局部麻醉对胃食管癌手术结局的影响：文献系统综述

Impact of Regional Anesthesia on Gastroesophageal Cancer Surgery Outcomes: A Systematic Review of the Literature

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局部麻醉可能对肿瘤的长期结局有积极作用。特别是已有研究表明局部麻醉可以调节免疫和炎症应答，从而延长胃肠道恶性肿瘤术后（包括胃癌和食管癌）的无瘤生存时间和总生存时间。然而人类研究的结果与之并不一致。这篇系统综述的目的是总结局部麻醉对胃食管手术术后免疫调节和肿瘤复发产生影响的证据。我们在 5 个不同的数据库中进行文献搜索。两名独立的审核人根据预先设定的纳入和排除标准进行选中初稿的质量分析。随机对照试验应用 Cochrane 风险偏倚评估工具评估潜在的来源偏倚。共有 6 项研究被纳入质量分析和系统综述。因为研究之间的高异质性、研究的低质量和缺乏标准结局的定义，我们并没有进行 Meta 分析。虽然这些文献表明局部麻醉在受试人群中有一定调节炎症和免疫应答的作用，但是我们的系统综述表明并没有证据支持或反驳硬膜外麻醉或镇痛的应用可以降低胃食管癌术后的复发率。
（王雅婷译 潘艳、薛张纲校）

Regional anesthesia may play a beneficial role in long-term oncological outcomes. Specifically, it has been suggested that it can prolong recurrence-free survival and overall survival after gastrointestinal cancer surgery, including gastric and esophageal cancer, by modulating the immune and inflammatory response. However, the results from human studies are conflicting. The goal of this systematic review was to summarize the evidence on the impact of regional anesthesia on immunomodulation and cancer recurrence after gastric and esophageal surgery. We conducted a literature search of 5 different databases. Two independent reviewers analyzed the quality of the selected manuscripts according to prespecified inclusion and exclusion criteria. Randomized controlled trials were assessed for potential sources of bias by using the Cochrane Risk of Bias tool. A total of 6 studies were included in the quality analysis and systematic review. A meta-analysis was not conducted for several reasons, including high heterogeneity among studies, low quality of the reports, and lack of standardized outcomes definitions. Although the literature suggests that regional anesthesia has some modulatory effects on the inflammatory and immunological response in the studied patient population, our systematic review indicates that there is no evidence to support or refute the use of epidural anesthesia or analgesia with the goal of reducing cancer recurrence after gastroesophageal cancer surgery.

使用实施研究统一框架实施的围手术期音乐疗法

Implementation of Perioperative Music Using the Consolidated Framework for Implementation Research

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背景：补充性整体健康疗法在围术期具有减轻疼痛，减少镇痛药的使用，减轻患者的焦虑以及提高患者满意度的作用。但是，该疗法长期使用具有不同程度的滞后性。实施研究统一框架（CFIR）可以减轻这一问题。

方法：我们审查了几个非药物治疗的证据（CFIR 域：干预的特征），并通过调查 11 个退伍军人（VA）医院（外部和内部设置）的医疗工作者研究外部背景和应变组织能力。我们询问患者接受音乐疗法的意愿，并对此与已知的阿片类药物使用风险因素之间的联系（个体特征）进行研究。我们为围手术期使用装有退伍军人喜欢的音乐的数字音乐播放器实施了一个规范，并评估了其在 6 个月内接受关节替换的患者亚组中的情况（实施过程））。然后，我们提取了术后恢复时间和其他转归的数据，并将它们与既往或同期队列进行比较。

结果：证据从强烈和直接到微弱和间接不等，强证据包的围手术期音乐疗法和针灸，弱证据包括冥想，瑜伽和太极拳。97 名围手术期医疗工作者完成了应变能力的研究，结果显示其均得到正分数（平均值> 0，范围从-2 到+2，相当于> 2.5 分在 5 分李克特量表中）。与大多数其他 VA 医院（+0.05--+0.63）相比，Durham（+0.47）的应变能力更好。3307 名退伍军人询问是否愿意接受音乐疗法，大约 68％（n = 2252）回答“是”。在多变量分析中，年纪越轻术前疼痛评分越高（入院前 90 天内> 4 分），二者呈正相关，该评分是与阿片类药物过度使用相关的因素。目标分组中的比例适中（81 个接收者中有 39 个接收音乐疗法），这可能是由于扩大到非目标人群中时，设备不可用性可能会降低。术后恢复时间没有改变，表明该策略可以顺利整合到工作流程中。

结论：CFIR 指导下实施的围手术期音乐疗法在三级 VA 医院是可行的，这类医院中高危患者比例适中。使用具有患者喜欢的播放列表的数字音乐播放器得到了大力推荐，医疗工作者的良好的应变能力，患者（特别是有阿片类药物过度使用风险的人）的良好接受度以及规范化的实施方法均发挥了重要作用。确定类似的有效的理论转化医疗活动的框架尚需进一步研究

(马瑞华译 潘艳、薛张纲校)

BACKGROUND: Complementary integrative health therapies have a perioperative role in the reduction of pain, analgesic use, and anxiety, and increasing patient satisfaction. However, long implementation lags have been quantified. The Consolidated Framework for Implementation Research (CFIR) can help mitigate this translational problem.

METHODS: We reviewed evidence for several nonpharmacological treatments (CFIR domain: characteristics of interventions) and studied external context and organizational readiness for change by surveying providers at 11 Veterans Affairs (VA) hospitals (domains: outer and inner settings). We asked patients about their

willingness to receive music and studied the association between this and known risk factors for opioid use (domain: characteristics of individuals). We implemented a protocol for the perioperative use of digital music players loaded with veteran-preferred playlists and evaluated its penetration in a subgroup of patients undergoing joint replacements over a 6-month period (domain: process of implementation). We then extracted data on postoperative recovery time and other outcomes, comparing them with historic and contemporary cohorts.
RESULTS: Evidence varied from strong and direct for perioperative music and acupuncture, to modest or weak and indirect for mindfulness, yoga, and tai chi, respectively. Readiness for change surveys completed by 97 perioperative providers showed overall positive scores (mean >0 on a scale from -2 to +2, equivalent to >2.5 on the 5-point Likert scale). Readiness was higher at Durham (+0.47) versus most other VA hospitals (range +0.05 to +0.63). Of 3307 veterans asked about willingness to receive music, approximately 68% (n = 2252) answered "yes." In multivariable analyses, a positive response (acceptability) was independently predicted by younger age and higher mean preoperative pain scores (>4 out of 10 over 90 days before admission), factors associated with opioid overuse. Penetration was modest in the targeted subset (39 received music out of a possible 81 recipients), potentially reduced by device nonavailability due to diffusion into nontargeted populations. Postoperative recovery time was not changed, suggesting smooth integration into workflow**.**
CONCLUSIONS:CFIR-guided implementation of perioperative music was feasible at a tertiary VA hospital, with moderate penetration in a high-risk subset of patients. Use of digital music players with preferred playlists was supported by strong evidence, tension for change, modest readiness among providers, good acceptability among patients (especially those at risk for opioid overuse), and a protocolized approach. Further study is needed to identify similar frameworks for effective knowledge-translation activities.

用利多卡因及左旋布比卡因有效灭活依赖抑制成人及新生儿 Nav1.5 通道
Potent Inactivation-Dependent Inhibition of Adult and Neonatal Nav1.5 Channels by Lidocaine and Levobupivacaine
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背景：局麻药（LAs）的心脏毒性涉及抑制 Nav1.5 钠电控通道。转移性乳腺癌和结肠癌细胞也表达 Nav1.5 通道，主要是新生儿剪切变异体 (nNaV1.5)以及通过 LAs 抑制其侵袭转移。通过选择性阻断和或优先失活在癌细胞中占优势的 nNaV1.5 通道，靶向癌细胞从而保护心脏功能的是有益的。我们分别从（1）成人及新生儿 Nav1.5 通道（2）Nav1.5 通道的休眠和失活状态来验证利多卡因及左旋布比卡因的差异影响。
方法：在 HEK-293 细胞中使用全细胞电压钳技术评价利多卡因及左旋布比卡因在重组表达 Nav1.5 通道的作用。细胞转染瞬间通过 cDNA 决定编码 aNaV1.5 或 nNaV1.5。使用电压来决定去极化点位来活化或者失活 50%时的最大电导（分别为 V½活化及 V½失活）。

结果：利多卡因及左旋布比卡因在保持电位-80mV 有效抑制值在 aNaV1.5（IC50 均值[标准差]分别为 20[22]和 1[0.6]μm）和 nNaV1.5 (IC50 均值[标准差]分别为 17 [10] 和 3 [1.6] μm）。在没有剪切变异体的影响下利多卡因和左旋布比卡因对 IC50 有显著差异。左旋布比卡因在 aNaV1.5 中 V½活化的去极化偏移存在统计学意义（均值[标准差]从-32 [4.6] mV 到 -26 [8.1] mV），但对 nNaV1.5 电控活化并没有影响。利多卡因对于两种受体 V½活化均无影响，但 nNaV1.5 与 aNaV1.5 相比存在最大电导的显著降低。对于两种 LAs 及两种 NaV1.5 通道在 V½失活（约 10mV）中也存在相似的统计学显著偏移。左旋布比卡因 (1μm)相对于利多卡因 (10μm)显著降低了两种变异体的复苏速度。两种局麻药在-80 mV 下保持约 50% 抑制 aNaV1.5 或 nNaV1.5 的作用。两种 LAs 在-90 或-120mV 时，几乎没有稳态失活。较高浓度的利多卡因 (300μm)或左旋布比卡因(100μm)在-120mV 时存在一个明显的阻滞。

结论：这些数据表明，低浓度的局麻药表现出与 NaV1.5 失活相关，这在其无心脏毒性的情况下安全的抑制转移性癌细胞的迁移和侵袭提供了理论依据。

（庞艳蓉译 潘艳、薛张纲校）

BACKGROUND: Cardiotoxic effects of local anesthetics (LAs) involve inhibition of NaV1.5 voltage-gated Na channels. Metastatic breast and colon cancer cells also express NaV1.5, predominantly the neonatal splice variant (nNaV1.5) and their inhibition by LAs reduces invasion and migration. It may be advantageous to target cancer cells while sparing cardiac function through selective blockade of nNaV1.5 and/or by preferentially affecting inactivated NaV1.5, which predominate in cancer cells. We tested the hypotheses that lidocaine and levobupivacaine differentially affect (1) adult (aNaV1.5) and nNaV1.5 and (2) the resting and inactivated states of NaV1.5.

