# Table of Contents

# September, 2014

## Cardiovascular Anesthesiology

- Van Duren, Albert;
- Botham, Mark;
- Santoscoy, Thomas;
- Sessler, Daniel I.

*Anesthesia & Analgesia. 119(3):543-549, September 2014.*

Brief Report
局部脑血流量在冠状动脉旁路手术后记忆处理过程中减少
(池晓颖 译 陈杰 校)

**Attenuation of Regional Cerebral Blood Flow During Memory Processing After Coronary Artery Bypass Surgery**

- Badgaiyan, Rajendra D.;
- Weise, Steven;
- Wack, David S.;
- Vidal Melo, Marcos F.

*Anesthesia & Analgesia. 119(3):550-553, September 2014.*

# Anesthetic Pharmacology

Research Report
麻醉剂特有的突触抑制作用
(杜芳译 薛张纲校)

**Anesthetic Agent-Specific Effects on Synaptic Inhibition**

- MacIver, M. Bruce

*Anesthesia & Analgesia. 119(3):558-569, September 2014.*

羟乙基淀粉分子的大小和起源不会影响其对体外的近端小管细胞的有害副作用
(李蔚文 译，李士通 审校)

**Molecular Size and Origin Do Not Influence the Harmful Side Effects of Hydroxyethyl Starch on Human Proximal Tubule Cells (HK-2) In Vitro**

- Bruno, Raphael R.;
- Neuhaus, Winfried;
- Roewer, Norbert;
- Wunder, Christian;
- Schick, Martin A.

*Anesthesia & Analgesia. 119(3):570-577, September 2014.*

# Technology, Computing, and Simulation

Research Report

## 腹部大手术患者应用无创心输出量监测确定目标定向控制围术期血流动力学稳定：一项前瞻性、随机、多中心的实用性实验：**POEMAS**（腹部大手术围术期目标导向治疗）研究

(隋永恒 译 陈杰 校)

**Perioperative Goal-Directed Hemodynamic Optimization Using Noninvasive Cardiac Output Monitoring in Major Abdominal Surgery: A Prospective, Randomized, Multicenter, Pragmatic Trial: POEMAS Study (PeriOperative goal-directed thErapy in Major Abdominal Surgery)**

- Pestaña, David;
- Espinosa, Elena;
- Eden, Arieh;
- Nájera, Diana;
- Collar, Luis;
- Aldecoa, César;
- Higuera, Eva;
- Escribano, Soledad;
- Bystritski, Dmitri;
- Pascual, Javier;
- Fernández-Garijo, Pilar;
- de Prada, Blanca;
- Muriel, Alfonso;
- Pizov, Reuven

*Anesthesia & Analgesia. 119(3):579-587, September 2014.*

## 一种新型术中血红蛋白损失量监测系统的临床评价

(江凌慧译 薛张纲校)

**Clinical Evaluation of a Novel System for Monitoring Surgical Hemoglobin Loss**

- Holmes, Allen A.;
- Konig, Gerhardt;
- Ting, Vicki;
- Philip, Bridget;
- Puzio, Thomas;
- Satish, Siddarth;
- Waters, Jonathan H.

*Anesthesia & Analgesia. 119(3):588-594, September 2014.*

## 对用于检测术中血红蛋白流失的新系统的体外评估

(田园 译，李士通 审校)

**In Vitro Evaluation of a Novel System for Monitoring Surgical Hemoglobin Loss**

- Konig, Gerhardt;
- Holmes, Allen A.;
- Garcia, Rosario;
- Mendoza, Julianne M.;
- Javidroozi, Mazyar;
- Satish, Siddarth;
- Waters, Jonathan H.

*Anesthesia & Analgesia. 119(3):595-600, September 2014.*

# Patient Safety

Research Report

血清维生素 D 浓度与非心脏手术后的严重并发症关系

(秦懿 译 陈杰 校)

**The Association of Serum Vitamin D Concentration with Serious Complications After Noncardiac Surgery**

- Turan, Alparslan;
- Hesler, Brian D.;
- You, Jing; Saager, Leif;
- Grady, Martin;
- Komatsu, Ryu;
- Kurz, Andrea;
- Sessler, Daniel I.

*Anesthesia & Analgesia. 119(3):603-612, September 2014.*

Special Article

住院患者中的维生素 D 缺乏症：是身体虚弱或者患有疾病需要治疗的一个标志吗？

(盖晓冬译 薛张纲校)

**Hypovitaminosis D in Hospitalized Patients: A Marker of Frailty or a Disease Requiring Treatment?**

- Zaloga, Gary P.;
- Butterworth, John F. IV

*Anesthesia & Analgesia. 119(3):613-618, September 2014.*

Brief Report

肥胖患者对麻醉中呼气末正压通气引起的颈内静脉扩张耐受性差

(田园 译，李士通 审校)

**Positive End-Expiratory Pressure to Increase Internal Jugular Vein Size Is Poorly Tolerated in Obese Anesthetized Adults**

- Downey, Laura A.;
- Blaine, Kevin P.;
- Sliwa, Jan;
- Macario, Alex;
- Brock-Utne, John

*Anesthesia & Analgesia. 119(3):619-621, September 2014.*

# Critical Care, Trauma, and Resuscitation

Research Report
大手术后的 C 反应蛋白动力学
(王筱婧译 陈杰校)

**C-Reactive Protein Kinetics After Major Surgery**

- Santonocito, Cristina;
- De Loecker, Isabelle;
- Donadello, Katia;
- Moussa, Mouhamed D.;
- Markowicz, Samuel;
- Gullo, Antonino;
- Vincent, Jean-Louis

*Anesthesia & Analgesia. 119(3):624-629, September 2014.*

# Obstetric Anesthesiology

Research Report
一项评估产前心理学测验对产后疼痛、硬膜外镇痛药的消耗量以及母体满意度的预测能力的前瞻性观察性研究
(郝光伟译 薛张纲校)

**A Prospective Observational Study Evaluating the Ability of Prelabor Psychological Tests to Predict Labor Pain, Epidural Analgesic Consumption, and Maternal Satisfaction**

- Carvalho, Brendan;
- Zheng, Ming;
- Aiono-Le Tagaloa, Leinani

*Anesthesia & Analgesia. 119(3):632-640, September 2014.*

# Pediatric Anesthesiology

Research Report
耶鲁术前焦虑量表修改版的简化改进

(李婷婷 译，李士通 审校)

**Development of a Short Version of the Modified Yale Preoperative Anxiety Scale**

- Jenkins, Brooke N.;
- Fortier, Michelle A.;
- Kaplan, Sherrie H.;
- Mayes, Linda C.;
- Kain, Zeev N.

*Anesthesia & Analgesia. 119(3):643-650, September 2014.*

# Pediatric Neuroscience

Research Report

婴儿期接受脊麻和手术的认知结果

(李慧 译 陈杰 校)

**Cognitive Outcome After Spinal Anesthesia and Surgery During Infancy**

- Williams, Robert K.;
- Black, Ian H.;
- Howard, Diantha B.;
- Adams, David C.;
- Mathews, Donald M.;
- Friend, Alexander F.;
- Meyers, H. W. Bud

*Anesthesia & Analgesia. 119(3):651-660, September 2014.*

Review Article

关于儿童期麻醉对神经系统发育影响的评估——文献回顾及推荐意见

(王飞译 薛张纲校)

**Neurodevelopmental Assessment After Anesthesia in Childhood: Review of the Literature and Recommendations**

- Beers, Sue R.;
- Rofey, Dana L.;
- McIntyre, Katie A.

*Anesthesia & Analgesia. 119(3):661-669, September 2014.*

# Economics, Education, and Policy

Research Report

Influence of Provider Type (Nurse Anesthetist or Resident Physician), Staff Assignments, and Other Covariates on Daily Evaluations of Anesthesiologists'

Quality of Supervision

Dexter, Franklin; Ledolter, Johannes; Smith, Thomas C.; Griffiths, David; Hindman, Bradley J.

Anesthesia & Analgesia. 119(3):670-678, September 2014.

Statistical Grand Rounds

Bernoulli Cumulative Sum (CUSUM) Control Charts for Monitoring of Anesthesiologists' Performance in Supervising Anesthesia Residents and Nurse Anesthetists

Dexter, Franklin; Ledolter, Johannes; Hindman, Bradley J.

Anesthesia & Analgesia. 119(3):679-685, September 2014.

# Pain Medicine

Research Report

超声引导下脉冲射频刺激肩胛上神经治疗粘连性关节囊炎：一项前瞻性、随机、对照试验

(许红娇 译，李士通 审校)

**Ultrasound-Guided Pulsed Radiofrequency Stimulation of the Suprascapular Nerve for Adhesive Capsulitis: A Prospective, Randomized, Controlled Trial**

- Wu, Yung-Tsan;
- Ho, Cheng-Wen;
- Chen, Yi-Ling;
- Li, Tsung-Ying;
- Lee, Kuei-Chen;
- Chen, Liang-Cheng

*Anesthesia & Analgesia. 119(3):686-692, September 2014.*

# Pain and Analgesic Mechanisms

Research Report

由单纯疱疹病毒载体介导的白细胞介素 **10** 在大鼠模型中能阻止由人免疫缺陷病毒 **gp120** 导致的神经性疼痛

(张帆 译 陈杰 校)

**Interleukin 10 Mediated by Herpes Simplex Virus Vectors Suppresses Neuropathic Pain Induced by Human Immunodeficiency Virus gp120 in Rats**

- Zheng, Wenwen;
- Huang, Wan;
- Liu, Shue;
- Levitt, Roy C.;

- Candiotti, Keith A.;
- Lubarsky, David A.;
- Hao, Shuanglin

*Anesthesia & Analgesia. 119(3):693-701, September 2014.*

剧烈的阻抗练习通过激活大鼠内源性大麻素系统产生镇痛作用

(潘艳译 薛张纲校)

**Acute Resistance Exercise Induces Antinociception by Activation of the Endocannabinoid System in Rats**

- Galdino, Giovane;
- Romero, Thiago;
- Pinho da Silva, José Felippe;
- Aguiar, Daniele;
- de Paula, Ana Maria;
- Cruz, Jader;
- Parrella, Cosimo;
- Piscitelli, Fabiana;
- Duarte, Igor;
- Di Marzo, Vincenzo;
- Perez, Andrea

*Anesthesia & Analgesia. 119(3):702-715, September 2014.*

# Regional Anesthesia

Research Report

椎管内麻醉用于预防术后死亡率和主要发病率的发生：一项采用 **Cochrane** 系统评价的概述

(许红娇 译，李士通 审校)

**Neuraxial Anesthesia for the Prevention of Postoperative Mortality and Major Morbidity: An Overview of Cochrane Systematic Reviews**

- Guay, Joanne;
- Choi, Peter T.;
- Suresh, Santhanam;
- Albert, Natalie;
- Kopp, Sandra;
- Pace, Nathan Leon

*Anesthesia & Analgesia. 119(3):716-725, September 2014.*

超声引导下腭大神经阻滞:一系列病例的解剖描述和临床评价

**Ultrasound-Guided Greater Palatine Nerve Block: A Case Series of Anatomical**

**Descriptions and Clinical Evaluations**

- Sahar Hafeez, Najmus;
- Sondekoppam, Rakesh V.;
- Ganapathy, Sugantha;
- Armstrong, Jerrold E.;
- Shimizu, Michael;
- Johnson, Marjorie;
- Merrifield, Peter;
- Galil, Khadry A.

*Anesthesia & Analgesia. 119(3):726-730, September 2014.*

# The Open Mind

The Open Mind
Intravenous Starches: Is Suspension the Best Solution?
Raghunathan, Karthik; Miller, Timothy E.; Shaw, Andrew D.
Anesthesia & Analgesia. 119(3):731-736, September 2014

Volume Therapy with Hydroxyethyl Starches: Are We Throwing the Anesthesia Baby Out with the Intensive Care Unit Bathwater?
Irwin, Michael G; Gan, Tong J.
Anesthesia & Analgesia. 119(3):737-739, September 2014.

