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在心脏手术中肝素抵抗为一个适当的肝素剂量达不到增加活化凝血时间（ACT）所需的水平。无法达到预定的ACT增幅意味着患者在未充分抗凝状态下开始心肺转流，导致止血系统的过度激活。虽然抗凝血酶缺乏通常被认为是肝素抵抗的主要机制，但肝素抵抗的原因是复杂的、多因素的。此外，ACT并非肝素抗凝作用的特征性反映，在心脏手术中多种常见变量可影响其结果。由于这些变量的存在，目前尚不清楚ACT测得的肝素反应性降低的结果是否表示抗凝不足。然而，许多临床医生选择一个预定的ACT值作为评估抗凝的依据，且在肝素抵抗情况下也常规采取一定措施使ACT达到预定值。对肝素反应性的治疗，即肝素抵抗/肝素反应异常，包括了额外剂量肝素或抗凝血酶的补充。本篇综述讨论了肝素效能的变异性、ACT测量得出的肝素反应性和对肝素抵抗的处理。
（孙莉荔　译　陈杰　校）

Heparin resistance during cardiac surgery is defined as the inability of an adequate heparin dose to increase the activated clotting time (ACT) to the desired level. Failure to attain the target ACT raises concerns that the patient is not fully anticoagulated and initiating cardiopulmonary bypass may result in excessive activation of the hemostatic system. Although antithrombin deficiency has generally been thought to be the primary mechanism of heparin resistance, the reasons for heparin resistance are both complex and multifactorial. Furthermore, the ACT is not specific to heparin's anticoagulant effect and is affected by multiple variables that are commonly present during cardiac surgery. Due to these many variables, it remains unclear whether decreased heparin responsiveness as measured by the ACT represents inadequate anticoagulation. Nevertheless, many clinicians choose a target ACT to assess anticoagulation, and interventions aimed at achieving the target ACT are routinely performed in the setting of heparin resistance. Treatments for heparin resistance/alterations in heparin responsiveness include additional heparin or antithrombin supplementation. In this review, we discuss the variability of heparin potency, heparin responsiveness as measured by the ACT, and the current management of heparin resistance.

碳基依托咪酯:与11β-羟化酶相互作用减弱的一种依托咪酯类似物

Carboetomidate: An Analog of Etomidate That Interacts Weakly with 11β-Hydroxylase

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背景：碳基依托咪酯是一种吡咯依托咪酯类似物；与依托咪酯（咪唑）相比，对体外皮质醇合成的抑制作用存在三个数量级幅度的减弱；并不抑制体内类固醇的产生。虽然碳基依托咪酯对类固醇合成功能影响的减弱被认为是对11β-羟化酶低结合亲和力的结果，但到目前为止，对11β-羟化酶这种结合能力的差别并未被任何的实验证明过。本实验通过一种光可活化的依托咪酯类似物来比较碳基依托咪酯与依托咪酯抑制光亲和力标记纯化酶的能力，以及改变酶吸收光谱来反应两者的配体结合情况，测试以下假设：碳基依托咪酯与依托咪酯对11β-羟化酶具有不同的亲和力。另外通过光谱方法初步探索了依托咪酯、碳基依托咪酯与11β-羟化酶相互作用的方式差异；以及通过分子建模技术去更好地理解它们选择性的结构基础。

方法：在H295R细胞上，评估测试[^{3}H] azi-依托咪酯抑制皮质醇合成的能力。碳基依托咪酯与依托咪酯对11β-羟化酶的亲和力通过以下评估比较：两者（1）抑制光敏依托咪酯类似物[^{3}H] azi-依托咪酯进行光融合入酶的能力；（2）改变酶血红素组吸收光谱的能力。在硅片对接的研究中，使用计算机软件GOLD分析依托咪酯、碳基依托咪酯和azi-依托咪酯与11β-羟化酶的结合情况。

结果：与依托咪酯相似，[^{3}H] azi-依托咪酯有效地抑制了体外皮质醇的合成。依托咪酯以浓度依赖方式抑制[^{3}H]azi-依托咪酯对11β-羟化酶的光标记。40μM浓度的依托咪酯减少了[^{3}H] azi-依托咪酯96%±1%的光融合，而没有通过实验方法检测到碳基依托咪酯的效应。此外，产生了代表依托咪酯与酶血红素铁络合作用的2型差异光谱；碳基依托咪酯无此效果，而azi-依托咪酯则产生反向1型光谱。电脑模拟研究预测：依托咪酯，碳基依托咪酯，以及azi-依托咪酯都能嵌入形成11β-羟化酶活性部位，含有血红素的口袋空间并使它们的羰基氧与血红素铁相互作用，使它们的苯环与苯丙氨酸-80相叠加。然而，更多依托咪酯和azi-依托咪酯的独特结合位点被确认，可能解释他们具有更高亲合力的原因。

结论：与依托咪酯相比，碳基依托咪酯抑制体外、体内类固醇合成较弱的能力反映了它与11β-羟化酶更低的亲合力；并且可能是由于碳基依托咪酯无法与位于酶活性部分的血红素铁形成配位键所导致的。

（王苑　译　陈杰　校）

BACKGROUND: Carboetomidate is a pyrrole etomidate analog that is 3 orders of magnitude less potent an inhibitor of in vitro cortisol synthesis than etomidate (an imidazole) and does not inhibit in vivo steroid production. Although carboetomidate's reduced functional effect on steroid synthesis is thought to reflect lower binding affinity to 11β-hydroxylase, differential binding to this enzyme has never been experimentally demonstrated. In the current study, we tested the hypothesis that carboetomidate and etomidate bind with differential affinity to 11β-

hydroxylase by comparing their abilities to inhibit photoaffinity labeling of purified enzyme by a photoactivatable etomidate analog and to modify the enzyme's absorption spectrum in a way that is indicative of ligand binding. In addition, we made a preliminary exploration of the manner in which etomidate and carboetomidate might differentially interact with this site using spectroscopic methods as well as molecular modeling techniques to better understand the structural basis for their selectivity.
METHODS: The ability of azi-etomidate to inhibit cortisol synthesis was tested by assessing its ability to inhibit cortisol synthesis by H295R cells. The binding affinities of etomidate and carboetomidate to 11β-hydroxylase were compared by assessing their abilities to (1) inhibit photoincorporation of the photolabile etomidate analog [^{3}H]azi-etomidate into the enzyme and (2) modify the absorption spectrum of the enzyme's heme group. In silico docking studies of etomidate, carboetomidate, and azi-etomidate binding to 11β-hydroxylase were performed using the computer software GOLD.
RESULTS: Similar to etomidate, azi-etomidate potently inhibits in vitro cortisol synthesis. Etomidate inhibited [^{3}H]azi-etomidate photolabeling of 11β-hydroxylase in a concentration-dependent manner. At a concentration of 40 μM, etomidate reduced photoincorporation of [^{3}H]azi-etomidate by 96% ± 1% whereas carboetomidate had no experimentally detectable effect. On addition of etomidate to 11β-hydroxylase, a type 2 difference spectrum was produced indicative of etomidate complexation with the enzyme's heme iron; carboetomidate had no effect whereas azi-etomidate produced a reverse type 1 spectrum. Computer modeling studies predicted that etomidate, carboetomidate, and azi-etomidate can fit into the heme-containing pocket that forms 11β-hydroxylase's active site and pose with their carbonyl oxygens interacting with the heme iron and their phenyl rings stacking with phenylalanine-80. However, additional unique poses were identified for etomidate and azi-etomidate that likely account for their higher affinities.
CONCLUSIONS: Carboetomidate's reduced ability to suppress in vitro and in vivo steroid synthesis as compared with etomidate reflects its lower binding affinity to 11β-hydroxylase and may be attributed to carboetomidate's inability to form a coordination bond with the heme iron located at the enzyme's active site.

综述：麻醉医师对胎儿的评估：你是否评估另一位病人？

Review Article: Fetal Assessment for Anesthesiologists: Are You Evaluating the Other Patient?

