指南建议的术前压力测试的预测率及费用研究

Anticipated Rates and Costs of Guideline-Concordant Preoperative Stress Testing

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背景：当前的指南建议对患者的心血管风险和功能状态进行术前评估，而且，建议心功能不佳或者心功能状态不明的这些具有更高的心血管风险的患者进行术前压力测试。但当前的参与测试的比例及由此产生的医疗费用尚不明了。假设美国的医生遵循现行指南并发现当前指南中包含的 2 种风险预测方法可能产生的差异，我们的研究旨在评估术前压力测试的预期比例及相关费用。

方法：我们将当前美国心脏病学会/美国心脏协会指南中包含的 2 种风险预测方法（修订的心脏风险指数和心肌梗死或心脏骤停）应用于一项针对 2009 年在美国接受手术的患者的多中心前瞻性研究中。我们随后计算了术前心脏压力测试的预期比率，预测全过的直接医疗支出（2017 年美元），以及两种风险预测工具之间的一致性差异。

结果：当前指南建议在术前压力测上花费一定量的资金。根据所使用的风险预测工具和功能状态评估的可靠性的不同，指南建议的支出会有很大差异。与“低”风险的患者相比，“高”风险患者的检测率和由此产生的支出可能要大得多。两项指南推荐的风险评估工具，修订的心脏风险指数和心肌梗死或心脏骤停，与目前建议的风险阈值范围一致性不佳。

结论：尽管无证实的益处，但术前压力测试确是医疗支出的重要来源。临床医生应该使用哪种围术期风险评估工具，哪些风险阈值适用于患者的筛选，以及功能状态评估的可靠性都值得进一步关注。

（马瑞华译 潘艳、薛张纲校）

BACKGROUND: Current guidelines recommend that patients have preoperative assessment of cardiac risk and functional status, and that patients at "elevated" cardiac risk with poor or unknown functional status be referred for preoperative stress testing. Little is known about current rates of testing or resultant medical costs. We set out to estimate the expected rates of preoperative stress testing and resultant costs if physicians in the United States were to follow current guidelines and to investigate differences that would arise from 2 risk prediction methods included in current guidelines.

METHODS: We applied 2 risk prediction tools (Revised Cardiac Risk Index and Myocardial Infarction or Cardiac Arrest) included in current American College of Cardiology/American Heart Association guidelines to a multicenter prospective registry of patients undergoing surgery in the United States in 2009. We then calculated expected ratesof preoperative cardiac stress testing if physicians were to follow American College of Cardiology/American Heart Association guidelines, expected nationwide direct medical expenditures

that would result (in 2017 US dollars), and agreement beyond chance between the 2 risk prediction tools.
RESULTS: Current guidelines recommend considerable spending on preoperative stress testing. Guideline-recommended spending would differ substantially depending on the risk prediction tool used and the reliability of the functional status assessment. Rates of testing and resultant spending are likely much greater among patients at "elevated" risk, compared with patients at "low" risk. Two guideline-recommended risk assessment tools, Revised Cardiac Risk Index and Myocardial Infarction or Cardiac Arrest, have poor agreement beyond chance across the currently recommended risk threshold.
CONCLUSIONS: Preoperative stress testing is likely a considerable source of medical spending, despite unproven benefit. Which perioperative risk assessment tool clinicians should use, what risk thresholds are appropriate for patient selection, and the reliability of the functional status assessment all warrant further attention.

围手术期脑电图与脑氧监测

Electroencephalography and Brain Oxygenation Monitoring in the Perioperative Period

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维持大脑功能和完整性是麻醉实践的关键部分。本综述旨在描述目前最常用的两种检测方法在围术期脑功能评价中的作用，即脑电图（EEG）和脑氧检测。现有证据表明，脑电图衍生的参数提供了更多的麻醉深度信息用于优化麻醉滴定。对减少药物消耗或恢复时间的影响是混杂的，但大多数研究表明，如果通过脑电图衍生参数滴定麻醉，苏醒时间会减少。有人假设，未来脑电图衍生参数将使人们更好地了解麻醉诱导引起意识改变的神经生理学原理，而不是目前最常用的概率方法。脑氧可以通过外科钻孔直接在脑实质中测量，也可以通过颈静脉体从脑静脉流出量进行估算，或者通过近红外光谱进行无创评估。后一种方法由于易于使用，及越来越多的证据表明近红外光谱分析得出的脑氧饱和度水平与神经性和/或一般围手术期并发症及死亡率增加有关，因此越来越被临床接受。此外，一个目标导向的策略，旨在避免大脑低氧饱和可能有助于减少这些并发症。最近的证据表明，这项技术还可用于评估脑血流的自动调节，从而帮助滴定动脉血压以满足个体需求，并用于床边诊断脑血流的自动调节紊乱。
（庞艳蓉 译 潘艳、薛张纲校）
Maintaining brain function and integrity is a pivotal part of anesthesiological practice. The present overview aims to describe the current role of the 2 most frequently used monitoring methods for evaluation brain function in the perioperative period, ie, electroencephalography (EEG) and brain oxygenation monitoring. Available evidence suggests that EEG-derived parameters give additional

information about depth of anesthesia for optimizing anesthetic titration. The effects on reduction of drug consumption or recovery time are heterogeneous, but most studies show a reduction of recovery times if anesthesia is titrated along processed EEG. It has been hypothesized that future EEG-derived indices will allow a better understanding of the neurophysiological principles of anesthetic-induced alteration of consciousness instead of the probabilistic approach most often used nowadays.Brain oxygenation can be either measured directly in brain parenchyma via a surgical burr hole, estimated from the venous outflow of the brain via a catheter in the jugular bulb, or assessed noninvasively by near-infrared spectroscopy. The latter method has increasingly been accepted clinically due to its ease of use and increasing evidence that near-infrared spectroscopy-derived cerebral oxygen saturation levels are associated with neurological and/or general perioperative complications and increased mortality. Furthermore, a goal-directed strategy aiming to avoid cerebral desaturations might help to reduce these complications. Recent evidence points out that this technology may additionally be used to assess autoregulation of cerebral blood flow and thereby help to titrate arterial blood pressure to the individual needs and for bedside diagnosis of disturbed autoregulation.

左啡诺的药理学特征，一种 G 蛋白偏向性阿片类镇痛药

Pharmacological Characterization of Levorphanol,a G-Protein Biased Opioid Analgesic.

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背景：左啡诺作为一种有效的镇痛药，已使用数十年，最常用于急性和癌症疼痛，它也有效对抗神经性疼痛。 最近对功能性偏倚的重要性以及多种阿片μ受体剪接变体的揭示的认识可能有助于解释患者对不同阿片类药物的反应的可变性。
方法：在这里，我们评估了左啡诺在各种传统的体外受体结合和功能测定，通过使用敲除（KO）小鼠行辐射热甩尾试验的体内镇痛研究，选择性拮抗剂和病毒拯救方法探索了响应的受体选择性。
结果：受体结合研究显示左啡诺对所有 μ， δ 和 κ 阿片受体都具有高的亲和力。左啡诺在 S-GTPγS 结合测定中，除了 MOR-1O 之外，是μ受体亚型的完全激动剂，但在 β-抑制蛋白 2 募集测定中显示出很少的活性，表明 G 蛋白是优先转导机制。KO 小鼠和选择性拮抗剂证实左啡诺镇痛是通过经典μ受体介导的，但是 6 跨膜受体做出了一定的贡献，如用病毒转染的 6 跨膜受体剪接可以改善外显子 11 KO 小鼠的较低反应。与吗啡相比，左啡诺在等剂量时的呼吸抑制较少。
结论：虽然左啡诺与经典的阿片类药物吗啡具有许多相同的特性，但它显示出微妙的差异，可能对其临床应用有帮助。其 G 蛋白信号偏倚与其减少的呼吸抑制一

致，而其与吗啡的不完全交叉耐受性表明它可能在临床上对阿片类药物逆转有价值。

（许智鸿 译 潘艳、薛张纲校）

BACKGROUND: Levorphanol is a potent analgesic that has been used for decades. Most commonly used for acute and cancer pain, it also is effective against neuropathic pain. The recent appreciation of the importance of functional bias and the uncovering of multiple μ opioid receptor splice variants may help explain the variability of patient responses to different opioid drugs.

