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当不能选择血液时：54 名危及生命的贫血患者运用基于血红蛋白的载氧溶液后存活的影响因素
When Blood Is Not an Option: Factors Affecting Survival After the Use of a Hemoglobin-Based Oxygen Carrier in 54 Patients with Life-Threatening Anemia
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背景：在经得同意的耶和华见证会中以及其他一些对血液有禁忌或不能取得血液的患者中，在治疗基础疾病时运用基于血红蛋白的载氧溶液（HBOC）-201 可以使急性贫血的患者得以存活。
方法：在一个多中心、不设盲系列的重度贫血的“同情使用”患者中由初学使用者鉴定生存的影响因素，这些患者接受可以得到的标准治疗加上由会诊医生支持的 HBOC-201。寻找预后的预计因子，并在存活者与非存活者之间比较。用一个复合的参数血红蛋白-持续时间短缺乘积来描述贫血严重程度以及病程的相互临床影响作用。从患者的记录中测定死亡率、患者特点之间的相互关系以及存活出院率。
结果：54 名具有威胁生命的贫血患者（年龄中位数 50 岁，请求时的血红蛋白浓度中位数 4g/dL）接受 60 到 300g HBOC-201。23 名患者（41.8%）出院。术中失血（45%）、恶性肿瘤(18%)和急性溶血（13%）是贫血的主要原因。从贫血发生（□8 g/dL）到输注 HBOC-201 时间在存活组较非存活组短(3.2 比 4.4 天, P = 0.027)。HBOC-201 输注前平均血红蛋白的水平在存活组与未存活组分别是 4.5g/dL 和 3.8g/dL（P = 0.120）。没有由于 HBOC-201 引起的严重不良事件。血红蛋白－持续时间短缺乘积区分存活者与未存活者。肿瘤以及肾脏疾病和未存活组有关。
结论：与晚期比较，早期由无经验的使用者对贫血患者使用 HBOC-201，可以改善急性出血以及溶血患者的存活机会。若在运用 HBOC-201 治疗前将低血红蛋白血症的持续时间以及严重程度减到最低，那么存活还是大有可能的。
(龚寅 译，马皓琳/李士通校)

BACKGROUND: In consenting Jehovah's Witness patients and others for whom blood is contraindicated or not available, hemoglobin-based oxygen carrier (HBOC)-201 may enable survival in acutely anemic patients while underlying conditions are treated.
METHODS: Survival factors were identified in a multicenter, unblinded series of severely anemic “compassionate use” patients receiving available standard treatment plus consultant-supported HBOC-201 administration by novice users. Predictors of outcome were sought and compared between survivors and nonsurvivors. A compound variable, hemoglobin-duration deficit product was used to describe the interactive clinical effects of severity and duration of anemia. Mortality, correlations between patient characteristics, and survival to hospital discharge were determined from patient records.
RESULTS: Fifty-four patients (median age 50 years) with life-threatening anemia (median hemoglobin concentration at time of request = 4 g/dL) received 60 to 300 g HBOC-201. Twenty-three patients (41.8%) were discharged. Intraoperative blood loss (45%), malignancy (18%), and acute hemolysis (13%) were the prevailing reasons for anemia. Time from onset of anemia (□8 g/dL) to HBOC-201 infusion was shorter for survivors than nonsurvivors (3.2 vs 4.4 days, P = 0.027). Mean hemoglobin levels before HBOC-201 infusion in survivors and nonsurvivors were 4.5 and 3.8 g/dL, respectively (P = 0.120). No serious adverse event was attributed to HBOC-201. The hemoglobin-duration deficit product separated survivors from nonsurvivors. Cancer and renal disease were associated with nonsurvival.
CONCLUSION: Earlier, compared with later, administration by inexperienced users of HBOC-201 to patients with anemia was associated with improved chances of survival of acutely bleeding and hemolyzing patients. Survival was more likely if the duration and magnitude of low hemoglobin was minimized before treatment with HBOC-201.

婴儿和儿童常规麻醉中一氧化碳的监测

Detection of Carbon Monoxide During Routine Anesthetics in Infants and Children

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背景：在吸入麻醉药被干燥的二氧化碳吸收剂降解的过程中，麻醉回路中会产生一氧化碳（CO），低流量麻醉时，呼出的 CO 会潜在地被人体再吸入。发育中的大脑接触了低浓度的 CO（12.5ppm）会产生神经毒性作用，而且可能导致神经发育的损害。本次研究中，我们对婴儿和儿童实施全身吸入麻醉，并在呼吸回路中安放了新的含强碱金属的二氧化碳吸收剂，目标就是要对回路中存在的 CO 进行定量，并确定与检测到的 CO 水平有关系的变量。

方法：在这个观察研究中，15 个婴儿和儿童（年龄在 4 个月-8 岁）予吸入诱导后施行全身吸入麻醉，然后对他们进行评估。在全麻过程中，每隔 5 分钟在麻醉回路的吸入端实时测量 CO 的浓度，持续 1 小时。在 1 小时的时点检测血中碳氧血红蛋白（COHb）的水平，并与基础值比较。
结果：CO 可以在每个 2 岁以上小儿中被检测到（0－18 ppm, mean 3.7 ± 4.8 ppm），而 2 岁以下小儿却很少检测到（0－2 ppm, mean 0.2 ± 0.6 ppm）。纵向回归分析调整后，只有 CO 的浓度和 FGF:Ve（新鲜气流量和分钟通气量的比值）之间的关系有显著意义（P < 0.001）。虽然没有有力的证据，但是 CO 的浓度与地氟醚的使用及患者性别也有一定的关系。而 CO 的浓度和麻醉药的浓度之间没有显著的关系。2 岁以下小儿 COHb 基础值水平较 2 岁以上小儿要高，在吸入麻醉 1 小时后，血中 COHb 水平与基础值和 2 岁以上小儿相比明显降低。然而在 2 岁以上小儿，随着吸入 CO 增加，COHb 水平较基础值以可预计的方式与之一致地明显上升。单一的线性回归分析，FGF:Ve 与 COHb 的变化显著相关。(r = 0.62; P < 0.02)。
结论：当 FGF:Ve <1 时，可以在全麻的婴儿和儿童中常规检测到 CO。在麻醉呼吸回路中检测到的 CO 峰值水平在被认为会对发育中的大脑造成损害的范围内。对于确定检测到的 CO 的来源（CO 是挥发性麻醉药降解产生，还是来自内源性 CO 复吸，或是两者都有）则需要更进一步的研究。然而这些发现提示，避免低流量麻醉可以预防呼出的 CO 再吸入；以及如果检测到的 CO 可归咎于挥发性麻醉药的降解，那么使用缺乏强金属氢氧化物的二氧化碳吸收剂可以限制吸入的 CO。
(徐妍君 译，马皓琳/李士通 校)
BACKGROUND: Carbon monoxide (CO) can be produced in the anesthesia circuit when inhaled anesthetics are degraded by dried carbon dioxide absorbent and exhaled CO can potentially be rebreathed during low-flow anesthesia. Exposure to low concentrations of CO (12.5 ppm) can cause neurotoxicity in the developing brain and may lead to neurodevelopmental impairment. In this study, we aimed to quantify the amount of CO present within a circle system breathing circuit during general endotracheal anesthesia in infants and children with fresh strong metal alkali carbon dioxide absorbent and define the variables associated with the levels detected.
METHODS: Fifteen infants and children (aged 4 months to 8 years) undergoing mask induction followed by general endotracheal anesthesia were evaluated in this observational study. CO was measured in real time from the inspiratory limb of the anesthesia circuit every 5 minutes for 1 hour during general anesthesia. Carboxyhemoglobin (COHb) levels were measured at the 1-hour time point and compared with baseline.
RESULTS: CO was detected in all patients older than 2 years (0–18 ppm, mean 3.7 ± 4.8 ppm) and rarely detected in patients younger than 2 years (0–2 ppm, mean 0.2 ± 0.6 ppm). Only the relationship between CO concentration and fresh gas flow to minute ventilation ratio (FGF:Ve) remained significant after adjustment in longitudinal regression analysis (P < 0.001). Although not powered to determine such a relationship, CO levels were weakly associated with the use of desflurane and female sex. There was no significant association between CO concentration and anesthetic concentration. Baseline COHb levels were higher in children younger than 2 years and decreased significantly at the 1-hour time point compared with baseline and children older than 2 years. However, COHb levels increased significantly from baseline in a predictable manner consistent with CO exposure in children older than 2

years. FGF:V̇e correlated significantly with change in COHb using simple linear regression (r = 0.62; P < 0.02).
CONCLUSIONS: CO was detected routinely during general anesthesia in infants and children when FGF:V̇e was <1. Peak CO levels measured in the anesthesia breathing circuit were in the range thought to impair the developing brain. Further study is required to identify the source of CO detected (CO produced by degradation of volatile anesthetic versus rebreathing CO from endogenous sources or both). However, these findings suggest that avoidance of low-flow anesthesia will prevent rebreathing of exhaled CO, and use of carbon dioxide absorbents that lack strong metal hydroxide could limit inspired CO if detection was attributable to degradation of volatile anesthetic.

七氟醚对老年患者的 QTc 间期延长效果较年轻患者更加显著

Sevoflurane Causes Greater QTc Interval Prolongation in Elderly Patients than in Younger Patients

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背景：七氟醚和氟哌利多均可造成病人 QT 间期延长，并且年龄的增长不仅是病人 QT 间期延长的因素之一，同时也是药物引起 QT 间期延长的危险因素之一。本次研究中，我们对于七氟醚和氟哌利多对校正后 QT（QTc）间期和心室复极离散度（从 T 波峰值到 T 波结束的间期[Tp-e]）的作用，在年老和年轻患者之间进行了比较。
方法：在七氟醚（1.5%-2.5%）联合止吐剂量氟哌利多（1.25mg）的麻醉下，我们对 30 例年老患者（70 岁及以上）和 30 例年轻患者（20-69 岁）进行了两小时的观察，并测量了 QT 间期和代表了跨心肌壁的透壁复极离散度的 Tp-e 间期。我们使用三个不同的公式依照心率校正 QT 间期：Bazett、Matsunaga 和 Van de Water。所用的资料以均数±标准差表示。
结果：年老患者组的平均年龄较年轻患者组大 24.4 岁（P<0.05）。两组患者 QTc 间期在实施麻醉前无明显差异。通过 3 个公式计算，年老患者组 QTc 间期在使用七氟醚后显著延长（用 Bazett 公式计算后，QTc 间期在实施麻醉前和吸入七氟醚后 60、75、90 和 120 分钟分别为 0.434 ± 0.028 秒、0.450 ± 0.037 秒、0.463 ± 0.037 秒、0.461 ± 0.037 秒以及 0.461 ± 0.038 秒）。七氟醚引起的年老患者组 QTc 间期延长较年轻患者组更加显著(用 Bazett 公式计算后，吸入七氟醚 60 分钟后为 0.450 ± 0.037 秒比 0.432 ± 0.034 秒；75 分钟后为 0.463 ± 0.037 秒比 0.441 ± 0.037 秒；以及 120 分钟后为 0.461 ± 0.038 秒比 0.436 ± 0.030 秒)，但延长吸入时间和使用氟哌利多均不能增大七氟醚引起的 QTc 间期延长的效果。两组患者的 Tp-e 间期均未受显著影响。
结论：七氟醚对老年患者的 QTc 间期延长效果较年轻患者更加显著。尽管七氟醚并不影响透壁的复极离散度，并且延长吸入时间和使用氟哌利多均不能增大七氟醚诱导后的 QTc 间期延长的效果，我们在对年老患者使用七氟醚麻醉时仍应当严密监测患者 QT 间期的延长以及与之相关的心律失常。
(刘伍 译，马皓琳/李士通 校)

BACKGROUND: Sevoflurane and droperidol prolong the QT interval, and advancing age is not only associated with a prolongation of the QT interval but is also a risk factor for drug-induced QT interval prolongation. In this study, we compared the effect of sevoflurane and droperidol on the corrected QT (QTc) interval and the dispersion of ventricular repolarization (time interval from the peak to the end of the T wave [Tp-e]) in elderly patients with those in younger patients.
METHODS: Under sevoflurane anesthesia (1.5%–2.5%) with an antiemetic dose of droperidol (1.25 mg), the QT interval and the Tp-e interval, which indicates transmural dispersion of repolarization across the myocardial wall, were measured in 30 elderly patients (70 years and older) and in 30 younger patients (20–69 years) for 2 hours. The QT interval was normalized for heart rate (QTc) using 3 different formulas: Bazett, Matsunaga, and Van de Water. Data are presented as mean ± sd.
RESULTS: The elderly group was 24.4 years older ($P < 0.05$) than the younger group. The QTc intervals in the 2 groups before anesthesia were not significantly different. Using all 3 formulas, the QTc interval in the elderly patient group was significantly prolonged by sevoflurane (the QTc intervals at preanesthesia and 60, 75, 90, and 120 minutes after sevoflurane exposure were 0.434 ± 0.028 seconds, 0.450 ± 0.037 seconds, 0.463 ± 0.037 seconds, 0.461 ± 0.037 seconds, and 0.461 ± 0.038 seconds, respectively, with the Bazett formula). The sevoflurane-induced QTc interval prolongation in the elderly patient group was significantly greater than that in the younger patient group (0.450 ± 0.037 seconds vs 0.432 ± 0.034 seconds, 60 minutes after sevoflurane exposure; 0.463 ± 0.037 seconds vs 0.441 ± 0.037 seconds, 75 minutes after sevoflurane exposure; and 0.461 ± 0.038 seconds vs 0.436 ± 0.030 seconds, 120 minutes after sevoflurane exposure with the Bazett formula), but the sevoflurane-induced QTc interval prolongation was neither further enhanced with time nor by droperidol. The Tp-e interval was not affected in either group.
CONCLUSION: Sevoflurane causes greater QTc interval prolongation in elderly patients than in younger patients. Although sevoflurane does not affect the transmural dispersion of repolarization and sevoflurane-induced QTc prolongation does not advance with time and by droperidol administration, QT interval prolongation and its associated arrhythmias should be carefully monitored during sevoflurane anesthesia in elderly patients.

