拟可用于探查技术、设备的故障模式和人-机交互作用。我们使用一个设备故障模拟方案、即氧气(O_2)/氧化亚氮(N_2O)管道交换，来调查住院医生的知识和他们在一个快速升高的危机中对麻醉设备的使用。
方法：在这个描述性研究中，20 个从业 3 年的麻醉科住院医生两两配对分为 10 组。本研究使用 Ohmeda Modulus SE 7500 麻醉机和提供生命体征和气体监护的 Datex AS/3 监护仪。实验开始前，我们转换了管道连接，即 N_2O 进入 O_2 管道而 O_2 进入 N_2O 管道。由于转换了管道，辅助 O_2 流量计测的是 N_2O 而非 O_2 的流量。两个专业、独立的评估人员观看实验录像并记录参与者明确注意到的警告和通气方法。
结果：9 组注意到了低吸入氧气分数(FIO_2)警报。只有 3 组认识到高吸入氧化亚氮分数(FIN_2O)警报。1 组均未认识到低 FIO_2 警报和高 FIN_2O 警报。9 组用了 3 步或更多的步骤来确定氧合线路。7 组在管理步骤中的几个点上使用了辅助 O_2 流量计。
结论：这么多参与者使用了辅助 O_2 流量计这个事实显露了设备危机中的机械因子和相关的人-机交互作用。作为 O_2 的假定外源，辅助 O_2 流量计的使用延迟了确定性治疗。很多参与者也没有注意到高 N_2O 的存在。这可部分归因于回顾录像时我们揭露的 2 个事实：(a)高 N_2O 警报的短暂性和(b)低 FIO_2 警报的显性，这些都可选择静音。我们建议高保真度模拟的使用可能是一个有希望的途径，可用来进一步检查与设备故障模式和临床医生合理管理应答策略相关的假设。
（周洁 译 马皓琳 李士通 校）

BACKGROUND: High-fidelity medical simulation can be used to explore failure modes of technology and equipment and human-machine interactions. We present the use of an equipment malfunction simulation scenario, oxygen (O_2)/nitrous oxide (N_2O) pipeline crossover, to probe residents' knowledge and their use of anesthetic equipment in a rapidly escalating crisis.
METHODS: In this descriptive study, 20 third-year anesthesia residents were paired into 10 two-member teams. The scenario involved an Ohmeda Modulus SE 7500 anesthetic

machine with a Datex AS/3 monitor that provided vital signs and gas monitoring. Before the scenario started, we switched pipeline connections so that N_2O entered through the O_2 pipeline and vice versa. Because of the switched pipeline, the auxiliary O_2 flowmeter delivered N_2O instead of O_2. Two expert, independent raters reviewed videotaped scenarios and recorded the alarms explicitly noted by participants and methods of ventilation.
RESULTS: Nine pairs became aware of the low fraction of inspired O_2 (FIO_2) alarm. Only 3 pairs recognized the high fraction of inspired N_2O (FIN_2O) alarm. One group failed to recognize both the low FIO_2 and the high FIN_2O alarms. Nine groups took 3 or more steps before instigating a definitive route of oxygenation. Seven groups used the auxiliary O_2 flowmeter at some point during the management steps.
CONCLUSIONS: The fact that so many participants used the auxiliary O_2 flowmeter may expose machine factors and related human-machine interactions during an equipment crisis. Use of the auxiliary O_2 flowmeter as a presumed external source of O_2 contributed to delays in definitive treatment. Many participants also failed to notice the presence of high N_2O. This may have been, in part, attributable to 2 facts that we uncovered during our video review: (a) the transitory nature of the "high N_2O" alert, and (b) the dominance of the low FIO_2 alarm, which many chose to mute. We suggest that the use of high-fidelity simulations may be a promising avenue to further examine hypotheses related to failure modes of equipment and possible management response strategies of clinicians.

医务工作者和高危病人间对天然橡胶胶乳敏感症的遗传素质存在差异

Genetic Predisposition to Natural Rubber Latex Allergy Differs Between Health Care Workers and High-Risk Patients

Constance L. Monitto, MD*, Robert G. Hamilton, PhD†, Eric Levey, MD‡, Anne E. Jedlicka, MS§, Amanda Dziedzic, BS§, John P. Gearhart, MD ‖ , Simeon A. Boyadjiev, MD¶ and Robert H. Brown, MD, MPH*#
From the *Department of Anesthesiology and Critical Care Medicine, †Division of Allergy and Clinical Immunology, Department of Medicine, and ‡Department of Pediatrics, Johns Hopkins University School of Medicine; §W. Harry Feinstone Department of Molecular Microbiology and Immunology, Johns Hopkins University Bloomberg School of Public Health; ‖ Department of Urology, James Buchanan Brady Urological Institute, Johns Hopkins University School of Medicine, Baltimore, Maryland; ¶Section of Genetics, Department of Pediatrics, University of California, Davis, Davis, California; and #Department of Environmental Health Sciences, Johns Hopkins University Bloomberg School of Public Health, Baltimore, Maryland.
Anesth Analg 2010;110(5):1310-1317;

背景: 已有研究显示在医务工作者中，当与非过敏性对照相比时，天然橡胶胶乳(NRL)敏感症显型与白介素 13 和 18（IL13 和 IL18）中的启动子多态性有关。然而，高危人群（诸如出生时就有神经管缺陷或泌尿生殖系统异常）是否显示出在医务工作者中已经报道的同样的遗传学/免疫学的危险因素的增高倾向。本研究中，

我们验证了编码 IL13 和 IL18 的基因的单核苷酸多态性在有脊柱裂（SB）或膀胱外翻（BE）的 NRL 敏感症病人中发生率增高这一假说。
方法：对 120 名试验对象（SB40，BE40 和对照组 40）应用临床病史调查表及血中的 NRL 特异性免疫球蛋白 E（IgE）抗体测定结果来筛选。从外周血淋巴细胞中提取出基因组 DNA，分析关注的候选基因中单核苷酸的多态性。进行单变量和多变量分析，来判断重要的参数是否具有显著性差异（定义为 P<0.05）。
结果： 对 NRL 变应原的致敏作用（IgE 抗体阳性）与特应性病史和既往手术次数有关，并且可通过在出生时就避免接触 NRL 来预防。然而，与医务工作者不同的是，当将 NRL 敏感的 SB 和 BE 病人与非敏感的病人、特应性及非特应性的对照病人相比时，NRL 过敏症显型并不与 IL13 或 IL18 中启动子的多态性显著有关。
结论：在出生时就患有 SB 或 BE 的病人，环境因素似乎在 NRL 致敏作用和明显的敏感症状的发展中比以前研究显示的在医务工作者中与 NRL 敏感症有关的 IL13 和 IL18 中 IL 多态性发挥着更重要的作用。
（黄丽娜 译 马皓琳 李士通 校）
BACKGROUND: In health care workers, the natural rubber latex (NRL) allergy phenotype has been shown to be associated with promoter polymorphisms in interleukins 13 and 18 (*IL13* and *IL18*) when compared with nonatopic controls. However, it is not known whether high-risk patient populations, such as those born with neural tube defects or genitourinary abnormalities, demonstrate a heightened propensity toward the same genetic/immunologic risk factors that have been reported for health care workers. In this study, we tested the hypothesis that single-nucleotide polymorphisms in genes encoding *IL13* and *IL18* occur at an increased frequency in NRL allergic patients with spina bifida (SB) or bladder exstrophy (BE).
METHODS: One hundred twenty subjects (40 SB, 40 BE, and 40 control) were screened using a clinical history questionnaire and NRL-specific immunoglobulin E (IgE) antibody measurements in the blood. Genomic DNA was extracted from peripheral blood lymphocytes and analyzed for single-nucleotide polymorphisms in candidate genes of interest. Univariate and multivariate analyses were performed to identify significant variables with significance defined as $P < 0.05$.
RESULTS: Sensitization (IgE antibody positivity) to NRL allergens was associated with atopic history and number of prior operations and was prevented by the avoidance of NRL beginning at birth. However, unlike health care workers, the NRL allergy phenotype was not significantly associated with promoter polymorphisms in *IL13* or *IL18* when comparing NRL allergic SB and BE patients with nonsensitized patients and with atopic and nonatopic controls.
CONCLUSIONS: In patients born with SB or BE, environmental factors seem to play a greater role in the development of NRL sensitization and overt allergic symptoms than the IL polymorphisms in *IL13* and *IL18* previously shown to be associated with NRL allergy in health care workers.

轻度低温在气栓导致急性肺损伤中的作用

The Role of Mild Hypothermia in Air Embolism–Induced Acute Lung Injury

Chung-Kan Peng, MD*†, Kun-Lun Huang, MD, PhD‡, Chin-Pyng Wu, MD, PhD*†, Min-Hui Li, MD, PhD§, Hen-I Lin, MD ‖, Ching-Wang Hsu, MD¶, Shih-Hung Tsai, MD¶ and Shi-Jye Chu, MD¶
From the *Graduate Institute of Medical Sciences, National Defense Medical Center; † Division of Pulmonary and Critical Care, Department of Internal Medicine, Tri-Service General Hospital; ‡Institute of Undersea and Hyperbaric Medicine; §Institute of Aerospace Medicine, National Defense Medical Center, Taipei, Taiwan; ‖ Department of Internal Medicine, Catholic Cardinal Tien Hospital, Fu-Jen Catholic University, Taipei Hsien, Taiwan; and ¶Department of Emergency Medicine, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan, Republic of China.
Anesth Analg 2010;110(5):1336-1342;

背景：轻度低温已成为缺血性脑损伤的一个重要治疗手段。然而，轻度低温对气栓导致肺损伤的作用还不清楚。在本研究中，我们探讨：在空气输注前和空气输注同时两个时间点，使用轻度低温是否减少气栓导致的急性肺损伤。
方法：在本次大鼠模型研究（Sprague-Dawley 大鼠）中，通过静脉输注空气（25μL/min，40min）产生肺气栓。对照大鼠不接受空气输注。大鼠随机分为：两个对照组（正常体温组 37°C 和轻度低温组 34°C）和三个空气栓塞组（输注空气前轻度低温；输注空气且正常体温；输注空气同时轻度低温）。在实验结束时，评估肺损伤变量。
结果：输注空气引起了肺的湿/干重量比例及支气管肺泡灌洗液中蛋白质、乳酸脱氢酶和肿瘤坏死因子（TNF）-α 浓度的明显增加。还明显增加了髓过氧化物酶活性、中性粒细胞浸润和间质水肿。另外，肺内核因子（NF）-κB 活性也明显增加。在输注空气前用轻度低温处理减少了以上变量的增加，然而输注空气同时进行轻度低温治疗则对它们无明显效果。
结论：我们实验表明：在输注空气前进行轻度低温，减少了气栓导致的急性肺损伤。这个保护机制可能是抑制了炎症反应。
（王海涛 译 马皓琳 李士通 校）
BACKGROUND: Mild hypothermia has become an important treatment for ischemic brain injury. However, the role of mild hypothermia in air embolism–induced lung injury has not been explored. In this study, we investigated whether treatment with mild hypothermia before and synchronous with air infusion can attenuate acute lung injury induced by air embolism.
METHODS: In this rat model study (Sprague-Dawley rats), pulmonary air embolism was induced by venous infusion of air at a rate of 25 μL/min for 40 minutes. Control animals received no air infusion. The rats were randomly assigned to 2 control groups of normothermia (37°C) and mild hypothermia (34°C) and 3 air embolism groups of mild hypothermia induced before air infusion, normothermia with air infusion, and mild hypothermia induced synchronous with air infusion. At the end of the experiment, the variables of lung injury were assessed.
RESULTS: Air infusion elicited a significant increase in lung wet/dry weight ratio and protein, lactate dehydrogenase, and tumor necrosis factor-α concentration of the bronchoalveolar lavage fluid. Myeloperoxidase activity, neutrophil infiltration, and

interstitial edema in lung tissue were also significantly increased. In addition, nuclear factor-κB activity was significantly increased in the lungs. Treatment with mild hypothermia before air infusion reduced increases in these variables, whereas mild hypothermia synchronous with air infusion had no significant effect on them.
CONCLUSIONS: Our study suggests that mild hypothermia before air infusion decreases air embolism–induced acute lung injury. The protective mechanism seems to be the inhibition of inflammation.

烧伤病人中烟碱型乙酰胆碱受体基因的表达发生改变

Nicotinic Acetylcholine Receptor Gene Expression Is Altered in Burn Patients

Walid A. Osta, MD*, Mohamed A. El-Osta, PhD†, Eric A. Pezhman, MD*, Robert A. Raad, MD*, Kris Ferguson, MD*, George M. Mckelvey, PhD*, Harold M. Marsh, MD*, Michael White, MD* and Samuel Perov, MD*
From the *Department of Anesthesia, Wayne State University, Detroit, Michigan; and † Department of Biochemistry, Medical University of South Carolina, Charleston, South Carolina.
Anesth Analg 2010;110(5):1355-1359;

简介：人们已经发现烧伤病人对去极化肌松药琥珀胆碱引起的高钾血症效应更加敏感。烟碱型乙酰胆碱受体（nAChR）亚单位组成的变化会造成受体电生理学、药理学及代谢特性的改变，从而导致由乙酰胆碱引起的高钾血症。目前还没有研究表明烧伤病人中 nAChR 亚单位组成发生上调和/或改变。对急性损伤的病人，在疾病的不同时间窗里进行肌肉活检，在技术上和伦理道德上均存在一定困难，这也是造成对人类的研究报告缺少的主要原因。nAChR 在口腔角质白细胞中表达，并且在吸烟者中上调或改变。然而，对于烧伤病人口腔粘膜中的 nAchRs 表达尚无研究。
方法：我们分别在 9 例烧伤病人和 6 例外科重症监护室病中对照非烧伤手术患者中收集了口腔黏膜削刮的碎屑。在两组病人中，我们在病人呈现时（记录为 0 小时）及 12 小时、24 小时、48 小时、一周和两周的时间点上采集组织。我们通过实时逆转录聚合酶链反应进行 nAChR 亚单位 α1、α7、γ 和 ϵ 的基因表达。
结果：在烧伤病人中，nAChR 亚单位 α 7 和 γ 基因的表达显著上调，而 α 1 和 ϵ nAChR 基因几乎不受影响，显示在整个研究过程中无显著变化。
讨论：经过 2 周的检测发现，烧伤和对照病人的 α 7 和 γ 基因发生上调，但烧伤病人中上调的 α7 和 γ 亚单位比例较对照的外科 ICU 病人显著较高。这提示热伤和基因表达的变化之间可能存在因果关系。我们发现这种作用是在非热伤的部位并且非肌肉组织，由此强调了热损伤产生影响的全身性。由于基因的表达是蛋白质产生的基础，α 7 和 γ 基因表达的上调可能转化为更多 α 7 和 γ 蛋白质亚单位，这些蛋白质也可以相互结合或是与其他类型的亚单位（如 α 1、β 、ϵ 等）结合来组成电生理学特性改变的 nAChR，从而导致了异常的临床表现。
总结：由于 nAChR 基因表达的上调/改变发生在远离损伤区域的非肌肉组织，热损伤导致的可能是全身性变化。人们可以通过使用微创的方法（口腔黏膜刮屑）和高

敏感度的技术（实时逆转录聚合酶链反应）研究热损伤对 nAChR 基因亚单位的影响，而避免使用创伤性更大的方法。
（刘伍 译 马皓琳 李士通 校）

INTRODUCTION: Burn patients have been observed to be more susceptible to the hyperkalemic effect of the depolarizing muscle relaxant succinylcholine. Changes in nicotinic acetylcholine receptor (nAChR) subunit composition may alter electrophysiologic, pharmacologic, and metabolic characteristics of the receptor inducing hyperkalemia on exposure to succinylcholine. No studies have been performed that show the upregulation and/or alteration of nAChR subunit composition in human burn patients. The scarcity of studies performed on humans with burn injury is mainly attributable to the technical and ethical difficulties in obtaining muscle biopsies at different time frames of illness in these acutely injured patients. nAChRs are expressed in oral keratinocytes and are upregulated or altered in smokers. However, no studies have addressed the expression of nAChRs in the oral mucosa of burn patients.
METHODS: Buccal mucosal scrapings were collected from 9 burn patients and 6 control nonburn surgical intensive care unit patients. For burn and control patients, tissues were collected upon presentation (time: 0 hour) and at time points 12, 24, and 48 hours, 1 week, and 2 weeks. Gene expression of the nAChR subunits α1, α7, γ, and ϵ were performed using real-time reverse transcriptase polymerase chain reaction.
RESULTS: α7 and γ nAChR genes were significantly upregulated in burn patients, whereas α1 and ϵ nAChR genes were minimally affected, showing no significant changes over time.
DISCUSSION: Over the 2 weeks of measurement, an upregulation of the α7 and γ genes occurred in both burn and control patients; however, the proportion of α7 and γ subunit increases was significantly higher in burn patients than in control surgical intensive care unit patients. The relationship between the thermal injury and the observed alteration in gene expression suggests a possible cause/effect relationship. This effect was observed at a site not affected by the burn injury and in nonmuscle tissues, thus emphasizing the systemic nature of the effect caused by the thermal injury. Because gene expression is the basis of protein production, the upregulation of α7 and γ genes might translate into more α7 and γ protein subunits. These proteins can also combine with each other or with other types of subunits (α1, β, ϵ . . .) to form nAChRs with altered electrophysiologic characteristics leading to the observed abnormal clinical outcomes.
CONCLUSION: Thermal injury may infer a systemic effect because upregulation/alteration of nAChRs occurs in nonmuscle tissues distant from the site of injury. The effect of thermal injury on nAChR gene subunits can be studied using a minimally invasive method (buccal mucosal scraping) and a highly sensitive technology (real-time reverse transcriptase polymerase chain reaction) obviating the need for more invasive methods.