METHODS: The whole-cell voltage-clamp technique was used to evaluate the actions of lidocaine and levobupivacaine on recombinant NaV1.5 channels expressed in HEK-293 cells. Cells were transiently transfected with cDNAs encoding either aNaV1.5 or nNaV1.5. Voltage protocols were applied to determine depolarizing potentials that either activated or inactivated 50% of maximum conductance (V½ activation and V½ inactivation, respectively).

RESULTS: Lidocaine and levobupivacaine potently inhibited aNaV1.5 (IC50 mean [SD]: 20 [22] and 1 [0.6] μM, respectively) and nNaV1.5 (IC50 mean [SD]: 17 [10] and 3 [1.6] μM, respectively) at a holding potential of -80 mV. IC50s differed significantly between lidocaine and levobupivacaine with no influence of splice variant. Levobupivacaine induced a statistically significant depolarizing shift in the V½ activation for aNaV1.5 (mean [SD] from -32 [4.6] mV to -26 [8.1] mV) but had no effect on the voltage dependence of activation of nNaV1.5. Lidocaine had no effect on V½ activation of either variant but caused a significantly greater depression of maximum current mediated by nNaV1.5 compared to aNaV1.5. Similar statistically significant shifts in the V½ inactivation (approximately -10 mV) occurred for both LAs and NaV1.5 variants. Levobupivacaine (1 μM) caused a significantly greater slowing of recovery from inactivation of both variants than did lidocaine (10 μM). Both LAs caused approximately 50% tonic inhibition of aNaV1.5 or nNaV1.5 when holding at -80 mV. Neither LA caused tonic block at a holding potential of either -90

or -120 mV, voltages at which there was little steady-state inactivation. Higher concentrations of either lidocaine (300 μM) or levobupivacaine (100 μM) caused significantly more tonic block at -120 mV.
CONCLUSIONS: These data demonstrate that low concentrations of the LAs exhibit inactivation-dependent block of NaV1.5, which may provide a rationale for their use to safely inhibit migration and invasion by metastatic cancer cells without cardiotoxicity.

α-细辛醚通过抑制肝脏 X 受体依赖性脊髓内质网应激减轻慢性压迫性损伤所致神经病理性疼痛

α-Asarone Alleviated Chronic Constriction Injury–Induced Neuropathic Pain Through Inhibition of Spinal Endoplasmic Reticulum Stress in an Liver X Receptor–Dependent

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背景：神经性疼痛是一种难治性且复杂的疾病。 最近的研究表明，内质网（ER）应激与神经病理性疼痛之间存在密切关系。 在这里，我们研究了 α-细辛醚（一种 ER 应激抑制剂）对慢性压迫性损伤（CCI）引起的神经性疼痛的影响。
方法：本研究包括两部分。 在第 1 部分中，将大鼠分成 7 组：假手术组，假手术+α-细辛醚-20mg / kg 组，CCI 组，CCI +溶剂组，CCI +α-细辛醚 5mg / kg 组，CCI +α-细辛醚 10mg / kg 组和 CCI +α-细辛醚 20mg / kg 组。 术后，每天用 α-细辛醚或生理盐水处理大鼠。 测量疼痛阈值，并且在第 7 天采集 L3-6 脊髓的样品进行蛋白质印迹和免疫荧光。在部分 2 中，将大鼠鞘内植入 PE-10 管并分成 4 组：CCI +α-细辛醚 20mg / kg 组，CCI +α-细辛醚 20mg / kg +溶剂组，CCI +α-细辛醚 20mg / kg + SR9243 组和 CCI 组。在鞘内注射后 1 小时，将每组中的 5 只大鼠分开进行行为测试。 其余的大鼠在第 7 天被杀死进行蛋白质印迹测试。
结果：在这项研究中，CCI 手术显著诱发机械性异常性疼痛和热痛觉过敏。 CCI 手术显著诱导大鼠 ER 应激（PERK-eIF2α，IRE1α，CHOP 和 XBP-1s）的激活。然而，用 20mg / kg 的 α-细辛醚治疗显著减轻了 CCI 诱导的 ER 应激的激活。 行为结果显示，在第 7 天，每天用 20mg / kg 的 α-细辛醚治疗显著减轻了 CCI 诱导的伤害感受行为（机械性异常性疼痛，P = .016,95％置信区间，0.645-5.811;热痛觉过敏，P = .012,95％置信区间，0.860-6.507）。 此外，α-细辛醚诱导肝 X 受体 β（LXRβ）和脊髓中下游蛋白的表达上调。 LXR 拮抗剂 SR9243 完全抑制 α-细辛醚在大鼠中的抗 ER 应激和抗伤害感受作用。
结论：α-细辛醚以 LXR 依赖性方式缓解 CCI 诱导的神经性疼痛。 α-细辛醚可以作为治疗神经性疼痛的潜在药剂。
（许智鸿译 潘艳、薛张纲校）

BACKGROUND: Neuropathic pain is an intractable and complex disease. Recent studies have shown a close relationship between endoplasmic reticulum (ER) stress and neuropathic pain. Here, we investigated the effect of [alpha]-asarone, an ER stress inhibitor, on chronic constriction injury (CCI)-induced neuropathic pain. **METHODS:** Two parts were included in this study. In part 1, rats were assigned to 7 groups: the sham group, the sham + [alpha]-asarone 20 mg/kg group, the CCI group, the CCI +

vehicle group, the CCI + [alpha]-asarone 5 mg/kg group, the CCI + [alpha]-asarone 10 mg/kg group, and the CCI + [alpha]-asarone 20 mg/kg group. After surgery, the rats were treated with [alpha]-asarone or normal saline daily. Pain thresholds were measured, and samples of the L3-6 spinal cord were taken for western blotting and immunofluorescence on day 7. In part 2, rats were intrathecally implanted with PE-10 tubes and divided into 4 groups: the CCI + [alpha]-asarone 20 mg/kg group, the CCI + [alpha]-asarone 20 mg/kg + vehicle group, the CCI + [alpha]-asarone 20 mg/kg + SR9243 group, and the CCI group. Five rats in each group were separated for behavioral tests 1 hour after intrathecal injection. The rest of them were killed for western blotting on day 7.

RESULTS: In this study, CCI surgery significantly induced mechanical allodynia and thermal hyperalgesia. CCI surgery significantly induced activation of ER stress (PERK-eIF2[alpha], IRE1[alpha], CHOP, and XBP-1s) in rats. However, treatment with 20 mg/kg of [alpha]-asarone significantly alleviated CCI-induced activation of ER stress. Behavioral results showed that daily treatment with 20 mg/kg of [alpha]-asarone significantly alleviated CCI-induced nociceptive behaviors, on day 7 (mechanical allodynia, P = .016, 95% confidence interval, 0.645-5.811; thermal hyperalgesia, P = .012, 95% confidence interval, 0.860-6.507). Furthermore, [alpha]-asarone induced upregulated expression of liver X receptor [beta] (LXR[beta]) and downstream proteins in the spinal cord. The LXR antagonist SR9243 completely inhibited the anti-ER stress and antinociceptive effects of [alpha]-asarone in rats.

CONCLUSIONS: [alpha]-Asarone relieved CCI-induced neuropathic pain in an LXR-dependent manner. [alpha]-Asarone may be a potential agent for treatment of neuropathic pain.

右旋美托咪定在儿童门诊手术应用中的群体药代动力学及药效学

Population Pharmacokinetics and Pharmacodynamics of Dexmedetomidine in Children Undergoing Ambulatory Surgery

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背景：右旋美托咪定（dexmedetomidine，DEX）是一种 α2 肾上腺素能激动剂，具有镇静和镇痛作用。虽然未经儿童食品药品监督管理局批准使用，但是右美越

来越多地被应用于小儿麻醉和重症监护。然而，可以获得的关于右美被用于儿童的药代动力学的资料非常有限。本课题旨在研究在墨西哥 2-18 岁接受门诊手术治疗的儿童中使用的右美的药代动力学和药效学（PK–PD）。

方法：30 名 2-18 岁的被美国麻醉医师学会身体状况评分评为 I / II 的儿童被纳入本项研究。右美单次静脉输注给药的剂量为 0.7μg/kg。采集静脉血样，结合高效液相色谱和电喷雾电离串联质谱分析血浆右美浓度。使用 Monolix 程序构建群体 PK-PD 模型。。

结果：二室模型充分地描述了浓度-时间关系。使用异速生长模型将体重标准设为 70 公斤。总体参数估计如下：平均值（受试者间差异）：清除率（Cl）（L/h×70kg）=20.8（27%）；中心分布容积（V1）（L×70kg）=21.9（20%）；外周分布容积（V2）（L×70kg）=81.2（21%）；隔室间清除率（Q）（L/h×70kg）=75.8（25%）。PK-PD 模型预测 IC50 为 0.501ng/ml 时最大平均动脉血压下降 45%，IC50 为 0.552ng/ml 时最大心率下降 28.9%。

结论：我们的研究结果提示，在墨西哥 2-18 岁美国麻醉师协会 I/II 评分的儿童中，使用右美的剂量应根据较低的右美清除率进行调整。

（汤洁译 潘艳、薛张纲校）

BACKGROUND: Dexmedetomidine (DEX) is an α-2 adrenergic agonist with sedative and analgesic properties. Although not approved for pediatric use by the Food and Drug Administration, DEX is increasingly used in pediatric anesthesia and critical care. However, very limited information is available regarding the pharmacokinetics of DEX in children. The aim of this study was to investigate DEX pharmacokinetics and pharmacodynamics (PK–PD) in Mexican children 2–18 years of age who were undergoing outpatient surgical procedures.

METHODS: Thirty children 2–18 years of age with American Society of Anesthesiologists physical status score of I/II were enrolled in this study. DEX (0.7 μg/kg) was administered as a single-dose intravenous infusion. Venous blood samples were collected, and plasma DEX concentrations were analyzed with a combination of high-performance liquid chromatography and electrospray ionization-tandem mass spectrometry. Population PK–PD models were constructed using the Monolix program.

