Table of Contents

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CARDIOVASCULAR ANESTHESIOLOGY:

术后认知功能障碍对绝经妇女心脏手术后 6 月生活质量的影

The Role of Postoperative Neurocognitive Dysfunction on Quality of Life for Postmenopausal Women 6 Months After Cardiac Surgery

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背景：妇女心脏手术后易于产生神经系统并发症。作者以前报导过术前用神经保护剂类固醇 17β-雌二醇,术后 4-6 周仍不能改善老年妇女认知功能。在此项研究中，作者评估了绝经妇女心脏手术早期术后认知功能障碍对术后 6 月生活质量的影响，并评估术前给予 17β-雌二醇是否具有治疗作用。

方法：174 名绝经妇女从手术前一天开始到术后第 5 天随机、双盲给予 17β-雌二醇或安慰剂。分别于术前、4-6 周、术后 6 个月对患者进行一组标准的心理测试。用 SF-36 问卷法和 Lawton 日常生活能力量表评价基线水平和术后 6 月的生活质量。

结果：108 名妇女获取有用资料，其中 13%患者发生术后认知功能障碍。依据多因素回归分析，术后 4-6 周认知缺陷预示 SF-36 部分评分较低($P = 0.004$)，并且术后 6 月 Lawton 日常生活能力量表评分较低($P = 0.015$)。用 17β-雌二醇治疗($P = 0.003$) 和吸烟($P = 0.015$)者 SF-36 精神健康部分更差。术前评分较低与各种方式测量的术后生活质量差非常相关。

结论：术后认知功能障碍与妇女心脏手术后生活质量受损有关。术前用 17β-雌二醇治疗对术后生活质量的改善没有益处。术前自评的健康状态低和术后自评的健康状态也低的关系表明，绝经妇女生活质量没有随心脏手术而改善。
（赵燕星 译 陈杰 校）

BACKGROUND: Women are prone to neurological complications after cardiac surgery. We have previously reported that treatment perioperatively with the neuroprotectant steroid 17β-estradiol did not improve neurocognitive end-points 4 to 6 wk after surgery for elderly women. In this study, we evaluated the influence of early postoperative neurocognitive dysfunction on quality of life in postmenopausal women undergoing cardiac surgery and whether it is impacted by perioperative 17β-estradiol treatment.
METHODS: One hundred seventy-four postmenopausal women randomly received 17β-estradiol or placebo in a double-blind manner beginning the day before surgery and continued until the fifth postoperative day. The patients underwent psychometric testing using a standard battery before surgery and again 4 to 6 wk and 6 mo postoperatively. Quality of life was assessed at baseline and 6 mo after surgery with the SF-36 questionnaire and the Lawton instrumental activities of daily living scale.
RESULTS: Complete data were available from 108 women of whom 13% demonstrated postoperative neurocognitive dysfunction. Based on multiple logistic regression analysis, a neurocognitive deficit 4 to 6 wk after surgery was an independent predictor of a lower SF-36 physical component score ($P = 0.004$) and lower Lawton instrumental activities of daily living scale 6 mo postoperatively ($P = 0.026$). Treatment with 17β-estradiol ($P = 0.003$) and smoking status ($P = 0.015$) were predictors of worse SF-36 mental health component rating. Preoperative lower scores were independently associated with low quality of life postoperatively for all measurements.
CONCLUSIONS: Postoperative neurocognitive dysfunction is associated with impaired quality of life in women after cardiac surgery. Perioperative treatment with 17β-estradiol provides no benefits to postoperative quality of life. The relationship between low preoperative and postoperative self-rated health status suggests that some aspects of quality of life in postmenopausal women are not amenable to improvements with cardiac surgery.

对女性缺血性心脏病病理生理学的最新认识导致在围术期管理上发生变化：一个核心综述

Newly Appreciated Pathophysiology of Ischemic Heart Disease in Women Mandates Changes in Perioperative Management: A Core Review (Review Article)

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男性和女性在病理生理学上相似的假设使得女性患者在临床上常常根据男性患者的标准来评估和治疗。然而文献中有越来越多的证据表明，除生殖系统外，男性和女性还存在其它基本的生理上的差异。这些差异在青春期以后很快体现出来并随年龄增长而变得更显著。体重、容量和肝肾代谢上的差异成为常用心血管药物疗效和副作用不同的原因。女性冠状动脉更细，心脏舒张功能障碍更常发生，冠脉疾病症状

不典型，血管重建术后效果不及男性。另外女性心动周期较男性短，更容易出现心律失常并且对抗心律失常药的反应存在个体差异。评估了非心脏手术后药理学心肌保护的作用或结果的大多数流行病学研究不是仅对男性患者研究，就是没有将女性患者单独分组做研究。最近研究表明冠脉痉挛可能是女性急性心肌缺血的主要原因。这也正解释了女性患者对常规心肌灌注试验敏感性和特异性不佳的原因。考虑到所有的这些证据，已很有必要基于性别来考虑手术风险分层。而这个探讨也会引起当前患者管理日常规范的调整。

（邱郁薇 译 马皓琳 李士通 校）

The assumption that males and females are physiologically similar has led to females being clinically evaluated and treated as males. However, there is growing evidence in the literature that, other than the reproductive system, there are other fundamental physiological differences between the two genders. The manifestation of these differences starts soon after puberty and becomes more pronounced with age. The differences in body mass and volume and renal and liver metabolism account for the difference in therapeutic efficacy and side effects of commonly used cardiovascular drugs. Women have smaller coronary arteries, more frequent diastolic dysfunction, present with vague symptoms of coronary artery disease and do worse than men after revascularization procedures. Women also have a shorter cardiac cycle and are more prone to develop arrhythmias and react differently to antiarrhythmic drugs. Most epidemiological trials that have assessed the utility of pharmacological myocardial protection or outcomes after noncardiac surgery have either been performed on men only or women were not identified as a separate group. Recent evidence is suggestive that coronary vasospasm may be the dominant etiology of acute myocardial ischemia in women. This may explain the poor sensitivity and specificity of the routine myocardial perfusion tests. Having considered all this evidence, it has become very essential to view the operative risk stratification as being gender-based. This approach may involve a shift in our present day paradigm of patient management.

动态监测和控制血糖在心脏手术中是有效的，可行的，安全的

Dynamic Tight Glycemic Control During and After Cardiac Surgery Is Effective, Feasible, and Safe

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背景：严密的血糖监测有助于减少危重病人的发病率和死亡率，但是，心脏手术当中的血糖监测经常很困难，且有低血糖的危险。在本项研究中，我们就一份胰岛素治疗的运算法则（Aalst 血糖胰岛素运算法则)评估在心脏手术中及在 ICU 中，将目标血糖控制在 80－110 mg/dL 的安全性和有效性。

方法：我们收集了进行体外循环的心脏手术的 483 例非糖尿病病人及 168 例糖尿病病人的资料。对手术期间的胰岛素需要和敏感性进行快速预测，我们用表格表现

血糖和胰岛素用量的关系，用排来表示血糖范围，用列来表示根据患者的胰岛素敏感性得出的胰岛素剂量。根据血糖的水平和胰岛素的敏感度调整胰岛素的剂量（例如，在体外循环时降低敏感性，术后正常化）。

结果：总共测量了 18893 个术中及术后血糖。手术中，非糖尿病病人的平均血糖在目标血糖范围中，除了体外循环时（112 ± 17 mg/dL）及复温时(113 ± 19 mg/dL)。在糖尿病病人，血糖由麻醉诱导时的 121 ± 40 mg/dL，降至手术结束时的 112 ± 26 mg/dL（P < 0.05)，52.9%的病人达到目标血糖。在 ICU，平均血糖水平均在目标血糖范围，除了糖尿病病人刚进入 ICU 时(113 ± 24 mg/dL)。在所有的血糖监测中（术中及 ICU 中）68.0%的病人在目标血糖范围，0.12% 的非糖尿病病人和 0.18% 糖尿病病人低于 60 mg/dL. 血糖低于 50 mg/dL 在所有病人中被避免，但还是有四个病人(0.6%)发生低血糖(40 mg/dL 时观测到的最低值).

结论：Aalst 血糖胰岛素运算法则对于严密监测心脏手术期间的血糖是有效的，而且可以将低血糖的危险性降到最低。

（胡艳译　　薛张刚校）

BACKGROUND: Tight blood glucose control reduces mortality and morbidity in critically ill patients, but intraoperative glucose control during cardiac surgery is often difficult, and risks hypoglycemia. In this study, we evaluated the safety and efficacy of a nurse-driven insulin protocol (the Aalst Glycemia Insulin Protocol) for achieving a target glucose level of 80–110 mg/dL during cardiac surgery and in the intensive care unit (ICU).

METHODS: We included 483 nondiabetics and 168 diabetics scheduled for cardiac surgery with cardiopulmonary bypass. To anticipate rapid perioperative changes in insulin requirement and/or sensitivity during surgery, we developed a dynamic algorithm presented in tabular form, with rows representing blood glucose ranges and columns representing insulin dosages based on the patients' insulin sensitivity. The algorithm adjusts insulin dosage based on blood glucose level and the projected insulin sensitivity (e.g., reduced sensitivity during cardiopulmonary bypass and normalizing sensitivity after surgery).

RESULTS: A total of 18,893 blood glucose measurements were made during and after surgery. During surgery, the mean glucose level in nondiabetic patients was within targeted levels except during (112 ± 17 mg/dL) and after rewarming (113 ± 19 mg/dL) on cardiopulmonary bypass. In diabetics, blood glucose was decreased from 121 ± 40 mg/dL at anesthesia induction to 112 ± 26 mg/dL at the end of surgery (P < 0.05), with 52.9% of patients achieving the target. In the ICU, the mean glucose level was within targeted range at all time points, except for diabetics upon ICU arrival (113 ± 24 mg/dL). Of all blood glucose measurements (operating room and ICU), 68.0% were within the target, with 0.12% of measurements in nondiabetics and 0.18% in diabetics below 60 mg/dL. Hypoglycemia < 50 mg/dL was avoided in all but four (0.6%) patients (40 mg/dL was the lowest observed value).

CONCLUSIONS: The Aalst Glycemia Insulin Protocol is effective for maintaining tight perioperative blood glucose control during cardiac surgery with minimal risk of hypoglycemia.

心脏手术后急性高血压的治疗：氯维地平的治疗效应-2（ESCAPE-2），一项随机双盲安慰剂对照研究

Treatment of Acute Postoperative Hypertension in Cardiac Surgery Patients: An Efficacy Study of Clevidipine Assessing Its Postoperative Antihypertensive Effect in Cardiac Surgery-2 (ESCAPE-2), a Randomized, Double-Blind, Placebo-Controlled Trial.

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背景：术后急性高血压是心脏手术后常见的并发症，且与术后其它并发症的发生密切相关。氯维地平，一超短效第三代二氢吡啶类钙离子拮抗剂具有血管选择性，特异性扩张动脉，从而降低动脉压且无负性肌力作用。在此项随机、双盲、安慰剂对照的试验中作者研究了氯维地平治疗心脏手术术后高血压的效能和安全性。

方法：206 名进行心脏手术的患者随机分组。其中 110 名符合研究标准（术后 4hSBP□140mmHg，且血压需要下降 15%以上）。给予患者注射氯维地平（0.4-0.8ug.kg-1.min-1）或 20%乳剂（安慰剂）30min-1h，除非治疗无效。试验的终点时治疗失败。治疗失败定义为 SBP 无法从基线下降 15%或用药开始后 30min 内无法继续研究。

结果：氯维地平与安慰剂相比治疗失败的发生率显著较低 [8.2% vs79.6%，P<0.001]。氯维地平治疗组治疗的成功率达 91.8%。达到目标 SBP 的中位时间为 5.3min(95%可信区间为 4-7min)。心率没有显著增快。两组的不良事件发生率相似。

结论：氯维地平能快速有效安全地治疗心脏手术后急性高血压。

（潘方立 译 陈杰 校）

BACKGROUND: Acute postoperative hypertension is a well-known complication of cardiac surgery and is associated with postoperative morbidity. Clevidipine, an ultrashort-acting, third-generation dihydropyridine calcium channel blocker, exerts vascular-selective, arterial-specific vasodilation to decrease arterial blood pressure without negatively impacting cardiac function. In this double-blind, placebo-controlled trial, we examined the efficacy and safety of clevidipine in treating postoperative hypertension in cardiac surgery patients.

METHODS: Two hundred six patients undergoing cardiac surgery were randomized preoperatively. Of these, 110 met postrandomization inclusion criteria for the study

[systolic blood pressure (SBP) ≥140 mm Hg within 4 h of admission to a postoperative setting, and clinically assessed as needing SBP reduction by ≥15% from baseline]. Patients received an infusion of either clevidipine (0.4–8.0 μg kg^{-1} min^{-1}) or 20% lipid emulsion (placebo) for 30 min to a maximum of 1 h unless treatment failure occurred sooner. The primary end point was the incidence of treatment failure, defined as the inability to decrease SBP by ≥15% from baseline, or the discontinuation of study treatment for any reason within the 30-min period after study drug initiation.
RESULTS: Clevidipine-treated patients had a significantly lower incidence of treatment failure than placebo patients [8.2% (5 of 61) vs 79.6% (39 of 49), $P < 0.0001$]. Treatment success was achieved in 91.8% of clevidipine-treated patients. Median time to target SBP with clevidipine was 5.3 min (95% confidence interval, 4–7 min). No clinically significant increase in heart rate from baseline was observed. Adverse event rates were similar for both treatment groups.
CONCLUSIONS: Clevidipine is effective and safe in the rapid treatment of acute postoperative hypertension after cardiac surgery.

