变性患者的围手术期护理

The Perioperative Care of the Transgender Patient

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Anesthesia & Analgesia: 2018 127 359–366

据估计，全世界有2500万人认定为变性人，其中约有100万人居住在美国。越来越高的可见性和接受度使得变性人更可能会出现在一般的手术中;因此，围术期医护人员必须学习在此期间安全管理变性患者所需的知识和技能。现有指南，例如由世界变性人健康专业协会和加州大学旧金山变性人健康卓越中心发布的指南，被作为变性患者监护的重要部分;然而，这些指南并没有解决他们独特的围手术期需求。麻醉医师必须掌握在围手术期安全管理变性患者所需的知识和技能。本综述概述了相关术语，提供文化敏感性监护的必要性，以及变性患者术前，术中和术后管理的指南。

（蒋长青 译 陈杰 校）

An estimated 25 million people identify as transgender worldwide, approximately 1 million of whom reside in the United States. The increasing visibility and acceptance of transgender people makes it likely that they will present in general surgical settings; therefore, perioperative health care providers must develop the knowledge and skills requisite for the safe management of transgender patients in the perioperative setting. Extant guidelines, such as those published by the World Professional Association for Transgender Health and the University of California San Francisco Center of Excellence for Transgender Health, serve as critical resources to those caring for transgender patients; however, they do not address their unique perioperative needs. It is essential that anesthesia providers develop the knowledge and skills necessary for safely managing transgender patients in the perioperative setting. This review provides an overview of relevant terminology, the imperative for the provision of culturally sensitive care, and guidelines for preoperative, intraoperative, and postoperative management of the transgender patient.

咪达唑仑联合羟考酮或舒芬太尼麻醉下接受内镜下注射硬化剂治疗肝硬化和食管静脉曲张患者镇痛作用的比较

Analgesic Effects of Oxycodone Relative to Those of Sufentanil, in the Presence of Midazolam, During Endoscopic Injection Sclerotherapy for Patients With Cirrhosis and Esophageal Varices

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Anesthesia & Analgesia: 2018 127 382–386

背景：作者对进行内镜下注射硬化治疗（EIS）的肝硬化和食管静脉曲张患者，应用咪达唑仑联合羟考酮或舒芬太尼进行麻醉，并对其疗效和胃肠病医师/患者满意度进行了评估。
方法：研究纳入 20~69 岁，体重指数为 18~25 kg / m^2，ASA 分级 I-II，接受择期 EIS 的肝硬化患者，将其随机分为 2 组。此次研究为前瞻、双盲的随机对照试验，一组应用咪达唑仑和羟考酮（n = 64），另一组使用咪达唑仑和舒芬太尼（n = 63）。比较 2 组之间的主要和次要结果指标。 主要结局指标是缺氧发生率。次要结局指标包括围手术期肢体运动、额外镇痛药的需求、额外镇静剂异丙酚的需求、特定的不良反应（术后肌阵挛，恶心，呕吐，头晕和嗜睡）、胃肠科医师的满意度以及患者对术后镇痛的满意度。
结果：咪达唑仑-羟考酮组患者与咪达唑仑-舒芬太尼组患者相比，缺氧发作次数降低 32%（95%可信区间[CI]，-45%至-18%; P <.001），围手术期肢体运动减少 36.73%（95%CI，-51.73%至-21.73%; P <.001），额外镇痛药需求减少 19.12%（95%CI，-30.85%至-7.40%; P = .002），且围手术期丙泊酚需要量减少（EIS 前，-17.83%; 95%CI，-33.82%～-1.85%; P = .003; EIS 术中，-36.73%; 95%CI，-51.73%～-21.73%; P <.001）。两组之间不良反应的发生率相似。胃肠科医师和患者对羟考酮的满意度均高于对舒芬太尼满意度。
结论：羟考酮与咪达唑仑联合麻醉，可减少 EIS 期间缺氧和其他不良疾病的发生。（张骁 译 陈杰 校）

BACKGROUND: We evaluated the efficacy and gastroenterologist/patient satisfaction of midazolam combined with oxycodone, relative to that of midazolam combined with sufentanil, for anesthesia during endoscopic injection sclerotherapy (EIS) in patients with cirrhosis and esophageal varices.
METHODS: Patients with cirrhosis (20-69 years of age), body mass index, 18-25 kg/m, American Society of Anesthesiology patient classification physical status I-II who underwent elective EIS were randomly assigned to 1 of 2 groups. In this prospective, double-blinded, randomized controlled trial, 1 group received midazolam and oxycodone (n = 64), and the other group received midazolam and sufentanil (n = 63). Primary and secondary outcome measures were compared between groups. The primary outcome measure was the incidence of hypoxia. Secondary outcome measures included perioperative limb movement, need for rescue analgesics, need for additional sedative propofol, specified adverse reactions (postoperative myoclonus, nausea, vomiting, dizziness, and drowsiness), gastroenterologist satisfaction, and patient satisfaction with postoperative analgesia.
RESULTS: Patients in the midazolam-oxycodone group had 32% fewer episodes of hypoxia than did those in the midazolam-sufentanil group (95% confidence interval [CI], -45% to -18%; P < .001), 36.73% fewer perioperative limb movements (95% CI, -51.73% to -21.73%; P <.001), 19.12% fewer required rescue analgesics (95% CI, -30.85% to -7.40%; P = .002),

and less propofol requirement in the perioperative period (before EIS, -17.83%; 95% CI, -33.82% to -1.85%; P = .003; throughout EIS, -36.73%; 95% CI, -51.73% to -21.73%; P < .001). The incidence rates for adverse reactions were similar between groups. Both the gastroenterologist and patients reported higher degrees of satisfaction with oxycodone than with sufentanil.

CONCLUSIONS: Oxycodone in combination with midazolam may provide an anesthetic technique that results in fewer episodes of hypoxia and other adverse conditions during EIS.

围手术期无创血压监测

Perioperative Noninvasive Blood Pressure Monitoring

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Anesthesia & Analgesia: 2018 127 408－411

围手术期血液动力学管理中最常见的监测变量是血压。在上个世纪已经开发了几种间接无创血压监测技术，包括间歇测量技术，例如听诊（Riva-Rocci 和 Korotkoff）和示波法（Marey），以及连续技术。随着 20 世纪 70 年代自动化无创血压装置的引入，示波技术迅速成为并且现在依然是自动间歇性血压测量的标准。用于评估极端的高血压和低血压时，它与有创血压相比更接近于正常值。用于计算平均动脉压的示波最大幅度算法的准确性受多种因素的影响，包括袖带尺寸和形状，动脉顺应性曲线和动脉压脉冲的形状以及脉压本身。另外，该技术通常假设动脉顺应性和动脉压力脉冲不变，因此动脉顺应性的改变和心律失常导致的血压脉冲的改变都可以影响准确性。基于 Penaz 原理的体积箝制和动脉张力测量可以提供动脉压脉冲的持续跟踪。目前血压监测技术已得到普遍使用，而关于最佳围手术期血压目标的证据却相对缺乏。

（宋英才 译 陈杰 校）

The most commonly monitored variable for perioperative hemodynamic management is blood pressure. Several indirect noninvasive blood pressure monitoring techniques have been developed over the last century, including intermittent techniques such as auscultation (Riva-Rocci and Korotkoff) and oscillometry (Marey) and continuous techniques. With the introduction of automated noninvasive blood pressure devices in the 1970s, the oscillometric technique quickly became and remains the standard for automated, intermittent blood pressure measurement. It tends to estimate more extreme high and low blood pressures closer to normal than what invasive measurements indicate. The accuracy of the oscillometric maximum amplitude algorithm for estimating mean arterial pressure is affected by multiple factors, including the cuff size and shape, the shape of the arterial compliance curve and arterial pressure pulse, and pulse pressure itself. Additionally, the technique typically assumes a consistent arterial compliance and arterial pressure pulse, thus changes in arterial compliance and arrhythmias that lead to variation in the pressure pulse can affect accuracy. Volume clamping, based on the Penaz principle, and

arterial tonometry provide continuous tracking of the arterial pressure pulse. The ubiquitous use of blood pressure monitoring is in contrast with the lack of evidence for optimal perioperative blood pressure targets.

连续无创血压监测用于非心脏手术的一项随机对照试验

A Randomized Trial of Continuous Noninvasive Blood Pressure Monitoring During Noncardiac Surgery

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Anesthesia & Analgesia: 2018 127 424－431

背景：术中低血压与术后死亡率有关。应用连续的血流动力学监测早期识别低血压的发生可能有助于及时治疗，从而减少术中低血压的发生。本研究假设，连续无创血压监测可以减少术中低血压发生。

方法：本研究纳入了年龄≥45 周岁、ASA 分级 III-IV 级并于全身麻醉下行中高危非心脏手术的患者。使用指套（ClearSight, Edwards Lifesciences, Irvine, CA）和标准的示波袖带对所有试验参与者进行连续无创血流动力学监测。对随机分配的半数患者，临床医生不知晓连续血压监测的数值，而对于另外半数患者，临床医生则知晓其连续血压值（非盲）。对两组患者的连续血压数值进行统计分析。使用两样本 Wilcoxon 秩和检验和 Hodges Lehmann 位移估计法比较两组患者平均动脉压<65mmHg 的时间权重平均值。

结果：320 例进行了随机化的患者中，对 316 例进行意向治疗分析。两组各有 158 例患者，连续血压监测组患者的平均动脉压<65mmHg 的时间权重平均值为 0.05 [95% CI：0.00, 0.22] mmHg，明显低于间断血压测量组的 0.11 [95% CI：0.00, 0.54] mmHg (P = 0.039, 显著性水平 P < 0.048)。

结论：连续无创血流动力学监测几乎可以减少一半的术中低血压。持续监测虽然可以显著减少低血压的发生，但目前尚缺乏确切的临床意义。

（王思洋 译 陈杰 校）

BACKGROUND: Intraoperative hypotension is associated with postoperative mortality. Early detection of hypotension by continuous hemodynamic monitoring might prompt timely therapy, thereby reducing intraoperative hypotension. We tested the hypothesis that continuous noninvasive blood pressure monitoring reduces intraoperative hypotension.

METHODS: Patients ≥45 years old with American Society of Anesthesiologists physical status III or IV having moderate-to-high-risk noncardiac surgery with general anesthesia were included. All participating patients had continuous noninvasive hemodynamic monitoring using a finger cuff (ClearSight, Edwards Lifesciences, Irvine, CA) and a standard oscillometric cuff. In half the patients, randomly assigned, clinicians were blinded to the continuous values, whereas the others (unblinded) had access to continuous blood pressure readings. Continuous pressures in both groups were used for analysis. Time-weighted average

for mean arterial pressure <65 mm Hg was compared using 2-sample Wilcoxon rank-sum tests and Hodges Lehmann estimation of location shift with corresponding asymptotic 95% CI.
RESULTS: Among 320 randomized patients, 316 were included in the intention-to-treat analysis. With 158 patients in each group, those assigned to continuous blood pressure monitoring had significantly lower time-weighted average mean arterial pressure <65 mm Hg, 0.05 [0.00, 0.22] mm Hg, versus intermittent blood pressure monitoring, 0.11 [0.00, 0.54] mm Hg (P = .039, significance criteria P < .048).
CONCLUSIONS: Continuous noninvasive hemodynamic monitoring nearly halved the amount of intraoperative hypotension. Hypotension reduction with continuous monitoring, while statistically significant, is currently of uncertain clinical importance.