RESULTS: A 2-compartment model adequately described the concentration–time relationship. The parameters were standardized for a body weight of 70 kg by using an allometric model. Population parameters estimates were as follows: mean (between-subject variability): clearance (Cl) (L/h × 70 kg) = 20.8 (27%); central volume of distribution (V1) (L × 70 kg) = 21.9 (20%); peripheral volume of distribution (V2) (L × 70 kg) = 81.2 (21%); and intercompartmental clearance (Q) (L/h × 70 kg) = 75.8 (25%). The PK–PD model predicted a maximum mean arterial blood pressure reduction of 45% with an IC50 of 0.501 ng/ml, and a maximum heart rate reduction of 28.9% with an IC50 of 0.552 ng/ml.

CONCLUSIONS: Our results suggest that in Mexican children 2–18 years of age with American Society of Anesthesiologists score of I/II, the DEX dose should be adjusted in accordance with lower DEX clearance.

瑞典学术型医院创伤性脑损伤后的植物人状态发生率低

Low Level of Vegetative State After Traumatic Brain Injury in a Swiss Academic Hospital

Stretti F, Klinzing S, Ehlers U, Steiger P, Schuepbach R, Krones T, Brandi G.
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背景：关于昏迷患者的决策没有标准，特别是关于挽救生命的治疗。这项回顾性，单中心研究的目的是分析瑞士学术三级医院中创伤性脑损伤（TBI）患者的临终结果和决策过程（EOL）。
方法：在 2012 年 1 月 1 日至 2015 年 6 月 30 日期间，至少进行 48 小时的外科重症监护病房（ICU）监护的中度至重度 TBI 患者及创伤性脑损伤后 6 个月内的死亡率被连续入组。使用了描述性统计数据。
结果：在研究期间，有 994 例 ICU 入院患者，其中 182 例初始格拉斯哥昏迷量表<13，ICU 住院时间> 48 小时。其中 174 例可根据格拉斯哥预后量表（GOS）进行为期 6 个月的结果评估：43.1％（36.0％-50.5％）有良好预后（GOS 4 或 5），28.7％（22.5％-35.9％） ）严重残疾（GOS 3），0.6％（0％-3.2％）植物人状态（GOS 2），27.6％（21.5％-34.7％）死亡（GOS 1）。在 GOS 1 个体中，45 名患者具有完整的数据集（73％的男性;中位年龄，67 岁;四分位数范围，43-79 岁）。在跨学科预测和代理决策者（SDM）参与尊重患者医嘱或意愿后，延长寿命的疗法仅限于 95.6％（85.2％-99.2％）。在 97.7％（87.9％-99.9％）的病例中，近亲属是代理决策者，参与临终决策和过程的 100％（96.3％-100.0％）的病例。14.0％（6.6％-27.3％）的患者可获得书面预先指示（ADs），34.9％（22.4％-49.8％）患者在创伤前与亲属分享临终意愿。在其他情况下，每个患者的假定遗嘱在与代理决策者会面后得到承认，并且对临终决定具有约束力。
结论：在我们的机构中，TBI 之后的大多数死亡都是在决定限制延长生命的疗法之后。 TBI 后 6 个月处于植物人状态的患者频率低于预期; 这可能是由于延长寿命限制疗法的普遍存在。临终决策遵循标准化流程，基于书面预先指示中记录的患者意愿或代理决策者假设的偏好。有书面预先指示的患者植物人状态患病率很低，应予以鼓励。
（彭孟圆 译 潘艳、薛张纲校）

BACKGROUND: No standards exist regarding decision making for comatose patients, especially concerning life-saving treatments. The aim of this retrospective, single-center study was to analyze outcomes and the decision-making process at the end of life (EOL) in patients with traumatic brain injury (TBI) in a Swiss academic tertiary care hospital.
METHODS: Consecutive admissions to the surgical intensive care unit (ICU) with stays of at least 48 hours between January 1, 2012 and June 30, 2015 in patients with moderate to severe TBI and with fatality within 6 months after trauma were included. Descriptive statistics were used.
RESULTS: Of 994 ICU admissions with TBI in the study period, 182 had an initial Glasgow Coma Scale <13 and a length of stay in the ICU >48 hours. For 174 of them, a 6-month outcome assessment based on the Glasgow Outcome Scale (GOS) was available: 43.1% (36.0%-50.5%) had favorable outcomes (GOS 4 or 5), 28.7% (22.5%-35.9%) a severe disability (GOS 3), 0.6% (0%-3.2%) a vegetative state (GOS 2), and 27.6% (21.5%-34.7%) died (GOS 1). Among the GOS 1 individuals, 45

patients had a complete dataset (73% men; median age, 67 years; interquartile range, 43-79 years). Life-prolonging therapies were limited in 95.6% (85.2%-99.2%) of the cases after interdisciplinary prognostication and involvement of the surrogate decision maker (SDM) to respect the patient's documented or presumed will. In 97.7% (87.9%-99.9%) of the cases, a next of kin was the SDM and was involved in the EOL decision and process in 100% (96.3%-100.0%) of the cases. Written advance directives (ADs) were available for 14.0% (6.6%-27.3%) of the patients, and 34.9% (22.4%-49.8%) of the patients had shared their EOL will with relatives before trauma. In the other cases, each patient's presumed will was acknowledged after a meeting with the SDM and was binding for the EOL decision.
CONCLUSIONS: At our institution, the majority of deaths after TBI follow a decision to limit life-prolonging therapies. The frequency of patients in vegetative state 6 months after TBI is lower than expected; this could be due to the high prevalence of limitation of life-prolonging therapies. EOL decision making follows a standardized process, based on patients' will documented in the ADs or on preferences assumed by the SDM. The prevalence of ADs was low and should be encouraged.

心血管手术中的纤维蛋白原浓缩物：一项随机对照试验的荟萃分析

Fibrinogen Concentrate in Cardiovascular Surgery: A Meta-analysis of Randomized Controlled Trials

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背景：心血管手术后出血是一项常见的并发症，并可能导致增加严重并发症发生率和死亡率。观察性研究显示内源性血浆纤维蛋白原浓度的降低与心脏手术后失血风险的增加紧密相关。虽然输注纤维蛋白原浓缩物越来越常见，但是在心血管手术中，围术期纤维蛋白原输注相关的潜在利益和风险仍不清楚。
方法：作者利用自动更新功能在 PubMed, Cochrane Library, Ovid MEDLINE, Embase, Web of Science,和 China National Knowledge Infrastructure 上检索 2017 年 1 月 15 日至 2018 年 2 月 15 日期间在成人心血管手术中以预防或治疗出血为目的而使用纤维蛋白原浓缩物相关的所有随机对照试验（RCT）。所有符合下列条件的 RCT 均被纳入研究：将输注纤维蛋白原组与其他组（安慰剂/标准的治疗措施或其它灵活的对照）进行比较，并至少报告了一项预先定义的临床结局。对于二分类变量和连续型变量，利用随机效应模型分别计算出相对风险度和加权平均差异（95%的可信区间）。预先计划根据纤维蛋白原的剂量和出血的基线风险进行亚组分析。
结果：一共纳入了 8 项有关纤维蛋白原浓缩物应用于高危或者混合风险的成人心血管手术的随机对照研究（n=597）。与安慰剂或非活性对照组相比，围术期输注浓缩纤维蛋白原并不能显著影响全因死亡率（rr，0.41；95%CI，0.12-1.38;I=10%P=.15）。纤维蛋白原显著减少了同种异体红细胞输血的发病率

（rr，0.64；95%CI，0.49-0.83；I=0%;P=.001）。在其他结局变量里并未找到明显的差异。当根据纤维蛋白原剂量，输注初始时间，平均心肺转流时间和旋转式血栓弹力计/FIBTEM 的使用进行分析时，亚组分析没有显著差异（所有亚组相互作用的 P 值均不显著）。

结论：现有的证据不足以支持或反对围术期纤维蛋白原浓缩物在成人心血管手术中的常规应用。纤维蛋白原浓缩物可能会减少心血管手术中高危或出血的成人患者额外异体血液产品的输注。然而，并没有发现相关的可降低死亡风险或其他临床相关结果的确定优势。在已有的随机试验中，少量的临床事件提示需要设计得更为完善、有着足够检验效力和持续时间的试验来衡量全因死亡率，卒中，心肌梗死，再次手术和血栓栓塞事件。未来的研究还应该解决与标准治疗相关的成本效益问题。

（冯昭妍 译　陈杰 校）

BACKGROUND: Postoperative bleeding remains a frequent complication after cardiovascular surgery and may contribute to serious morbidity and mortality. Observational studies have suggested a relationship between low endogenous plasma fibrinogen concentration and increased risk of postoperative blood loss in cardiac surgery. Although the transfusion of fibrinogen concentrate has been increasing, potential benefits and risks associated with perioperative fibrinogen supplementation in cardiovascular surgery are not fully understood.

METHODS: PubMed, Cochrane Library, Ovid MEDLINE, Embase, Web of Science, and China National Knowledge Infrastructure were searched on January 15, 2017, with automated updates searched until February 15, 2018, to identify all randomized controlled trials (RCTs) of fibrinogen concentrate, whether for prophylaxis or treatment of bleeding, in adults undergoing cardiovascular surgery. All RCTs comparing fibrinogen infusion versus any other comparator (placebo/standard of care or another active comparator) in adult cardiovascular surgery and reporting at least 1 predefined clinical outcome were included. The random-effects model was used to calculate risk ratios and weighted mean differences (95% confidence interval [CI]) for dichotomous and continuous variables, respectively. Subgroup analyses by fibrinogen dose and by baseline risk for bleeding were preplanned.

RESULTS: A total of 8 RCTs of fibrinogen concentrate in adults (n = 597) of mixed risk or high risk undergoing cardiovascular surgery were included. Compared to placebo or inactive control, perioperative fibrinogen concentrate did not significantly impact risk of all-cause mortality (risk ratio, 0.41; 95% CI, 0.12-1.38; I = 10%; P = .15). Fibrinogen significantly reduced incidence of allogeneic red blood cell transfusion (risk ratio, 0.64; 95% CI, 0.49-0.83; I = 0%; P = .001). No significant differences were found for other clinical outcomes. Subgroup analyses were unremarkable when analyzed according to fibrinogen dose, time of infusion initiation, mean cardiopulmonary bypass time, and rotational thromboelastometry/fibrinogen temogram use (all P values for subgroup interaction were nonsignificant).

