嗜鹼性粒細胞啟動試驗診斷舒更葡糖誘導的過敏性反應的有效性

Usefulness of Basophil Activation Tests for Diagnosis of Sugammadex-Induced Anaphylaxis

Horiuchi, Tatsuo, MD*; Yokohama, Akihiko, MD, PhD†; Orihara, Masaki, MD*; Tomita, Yukinari, MD, PhD‡; Tomioka, Akihiro, MD, PhD§; Yoshida, Nagahide, MD, PhD‖; Takahashi, Kenichiro, MD, PhD¶; Saito, Shigeru, MD, PhD*; Takazawa, Tomonori, MD, PhD#

Anesthesia & Analgesia: 2018 126 1509–1516

背景：舒更葡糖可以逆轉許多全身麻醉情況下神經肌肉阻滯劑的作用，但有一些關於使用舒更葡糖後發生過敏性反應的報導。皮膚測試時檢測過敏性反應致病因素的金標準。由於缺乏關於舒更葡糖的相關驗證性試驗，診斷準確性可能不足。目前，嗜鹼性粒細胞啟動試驗已被確立為一種具有高靈敏度和特異度的檢測過敏性反應致病因數的工具。然而，幾乎沒有試驗對嗜鹼性粒細胞啟動試驗對舒更葡糖誘導的過敏性反應的效用進行研究。

方法：本研究納入了 8 例在全身麻醉過程中對舒更葡糖立即發生反應的患者，並進行皮膚測試以診斷是否發生舒更葡糖誘導的過敏性反應。21 名對舒更葡糖相關過敏性皮膚試陰性患者作為對照組。選擇的嗜鹼性粒細胞用 CD63 和 CD203c 進行標記。

結果：活化嗜鹼性粒細胞比例顯著高於對照組：患者和對照組 CD203c 曲線下面積的中值分別為 1,265,985（95%可信區間[CI]，77,580-5,040,270）和 116,325（95 %CI，-268,605 至 232,690）（Mann-Whitney U 檢驗，P <0.01），患者和對照的 CD63 曲線下麵積分別為 788,647（95%CI，120,285-3,523,410）和 220,005 95%CI，-50,346 至 404,680）（Mann-Whitney U 檢驗，P <0.01）。這些患者表現出明顯的劑量依賴性 CD203c 上調，在 CD63 標記中結果一致。在 CD203c 標記結果中，BAT 對舒更葡糖的敏感性為 88%（95%CI，47%-100%），特異性為 100%（95%CI，84%-100%），而在 CD63 標記中敏感性和特異性分別為 75%（95%CI，35%-97%）和 100% （95% CI, 84%-100%）。

結論：該粒細胞活化試驗用於皮膚測試來診斷舒更葡糖誘導的過敏性反應有比較好的準確度。因此，CD203c 和 CD63 均可以用來檢測活化的嗜鹼性粒細胞。

（趙明曄譯 潘豔、薛張綱校）

BACKGROUND: Sugammadex is used to reverse the effects of neuromuscular blocking agents in many cases of general anesthesia. However, there are several reports of anaphylaxis after its use. Skin testing is the gold standard for detecting the causative agent of anaphylaxis. However, due to the lack of validated protocols for skin testing with sugammadex, the diagnostic accuracy might be inadequate. Recently, the basophil activation test (BAT) has been established as a tool to detect the causative agent of anaphylaxis with high sensitivity and specificity. However, few studies have investigated the utility of the BAT for sugammadex-induced anaphylaxis.

METHODS :Eight patients who presented with immediate hypersensitivity to sugammadex during general anesthesia were included in this study. We conducted skin tests to confirm the diagnosis of sugammadex-induced anaphylaxis. Twenty-one sugammadex-naive individuals who had a negative skin test for allergy to this drug were enrolled as controls. Basophils were selected on a CD3/CRTH2 gate and labeled with CD63 and CD203c.
RESULTS :The ratios of activated basophils in the patients were much higher than those in controls: the median values of areas under the curves in the patients and controls for CD203c were 1,265,985 (95% confidence interval [CI], 77,580-5,040,270) and 116,325 (95% CI, -268,605 to 232,690), respectively (Mann-Whitney U test, P < .01), and the areas under the curves in the patients and controls for CD63 were 788,647 (95% CI, 120,285-3,523,410) and 220,005 (95% CI, -50,346 to 404,680), respectively (Mann-Whitney U test, P < .01). The patients, but not controls, demonstrated clear dose-dependent CD203c upregulation. This was also true for CD63. In the case of CD203c, the sensitivity of the BAT for sugammadex was 88% (95% CI, 47%-100%), and specificity was 100% (95% CI, 84%-100%), while sensitivity and specificity for CD63 were 75% (95% CI, 35%-97%) and 100% (95% CI, 84%-100%), respectively.
CONCLUSIONS :The BAT seems to have comparable accuracy to skin tests for the diagnosis of sugammadex-induced anaphylaxis. For this purpose, both CD203c and CD63 can be used to detect activated basophils.

星狀神經節阻滯對上肢局部血流動力學的影響：一項隨機對照試驗

Effect of Stellate Ganglion Block on the Regional Hemodynamics of the Upper Extremity: A Randomized Controlled Trial

Kim, Min, Kyoung, MD, PhD*; Yi, Myung, Sub, MD*; Park, Pyung, Gul, MD*; Kang, Hyun, MD, PhD, MPH*; Lee, Jae, Sung, MD, PhD†; Shin, Hwa, Yong, MD, PhD, FIPP, CIPS*
Anesthesia & Analgesia: 2018 126 1705 - 1711

背景：星狀神經節阻滯(SGB)的成功與否傳統上是基於如下研究結果而確定的，包括 Horner 綜合征，面部溫度升高，鼓膜充血和鼻充血等。然而，手臂血管阻力的降低和血流量的增加可能是更有意義的發現。迄今為止，尚未使用脈衝多普勒超聲評估 SGB 對手臂局部血流動力學的影響。
方法：52 例接受前臂骨科手術的患者隨機分為甲呱卡因組（SGB + 5%0.5%甲呱卡因）或生理鹽水組（SGB + 5 mL 生理鹽水）。手術前，一位麻醉醫師在超聲引導下進行 SGB。在 SGB 之前，SGB 之後 15 分鐘和 30 分鐘以及術後 1 小時測

量上肢溫度，肱動脈阻力指數和血流量。並記錄疼痛的嚴重程度，搶救止痛藥的需求以及局部麻醉劑的副作用。

結果：SGB 後，發現在甲呱卡因的患者：阻滯指數顯著下降，肱動脈中血流量顯著增加（15 分鐘分別為：P = 0.004 和 P <0.001，30 分鐘分別為：P <0.001 和 P<0.001）。但是，這些值在手術後正常化。兩組患者的疼痛的嚴重程度，救援鎮痛藥的需求以及不良反應的發生率均無顯著差異。

結論：雖然 SGB 並未減少與前臂手術相關的疼痛，但超聲引導的 SGB 確實增加了血流量並降低了手臂血管阻力。因此，脈衝多普勒可用於監測 SGB 的成功。

（張連芳譯 潘豔、薛張綱校）

BACKGROUND: The success of stellate ganglion block (SGB) is traditionally determined on the basis of findings such as Horner's syndrome, temperature rise in the face, hyperemia of the tympanic membrane, and nasal congestion. However, decreases in vascular resistance and increases in blood flow in the arm may be more meaningful findings. To date, the effect of SGB on the regional hemodynamics of the arm has not been evaluated using pulsed-wave Doppler ultrasound.