成年不稳定颈椎患者的气道管理措施：港景医疗中心的临床经验总结

Airway Management Practice in Adults With an Unstable Cervical Spine: The Harborview Medical Center Experience

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Anesthesia & Analgesia: 2018 127 450－454

背景：目前对于急性脊椎损伤（CSI）患者的气道管理仍然是一项挑战。过去清醒下纤维支气管镜（FOB）作为推荐，因其在进行气管插管时颈椎的活动度小，且能够在插管后能完善神经功能检查。但是，随着可视喉镜（VL）的广泛普及，清醒状态下纤支镜插管的应用急剧减少。研究者旨在描述在作者单位一级创伤中心对于颈椎损伤患者的不同气道管理方法应用情况，同时报道因建立气道引发神经功能损伤的概率。
方法：纳入自 2010 年 9 月至 2017 年 6 月期间因 CSI 且尚未行气管插管的需手术患者。所有患者在手动稳定，应用硬质颈托或外科牵引条件下进行气管插管。神经功能变差被认定为新发术后活动或感觉功能障碍。
结果：本研究纳入 252 例患者，其中 76 例（30.2%）在插管前发现神经功能损伤。VL 是初次建立气道最常用的方法（49.6%）。镇静状态下纤支镜常单独（30.6%）或联合可视喉镜（13.5%）用于建立气道。清醒纤支镜（2.3%）和普通喉镜（2.8%）插管现已很少应用。所有方法都能够保证初次气管插管的高成功率，且没有患者因建立人工气道导致神经功能损伤。
结论：对于大型教学创伤中心的急性颈椎损伤患者，可视喉镜作为初次气管插管的最常用方法。清醒状况下纤支镜及普通喉镜插管不常应用。没有因任何方法建立人工气道引起神经功能继发性损伤的报道。在采取措施减少颈部活动度时，操作者应选用最舒适且熟练的技术辅助进行气管插管。
（金夏 译 陈杰 校）
BACKGROUND: Airway management in the presence of acute cervical spine injury (CSI) is challenging. Because it limits cervical spine motion during tracheal intubation and allows for neurological examination after the procedure, awake fiberoptic bronchoscopy (FOB) has traditionally been

recommended. However, with the widespread availability of video laryngoscopy (VL), its use has declined dramatically. Our aim was to describe the frequency of airway management techniques used in patients with CSI at our level I trauma center and report the incidence of neurological injury attributable to airway management.
METHODS: Adults presenting to the operating room with CSI without a tracheal tube in situ between September 2010 and June 2017 were included. All patients were intubated in the presence of manual-in-line stabilization, a hard cervical collar, or surgical traction. Worsening neurological status was defined as new motor or sensory deficits on postoperative examination.
RESULTS: Two hundred fifty-two patients were included, of which 76 (30.2%) had preexisting neurological deficits. VL was the most frequent initial airway management technique used (49.6%). Asleep FOB was commonly performed alone (30.6%) or in conjunction with VL (13.5%). Awake FOB was rarely performed (2.3%), as was direct laryngoscopy (2.8%). All techniques were associated with high first-attempt success rates, and no cases of neurological injury attributable to airway management technique were identified.
CONCLUSIONS: Among patients with acute CSI at a high-volume academic trauma center, VL was the most commonly used initial intubation technique. Awake FOB and direct laryngoscopy were performed infrequently. No cases of neurological deterioration secondary to airway management occurred with any method. Assuming care is taken to limit neck movement, providers should use the intubation technique with which they have the most comfort and skill.

关于GlideScope可视喉镜引导下儿童气管插管技术难度的一项前瞻性观察性研究

A Prospective Observational Study of Technical Difficulty With GlideScope-Guided Tracheal Intubation in Children

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Anesthesia & Analgesia: 2018 127 467－471

背景：GlideScope Cobalt可视喉镜是儿科麻醉中最常用的视频喉镜之一。尽管可视喉镜的应用使得气道可视化优于直接喉镜，然而使用者也需要学习一种新的间接气管插管技术。对于学习这种间接插管方法，遵循技术方法加强练习是必不可少的。关注临床医生在气管插管放置过程中的遇到的要点和难点有助于对其进行有的放矢的技术培训。本次前瞻性观察性研究探究了应用GlideScope可视喉镜引导下气管插管的技术难点的发生率和发生位置，应用不同补救措施后的插管成功率，以及技术难点对插管成功率的影响。
方法：作者于2014年2月至2014年8月间于第四纪儿科医院进行了此次观察性研究。作者观察了200例GlideScope可视喉镜引导下气管插管操作并记录了主

要的插管相关结果。记录了将气管插管正确置入所需的高级操作例数，技术难点发生的位置，解决技术难点的操作方法类型，以及插管的成功率。作者应用 300 例重复操作的偏倚校正自举法来得出一次气管插管操作中技术难点发生率的 95% 置信区间。

结果：排除无经验临床医师的插管尝试后，在 187 位患者中有 225 次，58%（225 次操作中存在 131 次，自举置信区间：51.6%-64.6%）的插管操作遭遇了技术困难。且当在将气管插管通过杓状软骨平面在声门上（区域 3）时最易发生技术困难。在区域 3 处顺时针旋转气管插管是最常见的成功补救措施。 所有气管插管的成功率为 98%（置信区间 95%-99%），然而，初次插管的成功率仅有 80%（置信区间 74%-86%）。存在插管困难的患者经历的尝试插管次数（中位数[四分位间距]，2[1-3]）较无插管困难患者的插管次数中位数（四分位间距，1[1-1；P 值<0.1]）更高。

结论：大量临床医师在应用 Cobalt 可视喉镜进行儿童视频喉镜气管插管时遭遇困难。这些困难导致了多次的气管插管操作，这是诱发插管相关并发症的重要风险因素。对临床医师进行有的放矢的培训可以降低插管技术难点的发生率。

（谢婷婷 译 陈杰 校）

BACKGROUND: The GlideScope Cobalt is one of the most commonly used videolaryngoscopes in pediatric anesthesia. Although visualization of the airway may be superior to direct laryngoscopy, users need to learn a new indirect way to insert the tracheal tube. Learning this indirect approach requires focused practice and instruction. Identifying the specific points during tube placement, during which clinicians struggle, would help with targeted education. We conducted this prospective observational study to determine the incidence and location of technical difficulties using the GlideScope, the success rates of various corrective maneuvers used, and the impact of technical difficulty on success rate.

METHODS: We conducted this observational study at our quaternary pediatric hospital between February 2014 and August 2014. We observed 200 GlideScope-guided intubations and documented key intubation-related outcomes. Inclusion criteria for patients were <6 years of age and elective surgery requiring endotracheal intubation. We documented the number of advancement maneuvers required to intubate the trachea, the location where technical difficulty occurred, the types of maneuvers used to address difficulties, and the tracheal intubation success rate. We used a bias-corrected bootstrapping method with 300 replicates to determine the 95% confidence interval (CI) around the rate of difficulty with an intubation attempt.

RESULTS: After excluding attempts by inexperienced clinicians, there were 225 attempts in 187 patients, 58% (131 of 225; bootstrap CI, 51.6%-64.6%)) of the attempts had technical difficulties. Technical difficulty was most likely to occur when inserting the tracheal tube between the plane of the arytenoid cartilages to just beyond the vocal cords: "zone 3." Clockwise rotation of the tube was the most common successful corrective maneuver

in zone 3. The overall tracheal intubation success rate was 98% (CI, 95%-99%); however, the first attempt success rate was only 80% (CI, 74%-86%). Patients with technical difficulty had more attempts (median [interquartile range], 2 [1-3] than those without technical difficulty median (interquartile range, 1 [1-1; P value <.01]).
CONCLUSIONS: A variety of clinicians experience technical difficulties with the GlideScope Cobalt videolaryngoscope in children. These difficulties result in more tracheal intubation attempts, an important risk factor for intubation-associated complications. Targeted education of clinicians may reduce the incidence of technical difficulties.

采用纤支镜辅助引导对比直接喉镜盲探法的经鼻气管插管对鼻衄发生率和严重程度的影响，一项随机、对照、双盲试验

A Randomized Trial Comparing the Effect of Fiberoptic Selection and Guidance Versus Random Selection, Blind Insertion, and Direct Laryngoscopy, on the Incidence and Severity of Epistaxis After Nasotracheal Intubation

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Anesthesia & Analgesia: 2018 127 485–489

背景：鼻衄是经鼻气管插管（NTI）后常见的并发症。由于这种出血可能与插管期间的创伤有关，因此采用可视化纤维光镜辅助和指导而不是直接喉镜辅助可能会影响鼻衄的发生率和严重程度。作者采用纤支镜和直接喉镜法比较了 NTI 术后鼻出血的发生率。
方法：本研究招募了 70 名需要 NTI 且能够通过无阻塞鼻孔轻松进行呼吸的患者。排除标准包括鼻气流不对等，鼻孔阻塞，有鼻外伤或手术史，以及经病史确定的凝血功能异常。患者被随机分配，通过采用传统的直接喉镜法或者纤支镜辅助下插入预热软化的 Mallinckrodt 经鼻直角气管导管（RAE）。所有患者首先接受麻醉诱导，然后随机分为盲探组或光纤组。盲探/直接喉镜组的患者随机选择鼻孔插入气管导管。光纤组的患者进行了睡眠状态下鼻腔纤支镜检查，以确定最适宜的鼻孔，然后在纤支镜引导下插入气管导管。 NTI 术后 10 分钟，患者鼻衄的发生率和严重程度由外科医生评估和分级，外科医生对插管方法不知情。
结果：初次的鼻腔纤维内窥镜检查确定 51％的患者有无症状的鼻腔病变：下鼻甲肥大（28.6％）和鼻中隔偏曲（22.8％）。盲法插入/直接喉镜组（88％）的鼻衄发生率高于光纤组（51％;RR 值，0.55; 95％置信区间，0.38-0.79; P = 0.0011）。在盲管插入/直接喉镜组中鼻衄的严重程度也更大（Wilcoxon Mann-Whitney odds，3.5; 95％置信区间，1.8-11.1）。
结论：与通过盲插和直接喉镜辅助的 NTI 相比，NTI 期间采用纤支镜选择插管鼻孔并引导插管降低了鼻衄的发生率并减轻了鼻衄的严重程度。
（陈冠楠 译 陈杰 校）
BACKGROUND: Epistaxis, or nasal bleeding, is a common complication after nasotracheal intubation (NTI). Because such bleeding is likely related to trauma during intubation, use of fiberoptic visualization and guidance rather than direct laryngoscopy may affect the incidence and severity of

epistaxis. We compared the incidence of epistaxis after NTI using a fiberoptic versus a direct laryngoscopy approach.
METHODS: Seventy patients who were able to breathe easily through unobstructed nostrils and required NTI as part of their anesthetic management were recruited. Exclusion criteria included unequal nasal airflow, nostril obstruction, previous nasal trauma or surgery, and coagulation abnormalities as determined by history. Patients were randomly assigned to undergo NTI with thermosoftened Mallinckrodt nasal Ring-Adair-Elwyn (RAE) tubes via either traditional direct laryngoscopy using a Macintosh blade or fiberoptic nasal intubation. All patients first underwent anesthetic induction and were randomized to blind or fiberoptic groups. Patients in the blind insertion/direct laryngoscopy group were then intubated via a randomly selected nostril. Patients in the fiberoptic group underwent an asleep nasal fiberoptic examination to determine the most patent nostril, followed by tube insertion under fiberoptic guidance. Ten minutes after NTI, the incidence and severity of epistaxis were evaluated and graded by the surgeon, who was blinded to the intubation method.
RESULTS: Initial nasal fiberoptic endoscopy identified asymptomatic nasal pathology in 51% of patients: inferior turbinate hypertrophy (28.6%) and deviation of the nasal septum in (22.8%). The incidence of epistaxis was higher in the blind insertion/direct laryngoscopy group (88%) than in the fiberoptic group (51%; relative risk, 0.55; 95% confidence interval, 0.38-0.79; P = .0011). The severity of bleeding was also greater in the blind tube insertion/direct laryngoscopy cohort (Wilcoxon Mann-Whitney odds, 3.5; 95% confidence interval, 1.8-11.1).
CONCLUSIONS: Fiberoptic nostril selection and guidance during NTI reduced the incidence and severity of epistaxis when compared with NTI performed via blind insertion and direct laryngoscopy.

术后认知功能障碍和非心脏手术

Postoperative Cognitive Dysfunction and Noncardiac Surgery

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Anesthesia & Analgesia: 2018 127 496 - 505

术后认知功能障碍（POCD）是与术前相比，患者术后出现一种可客观检测出来的认知功能下降。POCD 在麻醉和外科学文献中被认为是独立于认知衰退的，其在社区内的老年人群中较为常见，并被标记为轻度认知障碍、认识紊乱或痴呆。这篇叙述性综述尝试将 POCD 置于一般人群认知衰退的广阔背景下。100 多年前，曾有人指出麻醉和手术后存在认知的改变，最初被描述为谵妄和痴呆。20 世纪 80 年代 POCD 这个术语被提出，它是指单纯地根据神经心理测试结果变化而评估的认知下降，但这一概念的主体有很大的异质性。目前 POCD 的原因仍然不明，年龄的增长、基础认知障碍和所受教育程度较低均被认为与 POCD 的发生密切相关。在老年医学中认知障碍被定义和分类为轻度认知障碍、认知紊乱和痴呆症，

其具有明确的临床特征。为了明确围手术期相关的认知障碍的临床影响，POCD一词最近已根据这些老年医学结构进行了重新定义，以便可以阐明其短期、中期和长期的临床和功能性的影响。随着老年患者手术的增多以及许多临床或亚临床痴呆患者存在对麻醉的需求，麻醉师必须具备了解和管理这些患者的能力。
（周江平 译 陈杰 校）

Postoperative cognitive dysfunction (POCD) is an objectively measured decline in cognition postoperatively compared with preoperative function. POCD has been considered in the anesthetic and surgical literature in isolation of cognitive decline which is common in the elderly within the community and where it is labeled as mild cognitive impairment, neurocognitive disorder, or dementia. This narrative review seeks to place POCD in the broad context of cognitive decline in the general population. Cognitive change after anesthesia and surgery was described over 100 years ago, initially as delirium and dementia. The term POCD was applied in the 1980s to refer to cognitive decline assessed purely on the basis of a change in neuropsychological test results, but the construct has been the subject of great heterogeneity. The cause of POCD remains unknown. Increasing age, baseline cognitive impairment, and fewer years of education are consistently associated with POCD. In geriatric medicine, cognitive disorders defined and classified as mild cognitive impairment, neurocognitive disorder, and dementia have definitive clinical features. To identify the clinical impact of cognitive impairment associated with the perioperative period, POCD has recently been redefined in terms of these geriatric medicine constructs so that the short-, medium-, and long-term clinical and functional impact can be elucidated. As the aging population present in ever increasing numbers for surgery, many individuals with overt or subclinical dementia require anesthesia. Anesthesiologists must be equipped to understand and manage these patients.