PEDIATRIC ANESTHESIOLOGY:

术后接受由代理人进行的病人自控镇痛或者病人自控镇痛的儿童的不良事件的发生率和危险因素

The Prevalence of and Risk Factors for Adverse Events in Children Receiving Patient-Controlled Analgesia by Proxy or Patient-Controlled Analgesia After Surgery

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Anesth Analg 2008; 107:70-75

背景：最近的报导强调与由代理人进行的病人自控镇痛(PCA-P)相关的危险，然而在儿童中关于这些危险的资料仍然很少。我们比较了接受 PCA-P 和 PCA 的儿童有临床意义的不良事件的发生率，并且找出使儿童处于高风险的因素。
方法：回顾术后接受 PCA 或者 PCA-P 的未使用过阿片类药物的儿童（年龄在刚出生到 18 岁之间）的记录。数据包括一般情况、合并症、围手术期情况、疼痛、镇静和呼吸系统评价、氧饱和度、镇痛药、不良后果和干预措施。
结果：本研究中的 145 名儿童接受 PCA－P，另外 157 名儿童接受 PCA。PCA-P 组年龄更小且存在更多的合并症($P < 0.05$)。阿片类药物的医嘱是相似的，但在 PCA-P 组疼痛评分和阿片类药物的剂量较低，且较少的儿童接受地西泮($P < 0.05$)。有临床意义的不良事件（即需要干预措施的不良事件）在 PCA-P 组和 PCA 组的发生率分别为 22％和 24％；然而在 PCA 组有较多的儿童发生“临界事件”（需要较小的干预），在 PCA-P 组有较多的儿童发生“解救事件”（阿片类药物逆转或者提高监护

级别）。呼吸系统不良事件在 PCA-P 组较早发生($P < 0.05$)。与不良事件相关的因素包括骨科手术、认识障碍、呼吸系统合并症、连续背景阿片类药物输注、地西泮的使用以及在第 1、2、3 天给予较大剂量的阿片类药物。然而，只有认知障碍和第 1 天的阿片类药物使用剂量是独立预测这些事件的因素。

结论：本研究发现，虽然有较多的接受 PCA 或者 PCA-P 的儿童发生不良事件，但两组的发生率却没有差别。PCA-P 组有发生需要解救干预的不良事件的较高风险，其原因可能是其潜在的合并症。这些发现强调了仔细监护的需要，以便早期识别和及时干预呼吸抑制。

（吴进 译　马皓琳 李士通 校）

BACKGROUND: Recent reports emphasize the risks associated with patient-controlled analgesia by proxy (PCA-P), yet data regarding such risks in children remain sparse. We compared the prevalence of clinically significant adverse events in children receiving PCA-P versus PCA, and examined factors that place children at increased risk.

METHODS: The records were reviewed of opioid-naïve children, ages birth to 18 yr, who received PCA or PCA-P after surgery. Data included demographics, comorbidities, perioperative information, pain, sedation, and respiratory assessments, oxygen saturation, analgesics, adverse outcomes, and interventions.

RESULTS: This study included 145 children who received PCA-P and 157 PCA. The PCA-P group was younger and had more comorbidities ($P < 0.05$). Opioid orders were similar, but pain scores and opioid dosages were lower, and fewer children received diazepam in the PCA-P group ($P < 0.05$). Clinically significant adverse events (i.e., those requiring intervention) occurred in 22% and 24% of patients in the PCA-P and PCA groups, respectively; however, more children in the PCA group had "threshold events" (minor intervention) and more in the PCA-P group had "rescue events" (opioid reversal or escalation of level of care). Respiratory events occurred earlier in the PCA-P group ($P < 0.05$). Factors associated with adverse events included orthopedic surgery, cognitive impairment, respiratory comorbidity, use of continuous basal opioid infusion, use of diazepam, and larger opioid doses on days 1, 2, and 3. Yet, cognitive impairment and opioid dose on day 1 were the only factors independently predictive of these events.

CONCLUSIONS: This study found that although a significant number of children receiving PCA and PCA-P experienced adverse events, there was no difference in the prevalence between groups. The PCA-P group was at greater risk for events requiring rescue interventions, perhaps due to the prevalence of underlying comorbidities. These findings emphasize the need for vigilant monitoring to facilitate early recognition and timely intervention of respiratory depression.

AMBULATORY ANESTHESIOLOGY:

麻醉过程中听音乐不能减低获得特定脑电双频谱指数所需的七氟烷浓度

Listening to Music During Anesthesia Does Not Reduce the Sevoflurane Concentration Needed to Maintain a Constant Bispectral Index

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Anesth Analg 2008 107: 77-80.

背景：音乐可减低清醒受试者的应激反应。但治疗性应用音乐在全麻和术后苏醒中的角色仍有争议。因此我们测试了如下假设：腹腔镜手术中暴露于平和音乐能减低维持 50 左右的脑电双频谱指数(BIS)所需的呼末七氟烷浓度(ETSevo)。
方法：选取 40 名年龄在 40－60 岁间，ASA Ⅰ－Ⅱ级,拟行全麻下腹腔镜疝修补或胆囊切除术的患者。所有患者均行 BIS 检测。以芬太尼 2 μg/kg，七氟烷混合于氧气中，罗库溴铵(0.6 mg/kg)诱导；以七氟烷混合于氧气和 50%氧化亚氮中，持续输注芬太尼(1 μg • kg－1 • h－1)维持麻醉。整个过程中通过维持 50 左右的 BIS 滴定七氟烷。患者被随机指定是否听音乐。
结果：维持 50 左右的 BIS 所需的 ETSevo 在听音乐组(1.29 ± 0.33%)和不听音乐组(1.27 ± 0.33%, P = 0.84)实际相同。听音乐组患者诉痛感稍轻，但差异在统计学上无意义。听音乐组(101 ± 11 mm Hg)较不听音乐组(94 ± 10 mm Hg, P = 0.040)平均动脉压略高。
结论：行腹腔镜胆囊切除术维持 50 左右的 BIS 所需的 ETSevo 在暴露和非暴露于音乐的患者间实际相同。尽管先前的研究表明音乐能减轻术前应激且有助于镇静，但本试验结果并不支持术中使用音乐。
（黄凝译　薛张纲校）

BACKGROUND: Music reduces stress responses in awake subjects. However, there remains controversy about the role of music or therapeutic suggestions during general anesthesia and postoperative recovery. We thus tested the hypothesis that intraoperative exposure to soothing music reduces the end-tidal concentration of sevoflurane (ETSevo) necessary to maintain bispectral index (BIS) near 50 during laparoscopic surgery.
METHODS: Forty patients, aged 40–60 yrs, ASA I and II, undergoing laparoscopic hernias or cholecystectomy under general anesthesia were studied. All patients were connected to a BIS monitor. Anesthesia was induced with fentanyl 2 μg/kg, sevoflurane in oxygen, rocuronium (0.6 mg/kg), and maintained with sevoflurane in oxygen and 50% nitrous oxide, with an infusion of fentanyl (1 μg • kg–1 • h–1). Sevoflurane was titrated to maintain BIS near 50 throughout the procedure. Patients were randomly assigned to either listen to music or not.
RESULTS: The ETSevo necessary to maintain a BIS near 50 was virtually identical in patients who listened to music (1.29 ± 0.33%) and those who did not (1.27 ± 0.33%, P = 0.84). Patients who listened to music reported slightly less pain, but the difference was not statistically significant. Mean arterial blood pressure was slightly higher in patients who listened to music (101 ± 11 mm Hg) than in those who did not (94 ± 10 mm Hg, P = 0.040).
CONCLUSIONS: The end-tidal concentration of sevoflurane required to maintain BIS near 50 during laparoscopic cholecystectomy was virtually identical in patients exposed

to music or not. Although previous work suggests that music reduces preoperative stress and may be useful during sedation, our results do not support the use of music during surgery.

ANESTHETIC PHARMACOLOGY:

阿片类药物性别特异性反应：动物和人体研究综述

Sex-Specific Responses to Opiates: Animal and Human Studies (Review Article)

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Anesth Analg 2008 107: 83-95.

摘要：很多研究报导显示作用于μ，κ，δ阿片受体的镇痛药物在雄性和雌性动物的效应有量和质的差异。这种性别差异不仅局限于阿片类药物的镇痛和抗伤害特性方面，而且也表现在负反应方面。如对呼吸、运动能力、学习记忆和成瘾的影响以及对心血管系统的作用。尽管性别与阿片药物镇痛作用有关，但是越来越多用于直接测定此方面影响的动物和人体对照研究表明性别差异的特异和强度依赖于多种相互作用的因素。包括药物本身的特异性，比如剂量、药理活性、给药途径和时间和个体的差异，比如种群、疼痛类型、基因遗传、年龄及激素水平。本文将系统列举这些具体研究并探讨其相互影响因素。虽已观察到阿片药物的性别差异，但尚缺乏其它因素参与阿片类药物镇痛敏感性差异方面的知识，这就需要临床从业人员根据个体需要实行个体化的剂量方案。
（蒋宗明译 薛张纲校）
It is widely reported that analgesic drugs acting at μ, [kappa], and [delta] opioid-receptors display quantitative and qualitative differences in effect in males and females. These sex-related differences are not restricted to the analgesic/antinociceptive properties of opioids, but are also present in opioid-induced side effects, such as changes in respiration, locomotor activity, learning/memory, addiction, and changes in the cardiovascular system. An increasing number of well-controlled animal and human studies directly examining the issue of sex in the potency of opioids show that, although sex may affect opioid analgesia, the direction and magnitude of sex differences depend on many interacting variables. These include those specific to the drug itself, such as dose, pharmacology, and route and time of administration, and those particular to the subject, such as species, type of pain, genetics, age, and gonadal/hormonal status. In the current review, we systematically present these animal and human studies and discuss the data in relation to the depending variables. Although the observed sex differences in opioid effect may be clinically relevant, lack of knowledge on other factors involved in the large variability in patient opioid analgesic sensitivity should compel practitioners to customize their dosing regimens based on individual requirements.

右美托咪啶通过α-2A 肾上腺素受体来增强利多卡因局麻作用

Dexmedetomidine Enhances the Local Anesthetic Action of Lidocaine via an -2A Adrenoceptor **(Review Article)**

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Anesth Analg 2008; 107:96-101

背景：可乐定为α-2 肾上腺素受体激动剂，是中枢和外周阻滞的常用辅助药物。右美托咪啶是高选择性α-2 肾上腺素受体激动剂，也能够增强中枢神经阻滞作用。但是它的外周作用还不能完全阐明。因此，我们研究了右美托咪啶和其它α-2 肾上腺素受体激动剂对外周利多卡因局麻作用的影响，并探讨相关的机制。

方法：α-2 肾上腺素受体激动剂包括右美托咪啶、可乐定和羟甲唑啉，分别与利多卡因一起在雄性豚鼠背部进行皮内注射。每隔 5 分钟进行 6 下针刺试验直到注射后 60 分钟。将在 60 分钟的时间内对针刺无反应的次数相加，总和就当作表明局麻程度的麻醉得分。每组中与对照值的差别，先用方差分析再用由此的 Dennett's 检验来分析。此外，我们评估了育亨宾（一种α-2A、2B 和 2C 肾上腺素受体拮抗剂）或呱唑嗪（一种α-1、α-2B 和 2C 肾上腺素受体拮抗剂）对右旋美托咪啶效应的拮抗作用，用双因素方差分析进行分析。

结果：所有的α-2 肾上腺素受体激动剂都以剂量依赖性的方式增强利多卡因的局麻作用的程度。此外，育亨宾抑制右旋美托咪啶的效应，而呱唑嗪不抑制。

结论：我们证明了α-2 肾上腺素受体激动剂能够增强利多卡因的局麻作用，且提示右旋美托咪啶通过α-2A 肾上腺素受体起作用。

（唐亮 译　马皓琳 李士通 校）

BACKGROUND: Clonidine, an α-2 adrenoceptor agonist, is a common adjunct in both central and peripheral blocks. Dexmedetomidine, a more selective α-2 adrenoceptor agonist, is also known to enhance central neural blockades. Its peripheral effect, however, has not been fully elucidated. Thus, we evaluated the effect of dexmedetomidine and other α-2 adrenoceptor agonists on the local anesthetic action of lidocaine at the periphery and explored the mechanism involved.

METHODS: α-2 Adrenoceptor agonists, including dexmedetomidine, clonidine, and oxymetazoline, combined with lidocaine were intracutaneously injected into the back of male guinea pigs. The test of six pinpricks was applied every 5 min until 60 min after the injection. The number of times which the prick failed to elicit a response during the 60-min period was added and the sum served as an anesthetic score indicating the degree of local anesthesia. Differences from the control value within the group were analyzed using an analysis of variance followed by a post hoc Dunnett's test. Furthermore, we evaluated the antagonism of the effect of dexmedetomidine by yohimbine, an α-2A, 2B, and 2C

adrenoceptor antagonist, or prazosin, an α-1, α-2B, and 2C adrenoceptor antagonist, analyzed using a two-way analysis of variance.
RESULTS: All α-2 adrenoceptor agonists enhanced the degree of local anesthesia of lidocaine in a dose-dependent manner. Furthermore, yohimbine inhibited the effect of dexmedetomidine, whereas prazosin did not.
CONCLUSION: We demonstrated that α-2 adrenoceptor agonists enhanced the local anesthetic action of lidocaine, and suggest that dexmedetomidine acts via α-2A adrenoceptors.

9-四氢大麻醇对小鼠异丙酚麻醉效果的减弱作用

Propofol Sedation Is Reduced by 9-Tetrahydrocannabinol in Mice

(Review Article)

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Anesth Analg 2008 107: 102-106.

背景：9-四氢大麻醇(9-THC)可产生镇痛作用并改变警觉性。有报导显示异丙酚可增加脑内的内源性大麻醇的含量，但 9-THC 对异丙酚麻醉效果的影响作用还属未知。因此我们的研究目标即是探究出 9-THC 和异丙酚之间，在镇静及镇痛效果上的相互作用。
方法：我们用转棒仪来监测麻醉的镇静效果，再用甩尾潜伏期法来监测镇痛效果。在制定好各种药物的基准值后，我们对以 20 只小鼠为一组，各组分别经腹腔注射 50 mg/kg 的 9-THC 和 50、75 及 100 mg/kg 的异丙酚。而对照组的小鼠则予注射 9-THC 和戊硫代巴比妥或英特利匹特。
结果：根据转棒仪，腹腔注射 50 mg/kg 异丙酚的小鼠很快即进入麻醉镇静状态，其所需最短时间为 24s。单独注射 50 mg/kg 的 9-THC 并没有麻醉镇静作用。但 9-THC 却显著减小了异丙酚的麻醉镇静作用，将其转棒仪至少延长到了 60s($P < 0.001$)。而在合用 9-THC 的情况下，将异丙酚的用量增加至 100 mg/kg，根据转棒仪，其诱导时间又恢复至 27s。同样，在合用 9-THC 的情况下，戊硫代巴比妥的麻醉镇静作用也有着显著的减弱($P < 0.01$)。
结论：以上结果显示，在 9-THC 和异丙酚之间存在着剂量依赖性的拮抗作用，而在 9-THC 和戊硫代巴比妥之间同样如此。
（刘沁译 薛张纲校）
BACKGROUND: Δ9-Tetrahydrocannabinol (Δ9-THC) induces analgesic effects and alterations of alertness. It has been reported that propofol increases endocannabinoid levels in the brain, but the effects of Δ9-THC on propofol sedation remain unclear. Our aim was to characterize the interaction between Δ9-THC and propofol in terms of sedation and analgesia.