使用指示剂稀释技术监测心输出量：基础理论、限制和展望

Cardiac Output Monitoring Using Indicator-Dilution Techniques: Basics, Limits, and Perspectives

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能够监测心输出量是评估心血管并发症发生风险较高尤其是在已经存在心血管合并症的危重病人血流动力学用以管理的重要基石之一。30 多年来，通过单次注射肺动脉导管热稀释测量来评估心输出量已被广泛接受为用于高级血流动力

学监测的“临床标准”。 在这篇文章中，我们回顾了这一临床标准以及当前也以指示剂稀释技术为基础的其他供选技术，如跨心肺热稀释技术和锂稀释技术。在这篇综述里，不仅概述了各种指示剂稀释技术的基本技术原理和特点，而且也罗列了每种指示剂稀释技术应用的局限性。
(滕凌雅 译，马皓琳/李士通 校)
The ability to monitor cardiac output is one of the important cornerstones of hemodynamic assessment for managing critically ill patients at increased risk for developing cardiac complications, and in particular in patients with preexisting cardiovascular comorbidities. For >30 years, single-bolus thermodilution measurement through a pulmonary artery catheter for assessment of cardiac output has been widely accepted as the “clinical standard” for advanced hemodynamic monitoring. In this article, we review this clinical standard, along with current alternatives also based on the indicator-dilution technique, such as the transcardiopulmonary thermodilution and lithium dilution techniques. In this review, not only the underlying technical principles and the unique features but also the limitations of each application of indicator dilution are outlined.

术中知晓的新分类方法

A Novel Classification Instrument for Intraoperative Awareness Events

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背景：有显性回忆的术中知晓的发生率约为 1‰-2‰。由于发生率低，所以我们需要通过大量的研究数据来更好地理解术中知晓和后遗症。因此，知晓的一个标准化的描述和表达是很有价值的。
方法：我们创造了一个新的术中知晓的分类方法：0 级：没有知晓；1 级：听觉分离；2 级：触觉（如外科操作或者气管内导管）；3 级：疼痛；4 级：麻痹（如感觉不能移动、说话或呼吸）；5 级：疼痛和麻痹。另外还有一个“D”分级，指患者有害怕、焦虑、窒息、感觉不幸、濒死感或其他明确的描述。我们回顾了 15 项研究术中知晓发生率并提供术中知晓报道的特别信息的研究。3 个机构的 5 名了解分类方式的麻醉医生独立地对术中知晓进行分级。另有 20 位不了解分类方法的麻醉主治医师、麻醉住院医生、麻醉护士、医学院学生和辅助者也独立地对术中知晓进行分级。用 Fleiss's kappa 统计值来评价观察者之间的一致性。
结果：151 位成人术中知晓者被确定为分析有效。基本的 1-5 级总 kapper 值为 0.851 (95% 可信区间 0.847–0.856)。包括额外的精神损失的总 Kapper 值为 0.779 (95%可信区间 0.776–0.783)。
结论：我们报道的这项新的术中知晓的分类方法有很好的观察者间的一致性，并可能有助于术中知晓的研究。

(胡艳 译，马皓琳/李士通 校)

BACKGROUND: Intraoperative awareness with explicit recall occurs in approximately 1–2 cases per 1000. Given the rarity of the event, a better understanding of awareness and its sequelae will likely require the compilation of data from numerous studies. As such, a standard description and expression of awareness events would be of value.
METHODS: We developed a novel classification instrument for intraoperative awareness events: Class 0: no awareness; Class 1: isolated auditory perceptions; Class 2: tactile perceptions (e.g., surgical manipulation or endotracheal tube); Class 3: pain; Class 4: paralysis (e.g., feeling one cannot move, speak, or breathe); and Class 5: paralysis and pain. An additional designation of "D" for distress was also included for patient reports of fear, anxiety, suffocation, sense of doom, sense of impending death, or other explicit descriptions. We reviewed 15 studies of the incidence of awareness that provided specific information about awareness reports. Five anesthesiologists at three institutions who developed the categories independently classified the events. An additional 20 individuals (attending anesthesiologists, anesthesiology residents, nurse anesthetists, medical students, and ancillary staff) not involved in the development of the categories also independently classified the events. Fleiss's kappa statistic was used to evaluate inter-observer agreement.
RESULTS: One hundred fifty-one cases of intraoperative awareness in adults were identified as valid for analysis. The overall kappa value was 0.851 (0.847–0.856, 95% confidence interval) for the basic Classes 1–5. Including additional designations of emotional distress, the overall kappa value was 0.779 (0.776–0.783, 95% confidence interval).
CONCLUSION: We report a novel classification instrument for intraoperative awareness events that has excellent inter-observer agreement and that may facilitate the study of intraoperative awareness.

电阻加热或强制气流加温预防再分布低温

Resistive-Heating or Forced-Air Warming for the Prevention of Redistribution Hypothermia

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背景：我们评价了在麻醉诱导前施行电阻加热或强制气流加温以预防低体温的效能，并与未进行预加热进行对比。
方法：27 位患者择期行腹腔镜结直肠手术，随机分入 3 组中的其中 1 组：无预加热组；用 42°C 碳素纤维全身覆盖预加热 30min；手术前 30min42°C 强制气流加温。强制气流加温不包括肩膀、脚踝以及双足。预加热时间段精确地控制在 30min。在第 31min，启动全凭静脉麻醉技术，所有的病人应用电热毯主动加热。测量鼓膜温度和食管远端温度。分类数据应用 χ2 检验分析，连续数据应用方差分析来分析。P <0.05 被认为有统计学意义。
结果：在麻醉 40min 至 90min，食管远端温度的平均值在对照组和碳纤维组之间有明显差异。在麻醉 50min 后，对照组、碳纤维加热组和强制气流加温组食道温的平均值分别为 35.9°C ± 0.3°C、36.5°C ± 0.4°C 和 36.2°C ± 0.3°C。强制气

流加温组和对照组没有统计学显著差异。在电阻预加热 30min 后，病人的鼻咽温明显高于对照组。
结论：当病人存在术后低体温的风险时，预加热必须作为麻醉处理的一部分。
(黄丽娜 译， 马皓琳/李士通 校)
BACKGROUND: We evaluated the efficacy of resistive-heating or forced-air warming versus no prewarming, applied before induction of anesthesia for prevention of hypothermia.
METHODS: Twenty-seven patients scheduled for laparoscopic colorectal surgery were randomized into 1 of 3 groups: no prewarming; 30 minutes of prewarming with a carbon fiber total body cover at 42°C; or 30 minutes of preoperative forced-air warming at 42°C. The forced-air warming cover excluded the shoulders, ankles, and feet. The prewarming period was exactly 30 minutes. At the 31st minute, a total IV anesthesia technique was initiated, and all patients were actively warmed with a lithotomy blanket. Tympanic and distal esophageal temperatures were measured. Categorical data were analyzed using $\chi 2$ test, and continuous data were analyzed with analysis of variance. $P < 0.05$ was considered statistically significant.
RESULTS: The mean esophageal temperatures differed significantly between the control and the carbon fiber group from 40 to 90 minutes of anesthesia. After 50 minutes of anesthesia, the mean esophageal temperatures in the control, carbon fiber, and forced-air groups were 35.9°C ± 0.3°C, 36.5°C ± 0.4°C, and 36.2°C ± 0.3°C, respectively. No statistically significant difference was found between the forced-air and control groups. After 30 minutes of prewarming with resistive heating, patients had an esophageal temperature that was significantly higher than the control group.
CONCLUSIONS: Prewarming should be considered part of the anesthetic management when patients are at risk for postoperative hypothermia.

通过抑制兔子一氧化氮合成酶，可以调节兔肝脏血流动力学对动脉二氧化碳分压急性改变的反应

Modification of the Hepatic Hemodynamic Response to Acute Changes in Paco2 by Nitric Oxide Synthase Inhibition in Rabbits

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背景：已有报道高碳酸血症能调节肝脏循环。与此反应相关联的血管调节机制仍有部分未明了。
方法：对兔子进行麻醉并且通气，我们进行本研究目的是：1）在动脉二氧化碳分压改变后（通过改变二氧化碳的吸气分数），评估肝动脉和门静脉血流速度的调整（20MHz 脉冲多普勒）；2)评估非依赖动脉二氧化碳分压改变的 pH 的适当作用及门静脉 CO2 的作用；3）观察抑制一氧化氮合成酶对 CO2 导致的肝脏血流学调节的影响。
结果：随着 Paco2 的增加（从 30.9 ± 5 mm Hg 增加到 77 ± 11 mm Hg），动脉血压增加了 20%（$P < 0.01$），肝动脉血流速度增加了 90% ($P < 0.05$)，主动脉血流速度减少了 15%（$P < 0.05$）以及门静脉血流速度较少了 40% （$P < 0.05$）。在开腹下，改变 pH 值（输注 1ml 的 0.1N 盐酸）或仅改变门静脉 CO2(通过吸入

CO2 固定 Paco2) 对肝脏血流动力学没有影响。使用一氧化氮合成酶抑制剂（N ω-硝基- L -精氨酸，2.5mg/kg）预处理能减少对高碳酸血症的全身反应，然而门静脉的改变持续存在，肝动脉血流的增加受到大量的抑制。
结论：CO2 本身影响肝脏血流，是通过它的全身作用（很可能是通过化学反射）来实现的。一氧化氮并不调节 Paco2 急性变化引起的肝脏血流动力学的改变，但是它可能通过调节肝脏血管反应的幅度，来发挥其允许作用。
(王海涛 译，马皓琳/李士通 校)
BACKGROUND: Hypercapnia has been reported to modify liver circulation. The vascular regulations implicated in this response remain partly unknown.
METHODS: Using anesthetized and ventilated rabbits, we designed this study to evaluate the hepatic artery and portal vein blood flow velocity adjustments (20 MHz pulsed Doppler) after changes in Paco2 (by varying the inspiratory fraction of CO2) and to assess the proper role of pH, independent of Paco2 changes, the role of portal vein CO2, and the effect of nitric oxide synthase inhibition on CO2-induced modifications of hepatic hemodynamics.
RESULTS: Increasing Paco2 from 30.9 ± 5 mm Hg to 77 ± 11 mm Hg increased arterial blood pressure by 20% ($P < 0.01$) and hepatic artery blood flow velocity by 90% ($P < 0.05$) and decreased aortic blood flow velocity by 15% and portal vein blood flow velocity by 40% (both $P < 0.05$). Changes in pH (1 mL of 0.1 N hydrochloric acid infusion) or isolated changes in portal vein CO2 at constant Paco2 induced by CO2 insufflation in an open abdomen had no effect on hepatic hemodynamics. Pretreatment with a nitric oxide synthase inhibitor, Nω-nitro-l-arginine (2.5 mg/kg), blunted the systemic response to hypercapnia, whereas the portal modifications persisted, with a largely attenuated hepatic artery blood flow increase.
CONCLUSIONS: CO2 per se acts on hepatic blood flow by its systemic effect, probably via chemoreflexes. Nitric oxide does not mediate hepatosplanchnic hemodynamic modifications to acute changes in Paco2 but may play a permissive role by regulating the amplitude of hepatic vascular response.