9.小鼠足底注射高渗盐水实验可用于镇痛药物的快速筛查

An Intraplantar Hypertonic Saline Assay in Mice for Rapid Screening of Analgesics

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Anesthesia & Analgesia: 2018 127 548－555

背景：新型镇痛药的发展受到现有临床前筛查方法缺陷的限制，如药物反应变异大，镇痛药适用范围窄，以及诱发组织损伤的倾向。作者目的是确定在小鼠足底注射［i.pl］高渗盐水(HS)后，基于痛觉反应(舔和咬)的一种新的活体动物实验的可行性。

方法： 在动物保护机构委员会的批准下，对成年 CD-1 小鼠活体进行了一项随机盲法研究。作者首先研究了动物对高渗盐水伤害性反应的量效关系、时间过程和性别差异。随后对高渗盐水检测的筛选能力进行了评估，以检测属于不同类别的一系列已知镇痛药。最后进行了组织病理学研究以评估潜在的组织损伤。
结果： 雌鼠对足底注射高渗盐水产生的反应比雄鼠更严重，持续时间更长。对高渗盐水的反应与浓度有关，且变异最小。10%高渗盐水在最初的五分钟内引起了最大的反应。吗啡能够剂量依赖地减轻小鼠的痛觉反应(1-10 mg/kg 腹腔内[i.p])。当局部注射外周选择性 μ-阿片受体激动剂洛派丁胺时可减少疼痛的反应(30－100μg /爪,i.pl)。但当系统给药时则不会减少疼痛(1－10mg/kg,i.p)。乙酰水杨酸(300 mg/kg, i.p.)、萘普生(150 mg/kg, i.p)和醋氨酚(300 mg/kg, i.p.)都降低了伤害性反应，足底共同注射利多卡因(0.003%-1%)和 10% 高渗盐水也是同样如此。组织病理学检查未发现 HS 导致组织损伤。
结论： 足底注射高渗盐水实验很容易进行，可以快速检测标准镇痛药，且动物痛苦最小而不会造成组织损伤。建议此试验作为对现有的临床前镇痛筛查方法的补充。
（张元元 译 陈杰 校）

BACKGROUND: Development of new analgesics is limited by shortcomings of existing preclinical screening assays such as wide variations in response, suitability for a narrow range of analgesics, and propensity to induce tissue damage. Our aim was to determine the feasibility of a new in vivo animal assay as an analgesic screen based on nociceptive responses (licking and biting) after intraplantar (i.pl.) injection of hypertonic saline (HS) in mice.
METHODS: With approval from the Institutional Animal Care Committee, we conducted a randomized, investigator-blinded in vivo study in adult CD-1 mice. We first studied the concentration-response relationship, time course, and sex difference of animals' nociceptive responses to HS. Subsequently, we assessed the screening ability of the HS assay to detect a range of established analgesics belonging to different classes. Finally, we performed histopathologic studies to assess potential tissue damage.
RESULTS: The response produced by i.pl. HS was greater and longer in female than in male mice. The responses to HS were concentration dependent with minimal variance. Ten percent HS evoked a maximal response within the first 5 minutes. Morphine dose-dependently attenuated animals' nociceptive responses (1-10 mg/kg intraperitoneally [i.p.]). The peripherally restricted μ-opioid receptor agonist, loperamide, reduced nociceptive responses when injected locally (30-100 μg/paw, i.pl.) but not systemically (1-10 mg/kg, i.p.). Acetylsalicylic acid (300 mg/kg, i.p.), naproxen (150 mg/kg, i.p), and acetaminophen (300 mg/kg, i.p.) all decreased nociceptive responses, as did i.pl. coinjections of lidocaine (0.003%-1%) with 10% HS. Histopathologic assessment revealed no tissue damage due to HS.
CONCLUSIONS: The i.pl. HS assay is easily performed, rapidly detects standard analgesics, and produces minimal animal suffering without tissue

damage. We propose this assay as a useful addition to the armamentarium of existing preclinical analgesic screens.

区分 IgE 与非 IgE 介导的过敏反应中类胰蛋白酶升高标准的改进

Improvement of the Elevated Tryptase Criterion to Discriminate IgE- From Non-IgE-Mediated Allergic Reactions.

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Anesthesia & Analgesia 2018 127 414-419

背景：免疫球蛋白 E（IgE）依赖性和非依赖性超敏反应的区分可用于改善麻醉过程中出现过敏反应患者的病因定位和临床管理。血清类胰蛋白酶水平可能有助于明确过敏反应的免疫机制，但其诊断的准确性和最佳切点仍不清楚。我们的目的是在区分 IgE 与非 IgE 介导的过敏反应中，比较胰蛋白酶在单独的反应（TDR）中和 TDR /基础胰蛋白酶（TDR/BT）比值的诊断精确度，并估计这些指标的最佳结合点。

方法：本次实验挑选 111 名发生过敏反应的患者（45%名男性，年龄在 3-99 岁），即使过敏反应可能是非过敏性的。过敏反应分为 IgE 介导或非 IgE，用受试者特性曲线分析的曲线下面积（AUC）来估计 TDR 和 TDR/BT 比值的鉴定能力。

结果：由 IgE 介导的过敏反应占 49.5%，其中 56%人符合过敏反应标准。IgE 介导的 TDR 中位数（四分位）为 8.0（4.9～19.6）非 IgE 介导的 TDR 中位数 5.1（3.5-8-1）（P＝022）。IgE 介导的 TDR/BT 中位数（四分位）为 2.7（1.7～4.5），非 IgE 介导的 TDR/BT 比值中位数为 1.1（1.0～1.6）（P＜001）。与 TDR 相比 TDR/BT 比值能更好的区分 IgE 介导与非 IgE 介导的过敏反应(曲线下面积 TDR/BT = 0.79 [95% 可信区间 (CI), 1.1-2.2] 而曲线下面积 TDR = 0.66 [95% CI, 1.1-2.2]; P = .003)。TDR/BT 的最优切点（灵敏度和特异度最大结合）是 1.66 (95% CI, 1.1-2.2)。

结论：区分 IgE 和非 IgE 介导的过敏反应中，TDR/BT 比值比 TDR 明显更具有鉴别能力。在临床实践中，将最佳的 TDR/BT 比值阈值设置大约为 1.66，可有助于区分过敏反应为 IgE 介导还是非 IgE 介导。

（杨雨迎 译 潘艳、薛张纲校）

BACKGROUND: Differentiating between immunoglobulin E (IgE)-dependent and IgE- independent hypersensitivity reactions may improve the etiologic orientation and clinical management of patients with allergic reactions in the anesthesia setting. Serum tryptase levels may be useful to discriminate the immune mechanism of allergic reactions, but the diagnostic accuracy and optimal cutpoint remain unclear.We aimed to compare the diagnostic accuracy of tryptase during reaction (TDR) alone and the TDR/basal tryptase (TDR/BT) ratio for discriminating IgE- from non-IgE-mediated allergic reactions, and to estimate the best cut point for these indicators.

METHODS: We included 111 patients (45% men; aged 3-99 years) who had experienced an allergic reaction, even though the allergic reaction could be nonanaphylactic. Allergy tests were performed to classify the reaction as an IgE- or non-IgE-mediated one. The area under the curve (AUC) of the receiver operating

characteristic analysis was performed to estimate the discriminative ability of TDR and TDR/BT ratio.
RESULTS: An IgE-mediated reaction was diagnosed in 49.5% of patients, of whom 56% met anaphylaxis criteria. The median (quartiles) TDR for the IgE-mediated reactions was 8.0 (4.9- 19.6) and 5.1 (3.5-8.1) for the non-IgE-mediated (P = .022). The median (quartiles) TDR/BT ratio was 2.7 (1.7-4.5) in IgE-mediated and 1.1 (1.0-1.6) in non-IgE-mediated reactions (P < .001). The TDR/BT ratio showed the greatest ability to discriminate IgE- from non-IgE-mediated reactions compared to TDR (AUC TDR/BT = 0.79 [95% confidence interval (CI), 1.1-2.2] and AUC TDR = 0.66 [95% CI, 1.1-2.2]; P = .003). The optimal cut point for TDR/BT (maximization of the sum of the sensitivity and specificity) was 1.66 (95% CI, 1.1-2.2).
CONCLUSIONS: The TDR/BT ratio showed a significantly better discriminative ability than TDR to discriminate IgE- from non-IgE-mediated allergic reactions. An optimal TDR/BT ratio threshold of approximately 1.66 may be useful in clinical practice to classify allergic reactions as IgE- or non-IgE-mediated.

人应激激素皮质醇增加 IFN-υ 介导的人免疫细胞的致炎反应

The Stress Hormone Cortisol Enhances Interferon-υ–Mediated Proinflammatory Responses of Human Immune Cells

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Anesthesia & Analgesia: 2018 127 556–563

背景: 皮质醇是生命必须的典型的应激激素，然而皮质醇在人类面对创伤和感染时的确切作用还是不明确的。糖皮质激素例如皮质醇一直被认为能抑制炎症和免疫。然而，近期的研究显示糖皮质激素可以诱导迟发免疫反应，表现为免疫刺激。在这个研究中，我们展示了皮质醇增强典型炎症因子 IFN-υ 的炎症刺激作用。我们检验了皮质醇增强细菌内毒素刺激的单核巨噬细胞中 IFN-υ 介导的炎症反应的假说。
方法:人单核巨噬细胞在 LPS 刺激前在有或无 IFN-υ 和皮质醇的情况下培养十八个小时。MO 分化因子 GM-CSF 或 M-CSF 被添加到不同培养群。我们还比较了在 IFN-υ 和皮质醇，脂多糖下急性，四小时 MO 孵化和在脂多糖暴露前有皮质醇的 18 小时孵化之间的炎症反应。MO 活化由 IL-6 释放以及复杂的致炎和抗炎炎症可溶介质评估。
结果:经过 18 小时的孵化后，我们观察到皮质醇显著地增加了 IFN-υ 下未分化单核巨噬细胞脂多糖刺激的 IL-6 释放。在 GM-CSF 预处理的单核巨噬细胞中，皮质醇增加了四倍以上 IFN-υ 介导的 IL-6 的释放，增加了三倍以上炎症刺激因子 IFN-α2 的释放，同时抑制抗炎介质 IL-1 受体拮抗剂到对照组的 15%。这些效应可以被皮质醇受体拮抗剂 RU486 和 IFN-υ 受体 1 型抗体拮抗剂逆转。皮质醇单独可以增加未分化的和 GM-CSF 处理过的单核巨噬细胞 IFN-υ 1 型受体的表达。相反，IFN-υ 和皮质醇处理的急性的四小时孵化的 MO 表现出对脂多糖典型的 IL-6 抑制反应。
结论:这些结果显示了人应激激素和炎症活化因子 IFN-υ 之间强烈的致炎相互作用。这一结果支持新兴的皮质醇适应性作用的生理模型，皮质醇抑制早期的致炎

反应，但使炎症细胞在免疫挑战中进行扩增反应。这些发现拓宽了临床影响，并且对观察人类皮质醇增强的免疫反应的个体差异，机制提供了经验性的框架。（刘璐萍 译 潘艳、薛张纲校）

BACKGROUND: Cortisol is a prototypical human stress hormone essential for life, yet the precise role of cortisol in the human stress response to injury or infection is still uncertain. Glucocorticoids (GCs) such as cortisol are widely understood to suppress inflammation and immunity. However, recent research shows that GCs also induce delayed immune effects manifesting as immune stimulation. In this study, we show that cortisol enhances the immune-stimulating effects of a prototypical proinflammatory cytokine, interferon-υ (IFN-υ). We tested the hypothesis that cortisol enhances IFN-υ–mediated proinflammatory responses of human mononuclear phagocytes (monocyte/macrophages [MOs]) stimulated by bacterial endotoxin (lipopolysaccharide [LPS]).