心脏病患儿麻醉相关心脏停搏：来自儿科围术期心脏停搏(POCA)登记处的数据

Anesthesia-Related Cardiac Arrest in Children with Heart Disease: Data from the Pediatric Perioperative Cardiac Arrest (POCA) Registry

Chandra Ramamoorthy, MD*, Charles M. Haberkern, MD, MPH†, Sanjay M. Bhananker, MD†, Karen B. Domino, MD, MPH†, Karen L. Posner, PhD†, John S. Campos, MA†‡ and Jeffrey P. Morray, MD§
From the *Department of Anesthesiology, Stanford University School of Medicine, Stanford, California; †Department of Anesthesiology and Pain Medicine, University of Washington School of Medicine; ‡Department of Patient Safety, Virginia Mason Medical Center, Seattle, Washington; and §Phoenix Children's Hospital, Valley Anesthesiology Consultants, Ltd., Phoenix, Arizona.
Anesth Analg 2010;110(5):1376-1382

背景：1994 至 2005 年，儿科围术期心脏停搏登记处收集了 373 例儿童的麻醉相关心脏停搏(CAs)，其中 34%患有先天性或后天性心脏病(HD)。
方法：近 80 个志愿为儿童提供麻醉的北美机构加入了儿科围术期心脏停搏登记处。用于 18 岁及以下儿童中的每一例围术期心脏停搏的标准化数据表格以不记名方式交付。我们分析患和不患心脏病儿童的麻醉相关心脏停搏的原因和结果。
结果：和 245 例不患心脏病儿童相比，127 例患心脏病的停搏儿童病得更重（92%比 62% ASA 评分 III–V; $P < 0.01$），且更有可能由于心血管原因而停搏(50%比 38%; $P = 0.03$)，尽管停搏的确切的心血管原因通常很难确定。死亡率在心脏病患儿（33%）较非心脏病患儿高（23%, $P = 0.048$），但用 ASA 体格状态分级修正后则无差异。超过半数（54%）的患有心脏病患者的心脏停搏的报道来自普通手术室，26%来自心脏手术室，17%来自导管实验室。发生心脏停搏患者的最常见心脏病损害种类是单心室（$n = 24$）。在心脏停搏时，多数先天性心脏病患者尚未修补（59%）或病情减轻（26%）。患主动脉狭窄和心肌病患者的停搏和最高的死亡率相关（分别是 62%和 50%），虽然一些心脏病损害的小样本量妨碍了统计学比较。
结论：心脏病患儿比非心脏病患儿在麻醉相关心脏停搏发生时病情更严重，且在停搏后死亡率更高。此类停搏在普通手术室报道的频率最高且可能由心血管因素导致。麻醉相关心脏停搏的原因和相关因素的确认对其预防提示了可能的策略。
（唐李隽 译 马皓琳 李士通 校）
BACKGROUND: From 1994 to 2005, the Pediatric Perioperative Cardiac Arrest Registry collected data on 373 anesthesia-related cardiac arrests (CAs) in children, 34% of whom had congenital or acquired heart disease (HD).
METHODS: Nearly 80 North American institutions that provide anesthesia for children voluntarily enrolled in the Pediatric Perioperative Cardiac Arrest Registry. A standardized data form for each perioperative CA in children 18 years old or younger was submitted anonymously. We analyzed causes of and outcomes from anesthesia-related CA in children with and without HD.
RESULTS: Compared with the 245 children without HD, the 127 children with HD who arrested were sicker (92% vs 62% ASA physical status III–V; $P < 0.01$) and more likely to arrest from cardiovascular causes (50% vs 38%; $P = 0.03$), although often the exact cardiovascular cause of arrest could not be determined. Mortality was higher in patients with HD (33%) than those without HD (23%, $P = 0.048$) but did not differ when adjusted for ASA physical status classification. More than half (54%) of the CA in patients with HD were reported from the general operating room compared with 26% from the cardiac

operating room and 17% from the catheterization laboratory. The most common category of HD lesion in patients suffering CA was single ventricle (*n* = 24). At the time of CA, most patients with congenital HD were either unrepaired (59%) or palliated (26%). Arrests in patients with aortic stenosis and cardiomyopathy were associated with the highest mortality rates (62% and 50%, respectively), although statistical comparison was precluded by small sample size for some HD lesions.
CONCLUSIONS: Children with HD were sicker compared with those without HD at the time of anesthesia-related CA and had a higher mortality after arrest. These arrests were reported most frequently from the general operating room and were likely to be from cardiovascular causes. The identification of causes of and factors relating to anesthesia-related CA suggests possible strategies for prevention.

用于儿科医疗操作的氧化亚氮镇静水平

Level of Sedation with Nitrous Oxide for Pediatric Medical Procedures

Judith L. Zier, MD, FAAP*, Rod Tarrago, MD* and Meixia Liu, MS†
From the *Division of Pediatric Critical Care, and †Research and Sponsored Programs, Children's Hospitals and Clinics of Minnesota, Minneapolis, Minnesota.
Anesth Analg 2010;110(5):1399-1405;

背景：浓度小于 50%的氧化亚氮（N_2O）作为一种轻度镇静药被美国麻醉学家协会和美国儿科学会所接受。 N_2O 浓度大于 50%时的预期镇静水平不太明了。
方法：我们在明尼苏达的儿童医院和诊所对所有接受 N_2O 用于操作镇静的患儿进行了回顾性的病历检查。记录患儿年龄、最大 N_2O 浓度、N_2O 持续吸入时间、操作的完成以及不良事件。对镇静水平进行0-6分评分。
结果：给予年龄小于 18 岁的 1585 例患者吸入 1858 次 N_2O。大多数吸入（91.3%）的 N_2O 的浓度大于 50%，镇静水平评分如下：6 分（镇静不足）=1.3%，5 分（轻度镇静）=94.3%，4 分（嗜睡）=4.3%，没有评分小于 4 分的患者。59 名患者（3.3%）出现不良事件，其中 6 例（0.3%）不典型。N_2O 浓度□50%和>50%之间，在镇静水平和不良事件的数量上并没有差异。两岁以下的患儿（7.4%）较两岁以上的患儿（4%）达到 4 分的比例要高，但不良事件的发生率相似。N_2O 吸入持续时间对镇静水平没有影响。镇静不足的患者较其他组患者年龄要小。大多数操作（94.1%）在患者平静且不动的情况下进行。
结论：当用一个设计来滴定 N_2O 浓度范围为 0%-70%的系统经由鼻罩吸入 N_2O 浓度大于 50%时，大多数的患儿能够维持轻度镇静。用这种方式吸入 N_2O 浓度大于 50%的患者不良事件的发生率与一些大型研究中报道的 50%N_2O 的不良事件发生率相似。
（徐妍君 译　马皓琳 李士通 校）

BACKGROUND: Nitrous oxide (N_2O) delivered at a concentration <50% is accepted as a minimal sedation drug by both the American Society of Anesthesiologists and the American Academy of Pediatrics. The expected level of sedation at an N_2O concentration >50% is less clear.
METHODS: We conducted a retrospective chart review for all children receiving N_2O for procedural sedation at Children's Hospitals and Clinics of Minnesota. Patient age,

maximal N_2O concentration, duration of N_2O administration, completion of procedure, and adverse events were recorded. Level of sedation was assessed on a 0 to 6 scale.
RESULTS: N_2O was administered on 1858 occasions to 1585 patients younger than 18 years. Most administrations (91.3%) were N_2O concentration >50%. Level of sedation scores were as follows: 6 (inadequate) = 1.3%; 5 (minimal) = 94.3%; and 4 (drowsy) = 4.3%; no patient reached a sedation score <4. Fifty-nine patients (3.3%) had adverse events of which 6 (0.3%) were atypical. There was no difference between N_2O ≤50% and N_2O >50% in the level of sedation or number of adverse events. More children ≤2 years (7.4%) achieved a sedation level of 4 than those older than 2 years (4%), but they experienced a similar rate of adverse events. There was no difference in the level of sedation by duration of N_2O administration. Inadequately sedated patients were younger than the remainder of the group. Most procedures (94.1%) were completed with the patient calm and still.
CONCLUSIONS: A significant number of children remain minimally sedated while receiving N_2O at concentrations >50% via nasal hood using a system designed to titrate N_2O concentration from 0% to 70%. Adverse event rates of patients receiving >50% N_2O in this manner are similar to rates reported in large studies of 50% N_2O administration.

脑内出血的紧急处理：一项临床综述

The Acute Management of Intracerebral Hemorrhage: A Clinical Review

Justine Elliott, FRCA and Martin Smith, FRCA
From the Department of Neuroanaesthesia and Neurocritical Care, The National Hospital for Neurology and Neurosurgery, University College London Hospitals NHS Foundation Trust, Queen Square, London, UK.
Anesth Analg 2010;110(5):1419-1427;

脑内出血（ICH）是一种具有高发病率和死亡率的毁坏性疾病。ICH 的主要高危因素包括：慢性动脉高血压以及口服抗凝剂。首次出血后，血肿膨胀以及血肿周围水肿导致了继发性的脑损坏并恶化病情。急性的局部神经功能障碍并伴有颅内压增高的临床体征强烈提示了 ICH 的诊断，但是仍需头颅影像学检查与缺血性中风相鉴别。ICH 是医疗紧急情况并且早期的处理应该关注心肺参数的紧急稳定以及对颅内并发症的处理。超过 90%的患者有急性高血压，而且现有一些证据说明紧急的降压是安全的并且可减缓血肿扩张以及减少早期神经学上恶化的危险性。然而，对于早期使用重组因子 VIIa (rFVIIa)可能改善结果的乐观论并未被大量三期临床试验所证实。ICH 是华法令抗凝的最可怕的并发症，并且阻止颅内出血的需要比所有的其他因素更为重要。逆转华法令的治疗选项包括维生素 K、新鲜冰冻血浆、凝血酶原复合物浓缩剂和 rFVIIa。并没有证据来指导抗血小板治疗相关 ICH 的特殊处理。除了对脑积水患者置入脑室引流和对大量后颅窝血肿引流以外，其它的神经外科介入治疗的时间和性质仍具有争议性。大量证据表明，ICH 患者在专业的监护和管理心肺参数和颅内压并直接对症处理的神经专科重症监护室内可使愈后改善。液体以及血糖的管理、降低呼吸机获得性肺炎的可能性、发热控制、肠内营养供应以及预防血栓栓塞也必需注意。人们越来越多地体会到 ICH 急性期积极的处理可以改善 ICH 的愈后。

（龚寅 译 马皓琳 李士通 校）

Intracerebral hemorrhage (ICH) is a devastating disease with high rates of mortality and morbidity. The major risk factors for ICH include chronic arterial hypertension and oral anticoagulation. After the initial hemorrhage, hematoma expansion and perihematoma edema result in secondary brain damage and worsened outcome. A rapid onset of focal neurological deficit with clinical signs of increased intracranial pressure is strongly suggestive of a diagnosis of ICH, although cranial imaging is required to differentiate it from ischemic stroke. ICH is a medical emergency and initial management should focus on urgent stabilization of cardiorespiratory variables and treatment of intracranial complications. More than 90% of patients present with acute hypertension, and there is some evidence that acute arterial blood pressure reduction is safe and associated with slowed hematoma growth and reduced risk of early neurological deterioration. However, early optimism that outcome might be improved by the early administration of recombinant factor VIIa (rFVIIa) has not been substantiated by a large phase III study. ICH is the most feared complication of warfarin anticoagulation, and the need to arrest intracranial bleeding outweighs all other considerations. Treatment options for warfarin reversal include vitamin K, fresh frozen plasma, prothrombin complex concentrates, and rFVIIa. There is no evidence to guide the specific management of antiplatelet therapy–related ICH. With the exceptions of placement of a ventricular drain in patients with hydrocephalus and evacuation of a large posterior fossa hematoma, the timing and nature of other neurosurgical interventions is also controversial. There is substantial evidence that management of patients with ICH in a specialist neurointensive care unit, where treatment is directed toward monitoring and managing cardiorespiratory variables and intracranial pressure, is associated with improved outcomes. Attention must be given to fluid and glycemic management, minimizing the risk of ventilator-acquired pneumonia, fever control, provision of enteral nutrition, and thromboembolic prophylaxis. There is an increasing awareness that aggressive management in the acute phase can translate into improved outcomes after ICH.

在健康志愿者中用定量感觉检测来观察双侧针刺镇痛

Bilateral Acupuncture Analgesia Observed by Quantitative Sensory Testing in Healthy Volunteers

Philip M. Lang, MD, PhD*, Johanna Stoer, MD*, Gabriel M. Schober, MD*, Joseph F. Audette, MA, MD† and Dominik Irnich, MD, PhD*
From the *Department of Anaesthesiology, Multidisciplinary Pain Center, University of Munich (LMU), Germany; and †Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, Massachusetts.
Anesth Analg 2010;110(5):1448-1456

背景：有证据表明针灸激活不同的脊髓和棘上镇痛系统，但对感觉系统的具体调节作用没有得到系统的研究。在此研究中，我们评估了不同类型的针灸对温度、机械和振动感觉阈值的瞬即影响。

方法：24 个健康志愿者（12 例男性，12 例女性，平均年龄 33.1 岁）在一个单盲交叉试验接受 3 种不同形式的针灸，包括手工针刺、带低频电针刺激或高频电针刺激的针刺。干预之间的时间间隔为一个星期。所有类型的针灸用于单侧下肢上的标准穴道：脾 6、脾 9、胃 36 和胆囊 39。在每次干预后立即用系统定量感觉测试（QST）评估针灸效果。QST 测试在双下肢进行，包括热和机械感觉、痛觉和振动觉的阈值。
结果：手动针刺后，在针刺侧和非针刺侧的热痛阈与基础相比升高。低频率电刺激和高频率电刺激使针刺侧机械痛阈较基础和手动针刺较高。压力痛阈在所有类型的针灸中双侧皆升高，个体变化为基础值的 25%至 52%。
结论：三种普通针灸刺激方法后 QST 有一致的变化，单侧和双侧均有影响。
（滕凌雅 译 马皓琳 李士通 校）

BACKGROUND: There is evidence that acupuncture activates different spinal and supraspinal antinociceptive systems, but the specific modulatory effects on the sensory system have not been systematically investigated. In this study, we evaluated the immediate effects of different types of acupuncture on thermal, mechanical, and vibratory sensory thresholds.
METHODS: Twenty-four healthy volunteers (12 men and 12 women, mean age 33.1 years) received 3 different forms of acupuncture in a single-blinded crossover design; these included manual acupuncture, acupuncture with low-frequency electrical stimulation, and acupuncture with high-frequency electrical stimulation. The time between the interventions was 1 week. All forms of acupuncture were applied unilaterally in the leg at standard acupuncture points: spleen 6, spleen 9, stomach 36, and gallbladder 39. The effects of acupuncture were evaluated by systematic quantitative sensory testing (QST) immediately after each intervention. QST was performed on bilateral lower extremities, including thermal and mechanical perception and pain and vibratory thresholds.
RESULTS: The heat pain threshold was increased after manual acupuncture on the treated and untreated side compared with baseline. Low- and high-frequency electrostimulation led to a higher mechanical pain threshold on the treated side compared with baseline and manual acupuncture. The pressure pain threshold was increased by all forms of acupuncture on both sides, with individual changes from baseline ranging from 25% to 52%.
CONCLUSIONS: There were congruent changes on QST after 3 common acupuncture stimulation methods, with possible unilateral as well as bilateral effects.