METHODS:A total of 52 patients who were to undergo orthopedic surgery of the forearm were randomly assigned to either the mepivacaine group (SGB with 5 mL of 0.5% mepivacaine) or the saline group (SGB with 5 mL of normal saline). Before surgery, a single anesthesiologist performed a SGB under ultrasound guidance. The temperature of the upper extremity and the resistance index and blood flow in the brachial artery were measured before SGB, 15 and 30 minutes after SGB, and 1 hour after surgery. The severity of pain, requirement for rescue analgesics, and side effects of the local anesthetic agent were all documented.

RESULTS: After SGB, the resistance index decreased significantly and the blood flow increased significantly in the brachial artery of members of the mepivacaine group (15 minutes: $P = .004$ and $P < .001$, respectively; 30 minutes: $P < .001$ and $P < .001$, respectively). However, these values normalized after surgery. The severity of pain, need for rescue analgesics, and incidence of adverse effects were not significantly different between the 2 groups.

CONCLUSIONS: Although SGB did not decrease the pain associated with forearm surgery, ultrasound-guided SGB did increase blood flow and decrease vascular resistance in the arm. Therefore, pulsed-wave Doppler may be used to monitor the success of SGB.

- **麻醉藥物和阿片受體激動劑在 SD 大鼠心臟建立的活性氧自由基介導的心臟保護後處理中的不同作用**

  Differential Effects of Anesthetics and Opioid Receptor Activation on Cardioprotection Elicited by Reactive Oxygen Species–Mediated Postconditioning in Sprague-Dawley Rat Hearts

  Lucchinetti E1, Lou PH2, Gandhi M3, Clanachan AS3, Zaugg M1,3
  Anesthesia & Analgesia: 2018 126 1739-1746.

  背景：儘管在缺血再灌入（ischemia-reperfusion (IR)）損傷的臨床前模型中發現了不少心臟保護的方法，但是臨床應用還未實現。本研究調查了臨床麻醉中常用藥物是否會通過降低心臟保護信號通道上游觸發因數活性氧自由基（ROS）作用來影響心臟保護效果。通過 ROS 介導及 Intralipid（英脫利匹特，脂肪乳劑)後處理建立缺血後功能性恢復模型,比較丙泊酚,七氟醚和瑞芬太尼的作用。
  方法：在全腦缺血（20 分鐘）和再灌注（30 分鐘）處理後隔離的 Sprague-Dawley 老鼠心臟中測量左心室（LV）功能的恢復，即缺血再灌注損傷指數。心臟未經處理或者給予 Intralipid（1%，貫穿整個再灌注過程）的後處理。丙泊酚(10 μM), 七氟醚 (2 vol%), 瑞芬太尼 (3 nM)或者其組合在圍缺血期（缺血再灌注之前及期間）給藥。在磷酸化和非磷酸化條件下，通過 Amplex Red 測定法測定麻醉藥物對左室心臟纖維中 ROS 生成造成的影響。
  結果：左室功能恢復（表達為缺血前數值的百分比±標準差）在未經處理的心臟中較差(20% ± 7%),而經過 Intralipid 後處理組有所提升(58% ± 8%, P = .001)。在未經 Intralipid 後處理組中，丙泊酚(28% ± 9%, P = .049), 七氟醚 (49% ± 5%, P < .001), 和瑞芬太尼(51% ± 6%, P < .001) 對左室功能恢復有改善。Intralipid 後處理組的改善效果在丙泊酚 (33% ± 10%, P < .001)未見明顯體現，但是可以被七氟醚 (80%± 7%, P < .001)或瑞芬太尼(80% ± 9%, P < .001)加強。左室纖維中活性氧自由基信號被丙泊酚處理組中降低，但在七氟醚和瑞芬太尼處理組中無明顯變化。我們認為丙泊酚通過清掃活性氧自由基可以改善活性氧自由基介導的 Intralipid 後處理。七氟醚和瑞芬太尼的氧自由基介導的心臟保護作用則是本質上保護及提供額外的心臟保護。
  結論：在臨床麻醉中常規使用藥物的不同效果可能會影響到諸如 Intralipid 後處理等的心臟保護治療法從前臨床向臨床應用的推進。
  (劉邱阿雪譯 潘豔、薛張綱校)
  BACKGROUND: Despite an array of cardioprotective interventions identified in preclinical models of ischemia-reperfusion (IR) injury, successful clinical translation has not been achieved. This study investigated whether drugs routinely used in clinical anesthesia influence cardioprotective effectiveness by reducing effects of reactive oxygen species (ROS), upstream triggers of cardioprotective signaling. Effects of propofol, sevoflurane, or remifentanil were compared on postischemic functional recovery induced by ROS-mediated postconditioning with Intralipid.
  METHODS: Recovery of left ventricular (LV) work, an index of IR injury, was measured in isolated Sprague-Dawley rat hearts subjected to global

ischemia (20 minutes) and reperfusion (30 minutes). Hearts were either untreated or were treated with postconditioning with Intralipid (1%, throughout reperfusion). Propofol (10 μM), sevoflurane (2 vol%), remifentanil (3 nM), or combinations thereof were administered peri-ischemically (before and during IR). The effects of anesthetics on ROS production were measured in LV cardiac fibers by Amplex Red assay under phosphorylating and nonphosphorylating conditions.

RESULTS: Recovery of LV work (expressed as percentage of the preischemic value ± standard deviation) in untreated hearts was poor (20% ± 7%) and was improved by Intralipid postconditioning (58% ± 8%, P = .001). In the absence of Intralipid postconditioning, recovery of LV work was enhanced by propofol (28% ± 9%, P = .049), sevoflurane (49% ± 5%, P < .001), and remifentanil (51% ± 6%, P < .001). The benefit of Intralipid postconditioning was abolished by propofol (33% ± 10%, P < .001), but enhanced by sevoflurane (80%± 7%, P < .001) or remifentanil (80% ± 9%, P < .001). ROS signaling in LV fibers was abolished by propofol, but unaffected by sevoflurane or remifentanil. We conclude that propofol abolishes ROS-mediated Intralipid postconditioning by acting as a ROS scavenger. Sevoflurane and remifentanil are protective per se and provide additive cardioprotection to ROS-mediated cardioprotection.

CONCLUSIONS: These divergent effects of routinely used drugs in clinical anesthesia may influence the translatability of cardioprotective therapies such as Intralipid postconditioning.

減少左心室全球縱向應變預測延長住院時間:對主動脈瓣膜替換手術患者的佇列分析。

Reduced Left Ventricular Global Longitudinal Strain Predicts Prolonged Hospitalization: A Cohort Analysis of Patients Having Aortic Valve Replacement Surgery.