METHODS: Human MOs were cultured for 18 hours with or without IFN-υ and/or cortisol before LPS stimulation. MO differentiation factors granulocyte-macrophage colony stimulating factor (GM-CSF) or M-CSF were added to separate cultures. We also compared the inflammatory response with an acute, 4-hour MO incubation with IFN-υ plus cortisol and LPS to a delayed 18-hour incubation with cortisol before LPS exposure. MO activation was assessed by interleukin-6 (IL-6) release and by multiplex analysis of pro- and anti-inflammatory soluble mediators.

RESULTS: After the 18-hour incubation, we observed that cortisol significantly increased LPS-stimulated IL-6 release from IFN-υ–treated undifferentiated MOs. In GM-CSF–pretreated MOs, cortisol increased IFN-υ–mediated IL-6 release by >4-fold and release of the immune stimulant IFN-α2 (IFN-α2) by >3-fold, while suppressing release of the anti-inflammatory mediator, IL-1 receptor antagonist to 15% of control. These results were reversed by either the GC receptor antagonist RU486 or by an IFN-υ receptor type 1 antibody antagonist. Cortisol alone increased expression of the IFN-υ receptor type 1 on undifferentiated and GM-CSF–treated MOs. In contrast, an acute 4-hour incubation of MOs with IFN-υ and cortisol showed classic suppression of the IL-6 response to LPS.

CONCLUSIONS: These results reveal a surprisingly robust proinflammatory interaction between the human stress response hormone cortisol and the immune activating cytokine IFN-υ. The results support an emerging physiological model with an adaptive role for cortisol, wherein acute release of cortisol suppresses early proinflammatory responses but also primes immune cells for an augmented response to a subsequent immune challenge. These findings have broad clinical implications and provide an experimental framework to examine individual differences, mechanisms, and translational implications of cortisol-enhanced immune responses in humans.

脉压和颈动脉多普勒测速用于孕妇容量状态评估的指标：一项前瞻性队列研究

Pulse Pressure and Carotid Artery Doppler Velocimetry as Indicators of Maternal Volume Status: A Prospective Cohort Study.

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Anesthesia & Analgesia 2018 127 457-464

背景：窄脉压已被证实可以说明低中心血管的容量状态。 在危重病人中，容量状态的定性评估可以通过多普勒测速来实现，它可以评估在被动抬腿试验（PLR）中模拟自体血回输对颈动脉血流动力学的改变。以上两个参数都未在孕产妇人群中进行过前瞻性的评估。本研究的目的是：在分娩期健康妇女中使用颈动脉多普勒，以明确脉压是否能预测对自体血回输的反应。我们假设在窄脉压的妇女中，颈动脉多普勒对 PLR 的反应更大，这暗示了相对低血容量的状态。
方法：本次前瞻性队列研究招募对象为单胎妊娠≥孕 35 周的分娩期妇女，没有急性或慢性的基础疾病。 参与者按照入院脉压＜45mmHg（窄脉压），或≥50mmHg（正常）分为两组。 之后，我们给所有患者在 PLR 前后进行了颈动脉多普勒评估，我们采用的标准技术中颈动脉血流（mL/min）＝π×（颈动脉直径/2）×速度时间的积分×60 秒。速度时间积分通过多普勒波形计算得出。 研究的主要结局指标是 PLR 后颈动脉多普勒参数（颈动脉直径、速度时间积分、颈动脉血流）的变化。将各组间的结局指标进行单变量和多变量分析，比较并调整潜在混杂因素。
结果：33 名妇女同意参与，包括 18 名窄脉压组，15 名正常脉压组(初始脉压平均值和标准偏差分别为 38.3±4.4 vs 57.3±4.1mmHg)。除了初始脉压、收缩压和舒张压，以及种族以外，这两组人表现出相似的特征。在对 PLR 的反应中，与正常脉压组相比，窄脉压组的颈动脉直径明显增加(0.08 vs 0.02 cm；标准差，2.0；95%置信区间[CI]，1.16-2.84)，颈动脉血流明显增加(79.4 vs 16.0 mL/min；标准差，2.23；95％CI，1.36-3.10）以及颈动脉血流变化百分比也明显增加(47.5% vs 8.7%，标准差 2.52；95%CI，1.60-3.43)。在对潜在混杂因素进行调整后的多变量分析中，与正常脉压组的妇女相比，窄脉压组妇女在 PLR 后的颈动脉直径明显更大（0.66 vs 0.62cm；p＜.0001），颈动脉血流明显更多（246.7vs 219.3cm/s； p＝.001）。初始脉压与 PLR 后颈动脉血流的变化密切相关。
结论：在脉压窄的妇女中，颈动脉血流动力学对 PLR 后自体血回输的反应更大。脉压与自体血回输的生理反应相关，这提供了一个定性指标用于评估足月以及近期产妇的血管内容量状态。
（陈莹 译 潘艳、薛张纲校）

BACKGROUND: Narrow pulse pressure has been demonstrated to indicate low central volume status. In critically ill patients, volume status can be qualitatively evaluated using Doppler velocimetry to assess hemodynamic changes in the carotid artery in response to autotransfusion with passive leg raise (PLR). Neither parameter has been prospectively evaluated in an obstetric population.The objective of this study was to determine if pulse pressure could predict the response to autotransfusion using carotid artery Doppler in healthy intrapartum women.We hypothesized that the carotid

artery Doppler response to PLR would be greater in women with a narrow pulse pressure, indicating relative hypovolemia.
METHODS: Intrapartum women with singleton gestations ≥35 weeks without acute or chronic medical conditions were recruited to this prospective cohort study. Participants were grouped by admission pulse pressure as <45 mm Hg (narrow) or ≥50 mm Hg (normal). Maternal carotid artery Doppler assessment was then performed in all patients before and after PLR using a standard technique where carotid blood flow (mL/min) = π × (carotid artery diameter/2) × (velocity time integral) × (60 seconds). The velocity time integral was calculated from the Doppler waveform. The 2 groups demonstrated similar characteristics except for initial pulse pressure, systolic and diastolic blood pressure, and race. The primary outcome was the change in the carotid Doppler parameters (carotid artery diameter, velocity time integral, and carotid blood flow) after PLR. Outcomes were compared between study groups with univariable and multivariable analyses with adjustment for potential confounding factors.
RESULTS: Thirty-three women consented to participation, including 18 in the narrow and 15 in the normal pulse pressure groups (mean and standard deviation initial pulse pressure, 38.3 ± 4.4 vs 57.3 ± 4.1 mm Hg). In response to PLR, the narrow pulse pressure group had a significantly greater increase in carotid artery diameter (0.08 vs 0.02 cm; standardized difference, 2.0; 95% confidence interval [CI], 1.16-2.84), carotid blood flow (79.4 vs 16.0 mL/min; standardized difference, 2.23; 95% CI, 1.36-3.10), and percent change in carotid blood flow (47.5% vs 8.7%; standardized difference, 2.52; 95% CI, 1.60-3.43) compared with the normal pulse pressure group. In multivariable analysis with adjustment for potential confounding factors, women with narrow admission pulse pressure had a significantly larger carotid diameter (0.66 vs 0.62 cm; P < .0001) and greater carotid flow (246.7 vs 219.3 cm/s; P = .001) after PLR compared to women with a normal pulse pressure. Initial pulse pressure was strongly correlated with the change in carotid flow after PLR (r = 0.60; P < .0001).
CONCLUSIONS: The hemodynamic response of the carotid artery to autotransfusion after PLR is significantly greater in women with narrow pulse pressure. Pulse pressure correlates with the physiological response to autotransfusion and provides a qualitative indication of intravascular volume in term and near-term pregnant women.

地塞米松作为辅药用于小儿外科手术骶管阻滞：一项系统回顾和 meta 分析
Dexamethasone as an Adjuvant for Caudal Blockade in Pediatric Surgical Patients: A Systematic Review and Meta-analysis

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Anesthesia & Analgesia: 2018 127 520–528

背景：在小儿下腹手术后，通常使用骶管阻滞来提供术后镇痛。通常作为单次注射的方法使用，这种阻滞的一个限制是短时间的镇痛。为了克服这一点，地塞米

松被用作佐剂以延长阻滞持续时间。然而，有关激素相关的发病率和地塞米松给药(如骶管或静脉注射)的最佳途径尚不清楚。

方法：我们对招募接受骶管阻滞手术或术后镇痛的儿科手术患者的随机对照试验进行了系统回顾和随机效应 meta 分析。纳入的研究比较了地塞米松(骶管、静脉注射或两者均有)与对照。止痛时间是主要结果。截至 2017 年 8 月 18 日，数据库来源为 Medline、Embase、Cochrane 图书馆和谷歌 Scholar，不受语言限制。筛选研究、数据提取和偏见评估的风险由两位作者独立进行，一式两份。使用 Cochrane 方法评估偏倚风险，使用推荐评估、开发和评价(等级)系统对证据的强度进行评分。

结果：最初的搜索检索到 93 篇文章。14 项随机对照试验，包括 1315 名儿童患者，符合纳入标准。除 1 项研究外，其余均涉及下腹部手术(睾丸固定术、腹股沟疝修补术和尿道下裂修复术)。地塞米松的尾剂量和静脉注射剂量分别为 0.1 - 0.2 mg/kg 和 0.5 - 1.5 mg/kg，所有研究集中在主要分析中。地塞米松通过两种尾路延长镇痛时间(5.43 小时，95%可信区间[CI]， 3.52-7.35;P <措施;I2 = 99.3%;N = 9;n = 620;质量等级=中等)和静脉输液路径(5.51 小时;95%置信区间,3.56 - -7.46;P <措施;I2 = 98.9%;N = 5;n = 364;质量等级=中等)与对照。地塞米松的次级好处包括麻醉后护理单位麻醉抢救镇痛需求降低(相对风险[RR]， 0.30;95%置信区间,0.18 - -0.51;P <措施;I2 = 0.0%;N = 5;bene t [NNTB] = 5 需要治疗的人数;95% CI, 4-7)，术后抢救镇痛需求减少(RR, 0.46;95%可信区间,0.23 - 0.92;P = 0。;I2 = 96.0%;N = 9;n = 629;NNTB = 3;2 - 20 95% CI,;降低术后恶心呕吐率(RR, 0.47;95%置信区间,0.30 - -0.73;P =措施;I2 = 0.0%;NNTB = 11;95%可信区间,在 8 至 21;N = 9;n = 628)。与地塞米松有关的不良事件非常罕见。

结论：骶管和静脉注射地塞米松对骶管阻滞延长镇痛有同样的效果有效，使持续时间增加一倍至三倍。鉴于骶管注射地塞米松尚未获得批准，建议静脉注射——尽管只研究了高剂量(0.5 mg/kg 至 10 mg)的静脉注射。

(高华塬 译 潘艳、薛张纲校）

BACKGROUND: Caudal block is commonly used to provide postoperative analgesia after pediatric surgery in the lower abdomen. Typically administered as a single-shot technique, 1 limitation of this block is the short duration of analgesia. To overcome this, dexamethasone has been used as an adjuvant to prolong block duration. However, there are concerns about steroid-related morbidity and the optimal route of dexamethasone administration (eg, caudal or intravenous) is unknown.

METHODS: We conducted a systematic review and random-effects meta-analysis of random- ized controlled trials recruiting pediatric surgical patients receiving a caudal block for surgical anesthesia or postoperative analgesia. Included studies compared dexamethasone (caudal, intravenous, or both) to control. Duration of analgesia was the primary outcome. Database sources were Medline, Embase, the Cochrane Library, and Google Scholar searched up to August 18, 2017, without language restriction. Screening of studies, data extraction, and risk of bias assessment were performed independently and in duplicate by 2 authors. Risk of bias was assessed using Cochrane methodology and the strength of evidence was scored using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system.

RESULTS: The initial search retrieved 93 articles. Fourteen randomized controlled trials that comprised 1315 pediatric patients met the inclusion criteria. All but 1 study

involved lower abdominal operations (orchidopexy, inguinal hernia repair, and hypospadias repair). The caudal and intravenous dose of dexamethasone ranged from 0.1 to 0.2 mg/kg and 0.5 to 1.5 mg/ kg, respectively, and all studies were pooled in the main analysis. Dexamethasone prolonged the duration of analgesia by both the caudal route (5.43 hours, 95% con dence interval [CI], 3.52–7.35; P < .001; I2 = 99.3%; N = 9; n = 620; GRADE quality = moderate) and intravenous route (5.51 hours; 95% CI, 3.56–7.46; P < .001; I2 = 98.9%; N = 5; n = 364; GRADE quality = moderate) versus control. Secondary bene ts of dexamethasone included reduced narcotic rescue analgesia requirement in the postanesthetic care unit (relative risk [RR], 0.30; 95% CI, 0.18–0.51; P < .001; I2 = 0.0%; N = 5; number needed to treat for bene t [NNTB] = 5; 95% CI, 4–7), less subsequent postoperative rescue analgesia requirement (RR, 0.46; 95% CI, 0.23– 0.92; P = .03; I2 = 96.0%; N = 9; n = 629; NNTB = 3; 95% CI, 2–20; n = 310), and lower rates of postoperative nausea and vomiting (RR, 0.47; 95% CI, 0.30–0.73; P = .001; I2 = 0.0%; NNTB = 11; 95% CI, 8–21; N = 9; n = 628). Adverse events linked to the dexamethasone were rare.