CONCLUSIONS: Current evidence remains insufficient to support or refute routine perioperative administration of fibrinogen concentrate in patients undergoing cardiovascular surgery. Fibrinogen concentrate may reduce the need for additional allogeneic blood product transfusion in cardiovascular surgery patients at high risk or

with evidence of bleeding. However, no definitive advantage was found for reduction in risk of mortality or other clinically relevant outcomes. The small number of clinical events within existing randomized trials suggests that further well-designed studies of adequate power and duration to measure all-cause mortality, stroke, myocardial infarction, reoperation, and thromboembolic events should be conducted. Future studies should also address cost-effectiveness relative to standard of care.

有关对青霉素过敏的误解：对麻醉医师的影响

Misconceptions Surrounding Penicillin Allergy: Implications for Anesthesiologists

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通过使用诸如头孢菌素进行术前抗菌预防是手术部位感染预防指南的主要依据。不幸的是，由于普遍的误解，被标记为青霉素过敏的患者通常会使用替代性和效果较差的抗生素，使他们面临各种副作用的风险，其中包括发病率增加，手术部位的感染风险增加。围手术期医生应该确定先前过敏反应的性质，以帮助确定真正过敏的可能性。可以进行青霉素过敏测试，但在围手术期并非可行。关于青霉素和头孢菌素过敏结构决定因素的现有证据反驳了青霉素和头孢唑啉之间存在交叉反应的误解，并且目前尚无明确证据表明青霉素过敏患者接受头孢唑啉治疗时过敏反应的风险增加。围手术期评估的临床实践算法和报告青霉素过敏史的患者管理呈现并得出结论头孢菌素可以安全给予。

（金丽娜 译 陈杰 校）

Administration of preoperative antimicrobial prophylaxis, often with a cephalosporin, is the mainstay of surgical site infection prevention guidelines. Unfortunately, due to prevalent misconceptions, patients labeled as having a penicillin allergy often receive alternate and less-effective antibiotics, placing them at risk of a variety of adverse effects including increased morbidity and higher risk of surgical site infection. The perioperative physician should ascertain the nature of previous reactions to aid in determining the probability of the prevalence of a true allergy. Penicillin allergy testing may be performed but may not be feasible in the perioperative setting. Current evidence on the structural determinants of penicillin and cephalosporin allergies refutes the misconception of cross-reactivity between penicillins and cefazolin, and there is no clear evidence of an increased risk of anaphylaxis in cefazolin-naive, penicillin-allergic patients. A clinical practice algorithm for the perioperative evaluation and management of patients reporting a history of penicillin allergy is presented, concluding that cephalosporins can be safely administered to a majority of such patients.

疼痛及其对危重病患者日常生活的长期影响

Pain and Its Long-term Interference of Daily Life After Critical Illness

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背景:持续性疼痛常影响危重病患者的生活质量，但是研究数据仅限于流行病学及风险因素方面。作者试图寻找危重病患者持续性疼痛的流行病学特点及其对日常生活的影响。另外研究重症监护期间使用阿片类药物是否会增加持续性疼痛发展的风险。
方法:针对一个成年 ICU 幸存者队列，使用简易疼痛评分方法（BPI）来评估疼痛程度，及疼痛对出院后 3～12 个月期间患者日常生活的影响。考虑到潜在的干扰因素（如:年龄，前期阿片类药物的使用，体质虚弱、手术因素、疾病严重程度、谵妄持续时间、脓毒症）的前提下，作者使用了 BPI 评分，应用累积优势序列回归 Bonferroni 校正法来评估危重病患者使用阿片类药物与疼痛之间的独立联系。
结果:一共获得了 295 个患者的 BPI 评分数据。数据表明:在出院后的 3～12 个月期间，74%-77%患者存在持续性疼痛的症状。出院后 3～12 个月期间，疼痛程度评分的中位数（四分位距)是 3（1，5）。出院后的 3～12 个月期间，分别有 59%、62%的患者在第 3 月和第 12 月表示疼痛影响到了其日常生活。出院后 3 个月和 12 个月的总体疼痛干涉评分中位数为 2 (0, 5)。ICU 阿片药物的使用与出院后 3 个月（ [OR; 95% 置信区间], 2.12 [0.92-4.93]; P = .18）或 12 个月 (OR, 2.58 [1.26-5.29]; P = .04)的疼痛对日常生活的影响无关。
结论:持续性疼痛常伴发于危重病之后且频繁影响日常生活。危重病患者阿片类药物使用量的增加与疼痛程度的加剧无关。总而言之，明确危重病患者持续性疼痛的可变风险因素，以及危重病患者（无论是否有慢性疼痛）使用阿片类药物的疗效，仍然需要更深层次的研究。
（陈冬芳 译 陈杰 校）

BACKGROUND: Persistent pain likely interferes with quality of life in survivors of critical illness, but data are limited on its prevalence and risk factors. We sought to determine the prevalence of persistent pain after critical illness and its interference with daily life. Additionally, we sought to determine if intensive care unit (ICU) opioid exposure is a risk factor for its development.
METHODS: In a cohort of adult medical and surgical ICU survivors, we used the brief pain inventory (BPI) to assess pain intensity and pain interference of daily life at 3 and 12 months after hospital discharge. We used proportional odds logistic regression with Bonferroni correction to evaluate the independent association of ICU opioid exposure with BPI scores, adjusting for potential confounders including age, preadmission opioid use, frailty, surgery, severity of illness, and durations of delirium and sepsis while in the ICU.
RESULTS: We obtained BPI outcomes in 295 patients overall. At 3 and 12 months, 77% and 74% of patients reported persistent pain symptoms, respectively. The median (interquartile range) pain intensity score was 3 (1, 5) at both 3 and 12 months. Pain interference with daily life was reported in 59% and 62% of patients at 3 and 12 months, respectively. The median overall pain interference score was 2 (0, 5) at both 3 and 12 months. ICU opioid exposure was not associated with increased pain intensity at 3 months (odds ratio [OR; 95% confidence interval], 2.12 [0.92-4.93]; P = .18) or

12 months (OR, 2.58 [1.26-5.29]; P = .04). ICU opioid exposure was not associated with increased pain interference of daily life at 3 months (OR, 1.48 [0.65-3.38]; P = .64) or 12 months (OR, 1.46 [0.72-2.96]; P = .58).
CONCLUSIONS: Persistent pain is prevalent after critical illness and frequently interferes with daily life. Increased ICU opioid exposure was not associated with worse pain symptoms. Further studies are needed to identify modifiable risk factors for persistent pain in the critically ill and the effects of ICU opioids on patients with and without chronic pain.

先天性心脏病患儿非心脏手术围术期发生心血管和呼吸系统不良事件的概率和风险因素

Incidence and Risk Factors for Perioperative Cardiovascular and Respiratory Adverse Events in Pediatric Patients With Congenital Heart Disease Undergoing Noncardiac Procedures

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背景：针对不同程度先天性心脏病儿童非心脏手术时的死亡率和围术期不良事件，虽然已有不少多中心数据研究。然而迄今为止，研究先天性心脏病（CHD）患儿非心脏手术中发生不良结局的单中心研究中所纳入的严重性心脏病患者数量甚少。因此，此研究是针对一群来自同一中心的先天性心脏病患者，研究其在非心脏手术围术期发生心血管和呼吸事件的概率，并明确这些不良事件的风险因素。
方法：作者纳入 5 年内在本机构接受非心脏手术的 3010 名 CHD 患者，收集患者相应的统计学信息，包括手术经过、心脏病诊断以及用于评估术后 6 个月内心室功能的超声心动图，并根据 CHD 患者的残余病变情况和心血管功能状态将其分为 3 个等级（轻度、中度、重度）。此外还收集有关患者麻醉管理的数据。主要预后指标是术中心血管和呼吸事件的发生率，并采用单变量和多变量逻辑回归的方法确定这两种事件发生的风险因素。
结果：单变量和多变量分析表明心血管和呼吸事件的发生率分别为 11.5％和 4.7％。其中，患者围术期发生心血管事件与其 ASA 评级（高于III级）、急诊手术、中重度 CHD、单心室状态、心室功能不全、以及矫形、普外、神外和肺部手术有关。而围术期呼吸事件的发生与 ASA 评级（高于IV级）和耳鼻喉、胃肠、普外、颌面部手术相关。
结论：CHD 患者术中发生心血管和呼吸事件很常见。心血管事件的发生与患者心血管功能的状况密切相关，而呼吸事件与心血管状况并无相关性。
（钱佳红 译 陈杰 校）

BACKGROUND: While mortality and adverse perioperative events after noncardiac surgery in children with a broad range of congenital cardiac lesions have been investigated using large multiinstitutional databases, to date single-center studies addressing adverse outcomes in children with congenital heart disease (CHD) undergoing noncardiac surgery have only included small numbers of patients with significant heart disease. The primary objective of this study was to determine the

incidences of perioperative cardiovascular and respiratory events in a large cohort of patients from a single institution with a broad range of congenital cardiac lesions undergoing noncardiac procedures and to determine risk factors for these events.
METHODS: We identified 3010 CHD patients presenting for noncardiac procedures in our institution over a 5-year period. We collected demographic information, including procedure performed, cardiac diagnosis, ventricular function as assessed by echocardiogram within 6 months of the procedure, and classification of CHD into 3 groups (minor, major, or severe CHD) based on residual lesion burden and cardiovascular functional status. Characteristics related to conduct of anesthesia care were also collected. The primary outcome variables for our analysis were the incidences of intraoperative cardiovascular and respiratory events. Univariable and multivariable logistic regressions were used to determine risk factors for these 2 outcomes.
RESULTS: The incidence of cardiovascular events was 11.5% and of respiratory events was 4.7%. Univariate analysis and multivariable analysis demonstrated that American Society of Anesthesiologists (≥3), emergency cases, major and severe CHD, single-ventricle physiology, ventricular dysfunction, orthopedic surgery, general surgery, neurosurgery, and pulmonary procedures were associated with perioperative cardiovascular events. Respiratory events were associated with American Society of Anesthesiologists (≥4) and otolaryngology, gastrointestinal, general surgery, and maxillofacial procedures.
CONCLUSIONS: Intraoperative cardiovascular events and respiratory events in patients with CHD were relatively common. While cardiovascular events were highly associated with cardiovascular status, respiratory events were not associated with cardiovascular status.