METHODS: Here, we evaluate levorphanol in a variety of traditional in vitro receptor binding and functional assays. In vivo analgesia studies using the radiant heat tail flick assay explored the receptor selectivity of the responses through the use of knockout (KO) mice, selective antagonists, and viral rescue approaches.

RESULTS: Receptor binding studies revealed high levorphanol affinity for all the μ, δ, and κ opioidreceptors. In S-GTPγS binding assays, it was a full agonist at most μ receptor subtypes, with the exception of MOR-1O, but displayed little activity in β-arrestin2 recruitment assays, indicating a preference for G-protein transduction mechanisms. A KO mouse and selective antagonists confirmed that levorphanol analgesia was mediated through classical μ receptors, but there was a contribution from 6 transmembrane targets, as illustrated by a lower response in an exon 11 KO mouse and its rescue with a virally transfected 6 transmembrane receptor splice variant. Compared to morphine, levorphanol had less respiratory depression at equianalgesic doses.

CONCLUSIONS: While levorphanol shares many of the same properties as the classic opioidmorphine, it displays subtle differences that may prove helpful in its clinical use. Its G-protein signaling bias is consistent with its diminished respiratory depression, while its incomplete cross tolerance with morphine suggests it may prove valuable clinically with opioid rotation.

冠状动脉搭桥术后血红蛋白水平和30天再入院率

Discharge Hemoglobin Level and 30-Day Readmission Rates After Coronary Artery Bypass Surgery

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背景：大量随机试验支持的限制性输血策略导致心脏手术中血液利用率下降。然而，仍有待确定的是，较低的血红蛋白水平对再入院率的影响。我们评估了出院时血红蛋白水平较高和较低的患者，比较冠状动脉旁路移植术（CABG）后30天的再入院率。
方法：我们回顾性评估了我院2013年1月至2016年5月接受单独的CABG的1552例患者。我们评估了2个血红蛋白队列："高"（高于）和"低"（低于）平均出院血红蛋白水平（为9.4g/dl），比较了患者特征、血液利用率和临床结果，包括30天的再入院率。我们进一步评估了最低（<8 g/dl）出院血红蛋白水平对30天再入院率的影响，根据出院血红蛋白水平将患者分为4组："无贫血"（>12 g/dl）、"轻度贫血"（10–11.9 g/dl）、"中度贫血"（8–9.9 g/dl）和"重度贫血"（<8 g/dl）。风险调整包括年龄、性别、查尔森合并症指数、术前并发症、胸骨翻修术、患者血液管理计划的实施。
结果：除血红蛋白水平外，"高"组和"低"组的患者特征相似（平均出院血红蛋白分别为10.4±0.9和8.5±0.6 g/dl）。值得注意的是，没有证据表明"高"（76/746；10.2%）和"低"（97/806；12.0%）（p=0.25）Hb组30天再入院率之间存在差异。这4组贫血患者的年龄、胸骨翻修发生率、血红蛋白水平、某些患者合并症和再入院时间存在差异。在多变量分析中，"低"血红蛋白组（比值比1.16；95%置信区间0.84-1.61；P=0.36）的经风险调整的再入院率与"高"血红蛋白组相比差异不显著。与出院时Hb≥8g/dl患者相比，Hb <8g/dl患者的再入院率更高（22/129；17.1%比151/1423；10.6%；P=0.036）。多变量分析显示，出院时Hb<8g/dl可预测会再入院（比值比为1.77；95%可信区间为1.05-2.88；P=0.03）。再入院的最常见原因是容量过度负荷，其次是感染和心律失常。
结论：没有证据表明CABG患者的出院Hb水平低于机构平均值与30天再入院率增加相关。在少数出院时Hb<8g/dl患者中，有迹象表明再入院的风险增加，需要更多的对照研究来证实或反驳这一发现。
（汤洁 译 潘艳、薛张纲校）

BACKGROUND: Restrictive transfusion strategies supported by large randomized trials are resulting in decreased blood utilization in cardiac surgery. What remains to be determined, however, is the impact of lower discharge hemoglobin (Hb) levels on readmission rates. We assessed patients with higher versus lower Hb levels on discharge to compare 30-day readmission rates after coronary artery bypass grafting (CABG).
METHODS: We retrospectively evaluated 1552 patients undergoing isolated CABG at our institution from January 2013 to May 2016. We evaluated 2 Hb cohorts: "high" (above) and "low" (below) the mean discharge Hb level of 9.4 g/dL, comparing patient characteristics, blood utilization, and clinical outcomes including 30-day readmission rates. We further evaluated the effects of the lowest (<8 g/dL) discharge Hb levels on 30-day readmission rates by dividing the patients into 4 anemia cohorts based on discharge Hb levels: "no anemia" (>12 g/dL), "mild anemia" (10–

11.9 g/dL), “moderate anemia” (8–9.9 g/dL), and “severe anemia” (<8 g/dL). Risk adjustment accounted for age, sex, Charlson comorbidity index, preoperative comorbidities, revision sternotomy, and patient blood management program implementation.
RESULTS: The “high” and “low” groups had similar patient characteristics except for Hb levels (mean discharge Hb was 10.4 ± 0.9 vs 8.5 ± 0.6 g/dL, respectively). Notably, no evidence for a difference in 30-day readmission rates was noted between the “high” (76/746; 10.2%) and “low” (97/806; 12.0%) (P = .25) Hb cohorts. The 4 anemia cohorts had differences in age, revision sternotomy incidence, Hb levels, certain patient comorbidities, and time to readmission. On multivariable analysis, the risk-adjusted odds of readmission in the “low” Hb cohort (odds ratio, 1.16; 95% confidence interval, 0.84–1.61; P = .36) was not significant compared to the “high” Hb cohort. Compared to patients with discharge Hb ≥8 g/dL, patients with Hb <8 g/dL had a higher incidence of readmission (22/129; 17.1% vs 151/1423; 10.6%; P = .036). On multivariable analysis, Hb <8 g/dL on discharge was predictive of readmission (odds ratio, 1.77; 95% confidence interval, 1.05–2.88; P = .03). The most common reason for readmission was volume overload, followed by infection and arrhythmias.
CONCLUSIONS: A discharge Hb level below the institution mean for CABG patients does not
provide evidence for an association with an increased 30-day readmission rate. In the small
number of patients discharged with Hb <8 g/dL, there is a suggestion of increased risk for readmission and larger more controlled studies are needed to verify or refute this finding.