比较择期脑幕上肿瘤手术中 3%高张生理盐水和甘露醇的脑减压效果

A Comparison of 3% Hypertonic Saline and Mannitol for Brain Relaxation During Elective Supratentorial Brain Tumor Surgery

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背景：在本研究中，我们比较了脑幕上肿瘤手术中 3%高张生理盐水(HTS)和 20%甘露醇的脑减压效果、重症监护病房(ICU)停留时间及住院天数。
方法：这个前瞻、随机、双盲研究包括的病人选自于因脑幕上肿瘤择期行颅骨切除术的病人。病人在开始划头皮时 5 分钟输注 160 mL 3%HTS (HTS 组, n =

122)或 150 mL 20%甘露醇(M 组, n = 116) 。动脉血 Pco2 维持在 35-40mmHg 之间，动脉血压控制在基础值±20%，手术期间液体正平衡维持在 2 mL/kg/h 的速度。数据记录包括：输液量、尿量、动脉血气、血清钠浓度、ICU 停留时间和住院天数。外科医生在打开硬脑膜后即刻评估脑状态：紧、适中或软。
结果：HTS 组(软/适中/紧, n = 58/43/21)的脑减压效果比 M 组(软/适中/紧, n = 39/42/35; P = 0.02)好。随着时间的推移 HTS 组血清钠水平比 M 组高(P < 0.001)。M 组的平均尿量(707 mL)高于 HTS 组(596 mL) (P < 0.001)。两组在补液量、ICU 停留时间和住院天数上无显著差异。
结论：我们的结果表明在择期脑幕上肿瘤手术中 HTS 的脑减压效果优于甘露醇，但是对 ICU 停留时间和住院天数无影响。
(周洁 译，马皓琳/李士通 校)
BACKGROUND: In this study, we compared the effects of 3% hypertonic saline (HTS) and 20% mannitol on brain relaxation during supratentorial brain tumor surgery, intensive care unit (ICU) stays, and hospital days.
METHODS: This prospective, randomized, and double-blind study included patients who were selected for elective craniotomy for supratentorial brain tumors. Patients received either 160 mL of 3% HTS (HTS group, n = 122) or 150 mL of 20% mannitol infusion (M group, n = 116) for 5 minutes at the start of scalp incision. The Pco2 in arterial blood was maintained within 35 to 40 mm Hg, arterial blood pressure was controlled within baseline values ±20%, and positive fluid balance was maintained intraoperatively at a rate of 2 mL/kg/h. Outcome measures included fluid input, urine output, arterial blood gases, serum sodium concentration, ICU stays, and hospital days. Surgeons assessed the condition of the brain as “tight,” “adequate,” or “soft” immediately after opening the dura.
RESULTS: Brain relaxation conditions in the HTS group (soft/adequate/tight, n = 58/43/21) were better than those observed in the M group (soft/adequate/tight, n = 39/42/35; P = 0.02). The levels of serum sodium were higher in the HTS group compared with the M group over time (P < 0.001). The average urine output in the M group (707 mL) was higher than it was in the HTS group (596 mL) (P < 0.001). There were no significant differences in fluid input, ICU stays, and hospital days between the 2 groups.
CONCLUSIONS: Our results suggest that HTS provided better brain relaxation than did mannitol during elective supratentorial brain tumor surgery, whereas it did not affect ICU stays or hospital days.

氯胺酮抑制转录因子活化剂蛋白-1 和核因子-κB，白介素-8 的产生以及 CD11b 和 CD16 的表达：关于人白细胞和白细胞系的研究

Ketamine Inhibits Transcription Factors Activator Protein 1 and Nuclear Factor-κB, Interleukin-8 Production, as well as CD11b and CD16 Expression: Studies in Human Leukocytes and Leukocytic Cell Lines

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背景：新近资料显示氯胺酮可以发挥抗炎作用。然而，人们对于氯胺酮诱导的免疫调节信号机制知之甚少。我们在本实验中研究了氯胺酮对人白细胞样细胞系和全血中性粒细胞中脂多糖诱导的转录因子活化剂蛋白-1 (AP-1)和核因子-κB (NF-κB)的激活作用的影响。
方法：采用电泳迁移率变动分析来研究氯胺酮对 U937 细胞中两个转录因子的核结合活性的影响，运用全血流细胞计数法检测白细胞中 AP-1 和 NF-κB 的含量。把具有不同的阿片和 NMDA 受体表达模式的细胞系用于逆转录多聚酶链反应（RT-PCR）以研究与氯胺酮信号有关的受体。利用全血化验评估氯胺酮对白介素（IL）-8 产生的影响。
结果：氯胺酮以浓度依赖性的方式抑制两个转录因子。这些作用不依赖于阿片和 NMDA 受体。氯胺酮同样减少全血中 IL-8 的产生以及中性粒细胞中 CD11b 和 CD16 的表达。
结论：氯胺酮的免疫抑制作用至少部分是因为抑制了转录因子 NF-κB 和 AP-1，而后二者具有调节促炎调质产生的作用。然而，正是中枢神经系统中存在的不同于这些的信号机制在氯胺酮介导的免疫调节中起了很大的作用。
(江继宏 译，马皓琳/李士通 校)
BACKGROUND: Recent data indicate that ketamine exerts antiinflammatory actions. However, little is known about the signaling mechanisms involved in ketamine-induced immune modulation. In this study, we investigated the effects of ketamine on lipopolysaccharide-induced activation of transcription factors activator protein 1 (AP-1) and nuclear factor-κB (NF-κB) in human leukocyte-like cell lines and in human blood neutrophils.
METHODS: Electric mobility shift assays were used to investigate ketamine's effects on nuclear binding activity of both transcription factors in U937 cells, and a whole blood flow cytometric technique was used for AP-1 and NF-κB determination in leukocytes. Cell lines with different expression patterns of opioid and N-methyl-d-aspartate receptors were used for reverse transcription–polymerase chain reaction to investigate receptors involved in ketamine signaling. Ketamine's effect on interleukin-8 production was assessed in a whole blood assay.
RESULTS: Ketamine inhibited both transcription factors in a concentration-dependent manner. These effects did not depend on opiate or N-methyl-d-aspartate receptors. Ketamine also reduced interleukin-8 production in whole blood and expression of CD11b and CD16 on neutrophils.
CONCLUSION: The immunoinhibitory effects of ketamine are at least in part caused by inhibition of transcription factors NF-κB and AP-1, which regulate production of proinflammatory mediators. However, signaling mechanisms different from those present in the central nervous system are responsible for ketamine-mediated immunomodulation.

一种简单的不需要几何计算或多重定标的坐骨神经定位方法

A Simple Approach to the Sciatic Nerve That Does Not Require Geometric Calculations or Multiple Landmarks

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背景：坐骨神经阻滞对于使用外周神经封闭而达到下肢远端完全无痛是必要的。新鲜尸体解剖和病人身上均可根据坐骨结节来定位坐骨神经，本研究对比了坐骨神经阻滞的传统方法和我们的实验方法。特别检验了在患者保持俯卧位时，我们的新方法（进针点改为侧偏坐骨结节 3cm）进针次数较少且需时较少的假设。
方法：根据 20 例尸体解剖得到坐骨结节来定位坐骨神经，这一研究结果被用于设计坐骨神经定位的替代方法。在一项随机、对照、交叉的研究中，我们比较了俯卧位臀下进针法（传统方法，n=19）和患者俯卧位时进针点侧偏坐骨结节中点 3cm 的实验方法（n=20）。我们记录了进针次数及在 1.5 mA 以及<0.5 mA 电流刺激下首次得到坐骨神经颤搐所花的时间。
结果：俯卧位尸体解剖结果显示，坐骨神经与坐骨结节中点平均距离为 2.8 ± 0.4 cm。当从体表标志进针时，实验组进针总是横切坐骨神经。相反，采用传统方法的进针则偏离坐骨神经 2.27 ± 0.47 cm。临床上，我们的实验方法比传统方法达到坐骨神经抽搐的穿刺次数较少。55%采用传统进针方式的患者因得不到坐骨神经抽搐而改为实验方法进针。无论是原先就分配到实验组还是那些因传统方法失败而转为实验方法的患者，我们都观察到分别有 45%和 85%的患者在进针 1 次和 3 次时得到首次坐骨神经抽搐。
结论：我们描述了一个比俯卧位臀下进针法更有效的定位坐骨神经的体表标志。
(杨秀娟 译，马皓琳/李士通 校)
BACKGROUND: Blockade of the sciatic nerve is necessary for complete analgesia of the lower extremity using peripheral nerve blocks. We identified the sciatic nerve in relation to the ischial tuberosity in fresh cadaver dissections as well as in patients to compare sciatic nerve blockade using the conventional approach versus our experimental approach. Specifically, we tested the hypothesis that in patients in the prone position, our novel approach (changing the point of needle insertion to 3 cm lateral from the ischial tuberosity) requires fewer needle passes and less time.
METHODS: The location of the sciatic nerve in relation to the ischial tuberosity was identified in 20 cadavers; this information was used to devise an alternative approach to the sciatic nerve. In a randomized, controlled, crossover patient study, we compared a prone subgluteal approach (conventional approach, n = 19) with an experimental approach with the insertion point 3 cm lateral to the midpoint of ischial tuberosity with patients in prone position (n = 20). We recorded the number of passes and the time taken to obtain an initial sciatic nerve twitch at a current of 1.5 mA and a twitch at <0.5 mA.
RESULTS: The sciatic nerve averaged 2.8 ± 0.4 cm from the midpoint of ischial tuberosity in cadavers in prone position. When needles were inserted from surface landmarks, those inserted through the experimental insertion point consistently transected the sciatic nerve. In contrast, needles inserted through the conventional approach were 2.27 ± 0.47 cm lateral to the sciatic nerve. Clinically, our experimental approach required fewer passes to obtain a sciatic nerve twitch than the conventional approach. We were unable to obtain a twitch in 55% of patients with the conventional

approach and converted them to the experimental approach. In patients originally assigned to the experimental approach and those switched to the experimental approach after failure with the conventional approach, we obtained the first sciatic nerve twitch in 1 pass in 45% of the patients and in 3 passes in 85%.
CONCLUSIONS: We describe a landmark that is more effective for identifying the location of the sciatic nerve than that used for the prone subgluteal approach.

使用多极全血凝集法作为床边监测评估去氨加压素对心脏术后血小板功能异常的作用

A Point-of-Care Assessment of the Effects of Desmopressin on Impaired Platelet Function Using Multiple Electrode Whole-Blood Aggregometry in Patients After Cardiac Surgery

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背景：心脏术后出血可能由于体外循环后血小板获得性功能障碍引起的。血小板功能的监测对于临床上鉴定这类患者的血小板功能障碍是非常重要的。1-脱氨-8-d-精氨酸血管加压素（醋酸去氨加压素，去氨加压素）已被证明可以增强血小板功能，减少血小板功能异常患者的血液丢失。在这项研究中，作者研究了多极全血凝集法（MEA）对于体外循环后血小板功能障碍检测的可行性并以此监测去氨加压素的疗效。
方法：连续 58 例心脏术后前两个小时失血超过 150ml/h 的患者，作为筛选血小板功能障碍群体。 22 例患者确定疑有血小板功能障碍。血小板功能障碍假设为：常规凝血分析（血小板计数，活化部分凝血活酶时间，国际标准化比值和纤维蛋白原）结果异常没有达到需要输注异体血制品的程度，且没有可疑的外科原因。非随机方法选择 11 例患者接受 0.3ug/kg 去氨加压素， 11 例没有采取治疗。在术前和术后 2h 分别使用凝血酶受体激活肽（TRAPtest，32 μM），二磷酸腺苷（ADPtest，6.4 μM）和花生四烯酸（ASPItest，0.5 mM）激发后行 MEA 评估。记录常规的实验室参数。Mann-Whitney 法检测组间的差异，以及 Wilcoxon 法检测干预前后的差异。
结果：所有入组的患者显示血小板功能障碍，在 MEA 中表现为干预前血小板聚集受损。去氨加压素组药物干预后血小板功能改善，结果分别为：1）ASPI 激发后 MEA 评估干预后 49 U [30/72 U]，干预前 15 U [8/21 U] [P < 0.001]，（结果用中位数表述[第 25 百分位/第 75 百分位值]）; 2）ADP 激发后 MEA 评估干预后 35 U [24/54 U] 干预前为 14 U [7/28 U] [P = 0.002]; 3）TRAP 激发后 MEA 评估干预后 85 U [66/115 U] ，干预前 64 U [26/88 U] [P = 0.007])。与此相反，在对照组中 MEA 保持不变。结果分别为：1）ASPI 激发后 MEA 评估干预后(22 U [10/50 U] 干预前 33 U [14/57 U] [P = 0.175]; 2)ADP 激发后 MEA 评估干预后 17 U [12/20 U] ，干预前 14 U [10/28 U] [P = 0.147]; 3）TRAP 激发后 MEA 评估干预后 65 U [41/89 U] 对比干预前 57 U [30/91 U] [P = 0.123])。

结论：心脏手术后血小板功能障碍，可在床边用 MEA 进行评估。使用 MEA 可观察到去氨加压素对受损的血小板功能的影响，表现为使用激活物后血小板聚集显着改善。这个装置对于确定 DDAVP 治疗的可能受益对象是非常有用的。(张蕾 译，陈杰 校)

BACKGROUND: Blood loss after cardiac surgery can be caused by acquired platelet dysfunction after cardiopulmonary bypass. Monitoring of platelet function is clinically important for the identification of patients experiencing such platelet dysfunction. 1-Deamino-8-d-arginine vasopressin (desmopressin acetate, DDAVP) has been shown to augment platelet function and to reduce blood loss in patients with platelet dysfunction. In this study, we examined the feasibility of whole blood multiple electrode aggregometry (MEA) for the detection of cardiopulmonary bypass–induced platelet dysfunction and investigated its ability to monitor DDAVP treatment.