能否通过 STOP-Bang 和脉搏血氧饱和度测定来排除阻塞性呼吸睡眠暂停综合征？

Can STOP-Bang and Pulse Oximetry Detect and Exclude Obstructive Sleep Apnea?

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背景：阻塞性睡眠呼吸障碍综合症（OSA）是与术后并发症有关的一种常见疾病。然而，对于未能确诊的大多数 OSA 患者还需简单的筛选工具进行诊断。本研究试图确认 STOP-Bang 和血氧饱和度指数下降能否识别出 OSA。
方法：此项前瞻性、观察性、多中心研究共纳入 449 名成年患者，在瑞典 4 个中心通过动态多导睡眠图、脉搏血氧饱和度和 STOP-Bang 评分来评估每个患者的 OSA 情况。STOP-Bang 评分包括：打鼾，疲劳，观察呼吸暂停，高血压，体重指数＞35kg/m²，年龄＞50 岁，颈围＞40cm 和男性这 8 个肯定答案的总和。
结果：对于中度和重度睡眠呼吸障碍，STOP-Bang 临界值是 6，定义为呼吸暂停

低通气指数(AHI)≥15，其敏感性和特异性分别为 63%（95%CI，0.55-0.70）和 69%（95%CI，0.64-0.75）。STOP-Bang＜2 有 95%概率（95%CI，0.92-0.98）可排除 AHI＞15。STOP-Bang≥6 有 91%的特异度（95%CI，0.87-0.94）使 AHI＞15，。Bang 项目是 STOP-Bang 评分中核心部分。AHI 与 STOP-Bang 和 AHI 与脉搏氧饱和度下降呈正相关，Spearman，p 分别为 0.50（95% CI, 0.43-0.58)和 0.96 (95% CI, 0.94-0.97)。

结论：STOP-Bang 和脉搏血氧饱和度测定可用于睡眠呼吸暂停综合症的筛查。STOP-Bang＜2 可几乎排除中度和重度 OSA，而几乎所有 STOP-Bang≥6 的患者都有 OSA。建议在需要对睡眠呼吸暂停综合症进行术前筛查时增加脉搏血氧饱和度的测定和 STOP-Bang 评分为 2-5 的患者。

（郭宝超 译 陈杰 校）

BACKGROUND: Obstructive sleep apnea (OSA) is related to postoperative complications and is a common disorder. Most patients with sleep apnea are, however, undiagnosed, and there is a need for simple screening tools. We aimed to investigate whether STOP-Bang and oxygen desaturation index can identify subjects with OSA.

METHODS: In this prospective, observational multicenter trial, 449 adult patients referred to a sleep clinic for evaluation of OSA were investigated with ambulatory polygraphy, including pulse oximetry and the STOP-Bang questionnaire in 4 Swedish centers. The STOP-Bang score is the sum of 8 positive answers to Snoring, Tiredness, Observed apnea, high blood Pressure, Body mass index >35 kg/m, Age >50 years, Neck circumference >40 cm, and male Gender.

RESULTS: The optimal STOP-Bang cutoff score was 6 for moderate and severe sleep apnea, defined as apnea-hypopnea index (AHI) ≥15, and the sensitivity and specificity for this score were 63% (95% CI, 0.55-0.70) and 69% (95% CI, 0.64-0.75), respectively. A STOP-Bang score of <2 had a probability of 95% (95% CI, 0.92-0.98) to exclude an AHI >15 and a STOP-Bang score of ≥6 had a specificity of 91% (95% CI, 0.87-0.94) for an AHI >15. The items contributing most to the STOP-Bang were the Bang items. There was a positive correlation between AHI versus STOP-Bang and between AHI versus oxygen desaturation index, Spearman ρ 0.50 (95% CI, 0.43-0.58) and 0.96 (95% CI, 0.94-0.97), respectively.

CONCLUSIONS: STOP-Bang and pulse oximetry can be used to screen for sleep apnea. A STOP-Bang score of <2 almost excludes moderate and severe OSA, whereas nearly all the patients with a STOP-Bang score ≥6 have OSA. We suggest the addition of nightly pulse oximetry in patients with a STOP-Bang score of 2-5 when there is a need for screening for sleep apnea (ie, before surgery).

使用周围神经阻滞的足踝关节手术后出院准备:一项比较脊麻和全身麻醉作为神经阻滞补充的随机对照试验

Readiness for Discharge After Foot and Ankle Surgery Using Peripheral Nerve Blocks: A Randomized Controlled Trial Comparing Spinal and General Anesthesia as Supplements to Nerve Blocks

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背景：椎管内麻醉常被认为优于全身麻醉，但可能导致延迟出院。通常不使用多模式镇痛和神经阻滞进行效果比较。神经阻滞与全身麻醉联合使用可减轻疼痛、阿片类药物消耗和恶心发生率。作者假设全身麻醉(复合神经阻滞)会比椎管内麻醉(复合神经阻滞)使患者更早出院。
方法：所有患者都接受了预计时间为 1-3 小时的足踝关节手术。所有患者均接受布比卡因和地塞米松注射的腘窝坐骨神经和内收肌管阻滞。术中未使用阿片类药物。所有患者均接受昂丹司琼、地塞米松、氯胺酮和酮洛酸治疗。患者、数据收集者和数据分析师均未被告知小组分配情况。患者被随机分配到椎管内麻醉或全身麻醉组。椎管内麻醉采用甲哌卡因并行异丙酚镇静。全身麻醉以异丙酚诱导后，置入喉罩，并以七氟醚和异丙酚维持。主要结果是调整年龄和手术时间后，通过使用多变量无条件分位数回归比较两组患者出院前的时间。次要结果是采用 Holm-Bonferroni step-down 步骤对多个时间点的进行调整以进行多次比较。
结果：全麻患者较椎管内麻醉患者，平均提前 39min 出院(95%置信区间，2-75;P=.038)。两组患者在实际出院前基本满足出院标准。全麻患者离开手术室 1 小时后休息疼痛评分较高(调整均值差异，2.1[95%置信区间，1.0-3.2];P<.001)。次要结果提示(包括阿片类药物的使用、阿片类药物的副作用、恶心、头痛、喉痛和背部疼痛)没有显著差异。
结论：全身麻醉与更早的准备出院有关，但这种差异可能在临床上并不显著，也不会导致更早的实际出院。大多数次要结果在组间没有差异。椎管内麻醉或全身麻醉作为周围神经阻滞的辅助选择与否，可反映患者、临床医生和医疗机构的偏好。
（罗琨 译　陈杰 校）

BACKGROUND: Neuraxial anesthesia is often viewed as superior to general anesthesia but may delay discharge. Comparisons do not typically use multimodal analgesics and nerve blockade. Combining nerve blockade with general anesthesia may reduce pain, opioid consumption, and nausea. We hypothesized that general anesthesia (with nerve blocks) would lead to earlier readiness for discharge, compared to spinal anesthesia (with nerve blocks).
METHODS: All patients underwent ambulatory foot and ankle surgery, with a predicted case duration of 1-3 hours. All patients received popliteal and adductor canal nerve blocks using bupivacaine and dexamethasone. No intraoperative opioids were administered. All patients received ondansetron, dexamethasone, ketamine, and ketorolac. Patients, data collectors, and the data analyst were not informed of group assignment. Patients were randomized to spinal or general anesthesia with concealed allocation. Spinal anesthesia was performed with mepivacaine and accompanied with propofol sedation. After general anesthesia was induced with propofol, a laryngeal mask airway was inserted, followed by sevoflurane and propofol. Time until ready for discharge, the primary outcome, was compared between groups after adjusting for age and surgery time using multivariable unconditional quantile regression. Secondary outcomes compared at multiple timepoints were adjusted for multiple comparisons using the Holm-Bonferroni step-down procedure.
RESULTS: General anesthesia patients were ready for discharge at a median of 39

minutes earlier (95% confidence interval, 2-75; P = .038) versus spinal anesthesia patients. Patients in both groups met readiness criteria for discharge substantially before actual discharge. Pain scores at rest were higher among general anesthesia patients 1 hour after leaving the operating room (adjusted difference in means, 2.1 [95% confidence interval, 1.0-3.2]; P < .001). Other secondary outcomes (including opioid use, opioid side effects, nausea, headache, sore throat, and back pain) were not different.

CONCLUSIONS: General anesthesia was associated with earlier readiness for discharge, but the difference may not be clinically significant and did not lead to earlier actual discharge. Most secondary outcomes were not different between groups. The choice of spinal or general anesthesia as an adjunct to peripheral nerve blockade can reflect patient, clinician, and institutional preferences.