CONCLUSIONS: Caudal and intravenous dexamethasone are similarly effective for prolonging the duration of analgesia from caudal blockade, resulting in a doubled to tripled duration. Given the off-label status of caudal dexamethasone, intravenous administration is recommended—although only high intravenous doses (0.5 mg/kg up to 10 mg) have been studied.

5. 6 分钟步行距离短是否可以预示术后肌钙蛋白升高？

Does A Low 6-Minute Walk Distance Predict Elevated Postoperative Troponin?

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Anesthesia & Analgesia: 2018 127 Issue 2 - p e1–e3

我们研究了 100 例大血管手术和肾移植手术患者，将肌钙蛋白作为标志物，评估 6 分钟步行测试（6MWT）作为围术期心肌损伤指标的可行性。研究采用 logistic 回归分析和受试者工作特征曲线（ROC 曲线）下的面积来比较 6MWT、修订后的心脏风险指数和代谢当量。其中只有 6MWT 与术后肌钙蛋白升高有关（95% 可信区间， 0.98-0.99）。然而 6MWT 的 ROC 曲线下面积（0.71 [95% 可信区间，0.57-0.85]）与修订后的心脏风险指数（P=0.23）或代谢当量（P=0.14）的差异均无统计学意义。因此在围术期的心脏风险分级中， 6MWT 可能有一定作用。（王雅婷 译 潘艳、薛张纲校）

Our study of 100 major vascular and renal transplant patients evaluated the 6-minute walk test (6MWT) as an indicator of perioperative myocardial injury, using troponin as a marker. Using logistic regression and the area under the receiving operator characteristic curve, we compared the 6MWT to the Revised Cardiac Risk Index and metabolic equivalents. Only the 6MWT was associated with elevated postoperative

troponins (95% CI, 0.98-0.99). However, the 6MWT area under the receiving operator characteristic curve (0.71 [95% CI, 0.57-0.85]) was not different from the Revised Cardiac Risk Index (P = .23) or metabolic equivalents (P = .14). The 6MWT may have a role in cardiac risk stratification in the perioperative setting.

小儿围术期心脏停搏术后死亡：一项关于安全苏醒，提高儿科安全质量的倡议。
Pediatric Perioperative Cardiac Arrest, Death in the Off Hours: A Report From Wake Up Safe, The Pediatric Quality Improvement Initiative

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Anesthesia & Analgesia: 2018 127 472–477

小儿围手术期心脏停搏是一种罕见但又极危重的事件。 此篇病历对照研究旨在分析所有向唤醒安全组织汇报的儿童心跳停搏病例的病因，发生率及结局。 我们调查了与心脏停搏相关的因素及停搏后的死亡率，并研究了可能改善心跳停搏结局的治疗策略。儿童心脏停搏的定义来自唤醒安全小儿麻醉质量改进计划。这是一个多中心儿童麻醉不良事件注册机构。抽出有关心脏停搏发生率，人口统计学数据，潜在条件，病因及结局的数据，用描述性统计及逻辑回归的统计学方法研究上述与心脏停搏相关的因素及心脏停搏后的死亡率。在 1,006,685 次麻醉操作中共有 531 例心脏停搏发生。心脏停搏与年龄相关 ([95% 置信区间] 比较 ≥6 月 和<6 月 年龄组，让步比为 0.26 [0.22-0.32]; P = .014),与美国麻醉医师身体状况分类 相关(ASA PS III-V 与 I-II 比较, 9.24, 7.23-11.8; P < .001), 与紧急状况相关 (3.55, 2.88-4.37; P < .001)，更高的 ASA PS 与更高的死亡率相关(ASA PS III-V 与 I-II 比较， 3.25, 1.20-8.81; P = .02)， 但与麻醉有关的心脏停搏却对应更低的死亡率 (0.44, 0.26-0.74; P = .002)。 ASA 美国麻醉医师身体状况分类紧急情况 (1.83, 1.05-3.19; P = .03) 和休息时间 (夜晚及周末与工作日比较, 2.17, 1.22-3.86; P = .008) 是与心脏停搏后死亡率相关的其它因素。来自唤醒安全的数据验证了单一机构关于心脏停搏发生率，病因及儿童围术期心脏停搏结局的研究发现。然而，发生在休息时间的心脏停搏，在不考虑病人身体状况和急诊手术的条件下，明显得到更差的结局，这提示了改善结局的一个机会。

（符奕青 译 潘艳、薛张纲校）

Pediatric perioperative cardi ac arrest (CA) is a rare but catastrophic event. This case-control study aims to analyze the causes, incidence, and outcomes of all pediatric CA reported to Wake Up Safe. Factors associated with CA and mortality after arrest are examined and possible strategies for improving outcomes are considered.CA in children was identified from the Wake Up Safe Pediatric Anesthesia Quality Improvement Initiative, a multicenter registry of adverse events in pediatric anesthesia. Incidence, demographics, underlying conditions, causes of CA, and outcomes were extracted. Descriptive statistics and logistic regression were used to study the above factors associated with CA and mortality after CA.A total of 531 cases of CA occurred during 1,006,685 anesthetics. CA was associated with age (odds ratio [95% confidence interval] comparing ≥6 vs <6 months of 0.26 [0.22-0.32]; P = .014), American Society of Anesthesiologists physical status (ASA PS III-V versus

I-II, 9.24, 7.23-11.8; P < .001), and emergency status (3.55, 2.88-4.37; P < .001). Higher ASA PS was associated with increased mortality (ASA PS III-V versus I-II, 3.25, 1.20-8.81; P = .02) but anesthesia-related arrests were correlated with lower mortality (0.44, 0.26-0.74; P = .002). ASA emergency status (1.83, 1.05-3.19; P = .03) and off hours (night and weekend versus weekday, 2.17, 1.22-3.86; P = .008) were other factors associated with mortality after CA.The Wake Up Safe data validate single-institution studies' findings regarding incidence, factors associated with arrest, and outcomes of pediatric perioperative CA. However, CA occurring during the off hours had significantly worse outcomes, independent of patient physical status or emergency surgery. This suggests an opportunity for improved outcomes.

不同制剂的丁丙诺啡对慢性疼痛的疗效：临床研究的系统评价

Treatment of Chronic Pain With Various Buprenorphine Formulations: A Systematic Review of Clinical Studies

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Anesthesia & Analgesia: 2018 127 529–538

临床研究表明，丁丙诺啡是一种可用于治疗不同类型疼痛的药物。本研究调查了不同制剂的丁丙诺啡在慢性疼痛人群中的功效。本研究在 PubMed / MEDLINE，EMBASE，Cochrane 数据库，以及 clinicaltrials.gov 和 PROSPERO 上回顾了 2017 年 6 月 30 日之前的相关文献数据。通过回顾疼痛人群，干预措施，比较对象和结局，对 25 项随机对照试验进行了分析，包括 5 种不同的丙诺啡制剂：静脉注射丁丙诺啡制剂，舌下含服丁丙诺啡制剂，舌下含服丁丙诺啡/纳洛酮制剂，口服丁丙诺啡制剂和体外透皮丁丙诺啡制剂，主要与阿片类镇痛药或安慰剂作比较。在所回顾的 25 项研究中，共有 14 项研究显示丁丙诺啡在慢性疼痛治疗中有着显著的临床价值：6 项舌下和静脉注射丁丙诺啡的研究中有一篇，唯一一篇舌下含服丁丙诺啡/纳洛酮研究，3 篇口服丁丙诺啡研究中有 2 篇，15 篇透皮给药丁丙诺啡的研究中有 10 篇，均显示比对照组疼痛程度显着降低。在任何研究中均未报告严重不良反应。我们得出结论，体外透皮丁丙诺啡制剂对慢性疼痛患者可提供有效的镇痛，而基于目前有限的研究，口服丁丙诺啡制剂也具有广阔的前景。

(郭建 译 潘艳、薛张纲校)

Clinical studi es demonstrate that buprenorphine is a pharmacologic agent that can be used for the treatment of various types of painful conditions. This study investigated the efficacy of 5 different types of buprenorphine formulations in the chronic pain population. The literature was reviewed on PubMed/MEDLINE, EMBASE, Cochrane Database, clinicaltrials.gov, and PROSPERO that dated from inception until June 30, 2017. Using the population, intervention, comparator, and outcomes method, 25 randomized controlled trials were reviewed involving 5 buprenorphine formulations in patients with chronic pain: intravenous buprenorphine, sublingual buprenorphine, sublingual buprenorphine/naloxone, buccal buprenorphine, and transdermal buprenorphine, with comparators consisting of opioid analgesics or placebo. Of the 25 studies reviewed, a total of 14 studies demonstrated clinically significant benefit with

buprenorphine in the management of chronic pain: 1 study out of 6 sublingual and intravenous buprenorphine, the only sublingual buprenorphine/naloxone study, 2 out of 3 studies of buccal buprenorphine, and 10 out of 15 studies for transdermal buprenorphine showed significant reduction in pain against a comparator. No serious adverse effects were reported in any of the studies. We conclude that a transdermal buprenorphine formulation is an effective analgesic in patients with chronic pain, while buccal buprenorphine is also a promising formulation based on the limited number of studies.

针于设备采购的生命周期评估法与成本法：比较可重复使用及一次性使用的喉镜

Life Cycle Assessment and Costing Methods for Device Procurement: Comparing Reusable and Single-Use Disposable Laryngoscopes.

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Anesthesia &Analgesia 2018 127 434-443.

背景：传统医疗设备采购标准包括设备的有效性、安全性、使用及处理的难易程度还有采购成本等。然而，关于医疗设备从生产、使用到处理这一生命周期中对于环境的影响或是在购买后所产生的费用这方面的信息甚少。可重复使用的一次性喉镜是麻醉医师当前比较感兴趣的内容。许多机构面临越来越大的压力，为尽快满足或缓解来自于感染预防指南与监管机构建议这两者间的冲突，可能会选择使用一次性(SUD)硬性喉镜或过度清洗可重复使用的东西，这可能会增加成本并产生垃圾。本研究说明了在喉镜选择上对环境的影响以及使用者总成本的定量比较，这有利于设备采购和公共卫生方面的决策。

方法：我们详述了生命周期评估（LCA）法和生命周期-成本（LCC）法，并将其应用于耶鲁纽黑文医院（YNHH）的可重复使用金属或一次性塑料喉镜手柄和喉镜片。同时使用美国环境保护署的减少和评估化学及其它环境影响（Traci）生命周期评估方法来模拟温室气体和其它污染物的排放。

结果：一次性塑料手柄比传统的、低级消毒处理的、重复使用的不锈钢手柄多产生约 16-18 倍的二氧化碳当量（CO2-eq）。一次性塑料喉镜片比高级消毒处理的、可重复使用的、不锈钢喉镜片产生约 5-6 倍的 CO2-eq。一次性金属部件比所有替代物产生更高的排放。相比各种可重复使用清洗方案，一次性手柄和一次性喉镜片都增加了生命周期成本。推算若超过 1 年（60000 次插管），相比于可重复使用的东西，一次性手柄估计产生的支出增加了 495000~604000 美元，一次性喉镜片支出增加了 180000~265000 美元，这取决于可重复使用物品的清洗方案和假定 4000 次（额定）的用途。考虑到设备磨损，可重复使用的手柄如果持续使用 4-5 次，并且可重复使用的喉镜片在弃去前使用 5-7 次，就比一次性的更经济。

结论：生命周期评估法（LCA）和生命周期-成本法（LCC）是切实可行的两种方法，便于在设备采购时权衡环境影响及设施成本。虽然机构之间的管理实践各不相同，但本研究对所有标准清洁的方法进行了评价，并进行了敏感度的分析，

因而研究结果广泛适用。对于耶鲁纽黑文医院，可重复使用设备展现了相当大的成本优势，并且提供了更大的环境优势。从环境的角度来看，避免过度清洗可重复使用喉镜手柄和喉镜片是可取的。鉴于设备之间的成本不同，生命周期-成本法说明了在比较可重复使用设备和一次性设备选择时的时间-动作劳动分析的重要性。
（李艾伦 译 潘艳、薛张纲校）