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麻醉医生和产科医生之间非理想的交流与母亲和新生儿意外的不良预后相关，尤其是急诊剖宫产时。产科医生用产前和分娩期的胎儿评估结果来评估胎儿的健康状态和决定分娩的时间与方式。由于异常的结果可能导致需要紧急或急诊剖宫产，这些决定可能直接影响麻醉管理。缺乏对胎儿评估及其重要性的了解可能会阻碍实现理想治疗所需的交流。本文讨论了现今产前和分娩期的胎儿评估方法，包括无应激实验，生理评分，Doppler速度测量，电子胎心监护，胎儿心电图（STAN-

ST波形分析）及胎儿脉氧。回顾了这些模式背后的生理学基础和关于其在临床实践中作用的现有证据。对2008年国立儿童健康与人类发育研究工作组关于电子胎儿监护种类，被纳入美国妇产科医师学会的分娩期管理指南的报告进行审阅。同时讨论了这些测试的含义和产科麻醉实践。麻醉者对于胎儿评估模式的理解是改善和产科医生交流和改善高危产科病人剖宫产分娩计划所必须。

（詹恺诞　译　陈杰　校）

Suboptimal communication between anesthesiologists and obstetricians can be associated with unintended poor maternal and neonatal outcomes, especially for emergency cesarean deliveries. Obstetricians use the results of antepartum and intrapartum fetal assessments to assess fetal well-being and to make decisions about the timing and method of delivery. Because abnormal results may lead to the need for urgent or emergency cesarean deliveries, these decisions may directly impact anesthetic care. Lack of familiarity with fetal assessments and the significance of the results may thus hinder the communication necessary for optimal patient care. In this review article, we discuss the current antepartum and intrapartum fetal assessment modalities, including the nonstress test, biophysical profile, Doppler velocimetry, electronic fetal heart rate monitoring, fetal electrocardiogram (STAN-ST waveform analysis), and fetal pulse oximetry. The physiologic basis behind these modalities and the available evidence regarding their utility in clinical practice are also reviewed. The 2008 National Institute of Child Health and Human Development workshop report on electronic fetal monitoring categories, which are incorporated into the American College of Obstetricians and Gynecologists guidelines for intrapartum care, is examined. The implications of test interpretation to the practice of obstetric anesthesiology is also discussed. Anesthesia provider understanding of fetal assessment modalities is essential in improving communication with obstetricians and improving the planning of cesarean deliveries for high-risk obstetric patients.

儿科患者俯卧位手术期间的眼压监测

Intraocular Pressure in Pediatric Patients During Prone Surgery

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背景：小儿外科手术患者手术期间俯卧位时的眼压(IOP)及其随时间的变化尚未得到评估。本研究试图确定儿科患者在俯卧位手术中眼压随时间变化的情况。

方法：

选择30例接受俯卧位下神经外科手术的小儿患者。使用脉冲模式的气动眼压计，分别在仰卧位状态下麻醉实施前和麻醉诱导后，及俯卧位状态下手术开始和手术结束时测量眼压。采用经患者间相关性校正的线型混合模型（即随机斜率和截距模型）对俯卧位时随着时间变化的眼压进行评估。

结果：俯卧位时眼压平均每小时增加2.2 mmHg(P < 0.001)。俯卧位时63%的患者（95%可信区间[CI]为46%–81%）至少有一次眼压值超过30 mmHg，13%的患者（95%可信区间[CI]为1%–25%）至少有一次眼压值超过了40mmHg。从仰卧位变为俯卧位后平均眼压增加了7mmHg（95%可信区间[CI]为6%–9%）(P < 0.001) ，而从俯卧位变回仰卧位时平均眼压减少了10 mmHg（95%可信区间[CI]为9%–12%）(P < 0.001)。

结论：从仰卧位到俯卧位的体位改变显著增加麻醉后儿科患者的眼压。此外，尤其是在常见平均动脉血压较低的大型手术中，可发生眼压持续增加并可产生潜在危害。

（诸琳婕　译　陈杰　校）

BACKGROUND: Intraoperative intraocular pressure (IOP) in the prone position and IOP changes over time have not been evaluated in pediatric surgical patients. We sought to determine time-dependent changes in IOP in children undergoing surgery in prone position.

METHODS: Thirty patients undergoing neurosurgical procedures in prone position were included. Using a pulse-mode pneumatonometer, IOP was measured in supine position after induction and before emergence of anesthesia and in prone position before the start and after the end of surgery. IOP changes over time in the prone position were assessed with a linear mixed model (i.e., random slope and intercept model) to adjust for the within-patient correlation.

RESULTS: IOP in prone position increased by an average of 2.2 mm Hg per hour ($P < 0.001$). Sixty-three percent of patients (95% confidence interval [CI], 46%–81%) had at least 1 IOP value exceeding 30 mm Hg, and 13% (95% CI, 1%–25%) had at least 1 IOP value exceeding 40 mm Hg while prone. Mean IOP increased 7 mm Hg (95% CI, 6–9) during the position change from supine to prone ($P < 0.001$) and decreased 10 mm Hg (95% CI, 9–12) after changing the position from prone back to supine ($P < 0.001$).

CONCLUSIONS: Changing position from supine to prone significantly increases IOP in anesthetized pediatric patients. Moreover, the IOP continued to increase during surgery and reached potentially harmful values, especially when combined with low mean arterial blood pressures that are common during major surgery.

难治性癌痛的鞘内镇痛泵输注治疗：一个避免椎管内试验的运算法则

Intrathecal Pain Pump Infusions for Intractable Cancer Pain: An Algorithm for Dosing Without a Neuraxial Trial

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背景:晚期癌症伴有疼痛的患者往往生存期有限。在这些患者中为了放置鞘内泵而接受硬膜外试验可能耗费其有限的生存时间。本研究试图分析该癌症中心既往数据得出一种基于操作前全身给予阿片类药物方法，可预测初始鞘内泵注剂量的运算法则，如此可避免硬膜外试验并将住院时间最少化。

方法:分析46例使用全身性阿片类药物并在最后6年使用鞘内镇痛泵置入的癌症病人镇痛泵使用前以及使用后的数据，所有对象在使用镇痛泵前均接受了硬膜外穿刺试验。
结果:通过使用多元回归分析出院时鞘内阿片类药物剂量（静脉吗啡等效量）与年龄、疼痛类型、癌症类型、置管前阿片类药物剂量和置管前疼痛评分的关系，创造了一种基于镇痛泵使用前全身阿片类药物剂量，可预测癌症病人鞘内镇痛泵起始剂量的运算法则，由此避免了硬膜外试验。当所指向的试验可行时，这个预计值有很宽的95%可信区间(−122.7%到147.6%)。
结论:
当癌痛患者的硬膜外试验不可行且需要鞘内镇痛泵时，通过基于全身使用阿片类药物的剂量来预计鞘内镇痛泵的初始剂量是可能的。这样可以缩短达到满意镇痛效果的时间，早日出院。
（瞿亦枫　译　陈杰　校）

BACKGROUND: Patients with pain from advanced cancer often have limited life expectancy. Undergoing an epidural trial for placement of an intrathecal pump in these selected patients can exhaust limited days of life. We sought to analyze historical data at our cancer center to develop an algorithm to predict initial intrathecal pump dosing based on the starting preimplant systemic opioid regimen, thus averting an epidural trial and minimizing hospital stay.
METHODS: We used data pre- and postpump from 46 cancer patients receiving systemic opioids undergoing intrathecal pump placement in the last 6 years, all of whom had undergone an epidural trial before pump placement.
RESULTS: By analyzing intrathecal opioid dosage on discharge (in IV morphine equivalents) to age, type of pain, cancer type, preimplant opioid dose, and preimplant pain score using multiple regression, we created an algorithm that predicts, for cancer patients, an appropriate initial dose for an intrathecal pump based on the prepump systemic opioid dose, thus avoiding an epidural trial. The predicted value does have a broad 95% prediction interval (−122.7% to 147.6%) pointing to the value of a trial when feasible.
CONCLUSIONS: When an epidural trial is not feasible and an intrathecal pump is required in a cancer patient, it is possible to predict an initial dose for the intrathecal pump based on the systemic opioid usage. This minimizes delays in achieving satisfactory analgesia and discharge to home.