METHODS: Sedation was monitored by a rota-rod and analgesia by tail-flick latencies. Twenty mice received intraperitoneal injections of 50 mg/kg Δ9-THC with 50, 75 and 100 mg/kg propofol after baseline values were established for each drug. Control experiments were performed with Δ9-THC and thiopental or Intralipid.
RESULTS: Injection of 50 mg/kg propofol caused a rapid onset of sedation with a minimum of 24 s on the rota-rod. Fifty mg/kg Δ9-THC alone had no sedative effects. Administration of Δ9-THC significantly reduced the sedative effect of propofol to at least 60 s on the rota-rod ($P < 0.001$). After increasing the propofol dose to 100 mg/kg in the presence of Δ9-THC, sedation was re-established with 27 s on the rota-rod. Thiopental sedation was significantly reduced ($P < 0.01$) in the presence of Δ9-THC.
CONCLUSION: The results indicate a dose-dependent antagonistic interaction between Δ9-THC and propofol, and also between Δ9-THC and thiopental.

芬太尼样阿片类药物与氢化吗啡酮对人类 5-HT_{3A}受体的作用

The Effects of Fentanyl-Like Opioids and Hydromorphone on Human 5-HT_{3A} Receptors (Review Article)

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Anesth Analg 2008 107: 107-112.

背景:5-HT_{3A}受体有多重生理作用，如调制呕吐。5-HT_{3A}拮抗剂在临床上广泛用于强力止吐。呕吐是阿片类镇痛药的不良反应之一。然而,有趣的是,天然的阿片类药物吗啡在临床使用浓度下就能与人类 5-HT_{3A}受体相互作用。在本项试验中,作者研究了结构不一的阿片类药物是否具有共同效应。研究的药物包括:吗啡衍生物(菲型)氢化吗啡酮,芬太尼及其衍生物(4-甲氧羰基型).
方法:人胚肾 293 细胞配型的全细胞,导入人类 5-HT_{3A}受体 cDNA,通过膜片钳(电压钳)技术来检测阿片类药物对 5-HT(3 μM)诱导电流的影响.
结果:阿片类衍生物在临床使用的纳米摩尔浓度范围内(IC_{50}值 >30 μM)对通过 5-HT_{3A}受体的电流没有显著影响。与此相反,氢化吗啡酮对其影响相对较显著(IC_{50} = 5.3 μM)。与吗啡相似，它显著削弱了电流的活化和脱敏动力学.在高于临床使用浓度,但在 Meyer-Overton 相关性为非特异性相互作用推荐的浓度范围内，芬太尼衍生物都会产生对电流振幅的抑制作用,但是对人类 5-HT_{3A}受体的活化和脱敏动力学却有相反的作用效果.
结论:只有吗啡和氢化吗啡酮,在接近临床使用浓度时,可以减小 5-HT-诱导电流的振幅,削弱电流的动力学,而芬太尼衍生物没有这种作用效果。高效能的吗啡和氢化吗啡酮,相比亲脂性的衍生物,与 5-HT_{3A}受体有特异性的相互作用。而芬太尼样阿片类药物与之相互作用却是非特异性的。因为阿片类药物作用于人类 5-HT_{3A}受体的效能序列与作用于阿片受体的效能序列是相反,作用位点与阿片受体结合位点的结构不同。最近对于各种酚类的研究也支持:酚类的-OH 基团(吗啡和氢化吗啡酮都有)

可能参与了吗啡和氢化吗啡酮与人类 5-HT_{3A}受体的特异性作用。将来需要更多的临床研究探究不同类阿片类药物引起的呕吐是否具有相关性.

（杜唯佳 译 陈杰 校）

BACKGROUND: 5-HT_3 receptors are involved in various physiologic functions, including the modulation of emesis. 5-HT_3 antagonists are clinically widely used as potent antiemetics. Emesis is also a side effect of opioid analgesics. Intriguingly, the natural opioid morphine shows specific interactions with human 5-HT_3 receptors at clinically relevant concentrations. In the present study, we investigated whether this is a general effect of opioids, even when they are structurally diverse. Therefore, another morphine (phenanthrene-type) derivative, hydromorphone, and fentanyl including its (4-anilinopiperidine-type) derivatives were tested.

METHODS: Whole-cell patches from human embryonic kidney-293 cells, stably transfected with the human 5-HT_{3A} receptor cDNA, were used to determine the opioid effects on the 5-HT (3 μM)-induced currents using the patch clamp technique (voltage-clamp).

RESULTS: None of the fentanyl derivatives affected currents through the 5-HT_{3A} receptor (3 μM 5-HT) significantly in the clinically relevant nanomolar concentration range (IC_{50} values >30 μM). In contrast, hydromorphone was considerably more potent (IC_{50} = 5.3 μM), slowing the current activation- and desensitization-kinetics significantly (at 3 μM by a factor of 1.9 and 2.4, respectively), similar to morphine. At concentrations much higher than clinically relevant, but within the range predicted from Meyer-Overton correlations for nonspecific interactions, the fentanyl derivatives all showed at least a tendency to suppress current amplitudes, but they had diverse effects on the activation- and desensitization-kinetics of 5-HT_{3A} receptors.

CONCLUSIONS: Only morphine and hydromorphone, but not the fentanyl derivatives, reduced 5-HT-induced current amplitudes and slowed current kinetics near clinically relevant concentrations. The high potencies of morphine and hydromorphone, when compared to their lipophilicities, suggest a specific interaction with 5-HT_{3A} receptors. In contrast, the effects of fentanyl-type opioids appear to be of unspecific nature. Because the rank order of opioid potencies for human 5-HT_{3A} receptors is opposite of that for opioid receptors, the site involved is structurally different from opioid receptor binding sites. In agreement with recent data on different phenols, a phenolic OH-group (which morphine and hydromorphone possess) may contribute to specific interactions of morphine and hydromorphone with the 5-HT_{3A} receptor. Future clinical studies could test whether corresponding differences in emetogenicity between different classes of opioids will be found.

镰状细胞病患者阿曲库铵起效时间延迟

The Onset Time of Atracurium Is Prolonged in Patients with Sickle Cell Disease

(Brief Report)

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Anesth Analg 2008 107: 113-116.

背景：镰状细胞病患者在人生中常经历手术。一般认为，这些病人的围术期并发症的风险要比其它健康病人高并需要精细的麻醉处理。这些患者因微循环异常和贫血的缘故，麻醉药的药代动力学可能改变。
方法：在这个研究中，作者利用肌电图评估了 13 名镰状细胞病患者和 17 名对照病人给予单次剂量阿曲库铵（0.5mg/kg）的药代动力学。
结果：阿曲库铵的给药和 90%肌颤搐抑制（起效时间）之间的时间在镰状细胞病的病人更长 324±124s,而对照组为 165±36s（P<0.01）。在给予阿曲库铵后 3min 5/13 的镰状细胞病的病人和 1/17 的对照组病人存在不满意插管（P<0.05）。阿曲库铵的作用时间两组相似。TOFR 恢复到 0.9 的时间组建无显著差别（对照组是 101±24min,镰状细胞病人组 93±24min）。
结论：可能因为镰状细胞病人阿曲库铵分布容积增加导致起效时间延迟，但神经肌阻滞时间无差别。结果提示镰状细胞病人应监测神经肌肉阻滞作用而指导气管插管时机。
(胡潇 译 陈杰 校)
BACKGROUND: Patients with sickle cell disease (SCD) frequently undergo surgery during their lifetime. Patients with SCD are considered at greater risk of perioperative complications than otherwise healthy patients and require meticulous anesthetic management. The pharmacodynamics of anesthetics may be altered in patients with SCD due to microcirculatory abnormalities or anemia.
METHODS: In this study, we assessed the pharmacodynamics of a single dose of atracurium (0.5 mg/kg) by mechanomyography in 13 patients with SCD and in 17 control patients.
RESULTS: The time between atracurium administration and 90% twitch height depression (onset time) was longer in SCD patients (mean ± sd) 323 ± 124 s than in controls 165 ± 36 s ($P < 0.01$). Unsatisfactory intubation conditions at 3 min after atracurium administration were observed in 5/13 patients with SCD and 1/17 control patients ($P < 0.05$). The duration of action of atracurium in patients with SCD was similar to that of control patients. The time to spontaneous return of the train-of-four ratio to 0.9 was 101 ± 24 min in control patients and did not differ 93 ± 24 min in patients with SCD.
CONCLUSION: Delayed onset time, together with unchanged duration of the neuromuscular blocking effect of atracurium, may be explained by an increased distribution volume of atracurium in patients with SCD. Our results suggest that monitoring of neuromuscular block may guide the time of tracheal intubation in patients with SCD.

TECHNOLOGY, COMPUTING, AND STIMULATION:

异丙酚－芬太尼麻醉下复合听觉诱发电位指数和脑电双频指数的变异性比较
Variability Comparison of the Composite Auditory Evoked Potential Index and the Bispectral Index During Propofol-Fentanyl Anesthesia

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Anesth Analg 2008; 107:117-124

背景：催眠深度的监测有助于麻醉医生指导麻醉用药。不同监测的施行依赖于一些因素，催眠深度稳态时的指数变异性是其中一种因素。我们比较了最近介绍的AAI1.6和既定的双谱指数（BIS）在异丙酚稳定效应浓度下的指数变异性。
方法：得到伦理委员会同意及患者书面知情同意后，40位病人用异丙酚靶控输注和芬太尼实施麻醉。在预计的异丙酚恒定效应室浓度和恒定手术刺激水平期间计算BIS和AAI1.6的变异性，记作中位数和中位数绝对偏差（MAD）。变异性指数记作1.48×MAD/（阈值－中位数），其中阈值指苏醒和睡眠之间的分界线。用阈值交叉时间来评价预测病人意识恢复的能力。
结果：虽然用MAD计算的绝对变异性基本相似，但是AAI1.6的变异性指数显著较大。用BIS监测时，恢复前需要较早地减浅麻醉，尽管AAI1.6监测时苏醒期的Pk值要显著大于BIS。
结论：与BIS相比，AAI1.6监测时与麻醉期指数中位数和高敏感地发现知晓所需阈值间差异有关的变异性较大。这个与AAI1.6较剧烈的浓度－反应功能一样，使得AAI1.6在异丙酚浓度逐渐减少时不能很好地预测到意识即将恢复。然而，当真正苏醒时，这也使得AAI1.6就很能很适合地发现意识恢复。
（黄佳佳译，马皓琳，李士通校）
BACKGROUND: Monitors of hypnotic depth help anesthesiologists to guide the anesthetic. The performance of different monitors depends on several factors, index variability at a steady state of hypnotic depth being one. We compared the recently introduced AAI1.6 with the established bispectral index (BIS), regarding index variability during stable values of propofol effect-site concentration.
METHODS: After ethics committee approval and written informed consent, anesthesia was performed in 40 patients with propofol as the target controlled infusion and fentanyl. Variability of BIS and AAI1.6 was calculated during periods of constant predicted propofol effect compartment concentration and constant levels of surgical stimulation as the median absolute deviation (MAD) from the median value. A variability index was calculated as 1.48*MAD/(threshold – median value), with threshold being the division line between awake and asleep. Threshold crossing time was used to evaluate the performance in predicting return of consciousness.
RESULTS: Variability index, however, was significantly larger for the AAI1.6, despite similar absolute variability measured as MAD. Lightening of anesthesia before recovery could be noticed earlier using the BIS than the AAI1.6, although consciousness was detected with a significantly higher Pk-value by the AAI1.6.
CONCLUSION: Variability in relation to the difference between the median index value during anesthesia and the threshold necessary to detect consciousness with high sensitivity is higher for the AAI1.6 than for the BIS. This, as well as the steeper concentration–response function found for AAI1.6, impairs the performance of the AAI1.6 in predicting imminent return of consciousness during decreasing propofol

concentrations. However, it makes AAI1.6 well suited to detect consciousness when it has occurred.

对极低体重儿血氧饱和度（SpO2）/经皮二氧化碳分压(PtcCO2)联合监测新技术的评估

An Evaluation of a New Combined Spo_2/$PtcCO_2$ Sensor in Very Low Birth Weight Infants (Technical Communication)

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Anesth Analg 2008 107: 125-129.Abstract

背景：最近一款同时检测血氧饱和度（SpO2）和经皮二氧化碳分压(PtcCO2) 的传感器（TOSCA 500Radiometer America Inc）推出市场。而笔者设计这一实验来检测 TOSCA 在极低体重的新生儿（<=1500g）上使用时的有效性及可靠性。
方法：选择 22 名新生儿，将 TOSCA 放置于耳廓进行监测。同时采用目前临床使用的脉搏血氧饱和度仪（HP ;Ohmeda 3740）及经皮二氧化碳分压仪（TINA TCM3 Radiometer,Copenhagen）监测 60min。在第 1min 及第 60min 分别比较 TOSCA（$PtcCO_{2TOSCA}$）、TINA（$PtcCO_2$）与抽取血标本的 Pco_{2EAB}。研究中分别比较 $PtcCO_{2TOSCA}$、$PtcCO_2$ 以及 TOSCA 与血氧饱和度仪获得的 SatO2。相应数据采用 Bland-Altman 分析。
结果：第 1min 与第 60min$PtcCO_2$ 与 Pco_{2EAB} 偏差（精确度）分别为 3.5（12.4）mmHg、2.8（10.2）mmHg，而 Pco_{2EAB} 与 $PtcCO_{2TOSCA}$ 分别为 18.3（30.4）mmHg、1.8（25）mmHg。Bland-Altman 分析结果显示 $PtcCO_2$ 与 $PtcCO_{2TOSCA}$ 之间有良好的的相关性在 7-15 分钟之间。SpO2 与 SpO_{2TOSCA} 间无显著差异。
结论：TOSCA 检测仪可以应用于极低体重新生儿，使用安全简易。脉搏血氧饱和度仪对于逐步氧疗十分有效。用 TOSCA 作为 Pco_2 趋势监测最有用，如果需要精确值还需动脉 Pco_2 检测。
（陶颖莹 译 陈杰 校）

BACKGROUND: Recently, a new sensor for combined assessment of pulse oximetry oxygen saturation (Spo_2) and transcutaneous monitoring of carbon dioxide partial pressure ($PtcCO_2$) has been introduced (TOSCA 500, Radiometer America Inc.). We designed this study to evaluate the usability and reliability of TOSCA in neonates with birth weight ≤1500 g (very low birth weight).
METHODS: In a prospective study of 22 newborns, TOSCA was tested, positioning the sensor on the ear pinna with an adhesive attachment clip. Simultaneous monitoring with TOSCA, conventional pulse oximeter (HP; Datex Ohmeda 3740), and a transcutaneous device (TINA TCM3, Radiometer, Copenhagen) was performed for 60 min. $PtcCO_2$ measurement from TOSCA ($PtcCO_{2TOSCA}$) and TINA ($PtcCO_2$) were compared with Pco_2 from blood samples (PCO_{2EAB}) at 1 and 60 min. During the monitoring period, values of $PtcCO_{2TOSCA}$ were compared with $PtcCO_2$, and $SatO_2$ values from TOSCA with those from a pulse oximeter. Corresponding data were compared using Bland–Altman analysis.