Does Regional Analgesia for Major Surgery Improve Outcome? Focus on Epidural Analgesia
Kooij, Fabian O.; Schlack, Wolfgang S.; Preckel, Benedikt; Hollmann, Markus W.
Anesthesia & Analgesia. 119(3):740-744, September 2014.

# Media Reviews

Media Review
Beyond the Checklist: What Else Health Care Can Learn from Aviation Teamwork and Safety
Gupta, Deepak
Anesthesia & Analgesia. 119(3):745, September 2014.

Ultrasound-Guided Nerve Blocks on DVD Version 2: Upper & Lower Limbs Package for PC

Ferrell, Shelly

Anesthesia & Analgesia. 119(3):745-747, September 2014.

# 术前心力衰竭恶化而非心肌梗死与非心脏手术后死亡率和非心脏并发症有关：一项回顾性队列研究

# Worsening Preoperative Heart Failure Is Associated with Mortality and Noncardiac Complications, But Not Myocardial Infarction After Noncardiac Surgery: A Retrospective Cohort Study

Maile, Michael D. MD, MS; Engoren, Milo C. MD; Tremper, Kevin K. MD, PhD; Jewell, Elizabeth MS; Kheterpal, Sachin MD, MBA

Anesthesia & Analgesia 2014 119 522–532

**背景：**心力衰竭（HF）是围手术期并发症发病率和死亡率的一个重要危险因素。虽然这些患者的心脏不良事件的风险高，很少有数据描述这一人群中的非心脏并发症发生情况。

**方法：**作者对接受 2005 年到 2010 年间美国医学学会全国外科质量改进计划的非心脏手术的患者进行了一项多中心队列研究。将 HF（术后 30 天内新发或恶化的 HF）队列与其他外科手术的危险因素相关的对照组进行比较。

**结果：**5094 例术前恶化的 HF 患者与术前没有 HF 恶化的相似的患者队列相比较，术前 HF 恶化与 30 天全因死亡率增加（相对危险[RR] 2.08；95%置信区间[CI]，1.75－2.46；P＜0.001）以及发病风险增加有关（任何有记录的术后并发症）（RR 1.54; 95 % CI, 1.40-1.69; P<0.001）。HF 患者发生肾衰竭(RR 1.85; 95% CI, 1.37－2.49; P < 0.001)，机械通气的需要>48 小时(RR 1.81; 95% CI, 1.52－2.15; P < 0.001)， 肺炎 (RR 1.73; 95% CI, 1.44－2.08; P < 0.001), 心跳骤停 (RR 1.69; 95% CI, 1.29－2.21; P < 0.001), 计划外插管(RR 1.68; 95% CI, 1.41－1.99; P < 0.001), 肾功能不全(RR 1.64; 95% CI, 1.10－2.44; P = 0.014), 脓毒症(RR 1.43, 95% CI, 1.24－1.64; P < 0.001), 以及尿路感染 (RR 1.29; 95% CI, 1.06－1.58; P = 0.011)的风险增加。

**结论**：在控制其他并发症的条件下，术前 HF 恶化与术后并发症发病率和死亡率显著增加有关。虽然这似乎有多种病因，患者相对心脏并发症更有可能发生呼吸系统、肾脏和感染性并发症。

（柳韶华 译 陈杰 校）

**BACKGROUND:** Heart failure (HF) is an important risk factor for perioperative morbidity and mortality. While these patients are at high risk for cardiac adverse events, there are few current data describing the types of noncardiac complications that occur in this population.

**METHODS:** We performed a multicenter cohort study of patients undergoing noncardiac surgery from 2005 to 2010 as part of the American College of Surgeons National Surgical Quality Improvement Program. A HF cohort (HF that is new or worsening within 30 days of surgery) was compared with a control cohort that was matched regarding other surgical risk factors.

**RESULTS:** Five thousand ninety-four patients with worsening preoperative HF were compared with an otherwise similar cohort of patients without worsening preoperative HF. Worsening preoperative HF was associated with increased risk of 30-day all-cause mortality (relative risk [RR] 2.08; 95% confidence interval [CI], 1.75–2.46; P < 0.001) and increased risk of morbidity (any recorded postoperative complication) (RR 1.54; 95% CI, 1.40–1.69; P < 0.001). HF patients had increased risk of developing renal failure (RR 1.85; 95% CI, 1.37–2.49; P < 0.001), need for mechanical ventilation longer than 48 hours (RR 1.81; 95% CI, 1.52–2.15; P < 0.001), pneumonia (RR 1.73; 95% CI, 1.44–2.08; P < 0.001), cardiac arrest (RR 1.69; 95% CI,

1.29–2.21; P < 0.001), unplanned intubation (RR 1.68; 95% CI, 1.41–1.99; P < 0.001), renal insufficiency (RR 1.64; 95% CI, 1.10–2.44; P = 0.014), sepsis (RR 1.43, 95% CI, 1.24–1.64; P < 0.001), and urinary tract infection (RR 1.29; 95% CI, 1.06–1.58; P = 0.011). The incidence of myocardial infarction in the sample was similar between the 2 groups (RR 1.07; 95% CI, 0.75–1.52; P = 0.719).

**CONCLUSIONS:** Worsening preoperative HF is associated with a significant increase in postoperative morbidity and mortality when controlling for other comorbidities. Although these likely have a multifactorial etiology, patients are much more likely to suffer from respiratory, renal, and infectious complications than cardiac complications.

## 局部脑血流量在冠状动脉旁路手术后记忆处理过程中减少

**Attenuation of Regional Cerebral Blood Flow During Memory Processing After Coronary Artery Bypass Surgery**

Badgaiyan, Rajendra D. MD*; Weise, Steven BS†; Wack, David S. PhD‡; Vidal Melo, Marcos F. MD, PhD

Anesthesia & Analgesia 2014 119 550–553

心脏外科术后记忆障碍的报告是有争议的。为了解决这个争议，作者利用正电子发射断层扫描区域脑血流（rCBF）在择期 CABG 术前、术后记忆处理过程中的变化。在术后的扫描中，作者观察到脑血流量在两个最重要的记忆加工区域明显减少：内侧颞叶（P = 0.023）和前额叶皮层（P = 0.002）。结果表明，CABG 术后参与记忆加工的脑区 rCBF 减少。rCBF 的减少可以用于高危患者 CABG 术后记忆障碍严重程度的评价。

（池晓颖 译 陈杰 校）

Reports of memory impairment after cardiac surgery are controversial. To address this controversy, we used positron emission tomography to examine changes in regional cerebral blood flow (rCBF) during memory processing before and after elective coronary artery bypass grafting surgery. In postoperative scans, we observed significantly reduced rCBF in 2 of the most important memory processing areas: the medial temporal lobe (P = 0.023) and the prefrontal cortex (P = 0.002). The results suggest postoperative attenuation of rCBF in brain areas involved in memory processing. These reductions could be used to evaluate severity of memory impairment after coronary artery bypass grafting surgery in patients at risk.

## 腹部大手术患者应用无创心输出量监测确定目标定向控制围术期血流动力学稳定：一项前瞻性、随机、多中心的实用性实验：**POEMAS**（腹部大手术围术期目标导向治疗）研究

**Perioperative Goal-Directed Hemodynamic Optimization Using Noninvasive Cardiac Output Monitoring in Major Abdominal Surgery: A Prospective, Randomized, Multicenter, Pragmatic Trial: POEMAS Study (PeriOperative goal-directed thErapy in Major Abdominal Surgery)**

Pestaña, David PhD*; Espinosa, Elena PhD†; Eden, Arieh MD‡; Nájera, Diana MD*; Collar, Luis MD§; Aldecoa, César MD ‖; Higuera, Eva MD¶; Escribano, Soledad MD†; Bystritski, Dmitri MD‡; Pascual, Javier PhD§; Fernández-Garijo, Pilar MD ‖; de Prada, Blanca MD¶; Muriel, Alfonso#; Pizov, Reuven MD‡

Anesthesia & Analgesia 2014 119 579–587

**背景：**在本研究中，作者主要目的是研究基于无创心输出量监测引导控制血流动力学能否减少需要特殊监护的腹部大手术病人术后并发症的发生率以及住院时

间；其次研究其对肠蠕动的恢复时间及切口感染、吻合口瘘的发生率和死亡率的影响。

**方法**：实验组为在 6 个三级医院随机选择的 142 例计划进行开放结直肠手术、胃切除术或小肠切除术的病人。控制血流动力学稳定的方案包括：液体管理，根据动脉压、心指数和射血分数给予血管活性药物。随访病人至出院（出院时间由对该研究不知情的外科医生决定）或死亡。对照实验为临床实用性研究（与阐述性实验不同）通过模拟实际案例并为该研究获得最大外在有效性。

**结果**：实验组与对照组的液体管理没有显著差异，但输胶体量较多：实验组 2.4 ± 1.8、对照组：1.3 ± 1.4；P < 0.001。输红细胞单位数为：实验组 0.6 ± 1.3、对照组 0.2 ± 0.6；P = 0.019。实验组 25%患者术中应用多巴酚丁胺，术后 19.4%患者应用多巴酚丁胺；对照组分别为 1.4%和 0%（P < 0.001）。实验组需要再次手术的病例减少（5.6% vs 15.7%; P = 0.049）。而并发症发生率（40% vs 41%; 相对危险度 0.99 [0.67–1.44]; P = 0.397）、住院天数(11.5 [8–15] vs 10.5 [8–16]; P = 0.874)，第一次排气时间(62 小时 [40–76] vs 72 小时 [48–96]; P = 0.180)、切口感染例数（7 vs 14; P = 0.085）、吻合口瘘例数（2 vs 5; P = 0.23）以及死亡率（4.2% vs 5.7%; P = 0.67）均无显著差异。

**结论**：研究表明腹部大手术围术期应用无创心输出量监测引导控制血流动力学并不能降低并发症的发生率及住院时间。

（隋永恒 译 陈杰 校）

**BACKGROUND:** In this study, our objective was to determine whether a perioperative hemodynamic protocol based on noninvasive cardiac output monitoring decreases the incidence of postoperative complications and hospital length of stay in major abdominal surgery patients requiring intensive care unit admission. Secondary objectives were the time to peristalsis recovery and the incidence of wound infection, anastomotic leaks, and mortality.

**METHODS:** A randomized clinical trial was conducted in 6 tertiary hospitals. One hundred forty-two adult patients scheduled for open colorectal surgery, gastrectomy, or small bowel resection were enrolled. A hemodynamic protocol including fluid administration and vasoactive drugs based on arterial blood pressure, cardiac index, and stroke volume response was compared with standard practice. Patients were followed until hospital discharge (determined by a surgeon blinded to the study) or death. In contrast to previous studies, we designed a pragmatic trial (as opposed to explanatory trials) to mimic real practice and obtain maximal external validity for the study.

**RESULTS:** Fluid administration was similar except for the number of colloid boluses (2.4 ± 1.8 [treated] vs 1.3 ± 1.4 [control]; P < 0.001) and packed red blood cell units (0.6 ± 1.3 [treated] vs 0.2 ± 0.6 [control]; P = 0.019). Dobutamine was used in 25% (intraoperatively) and 19.4% (postoperatively) of the treated patients versus 1.4% and 0% in the control group (P < 0.001). We have observed a reduction in reoperations in the treated group (5.6% vs 15.7%; P = 0.049). However, no significant differences were observed in overall complications (40% vs 41%; relative risk 0.99 [0.67–1.44]; P = 0.397), length of stay (11.5 [8–15] vs 10.5 [8–16]; P = 0.874), time to first flatus (62 hours [40–76] vs 72 hours [48–96]; P = 0.180), wound infection (7 vs 14; P = 0.085), anastomotic leaks (2 vs 5; P = 0.23), or mortality (4.2% vs 5.7%; P = 0.67).