成纤维细胞生长因子和胰岛素样生长因子挽救丁卡因所致损伤后的感觉神经元生长锥塌缩

Fibroblast Growth Factor and Insulin-Like Growth Factor Rescue Growth Cones of Sensory Neurites from Collapse After Tetracaine-Induced Injury

Tomoko Seki, MD*, Ashraf Abdel Nazeer, MD*, Ken-ichi Sekimoto, MD, PhD*, Yao Guao, MD*, Wael Al-jahdari, PhD*† and Shigeru Saito, MD, PhD*
From the Departments of *Anesthesiology, and †Radiation Oncology, Graduate School of Medicine, Gunma University, Maebashi, Japan.
Anesth Analg 2010;110(5):1468-1472

背景：碱性成纤维细胞生长因子(bFGF)和胰岛素样生长因子(IGF)-1 具有包括增殖、分化和生存在内的多种细胞作用。本离体研究中，我们观察不同浓度的 IGF 和 bFGF 对丁卡因所致损伤后发育中的感觉神经元生长锥的形态学影响。
方法：分离胚胎期第 7 或 8 天的鸡胚胎背根神经节并培养 24h。随后，组织暴露于 100μmol/L 丁卡因 60min。用含有不同浓度 IGF、 bFGF 或者复合 IGF 50 ng/mL 和 bFGF 5 ng/mL 的无丁卡因培养基取代上述丁卡因培养基并额外孵育 24h。进行生长锥塌缩分析以评估神经再生情况。
结果：背根神经节暴露于 100μmol/L 丁卡因培养基 1h 后洗脱丁卡因 24h 后出现显著的生长锥塌缩($P < 0.01$)。我们还发现，在置换的培养基中加入 bFGF (5、10、20、和 50 ng/mL) 或 IGF (50 和 100 ng/mL)能显著降低洗脱丁卡因 24h 后的生长锥塌缩百分比($P < 0.01$)；然而，低浓度的 bFGF (2 ng/mL)或 IGF(25 ng/mL)不能引起明显的塌缩变化。同时加入 5 ng/mL bFGF 和 50 ng/mL IGF 后生长锥塌缩分别在统计学上和在边际上低于单独加入 5 ng/mL bFGF ($P < 0.01$)和单独给予 50 ng/mL IGF 后的值。
结论：bFGF 和 IGF 能减轻离体实验中丁卡因所致损伤后的生长锥塌缩。
(江继宏 译 马皓琳 李士通 校）

BACKGROUND: Basic fibroblast growth factor (bFGF) and insulin-like growth factor (IGF)-1 have multiple effects on cells, including proliferation, differentiation, and survival. In this study, we investigated the effects of different concentrations of IGF and bFGF on the morphology of growth cones of the developing sensory neurons after tetracaine-induced injury in vitro.
METHODS: Dorsal root ganglia were isolated from chick embryos on embryonic day 7 or 8 and cultured for 24 hours. Tissues were then exposed to 100 μmol/L tetracaine for 60 minutes. The media were replaced by tetracaine-free media containing different concentrations of IGF, bFGF, or combination of IGF 50 ng/mL and bFGF 5 ng/mL and incubated for a further 24 hours. Growth cone collapse assays were then performed to assess regeneration of neurons.
RESULTS: Exposure of dorsal root ganglia explants to tetracaine 100 μmol/L for 1 hour caused significant growth cone collapse 24 hours after washing out tetracaine ($P < 0.01$). It was found that adding bFGF (5, 10, 20, and 50 ng/mL) or IGF (50 and 100 ng/mL) to the replacement media significantly decreased growth cone collapse percentage at 24 hours after washout ($P < 0.01$); however, the low concentrations of bFGF (2 ng/mL) or IGF (25 ng/mL) did not cause significant change. Growth cone collapse after simultaneous addition of 5 ng/mL bFGF and 50 ng/mL IGF was statistically lower than the values after adding 5 ng/mL bFGF ($P < 0.01$), and it was marginally lower than 50 ng/mL IGF.
CONCLUSION: bFGF and bIGF decreased growth cone collapse after tetracaine-induced injury in vitro.

在足踝手术中 0.5%的左布比卡因在用 Labat 进路行坐骨神经阻滞后比相同剂量的罗哌卡因提供的镇痛时间长

Levobupivacaine 0.5% Provides Longer Analgesia After Sciatic Nerve Block Using the Labat Approach Than the Same Dose of Ropivacaine in Foot and Ankle Surgery

Roxane Fournier, MD, Alexandre Faust, MD, Olivier Chassot, MD and Zdravko Gamulin, MD
From the Department of Anesthesiology, University Hospital of Geneva, Geneva, Switzerland.

Anesth Analg 2010;110(5):1486-1489

背景：由于临床使用的安全性，左布比卡因和罗哌卡因是两个经常用于外周神经阻滞的左旋对映体分子。与罗哌卡因相比较，左布比卡因更为亲脂且在理论上更为有效，但是临床研究显示了在麻醉和镇痛特性方面不一致的结果。我们假定纯的布比卡因 S－对映体比罗哌卡因提供的镇痛持续时间更长。
方法：我们比较 20ml 左布比卡因和 20ml0.5%的罗哌卡因在用于足踝手术的坐骨神经阻滞（Labat 进路）中的镇痛特性。在双盲、随机、前瞻性研究中，80 名患者接受其中一种麻醉药。我们评估药物的起效、持续时间和阻滞成功率，以及 24 小时内额外镇痛药的需要和技术上的或神经系统的并发症。
结果：感觉阻滞起效时间和成功率左布比卡因和罗哌卡因两组相似（起效, 15min[5–40 min]对 15 min [5–60 min]; 成功率, 90%对 92.5%）。20ml0.5%左布比卡因组第一次要求镇痛药的平均时间晚于罗哌卡因(1605min[575–2400min]对 1035min[590–1500min], P < 0.001)。术后额外镇痛的需要，左布比卡因组高于罗哌卡因组(37/40 [92.5%]对 30/40 [75%], P < 0.034)。两组 24 小时内都未出现并发症。
结论：在足踝手术之后，20ml0.5%的左布比卡因在后臀（Labat）坐骨神经阻滞中比相同剂量的罗哌卡因提供的镇痛时间长。
（唐亮 译 马皓琳 李士通 校）

BACKGROUND: Levobupivacaine and ropivacaine are 2 left enantiomeric molecules frequently used for peripheral nerve blocks because of their safe clinical profile. Levobupivacaine is more lipophilic and theoretically more potent than ropivacaine, but clinical studies show conflicting results in terms of anesthetic and analgesic characteristics. We hypothesized that the pure S-enantiomer of bupivacaine provides longer-lasting analgesia than ropivacaine.
METHODS: We compared the analgesic characteristics of 20 mL levobupivacaine versus 20 mL ropivacaine 0.5% in a posterior sciatic nerve block (Labat approach) for foot and ankle surgery. In a double-blind, randomized, prospective design, 80 patients received either substance. We assessed the onset, duration, and success of the block, and the need for rescue analgesia and technical or neurologic complications over 24 hours.
RESULTS: The onset of sensory block (minutes) and the success rate were similar in levobupivacaine and ropivacaine groups (onset, 15 minutes [5–40 minutes] vs 15 minutes [5–60 minutes], respectively; success rate, 90% vs 92.5%). The average time for the first request of pain medication provided by 20 mL levobupivacaine 0.5% was significantly longer than with ropivacaine (1605 minutes [575–2400 minutes] vs 1035 minutes [590–1500 minutes], P < 0.001). The need for postoperative rescue analgesia was higher in the ropivacaine group (37 of 40 [92.5%] vs 30 of 40 [75%], P < 0.034). No complications were noted in either group at 24 hours.

CONCLUSION: Twenty milliliters levobupivacaine 0.5% in posterior gluteal (Labat) sciatic nerve block provided longer-lasting analgesia after foot and ankle surgery compared with the same dose of ropivacaine.

为肾上腺功能不全的外科患者围术期补充类固醇类药物

Supplemental Perioperative Steroids for Surgical Patients with Adrenal Insufficiency

Sin Leong Yong, Paul Marik, Marco Esposito and Paul Coulthard

Anesth Analg 2010;110(5):1506;

背景：肾上腺危象是肾上腺功能不全的患者因术中应激导致威胁生命的急症。这可以通过围术期给予大剂量类固醇来预防。但围术期补充类固醇是否必要、何时给、以及用药剂量和次数都存在争议。

目的：评估对因肾上腺皮质功能不全给予维持剂量的糖皮质激素的成年患者围术期补充类固醇是否必要。

搜索策略：我们搜索了循证医学中央寄存器中的对照试验（重要的）(循证医学 e 图书库 2009，第 1 期)；MEDLINE (1966～2009.1); EMBASE (1980～2009.1); LILACS (1982～2009.1)；以及正在进行的试验的数据库。我们手工搜索了临床内分泌学和新陈代谢杂志（1982～1997）、临床内分泌学（1972～1997）、外科学（1948～1994）、外科学编年史（1948～1994）和麻醉（1948～2000）。

选择标准：对于已给予维持剂量类固醇的成年病人比较围术期补充类固醇与给予安慰剂的随机、对照试验。

数据收集和分析：两名回顾作者独立地评估试验质量和萃取的数据。研究作者之间互通缺少的信息。我们使用平均差和标准差来概括每组的数据。

主要结果：计入了包括 37 名患者的两组试验。这些研究报道了对肾上腺功能不全的患者在手术期间补充围术期类固醇是没有必要的。在干预组和对照组都没有不良反应和并发症的报道。

作者结论：由于病人例数较少，结果可能不具有代表性。 鉴于目前可用的证据，我们不能支持或反对对肾上腺功能不全的患者在手术术期间补充围术期类固醇。

（杨秀娟 译 马皓琳 李士通校）

BACKGROUND: Adrenal crisis is a life threatening condition which can be induced by stress during surgery in patients with adrenal insufficiency. This may be prevented by perioperative administration of high doses of steroids. There is disagreement on whether supplemental perioperative steroids are required and, when administered, on the amount and frequency of doses.

OBJECTIVES: To assess whether it is necessary to administer supplemental perioperative steroids in adult patients on maintenance doses of glucocorticoids because of adrenal insufficiency.

SEARCH STRATEGY: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2009, Issue 1); MEDLINE (1966 to January 2009); EMBASE (1980 to January 2009); LILACS (1982 to January 2009); and the databases of ongoing trials. We handsearched the Journal of Clinical Endocrinology and

Metabolism (1982 to 1997), Clinical Endocrinology (1972 to 1997), Surgery (1948 to 1994), Annals of Surgery (1948 to 1994), and Anaesthesia (1948 to 2000).
SELECTION CRITERIA: Randomized, controlled trials that compared the use of supplemental perioperative steroids to placebo in adult patients on maintenance doses of steroids who required surgery.
DATA COLLECTION AND ANALYSIS: Two review authors independently assessed trial quality and extracted data. Study authors were contacted for missing information. We used mean differences and standard deviations to summarize the data for each group.
MAIN RESULTS: Two trials involving 37 patients were included. These studies reported that supplemental perioperative steroids were not required during surgery for patients with adrenal insufficiency. Neither study reported any adverse effects or complications in the intervention and control groups.
AUTHORS' CONCLUSIONS: Owing to the small number of patients, the results may not be representative. Based on current available evidence, we are unable to support or refute the use of supplemental perioperative steroids for patients with adrenal insufficiency during surgery.

异氟烷麻醉并不能满足快动眼睡眠期内环境稳定的需求

Isoflurane Anesthesia Does Not Satisfy the Homeostatic Need for Rapid Eye Movement Sleep

George A. Mashour, MD, PhD, William J. Lipinski, MS, Lisa B. Matlen, BS, Amanda J. Walker, BS, Ashley M. Turner, BS, Walter Schoen, BA, UnCheol Lee, PhD and Gina R. Poe, PhD
From the Division of Neuroanesthesiology and Department of Anesthesiology at the University of Michigan Medical School, Ann Arbor, Michigan.
Anesth Analg 2010 110:1283-1289

背景：睡眠和全身麻醉师完全不同的两种意识状态，但却有许多相同的特点。早前的研究提示，丙泊酚麻醉有助于从快动眼睡眠（REM）中恢复过来，且不产生非快动眼睡眠，但是吸入麻醉这一方面的作用尚未被研究。我们旨在验证这一假说，即异氟烷也有助于从快动眼睡眠剥夺中苏醒。
方法：在六只小鼠的浅表皮质层、深部海马区以及背部肌肉植入电极。在剥夺小鼠快动眼睡眠 24 小时以后分两组进行实验干预，1 组 ad libitum 睡眠 8 小时，2 组则立即应用异氟烷麻醉 4 小时，然后 ad libitum 睡眠 4 小时。在相同的无睡眠剥夺的情况下，将两组经干预后快动眼睡眠与非快动眼睡眠的比例进行比较。此外，还将异氟烷麻醉期间、快动眼睡眠期以及清醒活动期海马（theta）区的活动情况进行比较。
结果：在第一个 2 小时，快动眼睡眠期的剥夺后苏醒呈 5.7 倍增加（P=0.0005），在第二个 2 小时成 2.6 倍的增加（P=0.004）。而异氟烷麻醉组在第一个 2 小时，快动眼睡眠期的剥夺后苏醒呈 3.6 倍增加（P=0.001），在第二个 2 小时成 2.2 倍的增加（P=0.003）。在睡眠剥夺后的前 4 个小时内，两个实验组之间快动眼睡眠的波动状态并无显著差异。异氟烷麻醉期间海马（theta）区的活动并不受快动眼睡眠剥夺的影响，并且麻醉期间（theta）区活动可能的分布情况与清醒状态时更为相似，而非快动眼睡眠状态。

结论：与丙泊酚不同，异氟烷并不能满足快动眼睡眠期内环境稳定的需求。并且，麻醉期间海马（theta）区的活动规律和组织结构表现并不同于正常的睡眠状态。我们总结认为，不同的麻醉药物是作用于不同的层面来产生睡眠状态的。（单嘉琪译 薛张纲校）

BACKGROUND: Sleep and general anesthesia are distinct states of consciousness that share many traits. Prior studies suggest that propofol anesthesia facilitates recovery from rapid eye movement (REM) and non-REM (NREM) sleep deprivation, but the effects of inhaled anesthetics have not yet been studied. We tested the hypothesis that isoflurane anesthesia would also facilitate recovery from REM sleep deprivation.
METHODS: Six rats were implanted with superficial cortical, deep hippocampal, and nuchal muscle electrodes. Animals were deprived of REM sleep for 24 hours and then (1) allowed to sleep ad libitum for 8 hours or (2) were immediately anesthetized with isoflurane for a 4-hour period followed by ad libitum sleep for 4 hours. The percentage of REM and NREM sleep after the protocols was compared with similar conditions without sleep deprivation. Hippocampal [theta] activity during isoflurane anesthesia was also compared with [theta] activity during REM sleep and active waking.
RESULTS: Recovery after deprivation was associated with a 5.7-fold increase (P = 0.0005) in REM sleep in the first 2 hours and a 2.6-fold increase (P = 0.004) in the following 2 hours. Animals that underwent isoflurane anesthesia after deprivation demonstrated a 3.6-fold increase (P = 0.001) in REM sleep in the first 2 hours of recovery and a 2.2-fold increase (P = 0.003) in the second 2 hours. There were no significant differences in REM sleep rebound between the first 4 hours after deprivation and the first 4 hours after both deprivation and isoflurane anesthesia. Hippocampal [theta] activity during isoflurane anesthesia was not affected by REM sleep deprivation, and the probability distribution of [theta] events during anesthesia was more similar to that of waking than to REM sleep.
CONCLUSION: Unlike propofol, isoflurane does not satisfy the homeostatic need for REM sleep. Furthermore, the regulation and organization of hippocampal [theta] events during anesthesia are unlike sleep. We conclude that different anesthetics have distinct interfaces with sleep.