美国急诊科气道管理的职责

.Emergency Department Airway Management Responsibilities in the United States

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背景：在 20 世纪 90 年代，急诊医学（EM）医生负责对急诊室中需要气道管理的患者进行大约一半的插管。从那时起，没有研究揭示急诊室的气道管理职责的特点。
方法： 通过邮件调查东部外科和创伤协会以及创伤麻醉学会以及直接征集进行了调查。收集有关创伤中心水平，地理位置，负责急诊室气管插管的部门，创伤区气管插管部门，儿科是否有这些角色，是否每天 24 小时“内部”有麻醉师待命，以及麻醉师是否有协议作为插管期间的备用力量。回复被收集，审查，按城市链接，并使用 Python 进行映射。
结果：大多数答复来自东部创伤外科协会（84.6％）。 在受访者中，72.6％来自

一级创伤中心，大多数位于美国东半部。在急诊室，急诊科医生主要负责 81%的被调查机构的气管插管。在创伤区，急诊医生主要负责 61.4%的气管插管。在接受调查的机构中，负责管理气道的人员似乎没有地理模式。
结论：大多数机构都有急诊医生在急诊室和创伤区管理他们的呼吸道。与 20 年前相比，这可能支持急诊医生在急诊室和创伤区设置中增加气道管理百分比的观察结果。
（彭孟圆 译 潘艳、薛张纲校）
BACKGROUND: In the 1990s, emergency medicine (EM) physicians were responsible for intubating about half of the patients requiring airway management in emergency rooms. Since then, no studies have characterized the airway management responsibilities in the emergency room.
METHODS:A survey was sent via the Eastern Association for Surgery and Trauma and the Trauma Anesthesiology Society listservs, as well as by direct solicitation. Information was collected on trauma center level, geographical location, department responsible for intubation in the emergency room, department responsible for intubation in the trauma bay, whether these roles differed for pediatrics, whether an anesthesiologist was available "in-house" 24 hours a day, and whether there was a protocol for anesthesiologists to assist as backup during intubations. Responses were collected, reviewed, linked by city, and mapped using Python.
RESULTS: The majority of the responses came from the Eastern Association for Surgery of Trauma (84.6%). Of the respondents, 72.6% were from level-1 trauma centers, and most were located in the eastern half of the United States. In the emergency room, EM physicians were primarily responsible for intubations at 81% of the surveyed institutions. In trauma bays, EM physicians were primarily responsible for 61.4% of intubations. There did not appear to be a geographical pattern for personnel responsible for managing the airway at the institutions surveyed.
CONCLUSIONS: The majority of institutions have EM physicians managing their airways in both emergency rooms and trauma bays. This may support the observations of an increased percentage of airway management in the emergency room and trauma bay setting by EM physicians compared to 20 years ago.

髋关节骨折术前超声心动图检查

Preoperative Echocardiography for Patients With Hip Fractures Undergoing Surgery

A Retrospective Cohort Study Using a Nationwide Database

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背景：术前经胸超声心动图对拟接受手术治疗的髋部骨折患者临床结局的影响仍有争议。我们假设术前超声心动图与降低髋部骨折修复手术术后发病率和提高患

者生存率有关。

方法：从全国性数据库中选取 2008 年 4 月 1 日至 2016 年 12 月 31 日进行髋部骨折手术的患者。我们使用倾向评分匹配来检验术前超声心动图与住院死亡率的关系。次要结果包括术后并发症、术后重症监护病房入住率和住院时间。为了进行敏感性分析，整个队列仅限于入院后 2 天内进行的髋部骨折手术。

结果：66620 例手术患者中，术前行超声心动图筛查 34679 例（52.1%）。筛查患者（平均年龄 84.3 岁，[标准差 7.7 岁]；女性占 79.0%）倾向评分与 31941 名非筛查患者（平均年龄 82.1 岁，[标准差 8.7 岁]；女性占 78.2%）相匹配。倾向匹配前的总住院死亡率为 1.8%(1227 例患者)。倾向评分匹配创建了包含 25205 对患者的匹配队列。两组患者的院内死亡率无差异（筛查组与非筛查组：417 例（1.65%)对 439 例(1.74%),优势比为 0.95;95%置信区间:0.83-1.09;p=0.45)。术前超声心动图检查与减少术后并发症和重症监护病房入院率无关。在敏感性分析中，我们从整个队列（38.5%）中确定了 25637 名患者，这些患者在入院后 2 天内进行了髋部骨折手术。两组的住院死亡率无差异(筛选组与非筛选组：1.67%比 1.80%；优势比为 0.93；95%置信区间：0.72-1.18；p=0.53)。结果也与其他敏感性分析和亚组分析一致。

结论：此项大规模、回顾性、全国性队列研究表明，术前超声心动图与降低住院死亡率或术后并发症无关。

（吴洁译 李士通校）

BACKGROUND: The effect of preoperative transthoracic echocardiography on the clinical outcomes of patients with hip fractures undergoing surgical treatment remains controversial. We hypothesized that preoperative echocardiography is associated with reduced postoperative morbidity and improved patient survival after surgical repair of hip fractures.

METHODS: Drawing from a nationwide administrative database, patients undergoing hip fracture surgeries between April 1, 2008 and December 31, 2016 were included. We examined the association of preoperative echocardiography with the incidence of in-hospital mortality using propensity score matching. Secondary outcomes included postoperative complications, the incidence of postoperative intensive care unit admissions, and length of hospital stay. For sensitivity analyses, we restricted the overall cohort to include only hip fracture surgeries performed within 2 days from admission.

RESULTS: Overall, 34,679 (52.1%) of 66,620 surgical patients underwent preoperative echocardiography screening. The screened patients (mean [SD] age, 84.3 years [7.7 years]; 79.0% female) were propensity score matched to 31,941 nonscreened patients (mean [SD] age, 82.1 years [8.7 years]; 78.2% female). The overall in-hospital mortality, before propensity matching, was 1.8% (1227 patients). Propensity score matching created a matched cohort of 25,205 pairs of patients. There were no in-hospital mortality differences between the 2 groups (screened versus nonscreened: 417 [1.65%] vs 439 [1.74%]; odds ratio, 0.95; 95% confidence interval, 0.83 - 1.09; P = .45). Preoperative echocardiography was not associated with reduced postoperative complications and intensive care unit

admissions. In sensitivity analysis, we identified 25,637 patients from the overall cohort (38.5%) with hip fracture surgeries performed within 2 days of admission. There were no in-hospital mortality differences between the 2 groups (screened versus nonscreened: 1.67% vs 1.80%; odds ratio, 0.93; 95% confidence interval, 0.72–1.18; P = .53). Findings were also consistent with other sensitivity analyses and subgroup analyses.

CONCLUSIONS: This large, retrospective, nationwide cohort study demonstrated that preoperative echocardiography was not associated with reduced in-hospital mortality or postoperative complications.