RESULTS: Bias (precision) at 1 min and at 60 min between PCO_{2EAB} and $PtcCO_2$ values were 3.5 (12.4) mm Hg and 2.8 (10.2), respectively, whereas between PCO_{2EAB} and $PtcCO_{2TOSCA}$ values were 18.3 (30.4) mm Hg and 1.8 (25) mm Hg. Bland–Altman analysis shows a better correspondence $PtcCO_2$/$PtcCO_{2TOSCA}$ between 7 and 15 min. No significant differences were found between Spo_2 and SpO_{2TOSCA}.
CONCLUSIONS: The TOSCA monitor is safe and easy to apply in very low birth weight newborns. The pulse oximeter measurements may be useful for titrating oxygen therapy. Pco_2 measurement with TOSCA is most useful as a trend and independent confirmation of arterial Pco_2 is required if an accurate value is needed.

PATIENT SAFETY：

麻醉后恢复室内的残余神经肌肉阻滞和危险的呼吸事件

Residual Neuromuscular Blockade and Critical Respiratory Events in the Postanesthesia Care Unit

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背景：神经肌肉功能的不完全恢复可能会可能会损害肺和上呼吸道的功能，并且导致在麻醉后恢复室内（PACU）发生不良的呼吸事件。本研究的目的是评价和量化 PACU 内有危险的呼吸事件（CREs）体征或症状的病人的神经肌肉阻滞的严重性。
方法：我们收集了一年的资料。PACU 内的护士在病人进入 PACU 后的 15min 内判定其是否有预先定义的 CRE 的表现。应用加速度法肌松监测仪立即得出这些病人的 4 个成串刺激（TOF）的比值。同时也收集了对照组病人的 TOF 的数据，对照组由进行全身麻醉的年龄、性别和手术过程相匹配的处于同一阶段的病人组成。
结果：一年间共有 7459 名接受了全身麻醉，其中 61 名发生了 CRE。这些病人中共有 42 个病例与对照组相匹配，组成了用于统计分析的研究组。在相匹配的病例中，最常见的 CREs 为严重的低氧血症（42 名患者中有 22 名发生，占 52.4%）以及上呼吸道梗阻（42 名中有 15 名发生，占 35.7%）。病例组和匹配对照组在术前和术中的任何测得的数据无明显差异。病例组中 TOFR 的均数（±标准差）为 0.62（±0.20），73.8%的病例的 TOFR 值小于 0.70。相反，对照组中的 TOFR 的值为 0.98（±0.07）（差异为－0.36，而 95%可信区间的差异为－0.43 至 －0.30，P < 0.0001），对照组中没有病人 TOFR 的值小于 0.70（95%可信区间为 59%－85%，P < 0.0001）。
讨论：我们发现在有 CREs 的病人中，严重残余肌松的发生率很高，而在没有 CREs 的对照组病人中没有一例发生。这些发现提示不全的神经肌肉恢复是 PACU 内发生不良呼吸事件的一个重要的起作用的因素。
（黄丽娜 译 马皓琳 李士通 校）

BACKGROUND: Incomplete recovery of neuromuscular function may impair pulmonary and upper airway function and contribute to adverse respiratory events in the postanesthesia care unit (PACU). The aim of this investigation was to assess and quantify the severity of neuromuscular blockade in patients with signs or symptoms of critical respiratory events (CREs) in the PACU.
METHODS: We collected data over a 1-yr period. PACU nurses identified patients with evidence of a predefined CRE during the first 15 min of PACU admission. Train-of-four (TOF) ratios were immediately quantified in these patients using acceleromyography (cases). TOF data were also collected in a control group that consisted of patients undergoing a general anesthetic during the same period who were matched with the cases by age, sex, and surgical procedure.
RESULTS: A total of 7459 patients received a general anesthetic during the 1-yr period, of whom 61 developed a CRE. Forty-two of these cases were matched with controls and constituted the study group for statistical analysis. The most common CREs among matched cases were severe hypoxemia (22 of 42 patients; 52.4%) and upper airway obstruction (15 of 42 patients; 35.7%). There were no significant differences between the cases and matched controls in any measured preoperative or intraoperative variables. Mean (±sd) TOF ratios were 0.62 (±0.20) in the cases, with 73.8% of the cases having TOF ratios <0.70. In contrast, TOF values in the controls were 0.98 (±0.07) (a difference of –0.36 with a 95% confidence interval of –0.43 to –0.30, $P < 0.0001$), and no control patients were observed to have TOF values <0.70 (the 95% confidence interval of the difference was 59%–85%, $P < 0.0001$).
CONCLUSIONS: A high incidence of severe residual blockade was observed in patients with CREs, which was absent in control patients without CREs. These findings suggest that incomplete neuromuscular recovery is an important contributing factor in the development of adverse respiratory events in the PACU.

存在呼吸睡眠暂停综合征的肥胖病人与不存在呼吸睡眠暂停综合征的肥胖病人在腹腔镜术后低氧血症发生率比较

Postoperative Hypoxemia in Morbidly Obese Patients With and Without Obstructive Sleep Apnea Undergoing Laparoscopic Bariatric Surgery

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Anesth Analg 2008 107: 138-143

背景:病态肥胖发生率的增加导致肥胖病人手术的增加.呼吸睡眠暂停综合征在肥胖患者中多见镇静,镇痛等麻醉药会改变通气,使通气受阻,有报导显示即使微量的镇静麻醉药品都会引起其死亡.并且大多人并非很重视这些患者.此项研究将观察由多导睡眠图诊断的呼吸睡眠暂停综合的征肥胖病人与不存在呼吸睡眠暂停综合症的肥胖病人在腹腔镜术后 24 小时内低氧血症发生率比较.
方法:对象为成年人(体重指数 35-75 kg/m2)预定进行腹腔镜手术的患者.术前患者即给予指尖脉氧连续监测.所有对象术前 4 周均进行多导睡眠图测试.应用标准化麻

醉管理,用丙泊芬诱导,丙泊芬与瑞芬术中维持,术后疼痛管理应用患者自控吗啡镇痛每十分钟 1mg.低氧血症的发生以 Spo2 低于多导睡眠图基线>4%且长于 10 分钟.
结果:8 男 32 女入组,一个离组资料.40 名对象中 31 人被诊断为呼吸睡眠暂停综合征.八人夜晚需应用被动正压通气装置,六人术后继续应用.术前呼吸睡眠暂停综合征患者由多导睡眠图分析结果 Spo2 最低及多数窒息指数>10 与无呼吸睡眠暂停综合征患者比较术后 24 小时内氧饱和度在有无氧疗的存在呼吸睡眠暂停综合的征肥胖病人与不存在呼吸睡眠暂停综合征的肥胖病人中无明显区别,低氧血症的发生 Spo2 低于多导睡眠图基线>4%者也无明显区别.
结论:在病态肥胖对象中,在腹腔镜手术后 24 小时内存在呼吸睡眠暂停综合征的肥胖病人术后发生低氧血症的风险并无明显增加。我们的数据显示,尽管进行氧疗肥胖患者无论是否具有呼吸睡眠暂停综合征术后经常平凡发生缺氧,所以建议腹腔镜手术肥胖病人术前评估应包括估计术后低氧血症的发生。
（刘婷洁译 薛张纲校）

INTRODUCTION: The increased incidence of morbid obesity has resulted in an increase of bariatric surgical procedures. Obstructive sleep apnea (OSA) is a commonly encountered comorbidity in morbidly obese patients. Sedatives, analgesics, and anesthetics alter airway tone, and airway obstruction and death have been reported in patients with OSA after minimal doses of sedatives and anesthetics, yet there is a lack of consensus regarding the care of these patients. In this study, we sought to determine whether obese patients with polysomnography-confirmed diagnosis of OSA were at significantly greater risk for postoperative hypoxemic episodes in the first 24 h after laparoscopic bariatric surgery than morbidly obese patients without a diagnosis of OSA.
METHODS: Adult subjects (Body Mass Index, 35–75 kg/m2) scheduled to undergo laparoscopic bariatric surgery were studied. A finger pulse oximetry probe was placed preoperatively and oxygen saturation (Spo2) was recorded continuously. All subjects underwent preoperative polysomnography testing within 4 wk of surgery. Anesthetic management was standardized, using propofol for induction and desflurane and remifentanil for maintenance of anesthesia. Patient-controlled analgesia programmed to deliver morphine, 1 mg. every 10 minutes, was used for pain management postoperatively. Hypoxemic episodes were scored as Spo2 >4% below the polysomnography study baseline and lasting for more than 10 s.
RESULTS: Eight men and 32 women were enrolled and 1 subject had incomplete data. Thirty-one of the 40 subjects had polysomnography-confirmed OSA. Eight subjects used home continuous positive airway pressure devices nightly, and six of these used their device postoperatively. Preoperatively, subjects with OSA had lower nadir Spo2 during the polysomnography study and a larger number had an apnea/hypopnea index >10 episodes per hour compared with the non-OSA group. In the first 24 h postoperatively, there was no difference in the median Spo2 with and without oxygen therapy, between OSA and non-OSA groups.The number of episodes of oxygen desaturation >4% below the polysomnography study baseline value and the mean number of desaturation episodes per hour did not differ between the groups.
CONCLUSIONS: In morbidly obese subjects, in the first 24 h after laparoscopic bariatric surgery, OSA does not seem to increase the risk of postoperative hypoxemia. Our data confirm that morbidly obese subjects, with or without OSA, experience frequent oxygen

desaturation episodes postoperatively, despite supplemental oxygen therapy suggesting that perioperative management strategies in morbidly obese patients undergoing laparoscopic bariatric surgery should include measures to prevent postoperative hypoxemia.

经鼻气管内插管：GlideScope®视频喉镜与直接喉镜的比较

A Comparison of GlideScope® Videolaryngoscopy to Direct Laryngoscopy for Nasotracheal Intubation

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背 景：在这项研究中，作者比较了经鼻气管插管中，以插管时间（TTI）和插管难易性评定直接喉镜(DL)和 glidescope ®视频喉镜(GVL)的效果，。
方 法： 选择 70 名需要经鼻气管插管的患者随机分配进行 DL 或 GVL。 TTI 盲法评估。喉镜操作者事前不知。视觉模拟评分法评定插管难易性。记录插管尝试次数，失败次数，声门等级，出血量，Magill 的使用，术后咽喉痛的严重程度等。
结 果：使用 GVL 的插管时间(43.5 s,[IQR]: 39.8－67.3)比使用 DL 的插管时间(66.7 s, IQR: 53.8－89.9)短了 23.2 秒 ，P=0.0023。使用 GVL 经鼻气管插管难易评分要比 DL 低（VAS 10 mm, IQR: 5.5－18, vs 20 mm, IQR: 10－32, P = 0.0041)。术后中度或严重咽喉痛的发病率在 GVL 组明显减少(9% 对 34%, P = 0.018)。使用 GVL 组声门暴露较好 。GVL 组未使用 Magill 钳。DL 组的 49 %患者使用 Magill 钳（ $P < 0.0001$） 。并发症发生率和严重出血 2 组中相似。
结 论：与直接喉镜相比，GVL 具有显著的优势并大大减少术后咽喉痛的发生。GVL 在常规经鼻气管插管中具有明确的作用。
（张燕 译 陈杰 校）

BACKGROUND: In this study, we compared the effectiveness of direct laryngoscopy (DL) and the GlideScope® videolaryngoscope (GVL) for nasotracheal intubation, as judged by the time to intubation (TTI—the primary outcome) and the ease of intubation.
METHODS: Seventy patients requiring nasotracheal intubation for elective surgery were randomly allocated to intubation with the GVL or DL. TTI was assessed by a blinded observer. Operators were blinded until the start of laryngoscopy. A Visual Analog Scale assessed the ease of intubation. The number of intubation attempts, number of failures, glottic grades, amount of bleeding, usage of Magill forceps, and the severity of postoperative sore throat were recorded.
RESULTS: The median TTI was 23.2 s faster with the GVL (43.5 s, interquartile range [IQR]: 39.8–67.3) than with DL (66.7 s, IQR: 53.8–89.9), P = 0.0023. Nasotracheal intubation was easier with the GVL than with DL (Visual Analog Scale 10 mm, IQR: 5.5–18, vs 20 mm, IQR: 10–32, P = 0.0041). The incidence of postoperative moderate or severe sore throat was significantly reduced in the GVL group (9% vs 34%, P = 0.018). Glottic exposure was significantly better with the GVL. Magill forceps were not used in

the GVL group, but were used 49% of the time in the DL group, $P < 0.0001$. The incidence and severity of bleeding were similar between groups.
CONCLUSIONS: Compared with DL, the GVL has superior performance characteristics when used for nasotracheal intubation and demonstrates an important reduction of postoperative sore throat. The GVL has a clear role in routine nasotracheal intubation.