心脏骤停后治疗性低体温时的麻醉与镇痛方案：一个系统回顾

Anesthesia and Analgesia Protocol During Therapeutic Hypothermia After Cardiac Arrest: A Systematic Review

Carlos Chamorro, MD, PhD*, Jose M. Borrallo, MD†, Miguel A. Romera, MD*, Jose A. Silva, MD† ，and Bárbara Balandín, MD*
From the *Intensive Care Unit, Puerta de Hierro–Majadahonda University Hospital, Majadahonda, Madrid; and †Intensive Care Unit, Guadalajara University Hospital, Guadalajara, Spain.
Anesth Analg May 2010 110:1328-1335

背景：当代实践指南推荐在心跳骤停后昏迷并治疗性低体温病人中给予镇静-镇痛和神经肌肉阻滞。然而，无人建议最佳的给予方案。本研究中，我们评价了这方面重症监护室人员的选择。

方法：首先进行系统文献回顾寻找 1997 年至 2009 年 7 月之间进行的临床研究。文献需满足以下标准：心跳骤停后治疗性低体温来改善神经系统预后，特别提到镇静方案的运用。我们查找应用的药物和剂量。，使用的原因，及使用的神经系统和神经肌肉监测仪的种类。
结果：我们共收集了来自不同国家 68 个重症监护室报告应用方案的 44 个研究。咪达唑仑是最常用的镇静剂，在 39 个重症监护室中使用剂量在 5mg/h 至 0.3mg/kg/h 之间。异丙酚在 13 个重症监护室的使用剂量不超过 6mg/kg/h。18 个重症监护室没有报道使用任何镇痛药。芬太尼是应用最多的镇痛药，在 33 个重症监护室的使用剂量在 0.5 至 10ug/kg/h，其次是 4 个重症监护室中应用的吗啡。在 54 个重症监护室中常规使用神经肌肉阻滞药预防痉挛，8 个重症监护室中常规治疗痉挛；在 1 个重症监护室中，神经肌肉阻滞药的应用不积极。潘库溴铵的使用最多，有 24 个重症监护室选择了它，其次是顺式阿曲库铵，14 个重症监护室选择了它。4 个重症监护室应用四个成串刺激监测、三个重症监护室使用连续脑电活动监测来指导神经肌肉阻滞药的应用。
结论：治疗性低体温期间镇静镇痛方案有着显著差别。很多时候应用的药物和剂量并不十分合理。只有 3 个重症监护室在病人神经肌肉阻滞时常规使用脑电图监测。在怎样治疗这一类重症人群上达到共识是很必要的。
（黄剑译 薛张纲校）
BACKGROUND: Present practice guidelines recommend sedative-analgesic and neuromuscular blocking administration during therapeutic hypothermia in comatose patients after cardiac arrest. However, none suggests the best administration protocol. In this study, we evaluated intensivists' preferences regarding administration.
METHODS: A systematic literature review was conducted to identify clinical studies published between 1997 and July 2009. Selected articles had to meet the following criteria: use of hypothermia to improve neurologic outcome after cardiac arrest, and specific mention of the sedative protocol used. We checked drugs and dose used, the reason for their administration, and the specific type of neurologic and neuromuscular monitoring used.
RESULTS: We identified 44 studies reporting protocols used in 68 intensive care units (ICUs) from various countries. Midazolam, the sedative used most often, was used in 39 ICUs at doses between 5 mg/h and 0.3 mg/kg/h. Propofol was used in 13 ICUs at doses up to 6 mg/kg/h. Eighteen ICUs (26%) did not report using any analgesic. Fentanyl was the analgesic used the most, in 33 ICUs, at doses between 0.5 and 10 μg/kg/h, followed by morphine in 4 ICUs. Neuromuscular blocking drugs were routinely used to prevent shivering in 54 ICUs and to treat shivering in 8; in 1 ICU, their use was discouraged. Pancuronium was used the most, in 24 ICUs, followed by cisatracurium in 14. Four ICUs used neuromuscular blocking drug administration guided by train-of-four monitoring and 3 ICUs used continuous monitoring of cerebral activity.
CONCLUSIONS: There is great variability in the protocols used for anesthesia and analgesia during therapeutic hypothermia. Very often, the drug and the dose used do not seem the most appropriate. Only 3 ICUs routinely used electroencephalographic monitoring during paralysis. It is necessary to reach a consensus on how to treat this critical care population.

经 M 型超声评价膈肌运动用于预测上腹部手术后肺功能障碍的发生

An Evaluation of Diaphragmatic Movement by M-Mode Sonography as a Predictor of Pulmonary Dysfunction After Upper Abdominal Surgery

Soo Hwan Kim, MD,* Sungwon Na, MD, PhD,† Jin-Sub Choi, MD, PhD,‡ Se Hee Na, MD,† Seokyung Shin, MD,§ and Shin Ok Koh, MD, PhD†
From the *Department of Anesthesiology and Pain Medicine, Kangnam Sacred Heart Hospital, Hallym University College of Medicine; †Department of Anesthesiology and Pain Medicine, Anesthesia and Pain Research Institute, Yonsei University College of Medicine; and Departments of ‡Surgery, and §Anesthesiology and Pain Medicine, Yonsei University College of Medicine, Seoul, Republic of Korea.
Anesth Analg 2010 110(5): 1349-1354

背景：膈肌功能不全是上腹部手术后出现肺部并发症的主要发病因素。M 型超声是目前公认的定性检查方法，用于测量正常及病理状态下的膈肌呼吸运动。在这项研究中，我们评估了通过 M 型超声测量膈肌吸气运动幅度（DIA）在预测术后肺功能障碍发生中的价值。
方法：这项前瞻性的、单中心、单组的观察性研究是在 35 名 ASA 体格分级为 I-II 级的非吸烟病人中进行的，所有研究对象均为接受开腹肝叶切除术的病人。应用 M 型超声分别测量病人在术前常规肺功能检查后、术后第 1 天、第 2 天和第 7 天的膈肌运动功能，测量指标为安静、经鼻深呼吸时的膈肌吸气运动幅度（cm）。
结果：肝叶切除术后的第 1 天和第 2 天，膈肌吸气运动幅度（DIA）和肺活量值呈显著下降，其下降值为术前测量值的 60%（$P < 0.001$）。至术后第 7 天，上述两项变化指标与术前第 1 天和第 2 天相比恢复 30%（$P < 0.001$）。在深呼吸时，膈肌吸气运动幅度与肺活量显著相关（$r = 0.839$, $P < 0.0001$）。通过受试者工作特征曲线（ROC）分析，以 DIA 为 3.61cm 和 2.42cm 分别作为诊断肺活量值较术前下降 30%和 50%时的最佳临界值，其敏感度分别为 94%和 81%，特异度分别为 76%和 91%（$P = 0.0001$）。有 2 名病人术后出现膈神经麻痹但均无呼吸窘迫的症状，转至普通病房后亦不需要额外的氧气治疗。
结论：在术后观察期间，经 M 型超声测量的膈肌吸气运动幅度与肺量计测定的肺活量值存在线形相关关系。我们认为临床上应用 M 型超声技术检查术后膈肌功能不全是一种实用的方法，同时也可作为床旁筛查膈神经麻痹的有效方法。
（李莹译 薛张纲校）

BACKGROUND: Diaphragmatic dysfunction is a major factor in the etiology of postoperative pulmonary complications after upper abdominal surgery. M-mode ultrasonography is now an accepted qualitative method of assessing diaphragmatic motion in normal and pathological conditions. In this study, we evaluated whether diaphragmatic inspiratory amplitude (DIA) as measured by M-mode sonography can be a predictor of pulmonary dysfunction.
METHODS: A prospective, single-center, single-unit, observational study was performed in 35 ASA physical status I and II nonsmoking patients undergoing open liver lobectomy. Diaphragmatic movements were assessed by M-mode sonography after a pulmonary function test preoperatively and on postoperative days (PODs) 1, 2, and 7. We measured the DIA (cm) during quiet, deep, and sniff breathing.

RESULTS: After liver lobectomy, DIA during deep breathing and vital capacity (VC) showed significant reductions of 60% from their preoperative values on PODs 1 and 2 ($P < 0.001$). By POD 7, the variables recovered significantly, by 30% from the values on PODs 1 and 2 ($P < 0.001$). During deep breathing, DIA showed a significant correlation with VC ($r = 0.839$, $P < 0.0001$). The best cutoff values of DIA for detecting 30% and 50% decreases of VC from preoperative values, calculated by receiver operating characteristic analysis, were 3.61 and 2.41 cm, with sensitivity of 94% and 81% and specificity of 76% and 91%, respectively ($P = 0.0001$). Two patients showed postoperative diaphragmatic paralysis but did not complain of respiratory distress symptoms or need supplemental oxygen after being transferred to the general ward.
CONCLUSIONS: DIA using M-mode sonography showed a linear correlation with VC measured by spirometry throughout the postoperative period. We conclude that using the M-mode sonographic technique at the bedside can be a practical way to investigate postoperative diaphragmatic dysfunction, and may also be an effective bedside screening method for diaphragmatic paralysis.

全国大样本产妇产后出血的流行病学

The Epidemiology of Postpartum Hemorrhage in a Large, Nationwide Sample of Deliveries

Brian T. Bateman, MD*, Mitchell F. Berman, MD, MPH†, Laura E. Riley, MD‡ and Lisa R. Leffert, MD*
From the *Department of Anesthesia and Critical Care, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts; †Department of Anesthesiology, Columbia University College of Physicians and Surgeons, New York, New York; and ‡Department of Obstetrics, Gynecology and Reproductive Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts.
Anesth Analg May 2010 110:1368-1373

背景：在这个研究中，我们试图描述产后出血发生率的变化趋势，同时描述针对发生产后出血的危险因素和这一分娩并发生的产妇转归的当代流行病学。
方法：在美国最大的出院资料库，全国住院病人中找出入院分娩的病例。运用国际疾病分类法，临床修订版（第十版）的定义找出分娩后发生产后出血并发症的病例和可能为危险因素的伴发疾病。评估 1995 年至 2004 年产后出血发生率的变化趋势。运用 logistic 回归对产后出血最常见的病因子宫收缩乏力进行相关危险因素分析。
结果：2004 年，所有分娩者中产后出血的发生率为 2.9%；其中由于宫缩乏力造成的占了 79%。产后出血占了所有分娩后院内死亡病因的 19.1%。从 1995 年至 2004 年产后出血总体发生率上升了 27.5%，主要由于子宫收缩乏力的发生率上升；而其他造成宫缩乏力的原因如胎盘滞留、凝血系统疾病在这一期间基本保持稳定。经 Logistic 回归分析得出年龄<20 岁或>=40 岁、剖宫产、妊娠高血压疾病、羊水过多、绒毛膜羊膜炎、多胎妊娠、胎盘滞留和产前出血是造成宫缩乏力导致产后出血并输血的独立危险因素。除外产妇年龄和剖腹产，其他一个或多个原因在这些病例中仅占 38.8%。

结论：产后出血是分娩常见的并发症并且和产妇发病率和死亡率息息相关。在美国产后出血的发生率正在上升。由于宫缩乏力导致产后出血后的输血通常发生于无已知相关危险因素的病人中。
（姚敏敏译 薛张纲校）

BACKGROUND: In this study, we sought to (1) define trends in the incidence of postpartum hemorrhage (PPH), and (2) elucidate the contemporary epidemiology of PPH focusing on risk factors and maternal outcomes related to this delivery complication.
METHODS: Hospital admissions for delivery were extracted from the Nationwide Inpatient Sample, the largest discharge dataset in the United States. Using International Classification of Diseases, Clinical Modification (ninth revision) codes, deliveries complicated by PPH were identified, as were comorbid conditions that may be risk factors for PPH. Temporal trends in the incidence of PPH from 1995 to 2004 were assessed. Logistic regression was used to identify risk factors for the most common etiology of PPH—uterine atony.
RESULTS: In 2004, PPH complicated 2.9% of all deliveries; uterine atony accounted for 79% of the cases of PPH. PPH was associated with 19.1% of all in-hospital deaths after delivery. The overall rate of PPH increased 27.5% from 1995 to 2004, primarily because of an increase in the incidence of uterine atony; the rates of PPH from other causes including retained placenta and coagulopathy remained relatively stable during the study period. Logistic regression modeling identified age <20 or ≥40 years, cesarean delivery, hypertensive diseases of pregnancy, polyhydramnios, chorioamnionitis, multiple gestation, retained placenta, and antepartum hemorrhage as independent risk factors for PPH from uterine atony that resulted in transfusion. Excluding maternal age and cesarean delivery, one or more of these risk factors were present in only 38.8% of these patients.
CONCLUSION: PPH is a relatively common complication of delivery and is associated with substantial maternal morbidity and mortality. It is increasing in frequency in the United States. PPH caused by uterine atony resulting in transfusion often occurs in the absence of recognized risk factors.