Sonny, Abraham, MD*; Alfirevic, Andrej, MD, FASE*; Sale, Shiva, MD*; Zimmerman, Nicole, M., MS†; You, Jing, MS†; Gillinov, A., Marc, MD‡; Sessler, Daniel, I., MD§; Duncan, Andra, E., MD, MS, FASE‖

Anesthesia & Analgesia: 2018 126 1484－1493

在主動脈狹窄的患者中，左心室射血分數(LVEF)通常是正常的，因此無法區分正常心肌收縮功能和亞臨床功能障礙。測量心肌形變的整體縱向張力和應變率(SR)是心肌功能的可靠指標，可以檢測到常規超聲心動圖不明顯的細微心肌功能障礙。張力和 SR 可能比 LVEF 更能預測術後預後。我們調查的主要目的是評估在主動脈瓣置換術後主動脈狹窄患者的整體縱向張力與嚴重術後預後之間的關係。其次，我們還評估了整體縱向 SR 與 LVEF 的關係以及結果。在對隨機臨床試驗(NCT01187329)的資料進行分析後，我們檢查了心肌功能測量與下列結果之間的關係:(1)術後肌力/血管加壓素的支持;(2)住院時間延長(>7 天);(3)術後房顫。麻醉誘導後進行標準化的經食管超聲心動圖檢查。用斑點跟蹤超聲心動圖測量心

肌形變。採用多變數 logistic 回歸評估心肌功能和結果之間的關係，並根據潛在的混雜因素進行調整。評估了整體縱向張力、SR 和 LVEF 的預測能力，並將其作為接收操作特徵曲線下的區域。在接受臨床試驗的 100 例患者中，86 例主動脈瓣狹窄患者可接受整體縱向張力分析。最主要的是，更嚴重的術中全球縱向應變與延長住院時間有關(比值比[98.3%置信區間]，1.22[1.01-1.47]，每 1%降低[絕對值];P = .012，但沒有其他結果。其次，較差的全球縱向 SR 與延長住院時間有關(比值比[99.7%置信區間]，1.68[1.01-2.79]每 0.1 秒降低[絕對值];P = .003，但沒有其他結果。LVEF 與任何結果無關。心肌整體縱向 SR 是長期住院的最佳預測指標(AUC, 0.72)，其次是整體縱向張力(AUC, 0.67)和 LVEF (AUC, 0.62)。全球縱向張力和 SR 是主動脈瓣置換術患者延長住院時間的有效預測因素。

（曹雨楓譯 潘豔、薛張綱校）

Left ventricular ejection fraction (LVEF) is often preserved in patients with aortic stenosis and thus cannot distinguish between normal myocardial contractile function and subclinical dysfunction. Global longitudinal strain and strain rate (SR), which measure myocardial deformation, are robust indicators of myocardial function and can detect subtle myocardial dysfunction that is not apparent with conventional echocardiographic measures. Strain and SR may better predict postoperative outcomes than LVEF. The primary aim of our investigation was to assess the association between global longitudinal strain and serious postoperative outcomes in patients with aortic stenosis having aortic valve replacement. Secondarily, we also assessed the associations between global longitudinal SR and LVEF and the outcomes.In this post hoc analysis of data from a randomized clinical trial (NCT01187329), we examined the association between measures of myocardial function and the following outcomes: (1) need for postoperative inotropic/vasopressor support; (2) prolonged hospitalization (>7 days); and (3) postoperative atrial fibrillation. Standardized transesophageal echocardiographic examinations were performed after anesthetic induction. Myocardial deformation was measured using speckle-tracking echocardiography. Multivariable logistic regression was used to assess associations between measures of myocardial function and outcomes, adjusted for potential confounding factors. The predictive ability of global longitudinal strain, SR, and LVEF was assessed as area under receiver operating characteristics curves (AUCs).Of 100 patients enrolled in the clinical trial, 86 patients with aortic stenosis had acceptable images for global longitudinal strain analysis. Primarily, worse intraoperative global longitudinal strain was associated with prolonged hospitalization (odds ratio [98.3% confidence interval], 1.22 [1.01-1.47] per 1% decrease [absolute value] in strain; P = .012), but not with other outcomes. Secondarily, worse global longitudinal SR was associated with prolonged hospitalization (odds ratio [99.7% confidence interval], 1.68 [1.01-2.79] per 0.1 second decrease [absolute value] in SR; P = .003), but not other outcomes. LVEF was not

associated with any outcomes. Global longitudinal SR was the best predictor for prolonged hospitalization (AUC, 0.72), followed by global longitudinal strain (AUC, 0.67) and LVEF (AUC, 0.62).Global longitudinal strain and SR are useful predictors of prolonged hospitalization in patients with aortic stenosis having an aortic valve replacement.

支氣管熱成形術患者的麻醉管理

Anesthetic Considerations for Patients Undergoing Bronchial Thermoplasty.

Saran, Jagroop, S., MD*; Kreso, Melissa, MD*; Khurana, Sandhya, MBBS†; Nead, Michael, MD, PhD†; Larj, Michael, MD†; Karan, Suzanne, MD*

Anesthesia & Analgesia: 2018 126 1575－1579

支氣管熱成形術（BT）是食品和藥物管理局批准的非藥物治療新技術，可用于經傳統藥物治療仍然不受控制的哮喘患者。BT 涉及應用受控射頻能量來減少大中型氣道中的氣道平滑肌。儘管 BT 通常在全身麻醉下進行，但有關 BT 的麻醉管理策略仍欠缺。此次我們敘述 7 名在三級學術醫療中心接受了 19 次 BT 治療患者的麻醉管理。

（吳俊梅譯 潘豔、薛張綱校）

Bronchial thermoplasty (BT) is a novel, Food and Drug Administration-approved nondrug treatment for patients whose asthma remains uncontrolled despite traditional pharmacotherapy. BT involves application of controlled radiofrequency energy to reduce airway smooth muscle in large- and medium-sized airways. Although BT is often performed under general anesthesia, anesthetic management strategies for BT are poorly described. We describe the anesthetic management of 7 patients who underwent 19 BT treatments in a tertiary academic medical center.

老年人全身麻醉後認知恢復過程的描述：TORIE 專案的設計及理論基礎

Delineating the Trajectory of Cognitive Recovery From General Anesthesia in Older Adults: Design and Rationale of the TORIE (Trajectory of Recovery in the Elderly) Project.

Mincer, Joshua, S., MD, PhD[*,†]; Baxter, Mark, G., PhD[*,‡,§]; McCormick, Patrick, J., MD, MEng[*]; Sano, Mary, PhD[†,‖]; Schwartz, Arthur, E., MD[*]; Brallier, Jess, W., MD[*]; Allore, Heather, G., PhD[¶]; Delman, Bradley, N., MD[#]; Sewell, Margaret, C., PhD[‖]; Kundu, Prantik, PhD[#,‖]; Tang, Cheuk, Ying, PhD[#,‖]; Sanchez, Angela, BS[*]; Deiner, Stacie, G., MD, MS[*,§,**]

Anesthesia & Analgesia: 2018 126 1675-1683

背景：麻醉及術後認知恢復的機制尚無明顯的特徵性，但這可能對明確老年人麻醉及術後認知相關併發症如譫妄、術後認知障礙的病因至關重要。本文對目前正在進行的 TORIE 專案的目標及方法學進行闡述，TORIE 專案即 Trajectory of

Recovery in the Elderly，老年人康復過程，其重點在於研究老年人全麻後的認知恢復過程。

方法：本研究設計採用認知測試結合神經成像技術，如功能磁共振成像，擴散張量成像以及動脈自旋體標記，研究全麻後認知恢復的特點以及其生物學特徵。研究納入 40—80 歲年齡段的健康志願者，僅行全身麻醉，未進行手術，採用這些技術評估全麻後認知及功能神經網路的恢復。在麻醉前、麻醉期間、麻醉蘇醒即刻以及麻醉後 1 天、7 天採集影像資料。在上述相同時間點以及麻醉後 30 天採集認知資料，並且在麻醉後 6 個月及 12 個月重複進行簡易的認知評估。

結果：這項研究正在進行中，我們主要的假設是應用術後恢復品質量表認知測量評估認知恢復，老年人的認知恢復時間比年輕人顯著延長，但在麻醉後 30 天內均會恢復到認知基線水準。神經影像資料將解決系統神經科學與全麻後認知恢復的相關性。

結論：不論最終結果如何，本研究專案獲得的資料都將具有臨床與理論上的相關性，通過研究老年人短期認知恢復的機制，這將對我們理解麻醉藥品的效果有重要影響

（王雨婷譯 潘豔、薛張綱校）

BACKGROUND: Mechanistic aspects of cognitive recovery after anesthesia and surgery are not yet well characterized, but may be vital to distinguishing the contributions of anesthesia and surgery in cognitive complications common in the elderly such as delirium and postoperative cognitive dysfunction. This article describes the aims and methodological approach to the ongoing study, Trajectory of Recovery in the Elderly (TORIE), which focuses on the trajectory of cognitive recovery from general anesthesia.