简报：围术期和产科硬膜外导管置入后硬膜外血肿发生的风险和预后：来自多中心围手术期预后研究协会的一项报告

Brief Report: The Risk and Outcomes of Epidural Hematomas After Perioperative and Obstetric Epidural Catheterization: A Report from the Multicenter Perioperative Outcomes Group Research Consortium

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背景：此项研究试图确定硬膜外导管置入后硬膜外血肿发生的频率和预后。
方法：11个参与多中心围手术期预后研究组的中心采用电子麻醉信息系统和质控数据库来确认因产科或外科手术而接受硬膜外导管置入的患者。在此队列中确认硬膜外置管后六周内接受椎板切除血肿清除术的患者。
结果：62450例接受围术期硬膜外导管置入的患者中有7例发生了需要进行手术清除的硬膜外血肿。事件发生率为11.2×10^{-5}（95%信心区间[CI]，4.5×10^{-5}到23.1×10^{-5}）。其中4例接受过抗凝/抗血小板治疗，而此种情况违背美国局麻学会的指南。79837名接受硬膜外导管置入的产科病人中未发生硬膜外血肿(超过95%可信区间上限，4.6×10^{-5})。产科硬膜外置管后硬膜外血肿的发生率明显小于围术期硬膜外置管后的发生率。
结论：在一系列病例中，以围术期麻醉/镇痛为目的的硬膜外置管后发生需要进行椎板切除手术的硬膜外血肿频率的95%可信区间为每22189次置管发生1例至每4330次置管发生1例。产科硬膜外置管的风险明显更小。
（郑华容　译　陈杰　校）

BACKGROUND: In this study, we sought to determine the frequency and outcomes of epidural hematomas after epidural catheterization.
METHODS: Eleven centers participating in the Multicenter Perioperative Outcomes Group used electronic anesthesia information systems and quality assurance databases to identify patients who had epidural catheters inserted for either obstetrical or surgical indications. From this cohort, patients undergoing laminectomy for the evacuation of hematoma within 6 weeks of epidural placement were identified.
RESULTS: Seven of 62,450 patients undergoing perioperative epidural catheterizations developed hematoma requiring surgical evacuation. The event rate was 11.2×10^{-5} (95% confidence interval [CI], 4.5×10^{-5} to 23.1×10^{-5}). Four of the 7 had anticoagulation/antiplatelet therapy that deviated from American Society of Regional Anesthesia guidelines. None of 79,837 obstetric patients with epidural catheterizations developed hematoma (upper limit of the 95% CI, 4.6×10^{-5}). The hematoma rate in obstetric epidural catheterizations was significantly lower than in perioperative epidural catheterizations ($P = 0.003$).
CONCLUSIONS: In this series, the 95% CI for the frequency of epidural hematoma requiring laminectomy after epidural catheter placement for perioperative anesthesia/analgesia was 1 event per 22,189 placements to 1 event per 4330 placements. Risk was significantly lower in obstetric epidurals.

中国外科手术患者围术期吸烟行为调查

Perioperative Smoking Behavior of Chinese Surgical Patients

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背景：调查显示，与高吸烟率相符，大样本中的中国吸烟者不愿意戒烟。在其他文化中，手术治疗具有强有力的教育意义，是戒烟的动力，使得自发戒烟率上升。我们测定了中国择期手术的吸烟患者围手术期烟草的使用行为和与术前戒烟意愿及术后30天里主动上报的吸烟行为有关的因素。确切的说，我们验证了术前戒烟意愿和术后30天内自动上报禁烟行为与对吸烟增加健康风险的认知程度独立有关这一假设。
方法：在中国北京协和医院，≥18周岁择期非心脏手术的患者接受了术前及术后30天内与吸烟行为有关的因素评估，包括吸烟相关健康风险的知识检测。
结果：在227名被调查患者中，大多数患者（164名，72%）在出院后保持禁烟。204名术后30天保持联系的患者中，有126名（62%）仍处于禁烟状态。多变量分析中，与术后维持术前禁烟意愿有关的因素有高龄、戒烟的自我效验和接受大型手术治疗；与戒烟有关的因素包括：高龄、自我效验、大手术和术前戒烟意愿。对戒烟好处的较高认知度与意愿有关，但与戒烟无关。关于吸烟引起健康风险的知识与戒烟意向或戒烟行为均无关，所以，不支持这一假设。
结论：在中国外科手术患者中的戒烟意向和保持戒烟的自我效验看来较以往的中国总吸烟人群调查要高得多。并且大多数外科手术患者在术后至少30天保持戒烟。这些发现显示在中国，外科手术治疗具有强有力的教育意义，是戒烟行为的动力。
（盛嘉君 译 马皓琳 李士通校）

BACKGROUND: Surveys suggest that, consistent with a high smoking prevalence, Chinese smokers in the general population report little interest in quitting. In other cultures, surgery is a powerful teachable moment for smoking cessation, increasing the rate of spontaneous quitting. We determined the perioperative tobacco use behavior of Chinese patients scheduled for elective surgery who smoke cigarettes and factors associated with both preoperative intent to abstain and self-reported smoking behavior at 30 days postoperatively. Specifically, we tested the hypothesis that perception of the health risks of smoking would be independently associated with both preoperative intent to abstain and self-reported abstinence at 30 days postoperatively.
METHODS: Patients ≥18 years of age scheduled for elective noncardiovascular surgery at Peking Union Medical College Hospital in Beijing, China, were assessed preoperatively and up to 30 days postoperatively for factors associated with smoking behavior, including indices measuring knowledge of smoking-related health risks.
RESULTS: Of the 227 patients surveyed at baseline, most (164, 72%) intended to remain abstinent after hospital discharge. For the 204 patients contacted at 30 days postoperatively, 126 (62%) self-reported abstinence. In multivariate analysis, factors associated with preoperative

intent to abstain after surgery included older age, self-efficacy for abstaining, and undergoing major surgery; factors associated with abstinence included older age, self-efficacy, major surgery, and preoperative intent to abstain. Higher perception of benefits from quitting was associated with intent, but not abstinence. Knowledge of the health risks caused by smoking was not found to be associated with either intent or abstinence, so that the hypothesis was not supported.
CONCLUSIONS: Both intent to quit and self-efficacy for maintaining abstinence appear to be much higher in Chinese surgical patients than in prior surveys of the general Chinese population, and the majority of surgical patients maintained abstinence for at least 30 days. These findings suggest that surgery can serve as a powerful teachable moment for smoking cessation in China.

一个集群随机临床试验：近红外血管成像装置用于深肤色儿童静脉置管的效果

The Effectiveness of a Near-Infrared Vascular Imaging Device to Support Intravenous Cannulation in Children with Dark Skin Color: A Cluster Randomized Clinical Trial

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背景：肤色深的儿童静脉能见度低，这给静脉置管带来了挑战。我们研究近红外血管成像装置（VascuLuminator，血管发光体）便于手术室中深肤色儿童静脉置管的有效性。
方法：在库拉索岛一个综合医院的手术室里，所有需要静脉置管的连续儿童（年龄0-15岁）都被纳入一个集群随机临床试验中。在为期一周的随机化集群中的手术室里，麻醉医生随时可以用到VascuLuminator。
结果：在血管成像仪组一次成功率为63% (27/43, 95%可信区间[CI], 47%-77%)而对照组为51% (45人中有23人, 95% CI, 36%-66%)(P = 0.27)。在血管成像仪组成功置管所用时间的中位数是53秒（四分位距：34-154）；而对照组是68秒（四分位距：40-159）(P = 0.54)。且危险比为1.12 (95% CI, 0.73-1.71)。
结论：血管成像仪的使用对提高深肤色儿童静脉置管一次成功率的价值有限。
（王慧娟 译 马皓琳 李士通 校）
BACKGROUND: Poor vein visibility can make IV cannulation challenging in children with dark skin color. In the operating room, we studied the effectiveness of a near-infrared vascular imaging device (VascuLuminator) to facilitate IV cannulation in children with dark skin color.
METHODS: In the operating room of a general hospital in Curacao, all consecutive children (0-15 years of age) requiring IV cannulation were included in a pragmatic cluster randomized clinical trial. The VascuLuminator was made available to anesthesiologists at the operating complex in randomized clusters of 1 week.
RESULTS: Success at first attempt was 63% (27/43, 95% confidence interval [CI], 47%-77%) in the VascuLuminator group vs 51% (23 of 45 patients, 95% CI, 36%-66%) in the control group (P = 0.27). Median time to successful cannulation was 53 seconds (interquartile range: 34-154)

in the VascuLuminator group and 68 seconds (interquartile range: 40-159) in the control group (P = 0.54), and hazard ratio was 1.12 (95% CI, 0.73-1.71).
CONCLUSION: The VascuLuminator has limited value in improving success at first attempt of facilitating IV cannulation in children with dark skin color.