术前服用抗抑郁药和抗焦虑药物与术后住院时长间的关系

Relationship Between Preoperative Antidepressant and Antianxiety Medications and Postoperative Hospital Length of Stay

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背景：服用抗抑郁药物或抗焦虑药物的患者，由于疼痛管理困难、应激机制改变或药物相关问题，通常围手术期情况复杂。本研究在控制混杂因素的同时，研究了术前应用抗抑郁药和抗焦虑药物与术后住院时长的关系。

方法：从 2011 年至 2014 年在一个大型城市学术机构接受非心脏手术的 48435 名成人患者的管理数据库中，对年龄、性别、医学合并症和手术类型进行多变量零截断负二项回归分析，以评估术前暴露于抗抑郁或抗焦虑药物与术后住院时间的相关关系。

结果：抗抑郁药组 5111 例（10.5%），抗焦虑药组 4912 例（10.1%）。平均住院时间为 3 天（四分位间距=2-6）。在控制了混杂因素后，术前服用抗抑郁药物与住院时间增加有关，发病率比率为 1.04（99%置信区间：1.0-1.08，p<0.001），抗焦虑药物的发病率比率为 1.1（99%置信区间：1.06-1.14；p<0.001）。

结论：抗抑郁药或抗焦虑药物与术后住院时间增加之间的关系表明，这类患者为了加速术后恢复可能需要在围手术期投入更大的注意力，这可能涉及将术前咨询、术后精神咨询或整体康复方法整合到加速康复流程中。

（吴洁译 李士通校）

BACKGROUND: Patients on antidepressant or antianxiety medications often have complex perioperative courses due to difficult pain management, altered coping mechanisms, or medication-related issues. This study examined the relationship between preoperative antidepressants and antianxiety medications on postoperative hospital length of stay while controlling for confounding variables.

METHODS: From an administrative database of 48,435 adult patients who underwent noncardiac surgery from 2011 to 2014 at a single, large urban academic institution, multivariable zero-truncated negative binomial regression analyses controlling for age, sex, medical comorbidities, and surgical type were performed to assess whether preoperative exposure to

antidepressant or antianxiety medication use was associated with postoperative hospital length of stay.
RESULTS: There were 5111 (10.5%) patients on antidepressants and 4912 (10.1%) patients on antianxiety medications. The median length of stay was 3 days (interquartile range = 2 – 6). After controlling for confounding variables, preoperative antidepressant medication was associated with increased length of stay with an incidence rate ratio of 1.04 (99% confidence interval, 1.0 – 1.08, $P < .001$) and antianxiety medication with an incidence rate ratio of 1.1 (99% confidence interval, 1.06 – 1.14; $P < .001$).
CONCLUSIONS: The association between antidepressants or antianxiety medications and increased postoperative length of stay suggests that these patients may require greater attention in the perioperative period to hasten recovery, which may involve integrating preoperative counseling, postoperative psychiatric consults, or holistic recovery approaches into enhanced recovery protocols.

循环死亡后器官捐献
Organ Donation AfterCirculatory Death
Ethical Issues and International Practices
Jericho, Barbara G., MD, FASA
Anesthesia & Analgesia: 2019 128 280 – 285

循环死亡后捐献（DCD）是一种越来越广泛使用的做法，有助于减少器官供应和器官移植需求之间的差异。随着来自 DCD 供体的移植器官数量不断增加，有必要在机构 DCD 方案和临床实践中解决 DCD 的伦理问题。尊重潜在捐助者的临终愿望、尊重接受者的愿望和解决潜在利益冲突的伦理问题是制定 DCD 项目政策和程序的重要考虑因素。尽管欧洲、澳大利亚、以色列、中国、美国和加拿大的 DCD 项目可能存在多样性，但在器官捐赠的利他和慷慨行为中，解决这些 DCD 项目中的伦理问题对于尊重捐助者和接受者都至关重要。
（吴洁译 李士通校）
Donation after circulatory death (DCD) is an increasingly utilized practice that can contribute to reducing the difference between the supply of organs and the demand for organs for transplantation. As the number of transplanted organs from DCD donors continues to increase, there is an essential need to address the ethical aspects of DCD in institutional DCD protocols and clinical practice. Ethical issues of respecting the end-of-life wishes of a potential donor, respecting a recipient's wishes, and addressing potential conflicts of interest are important considerations in developing policies and procedures for DCD programs. Although there may be diversity among DCD programs in Europe, Australia, Israel, China, the United States, and Canada, addressing ethical considerations in these DCD programs is essential to respect donors and recipients during the altruistic and generous act of organ donation.

脊麻下剖宫产术中胶体预负荷与晶体联合应用与单纯晶体补液的比较

Combined Colloid Preload and Crystalloid Coload Versus Crystalloid Coload During Spinal Anesthesia for Cesarean Delivery

A Randomized Controlled Trial

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背景：脊髓麻醉下剖宫产的最佳液体治疗策略尚不清楚。下腔静脉超声检查（IVC）最近已被用来评估容量状态和预测液体反应性。在此项双盲、随机对照研究中，我们使用 500ml 胶体预负荷配合 500ml 晶体液与 1000ml 晶体液的组合比较了产妇的血流动力学情况。我们评估了在基初状态和脊髓麻醉后各时间点下腔静脉情况。

方法：200 名 ASA 分级 II 级的足月单胎妊娠产妇，拟在腰麻下行择期剖宫产，随机分配使用加压输液器接受 500ml 胶体液预负荷，联合 500ml 晶体补液（联合组）或单纯 1000ml 晶体补液（晶体补液组）。当收缩压分别低于基础值的 90%、80%（低血压）和 70%（严重低血压）时，给予麻黄碱 3、5 和 10 mg。在腰麻前时、鞘内注射后 1 分钟和 5 分钟以及分娩后即刻肋缘下长轴水平评估 IVC；测量最大和最小 IVC 直径，并使用公式：IVC-CI=（最大 IVC 直径-最小 IVC 直径）/最大 IVC 直径计算 IVC 塌陷指数（CI）。主要结果是麻黄碱总剂量。

结果：对 198 例患者（每组 99 例）的资料进行分析。联合组麻黄碱总剂量的中位数为 11（范围：0-60）mg，晶体补液组中位数为 13（0-61）mg；差异中位数为－2（95%非参数置信区间：－5-0.00005）mg，P=0.22。两组患者需要使用麻黄碱的人数、低血压和严重低血压的发生率、第一次麻黄碱的剂量以及新生儿 1 分钟和 5 分钟时的 Apgar 评分均无显著差异。两组的最大和最小下腔静脉直径在腰麻后和分娩后均增大，而联合组此直径增大。晶体补液组分娩后 IVC-CI 值较高。

结论：与 1000 毫升晶体补液相比，500 毫升胶体预负荷联合 500 毫升晶体液的组合并没有减少麻黄碱总使用剂量或改善产妇其他预后。在剖宫产前和剖宫产过程中均能可靠地观察到 IVC，其直径随时间变化明显，两组之间也存在差异。

（吴洁译 李士通校）

BACKGROUND: The optimal strategy of fluid administration during spinal anesthesia for cesarean delivery is still unclear. Ultrasonography of the inferior vena cava (IVC) has been recently used to assess the volume status and predict fluid responsiveness. In this double-blind, randomized controlled study, we compared maternal hemodynamics using a combination of 500-mL colloid preload and 500-mL crystalloid coload versus 1000-mL crystalloid coload. We assessed the IVC at baseline and at subsequent time points after spinal anesthesia.