加巴喷丁在儿科脊柱融合手术病人中的应用：一项随机、双盲、对照研究

Gabapentin Use in Pediatric Spinal Fusion Patients: A Randomized, Double-Blind, Controlled Trial

Lynn M. Rusy, MD,*§ Keri R. Hainsworth, PhD,* Tom J. Nelson, PharmD, RPh,§ Michelle L. Czarnecki, MSN, RN, BC, CPNP,§ J. Channing Tassone, MD,†§ John G. Thometz, MD,†§ Roger M. Lyon, MD,†§ Richard J. Berens, MD,*‡§ and Steven J. Weisman, MD*‡§
From the Departments of *Anesthesiology, †Orthopaedics, and ‡Pediatrics, Medical College of Wisconsin, and §Children's Hospital of Wisconsin, Milwaukee, Wisconsin.
Anesth Analg 2010;110(5): 1393-8

背景：在成年手术病人中，加巴喷丁具有降低阿片类药物使用量的效应，但尚未有涉及儿童和青少年病人的相关研究发表。在这项双盲、随机、对照研究中，我们分析了加巴喷丁能否减少患有特发性脊柱侧凸的儿科病人在接受脊柱融合术后阿片类药物的使用量。

方法：研究对象的年龄均在9至13岁之间，分为两组病人，术前分别给予加巴喷丁（15mg/kg，治疗组）或者安慰剂。术中采用标准的麻醉方法。术后所有病人均接受含阿片类药物的自控式镇痛装置，随后5天两组病人继续给予加巴喷丁（5mg/kg）或安慰剂，每天3次。阿片类药物的使用量按mg/kg/时间间隔计算，同时记录疼痛评分和阿片类药物副作用。
结果：59例病人（安慰剂组30例，加巴喷丁组29例）在人口统计数据上无差异。吗啡总消耗量（mg/kg/h ± SD）在加巴喷丁组要显著低于安慰剂组，使用量分别为恢复室（0.044 ± 0.017 vs 0.064 ± 0.031, P = 0.003）、术后第一天（0.046 ± 0.016 vs 0.055 ± 0.017, P = 0.051）、术后第二天（0.036 ± 0.016 vs 0.047 ± 0.019, P = 0.018）。此外，加巴喷丁能显著降低恢复室内第1次疼痛评分（2.5 ± 2.8 vs 6.0 ± 2.4, P < 0.001）及术后清晨疼痛评分（3.2 ± 2.6 vs 5.0 ± 2.2, P < 0.05），但在其他观察点的疼痛评分无显著性差异。研究期间，阿片类相关副作用在两组病人之间无差别。
结论：围手术期口服加巴喷丁可以减少脊柱融合术后用于镇痛的吗啡使用量，但并不相应地减少阿片类相关的副作用。治疗组的初始疼痛评分较对照组低。在接受脊柱融合术的儿童和青少年病人，围术期应用加巴喷丁似乎是改善恢复早期疼痛控制效果的有效辅助手段。
（俞佳译 薛张纲校）
BACKGROUND: Gabapentin has opioid-sparing effects in adult surgical patients, but no reported studies have involved children and adolescents. In a double-blind, randomized, controlled trial, we examined whether gabapentin decreases postoperative opioid consumption for pediatric spinal fusion patients with idiopathic scoliosis.
METHODS: Patients, aged 9 to 18 years, received preoperative gabapentin (15 mg/kg, treatment) or placebo. Anesthesia was standardized. After surgery, all patients received standardized patient-controlled analgesia opioid and continued on either gabapentin (5 mg/kg) or placebo 3 times per day for 5 days. Opioid use was calculated in mg/kg/time intervals. Pain scores and opioid side effects were recorded.
RESULTS: Data from 59 patients (30 placebo and 29 gabapentin) did not differ in demographics. Total morphine consumption (mg/kg/h ± SD) was significantly lower in the gabapentin group in the recovery room (0.044 ± 0.017 vs 0.064 ± 0.031, P = 0.003), postoperative day 1 (0.046 ± 0.016 vs 0.055 ± 0.017, P = 0.051), and postoperative day 2 (0.036 ± 0.016 vs 0.047 ± 0.019, P = 0.018). In addition, gabapentin significantly reduced first pain scores in the recovery room (2.5 ± 2.8 vs 6.0 ± 2.4, P < 0.001) and the morning after surgery (3.2 ± 2.6 vs 5.0 ± 2.2, P < 0.05), but otherwise pain scores were not significantly different. There were no differences in opioid-related side effects over the course of the study.
CONCLUSION: Perioperative oral gabapentin reduced the amount of morphine used for postoperative pain after spinal fusion surgery, but not overall opioid-related side effects. Initial pain scores were lower in the treatment group. Perioperative use of gabapentin seems to be an effective adjunct to improve pain control in the early stages of recovery in children and adolescents undergoing spinal fusion.

在局灶性脑缺血大鼠中，异氟醚预处理对脑血流、毛细管渗透率和耗氧量的影响

The Effects of Isoflurane Pretreatment on Cerebral Blood Flow, Capillary Permeability, and Oxygen Consumption in Focal Cerebral Ischemia in Rats

Oak Z. Chi, MD*,Christine Hunter, MD*, Xia Liu, MD* and Harvey R. Weiss, PhD†
From the Departments of *Anesthesia, and †Physiology and Biophysics, University of Medicine and Dentistry of New Jersey–Robert Wood Johnson Medical School, New Brunswick, New Jersey.

.Anesth Analg May 2010 110:1412-1418

背景：在我们的实验中，我们研究了局部脑缺血模型中异氟醚预处理对血管的影响，尤其小动脉和毛细血管对局部脑血流量（rCBF）、氧供和氧耗及毛细血管渗透性的影响。由于诱导型一氧化氮合酶（iNOS）与异氟醚预处理作用相关，我们同时研究了 iNOS 对 rCBF 抑制作用。

方法：大脑中动脉（MCA）阻塞前 24 小时，使用 2%的异氟醚通过气管导管和机械通气对大鼠预处理 30 分钟（IsoPC 组）。为了抑制组中 iNOS，在异氟醚预处理前注射 30 分钟氨基胍 200mg/kg。MCA 闭塞后一小时，使用 ^{14}C –碘安替比林测定 rCBF。 使用冷的显微分光光度测定法测定小动脉和小静脉的氧饱和度。通过测定 ^{14}C-α-氨基异丁酸的转换系数（Ki）测定毛细血管渗透性。MCA 阻塞后 3 小时测定 rCBF。

结果：大脑中动脉阻塞后，rCBF 及 O_2 消耗均降低，对照组及 IsoPC 组的 Ki 在 MCA 阻塞后 1 小时均增加。在缺血皮质（IC），IsoPC 组的 rCBF 和氧消耗量高于对照组（分别增加 40%和 41%），但两组在对侧皮质间没有差异。在缺血皮质或对侧皮质，两组的 Ki 没有显著差异。在 IsoPC 组 MCA 阻塞后 3 小时，在 IC 处 rCBF 增加 50%的。 随着 iNOS 的抑制，异氟醚预处理所致的 IC 处 rCBF 增加作用减弱。

结论：我们的资料表明，异氟醚预处理可以改善局部脑血流量，并增加缺血局部氧供和氧耗，但是在局部缺血早期并不影响毛细血管渗透性。异氟醚诱导的缺血区域 rCBF 增加在 iNOS 的抑制作用下变得微不足道。

（陈珺珺译 薛张纲校）

BACKGROUND: We performed experiments to test whether isoflurane pretreatment produces vascular effects, especially at the levels of arterioles and capillaries affecting regional cerebral blood flow (rCBF), O_2 supply and consumption, or capillary permeability in focal cerebral ischemia. Because inducible nitric oxide synthase (iNOS) was implicated as one of the mechanisms of isoflurane preconditioning, the effect of iNOS inhibition on rCBF was also studied.

METHODS: Twenty-four hours before middle cerebral artery (MCA) occlusion, rats were pretreated with 2% isoflurane for 30 minutes using an endotracheal tube and mechanical ventilation for the isoflurane preconditioned (IsoPC) group. For the group of iNOS inhibition, aminoguanidine 200 mg/kg was injected IP 30 minutes before isoflurane pretreatment. One hour after MCA occlusion, rCBF was measured using ^{14}C-iodoantipyrine autoradiography. Alternate slices of the tissue were used to determine arteriolar and venular O_2 saturation using cryo microspectrophotometry. Capillary permeability was determined by measuring the transfer coefficient (Ki) of ^{14}C-α-aminoisobutyric acid. Additional measurements of rCBF were performed at 3 hours after MCA occlusion.

RESULTS: MCA occlusion decreased rCBF and O_2 consumption and increased Ki in both the control and the IsoPC groups at 1 hour after MCA occlusion. In the ischemic cortex (IC), the rCBF and O_2 consumption were significantly greater in the IsoPC group than in the control group (+40% and +41%, respectively), but they were similar in the contralateral cortex between the 2 groups. There was no difference in Ki between the groups in the IC or in the contralateral cortex. The increase of rCBF in the IC (+50%) was sustained in the IsoPC group at 3 hours after MCA occlusion. With iNOS inhibition, the increase of rCBF in the IC with isoflurane pretreatment became insignificant.
CONCLUSIONS: Our data demonstrate that isoflurane pretreatment improved rCBF and increased the regional O_2 supply and consumption in the focal ischemic area but did not affect capillary permeability during the early stage of focal cerebral ischemia. The isoflurane-induced increase in rCBF in the ischemic area became insignificant with inhibition of iNOS.

肾移植术中输注大量晶体液时机对早期移植肾功能的影响

The impact of timing of maximal crystalloid hydration on early graft function during kidney transplantation.

Othman MM, Ismael AZ, Hammouda GE.
Department of Anesthesia and Surgical ICU, Urology and Nephrology Center, Faculty of Medicine, Mansoura University, Mansoura, Egypt.
Anesth Analg. 2010 May 1;110(5):1440-6.

背景：早期移植肾的功能是肾移植成功与否的关键所在。由于液体向血管外间隙的快速移动，适当液体的维持较为复杂。本研究的目的即检验移植肾缺血期输注大量液体对早期肾功能的影响。
方法：选取 40 例准备行活体肾移植手术的慢性肾功能不全的成年患者，将其随机分配至实验组和对照组。对照组患者在手术开始至肾血管吻合后开放期间按 10 到 12 mL．kg(-1)．h(-1)的速度输注 0.9%生理盐水。实验组（CVPT 组）患者调整 0.9%生理盐水的输注速度来维持中心静脉压水平在手术开始至阻断肾的主要血管期间在 5mmHg，在阻断至完成所有肾血管的吻合期间在 15mmHg。记录每组患者围术期的血流动力学、生理盐水输注量和输注速度、利尿剂的使用量、移植肾的肿胀度、尿量和术后 5 天的肾功能。
结果：在肾缺血期两组患者均接受了大约 3 L 的晶体液。CVPT 组患者的肾缺血期为 48 +/- 12 分钟，扩容至最高平台期间，平均每分钟接受 48.3 mL 的液体。该组患者的肾功能较对照组好，需要较少的血管活性药物和利尿剂，且术后组织水肿较对照组减轻。
结论：肾移植术中按适当中心静脉压水平来给于液体可使血流动力学更稳定且增加尿量。在约一个小时左右的肾缺血期以每分钟 45 到 50ml 的速度给于液体可提高早期移植肾功能。对于在此类患者中输注晶体液维持中心静脉压的临床获益则需要大样本和长期肾功能随访来明确。
（张钊译 薛张纲校）

BACKGROUND: Early graft function is crucial for successful kidney transplantation. Maintaining adequate hydration is complicated by rapid movement of water to the

extravascular space. We designed this study to test the effect of maximal hydration during graft ischemia time on early renal function.
METHODS: Forty adult patients with chronic renal failure underwent renal transplantation from related living donors. Study subjects were randomly assigned 1 of 2 regimens for intraoperative hydration. The constant infusion rate group received normal saline 0.9% at an infusion rate 10 to 12 mL . kg(-1) . h(-1) from the start of surgery until the renal vessels were unclamped after vascular anastomosis. The central venous pressure target (CVPT) group received normal saline 0.9% titrated to maintain a specific central venous pressure (CVP). The target CVP from the start of surgery until clamping of the donor renal vessels was5 mm Hg except for the interval from clamping of the renal vessels until the end of renal vascular anastomosis, when the target CVP was 15 mm Hg. Perioperative hemodynamics, infused saline volumes, rate of infusion, onset of diuresis, graft turgidity, urine volume, and renal function during the first 5 postoperative days were recorded.
RESULTS: At the end of renal ischemia time, both groups had received approximately 3 L crystalloid solution. The CVPT group achieved the highest peak of intravascular volume expansion with an average infusion rate of 48.3 mL . min(-1) during 48 +/- 12 minutes of renal ischemia. The CVPT group had better graft function, required fewer vasopressors and diuretics, and had less postoperative tissue edema than the constant infusion rate group.
CONCLUSIONS: Hydration directed toward maintaining a given CVP during kidney transplantation produced a more stable hemodynamic profile and promoted diuresis. The calculated infusion rate of approximately 45 to 50 mL . min(-1), within an hour ischemia time, seems feasible to enhance early graft function. A larger trial with long-term follow-up of renal function is warranted to confirm the clinical benefit of titrating IV crystalloid administration to maintain a given CVP in this population.

简要报道：荧光透视引导下穿透椎板和椎板间腰部硬膜外注射类固醇时管内注射的发生率

Brief Reports: Incidence of Intradiscal Injection During Lumbar Fluoroscopically Guided Transforaminal and Interlaminar Epidural Steroid Injections

Kenneth D. Candido, MD*, Jeffrey A. Katz, MD†, Mariadas Chinthagada, MD‡, Robert A. McCarthy, Pharm D† and Nebojsa Nick Knezevic, MD, PhD*
From the *Department of Anesthesiology, Advocate Illinois Masonic Medical Center; †Department of Anesthesiology, Division of Pain Management, Northwestern University/Feinberg School of Medicine, Chicago; and ‡Department of Anesthesiology, Division of Pain Management, Loyola University Medical Center, Maywood, Illinois.
Anesth Analg May 2010 110:1464-1467;

穿透椎板硬膜外类固醇注射和椎板间腰部硬膜外注射类固醇时发生管内注射的报道极少。因此，该回顾性观察报告首次试图去定量这一并发症的全部发生率。对 3 年可得数据（2004-2007）的回顾性分析共获得 2 个培训机构（Loyola 大学医学中心和西北大学 Feinberg 医学学校）的 2412 例穿透椎板的硬膜外类固醇注射。有 6 例发生管内注射，对比率为 1：402。同时期内，实施的 4723 例椎板间腰部硬膜外类固醇注射，仅一例发生管内注射，比率为 1：4723。

（朱兰芳译，薛张纲校）
Intradiscal injections during transforaminal epidural steroid injections and interlaminar lumbar epidural steroid injections have been reported rarely. In that regard, this retrospective observational report is the first attempt to quantify the overall rate of this complication. A retrospective analysis of 3 years of accrued data (2004–2007) showed that 2412 transforaminal epidural steroid injections were performed at the 2 training institutions (Loyola University Medical Center and Northwestern University/Feinberg School of Medicine). There were 6 intradiscal (annular) injections of contrast, for a rate of 1:402. Over the same interval, 4723 lumbar epidural steroid injections were performed, with 1 intradiscal injection, for a rate of 1:4723.

使用超声引导和神经刺激器行锁骨下臂丛神经阻滞时穿刺位置的比较

Selective Local Anesthetic Placement Using Ultrasound Guidance and Neurostimulation for Infraclavicular Brachial Plexus Block

Clifford Bowens Jr., MD*, Rajnish K. Gupta, MD*, William T. O'Byrne, MD*, Jonathan S. Schildcrout, PhD†, Yaping Shi, MS†, Jermel J. Hawkins, BS*, Damon R. Michaels, BS* and James M. Berry, MD*
From the Departments of *Anesthesiology, and †Biostatistics, Vanderbilt Medical Center, Nashville, Tennessee.
.Anesth Analg May 2010 110:1480-1485

背景：在我们的研究中，我们使用超声引导及神经刺激器进行锁骨下臂丛神经阻滞，我们比较了从中间或外周进路单次注射局麻药后成功的概率。
方法：218 名患者参加了这项连续前瞻性研究。患者被随机分为两组，通过超声引导及神经刺激器在中间（后束）或外周（中间或外侧束）注射局麻药。高年住院麻醉医师或主治医师进行操作。比较中间位置或外周位置进针的效果。
结果：总体而言，中间进路的成功率显著高于外周进路（96% vs 85%, P = 0.004）。每个束的成功率分别为：后侧束 99%，外侧束 92%和中间束 84%(P = 0.001)。中间组更多需要主治医师参与（27% vs 6%, P < 0.001）。术后中间组疼痛评分≤3 的患者更多（100% vs 94%, P = 0.012）。
结论：经中间进路单次注射局麻药使经锁骨下对臂丛神经后束阻滞有更高的成功率。
（陈珺珺译 薛张纲校）
BACKGROUND: In this study, we performed the infraclavicular block with combined ultrasound guidance and neurostimulation to selectively target cords to compare the success rates of placing a single injection of local anesthetic either in a central or peripheral location.
METHODS: Two hundred eighteen patients were enrolled in a consecutive, prospective study. Patients were randomized to injection of local anesthetic either centrally (posterior cord) or peripherally (medial or lateral cord) using ultrasound guidance and neurostimulation. Supervised senior anesthesiology residents or attending anesthesiologists performed the blocks. Both intent-to-treat and treatment-received analyses were used to compare central and peripheral placement efficacy.

RESULTS: The overall success rate was significantly higher for the central placements than peripheral placements (96% vs 85%, P = 0.004). Individual cord success rates were as follows: posterior 99%, lateral 92%, and medial 84% (P = 0.001). The central group required attending physician intervention more frequently (27% vs 6%, P < 0.001). Postoperative pain scores of ≤3 were more likely with central placement (100% vs 94%, P = 0.012).
CONCLUSION: Central placement of a single injection of local anesthetic targeted at the posterior cord resulted in a higher success rate for infraclavicular block.