踝肱血压指数预测非心脏手术后的心脏并发症的风险

The Ankle-to-Arm Blood Pressure Index Predicts Risk of Cardiac Complications After Noncardiac Surgery

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研究背景：已有研究显示通过踝肱血压指数(AAI)下降发现的外周动脉疾病，可预测心脏事件。然而，关于监测 AAI 来预测患者非心脏手术后的心脏并发症的实用性尚不清楚。
方法：在大学附属医院的院前诊室内我们前瞻性、连续性地研究了 242 位□50 岁的择期行非心脏手术的患者。我们对病人施行标准的临床评估，包括：计算校正心脏危险指数(rCRI)及使用触诊及多普勒技术监测 AAI。不知道对术前评估及 AAI 结果的独立的观察者在术后 7 天内查明心脏并发症。 我们使用似然比(LR)、ROC 曲线下面积(AUC)及多自变量的对数回归分析来调整 rCRI 结果，评估用异常的 AAI（≤0.9 或 4 个足部搏动均未触及）来预测术后心脏并发症的能力。
结果：研究对象的年龄中位数为 67 岁，60%为男性，19%患有糖尿病，14%患有缺血性心脏病，35%行腹腔内或胸腔内手术。术后 242 中的 14 位（6%）病人罹患了心脏并发症，但无病人死亡。44 位患者表现出异常的 AAI，其中的 10 位（23%）有术后心脏并发症：正 LR 4.79 (95% 可信区间：3.04－7.54)，负 LR0.34（95%可信区间：0.15－0.77），AUC = 0.80。AAI 与 rCRI 可比性很好，其正 LR4.22（95%可信区间：2.24－7.95），负 LR 0.57 (95%可信区间：0.34－0.96)，AUC = 0.74。在多变量分析中，对于那些 AAI 异常的患者，甚至在调整 rCRI 结果后，其心脏并发症的经调整的比值比为 10.16(95%可信区间： 2.90－36.02)。
结论：异常低的 AAI 表明患有外周动脉疾病，是术后心脏并发症的一个独立危险因素。AAI 的精确性与 rCRI 相似，它为术前心脏危险分层提供了额外的独立预见值。
（裘毅敏译，马皓琳 李士通校）

BACKGROUND: Peripheral arterial disease, as detected by a reduced ankle-to-arm blood pressure index (AAI), has been shown to predict future cardiac events. However,

the utility of measuring the AAI to predict postoperative cardiac complications in patients undergoing noncardiac surgery is unknown.
METHODS: We prospectively studied 242 consecutive patients aged 50 yr or older presenting to a university hospital preadmission clinic before elective noncardiac surgery. We performed a standardized clinical evaluation that included calculation of the revised cardiac risk index (rCRI) and measurement of the AAI using both palpation and Doppler techniques. Independent observers, blinded to preoperative assessment and AAI results, ascertained cardiac complications in the first 7 days after surgery. We assessed the ability of an abnormal AAI (≤0.9 or absence of all four pedal pulses) to predict postoperative cardiac complications using likelihood ratios (LR), area under the ROC curves (AUC), and multivariable logistic regression in which we adjusted for the rCRI result.
RESULTS: The cohort had a median age of 67 yr, 60% were male, 19% had diabetes, 14% had ischemic heart disease, and 35% underwent intraperitoneal or intrathoracic surgery. Postoperatively, 14 of 242 (6%) patients suffered cardiac complications, but no patients died. An abnormal AAI was present in 44 patients, 10 (23%) of whom had postoperative cardiac complications: positive LR 4.79 (95% CI: 3.04–7.54), negative LR 0.34 (95% CI: 0.15–0.77), AUC = 0.80. The AAI compared favorably with the rCRI, which had positive LR 4.22 (95% CI: 2.24–7.95), negative LR 0.57 (95% CI: 0.34–0.96), and AUC = 0.74. In multivariate analysis, the adjusted odds ratio for having a cardiac complication was 10.16 (95% CI: 2.90–36.02) for those patients with an abnormal AAI, even after adjusting for rCRI results.
CONCLUSIONS: An abnormally low AAI, indicative of underlying peripheral arterial disease, is an independent risk factor for postoperative cardiac complications. The accuracy of the AAI is similar to the rCRI, and it provides additional independent predictive value for preoperative cardiac risk stratification.

两种安全型周围静脉留置针的前瞻性随机临床对比试验

A Prospective Randomized Trial of Two Safety Peripheral Intravenous Catheters

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Anesth Analg 2008 107: 155-158

背景：为了降低意外针刺伤的危险程度，在被动型安全性周围静脉留置针的基础上，发展出了第一代主动型安全型静脉留置针。然而，这些装置是否容易应用，是否真正能够减少意外针刺伤的危险，还未被试验证实过。
方法：在这个前瞻性随机临床对比试验中，比较被动安全型，主动安全型，以及传统的非安全型周围静脉留置针。主要目的是为了评估插入留置针的困难度，这主要通过插入留置针的失败次数比较而得出；和置入留置针软管和拔出针芯的困难程度；以及在递药系统中血液返流情况。第二个目的是评估操作人员暴露于病人血液中以及血液进入周围环境的情况，并对此进行分级。
结果：本次试验共收集到 759 个评估卡片。三组的失效例数相似，并无统计学意义。在导入软管方面，主动型安全留置针更困难，拔出针芯方面，被动型安全留置

针更困难。血液回流在安全型的留置针中不正常的更多。操作人员的暴露在使用主动型安全性静脉留置针时更常见。使用安全型留置针时血液污染环境更常见。
结论：安全型周围静脉留置针在置管上并没有优势。操作者发现安全型周围静脉留置针的保护性更好，但是使用更难，并且会给周围环境带来更多的血液污染。比较主动型安全型静脉留置针和被动型安全性静脉留置针，被动型安全性留置针在穿周围静脉时更容易。操作人员暴露于血液的危险性更小。
（秦敏菊译 薛张纲校）

BACKGROUND: To reduce the risk of accidental needlestick injuries, first active then passive safety devices were developed on IV catheters. However, whether these catheters are easy to implement and really protect personnel from accidental needlestick is untested.
METHODS: In this prospective randomized survey, we compared a passive safety catheter with an active safety catheter and a nonsafety classic catheter. The main objective was to evaluate the difficulty of inserting the catheters in terms of the number of insertion failures, difficulties introducing the catheter and withdrawing the needle, and the normality of the blood reflux in the delivery system. The second objective was to determine the degree of exposure to patients' blood evaluated as the number of exposures of the staff and blood splashes of the environment, and the staff's sense of protection.
RESULTS: Seven hundred fifty-nine assessment cards were collected. The number of failures for the three catheter groups was similar and not statistically different. Introduction of the catheter was more difficult with the active safety catheter. Needle withdrawal was more difficult with the passive safety catheter. The blood reflux was abnormal more often with the safety catheters. The staff's exposure was more frequent with the active safety catheter. The number of blood splashes was more common with the safety catheters.
CONCLUSIONS: Safety catheters are not superior with regard to failure rate in the catheter's placement. Users feel better protected, but find the use of safety catheters more difficult, and their handling generates more splashing of blood into the environment. The passive safety catheter is more efficient than the active safety catheter with regard to ease of introduction of the catheter into the vein and the staff's exposure to the patient's blood.

CRITICAL CARE AND TRAUMA：

性激素及其受体拮抗剂：一种改善失血性创伤后免疫、心血管应答和减少脓毒症继发死亡率的辅助用药

Sex Steroids/Receptor Antagonist: Their Use as Adjuncts After Trauma-Hemorrhage for Improving Immune/Cardiovascular Responses and for Decreasing Mortality from Subsequent Sepsis (Review Article)

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Anesth Analg 2008 107: 159-166.

动物实验和临床研究均标明：雌性个体在动情前期（即维持高水平雌激素）比雄性个体能更好地耐受出血性创伤和脓毒症。雌激素是这种预后存在性别差异的关键因素。关于一些结果为阴性的研究，可能原因是在损伤当时的激素水平存在群体多相性。一些实验性研究显示：雄激素可引起出血性创伤后的免疫和心血管抑制。因此，在出血性创伤后使用雄激素受体拮抗剂对免疫和心血管功能有正向作用。同样，雌激素在出血性创伤后在免疫和心血管方面产生有益的作用，且显著地减少脓毒症继发的死亡率。雌激素的这种作用机制同时涉及基因和非基因的调控。出血性创伤后使用雌激素或雄激素受体拮抗剂是一种修复免疫和心血管功能的安全新方法，且可以降低脓毒症继发的死亡率。

（于章杰 译 陈杰 校）

Studies in human as well as animal models demonstrate that females in the proestrus cycle (i.e., with high estrogen) tolerate trauma-hemorrhage and sepsis far better than males. The female sex steroid, estrogen, is the significant factor contributing to this observed gender difference in outcome. One reason for the lack of significant gender association in some clinical studies is the possibility of heterogeneity of the population in terms of their hormonal status at the time of injury. Several experimental investigations have revealed that androgens produce immune and cardiovascular depression after trauma-hemorrhage. However, the use of an androgen receptor antagonist after trauma-hemorrhage has salutary effects of immune and cardiovascular function. Likewise, estrogen produces beneficial effects on immune and cardiovascular function after trauma-hemorrhage and significantly decreases mortality rates from subsequent sepsis. The salutary effects of estrogen after trauma-hemorrhage have been shown to be due to both genomic and nongenomic effects. Thus, the use of an estrogen or androgen receptor antagonist as an adjunct after trauma-hemorrhage is a safe and novel approach for restoring immune and cardiovascular function after trauma-hemorrhage and for decreasing the mortality from subsequent sepsis.

右美托咪啶对非插管通气病人的效用的初步研究

The Efficacy of Dexmedetomidine in Patients with Noninvasive Ventilation: A Preliminary Study (Brief Report)

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Anesth Analg 2008; 107:167-170

背景：激动会导致非插管通气(NIV)的失败。我们研究右美托咪啶在非插管通气病人中的作用。
方法：这是一个在重症监护病房中进行的前瞻性临床研究。对 10 个由于激动而无法进行 NIV 的病人输注右美托咪啶。
结果：Ramsay 和 Richmond 激动-镇静评分，分别维持在 2.94 ± 0.94 和－1.23 ± 1.30。所有的病人成功摆脱 NIV，且呼吸状态没有恶化。

结论：此研究显示右美托咪啶是一个有效的用于 NIV 病人镇静的药物。
（张曦 译，马皓琳 李士通 校）

BACKGROUND: Agitation is associated with failure of noninvasive ventilation (NIV). We investigated the effect of dexmedetomidine in patients with NIV.
METHODS: This was a prospective clinical investigation in an intensive care unit. Dexmedetomidine was infused in 10 patients in whom NIV was difficult because of agitation.
RESULTS: Ramsay and Richmond Agitation-Sedation Scale scores were maintained at 2.94 ± 0.94 and –1.23 ± 1.30, respectively. All patients were successfully weaned from NIV, and the respiratory state was not worsened.
CONCLUSION: This study shows that dexmedetomidine is an effective sedative drug for patients with NIV.

OBSTETRIC ANESTHESIOLOGY:

七氟烷与胎儿胎盘脉管系统：一氧化氮及类花生酸类的作用

Sevoflurane and the Feto-Placental Vasculature: The Role of Nitric Oxide and Vasoactive Eicosanoids

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Anesth Analg 2008; 107:171-177

背景：挥发性麻醉剂对胎儿胎盘的作用及其原理尚不为人知。我们的目标是量化七氟烷对血管活性的影响，并测定一氧化氮及类花生酸类在离体人绒毛膜板动脉环对这些影响的调节作用。
方法：我们将研究用的离体人绒毛膜板动脉环分为四组。在第一组中，应用血栓素类似物 U46619 使动脉环收缩，测定量化七氟烷的血管舒张作用。第二组的 A-C 例验证一氧化氮对七氟烷血管舒张作用的影响。在每次实验中，我们分别验证非特异性一氧化氮抑制因素：L-NAME，L-nMMA，及静止性 D-NAME，对七氟烷介导的血管舒张的调节作用。第二组的 D 例用于测定七氟烷是否影响血管平滑肌对外源性一氧化氮的敏感性。第三组的 A-D 例验证类花生酸类对七氟烷血管舒张作用的影响。在每次实验中，我们分别验证非特异性环加氧酶抑制剂、引哚美辛、5-脂氧合酶及去甲二氢愈创木酸对七氟烷介导的血管舒张的调节作用。
结果：七氟烷可使离体人绒毛膜板动脉环产生剂量依赖性血管舒张，当七氟醚的剂量为 2%-8%时，动脉环舒张平均增加 15 ± 7%到 67 ± 17%。阻断一氧化氮合成

酶不能减弱七氟烷的血管舒张作用。七氟烷不改变血管平滑肌对一氧化氮的敏感性。引哚美辛可增加七氟烷的血管舒张作用，血管舒张增加 10-5 米，而非 10-6 米。去甲二氢愈创木酸则可使血管舒张增加 3 x 10－6 米，而非 3 x 10－7 米。**结论：**在本次体外研究模型中，七氟烷是一种胎儿胎盘脉管系统舒张剂。七氟烷介导的这种血管舒张作用不受一氧化氮及环加氧酶影响，并表现为脂氧合酶介导的血管舒张作用的一部分。
（施颖译 薛张纲校）

BACKGROUND: The effects and mechanisms of action of volatile anesthetics on the feto-placental vasculature are not known. We aimed to quantify the vasoactive effects of sevoflurane and determine the role of nitric oxide (NO) and of vasoactive eicosanoids in mediating these effects in isolated human chorionic plate arterial rings.
METHODS: Quadruplicate ex vivo human chorionic plate arterial rings were used in all studies. Series 1 quantified the vasodilation produced by sevoflurane in rings preconstricted with the thromboxane analog U46619. Series 2A–C examined the role of NO in sevoflurane-mediated vasodilation. In separate experiments, we examined the potential for the nonspecific NO inhibitors, L-NAME, L-nMMA, and the inactive D-NAME, to modulate the vasodilation produced by sevoflurane. Series 2D determined whether sevoflurane altered vascular smooth muscle sensitivity to exogenous NO. Series 3A–D examined the role of vasoactive eicosanoids in sevoflurane-mediated vasodilation. In separate experimental series, we examined whether the nonspecific cyclooxygenase inhibitor, indomethacin, or the 5-lipoxygenase inhibitor, nordihydroguaiaretic acid, modulated sevoflurane-mediated vasodilation.
RESULTS: Sevoflurane produced dose-dependent vasodilation of preconstricted chorionic plate arterial rings, with mean ring vasodilation increasing from 15 ± 7% at 2% sevoflurane to 67 ± 17% (mean ± sd) at 8% sevoflurane. Blockade of NO synthase did not attenuate the vasodilator effects of sevoflurane. Sevoflurane did not alter smooth muscle sensitivity to NO. Indomethacin augmented sevoflurane vasodilation at 10–5 M, but not at 10–6 M. Conversely, nordihydroguaiaretic acid attenuated sevoflurane-mediated vasodilation at 3 x 10–6 M but not at 3 x 10–7 M.
CONCLUSIONS: Sevoflurane was a vasodilator in the feto-placental vasculature in this in vitro model. Sevoflurane-mediated vasodilation is NO and cyclooxygenase-independent and appears to be mediated in part via a lipoxygenase generated vasodilator eicosanoid.