METHODS: The study design employs cognitive testing coupled with neuroimaging techniques such as functional magnetic resonance imaging, diffusion tensor imaging, and arterial spin labeling to characterize cognitive recovery from anesthesia and its biological correlates. Applying these techniques to a cohort of age-specified healthy volunteers 40-80 years of age, who are exposed to general anesthesia alone, in the absence of surgery, will assess cognitive and functional neural network recovery after anesthesia. Imaging data are acquired before, during, and immediately after anesthesia, as well as 1 and 7 days after. Detailed cognitive data are captured at the same time points as well as 30 days after anesthesia, and brief cognitive assessments are repeated at 6 and 12 months after anesthesia.

RESULTS: The study is underway. Our primary hypothesis is that older adults may require significantly longer to achieve cognitive recovery, measured by Postoperative Quality of Recovery Scale cognitive domain, than younger adults in the immediate postanesthesia period, but all will fully recover to baseline levels within 30 days of anesthesia exposure.

Imaging data will address systems neuroscience correlates of cognitive recovery from general anesthesia.
CONCLUSIONS: The data acquired in this project will have both clinical and theoretical relevance regardless of the outcome by delineating the mechanism behind short-term recovery across the adult age lifespan, which will have major implications for our understanding of the effects of anesthetic drugs.

當代麻醉中眼內壓的生理及作用

Physiology and Role of Intraocular Pressure in Contemporary Anesthesia

Kelly, Dermot, J., MRCPI, FFARCSI, DABA; Farrell, Sinéad, M., MRCPI, MCAI
From the Department of Anesthesia, Royal Victoria Eye and Ear Hospital, Dublin, Ireland
Anesthesia & Analgesia: 2018 126 1551－1562

在美國有超過兩千六百萬人白內障患者，每年有三百六十萬人行白內障手術，白內障手術是最常見的手術。調解視力的眼睛微妙結構的完整性依賴於眼內壓（IOP）。然而，眼內壓會擠壓眼球內的血管——類似於 Starling 電阻——是決定眼內灌注壓的主要結構，定義為動脈壓與眼內壓之差。視網膜是機體內代謝活動最高的組織之一，它的功能完整性取決於充足的血供，其功能與眼內灌注壓線性相關。已經證明視網膜細胞會在低灌注壓（低於 50mmHg）下死亡。現代眼科手術中涉及眼球沖洗、操作、設備，這些會導致眼內壓力動態變化。許多眼科手術過程中長時間出現眼壓升高（高達正常值的 4-5 倍）並達到視網膜和視訊光碟灌注壓臨界值。普通外科手術，包括腹腔鏡、脊柱、心臟手術，特別是要求頭低腳高體位或長時間俯臥位和/或控制性降壓麻醉，都可以導致眼內壓改變及眼內灌注失衡。眼內壓及灌注快速改變在視野缺失的發病機理中起到一定作用且與眼睛的併發症有關，這些併發症通常使其他一些小手術變得複雜。這些不良後果的準確病因是多種因素的，但眼內低灌注是最顯著且通常可以避免的因素。術前存在眼內血流受損的患者特別容易導致術中缺血，包括高血壓、糖尿病、動脈粥樣硬化、青光眼。然而，考慮到患者的合併症狀況，對動脈壓和眼壓的過度積極治療可能是不可能的，並且可能導致患者暴露于災難性脈絡膜出血的風險中。麻醉管理可以顯著影響整個圍術期眼內壓力變化。保護視網膜灌注，減少缺血風險，降低不必要出血可能的策略必須是所選麻醉方案的核心。本篇綜述概括：重要的生理機制；眼科及普通外科手術很可能導致眼內壓水準受損及它的風險因素；麻醉藥物及方法對眼內壓的影響；最近的科學證據強調手術期間灌注變化的重要性；高危患者進行手術後術後視力喪失和管理方法的關鍵方面。
（胡翔翔譯 潘豔、薛張綱校）

More than 26 million Americans suffer with cataracts, and with 3.6 million cataract extractions performed annually in the United States, it is the

most common surgical procedure.The integrity of the delicate structures of the eye that mediate vision is dependent on the intraocular pressure (IOP).Yet, IOP acts to compress the vessels within the globe—akin to a Starling resistor—and is a key component that determines the ocular perfusion pressure, defined as the difference between arterial pressure and IOP.The retina is one of the most metabolically active tissues in the body, and its functional integrity is dependent on an adequate blood supply, with retinal function linearly related to the ocular perfusion pressure.Retinal cell death has been demonstrated at low perfusion pressures (below 50 mm Hg). Modern ophthalmic surgery involves globe irrigation, manipulation, and instrumentation, resulting in dynamic pressure fluxes within the eye. Marked elevations of IOP (up to 4–5 times the normal value) with consequent borderline retinal and optic disk perfusion pressures occur for prolonged periods during many ophthalmic procedures.General surgeries, including laparoscopic, spinal, and cardiac procedures, especially, with their demand for steep Trendelenburg or prolonged prone positioning and/or hypotensive anesthesia, can induce IOP changes and ocular perfusion imbalance. These rapid fluctuations in IOP, and so in perfusion, play a role in the pathogenesis of the visual field defects and associated ocular morbidity that frequently complicate otherwise uneventful surgeries. The exact etiology of such outcomes is multifactorial, but ocular hypoperfusion plays a significant and frequently avoidable role. Those with preexisting compromised ocular blood flow are especially vulnerable to intraoperative ischemia, including those with hypertension, diabetes, atherosclerosis, or glaucoma. However, overly aggressive management of arterial pressure and IOP may not be possible given a patient’s comorbidity status, and it potentially exposes the patient to risk of catastrophic choroidal hemorrhage. Anesthetic management significantly influences the pressure changes in the eye throughout the perioperative period. Strategies to safeguard retinal perfusion, reduce the ischemic risk, and minimize the potential for expulsive bleeding must be central to the anesthetic techniques selected. This review outlines: important physiological principles;ophthalmic and general procedures most likely to develop damaging IOP levels and their causative factors; the effect of anesthetic agents and techniques on IOP; recent scientific evidence highlighting the significance of perfusion changes during surgery; and key aspects of

postoperative visual loss and management approaches for high-risk patients presenting for surgery.