METHODS: Fifty-eight consecutive patients with blood loss exceeding 150 mL/h in the first 2 consecutive hours after cardiac surgery were screened for suspected isolated platelet dysfunction. Twenty-two patients had suspected isolated platelet dysfunction and were enrolled in the study. Platelet dysfunction was assumed if conventional coagulation analyses (platelet count, activated partial thromboplastin time, international normalized ratio, and fibrinogen) did not show abnormal values as d for transfusion of allogenic blood products, and no surgical cause of bleeding was suspected. Eleven patients received 0.3 μg/kg DDAVP, and 11 patients received no therapy in a nonrandomized manner. MEA was performed after stimulation with thrombin receptor–activating peptide (TRAPtest, 32 μM), adenosine diphosphate (ADPtest, 6.4 μM), and arachidonic acid (ASPItest, 0.5 mM) before and 2 hours after intervention. Conventional laboratory variables were recorded. The Mann-Whitney test was used to detect differences between the groups, and the Wilcoxon test was used to detect differences before and after intervention.

RESULTS: All enrolled patients showed platelet dysfunction that manifested as impaired platelet aggregation in MEA before intervention. After the intervention, platelet function improved in the DDAVP group (49 U [30/72 U], median [25th/75th percentile] postintervention vs 15 U [8/21 U] preintervention for the ASPItest [$P < 0.001$]; 35 U [24/54 U] vs 14 U [7/28 U] for the ADPtest [$P = 0.002$]; and 85 U [66/115 U] vs 64 U [26/88 U] for the TRAPtest [$P = 0.007$]). In contrast, MEA remained unchanged in the control group (22 U [10/50 U] postintervention vs 33 U [14/57 U] preintervention for the ASPItest [$P = 0.175$]; 17 U [12/20 U] vs 14 U [10/28 U] for the ADPtest [$P = 0.147$]; and 65 U [41/89 U] vs 57 U [30/91 U] for the TRAPtest [$P = 0.123$]).

CONCLUSIONS: Impaired platelet function after cardiac surgery can be assessed at the bedside using MEA. The effect of DDAVP on impaired platelet function can also be detected as significant improvement in platelet aggregation to all activators. This device might be helpful for the identification of patients who may benefit from DDAVP therapy.

水合氯醛用于早产儿和足月儿镇静的疗效和并发症的分析

Chloral Hydrate Sedation in Term and Preterm Infants: An Analysis of Efficacy and Complications

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背景：早产儿和足月儿在全麻后有发生呼吸暂停的潜在风险。对于这些人群中使用水合氯醛镇静后的发生呼吸暂停的风险程度尚未阐明。在这项研究中，通过观察水合氯醛镇静效果、对额外镇静药物的需要量、血氧饱和度下降及需要氧气支持治疗的发生率来研究一岁以下婴儿因需核磁共振检查而使用水合氯醛镇静的临床过程。目的是确定足月儿实足年龄和早产儿（<37 周）的孕龄、胎龄与这些因素之间的关系。
方法：这是一项包括 1394 名接受水合氯醛镇静行 MRI 检查的婴儿中进行的一项回顾性队列研究。气管内插管、气管切开和先天性心脏病的婴幼儿被排除在外。病历详细记录了 MRI 后 24 小时的变化以确定其中的独立的危险因素和预后相关参数。单因素和多因素分析用来确定结果变量的危险因素。
结果：术后低血氧饱和度更可能与住院病人（P <0.001）、低体重(3.9 ± 2.1 kg vs 6.6 ± 3.0 kg; P < 0.001)、呼吸暂停病史(33.3% vs 9.9%; P = 0.001)、较高的 ASA 评分（P = 0.002）、更低的实足年龄(58.7 ± 82.8 days vs 152 ± 105.9 days; P < 0.0001)有关。当对早产儿组进行独立分析后发现，术后低氧饱和度直接与更低的实足年龄(56.0 ± 41.5 days vs 150.6 ± 107.1 days; P = 0.012) 和更低的胎龄(39.5 ± 4.1 weeks vs 54.4 ± 15.2 weeks; P = 0.005)有关，但与孕龄无关。早产儿比足月婴儿更易发生心动过缓（P = 0.005）。孕周在 48 周以上的早产儿未见明显的低血氧饱和度。由于早产儿术后低血氧饱和度发生的比例相对较小（8/262 ），无法确切判断早产儿和足月儿之间发生率的差异。增加水合氯醛的剂量或追加咪达唑仑并没有增加并发症的发生率。
结论：术后低氧饱和度的发生与足月婴儿更低的实足年龄和早产儿的更低的孕周有直接关系。住院和具有显著并发症是两个足月儿需要长期氧气支持治疗的危险因素。
(丁俊云 译， 陈杰 校)
BACKGROUND: Term and preterm infants are at risk of developing apnea after receiving general anesthesia. The risk of apnea after sedation with chloral hydrate (CH) in this population is unknown. In this study, we aimed to describe the clinical course of infants younger than 1 year who received CH for magnetic resonance imaging (MRI), with regard to the efficacy of CH sedation, the need for additional sedative drugs, and the incidence of oxyhemoglobin desaturation or need for oxygen supplementation. We aimed to determine the relationship between these factors to chronological age in term infants and gestational and postconceptional age (PCA) in preterm infants (<37 weeks' gestation).
METHODS: This was a retrospective cohort study of 1394 infants undergoing MRI examination with CH sedation. Infants with an endotracheal tube, tracheostomy tube, or congenital heart disease were excluded. Patient charts were examined in detail to determine independent risk factors and dependent outcome variables up to 24 hours after MRI. Univariate and multivariate analyses were performed to determine risk factors for outcome variables.
RESULTS: Postprocedure oxyhemoglobin desaturation was more likely in inpatients (P < 0.001) and was associated with a lower body weight (3.9 ± 2.1 kg vs 6.6 ± 3.0 kg; P < 0.001), history of apnea (33.3% vs 9.9%; P = 0.001), higher ASA physical status

(P = 0.002), and younger chronological age (58.7 ± 82.8 days vs 152 ± 105.9 days; P < 0.0001). When the preterm group was analyzed separately, the risk of postprocedure oxyhemoglobin desaturation was directly correlated with younger chronological age (56.0 ± 41.5 days vs 150.6 ± 107.1 days; P = 0.012) and younger PCA (39.5 ± 4.1 weeks vs 54.4 ± 15.2 weeks; P = 0.005), but not gestational age. Preterm infants had more postprocedure bradycardia than term infants (P = 0.005). Postprocedural oxyhemoglobin desaturation was not seen in preterm infants older than 48 weeks' PCA. Because of the relatively small percentage of cases (8 of 262) of postprocedural oxyhemoglobin desaturation in preterm infants, we were not able to definitively determine the difference in incidence between preterm and term infants. Additional doses of CH or supplementation with midazolam did not increase the incidence of complications.
CONCLUSIONS: The occurrence of postprocedural oxyhemoglobin desaturation was directly correlated with younger chronological age in term infants and younger PCA in preterm infants. Term infants who required extended oxygen supplementation were inpatients and had significant comorbidities.

每搏心血管指数，CARDEAN：一项前瞻、随机实验评估其在结肠镜检查时减少体动的功效

A Beat-by-Beat Cardiovascular Index, CARDEAN: A Prospective Randomized Assessment of Its Utility for the Reduction of Movement During Colonoscopy

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背景：作者试图确定使用每搏心血管指数，CARDEAN，能否减少麻醉下的结肠镜检查时病人体动的发生。
方法：监测包括心电图，脉冲式无创每搏动脉血压，氧饱和度，脑电双频指数（BIS）和 CARDEAN。CARDEAN 由每搏 Finapres®(Ohmeda, Madison, WI)结合一个特定算法监测心动过速后高血压的发生确定一个范围为 0 到 100 的指标。麻醉医师无法直接接触 Finapres 和 CARDEAN 系统。调整异丙酚用量以保持 40 <BIS<60。按传统经验（心动过速，高血压及体动）给予阿芬太尼 3.5 $\mu g \cdot kg^{-1}$，除非病人的心动过缓/窒息或血氧<95%。159 位在异丙酚麻醉下行结肠镜检查的病人随机分为：（i）对照组：没有其他干预，或（ii）CARDEAN 组：除了传统经验，当 CARDEAN > 60 时观察者让麻醉医生追加阿芬太尼。主要观察指标是体动的次数。
结果：146 例病人的数据进行了分析（对照组：75; CARDEAN 组：71）。两组异丙酚和阿芬太尼用量相似。当 BIS<60，CARDEAN 组（3.3 次/100 分[2.3-4.8]）较对照组（6.7 [5.3-8.5]）体动发生较少（相对危险度：0.5 [0.32，0.76]P 值 0.001）。研究中第一个 10 分钟，CARDEAN 组体动的发生率为 38%，对照

组为 59%（P= 0.04）。
结论：当 BIS<60，无肌松患者行结肠镜检查时，使用 CARDEAN 引导阿片类镇痛药应用可减少 51%临床非可预测的体动，更多的研究需要进一步完善以评估 CARDEAN 在各外科手术期间的应用价值。
(张磊 译，陈杰 校)

BACKGROUND: We sought to determine whether online use of a beat-by-beat cardiovascular index, CARDEAN® (Alpha-2, Lyon, France), modifies the incidence of patient movement during colonoscopy under anesthesia.
METHODS: Monitoring included an electrocardiogram, oscillometric and noninvasive beat-by-beat arterial blood pressure, O2 saturation, bispectral index (BIS), and CARDEAN. CARDEAN consists of beat-by-beat Finapres® (Ohmeda, Madison, WI) combined with an algorithm that detects hypertension followed by tachycardia and produces an index scaled 0 to 100. The anesthesiologist was denied access to Finapres and CARDEAN. Propofol was adjusted to keep 40<BIS<60. Alfentanil 3.5 $\mu g \cdot kg^{-1}$ was administered according to conventional signs (tachycardia, hypertension, and movement), unless the patient had signs of brady/apnea or Spo2 <95%. One hundred fifty-nine patients presenting for colonoscopy under propofol anesthesia were prospectively randomized to (i) control: no other intervention, or (ii) CARDEAN: in addition to conventional signs, an observer instructed the anesthesiologist to administer alfentanil when CARDEAN was >60. The primary outcome was the number of observed movements.
RESULTS: Data were analyzed in 146 patients (control: 75; CARDEAN: 71). The doses of propofol and alfentanil were similar in both groups. When BIS was <60, movements were less frequent in the CARDEAN group (3.3 movements/100 min [2.3-4.8]) than in the control group (6.7 [5.3-8.5]) (odds ratio: 0.5 [0.32; 0.76], P = 0.001). During the first 10 minutes of the procedure, the incidence of movements was 38% and 59% in the CARDEAN and control groups, respectively (P = 0.04).
CONCLUSION: With BIS <60, CARDEAN-guided opioid administration is associated with a reduction of 51% of clinically unpredictable movements in unparalyzed patients undergoing colonoscopy. More studies are required to refine the role of CARDEAN in surgical settings.