一项关于病人对日间麻醉护理投诉的风险因素分析

An Analysis of Risk Factors for Patient Complaints About Ambulatory Anesthesiology Care

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背景:麻醉组成员不断为前进的专业实践评估、证书和其他的质量倡议而搜索数据资源和评估指标。一个关于病人对医生的投诉分析在以前就成为病人不满的标志和治疗不当索赔的预测。另外，其他专业以前的研究已显示出对专业人士抱怨的分布不均一性。在这项研究中，我们描述麻醉提供者之间的抱怨分布并且确认小儿和成人人群投诉风险的因素。
方法：我们为一个学术医学中心进行了投诉数据库的一项分析。在术后电话随访日间外科病人关于麻醉护理的质量时记录投诉作为备注。电话随访从2006.6.1到2010.6.30。危险因素分为3种类别：病人特征、操作和提供者特点。
结果：总共22871个电话代表120名麻醉师被评估，其中有307个投诉。在小儿组没有证据证明提供者之间的异质性。在成人组，在混合效应模式中对随机拦截方差分量未调整的测试，显示明显异质性（P=0.01）；然而，当调整了预先设定的危险因素，再也没有观察到提供者对提供者的异质性（P=0.20）。几个危险因素展示了投诉风险的证据。在小儿组病人模式中，与投诉风险有关的危险因素包括年龄10岁的变化、全身麻醉的应用（比非全麻）和实际减去计划开始时间的1个小时变动。比值比分别为1.47（95%可信区间，1.04-2.08）、0.22（95%可信区间，0,07-0.62）和1.27（95%可信区间，1.10-1.47）。在成人病人模式中，与投诉风险有关的危险因素包括男性、全麻、提供者经验10年的变化以及与病人交流（而不是与一个家属）。比值比分别为0.66（95%可信区间，0.47-0.92）、0.67(95%可信区间，0.47-0.95)、1.18（95%可信区间，1.01-1.38）和1.96（95%可信区间，1.17-3.29)。
结论：成人病人有明显的证据表明病人投诉的提供者风险异质性。然而，一旦在分析中承认病人、操作和提供者因素，这样异质性的证据会真正的减少。更深入的研究关于怎样和为什么这些因素和较大的投诉风险有关联可能揭示潜在的干预来减少投诉。
(王晓莉译 马皓琳 李士通校)

BACKGROUND: Anesthesiology groups continually seek data sources and evaluation metrics for ongoing professional practice evaluation, credentialing, and other quality initiatives. The analysis of patient complaints associated with physicians has been previously shown to be a marker for patient dissatisfaction and a predictor of malpractice claims. Additionally, previous

studies in other specialties have revealed a nonuniform distribution of complaints among professionals. In this study, we describe the distribution of complaints among anesthesia providers and identify factors associated with complaint risk in pediatric and adult populations.
METHODS: We performed an analysis of a complaint database for an academic medical center. Complaints were recorded as comments during postoperative telephone calls to ambulatory surgery patients regarding the quality of their anesthesiology care. Calls between July 1, 2006 and June 30, 2010 were included. Risk factors were grouped into 3 categories: patient demographics, procedural, and provider characteristics.
RESULTS: A total of 22,871 calls placed on behalf of 120 anesthesiologists were evaluated, of which 307 yielded a complaint. There was no evidence of provider-to-provider heterogeneity in complaint risk in the pediatric population. In the adult population, an unadjusted test for the random intercept variance component in the mixed effects model pointed toward significant heterogeneity (P = 0.01); however, after adjusting for a prespecified set of risk factors, provider-to-provider heterogeneity was no longer observed (P = 0.20). Several risk factors exhibited evidence for complaint risk. In the pediatric patient model, risk factors associated with complaint risk included a 10-year change in age, the use of general anesthesia (versus not), and a 1-hour change in the actual minus scheduled start times. Odds ratios were 1.47 (95% confidence interval (CI), 1.04-2.08), 0.22 (95% CI, 0.07-0.62), and 1.27 (95% CI, 1.10-1.47), respectively. In the adult patient model, risk factors associated with complaint risk included male gender, general anesthesia, a 10-year change in provider experience, and speaking with the patient (rather than a family member). Odd ratios were 0.66 (95% CI, 0.47-0.92), 0.67 (95% CI, 0.47-0.95), 1.18 (95% CI, 1.01-1.38), and 1.96 (95% CI, 1.17-3.29), respectively.
CONCLUSIONS: There was apparent evidence in adult patients to suggest heterogeneity in provider risk for a patient complaint. However, once patient, procedural, and provider factors were acknowledged in analyses, such evidence for heterogeneity is diminished substantially. Further study into how and why these factors are associated with greater complaint risk may reveal potential interventions to decrease complaints.

对日平均周转时间以及白天首例开始延迟的行为研究

A Behavioral Study of Daily Mean Turnover Times and First Case of the Day Start Tardiness

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背景：之前的研究表明在手术日的手术室里的决定中存在有2个心理偏差：手术室控制台上决策者的风险态度和手术室工作人员所做的决定以提高单位时间内他们被分配的临床工作。造成的决定比减少过度利用时间的随机机会更加糟糕。为了将第二种偏差从手术室控制台决定中分离出来，之前有关第二种偏差的研究分析了在非手术室环境下以及在夜间或者周末所作的决定。另外一种将第二种偏差从手术室控制台所产生的决定分离出来的方式是通过研究微乎其微的过度使用手术室时间的仪器设施。我们利用这些仪器得到的数据来检查第二种偏差。

方法：收集来自于一家有5个手术室的医院一年的数据。首先测定使手术室使用时间低效率最小化的分配手术室时间，以确定实际上没有过度利用的手术室时间。同时建立一个结构方程模型用来评估控制其他相关性时变量之间的关系。我们验证了这个假设，即非手术时间不再是与白天相当大的工作负荷成相对较低的关系。
结果：额外的手术室没有消耗效率（即，不同天数之间其平均潜在改善变化范围从21.1% ± 0.2% [SE]到38.9% ± 0.2%），导致非常低的过度使用手术室时间。然而，决策之前有条件的运行额外的手术室，在研究期间分配手术室时间最小化了手术室使用时间低效率。正如前面的结果显示，这类设施适合于这种行为的研究，并且也使得研究得以完成，并且假设关系最终也得以确定。在日常估计的择期病例（总）持续时间每减少一个小时将会给平均周转时间带来管理上不重要的减少(0.41 ± 0.21 分钟, P = 0.053)。如果排除大于两次周转同时出现时的周转，每日（总）持续时间每减少1小时，则平均周转时间无明显减少(0.17 ± 0.24 分钟, P = 0.464)。同样，在排除延长的周转（>60分钟）后，每日（总）持续中每减少1小时，平均周转时间也不会有明显的减少(0.16 ± 0.16 分钟, P = 0.315)。
结论：之前的实验和观测研究发现，许多临床医生在他们被分配的工作时间中单位时间内保持了较高的临床工作量。我们测试和确定了这种偏差应用在整个外科手术组中有规律的安排手术室使用时间的预测。总之，在少量或者几个小时中工作人员在白天工作速度是一样的。手术室工作人员没有减慢，从而弥补了时间间隙。这些结论对信息技术成本运用具有重要的影响，便于对手术日做出管理性决策。
（赵晓 译 马皓琳 李士通 校）

BACKGROUND: Previous research has identified 2 psychological biases in operating room (OR) decisions on the day of surgery: risk attitude of the decision-maker at the OR control desk and decisions made by OR staff to increase clinical work per unit time during the hours they are assigned. Resulting decisions are worse than random chance at reducing overutilized time. To isolate the second bias from decisions at the OR control desk, previous studies of the second bias have analyzed decisions made in non-OR locations and on nights/weekends. Another way to isolate the second bias from decisions at the OR control desk is to study facilities with negligible overutilized OR time. We examined the second bias using data from such a facility.
METHODS: One year of data was collected from a 5-OR hospital. Allocated OR time that minimized the inefficiency of use of OR time was determined first to confirm there was virtually no overutilized OR time. A structural equation model was then built to evaluate the relations among variables while controlling for other correlations. We tested the hypothesis that nonoperative times were no longer on days with little versus relatively large workload.
RESULTS: The extra ORs were not cost efficient (i.e., the mean potential improvement varied among days from 21.1% ± 0.2% [SE] to 38.9% ± 0.2%), resulting in very little overutilized OR time. However, conditioned on the preceding tactical decision of running extra ORs, the allocated OR time during the studied period was that which minimized the inefficiency of use of OR time. As the preceding results showed that the facility was suitable for the behavioral study, the behavioral study was performed, and the hypothesized relation confirmed. Each 1-hour decrease in the daily estimated (total) duration of elective cases resulted in a managerially unimportant decrease in the mean turnover times (0.41 ± 0.21 minutes, P = 0.053). Excluding turnovers when there were >2 turnovers occurring simultaneously, there was no significant decrease (0.17 ± 0.24 minutes, P = 0.464) in the mean turnover times per each 1-hour decrease in

the daily estimated (total) duration. Similarly, after excluding prolonged turnovers (>60 minutes), there was no significant decrease (0.16 ± 0.16 minutes, P = 0.315) in the mean turnover times per each 1-hour decrease in the daily estimated (total) duration.
CONCLUSIONS: Previous experimental and observational studies found many clinicians maintained high clinical work per unit time during the hours to which they were assigned. We tested and confirmed a prediction of this bias as was applied during regularly scheduled OR hours among an entire surgical team. Overall, the staff worked just as quickly on days with few or many hours of cases. The OR staff did not slow down, thus filling the time. These results have important implications for the cost utility of information technologies to facilitate managerial decision-making on the day of surgery.