分娩鎮痛作為降低產後抑鬱評分的預測因數：一項回顧性觀察研究

Labor Analgesia as a Predictor for Reduced Postpartum Depression Scores: A Retrospective Observational Study

Lim, Grace, MD, MS[*]; Farrell, Lia, M., BS[*]; Facco, Francesca, L., MD, MS[†]; Gold, Michael, S., PhD[‡]; Wasan, Ajay, D., MD, MSc[§,‖]

Anesthesia & Analgesia 2018 126 1598-1605

背景：使用分娩鎮痛——硬膜外鎮痛與產後抑鬱症的風險降低有關，但其中分娩鎮痛的作用尚不清楚。本研究的目的是為了驗證這一假設，即分娩時有效的硬膜外鎮痛與產後抑鬱症狀減輕相關。

方法：我們採用了單一的回顧性觀察性佇列研究。主要終點是在產後 6 周進行的愛丁堡產後抑鬱量表（EPDS）評分。納入最終分析中的受試者（1）接受了分娩硬膜外鎮痛;（2）開始分娩硬膜外鎮痛前和分娩期間通過 0-10 數值評分評估分娩疼痛;和（3）在產後 6 周訪視記錄的 EPDS 評估的抑鬱症風險。在調整了焦慮或抑鬱史，其他精神病史，藥物濫用，創傷，分娩方式以及其他母親或胎兒共患疾病後，採用簡單多元線性回歸作為確定疼痛改善（定義為疼痛改善百分比（PIP））和產後抑鬱之間關聯的最佳模型。

結果：最終分析中納入了 201 名患者。疼痛改善程度較高的婦女 EPDS 評分較低（r = 0.025; P = .002）。已知與抑鬱症有關的變數（體重指數，焦慮和/或抑鬱，三度和四度會陰撕裂以及貧血）與 EPDS 評分顯著相關，並包含在最終模型中。在我們調整了這些協變數後，PIP 仍然是 EPDS 評分的顯著預測因數（r = 0.49; P = .008），占產後抑鬱評分變異的 6.6%。包括疼痛，體重指數，焦慮和/或抑鬱，會陰裂傷和貧血的完整模型解釋了產後抑鬱評分變異的 24%。

結論：儘管硬膜外鎮痛減輕分娩疼痛的程度預示著產後抑鬱評分較低，但 PIP 對產後抑鬱症狀風險的相對影響可能低於其他已確定的抑鬱症危險因素。這些資料提示，分娩鎮痛對於產後抑鬱影響的臨床意義需要進一步研究。

（劉雯珺譯 潘豔、薛張綱校）

BACKGROUND: Using labor, epidural analgesia has been linked to a reduced risk of postpartum depression, but the role of labor pain relief in this association remains unclear. The goal of this study was to test the hypothesis that effective epidural analgesia during labor is associated with reduced postpartum depression symptomatology.

METHODS:A single, institutional, retrospective, observational cohort design was chosen. The primary outcome was Edinburgh postnatal depression scale (EPDS) score, measured at the 6-week postpartum visit. Subjects included in the final analysis had (1) received labor epidural analgesia; (2) pain assessed during labor both before and during initiation of labor epidural analgesia by 0–10 numeric rating scores; and (3) depression risk assessed by the EPDS and documented at their 6-week postpartum visit. Simple and multiple linear regression was used to identify the best model for

assessing the association between pain improvement, defined as percent improvement in pain (PIP), and depression, after adjusting for a history of anxiety or depression, other psychiatric history, abuse, trauma, mode of delivery, and other maternal or fetal comorbid diseases.

RESULTS: Two hundred one patients were included in the final analysis. Women with higher improvements in pain were associated with lower EPDS scores (r = 0.025; P = .002). Variables known to be associated with depression (body mass index, anxiety and/or depression, third- and fourth-degree perineal lacerations, and anemia) were significantly correlated with EPDS score and included in the final model. After we adjusted for these covariates, PIP remained a significant predictor of EPDS score (r = 0.49; P = .008), accounting for 6.6% of the variability in postpartum depression scores. The full model including pain, body mass index, anxiety and/or depression, perineal lacerations, and anemia explained 24% of the variability in postpartum depression scores.

CONCLUSIONS: Although the extent of labor pain relief by epidural analgesia predicts lower postpartum depression scores, the relative contribution of PIP to risk for postpartum depression symptoms may be less than other established risk factors for depression. These data support that the clinical significance of labor analgesia in the development of postpartum depression needs to be more clearly defined.

- 美國兒童外科醫學院驗證品質改進計畫：麻醉醫師現在需要瞭解的內容。

American College of Surgeons Children’s Surgery Verification Quality Improvement Program: What Anesthesiologists Need to Know Now

Brooks Peterson, Melissa, MD*; Houck, Constance, S., MD, MPH, FAAP†; Deshpande, Jayant, K., MD, MPH, FAAP‡; Flick, Randall, P., MD, MPH, FAAP§

Anesthesia & Analgesia: 2018 126 1624–1632

在美國外科醫師學會的支持下，由兒科外科專家組成的工作小組最近啟動了一項小兒外科驗證計畫，即兒童外科驗證品質改進計畫，其目標是改善兒科手術、術中和圍手術期護理。該計畫中包含了各種實踐環境中提供兒科麻醉護理的具體標準。我們回顧了全國兒科麻醉實踐的背景、可用證據、驗證要求、驗證過程及其影響。此外，我們還對最近3名兒童外科驗證認證的項目主管進行了特別訪談，以提供該兒童手術品質改善計畫的最新最現實的世界統一觀點。

（劉娟蘭譯 潘豔、薛張綱校）

A task force of pediatric surgical specialists with the support of The American College of Surgeons recently launched a verification program for pediatric surgery, the Children’s Surgery Verification quality improvement program, with the goal of improving pediatric surgical, procedural, and perioperative care. Included in this program are specific standards for the delivery of pediatric anesthesia care across a variety of practice settings. We review the background, available evidence,

requirements for verification, and verification process and its implications for the practice of pediatric anesthesia across the country. In addition, we have included a special roundtable interview of 3 recently Children's Surgery Verification-verified program directors to provide an up-to-date real-world perspective of this children's surgery quality improvement program.

一種新的自動選擇術中紅細胞輸注案例的方法的驗證

Validation of a New Method to Automatically Select Cases With Intraoperative Red Blood Cell Transfusion for Audit

Dexter, Franklin, MD, PhD*; Epstein, Richard, H., MD†; Ledolter, Johannes, PhD‡; Dasovich, Susan, M., MD§; Herman, Jay, H., MD‖; Maga, Joni, M., MD¶; Schwenk, Eric, S., MD#

Anesthesia & Analgesia: 2018 126 1654–1661

背景：醫院審查同種異體紅細胞（RBC）輸血是否合適。審核標準已經公佈，適用於 5 種常見過程。我們擴展了這項工作，以研究在所有手術過程（包括之前研究過的手術過程）中選擇涉及輸入至少 1 個 RBC 單元的審計（複查）的管理決策。

方法：這項回顧性觀察性研究包括 11 年間 1891 種不同手術中的 40 萬例病例。有 12,616 例紅細胞輸血病例。我們研究了根據最低血紅蛋白（Hb）大於醫院選擇的輸血閾值的標準或貧血或漏掉預計出血量（EBL）的 EBL 中值<500 mL 的患者進行審核的病例比例。 選擇這個 EBL 閾值是因為它大約是在血庫中捐獻一個單位全血的過程中被移除的體積。 EBL 缺失對於 EBL <500 mL 的病例的審計決定非常重要，因為如果沒有出血的程度指標，沒有足夠的資料來判斷是否有足夠的失血量來證明輸血的合理性。

結果：絕大多數情況下（> 50%）需要接受審核，而大部分情況下（> 50%）的患者在輸血中位數均在 EBL <500 mL（P <.0001）之間。 在輸血和最低 Hb> 9 g / dL 的病例中，手術的中位 EBL <500 mL，比中位 EBL≥500 mL 的病例多 3.0 倍。 根據 Hb 和/或 EBL 的缺失值，建議進行審計的比例要比基於 EBL 500 mL（P<.0001）的程式中超過 Hb 閾值的情況高。有血紅蛋白和/或 EBL 缺失值的輸血病例是≥500 mL 中 Hb>9g/dL 和 EBL 中位數的 3.7 倍。

結論：一個自動化的流程來選擇紅細胞術中輸注的審核，需要考慮手術的中位元 EBL，最低血紅蛋白 Hb 是否低於醫院的外科手術病例的 Hb 輸血閾值，以及是否缺乏 Hb 或 EBL 的情況。這個結論適用於所有手術病例和手術。

（吳靜怡譯 潘豔、薛張綱校）

BACKGROUND: Hospitals review allogeneic red blood cell (RBC) transfusions for appropriateness.