**CONCLUSIONS:** The results of our pragmatic study indicate that a perioperative hemodynamic protocol guided by a noninvasive cardiac output monitor was not associated with a decrease in the incidence of overall complications or length of stay in major abdominal surgery.

## 血清维生素 D 浓度与非心脏手术后的严重并发症关系

## The Association of Serum Vitamin D Concentration with Serious Complications After Noncardiac Surgery

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**背景：**维生素 D 缺乏是一个全球性的健康问题。流行病学研究表明，维生素 D 可以保护心脏和神经。维生素 D 也起着天然免疫和获得性免疫中发挥实质性作用。本研究目的是评估血清中维生素 D 浓度与非心脏手术病人的严重术后并发症和死亡的关系。

**方法：**回顾性分析在克利夫兰诊所主校区的 3509 例行非心脏手术，并有血清维生素 D 的测量数据的病人。血清中维生素 D 浓度与全因住院死亡率，及在医院的心血管发病率和严重的院内感染之间的关系通过广义估计方程模型并调整多元人口统计，病史变量，类型和手术时间后被评定出一个共同的效果比值比（OR）

**结果：**较高的维生素 D 浓度与降低住院死亡率/发病率的几率有关（P = 0.003）。相应的住院重症患者的公共效应比值比与维生素 D 的浓度呈 5ng/ml 单位递增在 4～44 ng/ml 范围中呈线性减少（OR0.93，95％可信区间，0.88-0.97）。此外，作者还发现，该比值在患者的维生素 D<13 ng/ml（即，第 1 分位）与患者的维生素 D 在 13-20，20-27，27-36 和>36 ng / mL（即第 2—5 分位）之间有显著性差异，相应的估计 OR 值分别为 0.65（99％可信区间，0.43-0.98），0.53（0.35-0.80），0.44（0.28-0.70）和 0.49（0.31-0.78）。然而，>13 ng/mL.的几个分位之间的该比值无统计学差异。

**结论：**维生素 D 浓度与行非心脏手术的病人在恢复过程中发生院内死亡，严重感染及严重心血管事件存在联系。虽然不能从本研究的回顾性分析中得出因果关系，但该协会提出有必要做关于术前补充维生素 D 和术后效果的大型随机试验。

（秦懿 译 陈杰 校）

**BACKGROUND:** Vitamin D deficiency is a global health problem. Epidemiological studies demonstrate that vitamin D is both cardioprotective and neuroprotective. Vitamin D also plays a substantial role in innate and acquired immunity. Our goal was to evaluate the association of serum vitamin D concentration on serious postoperative complications and death in noncardiac surgical patients.

METHODS: We retrospectively analyzed the data of 3509 patients who had noncardiac surgery at the Cleveland Clinic Main Campus and had a serum vitamin D measurement. The relationship between serum vitamin D concentration and all-cause in-hospital mortality, in-hospital cardiovascular morbidity, and serious in-hospital infections was assessed as a common effect odds ratio (OR) by using a multivariate generalized estimating equation model with adjustment for demographic, medical history variables, and type and duration of surgery.

**RESULTS:** Higher vitamin D concentrations were associated with decreased odds of in-hospital mortality/morbidity (P = 0.003). There was a linear reduction of the corresponding common effect odds ratio (OR 0.93, 95% confidence interval, 0.88–0.97) for severe in-hospital outcomes for each 5 ng/mL increase in vitamin D concentration over the range from 4 to 44 ng/mL. In addition, we found that the odds versus patients with vitamin D <13 ng/mL (i.e., 1st quintile) were significantly lower in patients with vitamin D 13–20, 20–27, 27–36, and > 36 ng/mL (i.e., 2nd–5th quintiles); the corresponding estimated ORs were 0.65 (99% confidence interval, 0.43–0.98), 0.53 (0.35–0.80), 0.44 (0.28–0.70), and 0.49 (0.31–0.78), respectively. However, there was no statistically significant difference among individual quintiles >13 ng/mL.

**CONCLUSIONS:** Vitamin D concentrations were associated with a composite of in-hospital death, serious infections, and serious cardiovascular events in patients recovering from noncardiac surgery. While causality cannot be determined from our retrospective analysis, the association suggests that a large randomized trial of preoperative vitamin D supplementation and postoperative outcomes is warranted.

# 大手术后的 C 反应蛋白动力学

## C-Reactive Protein Kinetics After Major Surgery

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**背景：**术后脓毒症的诊断是个挑战。炎症标志物的检测，例如 C 反应蛋白（CRP），已经在内科患者中进行，但是这些值在外科患者中的解释更为困难。作者评估了术后感染及未感染患者的血 CRP 水平及白细胞计数变化。

**方法：**入住 ICU （34 个床位）的所有患者包括了重要的（择期或急诊）心脏、神经、血管、胸或腹部手术后四个月内的患者，为前瞻性研究。CRP 水平和白细胞计数在所有患者手术治疗后每天记录直到第 7 天。

**结果：**151 名患者中，115 例进行了择期手术，36 名为急诊手术；心脏手术 49 例，神经外科手术 65 例，普外科手术 25 例，血管外科手术 7 例，胸外科手术 5 例。未感染患者的 CRP 平均值从基线开始上升至术后第三天（P<0.0001,估计平均差[EMD]=99.7mg/L，[95%可信区间，85.6-113.8]），然后开始下降直至术后第 7 天，但保持在比基线高的水平（P<0.0001,估计平均差[EMD]=49.2mg/L，[95%可信区间，27.1-71.2]）。发生术后感染的患者为 20 例（13.2%），在这些病人中，术后第 1 天的 CRP 水平已经高于非感染病人（P=0.0054）。

**结论：**大手术后 CRP 水平在第一周内上升，但比起非感染患者，感染患者上升程度更明显。术后第 4 天 CRP 水平居高不下，尤其当大于 100mg/L 时，提示有术后感染存在。

(王筱婧 译 陈杰 校)

**BACKGROUND:** Diagnosis of sepsis in the postoperative period is a challenge. Measurements of inflammatory markers, such as C-reactive protein (CRP), have been proposed in medical patients, but the interpretation of these values in surgical patients is more difficult. We evaluated the changes in blood CRP levels and white blood cell count in postoperative patients with and without infection.

**METHODS:** All patients admitted to our 34-bed Department of Intensive Care after major (elective or emergency) cardiac, neuro-, vascular, thoracic, or abdominal surgery during a 4-month period were prospectively included. Patients were screened daily and characterized as infected or noninfected. CRP levels and white blood cell counts were recorded daily in all patients for up to 7 days after the surgical intervention.

**RESULTS:** Of the 151 patients enrolled, 115 underwent elective surgery and 36 emergency surgery; cardiac surgery was performed in 49 patients, neurosurgery in 65, abdominal surgery in 25, vascular surgery in 7, and thoracic surgery in 5. In noninfected patients (n = 117), mean CRP values increased from baseline to postoperative day (POD) 3 (P < 0.0001, estimated mean difference [EMD] = 99.7 mg/L [95% confidence interval, 85.6–113.8]) and then decreased until POD 7 but remained higher than the level at baseline (P < 0.0001, EMD = 49.2 mg/L [95% confidence interval, 27.1–71.2]). Postoperative infection occurred in 20 patients (13.2%). In these patients, CRP values were already higher on POD 1 than in noninfected patients (P = 0.0054).

**CONCLUSIONS:** CRP levels increase in the first week after major surgery but to a much larger extent in infected than in noninfected patients. Persistently high CRP levels after POD 4, especially when >100 mg/L, suggest the presence of a postoperative infection.

# 婴儿期接受脊麻和手术的认知结果

**Cognitive Outcome After Spinal Anesthesia and Surgery During Infancy**

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**背景：**小儿麻醉的神经毒性的观察性研究无法区分手术相关因素中全麻（GA）的长期影响和。最近的一项在一群上小学的，在他们生命的第一年接受过一次全身麻醉的孩子们身上的研究，证实了小儿麻醉的持续时间和测试成绩减少之间的关系，也揭示了其中有一小部分群体有着“非常少的学术成就的孩子”（VPAA），即在标准化测试的得分都低于百分之五。在对一个类似的儿童的全身麻醉替代组术后认知功能进行的分析，可能有助于区分麻醉的影响与其他混杂因素。

**方法：**使用了一种新的方法来构建一个联合医疗和教育数据库，用来搜索这些在一个类似的接受脊麻的进行同样手术的儿童群体中的影响。作者将之前的一些病人和一个控制人数的有着相匹配的年级，性别，测试的年龄和社会经济地位的学生群体进行了比较。

**结果：**对佛蒙特州的教育部的记录进行分析，其中 265 个学生在其婴儿时期均在单次脊髓麻醉下进行过包皮环切术，幽门环肌切开术，或者腹股沟疝修补术。接受脊髓麻醉和手术治疗对有 VPAA 的儿童的比值无显著影响。（数学：P = 0.18；比值比为 1.50，置信区间（CI），0.83 – 2.68；阅读：P = 0.55；比值比= 1.19，置信区间 CI，0.67 – 2.1）。脊髓麻醉和手术的持续时间与在数学标准化测试（P=0.73）或者阅读的标准化测试中（P=0.57）的表现没有相关性。在实验组里有一个小的但是在统计学上有显著数学和阅读分数减少的差异。（P = 0.03；数学：阅读：P = 0.02）。

**结论：**作者并没有发现在婴儿期进行脊髓麻醉的手术持续时间与小学里学校考试分数之间的有任何关系。也没有发现婴儿期间的脊髓麻醉和手术治疗与小学测试的 VPAA 之间有任何关联，尽管置信区间很广。

（李慧 译 陈杰 校）

**BACKGROUND:** Observational studies on pediatric anesthesia neurotoxicity have been unable to distinguish long-term effects of general anesthesia (GA) from factors associated with the need for surgery. A recent study on elementary school children who had received a single GA during the first year of life demonstrated an association in otherwise healthy children between the duration of anesthesia and diminished test scores and also revealed a subgroup of children with “very poor academic achievement” (VPAA), scoring below the fifth percentile on standardized testing. Analysis of postoperative cognitive function in a similar cohort of children anesthetized with an alternative to GA may help to begin to separate the effects of anesthesia from other confounders.

**METHODS:** We used a novel methodology to construct a combined medical and educational database to search for these effects in a similar cohort of children receiving spinal anesthesia (SA) for the same procedures. We compared former patients with a control population of students matched by grade, gender, year of testing, and socioeconomic status.

**RESULTS:** Vermont Department of Education records were analyzed for 265 students who had a single exposure to SA during infancy for circumcision, pyloromyotomy, or inguinal hernia repair. Exposure to SA and surgery had no significant effect on the odds of children having VPAA. (mathematics: P = 0.18; odds ratio 1.50, confidence interval (CI), 0.83–2.68; reading: P = 0.55; odds ratio = 1.19,

CI, 0.67–2.1). There was no relationship between duration of exposure to SA and surgery and performance on mathematics (P = 0.73) or reading (P = 0.57) standardized testing. There was a small but statistically significant decrease in reading and math scores in the exposed group (mathematics: P = 0.03; reading: P = 0.02).

**CONCLUSIONS:** We found no link between duration of surgery with infant SA and scores on academic achievement testing in elementary school. We also found no relationship between infant SA and surgery with VPAA on elementary school testing, although the CIs were wide.