NEUROSURGICAL ANESTHESIOLOGY：

妊娠妇女的神经麻醉

Neuroanesthesia for the Pregnant Woman (Review Article)

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Anesth Analg 2008 107: 193-200.

妊娠病人需要神经麻醉的情况比较少见，且神经麻醉管理相关的循证医学证据较少。作者制定了一个对妊娠病人合并蛛网膜下或脑内出血、颅内肿瘤、颅脑外伤、脊髓肿瘤或脊髓外伤施行麻醉的框架，合理的处理方法。麻醉医师会在面对产前、剖宫产时或产后等不同情况下如何实施行神经外科手术麻醉。作者还讨论了这些方案的安全性和神经放射学介入时的麻醉考虑。
（于章杰 译 陈杰 校）
Neuroanesthesia for the pregnant patient is required infrequently, and evidence-based recommendations for neuroanesthetic management are sparse. We present a framework for a practical approach to anesthesia of the pregnant patient with subarachnoid or intracerebral hemorrhage, intracranial tumor, traumatic brain injury, spinal tumor, or spinal injury. The importance of a team-approach is emphasized. The anesthesiologist may have to anesthetize the pregnant patient for neurosurgery well before delivery, for cesarean delivery at the time of the neurosurgical procedure, or for delivery after neurosurgery. These scenarios are discussed along with fetal safety and anesthetic considerations for interventional neuroradiology.

性别和脑损伤的关系

Gender and the Injured Brain (Review Article)

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Anesth Analg 2008; 107:201-214

麻醉医师经常会遇到由于围术期中风或先前的外伤性脑损伤而造成有神经系统合并症风险的病人。在这篇综述中我们回顾了越来越多且吸引人的病例数据，我们在本文中回顾了脑缺血、预后外。这些数据都提示性别和性甾体影响这些病人损伤的病理生理学和伤性脑损伤和癫痫这几种疾病中性别差异对脑损伤的发病机制和预后的可能影响，以及雌激素、黄体酮和雄激素在决定这些发病过程中起的作用。最后我们也确定了对目前和未来围术期以及重症监护的建议。
（姜旭晖 译 马皓琳 李士通 校）
Anesthesiologists are frequently confronted with patients who are at risk for neurological complications due to perioperative stroke or prior traumatic brain injury. In this review, we address the growing and fascinating body of data that suggests gender and sex steroids influence the pathophysiology of injury and outcome for these patients. Cerebral ischemia, traumatic brain injury, and epilepsy are reviewed in the context of potential sex differences in mechanisms and outcomes of brain injury and the role of estrogen, progesterone, and androgens in shaping these processes. Lastly, implications for current and future perioperative and intensive care are identified.

经颅刺激前强直刺激单侧胫神经能增加来自双侧上下肢的 MEP 幅度

The Application of Tetanic Stimulation of the Unilateral Tibial Nerve Before Transcranial Stimulation Can Augment the Amplitudes of Myogenic Motor-

Evoked Potentials from the Muscles in the Bilateral Upper and Lower Limbs
(Review Article)

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Anesth Analg 2008 107: 215-220.

背景：最近，我们报导了在全麻下增加动作诱发电位（MEP）的新技术，利用该技术在经颅刺激之前强直刺激外周神经能增加来自受强直刺激影响的神经支配的肌肉的 MEP。在最近的研究中，我们测试了强直刺激左胫神经能否增加由不受强直刺激影响的神经支配的肌肉的 MEP。
方法：30 名在丙泊酚-芬太尼麻醉下，部分神经阻滞麻醉下接受脊柱手术的病人接受测试。作为常规 MEP（c-MEP）纪录，五个成串经颅刺激传递到颈 3-4，来自拇短展肌，足拇展肌，胫骨前肌，鱼际肌的动作电位被双向纪录。为了记录强直后动作诱发电位（p-MEP），在经颅刺激前 1 秒对左侧踝部的胫神经每隔 5 秒进行一次强直刺激（50 Hz，50 mA 的刺激强度）。经颅刺激和混合肌肉动作电位纪录方式和 c-MEP 一样。c-MEP 和 p-MEP 强度比较采用 Wilcoxon 等级测试。
结果：强直刺激影响的胫神经支配的左足拇展肌的 p-MEP 明显高于 c-MEP。不受左胫神经支配的双侧拇短展肌，右胫骨前肌，右鱼际肌的 p-MEP 也显著高于 c-MEP。
结论：对于丙泊酚-芬太尼麻醉下，部分神经阻滞麻醉下接受脊柱手术的病人，强直刺激左胫神经能增加来自肌肉的 MEP 强度-不管该肌肉由不由受强直刺激影响的神经支配。
（孙鹏飞译 薛张纲校）
BACKGROUND: Recently, we reported a new technique to augment motor-evoked potentials (MEPs) under general anesthesia, posttetanic MEP (p-MEP), in which tetanic stimulation of the peripheral nerve before transcranial stimulation enlarged amplitudes of MEPs from the muscle innervated by the nerve subjected to tetanic stimulation. In the present study, we tested whether tetanic stimulation of the left tibial nerve can also augment amplitudes of MEPs from the muscles which are not innervated by the nerve subjected to tetanic stimulation.
METHODS: Thirty patients undergoing spinal surgery under propofol-fentanyl anesthesia with partial neuromuscular blockade were examined. For conventional MEP (c-MEP) recording, transcranial stimulation with train-of-five pulses was delivered to C3-4, and the compound muscle action potentials were bilaterally recorded from the abductor pollicis brevis, abductor hallucis (AH), tibialis anterior, and soleus muscles. For p-MEP recording, tetanic stimulation (50 Hz, 50 mA of stimulus intensity) with a duration of 5 s was applied to the left tibial nerve at the ankle 1 s before transcranial stimulation. Transcranial stimulation and recording of compound muscle action potentials were performed in the same manner as c-MEP recording. Amplitudes of c-MEP and p-MEP were compared using Wilcoxon's signed rank test.

RESULTS: Amplitudes of p-MEPs from the left AH muscle innervated by the left tibial nerve with tetanic stimulation were significantly larger compared with those of c-MEPs. Amplitudes of p-MEPs from the bilateral abductor pollicis brevis and soleus muscles and right AH and tibialis anterior muscles, which were not innervated by the left tibial nerve with tetanic stimulation, were also significantly larger compared with those of c-MEPs. CONCLUSION: In patients under propofol and fentanyl anesthesia with partial neuromuscular blockade, the application of tetanic stimulation to the left tibial nerve augmented the amplitudes of MEPs from the muscles without tetanic nerve stimulation and those with stimulation.

髋关节固定术中脑微栓塞：一项前瞻性的研究

Cerebral Microemboli During Hip Fracture Fixation: A Prospective Study **(Review Article)**

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Anesth Analg 2008 107: 221-225.

背景：最近的研究显示大脑脂肪栓塞经常发生在髋关节手术或膝关节置换术中。在这个研究中，作者研究了髋关节固定术中固体或气体的脑栓塞的发生率。
方法：这项前瞻性研究中患者行急诊的髓内钉髋关节骨折固定术。术中通过经颅多普勒超声检测左右大脑中动脉的栓子。
结果：22 名患者入选，年龄中位数为 82 岁（范围从 51 岁——97 岁）。有 9 名患者（41%）在大脑中动脉中记录高强度信号的微栓子。均有固体和气体塞子的信号。其中一名术后发生了脑血管意外。
结论：在急诊行髋部骨折内固定手术中脑微栓子的发生率相当可观。这种现象并不局限于髋关节或膝关节置换手术。这一发现对临床意义还需要进一步调查。
（王腾 译 陈杰 校）

BACKGROUND: Recent studies have shown that cerebral fat microembolism takes place during surgery for hip or knee replacement. In this study, we examined the occurrence of cerebral microembolism, solid or gas, during a standard procedure of hip fracture fixation.
METHODS: This was a prospective study of patients who underwent urgent surgery with a dynamic hip screw for hip fracture fixation. During surgery, patients were monitored with transcranial Doppler for detection of microemboli from right and left middle cerebral arteries.
RESULTS: Twenty-two patients were included in the study; their median age was 82 yr (range, 51–97 yr). In nine (41%) patients, high intensity transient signals were recorded, indicating microemboli passage in the middle cerebral arteries. All nine patients had signals of both solid and gas emboli. One of these nine patients had a postoperative cerebrovascular accident.

CONCLUSIONS: The incidence of cerebral microemboli during urgent surgery for hip fracture fixation is considerable. This phenomenon is not confined to hip or knee replacement surgery. The clinical implications of this finding require further investigation.

GENERAL ARTICLES:

移植中的性别问题
Gender Issues in Transplantation (Special Article)

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Anesth Analg 2008; 107:232-238

半个世纪前人们已认识到临床移植中性别错配的作用。但临床移植中的性别问题影响了包括免疫学关注的问题及以外的许多层面的结果。许多导致移植的疾病都主要在一种性别中表达。器官捐献模式一向以女性活体捐献者为主要趋势。谁有权得到移植可能受移植人员与男性或女性等待移植者之间微妙的相互作用影响。在干细胞移植这个新的领域中，男性与女性之间成人干细胞功能上的差别可能使固体器官移植预后中的性别差异清楚地显示出来。本综述突出讨论了与移植相关的性别问题，目的是使所有移植患者得到最好的治疗。
（朱 慧译 马皓琳 李士通校）

The effects of gender mismatch in clinical transplantation have been recognized for half a century. But gender issues in clinical transplantation affect outcomes at many levels beyond immunologic concerns. Many diseases leading to transplantation are predominantly expressed in one gender. Organ donation patterns have consistently been defined by a greater tendency of women to be live donors. Access to transplantation may be affected by subtleties in the interactions of transplant personnel with women versus men candidates. In the new field of stem-cell transplantation, functional differences in male versus female adult stem cells may shed light on gender differences in outcomes for solid organ transplantation. This review highlights gender issues related to transplantation with a goal of optimizing the care of all transplant patients.

肾缺血：与性别相关？
Renal Ischemia: Does Sex Matter? (Review Article)

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Anesth Analg 2008 107: 239-249.

肾缺血是围手术期常见的并发症之一，具有高发病率和死亡率。与其它缺血情况（例如：心、脑）相比，肾缺血的发病和结局有显著的性别特异性。肾损伤的性别

差异已经被关注多年，现在成为临床和实验室研究的课题。从临床方面讲，除外心脏手术，女性围手术期急性肾衰的发生率更低。实验科学发现，性激素影响肾脏对缺血的反应。这篇报导中，我们评价了围手术期肾功能衰竭及肾缺血再灌注病理生理学的性别差异。且有很多研究指出与生物学机制相关，有足够数据支持性别及使用影响性激素水平的药物影响围手术期治疗计划的有效性。
（夏俊明译，薛张纲校）

Renal ischemia is a common complication in the perioperative period that leads to a high rate of morbidity and mortality. As in other forms of ischemia (i.e., cardiac, neurologic), the incidence and outcome of renal ischemia is strikingly sex-specific. Sexual dimorphism in response to renal injury has been noted for many years, but is now the subject of both clinical and experimental research. Clinically, women experience a lower incidence of perioperative acute renal failure, with the exception of cardiac surgery. Experimental science is now producing tantalizing clues that sex steroids, both male and female, play a role in the kidney's response to ischemia. In this review, we evaluated sex differences in perioperative renal failure and in the pathophysiology of renal ischemia/reperfusion injury. Although much work remains to characterize the biological mechanisms involved, the data are sufficient to support consideration of gender and the use of medications that impact steroid availability in the perioperative plan of care.

不同晶体液对肾移植患者酸碱平衡和术后早期肾功能影响

The Effect of Different Crystalloid Solutions on Acid-Base Balance and Early **Kidney Function After Kidney Transplantation**

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Anesth Analg 2008 107: 264-269.

背景：本实验旨在研究肾移植中给予不同的晶体液所引起的酸碱平衡，钾和乳酸水平的变化，从而为这类病人选择理想的晶体液。
方法：在这项双盲对照研究中，将患者随机分为三组（每组 n = 30），分别给予生理盐水，乳酸林格液，或 plasmalyte，用量均为 20-30ml·kg/h 。麻醉诱导前和术中每隔 30min 作一次动脉血分析，并记录静脉滴注的晶体液总量。记录术后第 1 ， 2 ， 3 ， 7 天的尿量，血肌酐，尿素氮和肌酐清除率。
结果：术中接受生理盐水的病人在 pH 值（ 7.44 ± 0.50 与 7.36 ±0.05 ）和碱剩余（ 0.4 ± 3.1 比-4.3 ± 2.1 ）方面有显著降低，而血清氯化物（ 104 ± 2 比 125 ± 3 毫米/ l ）显著增加。接受乳酸林格液的病人乳酸水平（ 0.48 ± 0.29 与 1.95 ± 0.48 ）显著增加。接受 plasmalyte 的病人乳酸水平和酸碱平衡均无明显变化。在任何一组中，钾水平均无显著变化。
结论：所有三种晶体液均可以安全地使用在简单，短时的肾移植术中。

Plasmalyte 较为理想。
（陈伟 译 陈杰 校）

BACKGROUND: This study aimed to quantify changes in acid-base balance, potassium and lactate levels as a function of administration of different crystalloid solutions during kidney transplantation, and to determine the ideal fluid for such patients.
METHODS: In this double-blind study, patients were randomized to three groups (n = 30 each) to receive either normal saline, lactated Ringer's, or Plasmalyte, all at 20–30 $mL \cdot kg^{-1} \cdot h^{-1}$. Arterial blood analyses were performed before induction of anesthesia, and at 30-min intervals during surgery, and total IV fluids recorded. Urine volume, serum creatinine and BUN, and creatinine clearance were recorded on postoperative days 1, 2, 3, and 7.
RESULTS: There was a statistically significant decrease in pH (7.44 ± 0.50 vs 7.36 ± 0.05), base excess (0.4 ± 3.1 vs –4.3 ± 2.1), and a significant increase in serum chloride (104 ± 2 vs 125 ± 3 mM/L) in patients receiving saline during surgery. Lactate levels increased significantly in patients who received Ringer's lactate (0.48 ± 0.29 vs 1.95 ± 0.48). No significant changes in acid-base measures or lactate levels occurred in patients who received Plasmalyte. Potassium levels were not significantly changed in any group.
CONCLUSIONS: All three crystalloid solutions can be safely used during uncomplicated, short-duration renal transplants; however, the best metabolic profile is maintained in patients who receive Plasmalyte.