Audit criteria have been published that apply to 5 common procedures. We expanded on this work to study the management decision of selecting which cases involving transfusion of at least 1 RBC unit to audit (review) among all surgical procedures, including those previously studied.

METHODS: This retrospective, observational study included 400,000 cases among 1891 different procedures over an 11-year period. There were 12,616 cases with RBC transfusion. We studied the proportions of cases that would be audited based on criteria of nadir hemoglobin (Hb) greater than the hospital's selected transfusion threshold, or absent Hb or missing estimated blood loss (EBL) among procedures with median EBL <500 mL. This threshold EBL was selected because it is approximately the volume removed during the donation of a single unit of whole blood at a blood bank. Missing EBL is important to the audit decision for cases in which the procedures' median EBL is <500 mL because, without an indication of the extent of bleeding, there are insufficient data to assume that there was sufficient blood loss to justify the transfusion.

RESULTS: Most cases (>50%) that would be audited and most cases (>50%) with transfusion were among procedures with median EBL <500 mL ($P < .0001$). Among cases with transfusion and nadir Hb >9 g/dL, the procedure's median EBL was <500 mL for 3.0 times more cases than for procedures having a median EBL ≥500 mL. A greater percentage of cases would be recommended for audit based on missing values for Hb and/or EBL than based on exceeding the Hb threshold among cases of procedures with median EBL ≥500 mL ($P < .0001$). There were 3.7 times as many cases with transfusion that had missing values for Hb and/or EBL than had a nadir Hb >9 g/dL and median EBL for the procedure ≥500 mL.

CONCLUSIONS: An automated process to select cases for audit of intraoperative transfusion of RBC needs to consider the median EBL of the procedure, whether the nadir Hb is below the hospital's Hb transfusion threshold for surgical cases, and the absence of either a Hb or entry of the EBL for the case. This conclusion applies to all surgical cases and procedures.

相關係數：合理使用和解釋

Correlation Coefficients: Appropriate Use and Interpretation

Schober, Patrick, MD, PhD, MMedStat; Boer, Christa, PhD, MSc; Schwarte, Lothar, A., MD, PhD, MBA

Anesthesia & Analgesia: 2018 126 1763－1768

最廣義上的相關性是表示變數之間關聯性的一種方法。在相關資料中，1 個變數的變化幅度與另一個變數的變化幅度相關，無論是相同的（正相關）還是相

反的（負相關）方向。通常，相關性用於兩個連續變數之間的線性關係，表示為 Pearson 積 - 矩相關。Pearson 相關係數通常用於聯合正態分佈資料（遵循二元正態分佈的資料）。對於非正態分佈的連續資料，對於有序數據或具有相關異常值的資料，Spearman 秩相關可以用作單調關聯的量度。兩個相關係數的比例都在-1 到+1 之間，其中 0 表示不存在線性關係或單調關聯，並且關係變得更強並且最終接近直線（Pearson 相關）或持續增加或減少的曲線（Spearman 相關），因為該係數接近 1 的絕對值。假設核對總和置信區間可以用來解決結果的統計顯著性，並估計採樣資料人群關係的強度。本教程旨在指導研究人員和臨床醫生適當使用和解釋相關係數。

（馬益梅譯 潘豔、薛張綱校）

Correlation in the broadest sense is a measure of an association between variables. In correlated data, the change in the magnitude of 1 variable is associated with a change in the magnitude of another variable, either in the same (positive correlation) or in the opposite (negative correlation) direction. Most often, the term correlation is used in the context of a linear relationship between 2 continuous variables and expressed as Pearson product-moment correlation. The Pearson correlation coefficient is typically used for jointly normally distributed data (data that follow a bivariate normal distribution). For nonnormally distributed continuous data, for ordinal data, or for data with relevant outliers, a Spearman rank correlation can be used as a measure of a monotonic association. Both correlation coefficients are scaled such that they range from -1 to +1, where 0 indicates that there is no linear or monotonic association, and the relationship gets stronger and ultimately approaches a straight line (Pearson correlation) or a constantly increasing or decreasing curve (Spearman correlation) as the coefficient approaches an absolute value of 1. Hypothesis tests and confidence intervals can be used to address the statistical significance of the results and to estimate the strength of the relationship in the population from which the data were sampled. The aim of this tutorial is to guide researchers and clinicians in the appropriate use and interpretation of correlation coefficients.

心臟電腦斷層掃描在術後心肌損傷患者中的新發現

Unexpected Cardiac Computed Tomography Findings in Patients With Postoperative Myocardial Injury

Grobben, Remco, B., MD, PhD[*,†]; van Waes, Judith A., R., MD, PhD[†]; Leiner, Tim, MD, PhD[‡]; Peelen, Linda, M., PhD[†,§]; de Borst, Gert, Jan, MD, PhD[‖]; Vogely, Henri, C., MD, PhD[¶]; Grobbee, Diederick, E., MD, PhD[§]; Doevendans, Pieter, A., MD, PhD[*]; van Klei, Wilton, A., MD, PhD[†]; Nathoe, Hendrik, M., MD, PhD[*]on behalf of the CHASE Investigators

Anesthesia & Analgesia: 2018 126 1462–1468

背景：術後心肌損傷（PMI）是非心臟手術後死亡率的一項有力預測指標。據信 PMI 可歸因於冠狀動脈疾病（CAD），但其病因尚不清楚。作者旨在使用冠狀動脈斷層掃描血管造影術（CCTA）來量化 PMI 患者和對照者 CAD 的患病率。

方法：這項前瞻性佇列研究納入 60 歲以上，無心臟病史，接受中高危非心臟手術的 PMI 和非 PMI 患者。 PMI 定義為術後前 3 天血清肌鈣蛋白 I 水準≥60ng / L。主要排除標準是已知的心臟疾病和術後心肌缺血症狀或心電圖異常。無創性影像學檢查即一次術後 CCTA。主要結局定義為 CCTA 證實冠狀動脈狹窄> 50％。

結果：統計分析納入 66 名患者。 PMI 組（n = 46）和對照組（n = 20）峰值肌鈣蛋白水準中位數分別為 150(四分位範圍,120-298)和 15(四分位間距,10-31) ng / L（P <0.01）。 23 例 PMI 患者（50％）與 3 例對照組患者（15％;相對危險度 3.3; 95％置信區間 1.1-9.8）被診斷為 CAD。值得注意的是，15 例 PMI 患者（33％）與 4 例對照組患者（20％;相對危險度 1.6; 95％置信區間 0.6-4.3）存在肺栓塞。無一患者在 30 天內死亡。

結論：在沒有心臟病史的患者中，接受非心臟手術後的 PMI 與 CAD 相關。另外，三分之一的 PMI 患者被發現存在無臨床症狀的肺栓塞。這促使採用影像學檢查來改善臨床檢查的相關研究進一步發展，並可能具有重要的臨床意義。

（崔璀 譯 陳傑 校）

BACKGROUND: Postoperative myocardial injury (PMI) is a strong predictor of mortality after noncardiac surgery. PMI is believed to be attributable to coronary artery disease (CAD), yet its etiology is largely unclear. We aimed to quantify the prevalence of significant CAD in patients with and without PMI using coronary computed tomography angiography (CCTA).