## 由单纯疱疹病毒载体介导的白细胞介素 10 在大鼠模型中能阻止由人免疫缺陷病毒 gp120 导致的神经性疼痛

**Interleukin 10 Mediated by Herpes Simplex Virus Vectors Suppresses Neuropathic Pain Induced by Human Immunodeficiency Virus gp120 in Rats**

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**背景：**人免疫缺陷病毒（HIV）相关的感觉神经病变是一种 HIV 感染后常见的神经并发症，它影响到多达 30%HIV 阳性的患者。然而，其确切的神经病理机制仍然不清楚，这妨碍了发现有效的治疗 HIV 相关神经性疼痛（NP）的方法。在这个研究中，作者在大鼠模型中检验了通过白细胞介素 10（IL-10）的过表达来抑制促炎症反应因子以减少 HIV 相关 NP。

**方法：**NP 是通过将重组 HIV-1 衣壳蛋白 gp120 应用至坐骨神经而产生。大鼠的后爪接种了表达抗炎细胞因子 IL-10 的单纯疱疹病毒（HSV）载体或对照载体。在接种载体前后分别使用 von Frey 纤维丝测试机械痛阈。通过时间相关的曲线下面积来评估机械痛阈。在接种载体后的第 14 天和第 28 天，分别使用 Western blots 方法检测脊髓腰段和 L4/5 背根神经节（DRG）中 p38 丝裂原活化蛋白磷酸激酶、肿瘤坏死因子-α，基质细胞衍生因子-1α 和 C-X-C 型趋化因子受体 4 的表达。

**结果：**作者发现在 gp120 诱导的 NP 模型中，由 HSV 载体介导的 IL-10 过表达组在接种载体 3 天后与对照组相比明显降低了机械痛阈（P < 0.001）。表达 IL-10 的 HSV 单独接种后，其止痛效果持续大于 28 天。表达 IL-10 的 HSV 载体组的曲线下面积与对照组相比有所增加（P < 0.0001）。表达 IL-10 的 HSV 载体在接种后第 14 天和/或第 28 天能够逆转在 DRG 和或脊髓后角中 p38 丝裂原活化蛋白磷酸激酶、肿瘤坏死因子-α，基质细胞衍生因子-1α 和 C-X-C 型趋化因子受体 4 的上调。

**结论：**研究证明使用表达 IL-10 的 HSV 载体阻断在 DRG 和/或脊髓后角中的促炎分子信号能够减少 HIV 相关 NP。这些结果提示了关于 HIV 相关 NP 发病机制的新观点，并且证明了使用此类基因疗法治疗 HIV 感觉神经病变的可能性。

（张帆 译 陈杰 校）

**BACKGROUND:** Human immunodeficiency virus (HIV)–associated sensory neuropathy is a common neurological complication of HIV infection affecting up to 30% of HIV-positive individuals. However, the exact neuropathological mechanisms remain unknown, which hinders our ability to develop effective treatments for HIV-related neuropathic pain (NP). In this study, we tested the hypothesis that inhibition of proinflammatory factors with overexpression of interleukin (IL)-10 reduces HIV-related NP in a rat model.

**METHODS:** NP was induced by the application of recombinant HIV-1 envelope protein gp120 into the sciatic nerve. The hindpaws of rats were inoculated with nonreplicating herpes simplex virus (HSV) vectors expressing anti-inflammatory cytokine IL-10 or control vector. Mechanical threshold was tested using von Frey

filaments before and after treatments with the vectors. The mechanical threshold response was assessed over time using the area under curves. The expression of phosphorylated p38 mitogen-activated kinase, tumor necrosis factor-α, stromal cell–derived factor-1α, and C-X-C chemokine receptor type 4 in both the lumbar spinal cord and the L4/5 dorsal root ganglia (DRG), was examined at 14 and 28 days after vector inoculation using Western blots.

**RESULTS:** We found that in the gp120-induced NP model, IL-10 overexpression mediated by the HSV vector resulted in a significant elevation of the mechanical threshold that was apparent on day 3 after vector inoculation compared with the control vector ($P < 0.001$). The antiallodynic effect of the single HSV vector inoculation expressing IL-10 lasted >28 days. The area under curve in the HSV vector expressing IL-10 was increased compared with that in the control vector ($P < 0.0001$). HSV vectors expressing IL-10 reversed the upregulation of phosphorylated p38 mitogen-activated kinase, tumor necrosis factor-α, stromal cell–derived factor-1α, and C-X-C chemokine receptor type 4 expression at 14 and/or 28 days in the DRG and/or the spinal dorsal horn.

**CONCLUSIONS:** Our studies demonstrate that blocking the signaling of these proinflammatory molecules in the DRG and/or the spinal cord using the HSV vector expressing IL-10 is able to reduce HIV-related NP. These results provide new insights on the potential mechanisms of HIV-associated NP and a proof of concept for treating painful HIV sensory neuropathy with this type of gene therapy.

## 超声引导下腭大神经阻滞:一系列病例的解剖描述和临床评价

## Ultrasound-Guided Greater Palatine Nerve Block: A Case Series of Anatomical Descriptions and Clinical Evaluations

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**背景：**腭大神经（GPN）阻滞通过骨性标志常用于上颌和上腭麻醉。超声（US）常用于当骨腭显示不易时连续鉴别腭大孔（GPF）以便超声引导下大孔周围注射。

**方法：**作者检查并注射 16 例在排除显著解剖畸形的防腐良好未分割半切除尸体的头。高频曲线探头（7–13 MHz）定位硬腭长轴平面直视 GPN。超声引导下注射 0.1ml 印度墨。标本注射后立即解剖并染色。记录 GPN 定位成功率、尝试次数及成功注射数。临床上 7 例患者牙科操作应用此技术。5 例超声引导下注射，2 例接受超声辅助腭大腔阻滞。

**结果：**GPN 成功用于 16 例部分切除的头。16 例中 7 例尸体标本，超声下能看到穿刺针进路并在腭大孔和翼腭窝见到印度墨。另 9 例染色能在硬腭前到 GPN 粘膜组织或软腭见到。临床上 7 例中 6 例 GPN 能成功定位，超声引导下 8 例尝试阻滞中 6 例成功，尝试中位数为 2（1-4）。2 例超声辅助注射均成功。

**结论：**在正常人及无齿腭骨超声均能成功定位 GPN。超声引导 GPN 阻滞技术上能挑战。超声引导或辅助 GPN 阻滞需大样本进一步评估。

**BACKGROUND:** Greater palatine nerve (GPN) block is commonly performed for maxillary and palatal anesthesia by using bony landmarks. Ultrasound (US) can be used to consistently identify greater palatine foramen (GPF) as a defect in the bony palate enabling US-guided injections near the foramen.

**METHODS:** We scanned and injected 16 undissected well-embalmed hemisectioned cadaveric heads after excluding major anatomical malformations. A linear high-frequency hockey stick probe (7–13 MHz) positioned in long axis to the hard

palate visualized GPF as a discontinuity in the hard palate. US-guided injections of 0.1 mL India ink were made in an oblique plane. Specimens were dissected immediately after inj ection, and dye distribution was noted. The success rate of identification of GPF, number of attempts, and number of successful injections were recorded. The technique was evaluated clinically in 7 patients undergoing dental procedures. Five patients had US-guided injections, and 2 patients received US-assisted greater palatine canal blocks.

**RESULTS:** GPF was successfully identified in 16 hemisectioned heads (n = 16). In 7 of 16 hemisectioned cadaveric specimens (n = 7/16), needle pass was seen on the US and traces of India ink were found within the greater palatine canal and pterygopalatine fossa. In the remaining heads (n = 9/16), the dye was observed in the mucosal tissue of the hard palate anterior to the GPF or in the soft palate. Clinical evaluation reconfirmed successful identification of GPF by US in 6 of 7 patients (n = 6/7). US-guided injections were successful in 6 of the 8 attempted blocks (n = 6/8) with median number (range) of attempts being 2 (1–4). US-assisted injections were successful in 2 patients (n = 2/2).

**CONCLUSIONS:** US has the potential to successfully locate and characterize GPF in normal and edentulous maxilla. US-guided GPN blocks can be technically challenging. The clinical applicability of US guidance or assistance for GPN block needs further evaluation in a larger sample of patients.

## 在纤维蛋白溶解快速检测的外在活性实验中，有无抑肽酶对早期的血栓弹性测定评估有差异

**Assessment of early thromboelastometric variables from extrinsically activated a ssays with and without aprotinin for rapid detection of fibrinolysis.**

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**背景：**尽管血栓弹力图可以用在纤维蛋白溶解的床旁诊断上，但是所需要的时间很长。未治疗的纤维蛋白溶解能引起凝血因子的消耗和出血，因此有必要做早期的诊断和决策。因此，我们在外在活性实验中对血栓弹力图进行评估，用抑肽酶可以快速识别出纤维蛋白溶解。我们假设，凝血时间延长、血栓块形成时间、血栓块强度低（分别在 5、10、15、20 分钟，标记为 A5、A10、A15、A20）、最大血栓块强度 MCF 降低等在有无抑肽酶试验中的不同可以预测纤维蛋白溶解。

**方法：**我们采用受试者工作特征来评估与分析 352 个病人的 411 份出现纤维蛋白溶解的血栓弹性测定结果和 1605 个病人的 2537 份没有纤维蛋白溶解的结果。以一种混合队列来分析这些数据，同时进一步分析与血栓溶解时间相关的纤维蛋白溶解的数据，即分别在 30 分钟、45 分钟和 60 分钟内血栓块强度降低到小于最大血栓块强度的 15%。受试者工作特征曲线的曲线下面积的 95%可信区间降低大体上说明不能改善逐渐增加的纤维蛋白溶解的检测。曲线下面积的可变性可以很好的预测纤维蛋白溶解。作为一个次要结局终点，用对应于最大约登指数的最优截点估计值来估算出各自的敏感性和特异性。

**结果：**在混合队列中，血栓块形成时间(AUC: 0.652 [0.016])、α 角(AUC: 0.675 [0.015])、A5 (AUC: 0.718 [0.013])、A10 (AUC: 0.734 [0.0.13])、A15 (AUC: 0.752 [0.013])、A20 (AUC: 0.771 [0.013])和最大血栓块强度(AUC: 0.799 [0.012])预示到纤维蛋白溶解。ΔA15 (AUC: 0.675 [0.016]), ΔA20 (AUC: 0.719 [0.015]), and ΔMCF (AUC: 0.812 [0.013])也提示纤维蛋白溶解。曲线下面积随时间而增加。在试验早期，血栓弹力图预测随后发生的纤维蛋白溶解的能力比试验晚期更强。尽管如此，在纤维蛋白溶解晚期，仅仅最大血栓块强度显示可能有临床价值。

**结论：**在外在活性血栓弹性测定试验中，血栓块强度在纤维蛋白溶解诊断中有较

低的早期诊断价值，而且可以更早的发现。与没有抑肽酶相比，使用抑肽酶的试验不能改善纤维蛋白溶解的早期诊断。

（吕越昌译 薛张纲校）

**BACKGROUND:**Although thromboelastometry (ROTEM®) and thrombelastography can be used for bedside diagnosis of fibrinolysis, the time needed for detection is often prolonged. Since untreated fibrinolysis can result in consumption of coagulation factors and bleeding, early diagnosis and decision making are desirable. Accordingly, we assessed ROTEM variables from extrinsically activated assays with (APTEM) and without (EXTEM) addition of aprotinin for their ability to rapidly identify fibrinolysis. Specifically, we tested the hypotheses that prolonged clotting time, clot formation time, low clot firmness (at 5, 10, 15, and 20 minutes, designated A5, A10, A15, and A20, respectively), low maximum clot firmness (MCF) in EXTEMassays, and differences in these variables from parallel APTEM and EXTEM assays (designated as Δvariables) predict fibrinolysis.

**METHODS:**Data from 411 thromboelastometric measurements (obtained from 352 patients) with fibrinolysis and from 2537 measurements withoutfibrinolysis (obtained from 1605 patients) were assessed and analyzed using receiver operating characteristics. Data were analyzed as a pooled fibrinolysis cohort, and subanalyses were performed from sets assigned to categories of fibrinolysis related to the timing of thrombus lysis (i.e., a decrease of clot firmness to <15% of MCF within 30, 45, and 60 minutes, respectively). A lower 95% confidence limit of the area under the receiver operating characteristic curve (AUC [SE] <0.6) was considered a failure to substantially improve detection of increased fibrinolysis. AUCs were compared to identify the variable providing the best predictive association with fibrinolysis. As a secondary end point, optimum cutoff values at the point estimate corresponding to the greatest Youden index were calculated along with the respective sensitivities and specificities.