METHODS: Two hundred American Society of Anesthesiologists physical status II parturients with full-term singleton pregnancies scheduled for

elective cesarean delivery under spinal anesthesia were randomly allocated to receive either 500-mL colloid preload followed by 500-mL crystalloid coload (combination group) or 1000-mL crystalloid coload (crystalloid coload group) administered using a pressurizer. Ephedrine 3, 5, and 10 mg boluses were administered when the systolic blood pressure decreased below 90%, 80% (hypotension), and 70% (severe hypotension) of the baseline value, respectively. The IVC was assessed using the subcostal long-axis view at baseline, at 1 and 5 minutes after intrathecal injection, and immediately after delivery; the maximum and minimum IVC diameters were measured, and the IVC collapsibility index (CI) was calculated using the formula: IVC-CI = (maximum IVC diameter − minimum IVC diameter)/maximum IVC diameter. The primary outcome was the total ephedrine dose.
RESULTS: Data from 198 patients (99 patients in each group) were analyzed. The median (range) of the total ephedrine dose was 11 (0–60) mg in the combination group and 13 (0–61) mg in the crystalloid coload group; the median of the difference (95% nonparametric confidence interval) was −2 (−5 to 0.00005) mg, P = .22. There were no significant differences between the 2 groups in the number of patients requiring ephedrine, the incidence of hypotension and severe hypotension, the time to the first ephedrine dose, and neonatal Apgar scores at 1 and 5 minutes. The maximum and minimum IVC diameters in each group increased after spinal anesthesia and after delivery, and they were larger in the combination group. The IVC-CI after delivery was higher in the crystalloid coload group.
CONCLUSIONS:
The combination of 500-mL colloid preload and 500-mL crystalloid coload did not reduce the total ephedrine dose or improve other maternal outcomes compared with 1000-mL crystalloid coload. The IVC was reliably viewed before and during cesarean delivery, and its diameters significantly changed over time and differed between the 2 groups.

术前唾液皮质醇 AM/PM 比值预测老年患者非心脏手术后早期术后认知功能障碍
Preoperative Salivary Cortisol AM/PM Ratio Predicts Early Postoperative Cognitive Dysfunction After Noncardiac Surgery in Elderly Patients
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背景：术后认知功能障碍（POCD）的诊断需要复杂的神经心理测试，往往会使诊断延迟。具有早期检测或预测作用的可能生物标志物对于预防和治疗 POCD 至关重要。术前对唾液皮质醇水平的筛查可能有助于确定 POCD 高危患者。

方法：120 名年龄大于 60 岁并接受非心脏大手术的患者在手术前 1 天和手术后 1 周接受了神经心理学测试。术前 1 天分别采集患者早上和晚上唾液样本。POCD 被定义为在至少 2 个不同的测试中 z 分数≤－1.96。主要结果是出现 POCD。本研究的主要目的是评估 AM（早上）与 PM（晚上）唾液皮质醇水平之比与 POCD 的发生之间的关系。第二个目的是评估 POCD 与早晚唾液皮质醇绝对值之间的关系。

结果：术后 1 周，17.02%（94 例中的 16 例；95%置信区间（CI）为 9.28%-24.76%）的患者观察到 POCD。术前 AM/PM 唾液皮质醇比值较高可预测早期 POCD 发病（比值比[OR]为 1.56；95%可信区间为 1.20-2.02；P=0.001），即使在调整了最小精神状态检查评分后（比值比为 1.55；95%可信区间为 1.19-2.02；P=0.001）。POCD 患者唾液皮质醇 AM/PM 比值受试者操作特征曲线下面积为 0.72（95%CI 为 0.56－0.88；P=0.006）。最佳临界值为 5.69，灵敏度为 50%，特异性为 91%。

结论：术前唾液皮质醇 AM/PM 比值与早期 POCD 的存在显著相关。这种生物标志物对于筛查患者是否存在 POCD 风险增加以及进一步阐明 POCD 的病因可能具有潜在的价值。

（吴洁译 李士通校）

BACKGROUND: The diagnosis of postoperative cognitive dysfunction (POCD) requires complicated neuropsychological testing and is often delayed. Possible biomarkers for early detection or prediction are essential for the prevention and treatment of POCD. Preoperative screening of salivary cortisol levels may help to identify patients at elevated risk for POCD.

METHODS: One hundred twenty patients >60 years of age and undergoing major noncardiac surgery underwent neuropsychological testing 1 day before and 1 week after surgery. Saliva samples were collected in the morning and the evening 1 day before surgery. POCD was defined as a Z-score of ≤ －1.96 on at least 2 different tests. The primary outcome was the presence of POCD. The primary objective of this study was to assess the relationship between the ratio of AM (morning) to PM (evening) salivary cortisol levels and the presence of POCD. The secondary objective was to assess the relationship between POCD and salivary cortisol absolute values in the morning or in the evening.

RESULTS: POCD was observed in 17.02% (16 of 94; 95% confidence interval [CI], 9.28%－24.76%) of patients 1 week after the operation. A higher preoperative AM/PM salivary cortisol ratio predicted early POCD onset (odds ratio [OR], 1.56; 95% CI, 1.20－2.02; P = .001), even after adjusting for the Mini-Mental Sate Examination score (odds ratio, 1.55; 95% CI, 1.19－2.02; P = .001). The area under the receiver operating characteristic curve for the salivary cortisol AM/PM ratio in individuals with POCD was 0.72 (95% CI, 0.56－0.88; P = .006). The optimal cutoff value was 5.69, with a sensitivity of 50% and specificity of 91%.

CONCLUSIONS:

The preoperative salivary cortisol AM/PM ratio was significantly

associated with the presence of early POCD. This biomarker may have potential utility for screening patients for an increased risk and also for further elucidating the etiology of POCD.

统计过程控制

Statistical Process Control

No Hits, No Runs, No Errors?

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新的干预或新的临床计划必须实现并维持其运用和临床目标。为了证明其成功优化医疗保健价值，提供者和其他利益相关人员必须纵向衡量和报告这些跟踪的相关结果。这包括临床医生和围手术期医疗服务研究人员，他们选择参与这些过程和质量的改进工作（“在此领域中发挥作用”）。统计过程控制是统计学的一个分支，它将严格的顺序、基于时间的分析方法与性能和质量数据的图形表示相结合。统计过程控制及其主要工具-控制图为研究人员和从业人员提供了一种更好地理解和交流医疗保健绩效和质量改进工作数据的方法。统计过程控制以一种通常更易于临床医生、管理人员和医疗保健决策者理解的格式呈现绩效和质量数据，并且通常更容易产生可操作的见解和结论。卫生保健质量的改进是以统计过程控制为基础的。在麻醉学、重症监护、围术期医学和急慢性疼痛管理方面进行、实现和报告持续的质量改进，从根本上均依赖于应用统计过程控制的方法和工具。因此，本基本统计教程重点介绍统计过程控制的日耳曼主题，包括随机（常见）变化原因与可分配（特殊）变化原因：六西格玛（）与精益生产与精益六西格玛（精益生产管理）、质量管理水平、运行图、控制图、选择适用的控制图类型。以及分析控制图。重点是准实验研究设计，特别适用于工艺改进和质量改进工作。

（吴洁译 李士通校）

A novel intervention or new clinical program must achieve and sustain its operational and clinical goals. To demonstrate successfully optimizing health care value, providers and other stakeholders must longitudinally measure and report these tracked relevant associated outcomes. This includes clinicians and perioperative health services researchers who chose to participate in these process improvement and quality improvement efforts (“play in this space”). Statistical process control is a branch of statistics that combines rigorous sequential, time-based analysis methods with graphical presentation of performance and quality data. Statistical process control and its primary tool—the control chart—provide researchers and practitioners with a method of better understanding and communicating data from health care performance and quality improvement efforts. Statistical process control presents performance and quality data in a format that is typically more understandable to practicing clinicians, administrators, and health care decision makers and often more readily generates actionable insights and conclusions. Health care quality improvement is predicated on statistical

process control. Undertaking, achieving, and reporting continuous quality improvement in anesthesiology, critical care, perioperative medicine, and acute and chronic pain management all fundamentally rely on applying statistical process control methods and tools. Thus, the present basic statistical tutorial focuses on the germane topic of statistical process control, including random (common) causes of variation versus assignable (special) causes of variation: Six Sigma versus Lean versus Lean Six Sigma, levels of quality management, run chart, control charts, selecting the applicable type of control chart, and analyzing a control chart. Specific attention is focused on quasi-experimental study designs, which are particularly applicable to process improvement and quality improvement efforts.