通过核磁共振研究胸段脊椎管解剖

The Anatomy of the Thoracic Spinal Canal Investigated with Magnetic Resonance Imaging

Luiz Eduardo Imbelloni, MD*†, Marcelo Bianco Quirici, MD‡, Jose Roberto Ferraz Filho, MD§, José Antonio Cordeiro, PhD¶ and Eliana Marisa Ganem, PhD†
From the *Hospital de Base-FAMERP, São José do Rio Preto, Sao Paulo; †Botucatu Medical School, University of São Paulo State, UNESP, Botucatu; ‡School of Medicine-FAMERP, and §Department of Radiology and Imaging and ¶Department of Biostatistics, Hospital de Base—FAMERP, São Josédo Rio Preto, Sao Paulo, Brazil.
.Anesth Analg May 2010 110:1494-1495

背景：我们通过核磁共振研究了没有脊髓疾病患者在胸 2、胸 5 及胸 10 节段硬脑膜到脊髓的距离。
方法：50 名患者行仰卧位核磁共振检查。通过 1.5-T 超导系统（Gyroscan Intera, Philips Medical Systems, Best, 荷兰）测量矢状位中间位置在胸 2、胸 5 及胸 10 节段两者间的相对距离。在 10 名患者中，测量了皮肤穿刺点到目标的相对角度。
结果：后路硬脑膜－脊髓的距离在中胸段、上胸段及下胸段有显著差异：胸 5 为 5.8 ± 0.8 mm，胸 2 为 3.9 ± 0.8 mm，胸 10 为 4.1 ± 1.0 mm (P < 0.015)。胸 2 和胸 10 段的空隙没有显著差异。硬脑膜－脊髓的距离与年龄没有差异。进针的角度在胸 2 为 9.0° ± 2.5°，胸 5 为 45.0° ± 7.4°，胸 10 为 9.5° ± 4.2°。
结论：这项研究证明了在胸 2、胸 5 及胸 10 后路到蛛网膜下腔较深。在胸 5 距离最大。
（陈珺珺译 薛张纲校）

BACKGROUND: We investigated, with magnetic resonance imaging, the distance of the dura mater to the spinal cord in patients without spinal or medullar disease at the 2nd, 5th, and 10th thoracic segments.
METHODS: Fifty patients in the supine position underwent magnetic resonance imaging. Medial sagittal slices of the 2nd, 5th, and 10th thoracic segments were measured for the relative distances using the 1.5-T superconducting system (Gyroscan Intera, Philips Medical Systems, Best, the Netherlands). In 10 patients, the angles relative to the tangent at the insertion point on the skin were measured.
RESULTS: The posterior dural-spinal cord distance is significantly greater at the midthoracic region (5th thoracic = 5.8 ± 0.8 mm) than at the upper (2nd thoracic = 3.9 ± 0.8 mm) and lower thoracic levels (10th thoracic = 4.1 ± 1.0 mm) (P < 0.015). There were no differences between interspaces T2 and T10. There was no correlation between

age and the measured distance between the dura mater and the spinal cord. The entry angle of the needle at T2 was 9.0° ± 2.5°; at T5, 45.0° ± 7.4°; and at T10, 9.5° ± 4.2°. **CONCLUSIONS**: This study demonstrated that there is greater depth of the posterior subarachnoid space at the T2, T5, and T10 levels. The greater distance was found at T5.

Hereditary Angioedema: Current and Emerging Treatment Options
遗传性血管性水肿：一般和紧急治疗方法
Jerrold H. Levy, MD, FAHA*, Douglas J. Freiberger, MD* and John Roback, MD, PhD†
From the Departments of *Cardiothoracic Anesthesiology and Critical Care, and †Transfusion Medicine, Emory University School of Medicine, Atlanta, Georgia.
Anesth Analg May 2010 110:1271-1280;

血管性水肿可由过敏、遗传和获得性因素引起。遗传性血管性水肿（HAE）可在起病时就致残，并可威胁患者生命，患者患病时常需入院治疗，并入住加护病房（ICU）。尽管 HAE 有几种亚型，但它们有着共同的最终通路：激活多种激肽及诸如激肽释放酶和缓激肽等介质。最终导致血管通透性增加，引起水肿——其命名即由此得来。以往在美国获得许可的治疗方法包括合成代谢类固醇和抗纤维蛋白溶解药，它们均伴随着难治的并发症，而且不能逆转急性发作。在欧洲，自 1974 年起 C1 酯酶抑制剂（C1-INH）浓缩物已被用于预防和终止疾病发作。在美国，现在这两种该药物已被许可用于 HAE 患者，一种用于预防，另一种用于对抗 HAE 相关的急性腹部及面部症状。最近，在美国，首个激肽通路的介质——ecallantide 已被许可用于治疗 HAE。本文的目的是描述 HAE，并回顾现有的处理疾病的方法及目前正在研究中的不同的治疗药物，着重关注 HAE 患者的围术期处理。
（周姝婧　译　陈杰　校）
Angioedema can result from allergic, hereditary, and acquired conditions. Hereditary angioedema (HAE) attacks are disabling at the time of occurrence and can be life threatening; they often result in hospitalization and intensive care unit admission. Although there are several variants of HAE, they share a final common pathway: unopposed activation of multiple kinins and mediators including kallikrein and bradykinin. This leads to increased vascular permeability, which in turn produces the edema after which the condition is named. Older treatment options licensed in the United States, anabolic steroids and antifibrinolytics, have troublesome side effect profiles and may not reverse a severe acute attack. In Europe, C1 esterase inhibitor (C1-INH) concentrates have been used since 1974 for both preventing and terminating attacks. Two of these have now been licensed in the United States for use in HAE patients, one for prophylaxis and the other for treating acute abdominal and facial HAE attacks. The first kinin pathway modulator, ecallantide, has also been licensed recently in the United States for treating HAE attacks. The objective of this article is to describe HAE and review the available options for managing patients, as well as different drugs currently under investigation. Specific attention is given to the perioperative management of patients with HAE.

The Link Between Intravenous Multiple Pump Flow Errors and Infusion System Mechanical Compliance.
静脉内多泵输注误差与输注系统的机械顺应性之间的关系
Robert S. Murphy, PhD* and Steven J. Wilcox, PhD†

From the *Faculty of Engineering, Manukau Institute of Technology, Auckland, New Zealand; and †Faculty of Advanced Technology, Glamorgan University, Wales, United Kingdom.
Anesth Analg May 2010 110:1297-1302;

在重症监护病房内，静脉输注药物的普遍形式是不同的输注装置通过共同的或者各自独立的输液通道同时输注。鉴于给予的药物的效能和患者的敏感性，药物通常需要被快速输注。一些病例报道表明，当输注系统的平衡被打破时，药物输注的精确性可出乎意料地发生劣化。作者描述了一种单一输注系统的数学模型，并用它来验证由一种简单的实验性多泵输注系统会导致故障情况的发生。结果显示，输注精确性劣化是由输注系统的体外容积——即顺应性的细小变化所引起的。这一模型可进一步扩展用于确定其它多泵输注系统中液体的真实输注方式，在将来用于设计新的静脉输注系统，并解释了为何小容积输注系统需要更小的机械顺应性。
(周姝婧　译　陈杰　校)

IV drug delivery in intensive care often takes the form of simultaneous multiple infusions from separate infusion devices via either shared or individual fluid pathways. Because of the potency of the drugs administered and the acuity of the patients, accurate drug delivery is required. Instances of unexpected and unacceptable accuracy degradation have been reported when the equilibrium of the infusion system is disturbed. We describe a mathematical model of a simple infusion system used to investigate and verify results reported from a simple experimental multiple pump fault scenario. The results suggest that flow degradation is attributable to small changes in infusion system extracorporeal volume, referred to as “compliance.” The model may, by expansion, be used to determine the nature of fluid flow within other multiple pump systems, be applied to the design of future IV systems, and explain the need for small-volume infusion systems with small mechanical compliance.

Rapid Sequence Induction and Intubation: Current Controversy.
快速程序性诱导及插管：目前争议

Mohammad El-Orbany, MD and Lois A. Connolly, MD
From the Department of Anesthesiology, Medical College of Wisconsin, Milwaukee, Wisconsin.
Anesth Analg May 2010 110:1318-1325;

对于快速程序性诱导及插管（RSII）的一些传统内容见解不同,导致其实际操作具有广泛差异，目前尚未建立一个 RSII 标准。本文总结了诱导药物的选择，用量及给药方式的争议。一些人喜欢快速地注入预定剂量，有些人喜欢滴定至意识丧失。两种方法的神经肌肉阻断药（NMBD）给药的时间不同。前者 NMBD 通常应在诱导药物后立即给予，后者在滴定至意识丧失时给予。琥珀胆碱推荐的最佳剂量为 1.0 至 1.5mg/kg，对于这个剂量支持和反对者双方都有争议。在 RSII 中传统推荐的琥珀胆碱给药前去颤措施现在存在争议。尽管赞成这种技术可加速非去极化肌松药的起效时间，但由于它潜在的并发症以及罗库溴铵的推出,它的使用大大减少。按照传统，气管插管前应避免手控通气以防气体进入胃部，但是目前手控通气已被接受，甚至有些人建议应用手控通气以避免低氧血症且可以“测试”面罩通气。环状软骨按压的争论最

为激烈，有些人认为其能有效防止肺吸入的发生；然而另一些则认为由于有利性证据的不足及可能出现并发症，所以不应按压环状软骨。饱胃患者麻醉诱导插管的最佳、最安全的位置，是头高位，头低位，或平卧位仍存在争议。这些争议内容需要讨论，研究，解决后才能确定标准的 RSII。

（陈毓雯　译　陈杰　校）

The changing opinion regarding some of the traditional components of rapid sequence induction and intubation (RSII) creates wide practice variations that impede attempts to establish a standard RSII protocol. There is controversy regarding the choice of induction drug, the dose, and the method of administration. Whereas some prefer the traditional rapid injection of a predetermined dose, others use the titration to loss of consciousness technique. The timing of neuromuscular blocking drug (NMBD) administration is different in both techniques. Whereas the NMBD should immediately follow the induction drug in the traditional technique, it is only given after establishing loss of consciousness in the titration technique. The optimal dose of succinylcholine is controversial with advocates and opponents for both higher and lower doses than the currently recommended 1.0 to 1.5 mg/kg dose. Defasciculation before succinylcholine was traditionally recommended in RSII but is currently controversial. Although the priming technique was advocated to accelerate onset of nondepolarizing NMBDs, its use has decreased because of potential complications and the introduction of rocuronium. Avoidance of manual ventilation before tracheal intubation was traditionally recommended to avoid gastric insufflation, but its use is currently acceptable and even recommended by some to avoid hypoxemia and to “test” the ability to mask ventilate. Cricoid pressure remains the most heated controversy; some believe in its effectiveness in preventing pulmonary aspiration, whereas others believe it should be abandoned because of the lack of scientific evidence of benefit and possible complications. There is still controversy regarding the best position and whether the head-up, head-down, or supine position is the safest during induction of anesthesia in full-stomach patients. These controversial components need to be discussed, studied, and resolved before establishing a standard RSII protocol.

原发性肺癌术后肺部并发症的临床预测规则

A Clinical Prediction Rule for Pulmonary Complications After Thoracic Surgery for Primary Lung Cancer.

David Amar, MD*, Daisy Munoz, MD*, Weiji Shi, MS†, Hao Zhang, MD* and Howard T. Thaler, PhD†

From the Departments of *Anesthesiology and Critical Care Medicine, and †Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, New York.

Anesth Analg May 2010 110:1343-1348;

背景：胸外科术后肺的一氧化碳弥散能力（DLCOppo）与第一秒用力呼气量对胸外科术后并发症的预测价值存在争议。

方法：作者使用数据库分析了 956 例在同一机构行肺癌切除术的患者。肺部并发症定义为：肺不张，肺炎，肺栓塞，呼吸衰竭和出院后需要吸氧。

结果：956 例患者中有 121 例出现肺部并发症（12.7%）。术前化疗（相对危险度 1.64，95%可信区间为 1.06-2.55，P=0.02，得 2 分），肺的一氧化碳弥散能力低（弥

散力递减 5%相对危险度递增 1.13，95%可信区间为 1.06-1.19，P<0.0001，一氧化碳弥散能力每递减 5%即得 1 分）为出现术后并发症的独立危险因素。肺部并发症的危险因素分为 3 类：低于≤10 分，448 例中有 39 例（9%）;11-13 分，256 例中有 37 例（14%）；大于≥14 分，159 例中有 42 例（26 %）。发生肺部并发症患者的平均住院天数显著高于无并发症患者：分别为 12 天（3-113）比 6 天（2-39），P <0.0001。同样，发生肺部并发症患者 30 天内死亡率高于无并发症患者：121 例中 16 例（13.2 %），835 例中 6 例（0.7%），P<0.0001。

结论：以上数据表明，一氧化碳弥散能力和病人是否化疗可较好地预测肺癌术后肺部并发症的发生。第一秒用力呼气量不能预测肺部并发症的发生。

（陈毓雯　译　陈杰　校）

BACKGROUND: There is controversy surrounding the value of the predicted postoperative diffusing capacity of lung for carbon monoxide (DLCOppo) in comparison to the forced expired volume in 1 s for prediction of pulmonary complications (PCs) after thoracic surgery.

METHODS: Using a prospective database, we performed an analysis of 956 patients who had resection for lung cancer at a single institution. PC was defined as the occurrence of any of the following: atelectasis, pneumonia, pulmonary embolism, respiratory failure, and need for supplemental oxygen at hospital discharge.

RESULTS: PCs occurred in 121 of 956 patients (12.7%). Preoperative chemotherapy (odds ratio 1.64, 95% confidence interval 1.06–2.55, *P* = 0.02, point score 2) and a lower DLCOppo (odds ratio per each 5% decrement 1.13, 95% confidence interval 1.06–1.19, *P* < 0.0001, point score 1 per each 5% decrement of DLCOppo less than 100%) were independent risk factors for PCs. We defined 3 overall risk categories for PCs: low ≤10 points, 39 of 448 patients (9%); intermediate 11–13 points, 37 of 256 patients (14%); and high ≥14 points, 42 of 159 patients (26%). The median (range) length of hospital stay was significantly greater for patients who developed PCs than for those who did not: 12 (3–113) days vs 6 (2–39) days, *P* < 0.0001, respectively. Similarly, 30-day mortality was significantly more frequent for patients who developed PCs than for those who did not: 16 of 121 (13.2%) vs 6 of 835 (0.7%), *P* < 0.0001.

CONCLUSIONS: These data show that PCs after thoracic surgery for lung cancer can be predicted with moderate accuracy based on DLCOppo and whether patients had chemotherapy. Forced expired volume in 1 s was not a predictor of PCs.

阻塞性睡眠呼吸障碍的病态肥胖病人行腔镜下减肥手术拔管后即刻予以无创通气可改善肺功能

Noninvasive Ventilation Immediately After Extubation Improves Lung Function in Morbidly Obese Patients with Obstructive Sleep Apnea Undergoing Laparoscopic Bariatric Surgery.