**RESULTS:**In the pooled cohort, clot formation time (AUC: 0.652 [0.016]), α-angle (AUC: 0.675 [0.015]), A5 (AUC: 0.718 [0.013]), A10 (AUC: 0.734 [0.0.13]), A15 (AUC: 0.752 [0.013]), A20 (AUC: 0.771 [0.013]), and MCF (AUC: 0.799 [0.012]) predicted fibrinolysis. Fibrinolysis was also predicted by ΔA15 (AUC: 0.675 [0.016]), ΔA20 (AUC: 0.719 [0.015]), and ΔMCF (AUC: 0.812 [0.013]). AUCs increased in a time-related fashion. The ability to predict subsequent fibrinolysis based on thromboelastometry was higher when it occurred early rather than later during testing. However, for prediction of late fibrinolysis, only MCF (AUC: 0.655 [0.025]) appears to be potentially clinically useful.

**CONCLUSIONS:**Low early values of clot firmness in extrinsically activated thromboelastometric assays are associated with fibrinolysis and improve its early detection. Additional assays with aprotinin fail to improve the early diagnosis of fibrinolysis compared with assays without aprotinin.

## 麻醉剂特有的突触抑制作用

**Anesthetic Agent-Specific Effects on Synaptic Inhibition**

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**背景：**麻醉剂可以加强 γ-氨基丁酸（GABA）介导的中枢神经系统抑制作用。不同的麻醉剂已被证明可不同程度地影响突触及突触外的 GABA 受体，但是否通过不同的机制介导不同形式的突触抑制尚未可知。基于此观点，我们检验不同类型的突触 GABA 受体对麻醉剂表现出不同的敏感性的假说。现有研究对比了异

氟醚、氟烷、戊巴比妥、硫喷妥钠以及异丙酚对于双脉冲 GABAA 受体接到的突触抑制作用。对于谷氨酸介导的异化作用的影响也进行了研究。

**方法：**在大鼠的海马脑片中测定突触应答。顺行双脉冲刺激被用来评价麻醉药物对 CA1 神经元的谷氨酸介导的兴奋性信号传入以及 GABA 介导的抑制性信号传入的影响。逆向的刺激用于评价麻醉剂对于 CA1 神经元背景兴奋性的影响。研究中不同的麻醉剂使用产生峰电位抑制的等效剂量，以对比他们对于突触抑制影响的相对程度。

**结果：**麻醉剂对于兴奋性谷氨酸突触双脉冲异化不同程度的影响是明显的，戊巴比妥表现出以前未发现的阻滞 GABA 抑制的活性。尽管 5 种麻醉药都可以抑制 CA1 神经元的突出活化作用，但不同麻醉剂参与增强 GABA 介导的抑制作用是显著不同的。异丙酚、硫喷妥钠以及戊巴比妥增强单脉冲抑制，而氟烷及异氟醚的这种作用则是微弱的。与此相反，异氟烷及硫喷妥钠增强双脉冲抑制的作用是显著的，而异丙酚、戊巴比妥及氟烷则几乎没有作用。

**结论：**这些观察结果支持不同的 GABA 突触受体含不同的亚基，不同的麻醉剂对这些受体表现出不同的选择性。现有研究中发现的谷氨酸受体及 GABA 突触受体不同的麻醉剂的敏感性，可以解释不同种类的麻醉剂独特的临床作用和表现，并且为新药开发提示了选择性的靶点。

(杜芳译 薛张纲校)

**BACKGROUND:** Anesthetics enhance γ-aminobutyric acid (GABA)-mediated inhibition in the central nervous system. Different agents have been shown to act on tonic versus synaptic GABA receptors to different degrees, but it remains unknown whether different forms of synaptic inhibition are also differentially engaged. With this in mind, we tested the hypothesis that different types of GABA-mediated synapses exhibit different anesthetic sensitivities. The present study compared effects produced by isoflurane, halothane, pentobarbital, thiopental, and propofol on paired-pulse GABAA receptor-mediated synaptic inhibition. Effects on glutamate-mediated facilitation were also studied.

**METHODS:** Synaptic responses were measured in rat hippocampal brain slices. Orthodromic paired-pulse stimulation was used to assess anesthetic effects on either glutamate-mediated excitatory inputs or GABA-mediated inhibitory inputs to CA1 neurons. Antidromic stimulation was used to assess anesthetic effects on CA1 background excitability. Agents were studied at equieffective concentrations for population spike depression to compare their relative degree of effect on synaptic inhibition.

**RESULTS:** Differing degrees of anesthetic effect on paired-pulse facilitation at excitatory glutamate synapses were evident, and blocking GABA inhibition revealed a previously unseen presynaptic action for pentobarbital. Although all 5 anesthetics depressed synaptically evoked excitation of CA1 neurons, the involvement of enhanced GABA-mediated inhibition differed considerably among agents. Single-pulse inhibition was enhanced by propofol, thiopental, and pentobarbital, but only marginally by halothane and isoflurane. In contrast, isoflurane enhanced paired-pulse inhibition strongly, as did thiopental, but propofol, pentobarbital, and halothane were less effective.

**CONCLUSIONS:** These observations support the idea that different GABA synapses use receptors with differing subunit compositions and that anesthetics exhibit differing degrees of selectivity for these receptors. The differing anesthetic sensitivities seen in the present study, at glutamate and GABA synapses, help explain the unique behavioral/clinical profiles produced by different classes of anesthetics and indicate that there are selective targets for new agent development.

## 一种新型术中血红蛋白损失量监测系统的临床评价

## Clinical Evaluation of a Novel System for Monitoring Surgical Hemoglobin Loss

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**背景**：术中失血量的精确测量对于补液管理及避免血液制品不必要的输注具有重要价值。在这项研究中利用外科开腹手术中使用的纱布来计算血液丢失，使用了面部识别技术建模编程的平板电脑进行了一个独特的算法来测量。在本研究中，我们评估了该系统在外科手术的精确度和性能。

**方法**：在这项前瞻性、多中心的研究中，入选了 46 例接受剖腹手术并预期有显著失血的研究对象，使用 Triton 系统的特征提取技术来测量止血纱布中的血红蛋白(Hb)损耗量。本研究将新系统所测量的 Hb 损耗量与手工漂洗纱布测定法进行了比较。采用线性回归和 Bland-Altman 分析进行准确性评价。此外，本研究还比较了新系统与止血纱布称重法估计血液丢失量的准确性。

**结果**：新系统测量的 Hb 值与冲洗所得的 Hb 质量之间呈现显著线性正相关（r=0.93，P <0.0001）。Bland-Altman 分析显示，结果偏移为 9.0g，新方法与冲洗血红蛋白质量之间的差异区间为（-7.5g—25.5g）。这种差异是在临床差异允许范围内（±30 克），这大约是一半单位的同种异基因的全血的血红蛋白含量。Bland-Altman 分析表明，止血纱布称重法估计失血量具有 466ml 的偏移（高估），差异区间为（-171ml—1103ml），可能原因是剖腹手术止血纱布中除了血液还有污染物的存在。

**结论**：与手工漂洗测量法相比，这种新颖的移动监视系统可以更准确测量手术止血纱布中 Hb 的质量，并且显著比止血纱布称重法精确。当然，还需要进一步的研究来评估临床使用的价值。

（江凌慧译 薛张纲校）

**BACKGROUND:**Accurate measurement of intraoperative blood loss is an important clinical variable in managing fluid resuscitation and avoiding unnecessary transfusion of blood products. In this study, blood lost onto laparotomy sponges during surgical cases was measured using a tablet computer programmed with a unique algorithm modeled after facial recognition technology. In this study, we assessed the accuracy and performance of the system in surgical cases.

**METHODS:**In this prospective, multicenter study, 46 patients undergoing surgery with anticipated significant blood loss contributed laparotomy sponges for hemoglobin (Hb) loss measurement using the Triton System with Feature Extraction Technology (Gauss Surgical, Inc., Los Altos, CA). The Hb loss measured by the new system was compared with that measured by manual rinsing of the sponges. Accuracy was evaluated using linear regression and Bland-Altman analysis. In addition, the new system's calculation of blood volume loss was compared with the gravimetric method of estimating blood loss from intraoperative sponge weights.

**RESULTS:**A significant positive linear correlation was noted between the new system's measurements and the rinsed Hb mass (r = 0.93, P < 0.0001). Bland-Altman analysis revealed a bias of 9.0 g and narrow limits of agreement (-7.5 to 25.5 g) between the new system's measures and the rinsed Hb mass. These limits were within the clinically relevant difference of ±30 g, which is approximately half of the Hb content of a unit of allogeneic whole blood. Bland-Altman analysis of the estimated blood loss on sponges using the gravimetric method demonstrated a bias of 466 mL (overestimation) with limits of agreement of -171 and 1103 mL, due to the presence of contaminants other than blood on the laparotomy sponges.

**CONCLUSIONS:**The novel mobile monitoring system provides an accurate measurement of Hb mass on surgical sponges as compared with that of manual rinsing measurements and is significantly more accurate than the gravimetric method. Further study is warranted to assess the clinical use of the technology.

## 住院患者中的维生素 D 缺乏症：是身体虚弱或者患有疾病需要治疗的一个标志吗？

**Hypovitaminosis D in Hospitalized Patients: A Marker of Frailty or a Disease Requiring Treatment?**

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在这篇发表在 AA 的文章中，Turan 等人报道了非心脏手术成人患者的维生素 D 水平并将维生素 D 水平与术后并发症和死亡相关联。虽然使用了回顾性队列分析的方法，但这篇文章使人们重视住院病人维生素 D 缺乏的高发生率及其与非骨骼并发症和死亡率的关系。这些发现引出了许多问题：是不是维生素 D 缺乏这一不被重视症状与手术患者不良预后有关？住院病人维生素 D 缺乏是不良手术预后的原因还是仅仅只是一个结果？维生素 D 水平的监测对手术患者是否有用，同时那些缺乏的病人是否应该术前补充维生素 D？不幸的是，这些问题没有明确的答案，但是近 15 年的科研文章对围手术期维生素 D 缺乏的概念提供了些许建议。我们在 PubMed 上检索了 1999 至 2014 年的英文文章，回顾整理了维生素 D 对外科预后的影响。

（盖晓冬译 薛张纲校)

In this issue of *Anesthesia &Analgesia*,Turan et al. report on vitamin D levels in adult patients undergoing noncardiac surgery and relate these levels to postoperative complications and death. Despite the methodological issues with retrospective cohort analysis, this study draws attentions to the high prevalence of hypovitaminosis D in hospitalized patients and the association of hypocitaminosis D with nonskeletal complications and mortality. These findings raise a number of questions: Is vitamin D deficiency an underappreciated condition responsible for poor outcomes in surgical patients? Is vitamin D deficiency in surgical patients a cause or just a consequence of poor outcomes? Is surveillance for vitamin D deficiency useful in patients undergoingsurgery,and should these patients receive vitamin D supplementation? Unfortunately, there are no simple answers to these questions, but the scientific literature of the last 15 years offers some suggestions about how to conceptualize peri operative vitamin D deficiency. We conducted a narrative review of English-language papers indexed in PubMed from 1999 to 2014 to explore the role of vitamin D in surgical outcomes.