PAIN MEDICINE：

辣椒素受体诱导的传导镇痛：具选择性、剂量依赖、长效且潜在神经毒性低。
Vanilloid-Induced Conduction Analgesia: Selective, Dose-Dependent, Long-Lasting, with a Low Level of Potential Neurotoxicity **(Special Article)**

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Anesth Analg 2008; 107:271-281

辣椒素受体激动剂（辣椒辣素，周树脂毒，[RTX]）应用于外周神经可造成传导阻滞。与局麻药引起的传导麻醉中镇痛成分不同，辣椒素受体激动剂引起的传导镇痛不抑制与疼痛无关的感觉运动功能。辣椒素受体激动剂可提供选择性的传导镇痛是因为其对于神经干的作用局限于 C- 和 Aδ-纤维。RTX 效能强于辣椒辣素，且治疗窗更宽。大鼠实验中，神经周围的 RTX 在相当大的有效浓度范围（0.00003% 到 0.001%）内可长时间地减轻机械和温度刺激所致的痛觉，此效应可持续数小时至数周。RTX 引起的神经阻滞可预防温度和机械刺激所致痛觉过敏的发展以及在切口痛模型中的疼痛行为。RTX 诱导的传导阻滞具有 TRPV1 受体激动剂固有的一个缺点即初始兴奋（疼痛）；故必须注射局麻药预防。提供传导镇痛所需剂量的 RTX 用于大鼠坐骨神经时，无髓鞘神经纤维退化的频率比治疗浓度的利多卡因低一个数量级以上。这些有价值的结果必须在啮齿类以外的种属（猪、羊）中实验来证实。综上所述，上述数据提示辣椒素受体诱导的传导镇痛可能有临床适用性。

（周雅春 译 马皓琳 李士通 校）
Vanilloid agonists (capsaicin, resiniferatoxin, [RTX]) applied to the peripheral nerves provide conduction blockade. In contrast to the analgesic component of conduction anesthesia produced by local anesthetics, vanilloid agonists provide conduction analgesia not associated with suppression of motor or sensory functions not related to pain. Vanilloid agonists provide conduction analgesia selectively because their effect on the nerve trunks is limited to C- and Aδ-fibers. RTX is much more potent than capsaicin and has a wider therapeutic window. In rat experiments, perineural RTX produced a long-lasting thermal and mechanical hypoalgesia with a very wide separation between effective concentrations (from 0.00003% to 0.001%) providing an effect lasting from several hours to several weeks. A nerve block with RTX prevented the development of thermal and mechanical hyperalgesia as well as pain behavior in a model of incisional pain. RTX-induced conduction blockade has an inherent drawback of TRPV1 agonists, the initial excitation (pain); therefore, a local anesthetic should be injected to prevent it. When RTX was applied to the rat's sciatic nerve in doses necessary to provide conduction analgesia, the frequency of unmyelinated fiber degeneration was more than an order of magnitude lower than that with the therapeutic concentration of lidocaine. These promising results should be confirmed by experiments in species other than rodents (pigs, sheep). Taken together, the data indicate possible clinical applicability of vanilloid-induced conduction analgesia.

在伤口上滴注一种新提纯的辣椒碱成分对疝切开手术后疼痛的效果：一个双盲、随机、对照试验

The Effect of Wound Instillation of a Novel Purified Capsaicin Formulation on Postherniotomy Pain: A Double-Blind, Randomized, Placebo-Controlled Study
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背景：急性术后疼痛在大多数手术操作后很常见。即使用了许多止痛剂，处理术后疼痛的效果也通常不令人满意。在体外、临床前以及临床试验中，纯化辣椒碱（ALGRX4975 纯度 98%）被证实能够延长对 C 纤维的阻滞作用，也许对治疗术后疼痛是一种有效的辅助物。
方法：我们完成了一个单中心、随机、双盲、对照试验：在 41 个成年男性行腹股沟疝修补术后病人的伤口滴入超纯化的辣椒碱（ALGRX4975）的止痛效果。术后第一周的基础的滴定终点是由平均每日疼痛评分的直观模拟标度（VAS）估计为曲线下面积（AUC）。疼痛被记录在疼痛日记中，一天两次，共四周。在术前和术后一

周进行体格检查和实验室检查，记录不良事件直至 28 天。不良事件已被记录。用非线性混合效应模型分析数据。

结果：VAS 的 AUC 分析在术后三天显著较低（P<0.05），而不是在术后整个一周或四周。非线性混合效应模型显示辣椒碱组疼痛评分在前四天显著较低（P<0.05）。非辣椒碱组被观察到出现严重不良事件，而在用辣椒碱治疗组中肝酶一过性轻度升高更常见。

结论：在有一个明确的镇痛记录标准的前提下，VAS 的 AUC 分析和混合效应分析表明，辣椒碱组在腹股沟疝修补术后 3-4 天的镇痛效果优于安慰剂组。

（宣丽真译 薛张纲校）

BACKGROUND: Acute postoperative pain is common after most surgical procedures. Despite the availability of many analgesic options, postoperative pain management is often unsatisfactory. Purified capsaicin (ALGRX 4975 98% pure) has demonstrated prolong inhibition of C-fiber function in in vitro, preclinical, and clinical studies, and may be an effective adjunct to postoperative pain management.

METHODS: We performed a single-center, randomized, double-blind, placebo-controlled study of the analgesic efficacy of a single intraoperative wound instillation of 1000 μg ultrapurified capsaicin (ALGRX 4975) after open mesh groin hernia repair in 41 adult male patients. The primary end-point was average daily visual analog scale (VAS) pain scores during the first week after surgery assessed as area under the curve (AUC). Pain was recorded twice daily in a pain diary for 4 wk. Physical examination and laboratory tests were done before and 1 wk after surgery, together with recordings of adverse events up to 28 days. Adverse events were recorded. Data were also analyzed using a mixed-effects analysis with NONMEM.

RESULTS: VAS AUC was significantly lower during the first 3 days postoperatively ($P < 0.05$), but not for the whole 1 or 4 wk postoperatively. Mixed-effects analysis with NONMEM revealed that pain scores were significantly lower ($P < 0.05$) in the capsaicin group during the first 4 days. No clinically significant serious adverse events were observed, although a mild transient increase in liver enzymes was seen more often in the capsaicin-treated group.

CONCLUSION: In the setting of a well-defined analgesic protocol standard, VAS AUC analysis and a mixed-effect analysis showed superior analgesia of capsaicin relative to placebo during the first 3–4 days after inguinal hernia repair.

在门诊行膝关节镜手术病人的关节内联合使用曲马多和布比卡因可延长药物的术后镇痛时间

Intraarticular Tramadol-Bupivacaine Combination Prolongs the Duration of Postoperative Analgesia After Outpatient Arthroscopic Knee Surgery

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Anesth Analg 2008 107: 292-299.

背景：关节腔内局部麻醉常用于处理和治疗膝关节镜术后疼痛。近来，关节腔内常使用曲马多来处理这些病人。然而，关节内联合使用局麻和曲马多使用效果还未在关节镜门诊病人得到证实。本研究目的是在行膝关节镜病人通过视觉模拟疼痛评分来研究关节内联合使用局麻和曲马多与分别使用局麻和曲马多的效果差别。
方法：90 名 ASA Ⅰ级和 II 级病人在全身麻醉下由外科医生行关节镜下部分半月板切除术，这些病人随机、双盲分为三组： B 组（30 名）术后接受 0.25%的布比卡因，T 组（30 名）接受 100mg 的曲马多，BT 组（30 名）接受 0.25%的布比卡因和 100mg 的曲马多稀释到 20ml。通过 VAS 法评定术后疼痛，分别在术后 0.5、1、2、4、6、8、12 及 24 小时时间点安静及活动时的疼痛程度。并记录麻醉持续时间，麻醉复苏后 24 小时的镇痛药消耗量，离床活动的时间和出院的时间。同时记录关节内注射药物引起的全身性反应。
结果： BT 组的 VAS 评分明显低于 T 组和 B 组。BT 组的术后疼痛开始时间晚于 B 组和 T 组，且恢复时间长与 B 组和 T 组。BT 组的 24 小时麻醉剂消耗量明显少于 B 组和 T 组。另外，BT 组出院的时间和可以独立行走的时间明显短于 B 组和 T 组，且没有伴随任何系统反应。
结论：在日间行膝关节镜手术的病人的关节内给予 100mg 曲马多和 0.25%布比卡因比单独给其中一种药可以显著的延长止痛的时间。
（王鹏 译 陈杰 校）

BACKGROUND: Intraarticular (IA) local anesthetics are often used for the management and prevention of pain after arthroscopic knee surgery. Recently, IA tramadol was also used for the management of these patients. However, the IA combination of local anesthetic and tramadol has not been evaluated in arthroscopic outpatients. Our primary aim in this study was to evaluate the analgesic effect of an IA combination of bupivacaine and tramadol when compared with each drug alone using visual analog scale (VAS) pain scores in patients undergoing day-care arthroscopic knee surgery. Additionally, we assessed analgesic demand.
METHODS: Ninety ASA I/II patients undergoing arthroscopic partial meniscectomy, performed by a single surgeon under general anesthesia, were assigned in a randomized, double-blind manner into three groups: group B (n = 30) received 0.25% bupivacaine, group T (n = 30) received 100 mg tramadol, and group BT (n = 30) received 0.25% bupivacaine and 100 mg tramadol to a total volume of 20 mL by the IA route after surgery. Postoperative pain scores were measured on a VAS, at rest and on mobilization at 0.5, 1, 2, 4, 6, 8, 12, and 24 h. Duration of analgesia, the subsequent 24 h consumption of rescue analgesia, time to ambulation, and time to discharge were evaluated. In addition, the systemic side effects of the IA injected drugs were also assessed.
RESULTS: The results showed significantly lower VAS pain scores in group BT (P << 0.1) when compared with groups T and B. Group BT had a later onset of postsurgical pain and longer time to first rescue analgesic than groups B and T. The 24 h consumption of analgesic was significantly less in group BT when compared with the other two groups (26.7% of the patients required rescue analgesia in group BT, whereas this number was 90% in group B and 86.7% in group T). In addition, time in hours to discharge and time

to unassisted ambulation were significantly shorter in group BT when compared with groups T and B, and this was not associated with any detectable systemic effects.
CONCLUSION: The IA admixture of tramadol 100 mg with bupivacaine 0.25% provides a pronounced prolongation of analgesia compared with either drug alone in patients undergoing day care arthroscopic knee surgery.

一种新的用于评估术后疼痛的功能性措施的大鼠膝部手术模型

A New Knee Surgery Model in Rats to Evaluate Functional Measures of Postoperative Pain

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背景：随着全膝手术数量的增加，术后镇痛处理依旧是一个挑战。我们使用了一种新的动物膝部手术模型来表现大鼠疼痛相关行为以及全身或鞘内用药的治疗调整的特点。
方法：用异氟醚麻醉大鼠，切开大鼠左膝皮肤暴露髌骨肌腱。将肌腱牵开，在膝关节上下 2 mm 处的股骨和胫骨上个各钻一个直径 1.4mm、深 0.5 mm 的洞。在洞内充入骨水泥，并缝合伤口。伪手术动物仅切开和缝合皮肤。术前部分动物在腰段鞘内置管用来给药。术后 24 小时时，动物全身给予如下药物：经腹腔给予硫酸吗啡 0.3－1 mg/kg、腹腔注射酮咯酸 2.5－20 mg/kg、口服塞来考昔 10－50 mg/kg、腹腔注射盐酸氯胺酮 2.5－10 mg/kg、腹腔注射盐酸可乐定 25 μg/kg、口服 pregabablin 10－20 mg/kg 或药物赋形剂；或者鞘内给予：硫酸吗啡 0.3－1 μg、酮咯酸 4－80 μg、L-745,337 80 μg、pregabalin 15 μg、新斯的明 0.5 μg 或生理盐水赋形剂。然后通过记录探测的自发活动来评估疼痛相关行为，其中自动记录水平和垂直光束的中断，以测定 60 分钟里大鼠的觅食行为和活动。用方差分析和 Tukey-B post hoc 检验比较数据。
结果：与伪皮肤切开对照组相比，术后 1－3 天模型动物觅食和活动都有障碍。全身和鞘内给予吗啡可以改善大鼠的觅食和活动，膝部手术/吗啡大鼠的活动与伪皮肤切开/赋形剂动物的活动一样多，但膝部手术/赋形剂大鼠的活动。鞘内给予减少。全身给予酮咯酸 20 mg/kg 可以改善大鼠的觅食和活动，膝部手术/酮咯酸 4－40 μg 大鼠的活动比膝部手术/赋形剂动物多，并没有增多大鼠的觅食或活动，但给予 80 μg 酮咯酸则有效。其它实验药物，无论是全身还是鞘内给药，均不能使活动恢复到正常水平。
结论：这个研究呈现了一个新颖、简单、可重现的大鼠模型，可以用来评估膝部手术后的功能和不适，以及对治疗措施的反应。在这个膝部手术模型中，全身和鞘内给予吗啡或酮咯酸可以逆转大鼠术后 24 小时时的觅食和活动功能障碍。
（张莹译　马皓琳 李士通校）

INTRODUCTION: With the increase in the number of total knee surgeries being performed, postoperative analgesic management remains a challenge. We used a new

animal knee surgery model to characterize pain-related behavior in the rat, and its therapeutic modulation with systemic and intrathecal drug treatment.
METHODS: Rats were anesthetized with isoflurane and an incision was made over the left knee to expose the patella tendon. The tendon was reflected aside and a 1.4-mm diameter, 0.5 mm deep hole was drilled in both the femur and tibia at 2 mm above and below the knee joint, respectively. The holes were filled with dental cement and the wound was closed. Sham surgery animals only had a skin incision. Some animals had previously been implanted with a lumbar intrathecal catheter for drug injection. At 24 h after surgery, animals received the following drugs systemically: i.p. morphine sulfate 0.3–1 mg/kg, i.p. ketorolac 2.5–20 mg/kg, p.o. celecoxib 10–50 mg/kg, i.p. ketamine hydrochloride 2.5–10 mg/kg, i.p. clonidine hydrochloride 25 μg/kg, p.o. pregabablin 10–20 mg/kg, or drug vehicle; or intrathecally: morphine sulfate 0.3–1 μg, ketorolac 4–80 μg, L-745,337 80 μg, pregabalin 15 μg, neostigmine 0.5 μg, or saline vehicle. Pain-related behavior was then assessed by recording exploratory spontaneous activity, in which vertical and horizontal light beam interruptions were automatically recorded to measure rearing activity and ambulation for 60 min. Data were compared using analysis of variance with the Tukey-B post hoc test.
RESULTS: The model demonstrated deficits in rearing and ambulation compared with sham skin incision control animals on postsurgery days 1–3. Systemic and intrathecal morphine improved rearing and ambulation, with knee surgery/ morphine rats displaying as much activity as sham skin incision/vehicle animals, whereas knee surgery/vehicle rats showed decreased activity. Systemic ketorolac 20 mg/kg improved rearing and ambulation, with knee surgery/ketorolac rats showing increased activity compared with knee surgery/vehicle animals. Intrathecal ketorolac 4–40 μg did not increase rearing or ambulation, but the 80 μg dose was effective. Other drugs tested, systemically or intrathecally, did not restore activity to normal levels.
CONCLUSION: This study presents a new simple, reproducible rat model to assess function and discomfort after knee surgery, and one that responds to therapeutic interventions. In this knee surgery model, both systemic and intrathecal administration of either morphine or ketorolac caused reversal of the deficits in rearing and ambulatory behavior at 24 h postsurgery.