彩色流动多普勒超声检查可区别骶尾部硬膜外注射与鞘内注射

Color Flow Doppler Ultrasonography Can Distinguish Caudal Epidural Injection from Intrathecal Injection

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背景：彩色流动多普勒超声检查已被用于确定骶尾部硬膜外注射，但其发现意外鞘内注射的能力仍未知。我们假设：彩色多普勒超声检查时，将药液注入硬膜外腔会引起湍流，而鞘内注射则没有彩色流动多普勒信号。
方法：为期2个月的前瞻性试验共包括了两组小儿患者（最大的为6岁）。一组（E组）为适用于用骶尾部硬膜外镇痛的择期手术患儿，另一组（I组）为接受腰椎穿刺行鞘内注射化疗药物的患儿。全身麻醉诱导并将患儿至于侧卧位后，使用8 MHZ的弧形阵列探头（Sonosite TITAN, Bothell, 华盛顿州）在腰段（L1-L3）获得一横截面图像。在两次连贯的（间隔为20秒）速度为0.5-1.0mL/s的0.1mL/kg局麻药（25%布比卡因）或化疗药（甲氨喋林、阿糖胞苷及氢化可的松的混合物）注射过程中，获得并记录彩色流动多普勒的实时影像。在获得研究影像后，用标准方式注入剩余药物。之后由另一不知情的麻醉医师记录影像来测定阳性或阴性结果（阳性为湍流出现时的一混合彩色信号；阴性为没有湍流或彩色信号）。从成功镇痛（组E）及鞘内（组I）注射的病例中计算敏感性、特异性及阴性或阳性预测值。
结果：本研究共囊括了41例患儿的40个记录影像（E组，n=21;I组，n=20）。观察到的敏感性、特异性、阳性预测值和阴性预测值都是100%。95%的置信低限是0.832。
结论：在本研究的背景中，用0.1mL/kg的注射容量和0.5-1.0mL/s的注射速度，彩色流动多普勒超声可以区分6岁以下儿童硬膜外注射及鞘内注射入骶尾腔。
（王赟 译　马皓琳 李士通 校）

BACKGROUND: Color flow Doppler ultrasonography has been used to confirm caudal epidural injection, but its ability to detect accidental intrathecal injection is unknown. We hypothesized that, when using color flow Doppler, the injection of fluid into the epidural space would result in turbulent flow which would appear as a burst of color while intrathecal injection would show an absence of a color flow Doppler signal.

METHODS: Two groups of pediatric patients (up to 6 years of age) were prospectively enrolled for this observational study during a 2-month period. One group (group E) consisted of patients suitable for elective surgery using caudal epidural analgesia, and the other (group I) included patients receiving lumbar puncture for intrathecal chemotherapeutic injection. After induction of general anesthesia and placement of the patient in the lateral position, an 8 MHz curved array probe (Sonosite TITAN, Bothell, WA) was applied to obtain a transverse image of the lumbar region (L1-L3). Real-time images using color flow Doppler were obtained and recorded during initial injections of 2 consecutive (20 seconds apart) aliquots of 0.1 mL/kg medication of local anesthetic (0.25% bupivacaine) or chemotherapy drugs (mixture of methotrexate, cytarabine, and hydrocortisone) at a rate of 0.5 to 1.0 mL/s. After obtaining the study images, the rest of the medication was injected in standard fashion. A blinded anesthesiologist later evaluated the recorded images to determine a positive or negative result (positive = presence of turbulence as illustrated by a medley of color; negative = no turbulence or color). Sensitivity, specificity, and positive and negative predictive values were calculated for those patients who had successful analgesia (group E) and intrathecal (group I) injections.
RESULTS: Forty recorded images from 41 patients (group E, n = 21; group I, n = 20) were included in the analysis. The observed sensitivity, specificity, positive predictive value, and negative predictive values were all 100%. The lower 95% confidence limits were 0.832.
CONCLUSION: In the context of this study, color flow Doppler could differentiate epidural from intrathecal injection into the caudal space of children up to 6 years of age using a 0.1 mL/kg injection volume and injection rate of 0.5 to 1.0 mL/s.

麻醉科住院医师和麻醉护士对于专业麻醉医师的有效临床监督的看法

Anesthesiology Residents' and Nurse Anesthetists' Perceptions of Effective Clinical Faculty Supervision by Anesthesiologists

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背景：通常麻醉中监护是由非专业人员的麻醉提供者（例如麻醉科住院医师和登记注册的麻醉科护士[CRNAs]）在专业麻醉医师的指导下提供的。因此对专业麻醉医师的绩效评价应包括对这一指导能力的评定。
方法：来自3家教学医院的麻醉科住院医师和麻醉护士给出他们"对于9位假设的麻醉医师的指导的印象，区分为可以达到他们的期望或不能、超出他们的期望或能力低于期望。"分数基于同这些麻醉医师一起工作的人的反馈而并非其他人。应用一项4点评分量表（例如，1=从不，2=很少，3=经常，4=总是），并计算出平均值。
结果：参与者比率为51%的麻醉护士（N=153）和58%的住院医师（N=47）。从事麻醉培训的年限与达到麻醉护士（肯德尔系数τb = 0.01; 95%可信区间[CI], ?0.13~+0.10; P = 0.90）和住院医师（τb = 0.03; 95% CI, ?0.16~+0.23; P = 0.77）期望的指导评分之间没有联系。大多数麻醉护士（67%）和住院医师（94%）认为达到期望的指导至少为"经常"（评分≥3.0）（两者P < 0.0001）。达到期望的指导评分的均数± SD对于麻醉护士和住院医师分别为3.14 ±

0.42与3.40 ± 0.30。麻醉护士评分的均数较住院医师的少0.26（P < 0.0001; 95% CI, 少0.15到0.37）。其中30%的麻醉护士的分数较住院医师的平均分数高。
结论：来自3家教学医院的大多数麻醉护士和住院医师认为达到他们期望的专业指导至少为"经常"，与实践年限无关。
（张怡 译 马皓琳 李士通 校）

BACKGROUND: Often anesthesia care is provided by nonfaculty anesthesia providers (e.g., anesthesiology residents and certified registered nurse anesthetists [CRNAs]) under the guidance of faculty anesthesiologists. Performance appraisal of faculty anesthesiologists should therefore include evaluation of this guidance.
METHODS: Residents and CRNAs from 3 teaching hospitals gave their "impression of 9 attributes of the hypothetical supervising anesthesiologist who meets … expectations … not … who exceeds expectations or whose activity is below … expectations." Scores were based on the anesthesiologist working with the respondent, not others. A 4-point scale (e.g., 1 = never, 2 = rarely, 3 = frequently, and 4 = always) was used, and the mean was calculated.
RESULTS: The participation rate was 51% among CRNAs (N = 153) and 58% among resident physicians (N = 47). There was no association between years since the start of training and supervision scores that met expectations among CRNAs (Kendall τb = 0.01; 95% confidence interval [CI], ?0.13 to +0.10; P = 0.90) or residents (τb = 0.03; 95% CI, ?0.16 to +0.23; P = 0.77). Most CRNAs (67%) and residents (94%) perceived that supervision that met their expectations was at least "frequent" (score ≥3.0) (both P < 0.0001). The mean ± SD of supervision scores that met expectations was 3.14 ± 0.42 for CRNAs versus 3.40 ± 0.30 for residents. The CRNAs' score mean was 0.26 less than that of residents (P < 0.0001; 95% CI, 0.15 to 0.37 less). There were 30% of CRNAs with scores larger than the residents' mean.
CONCLUSIONS: Most CRNAs and residents at 3 teaching hospitals considered faculty guidance that meets expectations to be at least "frequent," regardless of years in practice.