Patrick J. Neligan, MA, FFARCSI, Guarav Malhotra, Michael Fraser, RRT, Noel Williams, FRCSI, Eric P. Greenblatt, MD, Maurizio Cereda, MD and E. Andrew Ochroch, MD, MSCE

From the [*]Department of Anesthesiology and Critical Care, Hospital of University of Pennsylvania, Philadelphia, Pennsylvania; [†]Department of Anaesthesia and Intensive Care, University College Hospital, Galway, Ireland; [‡]University of Pennsylvania School

of Medicine; and Departments of §Respiratory Care, and Surgery, Hospital of University of Pennsylvania, Philadelphia, Pennsylvania
Anesth Analg May 2010 110:1360-1365

背景：无创正压通气（NIPPV）可以改善腹部手术病人术后肺功能，同时减少术后并发症的发生。本研究的目的是确定术后 NIPPV 的时机是否会影响术后第一天的肺功能情况。
方法：在标准麻醉监护下，将 40 个已知有阻塞性睡眠呼吸障碍的肥胖病人随机分成两组，这些病人都进行了腹腔镜下的减肥手术，拔管后，分别给予 NIPPV（干预组）或者吸氧（标准组）治疗。在麻醉后监护室（PACU），病人拔管后 30 分钟内，用同一个无创呼吸机给予病人持续气道正压通气。由同一个非知情观察者分别在入 PACU 一小时后以及术后第一天对这些病人做肺功能检查。主要观察结果是用力肺活量从基线到 24 小时内的变化程度。
结果：每组 20 例共 40 例入选本试验。1 秒用力呼气容量，用力肺活量，最高呼气流速在这两组中均有所下降。24 小时内干预组的用力肺活量仅下降 0.7L，而标准组则为 1.3L（P=0.0005）。协方差分析证实了以上这点，通过测定术后 1 小时和 24 小时的肺功能，发现术后即刻予以 NIPPV，可以更好地保护肺功能。具体来说，两组间的主要结果是有统计学差异的。
结论：阻塞性睡眠呼吸障碍的肥胖病人行腔镜下减肥手术，拔管后即刻给予 NIPPV 较 PACU 中给予持续气道正压通气可以明显改善术后 1 小时和术后第一天的肺功能情况。
（张婷　译　陈杰　校）
BACKGROUND: Noninvasive positive pressure ventilation (NIPPV) may improve postoperative lung function and reduce postoperative complications in patients undergoing abdominal surgery. The purpose of our study was to determine whether the timing of postoperative NIPPV affects lung function 1 day postoperatively.
METHODS: Forty morbidly obese patients with known obstructive sleep apnea undergoing laparoscopic bariatric surgery with standardized anesthesia care were randomly assigned to receive NIPPV immediately after tracheal extubation (immediate group) or supplemental oxygen (standard group). All patients had continuous positive airway pressure initiated 30 minutes after extubation in the postanesthesia care unit (PACU) via identical noninvasive ventilators. Spirometry was performed by a blinded observer in the perioperative holding area 1 hour after admission to the PACU and 1 day postoperatively. The primary outcome was the change in forced vital capacity (FVC) from baseline to 24 hours (FVC baseline–FVC 24 hours).
RESULTS: Forty patients, 20 in each group, were enrolled in the study. Forced expiratory volume in 1 second, FVC, and peak expiratory flow rate were significantly reduced in both groups from perioperative values throughout the study. At 24 hours, the intervention group had lost only 0.7 L FVC, versus 1.3 L for the intervention group ($P = 0.0005$). An analysis of covariance confirmed this and indicated that the immediate postoperative NIPPV better preserved spirometric function at 1 and 24 hours postoperatively. Specifically, the differences in the primary outcome were statistically significant.
CONCLUSIONS: NIPPV given immediately after extubation significantly improves spirometric lung function at 1 hour and 1 day postoperatively, compared with continuous

positive airway pressure started in the PACU, in morbidly obese patients with obstructive sleep apnea undergoing laparoscopic bariatric surgery.

心内直视手术后，右旋美托咪定在婴儿中的群体药代动力学

Population Pharmacokinetics of Dexmedetomidine in Infants After Open Heart Surgery.

Felice Su, MD, Susan C. Nicolson, MD, Marc R. Gastonguay, PhD, Jeffrey S. Barrett, PhD, Peter C. Adamson, MD, David S. Kang, BS, Rodolfo I. Godinez, MD, PhD and Athena F. Zuppa, MD, MSCE

From the *Division of Critical Care Medicine, Department of Pediatrics, Stanford University, Palo Alto, California; †Division of Cardiothoracic Anesthesia, Department of Anesthesiology and Critical Care Medicine, The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania; ‡Metrum Institute, Tariffville, Connecticut; and §Division of Clinical Pharmacology and Therapeutics, Department of Pediatrics, and ‖Division of Critical Care Medicine, Department of Anesthesiology and Critical Care Medicine, The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania

Anesth Analg May 2010 110:1383-1392;

背景：右旋美托咪定是一种高选择性的α2受体激动剂，同时具有催眠、镇痛及抗焦虑作用。在成人中，右旋美托咪定在镇静的同时不影响呼吸功能，又可减轻拔管时反应。但是该药在小儿病人中的药代动力学数据还相对缺乏。本试验的主要目的是研究心内直视手术后右旋美托咪定在婴儿中的药代动力学改变。

方法：本试验评估了 36 例心内直视手术后的婴儿，其年龄在 1-24 个月。将所有心内直视手术后需机械通气的婴儿分成三组，每组 12 例，分别给予以下 3 种不同的初始负荷剂量-连续静脉输注剂量（CIVI）：0.35-0.25,0.7-0.5,or 1-0.75ug /kg/h。术后即刻给予初始负荷剂量大于 10 分钟，然后再给予持续剂量不超过 24 小时。血浆右旋美托咪定浓度由高效液相色谱串联质谱分析仪测定。本试验使用群体非线性混合效应模型来说明右旋美托咪定的药效动力学特点。

结果：本试验用 2 房模型来评估右美托咪定的药代动力学参数，分别研究体重对药物清除率，两房间清除率，中枢和外周的分布容积的影响，总的转流时间对清除率和中央分布容积的影响，以及年龄和心室生理对清除率影响。婴儿的清除率是 28.1ml/min/kg，两房间清除率是 93.4ml/min/kg，中央分布容积是 1.2 L /kg,外周分布容积是 1.5L/kg。

讨论：右旋美托咪定的清除率随体重、年龄和单心室生理的增加而增加，而总转流时间则与清除率下降有关，中央分布容积随着总转流时间的增加而增加。与体重相关的清除率给现在临床上按体重给右旋美托咪定剂量提供了依据，但是其他变量效应对临床的影响还需更进一步的研究证实。在婴儿这类群体中，初始负荷剂量范围为 0.35-1ug/kg 大于 10 分钟，维持静脉输注剂量为 0.25-0.75ug/kg/h 是比较适合的。

（张婷　译　陈杰　校）

BACKGROUND: Dexmedetomidine is a highly selective α_2-agonist with hypnotic, analgesic, and anxiolytic properties. In adults, it provides sedation while preserving respiratory function facilitating extubation. Only limited pharmacokinetic data are available

for pediatric patients. The primary aim of this study was to determine the pharmacokinetics of dexmedetomidine in infants after open heart surgery.
METHODS: We evaluated 36 infants, aged 1 to 24 months, after open heart surgery. Cohorts of 12 infants requiring mechanical ventilation after open heart surgery were enrolled sequentially to 1 of the 3 initial loading dose—continuous IV infusion (CIVI) regimens: 0.35–0.25, 0.7–0.5, or 1–0.75 μg/kg-μg/kg/h. The initial loading dose was administered over 10 minutes immediately postoperatively followed by a CIVI of up to 24 hours. Plasma dexmedetomidine concentrations were determined using a validated high-performance liquid chromatography tandem mass spectrometry assay. A population nonlinear mixed effects modeling approach was used to characterize dexmedetomidine pharmacokinetics.
RESULTS: Pharmacokinetic parameters of dexmedetomidine were estimated using a 2-compartment disposition model with weight on drug clearance, intercompartmental clearance, central and peripheral volume of distributions, total bypass time as a covariate on clearance and central volume of distribution, and age and ventricular physiology as covariates on clearance. Infants demonstrated a clearance of 28.1 mL/min/kg$^{0.75}$, intercompartmental clearance of 93.4 mL/min/kg$^{0.75}$, central volume of distribution of 1.2 L/kg, and peripheral volume of distribution of 1.5 L/kg.
CONCLUSIONS: Dexmedetomidine clearance increased with weight, age, and single-ventricle physiology, whereas total bypass time was associated with a trend toward decreasing clearance, and central volume of distribution increased as a function of total bypass time. The dependence of clearance on body weight supports current practice of weight-based dexmedetomidine dosing, whereas the clinical impact of the remaining covariate effects requires further investigation. Initial loading doses in the range of 0.35 to 1 μg/kg over 10 minutes and CIVI of 0.25 to 0.75 μg/kg/h were well tolerated in this infant population.

腺苷诱导脑血流停止应用于颅内动脉瘤夹闭术：量效数据以及安全性

Adenosine-Induced Flow Arrest to Facilitate Intracranial Aneurysm Clip Ligation: Dose-Response Data and Safety Profile.

John F. Bebawy, MD, Dhanesh K. Gupta, MD, Bernard R. Bendok, MD, Laura B. Hemmer, MD, Carine Zeeni, MD, Michael J. Avram, PhD, H. Hunt Batjer, MD and Antoun Koht, MD
From the Department of Anesthesiology (Division of NeuroAnesthesia) and Department of Neurological Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois.
Anesth Analg May 2010 110:1406-1411;

背景：腺苷产生的短暂脑血流停止已经被用来协助颅内动脉瘤的夹闭。然而，其起始剂量,即能产生并维持一段足够时间低血压的腺苷剂量为多少还不得而知。作者回顾了以往经验来确定其量效关系以及腺苷对于颅内动脉瘤患者的围手术期安全性。
方法：本文包括了 24 例行颅内动脉瘤夹闭术，麻醉采用瑞芬太尼，低剂量的挥发性麻醉药，丙泊酚以及腺苷。报告侧重于使用的剂量，收缩压<60mmHg 的持续时间和围手术期观察到的心血管、神经以及呼吸系统的并发症。

结果：应用腺苷平均剂量 0.34 mg/kg（理想体重，范围：0.29–0.44 mg/kg）可导致收缩压<60mmHg 维持 57s（范围：26–105 s），腺苷的对数变换剂量与收缩压收缩压<60mmHg 的时间之间存在线性关系（R^2 = 0.38）。2 例患者出现短暂的、血流动力学稳定的房颤，2 例患者术后肌钙蛋白水平>0.03 ng/mL，但没有证据表明心功能不全，3 例患者术后出现神经功能变化。

结论：当无法或很难临时阻断颅内动脉瘤时，腺苷可以短暂降低血压，并有较低的围术期死亡率。在这些数据的基础上，0.3-0.4 mg/kg 理想体重的剂量是一个推荐的起始剂量，在瑞芬太尼、低浓度吸入麻醉和异丙酚诱导的爆发性抑制麻醉状态下可以产生大约 45s 的系统性较深的低血压。

（黄丹　译　陈杰　校）

BACKGROUND: Adenosine-induced transient flow arrest has been used to facilitate clip ligation of intracranial aneurysms. However, the starting dose that is most likely to produce an adequate duration of profound hypotension remains unclear. We reviewed our experience to determine the dose-response relationship and apparent perioperative safety profile of adenosine in intracranial aneurysm patients.

METHODS: This case series describes 24 aneurysm clip ligation procedures performed under an anesthetic consisting of remifentanil, low-dose volatile anesthetic, and propofol in which adenosine was used. The report focuses on the doses administered; duration of systolic blood pressure <60 mm Hg ($SBP_{<60\ mm\ Hg}$); and any cardiovascular, neurologic, or pulmonary complications observed in the perioperative period.

RESULTS: A median dose of 0.34 mg/kg ideal body weight (range: 0.29–0.44 mg/kg) resulted in a $SBP_{<60\ mm\ Hg}$ for a median of 57 seconds (range: 26–105 seconds). There was a linear relationship between the log-transformed dose of adenosine and the duration of a $SBP_{<60\ mm\ Hg}$ (R^2 = 0.38). Two patients developed transient, hemodynamically stable atrial fibrillation, 2 had postoperative troponin levels >0.03 ng/mL without any evidence of cardiac dysfunction, and 3 had postoperative neurologic changes.

CONCLUSIONS: For intracranial aneurysms in which temporary occlusion is impractical or difficult, adenosine is capable of providing brief periods of profound systemic hypotension with low perioperative morbidity. On the basis of these data, a dose of 0.3 to 0.4 mg/kg ideal body weight may be the recommended starting dose to achieve approximately 45 seconds of profound systemic hypotension during a remifentanil/low-dose volatile anesthetic with propofol induced burst suppression.

异氟醚和地氟醚、七氟醚麻醉拔管时间的平均值以及变异度对比：**meta** 分析

Meta-Analysis of Average and Variability of Time to Extubation Comparing Isoflurane with Desflurane or Isoflurane with Sevoflurane.

Andrew Agoliati, BA, Franklin Dexter, MD, PhD, Jason Lok, MD, Danielle Masursky, PhD, Muhammad F. Sarwar, MD, Sarah B. Stuart, MD, Emine O. Bayman, PhD and Richard H. Epstein, MD

From the [*]Department of Anesthesiology, SUNY Upstate Medical University, Syracuse, New York; Departments of [†]Anesthesia, [‡]Health Management and Policy, and [§]Biostatistics, University of Iowa, Iowa City, Iowa; and [¶]Department of Anesthesiology, Thomas Jefferson University, Philadelphia, PA.

Anesth Analg May 2010 110:1433-1439;

背景:最近，作者在探索如何通过麻醉信息管理系统数据来模拟从手术结束到拔管的时间。运用此系统来比较地氟醚和七氟醚麻醉维持后的拔管时间差异的 meta 分析。在这项研究中，作者应用 meta 分析分别对异氟醚与地氟醚、异氟醚与七氟醚进行比较。

方法：从 Medline 搜索 2009 年 12 月的研究,其特征为 1) 随机分为地氟醚和异氟醚组，组间没有其他差异（例如诱导用的药物），2) 报道拔管时间和/或能听从命令时间的均值和标准差。再进行异氟醚和七氟醚的类似比较研究搜索。拔管时间>15 分钟就被认为是拔管时间延长（在麻醉信息管理系统数据中占 15%的病例）。

结果：地氟醚相对异氟醚，拔管的平均时间减少 34%，拔管平均时间的变异度减少 36%。拔管时间延长的发生率分别减少 95%和 97%。七氟醚相对异氟醚，拔管平均时间减少 13%，拔管平均时间的标准差减少 8.7%。拔管时间延长的发生率分别减少 51%和 35%。

结论：虽然测量的时间差异较小,但吸入麻醉药的经济学方面差异是巨大的。因此，手术机构在制定药物采购和使用方法的管理决策时,应将这些数值和数据(如,平均拔管时间)进行比较。

（黄丹　译　陈杰　校）

BACKGROUND: We recently determined how to use anesthesia information management system data to model the time from end of surgery to extubation. We applied that knowledge for meta-analyses of trials comparing extubation times after maintenance with desflurane and sevoflurane. In this study, we repeated the meta-analyses to compare isoflurane with desflurane and sevoflurane.

METHODS: A Medline search through December 2009 was used to identify studies with (1) humans randomly assigned to isoflurane or desflurane groups without other differences (e.g., induction drugs) between groups, and (2) mean and SD reported for extubation time and/or time to follow commands. The search was repeated for random assignment to isoflurane or sevoflurane groups. We considered extubation times >15 minutes (representing 15% of cases in the anesthesia information management system data) to be prolonged.

RESULTS: Desflurane reduced the mean extubation time by 34% and reduced the variability in extubation time by 36% relative to isoflurane. These reductions would reduce the incidence of prolonged extubation times by 95% and 97%, respectively. Sevoflurane reduced the mean extubation time by 13% and reduced the SD by 8.7% relative to isoflurane. These reductions would reduce the incidence of prolonged extubation times by 51% and 35%, respectively.

CONCLUSIONS: The pharmacoeconomics of volatile anesthetics are highly sensitive to measurement of relatively small time differences. Therefore, surgical facilities should use these values combined with their local data (e.g., mean baseline extubation times) when making evidence-based management decisions regarding pharmaceutical purchases and usage guidelines.

利多卡因滴眼液有助减少带状疱疹后眼部神经痛

Lidocaine Eye Drops Attenuate Pain Associated with Ophthalmic Postherpetic Neuralgia.