PAIN MECHANISMS:

性、性别和疼痛： 一个复杂领域的总的看法

Sex, Gender, and Pain: An Overview of a Complex Field **(Review Article)**

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传统上，在雄性动物和男性患者开展了疼痛领域的生物医学研究。 在过去 20－30 年，越来越被认可这种狭窄的方法错过了重要可变物： 性。 研究的一个持续增长的数字建立了性区别以响应疼痛和镇痛药。 这些研究显示出，性之间的区别看上

去有一个生物和心理依据。 我们提供流行病学、啮齿目动物和人的实验性研究结果的简要的回顾。 在学术上的争论和普遍分歧突出需要一种进步方法针对在基本和临床生物医学以及在流行病学和社会科学努力合作问题。 为了使遭受急性和/或慢性疼痛的患者受益于这工作，方法必须涉及使用或发展临床疼痛或疼痛相关的模型回答基本而复杂问题。学术的现状不允许转变我们制定的临床决策。
（章一静译 薛张纲校）

Traditionally, biomedical research in the field of pain has been conducted with male animals and subjects. Over the past 20–30 yr, it has been increasingly recognized that this narrow approach has missed an important variable: sex. An ever-increasing number of studies have established sex differences in response to pain and analgesics. These studies have demonstrated that the differences between the sexes appear to have a biological and psychological basis. We will provide brief review of the epidemiology, rodent, and human experimental findings. The controversies and widespread disagreement in the literature highlight the need for a progressive approach to the questions involving collaborative efforts between those trained in the basic and clinical biomedical sciences and those in the epidemiological and social sciences. In order for patients suffering from acute and/or chronic pain to benefit from this work, the approach has to involve the use or development of clinically relevant models of nociception or pain to answer the basic, but complex, question. The present state of the literature allows no translation of the work to our clinical decision-making.

高浓度树脂毒素抑制克隆神经内分泌细胞的离子信道功能

A High Concentration of Resiniferatoxin Inhibits Ion Channel Function in Clonal Neuroendocrine Cells

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Anesth Analg 2008 107: 318-324.Abstract

背景：树脂毒素（RTX）是外周伤害性感受器跨膜受体 TRPV1 通道的强力激动剂。RTX 首先引起细胞兴奋，接着是长时间的不应期，从而起到镇痛作用。RTX 的效应可能是直接作用于 TRPV1 通道引起的，也可能是先前报导的 TRPV1 通道非依赖性效应。本实验检验 RTX 是否通过 TRPV1 信道非依赖性的方式作用于离子信道。

方法：克隆鼠垂体前叶细胞(GH$_3$)，置于 Ca^{2+}敏感的荧光染料中，用 Na^+通道激动剂藜芦定（VTD）刺激或直接用 60 mM K^+溶液去极化。以细胞内 Ca^{2+}浓度升高引起的荧光增强来评估暴露于 RTX 的生理效应。

结果：在 10 M RTX 时，VTD 与 60 mM K^+迅速使荧光改变分别降低到对照组的 45%与 50%(*P* 值分别为 0.018 与 0.043)。细胞长时间（24h）暴露于 10 M RTX 中，洗脱 2h，VTD 与 60 mM K^+分别使荧光改变降低到对照组 5.6%与 42%(*P*值分别为 0.027 与 0.011)。细胞在 RTX 阴性的培养基中培养 24h,其对 VTD 的反应部分恢复到对照组的 42%。

结论：10 M RTX 能直接迅速地以 TRPV1 非依赖的方式抑制电压门控 Ca^{2+}信道。长时间（24h）暴露于 10 M RTX 则以至少部分可逆性的方式抑制电压门控 Na^{+} 与 Ca^{2+} 信道。

（张江玲译 陈杰 校）

BACKGROUND: Resiniferatoxin (RTX) is a potent agonist of the transient receptor potential vanilloid 1 channel (TRPV1) found in peripheral nociceptors. RTX causes cellular excitation first, followed by a long-lasting refractory state, which has suggested its therapeutic use for pain control. RTX's effect could result from specific actions on TRPV1 channels, but might also arise from previously reported TRPV1-independent effects. We have tested whether exposure to RTX compromises ion channels in a TRPV1-independent manner.

METHODS: Clonal rat anterior pituitary (GH_3) cells, loaded with the Ca^{+2}-sensitive fluorescent dye (fluo-4), were stimulated with the Na^{+} channel activator veratridine (VTD) or directly depolarized by 60 mM K^{+} solution. The physiological effects of exposure to RTX were evaluated by stimulated increases of fluorescence from raised intracellular $[Ca^{2+}]$.

RESULTS: The presence of 10 μM RTX acutely reduced the median fluorescence changes by VTD and 60 mM K^{+} to 45% and 50%, respectively (P = 0.018 and 0.043). Prolonged exposure (24 h) of cells to 10 μM RTX, followed by a 2 h washout, reduced the median fluorescence changes by VTD and 60 mM K^{+} to 5.6% and 42% of control changes, respectively (P = 0.027 and 0.011). Cell responses to VTD partially recovered, to 42% of control, after incubation in RTX-free medium for 24 h.

CONCLUSION: RTX at 10 μM directly and acutely inhibited voltage-dependent Ca^{2+} channels, in a TRPV1-independent manner. Prolonged exposure (24 h) to 10 μM RTX inhibited voltage-dependent Na^{+} channels in addition to the Ca^{2+} channels, in at least a partially reversible manner.

REGIONAL ANESTHESIA:

硬膜外腔容量增大与鞘内麻醉剂量的需求：普通与重比重布比卡因的比较

Epidural Volume Extension and Intrathecal Dose Requirement: Plain Versus Hyperbaric Bupivacaine

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背景：硬膜外腔麻醉药容积增大可以使局麻药引起的知觉消失平面提高。但是在腰硬联合麻醉（CSE）中，剂量需要减少的情况下这种现象是否会存在还未阐明。同样，鞘内药物所产生的压力是否会影响硬膜外麻醉药的扩散也未研究。本研究通过比较普通与重比重布比卡因的 ED_{50} 伴或不伴硬膜外容量变化来研究小量硬膜外容积变化的效应及其与鞘内药物压力的关系。

方法：88 名在 CSE 下接受下肢整形外科手术的男性成年病人随机分成四组（每组 n=22）；鞘内注射分为普通布比卡因组及重比重布比卡因组；其中普通布比卡因组又分为普通布比卡因组（PB）和伴有硬膜外容积变化的普通布比卡因组（PBE），重比重布比卡因组又分为重比重布比卡因组（HB）和伴有硬膜外容积变化的重比重布比卡因组（PHB）。每组患者均鞘内注射芬太尼 25ug。PBE 及 HBE 两组硬膜外给予 10ml 生理盐水以改变硬膜外腔容积。鞘内布比卡因用药剂量通过序贯法给予。每组的第一个病人给予 10mg 布比卡因。一个成功的椎管阻滞定义为在鞘内给药 20min 后知觉平面的消失至少达到 T_{10} 同时伴有完全的运动阻滞。根据前一病人是否获得失败或成功的椎管内阻滞，布比卡因的剂量依次增加或减少 1mg。

结果：普通布比卡因配合采用硬膜外容积扩散时，PBE 组与 PB 相比较，ED_{50} 明显减少（相对功效评估：1.2，95%CI：1.04-1.64），且产生了最高的知觉阻滞平面（分别为 T_6 vs T_8，p〈0.05）。重比重布比卡因组（HB vs HBE）无此现象。在没有硬膜外容液扩散的影响下，与重比重布比卡因组相比普通布比卡因组的 ED_{50} 明显要低（PB 组 vs HB 组的相对功效评估：0.78，95%CI：0.54-0.93；PBE 组 vs HBE 组的相对功效评估：0.68，95%CI：0.37-0.87）。

结论：使用或不使用硬膜外容积增大，普通的布比卡因腰麻所受影响更为显著。与重比重布比卡因相比只需一个较小的剂量却在更早期产生了一个更高的知觉阻滞平面。当硬膜外容积增大应用于重比重布比卡因时，不能使之剂量减少或平面增高。

（潘钱玲 译 陈杰 校）

BACKGROUND: Epidural volume extension leads to an increase in sensory spread of local anesthetic, but whether this translates into lower dose requirements during combined spinal epidural (CSE) remains undetermined. Likewise, the influence of intrathecal drug baricity on the dose-sparing effect of epidural volume extension has not been investigated. We studied the dose-sparing effect of epidural volume extension and its relation to intrathecal drug baricity by comparing the ED_{50} of plain and hyperbaric bupivacaine with and without epidural volume extension.

METHODS: Eighty-eight adult male patients scheduled for lower limb orthopedic surgery under CSE in the sitting position were randomized to four groups (n = 22 each); intrathecal injection was made with plain bupivacaine in groups plain bupivacaine (PB) and plain bupivacaine with epidural volume extension (PBE), and hyperbaric bupivacaine in groups hyperbaric bupivacaine (HB) and hyperbaric bupivacaine with epidural volume extension (HBE). Fentanyl, 25 μg, was added to the intrathecal drug in all groups. Among these four groups, epidural volume extension was performed with 10 mL normal saline only for groups PBE and HBE. The dose of spinal bupivacaine was varied using the up-and-down sequential allocation method. The first patient of each group received 10 mg bupivacaine. A successful spinal block was defined as attainment of sensory level of at least T10 along with complete motor blockade within 20 min of the intrathecal injection. The dose of bupivacaine was sequentially increased or decreased by 1 mg depending on whether spinal block was a failure or success in the previous patient.

RESULTS: The addition of epidural volume extension to plain bupivacaine, i.e., group PBE versus group PB, resulted in a significant decrease in ED_{50} (relative potency estimate: 1.2, 95% CI: 1.04–1.64) and increase in maximum sensory level (T6 vs T8,

respectively, $P < 0.05$). These differences were not seen with hyperbaric bupivacaine (group HB vs HBE). Independent of the effect of epidural volume extension, the ED_{50} of plain bupivacaine when compared with hyperbaric bupivacaine was significantly lower (relative potency estimate of group PB vs group HB: 0.78, 95% CI: 0.54–0.93; and for group PBE vs group HBE: 0.68, 95% CI: 0.37–0.87).
CONCLUSIONS: Administered with or without epidural volume extension, plain bupivacaine appears to be more effective, requiring a smaller dose and producing a higher sensory block with an earlier onset in comparison to hyperbaric bupivacaine. Epidural volume extension, when applied to intrathecal hyperbaric bupivacaine, fails to decrease the dose or raise the level of block.

经肋间放置椎旁导管：一种可供选择的连续椎旁阻滞的进路方法

Intercostally Placed Paravertebral Catheterization: An Alternative Approach to Continuous Paravertebral Blockade (Brief Report)

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背景：连续椎旁神经阻滞能在腹部和胸部手术后提供有效的术后镇痛。尽管椎旁阻滞与胸段硬膜外镇痛相比具有很多优点，用经典进路方法并不总能轻易和/或可能到达椎旁间隙。因此，通过经皮肋间入路的连续椎旁神经阻滞在理论上可作为到达椎旁间隙的一个可供选择的进路方法。
方法：110 位接受腹部、胸部或腹膜后大手术的病人在术前经肋间入路放置单侧或双侧椎旁导管。在中线旁 8cm，以 5cm 长 18G Tuohy 针向头端 45 度，向正中矢状面 60 度进针，直至碰到肋骨下 1/3。针头保持原方向滑过肋骨下缘在肋骨下继续进 5-6mm 进入肋沟。在注射 0.5%罗呱卡因 5ml 后，向中线方向按照估计的距离放置椎旁导管。术后每根导管以 10ml/h 速度连续输注 0.2%罗呱卡因，在疼痛爆发时 1 小时内可追加 5ml。
结果：在术后第一个 24 小时内，病人中位疼痛评分（0-10）平均为 2，病人自控镇痛氢吗啡酮用量平均仅 1.69mg。该技术未发生明显临床并发症。
结论：经肋间放置椎旁导管可为胸部、腹部和腹膜后大手术提供术后镇痛。
（颜涛 译，马皓琳 李士通 校）

BACKGROUND: Continuous paravertebral nerve blocks can provide effective postoperative analgesia after abdominal and thoracic surgery. While offering a number of advantages compared with thoracic epidural analgesia, access to the paravertebral space using a classic approach is not always easily accomplished and/or possible. In this regard, continuous paravertebral blockade via a percutaneous intercostal approach may theoretically serve as an alternative approach to the paravertebral space.
METHODS: One hundred ten patients undergoing major abdominal, thoracic, or retroperitoneal procedures had preoperative placement of unilateral or bilateral paravertebral catheter(s) via an intercostal approach. At a point 8 cm lateral to the midline a 5 cm, 18 G Tuohy needle was advanced with the needle tip angled 45 degrees cephalad and 60 degrees medial to the sagittal plane to come in contact with the lower third of the rib. The needle was "walked-off" the inferior border of the rib while maintaining its orientation and advanced a further 5 to 6 mm under the rib to lie in the subcostal groove. After injection of 5 mL ropivacaine 0.5%, a catheter was advanced medially the estimated distance to the paravertebral space. Postoperatively 0.2% ropivacaine was continuously infused at 10 mL/h in each catheter with hourly boluses of 5 mL available for breakthrough pain.
RESULTS: Median pain scores averaged 2 on a scale of 0–10 and patient-controlled analgesia hydromorphone consumption averaged only 1.69 mg for the first 24 h postoperatively. There were no clinically significant complications of the technique.
CONCLUSION: The intercostally placed paravertebral catheter provides postoperative analgesia after major surgery of the chest, abdomen, or retroperitoneum.