灌注变异指数（**PVI**）在预测全麻下行机械通气状态下病人呼气末正压对血流动力学影响的作用。

The Ability of Pleth Variability Index to Predict the Hemodynamic Effects of Positive End-Expiratory Pressure in Mechanically Ventilated Patients Under General Anesthesia

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背景：灌注变异指数（PVI）是一种新的算法能通过脉搏血氧仪描计波形的振幅变化来自动持续地监测呼吸变化。PVI 可以无创地监测全麻机械通气患者的流体反应。作者猜测 PVI 可以预测 10 cm H2O PEEP 对血流动力学的影响。
方法：作者研究了 21 例冠状动脉旁路移植术后机械通气和镇静的患者。行肺动脉导管和连接到食指的脉搏血氧传感器监测。共记录连续 3 种潮气量（6，8 和 10mL/kg）零呼气末压力时的血流动力学数据（心指数，PVI，脉压变异度，中心静脉压），然后每种潮气量增加 10 cm H2O 的 PEEP 并记录数据。增加 PEEP 后 CI 下降> 15%的患者定义为血液动力学不稳定。
结果： PEEP 可引起潮气量（Vt）8 与 10 mL/kg 患者的 CI 和 PVI 的变化。血流动力学不稳定 6mL/kgVt 组有 5 例，Vt 8mL/kg 组有 6 例，Vt 10mL/kg 组有 9 例。当 Vt 为 8 mL/kg 时， PVI 阈值设定为 12%，其预测 ZEEP 时血流动力学不稳定的敏感度为 83%，特异度为 80%（受试者特征曲线区间下面积为 0.806 P 值 0.03）。当 Vt 为 10 mL/kg 时， PVI 阈值为 13%，其预测 ZEEP 时血流动力学不稳定的敏感度为 78%，特异度为 83%（受试者特征曲线区间下面积 0.829; P 值 0.01）。
结论：镇静下机械通气患者 Vt > 8 mL/kg 时， 可利用 PVI 无创自动地检测 PEEP 对血流动力学的影响，此方法具有可接受的敏感特异度。
(舒慧刚 译， 陈杰 校)

BACKGROUND: Pleth variability index (PVI) is a new algorithm allowing automated and continuous monitoring of respiratory variations in the pulse oximetry plethysmographic waveform amplitude. PVI can predict fluid responsiveness noninvasively in mechanically ventilated patients during general anesthesia. We hypothesized that PVI could predict the hemodynamic effects of 10 cm H2O positive end-expiratory pressure (PEEP).
METHODS: We studied 21 mechanically ventilated and sedated patients in the postoperative period after coronary artery bypass grafting. Patients were monitored with a pulmonary artery catheter and a pulse oximeter sensor attached to the index finger. Hemodynamic data (cardiac index [CI], PVI, pulse pressure variation, central venous pressure) were recorded at 3 successive tidal volumes (VT) (6, 8, and 10 mL/kg body weight) during zero end-expiratory pressure (ZEEP) and then after addition of a 10 cm H2O PEEP for each Vt. Hemodynamically unstable patients were defined as those with a >15% decrease in CI after the addition of PEEP.
RESULTS: PEEP induced changes in CI and PVI for Vt of 8 and 10 mL/kg. Hemodynamic instability occurred in 5 patients for a VT of 6 mL/kg, in 6 patients for a VT of 8 mL/kg, and in 9 patients for a VT of 10 mL/kg. For VT of 8 mL/kg, a PVI threshold value of 12% during ZEEP predicted hemodynamic instability with a sensitivity of 83% and a specificity of 80% (area under the receiver operating characteristic curve 0.806; P = 0.03). For VT of 10 mL/kg, a PVI threshold value of 13% during ZEEP predicted hemodynamic instability with a sensitivity of 78% and a specificity of 83% (area under the receiver operating characteristic curve 0.829; P = 0.01).
CONCLUSIONS: PVI may be useful in automatically and noninvasively detecting the hemodynamic effects of PEEP when VT is >8 mL/kg in ventilated and sedated patients with acceptable sensitivity and specificity.

脑功能监测证实的术中知晓病人发生创伤后应激障碍

Posttraumatic Stress Disorder in Aware Patients from the B-Aware Trial

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背景：术中知晓可所造成的长期影响并不一致，一些病人没有留下长期残疾，而另一些则导致心理上的问题，且可能是严重而持久。 在这项研究中，作者比较了在脑功能监测的随机试验中确认或者未确认发生术中知晓的病人，创伤后应激障碍（PTSD）的发生率。
方法：作者使用了一项匹配的队列设计，旨在匹配 13 例确认术中知晓的患者。对每个存活的知晓患者根据年龄，性别，手术类型，手术日期和医院配对 4 名对照者。根据对照组配对每一个知晓病人，并使用临床医生指导的的创伤后应激量表进行面试。
结果：本研究收集的数据发生在 2006 年 6 月 2007 年 3 月， 平均随访年限为 5.3 年（范围 4.3-5.7 年）。在确诊的 13 例知晓病人中 6 例死亡。确诊知晓的 7 例中的 5 例（71％）和 25 例对照组中的 3 例（12％）符合创伤后应激障碍（PTSD）（adjusted odds ratio = 13.3 [95％可信区间：1.4-650]; P = 0.02）。这些症状的中位发病时间为 14 天（范围：手术后 7-243 天），症状平均持续时间为 4.7 年（范围 4.4-5.6 年）。
结论：脑功能监测证实术中知晓的病人，发生创伤后应激障碍是常见且持久的。全身麻醉下发生知晓的防治策略应当修正。
(叶乐 译，陈杰 校)

BACKGROUND: The long-term consequences of an awareness episode vary. Some patients do not have any long-term disability, whereas others develop psychological problems that may be severe and persistent. In this study, we compared the incidence of posttraumatic stress disorder (PTSD) in patients with and without confirmed awareness who were randomized in the B-Aware Trial.
METHODS: We used a matched cohort design, aiming to follow up the 13 patients with confirmed awareness. Each surviving awareness patient was matched with 4 controls for age, sex, surgery type, date of surgery, and hospital. A face-to-face interview was conducted with each awareness patient and matched controls using the Clinician Administered Posttraumatic Stress Disorder Scale.
RESULTS: Data collection for this study occurred between June 2006 and March 2007, with a median follow-up time of 5.3 yr (range, 4.3–5.7 yr). Six of the 13 confirmed awareness patients had died. Five of the 7 confirmed awareness patients (71%) and 3 of the 25 controls (12%) fulfilled the criteria for PTSD at the time of the interview (adjusted odds ratio = 13.3 [95% confidence interval: 1.4–650]; P = 0.02). The median onset time of symptoms was 14 days (range, 7–243 days) after surgery, and the median duration of symptoms was 4.7 yr (range, 4.4–5.6 yr).
CONCLUSIONS: PTSD was common and persistent in the confirmed awareness patients of the B-Aware Trial. Strategies to prevent awareness in patients under general anesthesia are justified.

妊娠期影像技术

Imaging During Pregnancy
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在过去的 10 年中，影像技术在妇女怀孕期间的使用大大增加。本综述主要讨论超声、磁共振成像、计算机断层扫描和X线用于评估非产科疾病的风险和适应证。评估怀孕妇女非产科疾病的显像诊断正在进展中，并在不断地变化。现表明产妇放射诊断对胎儿潜在利益的价值大于风险是因为单一的辐射对胎儿风险很小。
(唐颖 译，陈杰 校)
The use of imaging techniques in women who are pregnant has increased greatly over the past decade. This focused review discusses the risks and indications of ultrasonography, magnetic resonance imaging, computed tomographic scanning, and fluoroscopy for the evaluation of the parturient with non-obstetric disorders. Diagnostic imaging of the pregnant woman for the evaluation of disorders not related to pregnancy is evolving, and protocols will vary from institution to institution. The potential benefit from indicated diagnostic radiological procedures in the parturient nearly always outweighs risk to the fetus because radiation exposure from a single procedure conveys little fetal risk.

动脉内应用尼卡地平和/或米力农治疗脑血管痉挛病人的血流动力学管理和预后

Hemodynamic Management and Outcome of Patients Treated for Cerebral Vasospasm with Intraarterial Nicardipine and/or Milrinone

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背景：脑血管痉挛是动脉瘤破裂蛛网膜下腔出血后潜在的致命性并发症。尽管目前临床上用动脉内尼卡地平或者米力农进行血管内治疗，但是对于治疗中血流动力学的管理以及预后和管理疗效知之甚少。作者测试了两个假设：（1）动脉内应用尼卡地平和米力农以治疗脑血管痉挛可能增加血管收缩药用量以维持动脉血压达到靶水平；（2）为了提高血压而应用大剂量升压药可能导致酸中毒以及靶器官（终末器官）缺血性损伤。
方法：收集 2005 年 3 月至 2007 年 7 月期间连续病例进行单中心回顾性研究，这些患者在动脉瘤破裂蛛血后出现脑血管痉挛临床症状，且经药物治疗（ “3H 疗法” ）无效而接受动脉内尼卡地平和/或米力农注射。
结果：在这 73 例患者（平均年龄 52± 10 岁，其中 50 位女性）所接受的 160 次治疗中，96 次仅用尼卡地平治疗，5 次仅用米力农，59 次用两种药物。93%的病例接受复合肌松的全身麻醉。在治疗过程中，维持目标血压所需要的血管收缩药的种类及剂量都增加；所需新福林的中位数从 200 μg/min(n = 121)增加至 325 μg/min (n = 122)，去甲肾上腺素从 12 μg/min (n = 60) 增加至 24.5 μg/min (n = 87)，血管加压素从 7 μg/min 增加至 24 μg/min。然而，治疗过程中动脉血压仍下降了 13%。大于 90%的病例治疗后的血管造影照片显示血管内径改善。

1 例患者表现出了肌钙蛋白 T（TnT）的增加，没有患者出现肾功能减退、肠缺血或外周缺血、系统性酸中毒或急性脑卒中。总体死亡率是 11%。
结论：动脉内应用尼卡地平/米力农治疗过程中需要应用血管收缩药以维持动脉血压。尽管需要用大剂量的血管收缩药，这种治疗方法具有低死亡率、最小程度的终末器官缺血性损伤及较少系统性酸中毒，且使痉挛脑血管的内径得以改善。
(邹巧群 译，陈杰 校)

BACKGROUND: Vasospasm is a potentially devastating complication after aneurysmal subarachnoid hemorrhage. Although endovascular treatment with intraarterial nicardipine and milrinone is an accepted clinical treatment strategy, there is little information either on hemodynamic management during treatment or on outcome and consequences of the hemodynamic management. We tested 2 hypotheses: (1) intraarterial administration of nicardipine and milrinone to treat cerebral vasospasm would require increased administration of vasoconstrictor to support arterial blood pressure at target levels; and (2) high-dose vasopressors administered to increase blood pressure in these patients would lead to systemic acidosis and end-organ ischemic damage.
METHODS: We conducted a single-center, retrospective review of consecutive patients with clinically symptomatic vasospasm after aneurysmal subarachnoid hemorrhage that failed medical management with “triple H therapy” and subsequently received intraarterial nicardipine and/or milrinone between March 2005 and July 2007.
RESULTS: Of 160 endovascular interventions in 73 patients (aged 52 ± 10 years; 50 women), 96 received only nicardipine, 5 only milrinone, and 59 both drugs. General anesthesia with muscle relaxation was performed for 93% of procedures. During treatment, both the number and dose of vasopressors required to maintain arterial blood pressure at target levels increased; the median dose of phenylephrine increased from 200 (n = 121) to 325 μg/min (n = 122), norepinephrine increased from 12 (n = 60) to 24.5 μg/min (n = 87), and vasopressin infusions increased from 7 to 24. Nonetheless, arterial blood pressure decreased 13% during treatment. In >90% of procedures, the postprocedure angiogram showed improved vessel caliber. A single patient demonstrated troponin T increase; no patients had a decrease in renal function, bowel or peripheral ischemia, systemic acidosis, or acute stroke. Overall mortality was 11%.
CONCLUSIONS: Intraarterial administration of nicardipine and/or milrinone requires use of vasopressors to maintain arterial blood pressure. Despite high doses of vasoconstrictors, treatment has low mortality, minimal end-organ ischemic damage or systemic acidosis, and results in improved caliber of cerebral vessels affected by vasospasm.