冠状动脉搭桥手术期间，有关抗凝血替代物质的剂量对肝素敏感及活性的相关研究

The Influence of Antithrombin Substitution on Heparin Sensitivity and Activation of Hemostasis During Coronary Artery Bypass Graft Surgery: A Dose-Finding Study

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背景：体外循环常伴有凝血系统激活程度高。补充抗凝血酶（AT）可能会减弱这种激活，并增加患者的肝素易感性。然而，AT适当的剂量还没明确。我们试图确定在心脏手术结束时AT达到100%活性时AT用量 和AT对肝素灵敏度的影响
方法：41例患者加入研究。三十例行体外循环接受冠状动脉搭桥手术的患者被分配到3个AT浓度增加的组中，11个额外的患者作为对照组。测定AT活性和凝血酶生成的分子标志物，并且计算肝素灵敏度。

结果：在低，中，高组给药时，AT浓度中位数分别为36.5 U（19.0
42.8）47.0U（41.3，61.6）和50.0
U（47.4，66.6）每公斤体重。在手术结束时，抗凝替代物质活性分别是84％（77
111），110％（92 120），104％（97
120）（中位数[第25日，第75百分位），对照组为63 ％（49
；79），（替换组与对照组相比P <0.05）。肝素的敏感性从对照组1.29（1.17，1.66）S / U每公斤，分别增加至2.02（1.43，3.65），2.56（1.52，3.64），1.72（1.24，2.66）S / U每公斤组（置换组与对照组相比P均<0.05）。
与术前值相比，在所有患者术后AT活性降低，并在术后第3天最低点（与基线相比P <0.05，AT中间组除外）。对应于这种减少，前凝血酶原片段1 +2 及D-
二聚体术后均观察到增加。
讨论：冠状动脉搭桥手术期间，给予高剂量的AT可保护生理AT活性
，并显着提高肝素的灵敏度分别。然而，术后5天将遇到AT活性显著减少，伴随凝血酶高水平的生成。
(邓利兵译 薛张纲校)

BACKGROUND: Cardiopulmonary bypass is associated with a high degree of hemostatic system activation. Supplementation of antithrombin (AT) may attenuate this activation and increase a patient's susceptibility to heparin. However, the appropriate dosage of AT has not been defined. We sought to determine the dosage of AT concentrate necessary to achieve >100% AT activity at the end of cardiac surgery and the influence of AT on heparin sensitivity.
METHODS: Forty-one patients were included. Thirty consecutive patients undergoing primary coronary artery bypass graft surgery with cardiopulmonary bypass were assigned to 3 groups of increasing dosages of AT concentrate. Eleven additional patients served as controls. AT activity and molecular markers of thrombin generation were determined, and heparin sensitivity was calculated.
RESULTS: A median amount of 36.5 U (19.0; 42.8), 47.0 U (41.3; 61.6), and 50.0 U (47.4; 66.6) AT concentrate/kilogram body weight in the low, medium, and high AT group, respectively, was administered. At the end of surgery, AT activity with substitution was 84% (77; 111), 110% (92; 120), and 104% (97; 120) (median [25th; 75th percentile]), respectively, compared with 63% (49; 79) in controls (P < 0.05 all substitution groups versus control). Heparin sensitivity increased from 1.29 (1.17; 1.66) s/U heparin/kg in the control group to 2.02 (1.43; 3.65), 2.56 (1.52; 3.64), 1.72 (1.24; 2.66) s/U heparin/kg in the groups with substitution (P < 0.05 all substitution groups versus control). Compared with preoperative values, AT activity decreased during the postoperative period in all patients with a nadir on postoperative day 3 (P < 0.05 compared with baseline except for the medium AT group). Corresponding to this decrease, an increase in prothrombin fragment 1+2 and D-dimer could be observed postoperatively.
DISCUSSION: High dosages of AT were required to preserve physiologic AT activity during coronary artery bypass graft surgery and to significantly enhance heparin sensitivity, respectively. However, a significant decrease in AT activity, accompanied by high levels of thrombin generation, was encountered up to 5 days postoperatively.

挥发性麻醉药对致敏幼兔过敏反应诱导的支气管痉挛的保护作用

The Protective Effects of Volatile Anesthestics Against the Bronchoconstriction Induced by an Allergic Reaction in Sensitized Rabbit Pups

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背景：在胆碱能刺激后挥发性吸入麻醉药能对支气管痉挛发展产生一个特异的保护作用。然而，它们对接触过敏原后的过敏反应对呼吸道不良影响的抑制能力尚未明确。因此，我们比较了异氟醚、七氟醚和地氟醚在小儿过敏反应模型中防止过敏反应引起肺不张的能力。
方法：测定4组分别以咪达唑仑（IV组）和吸入异氟醚（ISO组）、七氟醚（SEVO组）、地氟醚（DES组）麻醉的，用卵清蛋白（OVA）致敏的5周龄幼兔在MAC值为1时的低频呼吸的输入阻抗（Zrs）。Zrs在基准条件下，通过静脉注射过敏原(OVA 1mg)激发肺的过敏反应后测得，在此期间Zrs导致的气道阻力（Raw），组织阻尼（G），和弹性阻力的变化监测15分钟。
结果：过敏原的激发立即产生严重的支气管痉挛，在前3分钟里Raw的增加各组差异无统计学意义。相反，吸入挥发性麻醉药加快由过敏原引起支气管痉挛的恢复，尤其是在SEVO组在过敏原刺激后的4分钟里Raw显著低于IV组。在各组G的变化是平行的明显升高的，在DES组的动物更有显著的恶化。注射OVA后麻醉方案对持续增加顺应性的影响没有统计学意义。
结论：我们的研究结果提示，常用的挥发性麻醉药在过敏反应后，对中央气道和周围肺组织的平滑肌对过敏原最严重的急性期反应的抑制缺乏潜在的普遍性。吸入挥发性麻醉药，尤其是七氟醚，能够早期促进缓解支气管痉挛；这个有利的一面可能对患有过敏性肺疾病的小儿是有利的。
（方昕译 薛张纲校）
BACKGROUND: Volatile inhaled anesthetics exert a differential protective effect against bronchospasm development after cholinergic stimulation. However, their ability to inhibit the adverse respiratory consequences of an anaphylactic reaction after exposure to an allergen has not been characterized. We therefore compared the abilities of isoflurane, sevoflurane, and desflurane to prevent the lung constriction induced by an allergic reaction in a pediatric model of an anaphylactic reaction.
METHODS: Low-frequency respiratory input impedance (Zrs) was measured in 4 groups of ovalbumin (OVA)-sensitized 5-week-old rabbit pups anesthetized with midazolam (group IV) and with inhaled isoflurane (group ISO), sevoflurane (group SEVO), or desflurane (group DES) at 1 minimum alveolar concentration. Zrs was measured under baseline conditions and after an anaphylactic lung response provoked by IV allergen injection (OVA 1 mg), during which the changes in airway resistance (Raw), tissue damping (G), and elastance obtained from Zrs were followed for 15 minutes.
RESULTS: Allergen provocation generated immediate severe bronchoconstriction, with no statistically significant difference in Raw increase among the groups in the first 3 minutes. Conversely, the inhalation of volatile anesthetics accelerated the recovery from the allergen-

induced bronchoconstriction, particularly in group SEVO where the Raw was significantly lower than that in group IV 4 minutes after the allergen challenge. These changes were paralleled by significant elevations in G in all groups, with a significantly more pronounced deterioration in the animals in group DES. The anesthetic regimen did not statistically significantly affect the sustained increases in elastance after OVA injections.
CONCLUSIONS: Our results reveal the lack of potential of the commonly used volatile anesthetics to inhibit the most severe acute phase of the constrictor response to allergen after anaphylaxis in both the central airway and peripheral lung compartments. Inhalation of volatile anesthetics, particularly sevoflurane, promotes an earlier easing of the bronchospasm; this beneficial profile may be advantageous in children with atopic lung diseases.

增加红细胞输注量与小儿心脏移植患者预后不良相关。

Increased red blood cell transfusions are associated with worsening outcomes in pediatric heart transplant patients.