Akifumi Kanai, MD, PhD, Takashi Okamoto, MD, Kaoruko Suzuki, MD, Yuriko Niki, MD and Hirotsugu Okamoto, MD, PhD .
From the Department of Anesthesiology, Kitasato University School of Medicine, Kitasato, Sagamihara, Japan.
Anesth Analg May 2010 110:1457-1460

背景：对于带状疱疹后神经痛（PHN）事先局部应用利多卡因（LDC）凝胶或贴片治疗是有效的.然而无论是利多卡因凝胶或是贴片对于带状疱疹后眼部神经痛的患者都不适用。本文研究了 4%利多卡因（LDC）滴眼液对带状疱疹后眼部神经痛的有效性。
方法：24 例带状疱疹后眼部神经痛的患者随机分为两组：实验组（LDC 组）患者患侧眼部给予 0.4mL 的 4%利多卡因滴眼液，对照组（PBO 组）给予生理盐水。在 7 天后，两组患者交换使用对方的滴眼液继续治疗。在利多卡因滴眼液治疗前及之后 15 分钟使用视觉模拟评分（VAS）评估眼部及前额的疼痛。患者通过一项描述性量表来评定疼痛等级并被要求记录是否在治疗后再次产生疼痛及治疗后多久再次产生疼痛。
结果：应用利多卡因滴眼液（LDC）显著减少患者眼部持续性疼痛的 VAS 评分（基线：5.9 ± 2.2 cm; 眼部滴入利多卡因后 15 分钟: 0.9 ± 1.8 cm, 均数 ± 标准差[P < 0.01])，并显著减少前额部的持续性疼痛评分(基线: 6.3 ± 2.0 cm; 眼部滴入利多卡因后 15 分钟: 2.6 ± 2.7 cm [P < 0.01])。δ 变化显示 LDC 组及 PBO 组的 VAS 评分差异显著 (P < 0.01)。另外，23 例 LDC 组患者及 4 例对照组患者在接受治疗后表示疼痛缓和或有所改善。利多卡因滴眼液（LDC）的治疗有效时程平均为 36 小时（8-96 小时）。
结论：此次研究表明利多卡因（LDC）滴眼液对治疗带状疱疹后眼部神经痛有显著改善效果，且其镇痛迅速、全身副作用少、应用方便。
（赵嫣红　译　陈杰　校）
BACKGROUND: Topical lidocaine (LDC) treatment using a gel or patch preparation is effective in the treatment of postherpetic neuralgia (PHN), but neither is suited for the eye in patients with ophthalmic PHN. Herein, we examined the effect of LDC 4% eye drops on ophthalmic PHN pain.
METHODS: Twenty-four patients with ophthalmic PHN were randomized to receive 0.4 mL eye drops of either LDC 4% or saline placebo (PBO) in the painful eye. After a 7-day period, the patients were crossed over to receive the alternative eye drops. The pain in the eye and the forehead was assessed with a visual analog scale (VAS) before and 15 minutes after treatment. Patients used a descriptive scale to grade pain outcome and were asked to note whether the pain returned and how long after therapy it recurred.
RESULTS: LDC significantly decreased the VAS score of persistent pain in the eye (baseline: 5.9 ± 2.2 cm; 15 minutes after eye drops: 0.9 ± 1.8 cm, mean ± SD [$P < 0.01$]) and in the forehead (baseline: 6.3 ± 2.0 cm; 15 minutes after eye drops: 2.6 ± 2.7 cm [$P < 0.01$]). The δ change in these VAS scores between LDC and PBO was significant ($P < 0.01$). Moreover, pain was described as moderate or better by 23 patients after they received LDC and 4 patients of the PBO group. The effect of LDC persisted for a median of 36 hours (range, 8–96 hours) after application.

CONCLUSIONS: This study suggests that LDC provides a significant improvement of ophthalmic PHN because of its prompt analgesia, lack of systemic side effects, and convenience of use.

麻醉下机械通气的幼猪应用两种不同脂肪乳剂逆转布比卡因引起的心脏电生理变化

Reversal of Bupivacaine-Induced Cardiac Electrophysiologic Changes by Two Lipid Emulsions in Anesthetized and Mechanically Ventilated Piglets.

Damien Candela, MD, MSc, Guillaume Louart, MD, Philippe-Jean Bousquet, MD, PhD, Laurent Muller, MD, MSc, Micheline Nguyen, MD, Jean-Christophe Boyer, MD, MSc, Pascale A. Fabbro Peray, MD, PhD, Lucie Goret, PhD, Jacques Ripart, MD, PhD, Jean-Yves Lefrant, MD, PhD, and Jean E. de La Coussaye, MD, PhD
* From the Department of Anesthesiology, Critical Care, Emergency and Pain, University-Hospital of Nîmes; † Cardiovascular Laboratory of Vascular Interfaces Medical School of Montpellier-Nîmes, Montpellier 1 University; ‡ Department of Epidemiology and Biostatistics, University-Hospital of Nîmes, France; § Department of Anesthesiology, University of Montréal, Québec, Canada; and ‖ Service de biochimie, Fédération des Laboratoires, University-Hospital of Nîmes, France.
Anesth Analg May 2010 110:1473-1479;

背景：静脉误注布比卡因将作用于心血管功能导致致命的心律失常，而应用脂肪乳剂可缓解这种血流动力学改变。然而，对于脂肪乳剂的电生理作用仍然不甚明确。在此次研究中，作者对麻醉下机械通气的幼猪应用两种不同脂肪乳剂，并评估其是否对布比卡因引起的心脏电生理损害有逆转作用。

方法：入组 26 只幼猪在 30 秒内静脉注射布比卡因(4 mg · kg−1)。注射完毕 30 秒后对照组 1 分钟内静脉注射生理盐水 1.5 mL · kg−1；实验组 1 分钟内静脉注射长链甘油三酯乳剂（LCT 组）或长链/中链甘油三酯混合乳剂(LCT/MCT 组)。在注射后 30 分钟内监测幼猪心脏传导改变及心脏血流动力学改变。

结果：各组应用布比卡因静脉注射对心脏电生理改变及血流动力学改变相似。在注射后 3 分钟，对照组、LCT 组、LCT/MCT 组的心室-His 束间期（中位数和四分位数表示）分别为 100 (85–105)、45 (35–55)、 53 (48–73) 毫秒，三组均 $P < 0.001$。脂肪乳剂对 QRS 间期、心房-His 束间期及 PQ 间期（即 P 波起始至 QRS 波群中的 Q 波终止）的改变有所逆转。LCT/MCT 乳剂对左心室最大射血分数的下降有恢复作用（注射后 3 分钟，与对照组相比 $P < 0.01$）。

结论：静脉注射 4 mg · kg−1 布比卡因后应用 LCT 及 LCT/MCT 脂肪乳剂，能有效逆转心室-His 束间期、QRS 间期、心房-His 束间期及 PQ 间期的延长。

（赵嫣红　译　陈杰　校）

BACKGROUND: Accidental IV administration of bupivacaine can compromise cardiovascular function by inducing lethal arrhythmias whose hemodynamic consequences may be alleviated by lipid emulsions. However, little is known about the electrophysiologic effects of lipid emulsions. In this study, we assessed whether 2 different lipid emulsions can reverse cardiac electrophysiologic impairment induced by the IV administration of bupivacaine in anesthetized and mechanically ventilated piglets.

METHODS: Bupivacaine (4 mg · kg^{-1}) was injected over a 30-second period in 26 piglets. Thirty seconds after the end of bupivacaine injection, 1.5 mL · kg^{-1} saline solution for the control group, and long-chain triglyceride emulsion (LCT group) or a mixture of long-chain

and medium-chain triglyceride emulsion (LCT/MCT group) were infused over 1 minute. Cardiac conduction variables and hemodynamic variables were monitored for 30 minutes after injection.
RESULTS: Bupivacaine induced similar electrophysiologic and hemodynamic changes. After 3 minutes, His ventricle intervals (median and interquartiles) were 100 (85–105), 45 (35–55), and 53 (48–73) milliseconds in the control, LCT, and LCT/MCT groups, respectively ($P < 0.001$ between control and both lipid emulsion groups). Lipid emulsions also reversed the effects on QRS duration, atrial-His, and PQ (the onset of the P wave to the Q wave of the QRS complex) intervals. LCT/MCT emulsion restored the decrease in maximal first derivative of left ventricular pressure ($P < 0.01$ after 3 minutes versus control group).
CONCLUSIONS: LCT and LCT/MCT emulsions reversed the lengthening of His ventricle, QRS, atrial-His, and PQ intervals induced by the IV injection of 4 mg · kg^{-1} bupivacaine.

肛肠手术中性别对于罗哌卡因骶管麻醉最小局麻浓度的影响

The Effect of Sex on the Minimum Local Analgesic Concentration of Ropivacaine for Caudal Anesthesia in Anorectal Surgery.

Yuhong Li, MD, PhD*, Yujie Zhou, MS†, Hanjian Chen, MS* and Zhiying Feng, MD, PhD*
From the *Department of Anesthesiology, The First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou; and †Department of Anesthesiology, Zhoushan Hospital, Zhejiang, People's Republic of China.
Anesth Analg May 2010 110:1490-1493

背景：骶管麻醉常规应用于大部分日间肛肠手术（患者需要尽可能快的恢复）。局麻药的剂量在男性和女性患者之间可能不同。作者设计这项研究以探讨性别对于罗哌卡因骶管麻醉最小局麻浓度（MLAC）的影响。
方法：在这个双盲、前瞻性的研究中，共收集 70 例 ASA I 的病人（男女各 35 例），进行骶管麻醉下肛肠手术，并根据他们的性别分为两组。每位患者通过一个骶管单次给予罗哌卡因 20ml。使用 Dixon 序贯试验法，第一位患者给予 0.2%的罗哌卡因，后面患者的浓度根据前一位患者对于首次切皮刺激的止痛效果和肛门括约肌松弛程度来决定。浓度的变化单位为 0.025%。用 Dixon and Massey 分析药物浓度的上下的顺序，以量化患者的骶管麻醉阻滞效果的半数有效浓度。
结果：罗哌卡因镇痛的 MLAC，男性患者为 0.296%（95%可信区间，0.286% - 0.307%），女性患者位 0.389%（95%可信区间，0.372%-0.407%）（P <0.01）。
结论：罗哌卡因骶管麻醉中的 MLAC 女性患者比男性患者大 31%。
（怀晓蓉　译　陈杰　校）
BACKGROUND: Caudal anesthesia is routinely used in our hospital for most of ambulatory anorectal surgery; patients need to recover as quickly as possible. The dose of local anesthetic may be different for male and female patients. We designed this study to investigate the effect of sex on the minimum local anesthetic concentration (MLAC) of ropivacaine for caudal anesthesia.
METHODS: In this double-blind, prospective study, we enrolled 70 ASA physical status I patients (35 male and 35 female) who were scheduled for anorectal surgery under caudal anesthesia, and allocated them to 2 study groups according to their gender. Each participant

received a single injection of 20 mL ropivacaine through a caudal catheter. Using Dixon's up-and-down sequential allocation, the first participant received 0.2% and subsequent concentrations were determined by the analgesic response of the previous patients to the initial skin incision and laxity of the anal sphincter. The concentration change was 0.025%. The up-and-down sequences were analyzed using the Dixon and Massey method to quantify the caudal analgesic block effective concentrations in 50% of patients.
RESULTS: The MLAC of ropivacaine for caudal analgesia was 0.296% (95% confidence interval, 0.286%–0.307%) in male patients and 0.389% (95% confidence interval, 0.372%–0.407%) in female patients ($P < 0.01$).
CONCLUSIONS: We conclude that the ropivacaine MLAC for caudal anesthesia in female patients is 31% larger than in male patients.

围术期液体管理中高渗盐水的应用

Hypertonic Saline for Perioperative Fluid Management.
McAlister V, Burns KEA, Znajda T, Church B. Hypertonic saline for peri-operative fluid management. Cochrane Database of Systematic Reviews 2010, Issue 1. Art. No.: CD005576.
.Anesth Analg May 2010 110:1506;

背景：液体过量可能把接受手术的患者置于严重并发症的风险之中。高渗盐水（HS）比等渗盐水（IS）更好地在低静脉液体量的基础上维持血管容量，但可能会增加血清钠。
目标：比较手术患者应用 HS 和 IS 的优缺点
搜索：搜索 The Cochrane Central Register of Controlled Trials (CENTRAL), (The Cochrane Library) Issue 1, 2009; MEDLINE (1966 to 2009); EMBASE (1980 to 2009); LILACS (to August 2009) and CINAHL (1982 to 2009)有关文献，没有语言限制。
选择标准：纳入随机临床试验，手术患者， 作 HS 和 IS 比较研究。不考虑盲法，语言和出版情况。
数据收集和分析：评估给予 HS 对于死亡率、器官衰竭、液体平衡，血清钠，血清渗透压，利尿，心血管功能的生理测量的影响。分别应用比值比或平均差异（MD）汇总二进制和连续结果, 并采用随机效应模型。
主要结果：本研究共纳入了 15 个研究，614 例患者。每组有 1 人死亡，无其他严重不良事件的报告。当所有的病人术后处于正液体平衡时，HS 组患者中过量的患者明显较少（标准平均差小于（SMD）- 1.43L，95％可信区间（CI）少 0.8 至 2.1L; P <0.00001）。HS 组患者比 IS 组患者接受的液体明显较少（MD - 2.4 升，95％（CI），少 1.5 至 3.2L，P <0.00001），两组间尿量无差异。术中心脏最大指数 HS 组明显增加（SMD 高 0.6 L/min/M2，95％CI，0.1 至 1.0，P=0.02），但术中肺动脉楔压保持不变。而最高血清钠和研究结束时血清钠在 HS 组患者明显较高，但仍维持在正常范围（136-146 meq/L）。
结论：HS 减少了维持进行手术患者所需的静脉液体量，但短暂增加血清钠。这是否影响患者的存活率和发病率尚未清楚，因此应该设计临床随机试验以便有效地检测这些结果。
（怀晓蓉　译　陈杰　校）

BACKGROUND: Fluid excess may place patients undergoing surgery at risk for various complications. Hypertonic saline (HS) maintains intravascular volume with less intravenous fluid than isotonic salt (IS) solutions, but may increase serum sodium.
OBJECTIVES: To determine the benefits and harms of HS versus IS solutions administered to patients undergoing surgery.
SEARCH STRATEGY: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), (*The Cochrane Library*) Issue 1, 2009; MEDLINE (1966 to 2009); EMBASE (1980 to 2009); LILACS (to August 2009) and CINAHL (1982 to 2009) without language restrictions.
SELECTION CRITERIA: We included randomized clinical trials where HS was compared to IS in patients undergoing surgery, irrespective of blinding, language, and publication status.
DATA COLLECTION AND ANALYSIS: We assessed the impact of HS administration on mortality, organ failure, fluid balance, serum sodium, serum osmolarity, diuresis and physiologic measures of cardiovascular function. We pooled data using odds ratio or mean difference (MD) for binary and continuous outcomes, respectively, using random-effects models.
MAIN RESULTS: We included 15 studies with 614 participants. One death in each group and no other serious adverse events were reported. While all patients were in a positive fluid balance postoperatively, the excess was significantly less in HS patients (standardized mean difference (SMD) −1.43L, 95% confidence interval (CI) 0.8 to 2.1 L less; $P < 0.00001$). Patients treated with HS received significantly less fluid than IS-treated patients (MD −2.4L 95% (CI) 1.5 to 3.2 L less; $P < 0.00001$) without differences in diuresis between the groups. Maximum intraoperative cardiac index was significantly increased with HS (SMD 0.6 L/min/M2 higher, 95% CI 0.1 to 1.0, $P = 0.02$) but Intraoperative pulmonary artery wedge pressure remained unchanged. While the maximum serum sodium and the serum sodium at the end of the study were significantly higher in HS patients, the level remained within normal limits (136 to 146 meq/L).
AUTHORS' CONCLUSIONS: HS reduces the volume of intravenous fluid required to maintain patients undergoing surgery but transiently increases serum sodium. It is not known if HS effects patient survival and morbidity but it should be tested in randomized clinical trials that are designed and powered to test these outcomes.