.区域阻滞麻醉在门诊膝关节镜手术和前交叉韧带重建术中作用的循证学依据：第二部分

Evidence Basis for Regional Anesthesia in Ambulatory Arthroscopic Knee Surgery and Anterior Cruciate Ligament Reconstruction Part II

Adductor Canal Nerve Block—A Systematic Review and Meta-analysis

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背景：在过去十年中，内收肌管阻滞（ACB）已成为大型膝关节手术的一种有效区域镇痛技术。由于其运动保留的特性，ACB 在门诊膝关节手术中较有吸引力，但支持其在门诊膝关节镜手术中应用的证据存在矛盾。该系统评价和荟萃分析评估了 ACB 对门诊膝关节镜手术的镇痛作用。

方法：作者对电子数据库中，关于分析 ACB 与对照或任何其他方式相比的镇痛作用方面的随机对照临床试验，进行了全面检索。纳入小型关节镜和前交叉韧带重建（ACLR）手术。实验评估休息时和活动时的疼痛评分、阿片类药物消耗、阿片类药物相关不良反应、首次解救药物时间、患者满意度、股四头肌强度和阻滞相关并发症。使用随机效应建模汇总数据。

结果:作者检索到了 10 项随机对照试验，比较 ACB 与安慰剂或股神经阻滞（FNB）；根据膝关节手术的类型分亚组。对于小型膝关节镜手术，与对照相比，ACB 组术后静息疼痛评分更低，平均差异（95％置信区间）在 0、6 和 8 小时分别为-1.46 cm（-2.03 至-0.90）（P <.00001），－0.51 cm（-0.92 至-0.10），（P = .02）和-0.48cm（-0.93 至-0.04）（P = .03）。与对照相比，ACB 组动态疼痛评分更低，平均差异（95％置信区间）在 0、6 和 8 小时分别为-1.50 cm（-2.10 至-0.90）（P <.00001），－0.50 cm（-0.95 至-0.04）（P = .03）和-0.59cm（-1.12 至-0.05）（P = .03）。与对照组相比，ACB 组 24 小时累积口服吗啡当量消耗量更低，减少-7.41 mg（-14.75 至-0.08）（P = .05）。对于 ACLR 手术，与对

照组相比，ACB 没有提供任何镇痛益处，也没有改善任何检查结果。对于这些结果，ACB 也与 FNB 没有区别。

结论:小型门诊膝关节镜手术后，ACB 可提供适度的镇痛效果，包括改善静息疼痛，减少术后 8 小时和 24 小时内阿片类药物的消耗。在门诊 ACLR 后，ACB 的麻醉获益与安慰剂或 FNB 没有差别，表明两种阻滞在该过程中的作用有限。研究数量有限决定了应谨慎地解释此类研究结果。需要进一步的研究来确定 ACB 在局麻药滴注和/或移植供体部位镇痛中的作用。

（张骁 译 陈杰 校）

Background: Adductor canal block (ACB) has emerged as an effective analgesic regional technique for major knee surgeries in the last decade. Its motor-sparing properties make it particularly attractive for ambulatory knee surgery, but evidence supporting its use in ambulatory arthroscopic knee surgery is conflicting. This systematic review and meta-analysis evaluates the analgesic effects of ACB for ambulatory arthroscopic knee surgeries.

Methods: We conducted a comprehensive search of electronic databases for randomized controlled trials examining the analgesic effects of ACB compared to control or any other analgesic modality. Both minor arthroscopic and anterior cruciate ligament reconstruction (ACLR) surgeries were considered. Rest and dynamic pain scores, opioid consumption, opioid-related adverse effects, time to first analgesic request, patient satisfaction, quadriceps strength, and block-related complications were evaluated. Data were pooled using random-effects modeling.

Results: Our search yielded 10 randomized controlled trials comparing ACB with placebo or femoral nerve block (FNB); these were subgrouped according to the type of knee surgery. For minor knee arthroscopic surgery, ACB provided reduced postoperative resting pain scores by a mean difference (95% confidence interval) of -1.46 cm (-2.03 to -0.90) ($P < .00001$), -0.51 cm (-0.92 to -0.10) ($P = .02$), and -0.48 cm (-0.93 to -0.04) ($P = .03$) at 0, 6, and 8 hours, respectively, compared to control. Dynamic pain scores were reduced by a mean difference (95% confidence interval) of -1.50 cm (-2.10 to -0.90) ($P < .00001$), -0.50 cm (-0.95 to -0.04) ($P = .03$), and -0.59 cm (-1.12 to -0.05) ($P = .03$) at 0, 6, and 8 hours, respectively, compared to control. ACB also reduced the cumulative 24-hour oral morphine equivalent consumption by -7.41 mg (-14.75 to -0.08) ($P = .05$) compared to control. For ACLR surgery, ACB did not provide any analgesic benefits and did not improve any of the examined outcomes, compared to control. ACB was also not different from FNB for these outcomes.

Conclusions: After minor ambulatory arthroscopic knee surgery, ACB provides modest analgesic benefits, including improved relief for rest pain, and reduced opioid consumption for up to 8 and 24 hours, respectively. The analgesic benefits of ACB are not different from placebo or FNB after ambulatory ACLR, suggesting a limited role of both blocks in this

procedure. Paucity of trials dictates cautious interpretation of these findings. Future studies are needed to determine the role of ACB in the setting of local anesthetic instillation and/or graft donor-site analgesia

不同脂肪乳剂方案在布比卡因诱导的大鼠心脏停搏模型中复苏效果的比较

Comparative Regimens of Lipid Rescue From Bupivacaine-Induced Asystole in a Rat Model

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背景：目前尚不清楚通过外周静脉或中心静脉给予脂质乳剂（LE）对于抢救布比卡因诱导的心脏停搏孰优孰劣；也不清楚通过外周静脉施用不同的 LE 方案是否具有相似的治疗效果。本研究利用布比卡因诱导的大鼠心脏停搏模型比较了各种脂质给药方案的治疗效果。

方法：选取 45 只成年雄性 SD 大鼠，给予布比卡因诱导其出现心脏停搏，并随机将其分为 3 组：（1）通过颈内静脉持续输注 20％LE（CV 输注组）；（2）通过尾静脉持续输注 20％LE（PV 输注组）；（3）通过尾静脉间断推注 20％LE（PV-推注组）。各实验组 LE 的最大使用剂量不超过 10 mL/kg-1。在药物处理期间仍需对大鼠行胸外按压直至自主循环恢复（ROSC）或抢救时长达 40min。

结果：CV 输注组和 PV 推注组在 2～40min 内的存活率、ROSC 率、收缩压、心率、心率-血压乘积和冠状动脉灌注压方面均显著高于 PV 输注组（P <.01）；同时其血浆总布比卡因浓度和心肌布比卡因含量也均显著降低（P <.05）。在心脏复跳时间和 ROSC 时间方面 CV 输注组和 PV 推注组也明显短于 PV 输注组（P <.05）。

结论：在布比卡因诱导的大鼠心脏停搏模型中，通过外周静脉间断推注 LE 比外周静脉连续输注 LE 可产生更好的复苏结果，并且其与通过中心静脉连续输注 LE 具有类似的效果。

（周江平 译　陈杰 校）

BACKGROUND: It is currently unknown whether bupivacaine-induced asystole is better resuscitated with lipid emulsion (LE) administered peripherally or centrally, and whether different LE regimens administered peripherally demonstrated similar effects. In this study, we compared the effects of various regimens of lipid administration in a rat model of bupivacaine-induced asystole.