肺复张法和可变性通气联合应用可以减少麻醉中的肺部健康大鼠的组织损伤和肺部炎症

Variable Ventilation Associated With Recruitment Maneuver Minimizes Tissue Damage and Pulmonary Inflammation in Anesthetized Lung-Healthy Rats

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背景：肺复张法和呼气末正压通气（PEEP）可以用来治疗围术期麻醉相关肺不张。可变性通气模式可避免使用单一的潮气量来稳定呼吸力学，并且通过可变的潮气量完成肺复张保护肺实质。

方法：对 49 只雄性大鼠（每组 7 只）进行麻醉和机械通气。采用逐步减少呼气末正压值的复张法，同时采用最小二乘法持续评估呼吸系统力学。复张以后，继续采用容量控制通气模式或可变容量通气模式进行机械通气 2 小时。呼吸末正压设置为与最小肺部回弹相适应的数值或 2cm H2O 左右。对实验大鼠的肺进行组织学分析（左肺）和细胞因子测量（右肺）。7 只大鼠第一次复张后被进行安乐死作为对照。

结果：呼吸系统弹性随着时间增加，并被呼气末正压通气显著减少（P < .001）。可变性通气减弱促炎介质包括中性粒细胞因子介导中性粒细胞趋化因子-1 (VV = 40 ± 5 and VCV = 57 ± 8 pg/mg; P < .0001)和白细胞介素-1β (VV = 59 ± 25 and VCV = 261 ± 113 pg/mg; P < .0001)在肺实质的聚集。可变性通气也可以降低肺实质结构的损伤，降低所有机械通气动物的背部和尾部肺的空气分数（P < .001）。

结论：在采用呼气末正压通气时，可变性通气模式比传统的通气模式具有更好的保护作用。

（黄思铭 译 陈杰 校）

BACKGROUND: Recruitment maneuver and positive end-expiratory pressure (PEEP) can be used to counteract intraoperative anesthesia-induced atelectasis. Variable ventilation can stabilize lung mechanics by avoiding the monotonic tidal volume and protect lung parenchyma as tidal recruitment is encompassed within the

tidal volume variability.
METHODS: Forty-nine (7 per group) male Wistar rats were anesthetized, paralyzed, and mechanically ventilated. A recruitment maneuver followed by stepwise decremental PEEP titration was performed while continuously estimating respiratory system mechanics using recursive least squares. After a new recruitment, animals were ventilated for 2 hours in volume-control with monotonic (VCV) or variable (VV) tidal volumes. PEEP was adjusted at a level corresponding to the minimum elastance or 2 cm H2O above or below this level. Lungs were harvested for histologic analysis (left lung) and cytokines measurement (right lung). Seven animals were euthanized before the first recruitment as controls.
RESULTS: A time-dependent increase in respiratory system elastance was observed and significantly minimized by PEEP ($P < .001$). Variable ventilation attenuated the amount of concentrations of proinflammatory mediators in lung homogenate: neutrophil cytokine-induced neutrophil chemoattractant 1 (VV = 40 ± 5 and VCV = 57 ± 8 pg/mg; $P < .0001$) and interleukin-1β (VV = 59 ± 25 and VCV = 261 ± 113 pg/mg; $P < .0001$). Variable ventilation was also associated with lower structural lung parenchyma damage. Significant reductions in air fraction at dorsal and caudal lung regions were observed in all ventilated animals ($P < .001$).
CONCLUSIONS: Variable ventilation was more protective than conventional ventilation within the applied PEEP levels.

一种体外心脏灌注期间利用超声心动评估左心室功能的新装置

Description of a Novel Set-up for Functional Echocardiographic Assessment of Left Ventricular Performance During Ex Vivo Heart Perfusion

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体外心脏灌注(EVHP)是一种旨在减少冷缺血时间和在移植供心之前评估心脏功能的新技术。在实验性 EVHP 猪模型中，我们测试了一个 3D 打印定制装置，以便在左心室充血期对孤立跳动的心脏进行表面超声心动检查。在任何时间点获得的图像都等同于标准的经食道和经胸图像。在所有实验中都观察到 EVHP 期间左心室功能下降。
(吴洁译 李士通校)

Ex vivo heart perfusion (EVHP) is a new technology aimed at decreasing cold ischemia time and evaluating cardiac function before transplanting a donor heart. In an experimental EVHP swine model, we tested a 3D-printed custom-made set-up to perform surface echocardiography on an isolated beating heart during left ventricular loading. The views obtained at any time point were equivalent to standard transesophageal and transthoracic views. A decrease in left ventricular function during EVHP was observed in all experiments.

为提高女性患者甲状腺手术麻醉后复苏质量而术中静脉应用利多卡因和镁剂

Intravenously Administered Lidocaine and Magnesium During Thyroid Surgery in Female Patients for Better Quality of Recovery After Anesthesia

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背景：虽然静脉应用利多卡因和镁剂作为围手术期镇痛的辅助用药已获得广泛研究，但对同等条件下复苏质量缺乏有效评估。我们比较了女性患者甲状腺切除手术期间静脉应用利多卡因、镁剂或生理盐水的复苏质量 40（QoR-40）评分，以探讨它们对麻醉后恢复的综合影响。

方法：在这项前瞻性双盲试验中，135 名女性患者被随机分配至利多卡因组（L 组）、镁剂组（M 组）或对照组（C 组）。诱导后，L 组立即给予利多卡因（2mg/kg 15 分钟缓慢注射后 2mg/kg/h 持续泵注），M 组给予硫酸镁（20mg/kg 超过 15 分钟的速度缓慢注射后 20mg/kg/h 持续泵注）。C 组给予等量生理盐水。在术后第 1 天和第 2 天进行 QOR-40 的调查。

结果：QoR-40 术后第 1 天总平均分 L 组为 186.3（标准差，5.5），M 组为 184.3（4.7），C 组为 179.4（17.8），仅 L 组与 C 组有显著性差异（平均差 6.9；调整后 P=0.018）。在 QOR-40 评分的 5 个分级中，L 组的情绪状态、躯体舒适度和疼痛感觉均优于 C 组。

结论：以 QoR-40 评分作为测量标准，麻醉期间静脉应用利多卡因患者的术后复苏质量明显优于对照组。本研究发现中术中使用镁剂对复苏治疗无明显改善。

（韩穆佳译 李士通校）

BACKGROUND: Although systemic lidocaine and magnesium have been widely studied as perioperative analgesic adjuvants, they have been rarely evaluated with respect to recovery quality under the same conditions. We compared the quality of recovery 40 (QoR-40) scores of female patients who received intravenous lidocaine, magnesium, and saline during thyroidectomy to investigate their effects on comprehensive recovery from anesthesia.

METHODS: In this prospective, double-blind trial, 135 female patients scheduled for open thyroidectomy were randomly assigned to the lidocaine group (group L), magnesium group (group M), or control group (group C). Immediately after induction, lidocaine (2 mg/kg for 15 minutes followed by 2 mg/kg/h) was administered in group L and magnesium sulfate (20 mg/kg over 15 minutes followed by 20 mg/kg/h) was administered in group M. Group C received an equivalent volume of saline. The QoR-40 survey was conducted on postoperative days 1 and 2.

RESULTS: The mean global QoR-40 scores on postoperative day 1 were 186.3 (standard deviation, 5.5) in group L, 184.3 (4.7) in group M, and 179.4 (17.8) in group C, and there was a significant difference only between group L and group C (mean difference, 6.9; adjusted $P = .018$). Among the 5 dimensions of QoR-40, emotional state, physical comfort, and pain were superior in group L compared to group C.

CONCLUSIONS: Lidocaine administered intravenously during anesthesia led to

better quality of postoperative recovery measured by QoR-40 compared with the group C. Magnesium was found to be insufficient to induce any significant improvement with the dose used in the present study.

非心脏手术前连续服用血管紧张素转换酶抑制剂或血管紧张素受体抑制剂相关转归的系统回顾

A Systematic Review of Outcomes Associated With Withholding or Continuing Angiotensin-Converting Enzyme Inhibitors and Angiotensin Receptor Blockers Before Noncardiac Surgery

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背景：全球非心脏外科手术的比率每年都在增加，而在那些接受手术的患者中，越来越多的人正在服用血管紧张素转换酶抑制剂（ACE-I）或血管紧张素受体阻滞剂（ARB）。 目前关于是否在围手术期继续使用或停用 ACE-I 和 ARB 的建议是存在争议的。 以前的 meta 分析认为术前使用 ACE-I / ARB 治疗与诱导后低血压的发生有关系; 然而，他们未能将此与患者的不良后果联系起来。 这项 meta 分析的目的是确定围手术期持续服用或停用 ACE-I 或 ARB 治疗是否与患者死亡率和主要并发症有关。

方法：这项 meta 分析在 PROSPERO（CRD42017055291）上进行了前瞻性登记。 2016 年 12 月 6 日对 MEDLINE（PubMed），CINAHL（EBSCO 宿主），ProQuest，Cochrane 数据库，Scopus 和 Web of Science 进行了全面检索。我们将那些平常慢性服用 ACE-I 或 ARB 治疗的接受过非心脏手术的 18 岁以上成年人纳入了研究范围，手术当天 ACE-I 或 ARB 被继续服用或者暂停。主要结果包括各种原因所致的死亡率和主要不良心血管事件（MACE）。 次要结果包括充血性心力衰竭、急性肾损伤、中风、术中/术后低血压和住院时间延长的风险。

结果：经过抽象审查，检索了 25 项研究的全文，其中 9 项符合纳入标准：5 项为随机对照试验，4 项为队列研究。这些研究包含了在行非心脏手术前慢性服用 ACE-I 或 ARB 的 6022 名患者。其中 1816 名患者在数日清晨停用 ACEI 或 ARB 治疗，4206 名患者继续接受该治疗。 两组术前人口统计学相似。 停用 ACE-I / ARB 治疗与死亡率（比值比[OR]，0.97; 95％可信区间[CI]，0.62-1.52;＆nbsp; I＆nbsp; 2＆nbsp; = 0％）或（主要不良心血管事件）MACE（OR ，1.12; 95％CI，0.82-1.52;＆nbsp; I＆nbsp; 2＆nbsp; = 0％）无显著差异。 然而，停用治疗与术中低血压显着降低相关（OR，0.63; 95％CI，0.47-0.85; I＆nbsp; 2＆nbsp; = 71％）。没有关于住院时间和充血性心力衰竭的影响估计。

结论：这项 meta 分析并未证明围手术期服用 ACE-I / ARB 与死亡率或 MACE 之间存在关联。 然而，它证实了目前观察到围手术期继续使用 ACE-I / ARB 与术中低血压的发生率增加有关。一项大型的随机对照试验对于确定 ACE-I 和 ARB 的适当围手术期处理是必不可少的。

（蒋湘云译 李士通校）

BACKGROUND: The global rate of major noncardiac surgical procedures is increasing annually, and of those patients presenting for surgery, increasing numbers are taking either an angiotensin-converting enzyme inhibitor (ACE-I) or an

angiotensin receptor blocker (ARB). The current recommendations of whether to continue or withhold ACE-I and ARB in the perioperative period are conflicting. Previous meta-analyses have linked preoperative ACE-I/ARB therapy to the increased incidence of postinduction hypotension; however, they have failed to correlate this with adverse patient outcomes. The aim of this meta-analysis was to determine whether continuation or withholding ACE-I or ARB therapy in the perioperative period is associated with mortality and major morbidity.