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背景：由于其危险因素的独特性，接受心脏移植手术的儿童患者构成了一个独立的群体。红细胞（RBC）的输注于其死亡率呈正相关。尽管之前的对于非移植患者的研究焦点主要集中于术后输血的影响，与一般心脏手术患者相比，接受心脏移植手术的患者在围术期需要涉及更多的血液接触与更大量的术中输血。我们研究了心脏移植术中及术后输血量与临床预后之间的关系。假设在小儿心脏移植患者中输注更大量的红细胞与临床预后不良相关。
方法：我们查询并分析了数据库中自2004-2010年间108名接受心脏移植手术的患者术前和术后的临床风险因素以及术中和术后48小时输血量。预后情况根据住院时间、气管插管时间、心肺IS评分以及主要不良事件。通过二元及多元分析处理控制风险因素，确定输血量是否是一个独立的危险因素。
结果：49例病例完成了包含最终结果的数据采集。其中88%患者接受了红细胞输注，输注量的中位数是38.7毫升/公斤。通过多变量分析纠正其余8个变量使得输血量成为与ICU入住时长正相关的独立变量（MR=1.34；95%可信区间 1.03-1.76；P=0.03），8个变量包括IMPAC（心脏移植后死亡率预测值）、年龄、体重、移植器官的状态、冷缺血和热缺血时间、重复胸骨劈开以及移植前血细胞比容。并且输血量与术后第一个24小时的IS评分（MR=1.25；95%可信区间 1.04-1.52；P=0.04）正相关。大量输血患者的主要不良事件发生率也大大增加（p=0.002）。输血〉60毫升/公斤增加了术后相关主要不良事件的概率（76%）。包括术后败血症、体外氧合、开胸以及移植失败。
结论：大多数儿科心脏移植的患者行红细胞输注，大量的输血是在手术室中进行的。输血所产生的红细胞数量的提升与ICU入室时长、IS评分及主要不良事件呈正相关。由于移植用的心脏是有限的资源，切实提高输血质量可以促进小儿心脏移植患者的手术预后。
（郭晨跃译 薛张纲校）

BACKGROUND: Red blood cell (RBC) transfusions are associated with increased morbidity. Children receiving heart transplants constitute a unique group of patients due to their risk factors. Although previous studies in nontransplant patients have focused primarily on the effects of postoperative blood transfusions, a significant exposure to blood occurs during the intraoperative period, and a larger percentage of heart transplant patients require intraoperative blood transfusions when compared with general cardiac surgery patients. We investigated the relationship between clinical outcomes and the amount of blood transfused both during and after heart transplantation. We hypothesized that largeramounts of RBC transfusions are associated with worsening clinical outcomes in pediatric heart transplant patients.
METHODS: A database comprising 108 pediatric patients undergoing heart transplantation from 2004 to 2010 was queried. Preoperative and postoperative clinical risk factors, including the amount of blood transfused intraoperatively and 48 hours postoperatively, were analyzed. The outcome measures were length of hospital stay, duration of tracheal intubation, inotrope score, and major adverse events. Bivariate and multivariate analyses were performed to control for simultaneous risk factors and determine outcomes in which the amount of blood transfused was an independent risk factor.
RESULTS: Ninety-four patients with complete datasets were included in the final analysis. Eighty-eight percent received RBC transfusions, with a median transfusion amount of 38.7 mL/kg. A multivariate analysis correcting for 8 covariate risk factors, including the Index for Mortality Prediction After Cardiac Transplantation, age, weight, United Network for Organ Sharing status, warm and cold ischemia time, repeat sternotomy, and pretransplant hematocrit, showed RBC transfusions were independently associated with increased length of intensive care unit stay (means ratio = 1.34; 95% confidence interval, 1.03-1.76; P = 0.03), and increased inotrope score in the first postoperative 24 hour (mean ratio = 1.26; 95% confidence interval, 1.04-1.52; P = 0.04). Patients suffering major adverse events received significantly larger median amounts of blood RBC transfusions (P = 0.002). Transfusions >60 mL/kg were also associated with increased risk of major adverse events (accuracy 76%) including postoperative sepsis, extracorporeal membrane oxygenation, open chest, dialysis, and graft failure.
CONCLUSION: The majority of pediatric patients undergoing orthotropic heart transplantation receive RBC transfusions, with the largest amount transfused in the operating room. Escalating amounts of RBC transfusions are independently associated with increased length of intensive care unit stay, inotrope scores, and major adverse events. Since heart allografts are a limited resource, improvement in the blood transfusion and conservation practices can enhance clinical outcomes in pediatric heart transplant patients.

坐位或“沙滩椅”位时,5177接受神经外科和骨科手术治疗而无神经系统不良事件患者的血流动力学管理

The hemodynamic management of 5177 neurosurgical and orthopedic patients who underwent surgery in the sitting or "beach chair" position without incidence of adverse neurologic events.

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背景：少数报告提示，坐位或沙滩椅位术后出现缺血性脑脊髓损伤；因为血流动力学细节未知，所以脑脊髓缺血性损伤的发生率以及动脉血压和伤害的关系仍然未知。为增加坐位麻醉数据，我们检查众多未发生此恶性事件的患者的血流动力学情况。
方法：2002年1月1日和2009年12月31日之间，全面回顾了在罗切斯特梅奥诊所对5177例在坐姿下行的肩部手术或神经外科的患者电子血流动力学记录。
结果：5177位坐位手术的患者术后没有立即发生灾难性的结果。肩部手术，术中动脉血压在心脏水平，其收缩压下降14.4%±12.7%，绝对值下降75±8毫米汞柱，无创血压下降19.3%±12.6%，绝对值下降74±7毫米汞柱；神经外科的病人动脉血压在心脏水平，其平均动脉压下降17.6%±11.5%，绝对值下降为78±7毫米汞柱，无创血压在头部水平，其平均动脉压下降19.7%±10.7%，绝对值下降为75±7毫米汞柱。整个手术过程中，52%的神经外科患者和51%骨科患者通过A线监测，骨科48%的患者出现血压降低超过基础值40%时进行无创血压监测。
结论：这项研究提供了一个描述性的总结，术中监测血压，无论换能器或袖带在心脏水平还是头部水平（未低于心脏水平），无论是有创还是无创监测，患者在坐位行全麻手术未出现脑脊髓缺陷性损伤。
（韩叙译 薛张纲校）
BACKGROUND: A small number of highly publicized case reports describe ischemic brain or spinal cord injury after surgery in the sitting ("beach chair") position. The incidence of such catastrophic outcomes remains unknown, as does the relationship between arterial blood pressure management and injury, because few hemodynamic details were included with those 4 cases. To add quantitative data to the discussion of anesthesia in the sitting position, we examined the detailed hemodynamics of a large number of patients managed at our institution who sustained no similar catastrophic outcomes.
METHODS: A comprehensive, retrospective, interrogation was performed of the electronic hemodynamic record for all 5177 patients who underwent either orthopedic shoulder surgery or neurological surgery in the sitting position at Mayo Clinic Rochester between January 1, 2002 and December 31, 2009.
RESULTS: No immediate postoperative catastrophic outcomes occurred in 5177 sitting patients undergoing surgery and general anesthesia in the sitting position. For orthopedic shoulder surgery patients, intraoperative systolic blood pressures obtained from an arterial line referenced to heart level decreased 14.4% ± 12.7% (mean ± SD), and those obtained from a noninvasive blood pressure (NIBP) cuff referenced to heart level decreased 19.3% ± 12.6%. For neurosurgical patients, the average reductions in intraoperative mean arterial blood pressures from baseline were 17.6% ± 11.5% and 19.7% ± 10.7% for patients with heart- and head-level transducer placement, respectively. The absolute intraoperative mean arterial blood pressures (mean ± SD) for orthopedic patients measured by NIBP referenced to heart level were 75 ± 8 mm Hg; for orthopedic patients measured from an arterial line referenced to heart level were 74 ± 7 mm Hg; for neurosurgical patients measured with an arterial line referenced to heart level were 78 ± 7 mm Hg; and for neurosurgical patients measured with an arterial line referenced to head level were 75 ± 7 mm Hg. Over the entire duration of surgery, 52% (95% confidence interval [CI], 49%-56%) of neurosurgical patients, 51% (95% CI, 47%-55%) of orthopedic patients monitored with an A-line, and 48% (95% CI, 46%-50%) of orthopedic patients

monitored with NIBP experienced ≥1 episodes of systolic blood pressure reduction >40% below baseline.
CONCLUSION: This study provides a descriptive summary of intraoperative blood pressure changes, measured either invasively or noninvasively, and referenced to either head or heart level, but never lower than heart level, in patients under general anesthesia in the sitting position who sustained no catastrophic outcomes.