BACKGROUND: Traditional medical device procurement criteria include efficacy and safety, ease of use and handling, and procurement costs. However, little information is available about life cycle environmental impacts of the production, use, and disposal of medical devices, or about costs incurred after purchase. Reusable and disposable laryngoscopes are of current interest to anesthesiologists. Facing mounting pressure to quickly meet or exceed conflicting infection prevention guidelines and oversight body recommendations, many institutions may be electively switching to single-use disposable(SUD) rigid laryngoscopes or overcleaning reusables, potentially increasing both costs and waste generation. This study provides quantitative comparisons of environmental impacts and total cost of ownership among laryngoscope options, which can aid procurement decision making to benefit facilities and public health.
METHODS: We describe cradle-to-grave life cycle assessment (LCA) and life cycle costing (LCC) methods and apply these to reusable and SUD metal and plastic laryngoscope handles and tongue blade alternatives at Yale-New Haven Hospital (YNHH). The US Environmental Protection Agency's Tool for the Reduction and Assessment of Chemical and other environmental Impacts (TRACI) life cycle impact assessment method was used to model environmental impacts of greenhouse gases and other pollutant emissions.
RESULTS: The SUD plastic handle generates an estimated 16-18 times more life cycle carbon dioxide equivalents (CO2-eq) than traditional low-level disinfection of the reusable steel handle. The SUD plastic tongue blade generates an estimated 5-6 times more CO2-eq than the reusable steel blade treated with high-level disinfection. SUD metal components generated much higher emissions than all alternatives. Both the SUD handle and SUD blade increased life cycle costs compared to the various reusable cleaning scenarios at YNHH. When extrapolated over 1 year (60,000 intubations), estimated costs increased between $495,000 and $604,000 for SUD handles and between $180,000 and $265,000 for SUD blades, compared to reusables, depending on cleaning scenario and assuming 4000 (rated) uses. Considering device attrition, reusable handles would be more economical than SUDs if they last through 4-5 uses, and reusable blades 5-7 uses, before loss.
CONCLUSIONS: LCA and LCC are feasible methods to ease interpretation of environmental impacts and facility costs when weighing device procurement options. While management practices vary between institutions, all standard methods of cleaning were evaluated and sensitivity analyses performed so that results are widely applicable. For YNHH, the reusable options presented a considerable cost advantage, in addition to offering a better option environmentally. Avoiding overcleaning reusable laryngoscope handles and blades is desirable from an

environmental perspective. Costs may vary between facilities, and LCC methodology demonstrates the importance of time-motion labor analysis when comparing reusable and disposable device options.

异丙酚通过调节线粒体通透性转变来减轻地氟醚的心肌保护作用

Propofol Attenuates the Myocardial Protection Properties of Desflurane by Modulating Mitochondrial Permeability Transition

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Anesthesia & Analgesia: 2018 127 387–397

背景：地氟醚和异丙酚具有心脏保护作用，但相对疗效尚不清楚。 本研究旨在比较地氟醚和异丙酚单次，同时和连续给药时的心肌保护作用。

方法：60 只新西兰白兔和 65 只分离的 Sprague Dawley 大鼠心脏随机接受地氟醚，异丙酚，同时地氟醚和异丙酚，或先用地氟醚，然后用丙泊酚。将兔子细分为接受缺血 - 再灌注并暂时闭塞左前降支或时间匹配的非缺血性灌注方案，而大鼠心脏在具有全局缺血再灌注的 Langendorff 模型中灌注。观察的终点是血液动力学，功能恢复和线粒体摄取 H-2-脱氧-D-葡萄糖作为线粒体通透性转换的指标。

结果：在兔子组中，使用异丙酚（P <.001），地氟醚（P <.001）和地氟醚与丙泊酚（P <.001）组的预负荷可导致卒中增加极小，但与戊巴比妥（P = 0.576）和地氟醚-丙泊酚（P =0 .374）相比没有增加的证据。就舒张末期压力 - 体积关系而言，与使用地氟醚 - 丙泊酚的非缺血性对照组相比，没有证据表明有增加（P =0 .364），但地氟醚有小幅但显着的增加（P <.001），而戊巴比妥（P <.001），异丙酚（P <.001）和地氟醚和异丙酚（P <.001）则明显增加。在大鼠心脏中，异丙酚与地氟醚和丙泊酚之间线粒体 H-活性无统计学差异（165±51 * 10 vs 154±51 * 10 g·mL·min / mumol; P = .998）。地氟醚的摄取量低于异丙酚（65±21 * 10 vs 165±51 * 10 g·mL·min / mumol; P = .039），但地氟醚和地氟醚 - 丙泊酚之间无统计学差异（65± 21 * 10 vs 59±11 * 10 g·mL·min / mumol; P = .999）。

结论：异丙酚和地氟醚具有心脏保护作用，但地氟醚比异丙酚更有效。 当与异丙酚同时使用时，地氟醚的额外益处丧失。

（许智鸿 译 潘艳、薛张纲校））

BACKGROUND: Desflurane and propofol are cardioprotective, but relative efficacy is unclear. The aim was to compare myocardial protection of single, simultaneous, and serial administration of desflurane and propofol.

METHODS: Sixty New Zealand White rabbits and 65 isolated Sprague Dawley rat hearts randomly received desflurane, propofol, simultaneous desflurane and propofol, or sequential desflurane then propofol. Rabbits were subdivided to receive either ischemia-reperfusion with temporary occlusion of the left anterior descending artery or a time-matched, nonischemic perfusion protocol, whereas rat hearts were perfused in a Langendorff model with global ischemia-reperfusion. End points were hemodynamic, functional recovery, and mitochondrial uptake of H-2-deoxy-D-glucose as an indicator of mitochondrial permeability transition.

RESULTS: In rabbits, there were minimal increases in preload-recruitable stroke-work with propofol (P < .001), desflurane (P < .001), and

desflurane-and-propofol (P < .001) groups, but no evidence of increases with pentobarbitone (P = .576) and desflurane-then-propofol (P = .374). In terms of end-diastolic pressure-volume relationship, there was no evidence of increase compared to nonischemic controls with desflurane-then-propofol (P = .364), a small but significant increase with desflurane (P < .001), and larger increases with pentobarbitone (P < .001), propofol (P < .001), and desflurane-and-propofol (P < .001).In rat hearts, there was no statistically significant difference in mitochondrial H-activity between propofol and desflurane-and-propofol (165 ± 51 * 10 vs 154 ± 51 * 10 g·mL·min/mumol; P = .998). Desflurane had lower uptake than propofol (65 ± 21 * 10 vs 165 ± 51 * 10 g·mL·min/mumol; P = .039), but there was no statistically significant difference between desflurane and desflurane-then-propofol (65 ± 21 * 10 vs 59 ± 11 * 10 g·mL·min/mumol; P = .999).
CONCLUSIONS: Propofol and desflurane are cardioprotective, but desflurane is more effective than propofol. The added benefit of desflurane is lost when used simultaneously with propofol.

在独特临床环境下不同剂量血浆输注后国际标准化比率的变化

Changes in International Normalized Ratios After Plasma Transfusion of Varying Doses in Unique Clinical Environments

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Anesthesia & Analgesia: 2018 127 349－357

背景:血浆输注通常用于纠正异常的凝血筛查实验。本研究的目的是评估大量不同凝血检查异常和相同疾病的患者以及不同临床环境中血浆剂量与凝血实验结果变化之间的关系。
方法: 在这个单中心的历史队列研究中，在 2011 年到 2015 年期间提取了所有有异常凝血筛查试验的成年患者的血浆输血事件。主要结果是病人的比例达到正常输血后国际标准化比率(INR≤1.1)与二级结果包括患者的比例达到部分 INR 正常化(INR≤1.5)或者至少 50%的正常化输血前 1.1 的 INR 值
结果:总共有 6779 例患者接受了中位(四分位)预输血 INR 为 1.9(1.6-2.5)，中位输血量为 2(2-3)单位的血浆。大多数(85%)的输血发生在围手术期，20%的输血在手术前进行预防性注射。INR 下降中位数为 0.4(0.2-0.8)。12%的患者完全 INR 正常化。输血前 INR 值<3 时 INR 值的降低幅度不大。病人接受≥3 单位等离子体更容易实现至少比那些接受 50%的正常化 INR≤2 单位(68% vs 60%;P <0.001)
结论:在通常使用的临床剂量下，血浆输血后 INR 的变化是温和的，特别是在那些基础凝血筛查试验不那么混乱的患者中。需要进一步的研究来评估血浆介导的 INR 变化与临床结果之间的关系。
（刘玉齐译 李士通校）
BACKGROUND: Plasma transfusion is commonly performed for the correction of abnormal coagulation screening tests. The goal of this investigation was to assess the relationship between the dose of plasma administered

and changes in coagulation test results in a large and diverse cohort of patients with varying levels of coagulation abnormalities and comorbid disease and in a variety of clinical settings.

METHODS: In this single-center historical cohort study, all plasma transfusion episodes in adult patients with abnormal coagulation screening tests were extracted between 2011 and 2015. The primary outcome was the proportion of patients attaining normal posttransfusion international normalized ratio (INR ≤ 1.1) with secondary outcomes including the proportion of patients attaining partial normalization of INR (INR ≤ 1.5) or at least 50% normalization in pretransfusion values with respect to an INR of 1.1.

RESULTS: In total, 6779 unique patients received plasma with a median (quartiles) pretransfusion INR of 1.9 (1.6-2.5) and a median transfusion volume of 2 (2-3) units. The majority (85%) of transfusions occurred perioperatively, with 20% of transfusions administered prophylactically before a procedure. The median decrease in INR was 0.4 (0.2-0.8). Complete INR normalization was obtained in 12%. Reductions in INR were modest with pretransfusion INR values <3. Patients receiving ≥3 units of plasma were more likely to achieve at least 50% normalization in INR than those receiving ≤2 units (68% vs 60%; P < .001).

CONCLUSIONS: Changes in INR after plasma transfusion were modest at typically used clinical doses, particularly in those with less severely deranged baseline coagulation screening tests. Further studies are necessary to assess the relationships between plasma-mediated changes in INR and clinical outcomes.

再灌注综合征对活体肝移植术后急性肾损伤的影响：倾向性评分分析

The Impact of Postreperfusion Syndrome on Acute Kidney Injury in Living Donor Liver Transplantation: A Propensity Score Analysis

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Anesthesia & Analgesia: 2018 127 369 - 378

背景：再灌注综合征（PRS）已被证实与原位肝移植术后并发症和移植失败有关。迄今为止，很少有人知道再灌注综合征对术后急性肾损伤（AKI）和活体肝移植（LDLT）术后转归的影响。本研究的目的即确定再灌注综合征对活体肝移植术后急性肾损伤及术后转归的影响。

方法：我们回顾性地收集和评估了 2008 年 1 月至 2015 年 10 月期间 1865 例接受 LDLT 手术的患者记录。根据 PRS 的发展情况将患者分为 2 组：PRS 组（n＝715）和无 PRS 组（n＝1150）。采用多变量 Logistic 和 Cox 比例风险性回归模型分析 AKI 及其死亡率的危险因素。设计倾向指数（PS）分析（PS 匹配和逆概率处理的加权分析）来比较 2 组病人的转归。

结果：再灌注综合征（PRS）的发生率为 38%，病死率为 7%。在未调整的分析中，

PRS 组与非 PRS 组相比，急性肾损伤（AKI）的发生率更高（P＜0.001），住院时间更长（P＝0.010），在 ICU 停留超过 7 天的几率更高（P＜0.001）。经过倾向性匹配和逆概率权重法分析后，PRS 组术后发生 AKI（两组分别为 P＝0.023 和 P＝0.017）和活体肝移植（LDLT）术后 3 个月发生肾功能不全（两组分别为 P＝0.036 和 P＝0.006）的几率均较高，在 ICU 停留超过 7 天的几率也较高（两组分别为 P＝0.014 和 P＝0.032）。

结论：我们证明，由再灌注综合征（PRS）引发的低血压的幅度和持续时间是导致活体肝移植（LDLT）术后急性肾损伤（AKT）AKI 发展及导致术后 3 个月肾功能障碍的一个因素。

（吴洁译 李士通校）

BACKGROUND: Postreperfusion syndrome (PRS) has been shown to be related to postoperative morbidity and graft failure in orthotopic liver transplantation. To date, little is known about the impact of PRS on the prevalence of postoperative acute kidney injury (AKI) and the postoperative outcomes after living donor liver transplantation (LDLT). The purpose of our study was to determine the impact of PRS on AKI and postoperative outcomes after LDLT surgery.