METHODS: This prospective cohort study included patients of 60 years or older without a history of cardiac disease and with and without PMI after intermediate- to high-risk noncardiac surgery. PMI was defined as any serum troponin I level ≥60 ng/L on the first 3 postoperative days. Main exclusion criteria were known cardiac disease and postoperative ischemic

symptoms or electrocardiography abnormalities. Noninvasive imaging consisted of a postoperative CCTA. Main outcome was CAD defined as >50% coronary stenosis on CCTA

RESULTS: The analysis included 66 patients. Median peak troponin levels in the PMI (n = 46) and control group (n = 20) were 150 (interquartile range, 120-298) vs 15 (interquartile range, 10-31) ng/L (P < .01). CAD was found in 23 patients with PMI (50%) vs 3 without PMI (15%; relative risk, 3.3; 95% confidence interval, 1.1-9.8). Remarkably, pulmonary embolism was present in 15 patients with PMI (33%) versus in 4 without PMI (20%; relative risk, 1.6; 95% confidence interval, 0.6-4.3). None of the patients died within 30 days.

CONCLUSIONS: In patients without a history of cardiac disease, PMI after noncardiac surgery was associated with CAD. In addition, a clinically silent pulmonary embolism was found in one-third of patients with PMI. This urges further research to improve clinical workup using imaging and may have important clinical implications.

接受原位肝移植術的受體患者的重症監護病房加速康復途徑:一項前瞻性觀察研究

Intensive Care Unit Enhanced Recovery Pathway for Patients Undergoing Orthotopic Liver Transplants Recipients: A Prospective, Observational Study

King, Adam, B., MD*; Kensinger, Clark, D., MD†; Shi, Yaping, MS‡; Shotwell, Matthew, S., PhD‡; Karp, Seth, J., MD†; Pandharipande, Pratik, P., MD*; Wright, J., Kelly, MD†; Weavind, Liza, M., MB, BCh*

Anesthesia & Analgesia: 2018 126 1495 - 1503

背景：儘管圍術期監護的改善，肝移植受體往往佔用較多的圍術期資源且更長的住院時間。加速康復途徑在其他外科手術人群中已證明能降低醫療資源利用率。

方法：此項前瞻性觀察研究旨在檢驗加速康復途徑（ESP）對肝移植術後患者恢復效果的影響。將 2013 年 11 月 1 日至 2014 年 10 月 31 日接受肝移植且 ESP 的患者預後與實施 ESP 前一年的肝移植受體進行比較。使用多元回歸分析來評估臨床路徑與臨床預後的關聯。

結果：干預組和對照組分別納入 141 例和 106 例患者。對照組和干預組在人口學方面，也包括手術時間和冷缺血時間，沒有組間差異。重症監護病房停留時間中位數從 4.4 天縮短至 2.6 天（P <.001）。干預組較早出院的可能性較高（風險比[95%CI]，2.01 [1.55-2.62]; P <.001），接受血漿或濃縮紅細胞輸注的可

能性更低（比值比分別為 69%和 65%，P <.001 和 P <.001）。院內死亡率（P = 0.40），重症監護室再入住率（P = 0.75）或術後感染（尿路感染：P = .09; 肺炎：P = .27）無顯著區別。

結論：ERP 側重於重症監護室管理的基於 ICU 管理里程碑式的要素和預先確定的管理觸發因素，包括血流動力學目標，液體療法，圍手術期抗生素，血糖控制和標準化輸血觸發因素。這些促成該類患者重症監護病房停留時間縮短而未增加圍手術期併發症。

（陳聰 譯 陳傑 校）

BACKGROUND: Liver transplant recipients continue to have high perioperative resource utilization and prolonged length of stay despite improvements in perioperative care. Enhanced recovery pathways have been shown in other surgical populations to produce reductions in hospital resource utilization.

METHODS: A prospective, observational study was performed to examine the effect of an enhanced recovery pathway for postoperative care after liver transplantation. Outcomes from patients undergoing liver transplantation from November 1, 2013, to October 31, 2014, managed by the pathway were compared to transplant recipients from the year before pathway implementation. Multivariable regression analysis was used to assess the association of the clinical pathway on clinical outcomes.

RESULTS: The intervention and control groups included 141 and 106 patients, respectively. There were no demographic differences between the control and intervention group including no differences between the length of surgery and cold ischemic time. Median intensive care unit length of stay was reduced from 4.4 to 2.6 days (P < .001). The intervention group had a higher likelihood of earlier discharge (hazard ratio [95% CI], 2.01 [1.55-2.62]; P < .001), and a 69% and 65% lower odds of receiving a plasma (P < .001) or packed red blood cell (P < .001) transfusion. There was no significant effect on hospital mortality (P = .40), intensive care unit readmission rates (P = .75), or postoperative infections (urinary traction infections: P = .09; pneumonia: P = .27).

CONCLUSIONS: An enhanced recovery pathway focused on milestone-based elements of intensive care unit management and predetermined management triggers including hemodynamic goals, fluid therapy, perioperative antibiotics, glycemic control, and standardized transfusion triggers led to reductions in intensive care unit length of stay without an increase in perioperative complications.

無創脈搏血氧飽和度-血紅蛋白測量在深色皮膚的危重病患者中的臨床應用

The Clinical Utility of Noninvasive Pulse Co-oximetry Hemoglobin Measurements in Dark-Skinned Critically Ill Patients

Murphy, Susan, M., MBBCh, FCPaed(SA), Crit Care (SA); Omar, Shahed, FCPath (Chem Path), Crit Care (SA)

Anesthesia & Analgesia: 2018 126 1519–1526

背景：這項研究的主要目的是評估一個用於無創血紅蛋白（SpHb）測量的床旁設備用於患有黑色皮膚色素沉著的危重病人時的臨床價值。

方法：來自多學科重症監護病房的 146 名成人和兒童患者接受無創血紅蛋白的測量，週期為至少每 4 小時一次。共分析了 371 個資料。使用床旁血氣分析儀採集並評估血紅蛋白水準，同時將血液樣本送至中心試驗室，使用十二烷基硫酸鈉方法測量血紅蛋白水準。構建 Bland-Altman 圖評估即時合理設備與參考標準（實驗室血紅蛋白水準）之間的一致性。

結果：與實驗室血紅蛋白相比，SpHb 表現出明顯的偏倚，而血氣分析中血紅蛋白測量則沒有。SpHb 的平均偏倚為+1.64（-1.03~4.31），血氣血紅蛋白的平均偏倚為 0.26（-0.84~1.37）。SpHb 的偏倚幅度隨著平均血紅蛋白水準的增加而增加。在所有附加的研究變數評估對偏倚的影響中，只有成年患者的 APACHEⅡ評分（P<0.0001）和平均動脈壓（P=0.001）有影響。皮膚色素沉著對偏倚的大小沒有任何影響。

結論：無創血紅蛋白測量對於低血紅蛋白水準的深色皮膚危重患者是一項有前途的工具，但需要進一步改進才具有臨床實用性。

（丁曦冰 譯 陳傑 校）

BACKGROUND: The primary objective of this study was to assess the clinical usefulness of a point-of-care device which measures hemoglobin noninvasively (SpHb) in a group of critically ill participants with dark skin pigmentation.