METHODS: This meta-analysis was prospectively registered on PROSPERO (CRD42017055291). A comprehensive search of MEDLINE (PubMed), CINAHL (EBSCO host), ProQuest, Cochrane database, Scopus, and Web of Science was conducted on December 6, 2016. We included adult patients >18 years of age on chronic ACE-I or ARB therapy who underwent noncardiac surgery in which ACE-I or ARB was either withheld or continued on the morning of surgery. Primary outcomes included all-cause mortality and major cardiac events (MACE). Secondary outcomes included the risk of congestive heart failure, acute kidney injury, stroke, intraoperative/postoperative hypotension, and the length of hospital stay.

RESULTS: After abstract review, the full text of 25 studies was retrieved, of which 9 fulfilled the inclusion criteria: 5 were randomized control trials, and 4 were cohort studies. These studies included a total of 6022 patients on chronic ACE-I/ARB therapy before noncardiac surgery. A total of 1816 patients withheld treatment the morning of surgery and 4206 continued their ACE-I/ARB. Preoperative demographics were similar between the 2 groups. Withholding ACE-I/ARB therapy was not associated with a difference in mortality (odds ratio [OR], 0.97; 95% confidence interval [CI], 0.62–1.52; $I^2 = 0\%$) or MACE (OR, 1.12; 95% CI, 0.82–1.52; $I^2 = 0\%$). However, withholding therapy was associated with significantly less intraoperative hypotension (OR, 0.63; 95% CI, 0.47–0.85; $I^2 = 71\%$). No effect estimate could be pooled concerning length of hospital stay and congestive heart failure.

CONCLUSIONS: This meta-analysis did not demonstrate an association between perioperative administration of ACE-I/ARB and mortality or MACE. It did, however, confirm the current observation that perioperative continuation of ACE-I/ARBs is associated with an increased incidence of intraoperative hypotension. A large randomized control trial is necessary to determine the appropriate perioperative management of ACE-I and ARBs.

4. 中国某妇产医院剖宫产时有针对性的进行血液回收与输同种异体血之间的关系

The Association of Targeted Cell Salvage Blood Transfusion During Cesarean Delivery With Allogeneic Packed Red Blood Cell Transfusions in a Maternity Hospital in China

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背景：尽管证实数据有限，但术中自体血细胞回输是减少剖宫产术后异体红细胞

输注的方法。本研究评估了中国宁波妇幼医院高危出血风险产妇剖宫产术中实施术中自体血细胞回输的情况。

方法：所有孕期>28 周剖宫产妇都被纳入研究。使用间断时间序列分析对术中自体血回收实施前（2010 年 10 月 1 日至 2012 年 8 月 31 日，n = 11,322）与实施后（2012 年 9 月 1 日至 2015 年 6 月 30 日，n=17456）阶段进行比较。在实施后阶段，共有怀疑需要输血风险增加的妇女（1604，9.2%）接受了术中自体血回输。本实验的主要结果为同种异体红细胞的月使用率和急性输血反应的发生率。

结果：57 个月研究结束时，同种异体红细胞月输注率的平均值（标准差）为 2.2%±0.7%，与未实施的 2.7%±0.9%相比，差异有显著性-0.5%，95%CI，-1.4%～0.3%，P=22.每例患者平均输注异体红细胞量为 4.1±0.4u，实施后为 3.9±0.9u，差异 0.2、95%CI，-1.7～1.1u，P=.69。术中自体血回收且使用的有 757 例（47%），另有 847 例（53%）的自体血浪费。实施后的同种异体红细胞月使用率低（差异_0.7%，95%CI，0.1%到_1.4%，P=0.03），但产后同种异体红细胞月使用率无明显变化（差异-0.2%，95%CI，0.4%到 0.7%，P=.56）。临床表现为急性输血反应的发生率的各时段间无显著差异（差异-2%，95%CI，-9%~57%，P=.55）。

结论：我们的研究结果提示，在女性剖宫产手术中，有针对性的术中自体血回收与手术室中较少的同种异体血暴露有关，但与术后时期无关。目标剖宫产术中的红细胞回收与住院期间较少的同种异体红细胞暴露无关。与术中自体血回收相关的不良事件的缺乏支持了剖宫产术中自体血回收的安全性。

（陶强译 李士通校）

BACKGROUND: Autologous transfusion of intraoperative cell salvage blood may be a potential method to decrease the need for allogeneic packed red blood cell transfusions after cesarean delivery, although there are limited data on the benefits of this method. This study evaluated the implementation of targeted intraoperative cell salvage during cesarean delivery in women at increased risk for hemorrhage at the Women's and Children's Hospital in Ningbo, China.

METHODS: All women who underwent cesarean delivery >28 weeks of gestation were included in the study. The period before intraoperative cell collection (October 1, 2010, to August 31, 2012, n = 11,322) was compared with the postimplementation period (September 1, 2012, to June 30, 2015, n = 17,456) using an interrupted time series analysis. In the postimplementation period, women suspected to be at increased risk of the need for a blood transfusion (1604, 9.2%) underwent intraoperative cell salvage collection. The primary outcomes were the monthly rate of allogeneic packed red blood cell use and the incidence of clinical manifestation of acute blood transfusion reactions.

RESULTS: The mean (standard deviation) estimated monthly allogeneic packed blood cell transfusion rate at the end of the 57-month study was 2.2% ± 0.7% with the implementation compared with 2.7% ± 0.9% without, difference −0.5%, 95% CI, −1.4% to 0.3%; *P* = .22. The mean number of allogeneic units transfused per patient was 4.1 ± 0.4 units with implementation and 3.9 ± 0.9 units without, difference 0.2, 95% CI, −1.7 to 1.1 units; *P* = .69. Intraoperative cell salvage blood was reinfused in 757 (47%) and wasted in 847 (53%) cases. The monthly intraoperative allogeneic packed red blood cells use rate was lower after implementation (difference −0.7%, 95% CI, −0.1% to −1.4%; *P* = .03); however, the monthly postpartum allogeneic packed red blood

cell use rate was unchanged (difference −0.2%, 95% CI, −0.4% to 0.7%; *P* = .56). The clinical manifestation of acute blood transfusion reactions rate was unchanged (difference −2%, 99% CI, −9% to 5%; *P* = .55) between the periods.

CONCLUSIONS: Our findings suggest that targeted intraoperative cell salvage in women undergoing cesarean delivery was associated with less allogeneic blood exposure in the operating room, but not in the postoperative period. Intraoperative cell salvage in targeted cesarean deliveries was not associated with a lesser allogeneic red blood cell exposure over the hospital admission period. The lack of adverse events associated with intraoperative cell salvage supports the safety of intraoperative cell salvage in cesarean delivery.

美国东南部人群围麻醉期与麻醉相关死亡率：前瞻性收集的质量保证数据库的纵向回顾

Perianesthetic and Anesthesia-Related Mortality in a Southeastern United States Population: A Longitudinal Review of a Prospectively Collected Quality Assurance Data Base

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背景：围麻醉期死亡率(在麻醉后 48 小时内发生的死亡率)根据研究对象的不同一直存在很大的差异。作者在一个私人执业医师小组进行研究，该小组覆盖了美国东南部多个麻醉场所。该小组有一个健全的质量保证(QA)数据库跟踪所有接受麻醉的病人。通过这项研究，我们估计了在这个 QA 数据库中与麻醉相关和围麻醉期死亡率的发生率。

方法：经过机构审查委员会的批准，2011 年至 2016 年的数据来自一个大型的基于社区的麻醉学团体实践的 QA 数据库。该医师执业范围涵盖了 233 个麻醉场所，遍布美国 2 个州的 20 个设施。所有发现的麻醉死亡病例均从数据库中提取，并与患者的电子病历进行比较。这些病例由 3 名麻醉师组成的委员会进一步检查，以确定死亡是否与麻醉有关(仅由麻醉提供者或麻醉提供者造成的围手术期死亡)。

结果：研究期间共检查了 785,467 例麻醉手术。共检出 592 例麻醉死亡，10 万例总死亡率为 75.37 例(95% CI, 69.5-81.7)。4 例患者死亡判定为麻醉相关，死亡率为 0.509 / 100,000 (95% CI 0.198-1.31)。18 例死亡被判定为麻醉导致的，死亡率为 2.29 / 10 万(95% CI, 1.45-3.7)。总共有 570 例被判定为非麻醉相关，每 10 万名麻醉药中有 72.6 例(95 例)。

结论：在一个代表美国东南部所有麻醉实践和地点的大型综合数据库中，麻药死亡率为 10 万分之 0.509(95%可信区间为 0.198-1.31)。关于麻醉死亡流行病学的进一步深入分析将在以后的研究中报道。

(方怡娇译 李士通校)

BACKGROUND: Perianesthetic mortality (death occurring within 48 hours of an anesthetic) continues to vary widely depending on the study population examined. The authors study in a private practice physician group that covers multiple

anesthetizing locations in the Southeastern United States. This group has in place a robust quality assurance (QA) database to follow all patients undergoing anesthesia. With this study, we estimate the incidence of anesthesia-related and perianesthetic mortality in this QA database.

METHODS： Following institutional review board approval, data from 2011 to 2016 were obtained from the QA database of a large, community-based anesthesiology group practice. The physician practice covers 233 anesthetizing locations across 20 facilities in 2 US states. All detected cases of perianesthetic death were extracted from the database and compared to the patients' electronic medical record. These cases were further examined by a committee of 3 anesthesiologists to determine whether the death was anesthesia related (a periopera tive death solely attributable to either the anesthesia provider or anesthetic technique), anesthetic contributory (a perioperative death in which anesthesia role could not be entirely excluded), or not due to anesthesia.

RESULTS: A total of 785,467 anesthesia procedures were examined from the study period. A total of 592 cases of perianesthetic deaths were detected, giving an overall death rate of 75.37 in 100,000 cases (95% CI, 69.5–81.7). Mortality judged to be anesthesia related was found in 4 cases, giving a mortality rate of 0.509 in 100,000 (95% CI, 0.198–1.31). Mortality judged to be anesthesia contributory were found in 18 cases, giving a mortality of 2.29 in 100,000 patients (95% CI, 1.45–3.7). A total of 570 cases were judged to be nonanesthesia related, giving an incidence of 72.6 per 100,000 anesthetics (95% CI, 69.3–75.7).