## 一项评估产前心理学测验对产后疼痛、硬膜外镇痛药的消耗量以及母体满意度的预测能力的前瞻性观察性研究

**A prospective observational study evaluating the ability of prelabor psychological tests to predict labor pain, epidural analgesic consumption, and maternal satisfaction.**

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**背景：**心理学状态可能影响疼痛的阐释和表达。本研究中，我们试图探讨有效的心理学测验对产后疼痛经历是否具有预测作用。

**方法：**本前瞻性、观察性研究的研究对象为 39 名行引产术或成功经阴道分娩的辛格尔顿足月产妇或过月产妇。在产前进行四种有效的心理学问卷（焦虑敏感指数量表[ASI]、惧痛量表[FPQIII]、疼痛灾难性感觉量表[PCS]以及简式艾森克人格问卷）和对焦虑、自信和镇痛期望的分级调查。主要观察指标有开始需要进行硬膜外镇痛的时间长短、需要进行硬膜外镇痛时的疼痛程度、疼痛-时间曲线下面积、每小时硬膜外局麻药用量以及对产后镇痛的满意程度。心理学预测与临床反应之间的关系用双变量相关与回归模型描述。

**结果：**临床上产后疼痛的曲线下面积（R = 0.45, P = 0.006）、硬膜外局麻药的应用(R = 0.45, P = 0.019)以及开始需要进行硬膜外镇痛的时间长短(R = 0.36, P = 0.015)与心理学预测结果相一致。ASI、PCS、人格特征（撒谎、外向、精神质）以及对焦虑、自信和镇痛期望的分级均对结果预计有帮助。在应用多变量线性回归模型进行筛选以后，惧痛量表[FPQIII]和疼痛灾难性感觉量表[PCS]均不适合应用于疼痛曲线下面积的预测，而疼痛灾难性感觉量表[PCS]则可以（P=0.022）。ASI 和自我报告的焦虑无明显相关性（r = 0.03, P = 0.91）。

**总结：**人格特征（撒谎、外向、精神质）以及对焦虑、自信和镇痛期望的分级对产痛、硬膜外局麻药的应用以及开始需要进行硬膜外镇痛的时间长短的预计有帮助。尽管 ASI 包含在预计产后疼痛的曲线下面积的最终模型中（惧痛量表[FPQIII]和疼痛灾难性感觉量表[PCS]没有），ASI 在对疼痛的预计方面是否优于惧痛量表[FPQIII]和疼痛灾难性感觉量表[PCS]尚需要进一步研究证实。

（郝光伟译 薛张纲校）

**BACKGROUND:** Psychological characteristics may affect interpretation and expression of pain. In this study, we sought to determine whether validated psychological tests predict the labor pain experience.

**METHODS:** Thirty-nine women with singleton term or post-term pregnancies undergoing induction of labor and successful vaginal delivery comprised the study population for this prospective observational study. Four validated psychological questionnaires (Anxiety Sensitivity Index [ASI], Fear of Pain [FPQIII], Pain Catastrophizing Scale [PCS]), and Eysenck Personality Questionnaire-Short Scale) and 3-scaled ratings of anxiety, confidence, and analgesic expectations were completed before onset of labor. Outcome measures included time to epidural analgesia request, pain at request for epidural analgesia, area under the pain × time curve (AUC), epidural local anesthetic use per hour, and maternal satisfaction with analgesia. The relationship between psychological predictors and clinical responses was assessed using bivariate correlations and regression modeling.

**RESULTS:** Labor pain AUC (R = 0.45, P = 0.006), epidural local anesthetic use (R = 0.45, P = 0.019), and time to epidural analgesia request (R = 0.36, P = 0.015) were predicted with models incorporating some of the prelabor predictors. ASI, PCS, personality traits (lying, extroversion, psychoticism), and scaled ratings of anxiety, confidence, and analgesic expectations all contributed to the regression models of the outcomes. After proper model selection, neither FPQIII nor PCS was in the final multivariate linear regression model for labor pain AUC, although ASI was still included (P = 0.022). There was no significant correlation between ASI and self-reported anxiety (r = 0.03, P = 0.91).

**CONCLUSIONS:** Personality traits (psychoticism, extroversion, and lying), as well as scaled ratings of anxiety, confidence, and analgesia expectations, show some potential to predict labor pain, epidural local anesthetic use, and time to epidural analgesia request. Although ASI was included in the final model for labor pain AUC, and FPQ and PCS were not, further study is required to determine whether ASI is a better predictor than FPQ or PCS.

## 关于儿童期麻醉对神经系统发育影响的评估——文献回顾及推荐意见

**Neurodevelopmental Assessment After Anesthesia in Childhood: Review of the Literature and Recommendations**

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前临床研究已经表明麻醉对新生动物的大脑是有毒性作用的，但是却鲜有实验研究麻醉暴露对神经系统发育的影响。本文主要对一些特定时期的儿童（出生到四岁左右）麻醉暴露后的预后评估方面进行了讨论。为了更好的了解现存文献关于神经发育影响的贡献及局限性，我们对最近的研究进行了回顾分析。我们采用了以研究为基础的系统回顾，这是一种在队列研究中经常用来评估认知水平的方法。对这些文献的价值及局限性我们进行了回顾，并且对未来这方面的实验研究是否应该更多地针对于中枢神经系统状况进行了讨论。对神经心理学评估我们进行了描述，并且可以为今后的评估儿童期麻醉暴露的早期及远期影响方面研究提供一种新的视角，从而可以提高研究的可信度及敏感度。

（王飞译 薛张纲校）

Preclinical studies have established that anesthesia is toxic to the brain in neonatal animals, but scant research investigates the neurodevelopmental effects of exposure to anesthesia. In this article, we discuss the issue of outcome measurement of children after anesthesia administered between infancy and approximately 4 years of age. Recent studies are reviewed with the goal of understanding the contributions and limitations of the extant literature with respect to neurodevelopmental outcome. A review of school-based information (academic achievement and learning disability characterization), which are most frequently applied to measure cognitive outcome in cohort studies, is provided. The strengths and limitations of this literature is reviewed, followed by a discussion of how future trials investigating neurodevelopmental outcome after anesthesia might be improved by procedures designed specifically to assess the status of the central nervous system. Neuropsychological assessment is described and proposed as a way to increase the validity and sensitivity of forthcoming studies that intend to evaluate the short- and long-term effects of exposure to anesthesia during infancy and early childhood.

## 剧烈的阻抗练习通过激活大鼠内源性大麻素系统产生镇痛作用

## Acute Resistance Exercise Induces Antinociception by Activation of the Endocannabinoid System in Rats

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**背景**：阻抗练习（RE）也被称为力量训练，可以用来提高肌肉的力量和质量，骨骼强度以及代谢。RE 也越来越多的用于减轻疼痛。然而，其镇痛作用机制尚待研究。本试验旨在探究内源性大麻素系统在 RE 镇痛机制中的作用。

**方法**：雄性 Wistar 大鼠通过举重模型来模拟剧烈的阻抗练习。训练前后的疼痛

阈值则通过一项机械伤害性测试（爪压力）测得。为探究大麻素受体和内源性大麻素在 RE 镇痛中的作用，在进行 RE 前分别注射大麻素受体反兴奋剂，内源性大麻素代谢酶抑制剂以及大麻素再摄取抑制剂。RE 过后，通过 WB 和免疫荧光法检测大鼠脑组织 CB1 受体的表达，同位素 dilution-liquid 色谱质谱分析检测血浆大麻素受体的表达水平。

**结果**：RE 的镇痛作用被预先注射的 CB1 和 CB2 大麻素受体反兴奋剂抑制。相反，预先注射大麻素受体代谢酶抑制剂和大麻素受体再摄取抑制剂则增强此镇痛作用。同时，RE 可提高大鼠脑组织以及中脑背侧和腹外侧导水管周围的 CB1 大麻素受体的表达及活性，增加血浆内源性大麻素的表达。

**结论**：本研究表明 RE 可通过激活内源性大麻素系统来产生镇痛作用。

（潘艳译 薛张纲校）

**BACKGROUND**: Resistance exercise (RE) is also known as strength training, and it is performed to increase the strength and mass of muscles, bone strength, and metabolism. RE has been increasingly prescribed for pain relief. However, the endogenous mechanisms underlying this antinociceptive effect are still largely unexplored. Thus, we investigated the involvement of the endocannabinoid system in RE-induced antinociception.

**METHODS**: Male Wistar rats were submitted to acute RE in a weight-lifting model. The nociceptive threshold was measured by a mechanical nociceptive test (paw pressure) before and after exercise. To investigate the involvement of cannabinoid receptors and endocannabinoids in RE-induced antinociception, cannabinoid receptor inverse agonists, endocannabinoid metabolizing enzyme inhibitors, and an anandamide reuptake inhibitor were injected before RE. After RE, CB1 cannabinoid receptors were quantified in rat brain tissue by Western blot and immunofluorescence. In addition, endocannabinoid plasma levels were measured by isotope dilution-liquid chromatography mass spectrometry.

**RESULTS**: RE-induced antinociception was prevented by preinjection with CB1 and CB2 cannabinoid receptor inverse agonists. By contrast, preadministration of metabolizing enzyme inhibitors and the anandamide reuptake inhibitor prolonged and enhanced this effect. RE also produced an increase in the expression and activation of CB1 cannabinoid receptors in rat brain tissue and in the dorsolateral and ventrolateral periaqueductal regions and an increase in endocannabinoid plasma levels.

**CONCLUSIONS**: The present study suggests that a single session of RE activates the endocannabinoid system to induce antinociception.

## 一项关于心脏外科手术患者的零热通量皮肤温度计的研究

## An Evaluation of a Zero-Heat-Flux Cutaneous Thermometer in Cardiac Surgical Patients

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**背景**：尽管人体的中心温度可以被测量，但是目前没有广泛、可靠、用于体表的温度计可用，因此我们在测量肺动脉导管的温度时把标准的零热通量的温度计和即时测温的温度计进行了比较。特别的，我们假设零热通量的温度计可足够准确的用于常规临床患者。

**方法**：在 105 个非急诊的心脏手术患者身上，我们用标准的零热通量深部组织温度计和热敏电阻分别测肺动脉导管的温度。零热通量的温度探头放置于前额的两

侧和颈部的两侧，放置于前额的表皮温度探头和零热通量的温度探头紧临。温度间隔 1 分钟测量一次，但是不包括心肺旁路的时间和术后 4 小时以内的时间。然后将零热通量温度计的测量值和肺动脉的温度进行偏差分析，若偏差超过 0.5℃则认为有潜在的临床意义。

**结果：**在手术室的平均持续时间在 279 ± 75 分钟，平均横跨钳闭时间在 118 ± 50 分钟。所有病人都在重症监护病房观察了另外 4 小时。总的来说，放置于前额的零热通量温度计测的温度和肺动脉导管温度的平均偏差（即：前额温度减去肺动脉导管温度）在−0.23℃（95%的可信区间在±0.82）；78%的偏差≤0.5°C。平均的术中温度偏差为−0.08℃（95%的可信区间在 ±0.88）；84% 的偏差≤0.5°C。平均的术后温度偏差为−0.32℃ (95%的可信区间在 ±0.75); 84% 的偏差 ≤0.5°C。颈部的测量偏差和精确值与前额的数值相似。未校正的前额皮肤温度体现了随着中心温度的降低而不断增加的消极偏差。

**结论：**中心温度可以通过零热通量温度计的方法测量，偏差很小，但是准确度和肺动脉导管的温度相比，稍微低了特定的 0.5℃ 的可信度。

（李蔚文 译，李士通 审校）

**BACKGROUND:** Although core temperature can be measured invasively, there are currently no widely available, reliable, noninvasive thermometers for its measurement. We thus compared a prototype zero-heat-flux thermometer with simultaneous measurements from a pulmonary artery catheter. Specifically, we tested the hypothesis that zero-heat-flux temperatures are sufficiently accurate for routine clinical use.

**METHODS**: Core temperature was measured from the thermistor of a standard pulmonary artery catheter and with a prototype zero-heat-flux deep-tissue thermometer in 105 patients having nonemergent cardiac surgery. Zero-heat-flux probes were positioned on the lateral forehead and lateral neck. Skin surface temperature probes were attached to the forehead just adjacent to the zero-heat-flux probe. Temperatures were recorded at 1-minute intervals, excluding the period of cardiopulmonary bypass, and for the first 4 postoperative hours. Zero-heat-flux and pulmonary artery temperatures were compared with bias analysis; differences exceeding 0.5°C were considered to be potentially clinically important.