吗啡在脊柱融合术中自体髂骨植骨术供骨区的局部镇痛作用：一项前瞻性，随机，双盲，安慰剂对照的研究

Local Administration of Morphine for Analgesia After Autogenous Anterior or Posterior Iliac Crest Bone Graft Harvest for Spinal Fusion: A Prospective, Randomized, Double-Blind, Placebo-Controlled Study

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背景：一些脊柱融合术中髂骨移植的患者术后供骨区有残余痛或慢性疼痛。多种治疗措施用来减少有关疼痛，如吗啡局部注射治疗。
方法：作者设计如下一项前瞻性，随机，双盲，安慰剂对照研究。针对择期进行脊柱手术的病人，术中在髂脊骨供区局部注射吗啡 5mg（治疗组）或生理盐水（安慰剂组）。排除在围术期大量使用阿片类药物患者，如每天使用吗啡大于等于 60mg，或者使用次数大于三次的。术后（恢复室开始并行病人自控镇痛方法）吗啡应用标准化。在术后当天和 3、6、12 个月评估供区疼痛指数。
结果：54 例中 47 例（87%）成功随访至术后最少 1 年。两组患者间在年龄、性别、疾病均相似。两组在围术期术后 24 小时内使用吗啡总量无显著差异（P=0.48）。重复测量的方差分析表明一段时间没有组相互作用的影响：静休时臀部疼痛（P=0.94），活动时臀部疼痛（P=0.90），静休时脊柱疼痛（P=0.99），活动时脊柱疼痛（P=0.83）。两组术后 1 年随访有脊柱疼痛的病人相似（P=0.95）。
结论：研究表明，脊柱融合术中在供区应用吗啡对术后疼痛缓解无明显作用。
(杨秋娟 译，陈杰 校)
BACKGROUND: Harvesting of iliac crest graft for spinal fusions is associated with a number of patients reporting residual or chronic pain at the harvest site. Various interventions, including morphine infiltration, have been proposed to minimize the associated pain.
METHODS: We performed a prospective, double-blind, randomized, placebo-controlled study comparing intraoperative infiltration of 5 mg morphine (treatment) versus saline (placebo) into the iliac crest harvest site for patients undergoing elective spinal surgery. Patients with myelopathy, excessive perioperative opioid use (60 mg equivalent morphine/d or more), or multilevel (>3 levels) spinal surgery were excluded. Postoperative administration of morphine (recovery room and patient-controlled analgesia) was standardized. Numerical pain scores specific for the iliac crest site were determined in the immediate postoperative period and at 3, 6, and 12 months.
RESULTS: Of the 54 patients randomized, 47 (87%) were available for review with a minimum of 1-year follow-up. The groups were similar in baseline age, gender, and comorbidities. There was no significant difference between groups in total use of postoperative morphine during the first 24 hours (P = 0.48). Repeated measures analysis of variance demonstrated no interacting effect of group over time for hip pain at rest (P = 0.94), hip pain while moving (P = 0.90), spine pain at rest (P = 0.99), or spine pain while moving (P = 0.83). The proportion of patients reporting iliac crest pain at 1-year follow-up was the same between groups (P = 0.95).
CONCLUSIONS: This study has demonstrated that there are no additional benefits for the use of intraoperative infiltration of morphine into the iliac crest harvest site during spinal fusions.

远端腓肠神经和胫后神经的感觉测试能提供早期预测臀肌下股二头肌旁单次注射坐骨神经阻滞麻醉效果

Sensory Testing of Distal Sural and Posterior Tibial Nerves Provides Early Prediction of Surgical Anesthesia After Single-Injection Infragluteal-Parabiceps Sciatic Nerve Block

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背景：踝关节重建的外科手术麻醉需要坐骨神经所有终末支分布区域感觉和运动阻滞。在这项前瞻性的研究中，作者研究足部感觉运动试验对局部麻醉注射后，预测坐骨神经完全阻滞和确定麻醉不完全所需时限是否有价值。
方法：在进行踝关节重建的手术患者（n=180），用‘臀肌下股二头肌旁’方法进行坐骨神经阻滞，在 <0.4 mA 引出跖屈或内翻的运动反应后，注射 0.625%左旋布比卡因并混有肾上腺素 1:300,000 (0.4 mL/kg)。由另一位对电刺激运动反应结果不知情的观察者间隔对腓浅神经、腓深神经、胫后神经、腓肠神经分布远端皮肤行针刺感觉评估；运动阻滞效果通过足（跖屈及背屈）运动和脚趾运动来评估。完善的阻滞定义为在局部麻醉注射的 25 分钟内坐骨神经分布的所有区域感觉和运动丧失。感觉运动试验各节点的最佳敏感特异度是由 ROC 分析决定。使用非参数检验法来比较曲线下的面积，截止时间是由敏感度和特异度曲线的交点决定。

结果：坐骨神经阻滞前，87 例患者电刺激运动反应表现为跖屈而 93 例患者表现为内翻，93 例中的 88 例（94.6%）和 87 例中的 49 例（55.7%）在 25 分钟内取得完全坐骨神经阻滞。在测试范例中，曲线下的区域是相似。ROC 分析显示：对于那些电刺激运动反应为内翻者，腓肠神经测试最佳时间为 4 分钟，胫后神经测试最佳时间为 6 分钟；而对于那些电刺激运动反应为内翻者，其腓肠神经和胫后神经测试最佳时间均为 6 分钟。不完全阻滞的受试者没有一个在 10min 时腓神经麻醉。
结论：从预测坐骨神经阻滞是否成功方面看，4-6 分钟内出现腓肠神经麻醉（脚跟外侧和足外侧、第五脚趾）具有与胫后神经和腓总神经分布区域麻醉或随后的足部运动反应同样的价值。此外，未能在 10 分钟内取得腓肠神经麻醉能预测阻滞失败。
(刘世文 译，陈杰 校)

BACKGROUND: Surgical anesthesia for reconstructive ankle surgery requires sensory and motor block of all the terminal nerve distributions of the sciatic nerve. In this prospective observational study, we investigated the value of sensory and motor testing of the foot, after local anesthetic injection, for predicting complete sciatic nerve blockade and the duration of testing required for identifying incomplete anesthesia.
METHODS: Sciatic nerve blocks (n = 180) using the infragluteal-parabiceps approach were performed in patients undergoing reconstructive ankle surgery. Levobupivacaine 0.625% with epinephrine 1:300,000 (0.4 mL/kg) was injected after obtaining an elicited motor response at <0.4 mA of plantar flexion or inversion. Pinprick sensory assessments were performed at intervals by an observer unaware of

the elicited motor response in the distal cutaneous distributions of the superficial peroneal nerve, deep peroneal nerve, posterior tibial nerve, and sural nerve. Motor block was assessed using foot (plantar flexion and dorsiflexion) movement and toe movement. A complete block was defined as sensory and motor loss in all distributions of the sciatic nerve within 25 minutes of local anesthetic injection. The optimal sensitivity and specificity of various cutoff times of sensory and motor testing were determined by receiver operating characteristic analysis. The area under the curves was compared for equivalence using nonparametric methods. The cutoff times were determined as the point of intersection of the lines of sensitivity and specificity.
RESULTS: The elicited evoked motor response before sciatic nerve block was plantar flexion in 87 patients and inversion in 93. Eighty-eight of 93 patients (94.6%) who had an elicited motor response of inversion and 49 of 87 (55.7%) who had an elicited motor response of plantar flexion achieved complete sciatic nerve block at 25 minutes. Area under the curves were not different among testing paradigms. Receiver operating characteristic analysis identified optimal testing times of 4 minutes for the sural and 6 minutes for the posterior tibial nerve with an elicited motor response of inversion and 6 minutes with an elicited motor response of plantar flexion. No subject with an incomplete block achieved sural anesthesia by 10 minutes.
CONCLUSION: Sural anesthesia assessed at the lateral heel and the lateral aspect of the foot and the fifth toe identified within 4 to 6 minutes demonstrated a similar posttest predictive value as anesthesia in the distributions of the posterior tibial and peroneal nerves or motor movement of the foot at later intervals. In addition, failure to achieve sural anesthesia within 10 minutes was predictive of block failure.

使用氨甲环酸后完全不同的暂时性和区域性纤维蛋白酶活性

Temporally and Regionally Disparate Differences in Plasmin Activity by Tranexamic Acid

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背景：心脏手术一个主要的并发症是围手术期过多、过久的出血。因此通过抑制纤维蛋白溶解来增加凝血功能成为了心脏外科手术患者的一项重要药物治疗，其主要是通过应用氨甲环酸（TXA）等抗纤维蛋白溶解药物来抑制纤维蛋白酶的活性（PLact）。虽然这一方法几乎是普遍使用的，但是尚未有人深入研究过由 TXA 所导致的暂时性或区域性纤维蛋白酶活性改变。因此，我们应用荧光基因微量分析系统研究了使用 TXA 后大型动物模型体内纤维蛋白酶活性的动态变化。
方法：将实验用猪（25-35kg）随机分为两组，其中一组 TXA 组（使用 TXA30mg/kg，用生理盐水稀释至 50ml；样本量=9），一组空白对照组（50ml 生理盐水；样本量=7）。微量分析探头被置于肝脏、心肌、肾脏以及四头肌肌间隔内。微量透析液中含有一种经证实具有纤维蛋白酶特异性的荧光基因肽。当注入 TXA 或空白试剂后，通过微量分析探头采集初始液体，它能最直接地反映纤维蛋白酶的活性。然后零点基线、30 分钟、60 分钟、90 分钟和 120 分钟五个测量时点检测液体荧光值（标准荧光基因单位 SFU）。于同样的测量时点用同样的荧光基因方法检测血浆纤维蛋白酶活性。

结果：与空白对照组相比，TXA 组在 30 分钟，输注了超过 110SFU 后血浆纤维蛋白酶活性显著下降（P<0.05）。肝内的纤维蛋白酶活性在应用 TXA 后的 90 分钟（>150SFU）和 120 分钟（>175SFU）也分别特异性的下降了（P<0.05）。肝内纤维蛋白酶活性的下降是在血浆纤维蛋白酶活性降至最低的 60 分钟以后开始的。与之相反，肾脏、心脏以及四头肌的纤维蛋白酶活性却在机体整体活性降低后的 120 分钟出现暂时性的增强。
结论：通过这个大型动物实验模型体内微量分析法研究发现，纤维蛋白酶活性改变具有两面性。一方面，使用 TXA 所致的暂时性纤维蛋白酶活性改变在血浆和机体特定部位是完全不同的。另一方面，使用 TXA 会使得纤维蛋白酶活性发生区域特异性改变。在围手术期使用纤溶治疗时，可能需要在治疗方案中考虑到这些应用 TXA 后所产生的暂时性和区域性的不同纤溶效果。
(单嘉琪 译，薛张纲 校)

BACKGROUND: A major complication associated with cardiac surgery is excessive and prolonged bleeding in the perioperative period. Improving coagulation by inhibiting fibrinolysis, primarily through inhibition of plasmin activity (PLact) with antifibrinolytics such as tranexamic acid (TXA), has been a pharmacological mainstay in cardiac surgical patients. Despite its almost ubiquitous use, the temporal and regional modulation of PLact profiles by TXA remains unexplored. Accordingly, we developed a fluorogenic-microdialysis system to measure in vivo dynamic changes in PLact after TXA administration in a large animal model.
METHODS: Pigs (25-35 kg) were randomly assigned to receive TXA (30 mg/kg, diluted into 50 mL normal saline; n = 9) or vehicle (50 mL normal saline; n = 7). Microdialysis probes were placed in the liver, myocardium, kidney, and quadriceps muscle compartments. The microdialysate infusion contained a validated plasmin-specific fluorogenic peptide. The fluorescence emission (standard fluorogenic units [SFU]) of the interstitial fluid collected from the microdialysis probes, which directly reflects PLact, was determined at steady-state baseline and 30, 60, 90, and 120 min after TXA/vehicle infusion. Plasma PLact was determined at the same time points using the same fluorogenic substrate approach.
RESULTS: TXA reduced plasma PLact at 30 min after infusion by >110 SFU compared with vehicle values ($P < 0.05$). Specifically, there was a decrease in liver PLact at 90 and 120 min after TXA infusion of >150 SFU ($P < 0.05$) and 175 SFU ($P < 0.05$), respectively. The decrease in liver PLact occurred 60 min after the maximal decrease in plasma PLact. In contrast, kidney, heart, and quadriceps PLact transiently increased followed by an overall decrease at 120 min.
CONCLUSIONS: Using a large animal model and in vivo microdialysis measurements of PLact, the unique findings from this study were 2-fold. First, TXA induced temporally distinct PLact profiles within the plasma and selected interstitial compartments. Second, TXA caused region-specific changes in PLact profiles. These temporal and regional differences in the effects of TXA may have important therapeutic considerations when managing fibrinolysis in the perioperative period.

过去50年间新镇痛药物的发展：缺乏真正具有突破性的新型药物

The Development of New Analgesics Over the Past 50 Years: A Lack of Real Breakthrough Drugs.

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1960年至2009年间，共有49种药物被发现具有镇痛作用，并且使用至今。其中有7种药物被认为具有新奇的分子靶位，但是只有舒马曲坦这一种药物，有效地激励了人们努力去发现作用于同一靶点的结构类似的药物。这一段时间里，涌现了大量的关于疼痛领域的文章。相较于其他镇痛药物，基于吗啡的疼痛相关文献占了主导地位。众多的研究致力于与疼痛机制有关的多种分子靶点，并且已发表了数千篇文献报道，但是这些研究并非能产生出一种新的镇痛药物来改变阿片类药物和非甾体类抗炎药所占的份额。吗啡和阿斯匹林，这两种一个世纪之前就用于疼痛治疗的药物，尽管在很多方面作用有限（比如神经性疼痛）并且有很多严重的不良反应，但是它们仍然在生物医学文献中占主导地位。目前的评估显示，尽管大量研究努力，但是镇痛药物的发展仍然缺乏突破。本文讨论了关于新的镇痛药物研究停滞不前的可能因素。
(黄剑 译，薛张纲 校)
Fifty-nine drugs identified as analgesics were introduced from 1960 to 2009 and remain in use. Seven can be regarded as having novel molecular targets; however, only one, sumatriptan, was sufficiently effective to motivate the introduction of many similar drugs acting at the same target (triptans). Publication productivity in the area of pain grew exponentially during this period. Pain-related publications on morphine were dominant among other analgesics. Very intensive research efforts directed at diverse molecular targets related to pain mechanisms produced thousands of publications, but those efforts have not yet yielded new analgesics with sufficient effectiveness to change the share of publications on opioids or nonsteroidal antiinflammatory drugs. Morphine and aspirin, introduced for the treatment of pain more than a century ago, continue to dominate biomedical publications despite their limited effectiveness in many areas (e.g., neuropathic pain) and multiple serious adverse effects. The present assessment reveals the lack of real breakthroughs in analgesic drug development despite intense research efforts. Possible factors contributing to the apparent drought of novel analgesics are discussed.