METHODS: Between January 2008 and October 2015, we retrospectively collected and evaluated the records of 1865 patients who underwent LDLT surgery. We divided the patients into 2 groups according to the development of PRS: PRS group (n = 715) versus no PRS group (n = 1150). Risk factors for AKI and mortality were investigated by multivariable logistic and Cox proportional hazards regression model analysis. Propensity score (PS) analysis (PS matching and inverse probability of treatment weighting analysis) was designed to compare the outcomes between the 2 groups. **RESULTS:** The prevalence of PRS and the mortality rate were 38% and 7%, respectively. In unadjusted analyses, the PRS group showed more frequent development of AKI (P < .001), longer hospital stay (P = .010), and higher incidence of intensive care unit stay over 7 days (P < .001) than the no PRS group. After PS matching and inverse probability of treatment weighting analysis, the PRS group showed a higher prevalence of postoperative AKI (P = .023 and P = .017, respectively) and renal dysfunction 3 months after LDLT (P = .036 and P = .006, respectively), and a higher incidence of intensive care unit stay over 7 days (P = .014 and P = .032, respectively).

CONCLUSIONS: We demonstrated that the magnitude and duration of hypotension caused by PRS is a factor contributing to the development of AKI and residual renal dysfunction 3 months after LDLT.

比较心输出量的方法：用三维超声心动图测量的术中多普勒心输出量与肺导管热稀释测得的心输出量二者不可互换

Comparing Methods for Cardiac Output: Intraoperatively Doppler-Derived Cardiac Output Measured With 3-Dimensional Echocardiography Is Not Interchangeable With Cardiac Output by Pulmonary Catheter Thermodilution

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Anesthesia & Analgesia: 2018 127 399 - 407

背景：心输出量（CO）的估计对于循环不稳定患者的治疗是必不可少的。 通过肺动脉导管热稀释测量的CO被认为是金标准，但有并发严重并发症的可能。 心搏量和CO可通过经食道超声心动图（TEE）测量，其在心脏手术期间广泛使用。我们假设三维(3D)TEE的多普勒衍生的CO与肺动脉导管热稀释测量的CO一致，作为基于对左心室流出道的横截面积的精确测量的参考方法。
方法：本研究的主要目的是在大量接受心脏手术的患者中对三维（3D）TEE多普勒衍生的CO和热稀释测量的CO进行系统比较。 通过比较TEE的横截面积与心脏计算机断层扫描（CT）血管造影进行亚分析。研究包括择期行心脏手术的62名患者被包括在内;由于回归原因排除1名。纳入标准是冠状动脉搭桥手术（N = 42）和主动脉瓣置换术（N = 19）。排除标准是慢性心房颤动，左心室射血分数低于0.40和心内分流。19名随机选择的患者在手术前一天进行了心脏CT检查。存储所有图像用于盲法分析，并且使用Bland-Altman图来评估测量方法之间的一致性，偏差的定义（方法之间的平均差异），置信区间和百分比误差（一致性除以2种方法的平均值）。确定各个方法的精确度（等于重复测量之间偏差的2个标准偏差），以确定可接受的一致限度。
结果：我们发现通过3D TEE测量的多普勒衍生CO具有良好的精确度，但尽管3D与多普勒衍生的CO相比与热稀释相比误差仅为0.3 L / min（置信区间，0.04-0.58），但是置信区间广泛（-1.8至2.5 L / min），百分比误差为55％。与心脏CT血管造影相比，通过3D TEE测量的横截面积具有-0.27cm^2的低偏差（置信区间，-0.45至-0.08）和18％的百分比误差。
结论：尽管偏差较低，但通过热稀释与3D相比，3D TEE对多普勒衍生的CO的一致性的宽限制将限制临床应用，因此不能认为可与通过热稀释获得的CO互换。
(张渺译 李士通校)
BACKGROUND: Estimation of cardiac output (CO) is essential in the treatment of circulatory unstable patients. CO measured by pulmonary artery catheter thermodilution is considered the gold standard but carries a small risk of severe complications. Stroke volume and CO can be measured by transesophageal echocardiography (TEE), which is widely used during cardiac surgery. We hypothesized that Doppler-derived CO by 3-dimensional (3D) TEE would agree well with CO measured with pulmonary artery catheter thermodilution as a reference method based on accurate measurements of the cross-sectional area of the left ventricular outflow tract.
METHODS: The primary aim was a systematic comparison of CO with Doppler-derived 3D TEE and CO by thermodilution in a broad population of patients undergoing cardiac surgery. A subanalysis was performed comparing cross-sectional area by TEE with cardiac computed tomography (CT) angiography. Sixty-two patients, scheduled for elective heart surgery, were included; 1 was subsequently excluded for logistic reasons.

Inclusion criteria were coronary artery bypass surgery (N = 42) and aortic valve replacement (N = 19). Exclusion criteria were chronic atrial fibrillation, left ventricular ejection fraction below 0.40 and intracardiac shunts. Nineteen randomly selected patients had a cardiac CT the day before surgery. All images were stored for blinded post hoc analyses, and Bland-Altman plots were used to assess agreement between measurement methods, defined as the bias (mean difference between methods), limits of agreement (equal to bias ± 2 standard deviations of the bias), and percentage error (limits of agreement divided by the mean of the 2 methods). Precision was determined for the individual methods (equal to 2 standard deviations of the bias between replicate measurements) to determine the acceptable limits of agreement.

RESULTS: We found a good precision for Doppler-derived CO measured by 3D TEE, but although the bias for Doppler-derived CO by 3D compared to thermodilution was only 0.3 L/min (confidence interval, 0.04–0.58), there were wide limits of agreement (−1.8 to 2.5 L/min) with a percentage error of 55%. Measurements of cross-sectional area by 3D TEE had low bias of −0.27 cm^2 (confidence interval, −0.45 to −0.08) and a percentage error of 18% compared to cardiac CT angiography.

CONCLUSIONS: Despite low bias, the wide limits of agreement of Doppler-derived CO by 3D TEE compared to CO by thermodilution will limit clinical application and can therefore not be considered interchangeable with CO obtained by thermodilution. The lack of agreement is not explained by lack of agreement of the 3D technique.

内镜逆行胰胆管造影术中静脉空气栓塞的发生率

Incidence of Venous Air Embolism During Endoscopic Retrograde Cholangiopancreatography

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Anesthesia & Analgesia: 2018 127 420–423

背景：内镜逆行胰胆管造影术（ERCP）的已知并发症包括胰腺炎，出血，十二指肠穿孔和静脉空气栓塞（VAE）。本研究的目的是确定 ERCP 期间 VAE 的发生率，并能够区分高风险和低风险的 ERCP。

方法：这是一项前瞻性队列研究，由接受 ERCP 治疗且接受 VAE 心前区多普勒超声（PDU）监测的患者组成。PDU 监测由数字记录和分析以确认可疑的 VAE。分析了与麻醉护理，内窥镜手术和术中血流动力学相关的人口统计学和临床数据。

结果：在 15 个月的时间内共进行了 843 次 ERCP 手术。VAE 的发生率为 2.4％（20 名患者）。所有 VAE 都发生在支架置入，括约肌切开术，活组织检查，导管扩张，胆结石取出，胆管镜检查或坏死切除术的过程中。 20 例（50％）VAE 中有 10

例与血液动力学改变有关。如果仅是诊断性的或用于移除支架的操作，则不会发生。对手术类型的细分分析显示，当移除支架然后更换支架或进行胆管镜检查时，在统计学上 VAE 的发生会更加频繁。

结论：VAE 的高发病率凸显了从业者需要意识到这一潜在的严重事件。 PDU 的使用有助于在 ERCP 期间检测 VAE，尤其在高风险治疗过程中应予以考虑。在发生诸如心血管衰竭的严重不良事件之前，可以进行检测以行适当的干预。

（张渺译 李士通校）

BACKGROUND: Known complications of endoscopic retrograde cholangiopancreatography (ERCP) include pancreatitis, bleeding, duodenal perforation, and venous air embolism (VAE). The aim of this study was to determine the incidence of VAE during ERCP and be able to differentiate high-risk versus low-risk ERCP procedures.

METHODS: This is a prospective cohort study consisting of patients who underwent ERCP and were monitored with a precordial Doppler ultrasound (PDU) for VAE. PDU monitoring was digitally recorded and analyzed to confirm the suspected VAE. Demographic and clinical data related to the anesthetic care, endoscopic procedure, and intraoperative hemodynamics were analyzed.

RESULTS: A total of 843 ERCP procedures were performed over a 15-month period. The incidence of VAE was 2.4% (20 patients). All VAE's occurred during procedures in which stent placement, sphincterotomy, biopsy, duct dilation, gallstone retrieval, cholangioscopy, or necrosectomy occurred. Ten of 20 (50%) of VAEs were associated with hemodynamic alterations. None occurred if the procedure was only diagnostic or for stent removal. Subanalysis for the type of procedure showed that VAE was statistically more frequent when stents were removed and then replaced or if a cholangioscopy was performed.

CONCLUSIONS: The high incidence of VAE highlights the need for practitioners to be aware of this potentially serious event. Use of PDU can aid in the detection of VAE during ERCP and should be considered especially during high-risk therapeutic procedures. Detection may allow appropriate interventions before serious adverse events such as cardiovascular collapse occur.

大城市三级医院中为期 10 年的输血相关急性肺损伤发生率的研究

The Incidence of Transfusion-Related Acute Lung Injury at a Large, Urban Tertiary Medical Center: A Decade's Experience

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Anesthesia & Analgesia: 2018 127 444－449

背景：近期研究报告输血浆后的输血相关急性肺损伤（TRALI）的发生率是 0.008%，

输全血后的输血相关急性肺损伤是 0.004%，仍然是输血相关死亡率中的首要原因，占 37%。因为血库人为支配血浆的运输，使得输血相关急性肺损伤的出现减小到一个极低的发生概率。这个研究的目的是为了估计目前能够在创伤、失血性休克和大量输血时早期积极使用血浆的大城市三级医院中 TRALI 的发生率。

方法：查询从 2002 年 9 月到 2013 年 3 月在我院血库登记输血的患者。血库收集调查所有临床上定义为 TRALI 的急性肺损伤，以及潜在的病例那些被召回的具有高反应活性的人类白细胞抗原抗体的捐献品（抗体可能导致 TRALI）。临床反应加上独立血清学试验，该反应被输血医师划为“可能的 TRALI”或者“病因学无关的”。同时记录在这个时间段里所有被估计 TRALI 发生率的单位输血。对病例的一般情况，结果，血型，观察症状，持续时间以及输血类型进行分析。

结果：在创伤中心共有 7 例病例被确诊。在 2002 年 9 月至 2013 年 3 月，一共有 714757 个单位的血制品被输注。在整个研究周期中，TRALI 的发生率为每 10 万个单位中发生一次。广泛的病人受到了影响。与之前描述的一样，一次急性症状的持续时间为平均 1.4 天，通常通过支持治疗处理。在血浆制品中，特殊类型和非特殊类型的反应都很主要。

结论：本研究表明，虽然 TRALI 仍然存在，但临床有意义的病例是罕见的。此外，尽管在创伤环境中血浆和血小板的使用越来越多，但 TRALI 的比率仍然很低。

（方怡娇译 李士通校）

BACKGROUND: While transfusion-related acute lung injury (TRALI) remains the primary cause of transfusion-related fatalities (37%), recent reports estimate the incidence of TRALI at 0.008% per unit of plasma transfused and 0.004% per all products transfused. Because blood banks have moved toward male-predominant plasma, TRALI appears, anecdotally, to have been reduced to an extremely rare event. The purpose of this study was to estimate the current incidence of TRALI at a large, urban center known for its early and aggressive use of plasma in the setting of trauma, hemorrhagic shock, and massive transfusion.

METHODS: The Blood Bank Registry of our hospital was queried for all transfused patients admitted from September 2002 through March 2013. The blood bank collected and investigated all cases of clinical acute lung injury meeting the consensus definition for TRALI, as well as potential cases for which the donor product was recalled for having a high reactivity level of human leukocyte antigen antibodies (ie, the antibodies that could cause TRALI). Clinical reactions were reviewed in conjunction with independent serological testing and classified by transfusion medicine physicians as being “probable TRALI” or of “unrelated etiology.” The total number of units transfused at our facility during this time period was also obtained, allowing the incidence of TRALI to be estimated. Cases were analyzed based on demographics, outcome, blood types, observed symptoms and their duration, and type of product transfused.

RESULTS: Seven cases were identified at our center for the indicated time period, with only 3 of these occurring in trauma. A total of 714,757 units of blood products were transfused between September 2002 and March 2013. The incidence of TRALI was estimated to be 1 case per 100,000 units of

product for the entire study period. A broad range of patients was affected. Consistent with previous descriptions, an acute duration of symptoms (average, 1.4 days) was observed and usually resolved with supportive care. Reactions were observed predominantly in plasma products, both type specific and nontype specific.
CONCLUSIONS:This study demonstrates that while TRALI still occurs, clinically meaningful cases are rare. Moreover, TRALI rates remain low despite the increasingly aggressive use of plasma and platelets in the trauma setting.