CONCLUSIONS: In a large, comprehensive database representing the full range of anesthesia practices and locations in the Southeastern United States, the rate of perianesthestic death was 0.509 in 100,000 (95% CI, 0.198–1.31). Future in-depth analysis of the epidemiology of perianesthetic deaths will be reported in later studies.

6. 促进限制性术中输血的策略：输血指南和新型软件工具的影响

Promoting a Restrictive Intraoperative Transfusion Strategy: The Influence of a Transfusion Guideline and a Novel Software Tool

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背景：输血指南和决策支持工具在手术中输血的效果以前都没有评估。本研究的主要目的是评估输血指南和软件输血工具的可选使用与术中行为、输血前红细胞压积评估(在每个红细胞单元之前是否检查红细胞压积)和限制性红细胞的关系。细胞使用（除非血细胞比容小于 21%）停止输血。密歇根大学在 2009 年引入了输血指导方针，2011 年麻醉学系开发了输血决策支持工具。

方法：这是一项术前后回顾性研究，其中没有术中输注 1-3 个单位红细胞的患者作为对照组。研究三个阶段以提供输血指南和术中软件工具实施前后的数据。在每个阶段，检查输血前的血细胞比容和限制性输血的趋势是随时间变化的。采用

F 检验法测量坡度差异。使用 Mann-Whitney U 检验测量各相的平均值之间的差异。使用混合效应多变量 logistic 回归测量独立关联。对 30 天死亡率、心肌梗死、肾损伤及其组合进行二级结果分析。

结果：输血指南与输血前红细胞压积评价（67.4%，标准差[SD]3.9 比 76.5%，SD 2.7；P<0.001）和限制性输血实践（14.0%，SD 7.4 比 33.3%，SD 4.4；P=0.001）相关。调整混杂因素后，指导阶段与红细胞压积检查（优势比，1.72；95%置信区间，1.46-2.03；P<0.001）和限制性红细胞输注（优势比，2.95；95%置信区间，2.46-3.54；P<0.001）独立相关。软件工具与输血行为无关。肾损伤率（16.06%）、心肌损伤（4.93%）、30 天死亡率（5.47%）或复合物（21.90%）无显著变化。

结论：输血指南的引入与术中输血前红细胞压积的评估和限制性输血的独立相关。软件工具的使用并没有进一步影响任何行为。

（韩穆佳译 李士通校）

BACKGROUND: The effect of neither transfusion guidelines nor decision support tools on intraoperative transfusion has been previously evaluated. The University of Michigan introduced a transfusion guideline in 2009, and in 2011, the Department of Anesthesiology developed a transfusion decision support tool. The primary aim of this study was to assess the associations of the transfusion guideline and the optional use of the software transfusion tool with intraoperative behaviors; pretransfusion hematocrit assessment (whether or not a hematocrit was checked before each red cell unit) and restrictive red cell use (withholding transfusion unless the hematocrit was ≤21%).

METHODS: This was a before–after retrospective study without a concurrent control group of patients transfused 1–3 units of red cells intraoperatively. Three phases were studied to provide data both before and after the implementation of the transfusion guideline and the intraoperative software tool. Within each phase, trends of checking hematocrits before transfusion and restrictive transfusion were charted against time. F tests were used to measure differences of slopes. The difference between means of each phase was measured using Mann-Whitney *U* tests. Independent associations were measured using mixed-effects multivariable logistic regression. A secondary outcome analysis was conducted for 30-day mortality, myocardial infarction, renal injury, and their combination.

RESULTS: The transfusion guideline was associated with increased pretransfusion hematocrit evaluation (67.4%, standard deviation [SD] 3.9 vs 76.5%, SD 2.7; $P < .001$) and restrictive transfusion practice (14.0%, SD 7.4 vs 33.3%, SD 4.4; $P = .001$). After adjustment for confounders, the guideline phase was independently associated with increased hematocrit checking (odds ratio, 1.72; 95% confidence interval, 1.46–2.03; $P < .001$) and restrictive red cell transfusion (odds ratio, 2.95; 95% confidence interval, 2.46–3.54; $P < .001$). The software tool was not associated with either transfusion behavior. There was no significant change in the rate of renal injury (16.06%), myocardial injury (4.93%), 30-day mortality (5.47%), or a composite (21.90%).

CONCLUSIONS: The introduction of a transfusion guideline was independently associated with increased intraoperative pretransfusion hematocrit assessment and restrictive transfusion. The use of a software tool did not further influence either

behavior.

阿片类药物滥用和术后肺部并发症的风险

Opioid Use Disorders and the Risk of Postoperative Pulmonary Complications

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背景： 随着阿片类药物滥用的与日俱增，围手术期医生为手术后患者提供镇痛面临着越来越多的挑战。由于阿片类药物使用剂量在围手术期可能增加，我们假设阿片类药物依赖患者发生术后肺部并发症的风险增加。

方法： 我们从全国住院病人样本中选取 2002 年至 2011 年期间的 6 种具有代表性的择期手术患者进行回顾性横断面分析。主要结果包括延长的机械通气、再插管和急性呼吸衰竭。次要结果是住院时间、住院死亡率和总住院费用。多变量 logistic 回归和倾向评分匹配都被用来确定阿片类药物滥用对结果的影响。

结果：总样本加权队列包括 7533050 名患者。阿片类药物滥用患者更容易患肺部并发症，发生率为 4.2%，而非阿片类依赖组为 1.6%（P <0.001），并且，在多变量回归分析中，阿片类药物滥用患者发生风险的可能性高出对照组 1.62 倍（95%可信度[CI]，1.16-2.27）。在次级亚组分析中，只有接受结肠切除术的阿片类药物滥用患者发生肺部并发症的几率更高（优势比，2.64; 95%CI，1.42-4.91; P = 0.0021）。此外，阿片类药物滥用患者的住院时间更长（0.84 天[95%CI，0.52-1.16; P <0.001]）和住院费用更高（1816 美元[95% CI, 935-2698; P < 0.001]）。

结论： 本研究表明，阿片类药物滥用患者发生术后肺部并发症风险增加，住院时间延长，资源利用时间延长。针对降低这类患者并发症风险的干预措施，还需要进行进一步研究。

（毛玉林译 李士通校）

BACKGROUND: As the rate of opioid use disorders continues to rise, perioperative physicians are increasingly faced with the challenge of providing analgesia to these patients after surgery. Due to the likelihood of opioid dose escalation in the perioperative period, we hypothesized that opioid-dependent patients would be at increased risk for postoperative pulmonary complications.

METHODS: A retrospective cross-sectional analysis of patients undergoing 6 representative elective surgical procedures was performed using the Nationwide Inpatient Sample from 2002 to 2011. The primary outcome was a composite including prolonged mechanical ventilation, reintubation, and acute respiratory failure. Secondary outcomes were length of stay, in-hospital mortality, and total hospital costs. Both multivariable logistic regression and propensity score matching were used to determine the impact of opioid use disorder on outcomes.

RESULTS: The total sample-weighted cohort consisted of 7,533,050 patients. Patients with opioid use disorders were more likely to suffer pulmonary complications, with a frequency of 4.2% compared to 1.6% in the nonopioid-dependent group ($P < .001$), and had a 1.62 times higher odds (95% confidence interval [CI], 1.16–2.27) in multivariable regression analysis. In a secondary subgroup analysis, only patients undergoing a colectomy had a greater odds of suffering pulmonary

complications (odds ratio, 2.64; 95% CI, 1.42–4.91; *P* = .0021). Additionally, patients with an opioid use disorder had a longer length of stay (0.84 days [95% CI, 0.52–1.16; *P*< .001]) and greater costs ($1816 [95% CI, 935–2698; *P* < .001]).
CONCLUSIONS: This study demonstrates that patients with opioid use disorders are at increased risk for postoperative pulmonary complications, and have prolonged length of stay and resource utilization. Further research is needed regarding interventions to reduce the risk of complications in this subset of patients.

生存分析和时间-事件数据解释:龟与兔

Survival Analysis and Interpretation of Time-to-Event Data: The Tortoise and the Hare

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生存分析，或者更通俗地说，时间-事件分析，指的是一组分析直到出现一个明确定义终点的时间长度的方法。生存数据的一个独特特征是，通常不是所有的患者在观察期结束时都经历过这个事件(如死亡)，因此一些患者的实际生存时间是未知的。这种现象，被称为审查，必须在分析中进行解释，才能做出有效的推论。此外，生存时间通常是倾斜的，限制了假定正常数据分布的分析方法的有效性。作为正在进行的《麻醉与镇痛》系列的一部分，本教程回顾了适用于分析事件时间数据的统计方法，包括非参数和半参数方法，特别是 Kaplan-Meier 估计、log-rank 检验和 Cox 比例风险模型。这些方法是目前医学文献中分析这类数据最常用的数据处理方法。从《麻醉与镇痛》杂志上发表的研究中，举例说明了这些技术在实践中是如何使用的，简要讨论了全参数模型和处理特殊情况的模型，如重复事件模型、竞争风险模型和衰弱模型。
(毛玉林译 李士通校)
Survival analysis, or more generally, time-to-event analysis, refers to a set of methods for analyzing the length of time until the occurrence of a well-defined end point of interest. A unique feature of survival data is that typically not all patients experience the event (eg, death) by the end of the observation period, so the actual survival times for some patients are unknown. This phenomenon, referred to as censoring, must be accounted for in the analysis to allow for valid inferences. Moreover, survival times are usually skewed, limiting the usefulness of analysis methods that assume a normal data distribution. As part of the ongoing series in *Anesthesia & Analgesia* , this tutorial reviews statistical methods for the appropriate analysis of time-to-event data, including nonparametric and semiparametric methods—specifically the Kaplan-Meier estimator, log-rank test, and Cox proportional hazards model. These methods are by far the most commonly used techniques for such data in medical literature. Illustrative examples from studies published in *Anesthesia & Analgesia* demonstrate how these techniques are used in practice. Full parametric models and models to deal with special circumstances, such as recurrent events models, competing risks models, and frailty models, are briefly discussed.