B-Aware 试验研究双频指数监测对长期生存的影响

The Effect of Bispectral Index Monitoring on Long-Term Survival in the B-Aware Trial

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背景：当麻醉使用双频指数（BIS）监测时，给予病人的麻醉药物剂量通常会减少。低剂量的麻醉或许可以避免术中低血压和器官毒性，但能否降低重病发生率或死亡率仍有争议。在 B-Aware 实验中将 2463 名病人随机的分配在双频指数引导麻醉和常规麻醉两组中。我们对接受 BIS 监测麻醉的病人的死亡、心肌梗死（MI）、中风的发生风险低于接受常规麻醉的病人这一假设进行了试验。
方法：回顾调查所有手术后 30 天内未死亡患者的病史记录。记录死亡和心肌梗死或中风发生的日期和诱因。电话采访当时所有生存的患者。这项研究的主要终点为生存。

结果：中位随访时间为 4.1 年（范围：0-6.5 年）。548 例（22.2%）病人手术后死亡，220 例（89%）病人发生心肌梗死，115 位（4.7%）病人发生中风。BIS 监测病人和常规麻醉病人的死亡风险并无显著性差异（风险比为 0.86 [95%可信区间（0.72-1.01）]; P=0.07）。但是，倾向分数分析表明，BIS 监测组中 BIS 值低于 40 的时间超过 5 分钟的病人的死亡风险相对于组内其他病人为 1.41（95%可信区间为（1.02-1.95），P=0.039），此外，心肌梗死的发生率之比为 1.94（95%可信区间为（1.12-3.35），P 值=0.02），中风的发生率之比为 3.23（95%可信区间为（1.29-8.07），P=0.01）。

结论：进行 BIS 监测并确保 BIS 值低于 40 的时间不超过 5 分钟可改善患者生存和降低相关发病率。

(李莹 译，薛张纲 校)

BACKGROUND: When anesthesia is titrated using bispectral index (BIS) monitoring, patients generally receive lower doses of hypnotic drugs. Intraoperative hypotension and organ toxicity might be avoided if lower doses of anesthetics are administered, but whether this translates into a reduction in serious morbidity or mortality remains controversial. The B-Aware Trial randomly allocated 2463 patients at high risk of awareness to BIS-guided anesthesia or routine care. We tested the hypothesis that the risks of death, myocardial infarction (MI), and stroke would be lower in patients allocated to BIS-guided management than in those allocated to routine care.

METHODS: The medical records of all patients who had not died within 30 days of surgery were reviewed. The date and cause of death and occurrence of MI or stroke were recorded. A telephone interview was then conducted with all surviving patients. The primary end point of the study was survival.

RESULTS: The median follow-up time was 4.1 (range: 0-6.5) years. Five hundred forty-eight patients (22.2%) had died since the index surgery, 220 patients (8.9%) had an MI, and 115 patients (4.7%) had a stroke. The risk of death in BIS patients was not significantly different than in routine care patients (hazard ratio = 0.86 [95% confidence interval {CI}: 0.72-1.01]; P = 0.07). However, propensity score analysis indicated that the hazard ratio for death in patients who recorded BIS values <40 for >5 min compared with other BIS-monitored patients was 1.41 (95% CI: 1.02-1.95; P = 0.039). In addition, the odds ratios for MI in patients who recorded BIS values <40 for >5 min compared with other BIS-monitored patients was 1.94 (95% CI: 1.12-3.35; P = 0.02) and the odds ratio for stroke was 3.23 (95% CI: 1.29-8.07; P = 0.01).

CONCLUSIONS: Monitoring with BIS and absence of BIS values <40 for >5 min were associated with improved survival and reduced morbidity in patients enrolled in the B-Aware Trial.

电阻聚合物与强热空气加温：志愿者的热量传递和核心温度复温速度比较

Resistive-Polymer Versus Forced-Air Warming: Comparable Efficacy in Orthopedic Patients

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背景：一些不良结局是由围术期轻度的低体温造成的。用时下最常用的强热空气加温来保持正常体温成为麻醉过程中的标准程序。最近发明了一种电阻聚合物患者加温装置。我们用前瞻性、随机的临床试验来比较广泛应用的强热空气加热装置（Bair Hugger 加热毯#522 和送风机#750，Arizant，Eden Prairie, MN）和电阻聚合物加热装置（Hot Dog 多体位加热毯和控制器，Augustine 生物医学, Eden Prairie, MN）的效能。
方法：八十个将进行矫形外科手术的患者被随机分入强热空气加热组或电阻聚合物加热组。连续记录他们的核心温度、皮温（头部、上臂、前臂、胸部、腹部、背部、大腿、小腿）和房间温度（整体和靠近病人处）。
结果：在最初的下降之后，两组的核心温度上升无统计学差异（强热空气组：0.33 度/小时 ± 0.34 度/小时；电阻聚合物组：0.29 度/小时 ± 0.35 度/小时；P 值 =0.6）。在平均皮温和核心温度方面也无统计学差异。同电阻聚合物组相比，强热空气组能升高病人周围（外科医生和麻醉医生的工作区）的温度（强热空气组：24.4 度± 5.2 度；电阻聚合物组：22.6 度± 1.9 度 30 分钟处；P 曲线下面积 <0.01）
结论：在行矫形外科手术的患者中，电阻聚合物装置与强热空气装置的保温效能是一样的。
(姚敏敏 译，薛张纲 校)
BACKGROUND: Several adverse consequences are caused by mild perioperative hypothermia. Maintaining normothermia with patient warming systems, today mostly with forced air (FA), has thus become a standard procedure during anesthesia. Recently, a polymer-based resistive patient warming system was developed. We compared the efficacy of a widely distributed FA system with the resistive-polymer (RP) system in a prospective, randomized clinical study.
METHODS: Eighty patients scheduled for orthopedic surgery were randomized to either FA warming (Bair Hugger warming blanket #522 and blower #750, Arizant, Eden Prairie, MN) or RP warming (Hot Dog Multi-Position Blanket and Hot Dog controller, Augustine Biomedical, Eden Prairie, MN). Core temperature, skin temperature (head, upper and lower arm, chest, abdomen, back, thigh, and calf), and room temperature (general and near the patient) were recorded continuously.
RESULTS: After an initial decrease, core temperatures increased in both groups at comparable rates (FA: 0.33°C/h ± 0.34°C/h; RP: 0.29°C/h ± 0.35°C/h; P = 0.6). There was also no difference in the course of mean skin and mean body (core) temperature. FA warming increased the environment close to the patient (the workplace of anesthesiologists and surgeons) more than RP warming (24.4°C ± 5.2°C for FA vs 22.6 °C ± 1.9°C for RP at 30 minutes; PAUC <0.01).
CONCLUSION: RP warming performed as efficiently as FA warming in patients undergoing orthopedic surgery.

血管加压素对双重灌流人胎盘模型中胎儿胎盘血流的多元效应

The Diverse Effects of Vasopressors on the Fetoplacental Circulation of the Dual Perfused Human Placenta

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背景：我们使用双重灌注，单分离子叶，人胎盘模型来研究 5 种血管加压素对胎儿动脉灌注压（FAP）的影响。
方法：在 29 例单独的实验中，分别加入肾上腺素（75mg），去甲肾上腺素（75mg），麻黄素（50mg），新福林（2mg）和甲氧胺（40mg）至作为母体血液循环的水池中，来决定上述药物对 FAP 的影响。药物对每个胎盘子叶的暴露时间约为 180 分钟。
结果：180 分钟后，麻黄素组 FAP（mean± sd）由 64 ± 3 mm Hg 上升到 172 ± 71 mm Hg (P < 0.001)，新福林组 FAP 由 81 ± 4 mm Hg 上升到 132 ± 11 mm Hg (P = 0.003)。肾上腺组、去甲肾上腺素组和甲氧胺组 FAP 值没有变化。
结论：在双重灌注，单分离子叶，人胎盘模型中，麻黄素和新福林作用于母体循环能引起 FAP 的升高，而肾上腺素、去甲肾上腺素和甲氧胺不会引起 FAP 变化。这些区别的药效动力学机制还未阐明。因此，这些发现的临床意义尚不明朗。
(俞佳 译，薛张纲 校)
BACKGROUND: We studied the effects of 5 vasopressors on fetal arterial perfusion pressure (FAP) in vitro using the dual perfused, single isolated cotyledon, human placental model.
METHODS: In 29 separate experiments, epinephrine (75 mg), norepinephrine (75 mg), ephedrine (50 mg), phenylephrine (2 mg), and methoxamine (40 mg) were introduced into the 250-mL reservoir serving the maternal perfusion circuit to determine the effect of each drug on FAP. The duration of drug exposure for each placental cotyledon was approximately 180 minutes.
RESULTS: After 180 minutes, FAP (mean ± sd) increased significantly with ephedrine from 64 ± 3 to 172 ± 71 mm Hg (P < 0.001) and with phenylephrine from 81 ± 4 to 132 ± 11 mm Hg (P = 0.003). No changes in FAP were seen with epinephrine, norepinephrine, and methoxamine.
CONCLUSIONS: In the dual perfused, single isolated cotyledon, human placental model, exposure of the maternal circulation to ephedrine and phenylephrine caused an increase in FAP, whereas exposure to norepinephrine, epinephrine, and methoxamine did not. The pharmacodynamic mechanisms underlying these differences have yet to be explained. Thus, the clinical implications of the findings are as yet unclear.

磷酸二酯酶抑制剂奥普力农在全脑缺血中的作用

The Effects of the Phosphodiesterase Inhibitor Olprinone on Global Cerebral Ischemia

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背景：磷酸二酯酶抑制剂奥普力农三号已被证实能改善心肌功能并增加脑血流量；因此，如果奥普力农对全脑缺血的直接神经保护作用与西洛他唑的程度相

同的话，那么奥普力农可能对心跳骤停后的脑复苏有用。我们分别从体内体外两条途径试验了奥普力农是否在全脑缺血时对神经细胞有保护作用。

方法：在一个通过阻塞四条血管诱发的十分钟全脑缺血的老鼠模型上，于 40 分钟的围缺血期内注射 0.3, 3, 或者 30 μg · kg−1 · min−1 的奥普力农或生理盐水（每组 6 个）。再灌注后的三天里清点海马 CA1 区神经细胞数量，收集再灌注后 15 分钟的标本用 Western 印迹法分析环磷酸腺苷磷酸 3'5' -磷酸腺苷反应元件结合蛋白的磷酸化程度。在体外，培养的脑神经元暴露在低氧和乏糖环境下 4 小时，然后在 24 小时的复苏期内使用(10−11–10−5 mol · L−1)或不用奥普力农。细胞活性测定使用细胞计数试剂盒- 8（Dojindo 分子技术，马里兰州盖瑟斯堡）。

结果：在老鼠全脑缺血模型中，存活的 CA1 神经元数量在一个显微镜视野里计数，30 μg · kg−1 · min−1 组(49.9 ± 9.2)明显高于生理盐水注射对照组(7.2 ± 3.4), 且奥普力农治疗增加了环磷酸腺苷磷酸 3'5' -磷酸腺苷反应元件结合蛋白的磷酸化。在剂量依赖规则下有奥普力农环境中培养的神经细胞的存活分数要显著高于没有奥普力农环境下培养出来的神经细胞。

结论：本研究第一次成功地证明了奥普力农在体内和体外都有神经细胞保护作用，尤其是在抗全脑缺血时。这些结果提示奥普力农可能对经历全脑缺血的病人有治疗作用。

(张玥琪 译，薛张纲 校)

BACKGROUND: The phosphodiesterase III inhibitor olprinone has been confirmed to improve myocardial function and increase cerebral blood flow; therefore, if olprinone exerts direct neuroprotective effects against global cerebral ischemia to the same degree as cilostazol, olprinone could be useful for cerebral resuscitation after cardiac arrest. We examined whether olprinone directly protected neuronal cells from global cerebral ischemia both in vivo and in vitro.