**RESULTS:** The mean duration in the operating room was 279 ± 75 minutes, and the mean cross-clamp time was 118 ± 50 minutes. All subjects were monitored for an additional 4 hours in the intensive care unit. The average overall difference between forehead zero-heat-flux and pulmonary artery temperatures (i.e., forehead minus pulmonary artery) was −0.23°C (95% limits of agreement of ±0.82); 78% of the differences were ≤0.5°C. The average intraoperative temperature difference was −0.08°C (95% limits of agreement of ±0.88); 84% of the differences were ≤0.5°C. The average postoperative difference was −0.32°C (95% limits of agreement of ±0.75); 84% of the differences were ≤0.5°C. Bias and precision values for neck site were similar to the forehead values. Uncorrected forehead skin temperature showed an increasing negative bias as core temperature decreased.

**CONCLUSIONS:** Core temperature can be noninvasively measured using the zero-heat-flux method. Bias was small, but precision was slightly worse than our designated 0.5°C limits compared with measurements from a pulmonary artery catheter.

## 羟乙基淀粉分子的大小和起源不会影响其对体外的近端小管细胞的有害副作用

## Molecular Size and Origin Do Not Influence the Harmful Side Effects of Hydroxyethyl Starch on Human Proximal Tubule Cells (HK-2) In Vitro

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**背景：**最近，临床试验表明羟乙基淀粉(HES)用于脓毒性患者会引起肾脏的损伤。在先前的研究中，我们证明了羟乙基淀粉会在肾脏的近端小管细胞中沉积。但是相关的病理机制却没有被发现。为了验证羟乙基淀粉的分子本身是有害的，而不在于他的分子量大小和起源这一假设，我们进行了一项综合的研究来说明不同的羟乙基淀粉实验组对体外的肾近端小管细胞生存能力的影响。

**方法**：人类的肾近端小管细胞的生存能力通过细胞毒性试验来测量，将四唑盐到甲月替染色的减少进行了量化。试验通过评估羟乙基淀粉的不同的载体（平衡液，非平衡液和培养基），不同的平均分子量（70,130,200kDa），不同的来源（分别来源于土豆和玉米），以及不同时间的培养（2-21 小时）的影响。而且，130/0.4 的羟乙基淀粉可以通过超滤作用被分解，我们发现他对于平均单一尺寸细胞的生存能力的影响分别为<3.3- 10, 10 - 30, 30- 50, 50-100, 和 >100 kDa。另外我们对于肿瘤坏死因子 α 引起炎症这一协同作用进行了研究。

**结果：**羟乙基淀粉的所有试验方法，通过等量和剂量依赖性的方式，都降低了细胞的生存能力，不管来源和载体基质是否相同。肿瘤坏死因子 α 不会减少羟乙基淀粉引起的细胞生存能力的降低。70,130,200kDa 实验组相比较也只有很小的差异。通过对不同分级的羟乙基淀粉进行研究，我们发现每一部分都会降低细胞的生存能力。即使羟乙基淀粉的分子量很小（10-30kDa）都会造成严重的损害。

**结论**：我们第一次能够证明仅仅是提供的全部羟乙基淀粉的分子都会对体外的肾近端小管细胞造成严重的损害，这一损害和羟乙基淀粉的分子量以及来源都没有关系。

（李蔚文 译，李士通 审校）

**BACKGROUND**: Recently, clinical trials revealed renal impairment induced by hydroxyethyl starch (HES) in septic patients. In prior studies, we managed to demonstrate that HES accumulated in renal proximal tubule cells (PTCs). The related pathomechanism has not yet been discovered. To validate our hypothesis that the HES molecule itself is harmful, regardless of its molecule size or origin, we conducted a comprehensive study to elucidate the influences of different HES preparations on PTC viability in vitro.

**METHODS**: Cell viability of human PTC was measured with a cytotoxicity assay, quantifying the reduction of tetrazolium salt to colored formazan. Experiments were performed by assessing the influence of different carrier solutions of HES (balanced, nonbalanced, culture medium), different average molecular weights (70, 130, 200 kDa), different origins (potato or corn derived), and various durations of incubation (2–21 hours). Furthermore, HES 130/0.4 was fractionated by ultrafiltration, and the impact on cell viability of average single-size fractions with <3, 3 to 10, 10 to 30, 30 to 50, 50 to 100, and >100 kDa was investigated. We also tested the possible synergistic effects of inflammation induced by tumor necrosis factor-α.

**RESULTS**: All tested HES solutions, regardless of origin or carrier matrix, decreased cell viability in an equivalent, dose-dependent manner. Coincubation with tumor necrosis factor-α did not reduce HES-induced reduction of cell viability. Minor differences were detected comparing 70, 130, and 200 kDa preparations. Analysis of fractionated HES revealed that each fraction decreased cell viability. Even small HES molecules (10–30 kDa) were significantly deleterious.

**CONCLUSIONS:** For the first time, we were able to show that only the total mass of HES molecules applied is responsible for the harmful impact on renal PTC in vitro. Neither molecular size nor their origin showed any relevance.

## 对用于检测术中血红蛋白流失的新系统的体外评估

**In Vitro Evaluation of a Novel System for Monitoring Surgical Hemoglobin Loss**

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**背景：**精确测量术中出血量是麻醉后液体复苏的一个重要的临床变量，同时可以减少临床中不必要的血制品输入。在这项研究中，我们运用了一种特殊的仿造脸部识别系统的计算技术，通过平板电脑来统计患者术中的失血量。该研究目的在于评估该系统在统计体外手术巾留存血量方面的性能及准确性。

**方法：**预先测定好血红蛋白含量及体积的全血样本被重组成人类红细胞悬液及血浆，同时倾倒于手术铺巾上。加入常规生理盐水以在不同程度稀释血液，同时进行冲洗。在手术室内，通过使用 Triton 系统结合特征提取技术，在 3 种不同背景光的环境下，对来自四大制造厂商的手术铺巾进行扫描测定。血红蛋白损失量的统计测量结果的准确性，与线性回归分析技术及 Bland-Altman 系统分析技术密切相关。通过非参数检验对于已知变量与测量偏倚有无相关性进行判定。

**结果：**在测量血红蛋白损失量的过程中产生的平均百分误差为 12.3%（信任区间为 95%）。在大范围的不同程度的术中照明条件下，预测量好的血红蛋白含量与实际血红蛋白聚集量呈明显的线性相关。不同程度的术中照明条件包括术中环境光线充足、光线中等、光线较弱等三种。Bland-Altman 分析结果表明：在上述 2 种测定方式中存在 0.01g 的偏差。经测定，每块手术铺巾上的血红蛋白含量高低的一致性界线为 1.16g 到 1.19g。使用新系统来检测估计的失血量及血红蛋白聚集量中的测量偏倚与使用的用于稀释血液的生理盐水的体积不相关。同时表明对于在较大范围内有不同饱和系数的手术铺巾，该系统的使用依然可靠。

**结论：**通过使用 Triton 系统来进行动态失血量监控，在评估血红蛋白体外（手术铺巾）聚集量方面得到的结果是很精确的，同时适用于不同程度的外界光线条件、不同饱和度的手术铺巾、盐分稀释、以及最初失血量的多少。该项技术的使用可以极大程度的提高估算术中失血量的准确性。

（田园 译，李士通 审校）

**BACKGROUND**: Accurate measurement of intraoperative blood loss is an important clinical variable in managing fluid resuscitation and avoiding unnecessary transfusion of blood products. In this study, we measured surgical blood loss using a tablet computer programmed with a unique algorithm modeled after facial recognition technology. The aim of the study was to assess the accuracy and performance of the system on surgical laparotomy sponges in vitro.

**METHODS**: Whole blood samples of premeasured hemoglobin (Hb) and volume were reconstituted from units of human packed red blood cells and plasma and distributed across surgical laparotomy sponges. Normal saline was added to simulate the presence of varying levels of hemodilution and/or irrigation use. Soaked sponges from 4 different manufacturers were scanned using the Triton System with Feature Extraction Technology (Gauss Surgical, Inc., Palo Alto, CA) under 3 different ambient light conditions in an operating room. Accuracy of Hb loss measurement was evaluated relative to the premeasured values using linear regression and Bland-Altman analysis. Correlations between studied variables and measurement bias were analyzed using nonparametric tests.

**RESULTS:** The overall mean percent error for measure of Hb loss for the Triton System was 12.3% (95% confidence interval [CI], 8.2%-16.4%). A strong positive linear correlation between the premeasured and actual Hb masses was noted across the full range of intraoperative lighting conditions, including (A) high (r = 0.95 [95% CI, 0.93-0.96]), (B) medium (r = 0.94 [95% CI, 0.93-0.96]), and (C) low (r = 0.90 [95% CI, 0.87-0.93]) mean ambient light intensity. Bland-Altman analysis revealed a bias of 0.01 g [95% CI, -0.03 to 0.06 g] of Hb per sponge between the 2 measures. The corresponding lower and upper limits of agreement were -1.16 g (95% CI, -1.21 to -1.12 g) per sponge and 1.19 g (95% CI, 1.15-1.24 g) per sponge, respectively. Measurement bias of estimated blood loss and Hb mass using the new system were not associated with the volume of saline used to reconstitute the samples (P = 0.506

and P = 0.469, respectively), suggesting that the system is robust under a wide range of sponge saturation conditions.

**CONCLUSIONS:** Mobile blood loss monitoring using the Triton system is accurate in assessing Hb mass on surgical sponges across a range of ambient light conditions, sponge saturation, saline contamination, and initial blood Hb. Utilization of this tool could significantly improve the accuracy of blood loss estimates.

## 肥胖患者对麻醉中呼气末正压通气引起的颈内静脉扩张耐受性差

**Positive End-Expiratory Pressure to Increase Internal Jugular Vein Size Is Poorly Tolerated in Obese Anesthetized Adults**

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**背景：**对肥胖患者的中心静脉插管已经发生了技术上的改变。我们假设：肥胖患者麻醉过程中的呼气末正压通气会显著扩张颈内静脉。

**方法：**以肥胖患者为研究对象，在全麻过程中，分别测量患者在 PEEP 值为 0、5、10cm 水柱的条件下颈内静脉圆周及横截面积。记录结果进行统计学分析。
**结果：**年龄在 18-24 岁的肥胖患者，对于 PEEP 值在 10 厘米水柱下引起的颈静脉扩张具有一定的耐受性。PEEP 值每增加 5 厘米水柱，颈内静脉横截面积增加 0.16±0.02cm$^2$(P<0.0001)，同时颈内静脉的圆周长度增加 0.23±0.03cm(P<0.0001)。
**结论：**对于肥胖患者，呼气末正压通气可以小幅引起患者颈内静脉扩张，但由于由此引发的低血压致使患者难以耐受。

（田园 译，李士通 审校）

**BACKGROUND:** Central venous cannulation is technically challenging in obese patients. We hypothesized that positive end-expiratory pressure (PEEP) increases the size of the internal jugular vein (IJV) in obese adults.

**METHODS:** The circumference and cross-sectional area of the IJV were measured in obese patients under general anesthesia at PEEP 0, 5, and 10 cm $H_2O$. Results are reported as means ± SE.

**RESULTS:** PEEP at 10 cm $H_2O$ was tolerated by 18 of 24 obese patients. Each 5 cm $H_2O$ of PEEP increased the cross-sectional area by 0.16 ± 0.02 cm (P < 0.0001) and the circumference by 0.23 ± 0.03 cm (P < 0.0001).

CONCLUSIONS: PEEP modestly increases the size of the IJV in obese adults but was poorly tolerated because of hypotension.