常规术前怀孕测试的回顾性研究:结果和观点
Retrospective Review of Universal Preoperative Pregnancy Testing: Results and Perspectives
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Anesthesia & Analgesia: 2018 127 e4–e5

在实施择期手术的患者中未被发现怀孕可导致重大的并发症,因此被给与特殊的关注。在发达国家中，准确并且廉价的尿妊娠试验被广泛的应用。因此，通常常规术前怀孕筛查会被实施。但是这种常规检查的效用是有争议的。我们回顾性研究了美国亚利桑那州菲尼克斯梅奥医院的 8245 例术前怀孕试验，发现 11 个阳性结果中有 6 个是假阳性。我们在近乎普查的基础上，认为在病人中术前怀孕试验提供了较低的预测率。
（方怡娇译 李士通校）
Unrecognized pregnancy in patients presenting for elective surgery is of particular concern due to the potential for significant complications. Accurate and inexpensive urine pregnancy tests are widely available in the developed world. As a result, universal preoperative pregnancy screening is commonly implemented. However, the utility of such routine testing is controversial. We retrospectively studied 8245 immediate presurgery pregnancy tests at Mayo Clinic Hospital, Phoenix, AZ, and found 11 positive tests of which 6 were false positives. We constructed a census-based approximation for unrecognized pregnancies, which shows significantly low pretest probability in this patient population. Taken together, the utility of immediate universal presurgical pregnancy testing is questionable.

临床指南对门诊小儿腺样体扁桃体切除术后再访的影响
Impact of Clinical Guidelines on Revisits After Ambulatory Pediatric Adenotonsillectomy
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Anesthesia & Analgesia: 2018 127 478–484

背景：小儿腺样体扁桃体切除术是常见的并且已知具有严重潜在并发症的风险。

需要重新访问急诊科或再入院的并发症会增加成本，且可能与联邦项目的较低报销政策相联系。在 2011 年和 2012 年，发布了儿科和外科组织关于选择门诊患者的建议意见。 我们假设实践模式中与指南相关的变化会降低再访的几率。本研究的主要结局是评估在考虑预干预时间趋势和水平后，在发布指南后，并发症相关再访的几率是否下降。次要结局是确定指南发布与门诊手术人群特征之间是否存在时间关联。

方法：本研究采用间断时间序列设计来评估临床指南对再访的纵向影响。结局规定为私人保险患者进行门诊扁桃体切除术后的再访。数据来自 Truven Health Analytics MarketScan 数据库，2008-2015。再访规定为最常见的并发症类型：出血，脱水，疼痛，恶心，呼吸问题，感染和发热。时间段由手术于指南发布之前，之间和之后进行来规定。未调整的比值比估计再访和临床协变量之间的关联。采用多变量逻辑回归评估指南对再访的影响。使用 Wald 检验测试了指南发布前，期间和之后时间段再访趋势的差异。

结果在 P <.005 时具有统计学意义。

结果：共有 326,993 例手术符合研究标准。绝对再访率随着时间的推移而增加，从 5.9%（95%可信区间[CI]，5.8-6.0）增加到 6.7%（95%CI，6.6-6.9）。幼儿比例略有下降，从 6.4%下降到 5.9%（P <.001）。在门诊手术中心进行扁桃体切除术的患者比例增加（16.5%-31%；P <.001），阻塞性睡眠呼吸暂停（7.0%-14.0%；P <.001）和睡眠障碍呼吸（20.6%-35.0%；P <.001）的发生率也都有增加。在针对年龄，性别，合并症和手术地点的多变量逻辑回归模型中，在预指导期间再访的几率增加（每月增加 0.4%；95%CI，0.24%-0.54%；P <.001）。指导后，这一月度增长没有继续（P = .002）。

结论：虽然指南发布后术后再访的几率没有下降，但指导前后时间段的趋势存在显著差异。门诊手术人群的变化也表明至少部分是遵守指南的。

(沈辰译 李士通校)

BACKGROUND: Pediatric adenotonsillectomies are common and carry known risks of potentially severe complications. Complications that require a revisit, to either the emergency department or hospital readmission, increase costs and may be tied to lower reimbursements by federal programs. In 2011 and 2012, recommendations by pediatric and surgical organizations regarding selection of candidates for ambulatory procedures were issued. We hypothesized that guideline-associated changes in practice patterns would lower the odds of revisits. The primary objective of this study was to assess whether the odds of a complication-related revisit decreased after publication of guidelines after accounting for preintervention temporal trends and levels. The secondary objective was to determine whether temporal associations existed between guideline publication and characteristics of the ambulatory surgical population.

METHODS: This study employs an interrupted time series design to evaluate the longitudinal effects of clinical guidelines on revisits. The outcome was defined as revisits after ambulatory tonsillectomy for privately insured patients. Data were sourced from the Truven Health Analytics MarketScan database, 2008–2015. Revisits were defined by the most prevalent complication types: hemorrhage, dehydration, pain, nausea,

respiratory problem, infection, and fever. Time periods were defined by surgeries before, between, and after guidelines publication. Unadjusted odds ratios estimated associations between revisits and clinical covariates. Multivariable logistic regression was used to estimate the impact of guidelines on revisits. Differences in revisit trends among pre-, peri-, and postguideline periods were tested using the Wald test. Results were statistically significant at $P < .005$.

RESULTS: A total of 326,993 surgeries met study criteria. The absolute revisit rate increased over time, from 5.9% (95% confidence interval [CI], 5.8–6.0) to 6.7% (95% CI, 6.6–6.9). The proportion of young children declined slightly, from 6.4% to 5.9% ($P < .001$). The proportion of patients having a tonsillectomy in an ambulatory surgery center increased (16.5%–31%; $P < .001$), as did the prevalence of obstructive sleep apnea (7.0%–14.0%; $P < .001$) and sleep-disordered breathing (20.6%–35.0%; $P < .001$). In a multivariable logistic regression model adjusted for age, sex, comorbidities, and surgical location, odds of a revisit increased during the preguideline period (0.4% increase per month; 95% CI, 0.24%–0.54%; $P < .001$). This monthly increase did not continue after guidelines ($P = .002$).

CONCLUSIONS: While odds of a postoperative revisit did not decline after guideline publication, there was a significant difference in trend between the pre- and postguideline periods. Changes in the ambulatory surgery population also suggest at least partial adherence to guidelines.

拒绝输血的心脏手术患者接受促红细胞生成素与未接受者相比较的结果：一项匹配的队列研究

Outcomes in Patients Undergoing Cardiac Surgery Who Decline Transfusion and Received Erythropoietin Compared to Patients Who Did Not: A Matched Cohort Study

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Anesthesia & Analgesia: 2018 127 490–495

背景： 红细胞生成刺激剂，例如促红细胞生成素（EPO），可用于治疗术前贫血。一些研究提示的死亡及血栓形成事件的风险增加，以及在心血管外科手术中的使用仍尚无定论。这项研究比较了拒绝输血而接受 EPO 的心脏手术患者与没有接受 EPO 患者匹配队列的结果。

方法： 在机构审查委员会批准后，我们对所有在 2004 年 1 月 1 日至 2015 年 6 月 15 日期间接受心脏手术，拒绝输血并且在单一机构接受 EPO 的输血患者进行了回顾性研究。对照患者为在同一时期内，围手术期未接受 EPO 且未输注同种异体红细胞的患者。使用基于年龄，手术日期，性别，手术程序和外科医生的最佳匹配算法将每个 EPO 患者匹配两个对照。欧洲心脏手术风险评估系统（EuroSCORE）和匹配队列中保持不平衡的基线特征用于评估患者预后。主要结局是死亡率和血栓形成事件的综合，次要结局包括从基线到出院的血红蛋白（Hb）变化，急性肾

损伤(AKI),胸骨伤口感染,心房颤动,拔管时间,重症监护病房和住院时间(LOS)。
结果：将 55 例拒绝输血并接受 EPO 的患者与围手术期未接受 EPO 或红细胞输血的 106 名最佳匹配对照患者进行比较。EuroSCORE 的中位数在 EPO 组和对照组之间相似[6（4,9）vs 5（3,7）; P = .39]。主要结果无差异（P = .12），两组死亡率均为零。 EPO 组术前平均 Hb 较高（13.91 g / dL vs 13.31; P = .02），Hb 较基线变化较小(-2.65 vs -3.60; P = .001)。AKI 发生率(47.17％vs 41.51％; P = .49）相似，所有其他结果均无显着差异，包括拔管时间，住院或重症监护病房时间（LOS)。
结论：在这项回顾性匹配队列研究中，拒绝输血并接受 EPO 的患者与对照组患者相比，结果没有临床意义上的差异。
BACKGROUND: Erythropoiesis-stimulating agents, such as erythropoietin (EPO), can be used to treat preoperative anemia. Some studies suggest an increased risk of mortality and thrombotic events, and use in cardiovascular surgery remains off-label. This study compares outcomes in cardiac surgery patients declining blood transfusion who received EPO with a matched cohort who did not.
METHODS: After institutional review board approval, we conducted a retrospective review of all patients who decline blood transfusion who underwent cardiac surgery and received EPO between January 1, 2004, and June 15, 2015, at a single institution. Control patients who did not receive EPO and were not transfused allogeneic red blood cells perioperatively were identified during the same period. Two controls were matched to each EPO patient using an optimal matching algorithm based on age, date of surgery, gender, operative procedure, and surgeon. The European System for Cardiac Operative Risk Evaluation (EuroSCORE) and baseline characteristics remaining unbalanced in the matched cohorts were controlled for in assessing patient outcomes. The primary outcome was a composite of mortality and thrombotic events, and secondary outcomes included change in hemoglobin (Hb) from baseline to discharge, acute kidney injury (AKI), sternal wound infection, atrial fibrillation, time to extubation, intensive care unit, and hospital length of stay (LOS).
RESULTS: Fifty-three patients who decline transfusion and received EPO were compared to 106 optimally matched control patients who did not receive EPO or red blood cell transfusion in the perioperative period. The median additive EuroSCORE was similar between the EPO and control group [6 (4, 9) vs 5 (3, 7), respectively; P = .39]. There was no difference in the primary outcome (P = .12) and mortality was zero in both groups. The EPO group had a higher mean preoperative Hb (13.91 g/dL vs 13.31; P = .02) and a smaller change in Hb from baseline (−2.65 vs −3.60; P = .001). The incidence of AKI (47.17% vs 41.51%; P = .49) was similar and there was no significant difference in all other outcomes, including time to extubation, hospital LOS, or intensive care unit LOS.

CONCLUSIONS:In this retrospective matched cohort study of patients declining transfusion and receiving EPO matched to control patients, there were no clinically meaningful differences in the outcomes.

阿片类药物使用障碍:特殊人群的围手术期管理

Opioid Use Disorders: Perioperative Management of a Special Population Ward

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Anesthesia & Analgesia: 2018 127 539－547

与阿片类药物有关的过量死亡在过去十年达到了流行水平。预防、识别和治疗阿片类药物使用障碍(OUDs)的工作主要集中在门诊。尽管他们经常被高估，但对OUDs患者的住院管理了解较少。具体来说，OUDs患者的围手术期是一个非常脆弱的时期，关于急性疼痛的最佳治疗方法的研究很少。术前评估的目的应该是识别有OUDs的患者，并评估可能干扰OUD治疗和疼痛管理的因素。应努力向患者及其支持系统提供教育和援助。对于那些积极与阿片类药物使用作斗争的人来说，围手术期可以是一个参与和开始治疗的机会。丁丙诺啡、美沙酮和纳曲酮药物治疗对乌德和阿片类药物耐受性复杂的围手术期疼痛管理。一个多学科的团队方法是至关重要的，以提供临床平衡的疼痛缓解，而不危及患者的恢复。本文综述了目前关于OUDs患者围手术期管理的文献，并对该患者群体的最佳护理提出了临床建议。

（刘玉齐译 李士通校）

Opioid-related overdose deaths have reached epidemic levels within the last decade. The efforts to prevent, identify, and treat opioid use disorders (OUDs) mostly focus on the outpatient setting. Despite their frequent overrepresentation, less is known about the inpatient management of patients with OUDs. Specifically, the perioperative phase is a very vulnerable time for patients with OUDs, and little has been studied on the optimal management of acute pain in these patients. The preoperative evaluation should aim to identify those with OUDs and assess factors that may interfere with OUD treatment and pain management. Efforts should be made to provide education and assistance to patients and their support systems. For those who are actively struggling with opioid use, the perioperative phase can be an opportunity for engagement and to initiate treatment. Buprenorphine, methadone, and naltrexone medication treatment for OUD and opioid tolerance complicate perioperative pain management. A multidisciplinary team approach is crucial to provide clinically balanced pain relief without jeopardizing the patient’s recovery. This article reviews the existing literature on the perioperative management of patients with OUDs and provides clinical suggestions for the optimal care of this patient population.