METHODS: In a rat model of 10-minute global cerebral ischemia induced by 4-vessel occlusion, 0.3, 3, or 30 μg · kg^{-1} · min^{-1} olprinone or saline was infused for a periischemic period of 40 minutes (n = 6 for each group). Hippocampal CA1 neuronal cells were then counted 3 days after reperfusion, and the phosphorylation of cyclic adenosine 3′5′-monophosphate response element-binding protein was examined using Western blotting analyses of specimens obtained 15 minutes after reperfusion. In vitro, cultured cerebral neurons were exposed to 4 hours of hypoxia and glucose deprivation and then 24 hours of recovery in the absence or presence of olprinone (10^{-11}–10^{-5} mol · L^{-1}). Cell viability was measured using the Cell Counting Kit-8 (Dojindo Molecular Technologies, Gaithersburg, MD).

RESULTS: In the rat model of global ischemia, the number of surviving CA1 neurons counted under a microscopic field in the 30 μg · kg^{-1} · min^{-1} olprinone-treated group (49.9 ± 9.2) was significantly higher than that in the saline infusion control group (7.2 ± 3.4), and olprinone treatment increased the phosphorylation of cyclic adenosine 3′5′-monophosphate response element-binding protein. The survival fraction of the neuronal cells cultured in the presence of olprinone was also significantly higher than that of cells cultured in the absence of olprinone in a dose-dependent manner.

CONCLUSIONS: Our study successfully demonstrated, for the first time, that olprinone had a protective effect on neuronal cells in vitro and in vivo, especially against global cerebral ischemia. These results suggest that olprinone might be useful for the treatment of patients experiencing global cerebral ischemia.

局部压力如何反映疼痛部位？一项关于颈椎关节突关节疼痛的研究

What does local tenderness say about the origin of pain? An investigation of cervical zygapophysial joint pain.

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背景：不管使用触诊法还是计量痛压计，每个疼痛患者都需进行机械性痛觉灵敏度测验。尽管该评估方法已被广泛应用，但是至今没有机械性痛觉灵敏度测验对于疼痛定位相关意义的研究报道。我们测试了通过进行机械性痛觉灵敏度测验来辨别颈椎关节突出导致的疼痛的临床假设。

方法：共有 33 例慢性单侧颈部疼痛的患者纳入该项研究。测定双侧颈椎关节突关节的压痛阈值（Pressure pain thresholds ， PPTs)。使用选择性神经阻滞法确诊颈椎关节突关节疼痛。初步比较所有患者有症状侧和无症状侧关节突关节的 PPTs 值的差异。进一步比较存在关节突关节疼痛的患者中有症状侧和无症状侧的关节 PPT 值差异，比较有关节突关节疼痛患者和无关节突关节疼痛患者疼痛侧的 PPT 差异。PPT 对于两种不同截值的敏感性和特异性(痛侧和对侧 PPT 存在差异界定为 1kPa 和 30kPa；即：试验结果阳性，则痛侧与对侧 PPT 的差异至少分别为 1kPa 和 30kPa，否则试验结果为阴性)。

结果：患有关节突关节疼痛的患者共 14 例。这些病例中，初步分析痛侧 PPT 与对侧 PPT 均值差异为-6.2 kPa (95% 置信区间: -19.5 to 7.2, P = 0.34)。此外进一步分析并未产生有统计学意义结果。截值 1kPa 的敏感性和特异性分别为 67%和 16%，阳性似然比 0.79，诊断置信度为 38%。而截值 30kPa 的敏感性下降为 13％，但特异性升至 95%，阳性似然比 2.53，诊断置信度为 67%。有关节突关节患者的 PPT 值明显低于无痛患者（P < 0.001）。

结论：机械性疼痛灵敏度的评估尚不能诊断颈椎关节突关节的疼痛。但此项结果将有助于促进更多在临床广泛使用的对于疼痛患者的临床诊断工具的研究。
(张钊 译，薛张纲 校)

BACKGROUND: Mechanical pain sensitivity is assessed in every patient with pain, either by palpation or by quantitative pressure algometry. Despite widespread use, no studies have formally addressed the usefulness of this practice for the identification of the source of pain. We tested the hypothesis that assessing mechanical pain sensitivity distinguishes damaged from healthy cervical zygapophysial (facet) joints.

METHODS: Thirty-three patients with chronic unilateral neck pain were studied. Pressure pain thresholds (PPTs) were assessed bilaterally at all cervical zygapophysial joints. The diagnosis of zygapophysial joint pain was made by selective nerve blocks. Primary analysis was the comparison of the PPT between symptomatic and contralateral asymptomatic joints. The secondary end points were as follows: differences in PPT between affected and asymptomatic joints of the same side of patients with zygapophysial joint pain; differences in PPT at the painful side between patients with and without zygapophysial joint pain; and sensitivity and specificity of PPT for 2 different cutoffs (difference in PPT between affected and contralateral side by 1 and 30 kPa, meaning that the test was considered positive if the difference in PPT between painful and contralateral side was negative by at least 1 and 30 kPa, respectively). The PPT of patients was also compared with the PPT of 12 pain-free subjects.

RESULTS: Zygapophysial joint pain was present in 14 patients. In these cases, the difference in mean PPT between affected and contralateral side (primary analysis) was -6.2 kPa (95% confidence interval: -19.5 to 7.2, P = 0.34). In addition, the secondary analyses yielded no statistically significant differences. For the cutoff of 1 kPa, sensitivity and specificity of PPT were 67% and 16%, respectively, resulting in a positive likelihood ratio of 0.79 and a diagnostic confidence of 38%. When the cutoff of 30 kPa was considered, the sensitivity decreased to only 13%, whereas the specificity increased to 95%, resulting in a positive likelihood ratio of 2.53 and a diagnostic confidence of 67%. The PPT was significantly lower in patients than in pain-free subjects (P < 0.001).
CONCLUSIONS: Assessing mechanical pain sensitivity is not diagnostic for cervical zygapophysial joint pain. The finding should stimulate further research into a diagnostic tool that is widely used in the clinical examination of patients with pain.

疼痛机制：N-安替比林-3，4-二叶绿素马来酰亚胺，一种有效治疗慢性疼痛的环酰亚胺：谷氨酸能系统的作用

PAIN MECHANISMS: *N*-Antipyrine-3, 4-Dichloromaleimide, an Effective Cyclic Imide for the Treatment of Chronic Pain: The Role of the Glutamatergic System

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背景：近些年，环酰亚胺因其可能的治疗潜能吸引了科学界的注意。关于复合物 NA-3,4-DCM 的研究也证明了其在福尔马林和辣椒碱伤害模型中的抗伤害效果，以及减少小鼠醋酸诱导的腹部扭动。
方法：本实验中，我们检测了 NA-3,4-DCM 对小鼠持续性疼痛样行为模型中机械性超强伤害的影响。我们也观察了 NA-3,4-DCM 在外周、表皮、脊髓和脊髓上水平的抗伤害特性，并评估谷氨酸能系统在 NA-3,4-DCM 抗伤害效应中的作用。
结果：NA-3,4-DCM 全身使用（腹腔内给药或口服）能干扰小鼠跖肌内注射角叉藻聚糖和完全弗罗因德佐剂诱导的机械性超强伤害的发生。有趣的是，重复腹腔内给药或口服 NA-3,4-DCM 不仅减轻强伤害性刺激，也逆转注射完全弗罗因德佐剂或局部结扎坐骨神经的机械性致敏作用，且给药剂量较加巴喷丁——临床上用于治疗慢性疼痛的药物——更低。全身、表皮、脊髓和脊髓上给予 NA-3,4-DCM 都能抑制福尔马林试验两个阶段中明显的伤害性感受。全身给予 NA-3,4-DCM 还能减轻小鼠跖间或鞘内注射谷氨酸诱导的伤害性感受。此外，NA-3,4-DCM 能明显抑制鞘内注射 I 类亲代谢性谷氨酸盐受体激动剂(1S,3R)- 氨基酸环戊烷-反式-1,3-dicardboxylic 酸 (ACPD)或 *N*- 甲基-d- 天冬氨酸(NMDA)诱导的伤害性反应，而不干扰其他非 NMDA 受体激动剂（α-氨基酸-3-羟-5-甲基-4-异噁唑丙酸和红藻氨酸盐）或 P 物质诱导的伤害性感受。值得注意的是，在相同剂量范围内复合物 NA-3,4-DCM 产生的抗伤害效应与非特异性效应如活动能力和运动协调能力的改变无关。

结论：这些结果强烈证明在小鼠外周、脊髓和脊髓上位置 NA-3,4-DCM 都能发挥抗超强伤害性感受的作用，并且 NA-3,4-DCM 与 I 类亲代谢性谷氨酸盐受体和 NMDA 受体的相互反应参与其作用机制。
(朱兰芳 译，薛张纲 校)

BACKGROUND: In recent years, cyclic imides have attracted the attention of the scientific community because of their promising therapeutic potential. Studies with the compound *N*-antipyrine-3,4-dichloromaleimide (NA-3,4-DCM) also demonstrated an antinociceptive effect in formalin or capsaicin models of nociception, and that it reduced acetic acid–induced abdominal writhing in mice.
METHODS: In this study, we examined the effects of NA-3,4-DCM on mechanical hypernociception in persistent pain-like behavioral models in mice. We also investigated the peripheral, topical, spinal, and supraspinal antinociceptive properties of NA-3,4-DCM and evaluated the involvement of the glutamatergic system on the antinociceptive effects of NA-3,4-DCM in mice.
RESULTS: NA-3,4-DCM, dosed systemically (intraperitoneally or per os), was capable of interfering with the development of mechanical hypernociception induced by intraplantar injection of carrageenan and complete Freund adjuvant in mice. Interestingly, repeated intraperitoneal or per os treatment with NA-3,4-DCM, administered after the induction of hypernociception, also reversed the mechanical sensitization induced by complete Freund adjuvant injection or partial ligation of the sciatic nerve in mice, with lower doses than gabapentin, a drug used clinically to treat chronic pain. When administered systemically, locally, spinally, or supraspinally, NA-3,4-DCM was able to inhibit the overt nociception of both phases of the formalin test. The systemic administration of NA-3,4-DCM also reduced the nociception induced by intraplantar or intrathecal injection of glutamate in mice. Furthermore, NA-3,4-DCM caused marked inhibition of the nociceptive response induced by intrathecal injection of a group I metabotropic glutamate receptors agonist (1S,3R)-aminoyclopentane-trans-1,3-dicardboxylic acid (ACPD) or *N*-methyl-d-aspartate (NMDA), without interfering with nociception induced by other non-NMDA receptor agonists (α-amino-3-hydroxyl-5-methyl-4-isoxazole-propionic acid and kainate) or by substance P. Notably, in the same range of doses, the antinociception caused by the compound NA-3,4-DCM was not associated with nonspecific effects such as changes in locomotor activity or motor coordination.
CONCLUSION: These results provide strong evidence that NA-3,4-DCM produces antihypernociception in mice at peripheral, spinal, and supraspinal sites, and that interaction with the group I metabotropic glutamate receptors and NMDA receptors contributes to the mechanisms underlying its effect.

通过超声引导研究颈深丛及颈交感干神经阻滞的解剖学基础

An Anatomical Basis for Blocking of the Deep Cervical Plexus and Cervical Sympathetic Tract Using an Ultrasound-Guided Technique

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背景：选择性阻滞颈丛和颈交感干的方法尚没有建立。
方法：我们仔细研究了 28 具尸体的颈部解剖。并且在两名健康志愿者身上注射局麻药，并通过计算机断层扫描技术观察局麻药的分布情况。
结果：颈深丛位于头长肌和斜角肌的肌间沟内。颈交感干位于位于头长肌的前内侧表面。尽管局麻药注射入长头肌后药物局限在肌肉内，但是它也可以扩散到临近的 C2 至 C5 神经根及交感神经干。
结论：长头肌是阻滞颈丛和交感干的合适的标志物。
(陈珺珺 译，薛张纲 校)
BACKGROUND: A selective blocking method for the cervical plexus and the cervical sympathetic trunk has not yet been established.
METHODS: We performed a detailed examination of the neck anatomy using 28 cadavers. The pattern of local anesthetic distribution after injection in 2 healthy volunteers was imaged using computed tomographic scan.
RESULTS: The deep cervical plexus was located in the groove between the longus capitis and scalenus medius muscles. The cervical sympathetic trunk was located on the anteromedial surface of the longus capitis. Although anesthetic injected into the longus capitis was confined to the muscle, it infiltrated into neighboring structures including the C2 to C5 roots and sympathetic trunk.
CONCLUSIONS: The longus capitis muscle is a suitable landmark for blocking the cervical plexus and trunk.