简要报告：胸外科手术围手术期连续硬膜外输注s(+)-氯胺酮的镇痛疗效和血药浓度。

Brief report: perioperative analgesic efficacy and plasma concentrations of s(+)-ketamine in continuous epiduralinfusion during thoracic surgery.

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背景：在开胸手术术后镇痛治疗研究中，我们评估了术中连续硬膜外输注亚麻醉剂量的S(+)-氯胺酮的镇痛效果和血药浓度持续时间。
方法：将140名开胸手术病人随机分配为持续硬膜外输注S（+）氯胺酮或罗卡因。衡量结果如下：（一）术中芬太尼的需求量;（二）术后疼痛强度;及（三）术后镇痛药补救量。
结果：氯胺酮组患者术中芬太尼消耗量比罗哌卡因组患者显着降低（中位数差异：-58.6微克，95％可信区间[CI]，-97.2至-19.6微克，P=0.0032）。氯胺酮组术后视觉模拟评分量表得分明显低于对照组（魏氏采用Mann-Whitney赔率在24小时=6.25，95％可信区间，4.07～1.97，P<0.0001）。控制组比氯胺酮组镇痛药补救更加频繁（百分比差异：58.6％，95％可信区间，43.3％，69.6％，P<0.0001）。连续硬膜外输注时氯胺酮平均血浆浓度迅速下降，停止输注后慢慢消退。
结论：我们的数据显示，开胸手术过程中硬膜外输注亚麻醉剂量的S（+）氯胺酮比输注罗哌卡因能提供更好的术后镇痛。
（贺盼译 薛张纲校）
BACKGROUND: In our study, we evaluated the analgesic effect and plasma level time course of subanesthetic doses of intraoperative S(+)-ketamineadministered by continuous epidural infusion for postthoracotomic pain.
METHODS:A study population of 140 patients undergoing thoracic surgery was randomly assigned to either S(+)-ketamine or ropivacaine bycontinuous epidural infusion. The outcome measures were as follows: (a) intraoperative fentanyl requirements; (b) postoperative pain intensity; and (c) postoperative rescue analgesics.
RESULTS: Intraoperative fentanyl consumption was significantly lower (median of difference: -58.6 μg; 95% confidence interval [CI], -97.2 to -19.6 μg; P = 0.0032) in patients in the ketamine group than those in the ropivacaine group. Postoperative visual analog scale scores were significantly lower in the ketamine group than in controls (Wilcoxon-Mann-Whitney odds at 24 hours = 6.25; 95% CI, 4.07 to 1.97; P < 0.0001). Rescue analgesics were required more frequently in controls than in the ketamine group (percentage difference: 58.6%; 95% CI, 43.3%

to 69.6%; P < 0.0001). The meanplasma level of ketamine declined rapidly during continuous epidural infusion and decayed slowly after it had stopped.
CONCLUSIONS: Our data show that epidural infusion of subanesthetic doses of S(+)-ketamine during thoracic surgery provides better postoperative analgesia than epidural ropivacaine.

居民评定在麻醉师手术室监督的决定因素，内在联系和心理属性

Determinants, associations, and psychometric properties of resident assessments of anesthesiologist operating room supervision.

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背景：德奥利维拉略等进行的一项研究。报告验证组阐述利用9个问题来对巴西麻醉人士在手术室中进行学院评估的监督。这项研究的目的是使用这个问题设置，以确定是否学院手术室监督分数是与居民一年的临床麻醉培训和/或特定居民-学院互动有关联。我们同样描述了学院手术室监督分数和居民评估之间的关联：（1）在手术室以外的设置，学院的监督，（2）学院临床能力（家庭选择），及（3）学院的教学效果。最后，我们将德奥利维拉略等人的问题设置试用于美国麻醉住院医师计划。
方法：所有的39 位在lowa大学麻醉专业接受麻醉训练的人士，无论是在他们的第一年（n = 14），第二年（n = 13），或第三年（n = 12），将接受至少有1/3个临床部门（[N = 49]，外科重症监护病房[N = 10]，疼痛门诊[N = 6]）工作人员的监督。对于所有的居民-学院组，部门计费数据被用来定量居民-学院互动和最后的互动和评估之间的间隔数。一个普遍性研究来确定最低数量的居民评估的高可用性和可靠性。
结果：没有显着的关联在学院平均手术室监管分数和：（1）居民-学院-病人接触（KendallτB= 0.01，95％可信区间[CI]，-0.02到0.04，P = 0.71），（2）居民-学院长期的互动（τB= -0.01; 95％CI，-0.05至+0.02，P = 0.46），和（3）上一个居民-学院互动时间（τB= 0.01，95％CI，-0.02至0.05，P = 0.49）。手术室和外科重症监护病房的监督分数呈高度相关（τB= 0.71，95％CI，0.63～0.78，P <0.0001）。手术室的监督分数与家人选择分数高度相关（τB= 0.77，95％CI，0.70～0.84，P <0.0001），教学成绩（τB= 0.87，95％CI，0.82～0.92，P <0.0001 ）。高可用性和可靠性（G-φ系数> 0.80）发生在个别学院麻醉师获得15个或更多种不同居民的评估。
结论：所有居民提供的监管分数与评价个别学院麻醉师的平均监管分数有同等分量。评估监督，教学和临床护理质量是高度相关的。当德·奥利维拉略等人提出的的提问计划被用在美国麻醉住院医师程序中时，由至少15名居民参与评估所得的监督分数是高度可信和可靠的。

（胡晓清译 薛张纲校）

BACKGROUND:A study by de Oliveira Filho et al. reported a validated set of 9 questions by which Brazilian anesthesia residents assessed faculty supervision in the operating room. The aim of this study was to use this question set to determine whether faculty operating room supervision scores were associated with residents' year of clinical anesthesia training and/or number of specific resident-faculty interactions. We also characterized associations between faculty operating room supervision scores and resident assessments of: (1) faculty supervision in settings other than operating rooms, (2) faculty clinical ability (family choice), and (3) faculty teaching effectiveness. Finally, we characterized the psychometric properties of the de Oliveira Filho etal. question set in an United States anesthesia residency program.

METHODS: All 39 residents in the Department of Anesthesia of the University of Iowa in their first (n = 14), second (n = 13), or third (n = 12) year of clinical anesthesia training evaluated the supervision provided by all anesthesia faculty who staffed in at least 1 of 3 clinical settings (operating room [n = 49], surgical intensive care unit [n = 10], pain clinic [n = 6]). For all resident-faculty pairs, departmental billing data were used to quantitate the number of resident-faculty interactions and the interval between the last interaction and the assessment. A generalizability study was performed to determine the minimum number of resident evaluations needed for high reliability and dependability.

RESULTS: There were no significant associations between faculty mean operating room supervision scores and: (1) resident-faculty patient encounters (Kendall $\tau b = 0.01$; 95% confidence interval [CI], -0.02 to +0.04; P = 0.71), (2) resident-faculty days of interaction ($\tau b = -0.01$; 95% CI, -0.05 to +0.02; P = 0.46), and (3) days since last resident-faculty interaction ($\tau b = 0.01$; 95% CI, -0.02 to 0.05; P = 0.49). Supervision scores for the operating room and surgical intensive care unit were highly correlated ($\tau b = 0.71$; 95% CI, 0.63 to 0.78; $P < 0.0001$). Supervision scores for the operating room also were highly correlated with family choice scores ($\tau b = 0.77$; 95% CI, 0.70 to 0.84; $P < 0.0001$) and teaching scores ($\tau b = 0.87$; 95% CI, 0.82 to 0.92; $P < 0.0001$). High reliability and dependability (both G- and ϕ-coefficients > 0.80) occurred when individual faculty anesthesiologists received assessments from 15 or more different residents.

CONCLUSION: Supervision scores provided by all residents can be given equal weight when calculating an individual faculty anesthesiologist's mean supervision score. Assessments of supervision, teaching, and quality of clinical care are highly correlated. When the de Oliveira Filho et al. question set is used in a United States anesthesia residency program, supervision scores are highly reliable and dependable when at least 15 residents assess each faculty.