METHODS: Forty-five adult male Sprague-Dawley rats were subjected to bupivacaine-induced asystole and randomly divided into 3 lipid regimens groups: (1) 20% LE was administered continuously via the internal jugular vein (CV-infusion group); (2) 20% LE was administered continuously via the tail vein (PV-infusion group); and (3) 20% LE was administered as divided boluses via the tail vein (PV-bolus group). The maximum dose of LE did not exceed 10 mL・kg－1. External chest compressions were

administered until the return of spontaneous circulation (ROSC) or the end of a 40-minute resuscitation period.
RESULTS: The survival rate, rate of ROSC, systolic blood pressure, heart rate, heart rate - blood pressure product, and coronary perfusion pressure during 2 - 40 minutes in the CV-infusion and PV-bolus groups were significantly higher than those in the PV-infusion group ($P < .01$), and the plasma total bupivacaine concentration and myocardial bupivacaine content were significantly lower ($P < .05$). Time to heartbeat return and time to ROSC in the CV-infusion and PV-bolus groups were significantly shorter than those in the PV-infusion group ($P < .05$).
CONCLUSIONS: In the rat model of bupivacaine-induced asystole, a divided LE bolus regimen administered peripherally provided a better resuscitation outcome than that of a continuous LE infusion regimen peripherally, and performed in a similar fashion as the continuous LE infusion regimen administered centrally.

血小板预防性输注对于血小板减少危重病人的作用

Prophylactic Platelet Transfusions for Critically Ill Patients With Thrombocytopenia

A Single-Institution Propensity-Matched Cohort Study

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背景：重症患者经常伴发血小板减少症，通常会预防性输注血小板以减少出血并发症。 然而，此种做法的功效仍不清楚。本研究目的是确定危重病人预防性血小板输注与出血并发症之间的关系。
方法：此项回顾性队列研究纳入 2009 年 1 月 1 日至 2013 年 12 月 31 日期间在单一学术机构入住外科、内科或综合重症监护病房（ICU）的成人。纳入标准包括年龄≥18 岁和 ICU 入住时进行血小板计数。倾向性匹配分析用于评估预防性血小板输注和相关结果之间的关联，其中主要观察结果是随后的 24 小时内红细胞输注情况，次要观察结果是非 ICU 和非住院天数以及连续器官衰竭评估评分的变化。
结果：这项调查共纳入 40,693 例患者，3227 例（7.9％）接受过血小板输注，其中 1065 例（33.0％）为预防性输注。在倾向性匹配分析中，994 例预防性血小板输注患者与未输注患者相匹配。在随后的 24 小时内接受预防性血小板治疗的患者红细胞输注率明显增高（比值比为 7.5 [5.9-9.5]; P <0.001），非 ICU 天数明显减少（平均[标准差] 20.8 [9.1] vs 22.7 [8.3]天; P = 0.004），非住院天数明显减少（13.0 [9.7] vs 15.8 [9.4]天; P <0.001），连续器官衰竭评估评分的改善更少（平均下降 0.2 [3.6] vs 1.8 [3.3] ）; P <0.001）。 这些发现较为确定，持续存在于多个预定义的敏感性分析中。
结论：虽然存在一些混杂因素，但危重病人血小板的预防性输注给药与改善的临床结果并无无关。有必要进一步调查这一人群中的血小板输注策略。
(宋英才 译　陈杰 校)

BACKGROUND: Thrombocytopenia is frequently encountered in critically ill patients, often resulting in prophylactic transfusion of platelets for the prevention of bleeding complications. However, the efficacy of this practice remains unclear. The objective of this study was to determine the relationship between prophylactic platelet transfusion and bleeding complications in critically ill patients.
METHODS: This is a retrospective cohort study of adults admitted to surgical, medical, or combined medical-surgical intensive care units (ICUs) at a single academic institution between January 1, 2009, and December 31, 2013. Inclusion criteria included age ≥18 years and a platelet count measured during ICU admission. Propensity-matched analyses were used to evaluate associations between prophylactic platelet transfusions and the outcomes of interest with a primary outcome of red blood cell transfusion in the ensuing 24 hours and secondary outcomes of ICU and hospital-free days and changes in sequential organ failure assessment scores.
RESULTS: A total of 40,693 patients were included in the investigation with 3227 (7.9%) receiving a platelet transfusion and 1065 (33.0%) for which platelet transfusion was prophylactic in nature. In propensity-matched analyses, 994 patients with prophylactic platelet transfusion were matched to those without a transfusion. Patients receiving prophylactic platelets had significantly higher red blood cell transfusion rates (odds ratio 7.5 [5.9-9.5]; P < .001), fewer ICU-free days (mean [standard deviation] 20.8 [9.1] vs 22.7 [8.3] days; P = .004), fewer hospital-free days (13.0 [9.7] vs 15.8 [9.4] days; P < .001), and less improvement in sequential organ failure assessment scores (mean decrease of 0.2 [3.6] vs 1.8 [3.3]; P < .001) in the subsequent 24 hours. These findings appeared robust, persisting in multiple predefined sensitivity analyses.
CONCLUSIONS: Prophylactic administration of platelets in the critically ill was not associated with improved clinical outcomes, though residual confounding may exist. Further investigation of platelet transfusion strategies in this population is warranted.

微创漏斗胸纠治术的围术期管理及院内转归：儿科麻醉改善协会的多中心注册报告

Perioperative Management and In-Hospital Outcomes After Minimally Invasive Repair of Pectus Excavatum

A Multicenter Registry Report From the Society for Pediatric Anesthesia Improvement Network