## 耶鲁术前焦虑量表修改版的简化改进

**Development of a Short Version of the Modified Yale Preoperative Anxiety Scale**

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**背景：**修改后的耶鲁术前焦虑量表(mYPAS)是当前评估儿童麻醉诱导期间的产生焦虑的“评准标准”，且(mYPAS)至少被应用大于 100 研究中。这个观测手段涵盖 5 项内容,通常应用在 4 个围手术期时间点。然而，这种复杂手段在繁忙的手术室设置管理的应用带来了挑战。在这项调查中,我们检查这种手段是否可以修改并且简化在手术室设置管理的应用。

**方法：**本研究采用定性方法、主成分分析、克伦巴赫系数,和效量大小创建

mYPAS-ShortForm(mYPAS-SF)和减少评估的时间点。获得的数据来自多个患者(总数 = 3798;男= 5.63%)，他们是 15 年前在之前的调查中被招募使用 mYPAS。

**结果**：定性分析后,由于与其他内容重叠“父母使用”的这项内容被消除。在孩子产生焦虑差异方面，这项减少内容占 82%或更多，并且克伦巴赫系数至少在 0.92。为减少评估的时间点数量, mYPAS 在时间点方面的评分，产生 Cohen D 效应量标准 0.48 的改变被应用。这导致手术室通道和手术室入口两项时间点的消除。

**结论**：减少 mYPAS 到 4 项内容, 创建 mYPAS-SF 可以应用在 2 个时间点,这保留了测量的准确性,同时使临床研究设置管理的手段更容易应用。

（李婷婷 译，李士通 审校）

**BACKGROUND:** The modified Yale Preoperative Anxiety Scale (mYPAS) is the current "criterion standard" for assessing child anxiety during induction of anesthesia and has been used in >100 studies. This observational instrument covers 5 items and is typically administered at 4 perioperative time points. Application of this complex instrument in busy operating room (OR) settings, however, presents a challenge. In this investigation, we examined whether the instrument could be modified and made easier to use in OR settings.

**METHODS:** This study used qualitative methods, principal component analyses, Cronbach αs, and effect sizes to create the mYPAS-Short Form (mYPAS-SF) and reduce time points of assessment. Data were obtained from multiple patients (N = 3798; Mage = 5.63) who were recruited in previous investigations using the mYPAS over the past 15 years.

**RESULTS:** After qualitative analysis, the "use of parent" item was eliminated due to content overlap with other items. The reduced item set accounted for 82% or more of the variance in child anxiety and produced the Cronbach α of at least 0.92. To reduce the number of time points of assessment, a minimum Cohen d effect size criterion of 0.48 change in mYPAS score across time points was used. This led to eliminating the walk to the OR and entrance to the OR time points.

**CONCLUSIONS:** Reducing the mYPAS to 4 items, creating the mYPAS-SF that can be administered at 2 time points, retained the accuracy of the measure while allowing the instrument to be more easily used in clinical research settings.

## 超声引导下脉冲射频刺激肩胛上神经治疗粘连性关节囊炎：一项前瞻性、随机、对照试验

**Ultrasound-Guided Pulsed Radiofrequency Stimulation of the Suprascapular Nerve for Adhesive Capsulitis: A Prospective, Randomized, Controlled Trial**

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**背景:** 粘连性关节囊炎（AC）的治疗是一个众所周知的、复杂和漫长的过程。最近的研究表明，在荧光透视或 CT 引导下使用脉冲射频（PRF）损毁肩胛上神经（SSN），可以减轻肩痛。然后目前并没有关于在超声引导（UG）下使用 PRF 损毁 SSN 的研究，仅只有两例病例报道。在本研究中，我们比较了单纯物理治疗与在 UG 引导用 PRF 损毁 SSN 与理疗联合治疗的效果。

**方法：**研究共纳入六十例 AC 患者。随机分为以下 2 组：干预组患者在一疗程的 PRF 损毁 SSN 治疗后接受了 12 周的理疗，对照组患者只接受 12 周理疗。所有的结果测量包括为治疗后 1，4，8，12 周的视觉模拟评分（VAS）、肩部疼痛和残疾指数、以及被动运动范围（PROM）。

**结果：**42 例患者（每组 21 例）完成了研究。干预组明显缩短了疼痛显著缓解的

发作时间（6.1±3.4 vs 28.1±9.2 天；P＜0.001），并且 VAS 评分在第 1 周也比对照组明显减少（40% vs 4.7%）（P＜0.001）。所测量的干预组中所有变量和对照组大部分变量都显示相对基线的显著改善（P＜0.05）。组间比较表明，干预组存在更大的改善，在所有时间点的 VAS 评分、肩部疼痛和残疾指数评分（P＜0.05），与大多数的 PROM（P＜0.05）都存在增益。两组都没有严重的不良反应或并发症。

**结论**：本研究表明，超声引导在采用 PRF 毁损 SSN 与理疗结合应用治疗 AC 较之单纯理疗能够更好更快的缓解疼痛、减少残疾，效果至少持续 12 周。

（许红娇 译，李士通 审校）

**BACKGROUND:** The treatment of adhesive capsulitis (AC) is a well-known,complicated, and long process. Recent studies have shown that pulsed radiofrequency (PRF) lesioning of the suprascapular nerve (SSN) using a fluoroscopy- or computed tomography-guided technique can alleviate shoulder pain.However, there are no studies of PRF lesioning of the SSN in patients with AC using ultrasound-guided (UG) techniques, except for 2 case reports. In this study, we compared the effect of physical therapy alone with physical therapy and PRF lesioning of the SSN using a UG technique.

**METHODS:** Sixty patients with AC were included in the study. Patients were randomized into the following 2 groups: the intervention group containing patients who received 12 weeks of physical therapy after 1 treatment of PRF lesioning of the SSN, and the control group containing patients who received 12 weeks of physical therapy alone. All outcome measurements including visual analog scale (VAS), shoulder pain and disability index, and passive range of motion (PROM) were performed at 1, 4, 8, and 12 weeks after treatment.

**RESULTS:** Forty-two patients (21 patients in each group) completed the study. The intervention group had a notably shorter time to onset of significant pain relief (6.1 ± 3.4 vs 28.1 ± 9.2 days; P < 0.001) and noticeable reduction of VAS score at week 1 (40% vs 4.7%) than the control group (P < 0.001). All measured variables in the intervention group and most variables in the control group showed significant improvement from the baseline (P < 0.05). A comparison of the 2 groups indicated significantly greater improvement in the intervention group at all times in VAS and shoulder pain and disability index scores (all P < 0.05), and for most gain of PROM (P < 0.05). There were no serious adverse effects or complications in either group.

**CONCLUSIONS**: This study indicates that the application of PRF lesioning of the SSN using a UG technique combined with physical therapy provided better and faster relief from pain, reduced disability, and improved PROM when compared with physical therapy alone in patients with AC,  n effect that persisted for at least 12 weeks.

## 椎管内麻醉用于预防术后死亡率和主要发病率的发生：一项采用 Cochrane 系统评价的概述

**Neuraxial Anesthesia for the Prevention of Postoperative Mortality and Major Morbidity: An Overview of Cochrane Systematic Reviews**

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**背景**：本文分析总结 CSR 评价椎管内麻醉对围术期死亡、胸部感染和心肌梗死的发生率的影响。

**方法**：于 2012 年 7 月 13 日对 Cochrane 系统评价数据库进行检索。。我们纳入 CSR 数据库中任何年龄进行任何类型（开放手术或内镜下）外科手术。将椎管

内麻醉与单独全身麻醉进行对比；将椎管内联合全身麻醉与单独全身麻醉进行对比，总结死亡、胸部感染、心肌梗死、和/或严重不良事件的结果。本总数采用相同纳入标准纳入所选研究。

**结果**： Cochrane 系统评价数据库中，9 份概述被纳入。其概述质量评估问卷从 4 变化到 6 的，最大评分为 7 分。从 20 份研究中的 3006 名患者来看，相比全身麻醉，椎管内麻醉减少了 0 到 30 天的死亡率（风险比（RR）0.71，95%置信区间[CI],0.53-0.94；I = 0 %）。椎管内麻醉也降低了肺炎的风险（RR 0.45；95% CI，0.26-0.79；I= 0%）(基于 5 项研究 400 人)。而两者心肌梗死分胜率无显著性差异（RR 1.17；95% CI，0.57-2.37；我= 0%）（基于 6 项研究 849 名患者）。与单纯全身麻醉相比，椎管内联合麻醉对其 0 至 30 天死亡率并没有影响（RR 1.07；95% CI，0.76-1.51；I= 0%）（18 项研究 3228 人）。椎管内联合全麻与单纯全麻的心肌梗死风险无明显差异（RR 0.69；95% CI，0.44-1.09；我= 0%）（8 项研究 1580 人）。在矫正了发表偏倚后的结果表明，椎管内联合全麻减少肺炎的发生率（RR 0.69；95% CI，0.49-0.98；I= 9%）（9 项研究 2433 人）。所有 6 个并发症都被评价为中度的，与椎管内阻滞的相关评分为 9 分（4 至 12 [中值范围]），最高得分为 14。

**结论**：对于存在中-高度心脏风险的患者，椎管内麻醉相对全麻可能降低 0 至 30 天的死亡率。在此，对比全麻与椎管内麻醉的死亡与其他主要后果，需要大型随机对照试验进一步证明。

（许红娇 译，李士通 审校）

**BACKGROUND:** This analysis summarized Cochrane reviews that assess the effects of neuraxial anesthesia on perioperative rates of death, chest infections, and myocardial infarction.

**METHODS:** A search was performed in the Cochrane Database of Systematic Reviews on July 13, 2012. We have included all Cochrane systematic reviews that examined subjects of any age undergoing any type of surgical (open or endoscopic) procedure, compared neuraxial anesthesia to general anesthesia alone for the surgical anesthesia, or neuraxial anesthesia plus general anesthesia to general anesthesia alone for the surgical anesthesia, and included death, chest infections, myocardial infarction, and/or serious adverse events as outcomes. Studies included in these reviews were selected on the same criteria.

**RESULTS:** Nine Cochrane reviews were selected for this overview. Their scores on the Overview Quality Assessment Questionnaire varied from 4 to 6 of a maximal possible score of 7. Compared with general anesthesia, neuraxial anesthesia reduced the 0- to-30-day mortality (risk ratio [RR] 0.71; 95% confidence interval [CI], 0.53-0.94; I = 0%) based on 20 studies that included 3006 participants. Neuraxial anesthesia also decreased the risk of pneumonia (RR 0.45; 95% CI, 0.26-0.79; I = 0%) based on 5 studies that included 400 participants. No difference was detected in the risk of myocardial infarction between the 2 techniques (RR 1.17; 95% CI, 0.57-2.37; I = 0%) based on 6 studies with 849 participants. Compared with general anesthesia alone, adding neuraxial anesthesia to general anesthesia did not affect the 0- to-30-day mortality (RR 1.07; 95% CI, 0.76-1.51; I = 0%) based on 18 studies with 3228 participants. No difference was detected in the risk of myocardial infarction between combined neuraxial anesthesia-general anesthesia and general anesthesia alone (RR 0.69; 95% CI, 0.44-1.09; I = 0%) based on 8 studies that included 1580 participants. Adding a neuraxial anesthesia to general anesthesia reduced the risk of pneumonia (RR 0.69; 95% CI, 0.49-0.98; I = 9%) after adjustment for publication bias and based on 9 studies that included 2433 participants. The quality of the evidence was judged as moderate for all 6 comparisons. The quality of the reporting score of complications related to neuraxial blocks was 9 (4 to 12 [median {range}]) for a possible maximum score of 14.

**CONCLUSIONS:** Compared with general anesthesia, neuraxial anesthesia may reduce the 0-to-30-day mortality for patients undergoing a surgery with an intermediate-to-high cardiac risk (level of evidence moderate). Large randomized

controlled trials on the difference in death and major outcomes between regional and general anesthesia are required.