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背景：目前微创漏斗胸纠治术（minimally invasive repair of pectus excavatum, MIRPE）患者的镇痛管理相关的对照研究较少。建立儿科麻醉改善网络协会以调查那些存在显著管理差异的操作的预后。作者在首次研究中建立一个多中心观察数据库来描述用于 MIRPE 患儿的镇痛策略。各中心的预后数据用于评估镇痛策略与疼痛预后之间的关系。
方法：从 2014 年 6 月至 2015 年 8 月，共有 14 个医疗机构招募患者。研究成员均同意采用同一种观察方法，每个机构根据各自的标准及协议管理病人，没有要求标准化监护。根据镇痛策略对患者进行分组：硬膜外置管（EC）、椎旁置管（PVC）、切口置管（WC）、非区域镇痛（NR）、鞘内吗啡应用。在使用多变量模型对以下 5 项协变量（年龄、性别、植入钢板数、胸科指数及术前疼痛用药）进行混杂因素调整后，以术后某日（POD）的疼痛评分和阿片类药物消耗量作为主要预后指标，进行组间比较。疼痛评分采用 Bonferroni 校正的重复测量方差分析。使用多变量分位数回归分析阿片类药物消耗量。
结果：收集 348 例 MIPRE 患者的数据并按主要镇痛策略进行分类：EC（122），PVC（57），WC（41），NR（120），和鞘内吗啡应用（8）。与 EC 相比，PVC(POD 0)、WC(POD 0,1,2,3,)、和 NR(POD 0,1,2)组的日疼痛评分中位数更高（各组间 P<0.001-0.024）。PVC(POD 0)、WC(POD 0,1,2,3,)和 NR(POD 0,1,2)组的日阿片需求量均较 EC 组患者更多（P<0.001）。
结论：数据表明，本研究网络中 MIRPE 患者的镇痛策略多样。结果表明，无论采用何种方式，多数患者术后出现轻至中度疼痛。与其他策略相较，EC 治疗的患者在康复早期疼痛评分及阿片类药物消耗更低。
（金夏 译 陈杰 校）
BACKGROUND: There are few comparative data on the analgesic options used to manage patients undergoing minimally invasive repair of pectus excavatum (MIRPE). The Society for Pediatric Anesthesia Improvement Network was established to investigate outcomes for procedures where there is significant management variability. For our first study, we established a multicenter observational database to characterize the analgesic strategies used to manage pediatric patients undergoing MIRPE. Outcome data from the participating centers were used to assess the association between analgesic strategy and pain outcomes.
METHODS: Fourteen institutions enrolled patients from June 2014 through August 2015. Network members agreed to an observational methodology where each institution managed patients based on their institutional standards and protocols. There was no requirement to standardize care. Patients were categorized based on analgesic strategy: epidural catheter (EC), paravertebral catheter (PVC), wound catheter (WC), no regional (NR) analgesia, and intrathecal morphine techniques. Primary outcomes, pain

score and opioid consumption by postoperative day (POD), for each technique were compared while adjusting for confounders using multivariable modeling that included 5 covariates: age, sex, number of bars, Haller index, and use of preoperative pain medication. Pain scores were analyzed using repeated-measures analysis of variance with Bonferroni correction. Opioid consumption was analyzed using a multivariable quantile regression.

RESULTS: Data were collected on 348 patients and categorized based on primary analgesic strategy: EC (122), PVC (57), WC (41), NR (120), and intrathecal morphine (8). Compared to EC, daily median pain scores were higher in patients managed with PVC (POD 0), WC (POD 0, 1, 2, 3), and NR (POD 0, 1, 2), respectively ($P < .001$-.024 depending on group). Daily opioid requirements were higher in patients managed with PVC (POD 0, 1), WC (POD 0, 1, 2), and NR (POD 0, 1, 2) when compared to patients managed with EC ($P < .001$).

CONCLUSIONS: Our data indicate variation in pain management strategies for patients undergoing MIRPE within our network. The results indicate that most patients have mild-to-moderate pain postoperatively regardless of analgesic management. Patients managed with EC had lower pain scores and opioid consumption in the early recovery period compared to other treatment strategies.

一项关于“关节和脊柱手术后阿片类药物处方过量的前瞻性队列研究

Opioid Oversupply After Joint and Spine Surgery
A Prospective Cohort Study

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背景：许多患者在术后出院时接受阿片类药物的处方，但对阿片类药物的剩余情况知之甚少。作者对门诊和住院手术后剩余阿片类药物的发生率，非阿片类镇痛药的使用以及此类药物的储存和处置方法进行评估。

方法：此项前瞻性队列研究招募对象为一所大型市级三级医院自 2016 年 8 月至 11 月期间择期接受门诊或住院关节和脊柱外科手术的 18 岁以上患者。通过电话调查，作者评估了患者术后 2 天，2 周，1 个月和 6 个月时的预后情况，评估内容包括：（1）停止阿片类药物治疗和拥有的剩余阿片类药物（主要结果），（2）停止使用阿片类药物后剩余的阿片类药物数量（3）非阿片类药物疼痛治疗方式和（4）对于安全储存和处置阿片类药物的知识和实践情况。

结果：在 141 名符合条件的患者中，获得 140 名（99％）知情同意（其中 35％的患者术前服用阿片类药物;平均年龄 56 岁[标准差 16 岁]; 其中 47％为女性）。对 115 名（82％）和 110 名患者（80％）分别进行了 1 个月和 6 个月的随访。在停止阿片类药物治疗的患者中，在术后 1 个月随访时，还拥有剩余阿片类药物的患者比例为 73％（置信区间为 95％，62％-82％），术后 6 个月者为 34％（置信区间为 24％-45％）。在术后 1 月时，有 46％的患者还拥有超过 20 片剩余阿片类

药物，有37%的患者拥有大于200mg吗啡当量的药品，而只有6%的患者使用多种非阿片类药物。许多患者在术后1个月（分别为91%和96%）和6个月（分别为92%和47%）随访时表现出未能安全储存和处置阿片类药物。

结论：作者研究发现，在关节和脊柱手术后，许多患者拥有剩余阿片类药物、不常用的镇痛药替代物，并缺乏安全储存和处置阿片类药物的知识。亟需一些干预手段以更好地定制术后镇痛方案，并改善处方阿片类药物的安全储存和处置情况。(谢婷婷 译　陈杰 校)

BACKGROUND: Many patients receive prescription opioids at hospital discharge after surgery, yet little is known regarding how often these opioids go unused. We estimated the prevalence of unused opioids, use of nonopioid analgesics, and storage and disposal practices after same-day and inpatient surgery.

METHODS: In this prospective cohort study at a large, inner-city tertiary care hospital, we recruited individuals ≥18 years of age undergoing elective same-day or inpatient joint and spine surgery from August to November 2016. Using patient surveys via telephone calls, we assessed patient-reported outcomes at 2-day, 2-week, 1-month, and 6-month intervals, including: (1) stopping opioid treatment and in possession of unused opioid pills (primary outcome), (2) number of unused opioid tablets reported after stopping opioids, (3) use of nonopioid pain treatments, and (4) knowledge and practice regarding safe opioid storage and disposal.

RESULTS: Of 141 eligible patients, 140 (99%) consented (35% taking preoperative opioids; mean age 56 years [standard deviation 16 years]; 47% women). One- and 6-month follow-up was achieved for 115 (82%) and 110 patients (80%), respectively. Among patients who stopped opioid therapy, possession of unused opioids was reported by 73% (95% confidence intervals, 62%-82%) at 1-month follow-up and 34% (confidence interval, 24%-45%) at 6-month follow-up. At 1 month, 46% had ≥20 unused pills, 37% had ≥200 morphine milligram equivalents, and only 6% reported using multiple nonopioid adjuncts. Many patients reported unsafe storage and failure to dispose of opioids at both 1-month (91% and 96%, respectively) and 6-month (92% and 47%, respectively) follow-up.

CONCLUSIONS: After joint and spine surgery, many patients reported unused opioids, infrequent use of analgesic alternatives, and lack of knowledge regarding safe opioid storage and disposal. Interventions are needed to better tailor postoperative analgesia and improve the safe storage and disposal of prescription opioids.