METHODS: One hundred forty-six adult and pediatric participants from a multidisciplinary intensive care unit had intermittent readings of noninvasive hemoglobin measurements performed at a minimum of 4 hourly intervals. A total of 371 readings were analyzed. Concurrent blood samples were taken to assess hemoglobin levels using point-of-care blood gas analyzer, as well as sent to a central laboratory where hemoglobin was measured using the sodium lauryl sulfate method. Bland-Altman plots were constructed to assess the agreement between results from the 2 point-of-care devices with the reference standard (laboratory hemoglobin).

RESULTS: SpHb exhibited significant bias when compared to laboratory hemoglobin, while blood gas hemoglobin did not. Mean bias for SpHb was +1.64 with limits of agreement of -1.03 to 4.31 compared to blood gas hemoglobin which showed a bias of 0.26 and limits of agreement of -0.84 to 1.37. The magnitude of the bias for SpHb increased with increasing mean hemoglobin levels. Of all the additional study variables assessed for effect on the bias, only Acute Physiology and Chronic Health Evaluation II score in adult patients ($P < .0001$) and mean arterial blood pressure ($P = .001$) had an effect. Skin pigmentation did not have any effect on the magnitude of bias.

CONCLUSIONS: Noninvasive Hemoglobin measurement is a promising tool in dark-skinned critically ill patients with low hemoglobin levels, but requires further refinements for it to have clinical usefulness.

白內障手術患者的傷害：麻塞諸塞州不良事件的系列報導

Patient Harm in Cataract Surgery: A Series of Adverse Events in Massachusetts

Roberto, Sarah, A., MPP[*]; Bayes, Joseph, MD[†]; Karner, Paul, E., PhD[*]; Morley, Michael, G., MD, ScM[‡]; Nanji, Karen, C., MD, MPH[§]

Anesthesia & Analgesia: 2018 126 1548–1550

麻塞諸塞州州政府自2011年至2015年收到涉及白內障手術的37件不良事件(AE)報告。其中15件與麻醉有關，包括5例眼部阻滯失誤、3例血流動力學不穩定、2例球後血腫／出血，和5例眼球穿孔導致永久性視力喪失。雖然麻塞諸塞州不良事件報告不足以代表白內障手術中發生不良事件的真實數量，但它們提供有用的資料提示在這類手術中會發生的患者傷害類型。

（葛家希 譯 陳傑 校）

Massachusetts state agencies received reports of 37 adverse events (AEs) involving cataract surgery from 2011 to 2015. Fifteen were anesthesia related, including 5 wrong eye blocks, 3 cases of hemodynamic instability, 2 retrobulbar hematoma/hemorrhages, and 5 globe perforations resulting in permanent loss of vision. While Massachusetts' reported AEs likely underrepresent the true number of AEs that occur during cataract surgery, they do offer useful signal data to indicate the types of patient harm occurring during these procedures.

採用調查和德菲程式來理解創傷麻醉監護實踐

Use of Survey and Delphi Process to Understand Trauma Anesthesia Care Practices

Kuza, Catherine, M., MD[*]; Vavilala, Monica, S., MD[†]; Speck, Rebecca, M., MPH[‡, §]; Dutton, Richard, P., MD, MBA[‖]; McCunn, Maureen, MD, MIPP, FCCM[¶]

Anesthesia & Analgesia: 2018 126 1580－1587

背景：如今，很少有創傷相關的指南評估和推薦麻醉實踐，且沒有創傷麻醉專用指南存在。同時沒有關於麻醉科醫師如何看待臨床實踐模式的資訊。因此作者進行該項調查的目標是瞭解麻醉醫生對創傷麻醉實踐的看法。

方法：將評估創傷患者的麻醉管理的調查問卷分發給 21,491 名麻醉醫師。其中 10 個問題設為一個子集，由創傷麻醉學專業小組通過 3 輪基於網路的德菲分析程式進行評閱。如果在第 1 輪和第 2 輪時，達成一致意見比例最高的答覆保持不變，那麼這個問題就被視為達成共識。

結果：共有 2360 名麻醉醫師（回答率為 11%）回應了這項調查。結果顯示，從業人員的答案與現有外科創傷協會的建議（如何時進行成分輸血治療）以及幾個缺乏任何指導原則的領域相衝突，導致麻醉醫師間回答存在差異，其中沒有 1 個答案達到了>75%的一致性(如對病史不清的頸髓損傷患者選擇的插管技術)。13 位創傷麻醉醫師參與了第 1 輪（有效率 100%）德菲分析程式，12 位元參與了第 2 輪和第 3 輪（有效率 92%）的德菲分析程式。沒有任何問題達成 100%統一意見。有關創傷麻醉監護的 10 條陳述中有 9 條得到了共識。對於病史不清的頸髓損傷合併血流動力學不穩定的患者相關氣管插管技術無法達成一致意見。德菲分析程式參與者的意見與現有的 2 條陳述的指導原則相衝突：是否採用環狀軟骨加壓以及何時開始成分輸血的時間。

結論：創傷麻醉實踐中有幾個重要領域沒有麻醉指南，有些麻醉指南並未得到大多數參與此項調查的麻醉醫師的認可。缺乏對創傷麻醉管理的共識和調查反映出的差異性表明需要制定基於循證醫學的創傷麻醉指南。

（黃莉莉 譯 陳傑 校）

BACKGROUND: Few trauma guidelines evaluate and recommend anesthesiology practices and there are no trauma anesthesia-specific guidelines. There is no information on how anesthesiologists perceive clinical practice patterns. Our objective was to understand the perceptions of anesthesiologists regarding trauma anesthesia practices.

METHODS: A survey assessing anesthesia management of trauma patients was distributed to 21,491 anesthesiologists. A subset of 10 of these questions

was subsequently reviewed by a trauma anesthesiology focus group through a 3-round web-based Delphi process. A question was deemed to have respondent consensus if the response with the highest percentage of agreement was unchanged between rounds 1 and 2.

RESULTS: A total of 2360 anesthesiologists (11% response rate) responded to the survey. Results demonstrated that the practitioners' answers conflicted with existing surgical trauma society recommendations (ie, when to transfuse component therapy), and several areas that lacked any guidelines, resulted in response variability among anesthesiologists where not 1 answer achieved >75% agreement (ie, intubation technique of choice for patients with uncleared cervical spine). Thirteen trauma anesthesiologists participated in round 1 (response rate 100%), and 12 responded in rounds 2 and 3 (response rate 92%) of the Delphi process. None of the questions received 100% agreement. Consensus was achieved on 9 of 10 statements pertaining to trauma anesthesia care. Consensus was not reached on the intubating technique in a hemodynamically unstable patient with an uncleared cervical spine with deficits. Delphi participant opinion conflicted with existing guidelines on 2 statements: the use of cricoid pressure, and when to begin blood component therapy.

CONCLUSIONS: There are several important areas of trauma anesthesia practice where guidelines do not exist and several where existing guidelines are not endorsed by the majority of practitioners who completed our survey. The lack of consensus on trauma anesthesia management and the variation in survey responses demonstrate a need to develop evidence-based trauma anesthesia guidelines.

預測剖宮產術後急性疼痛的嚴重程度：一篇敘述性綜述

Predicting Severity of Acute Pain After Cesarean Delivery: A Narrative Review

Gamez, Brock, H., BS; Habib, Ashraf, S., MBBCh, MSc, MHSc, FRCA

Anesthesia & Analgesia: 2018 126 1606–1614

剖宮產是美國最常見的外科手術之一，年手術量達 130 萬台以上。剖宮產術後五分之一的婦女後會經歷圍術期急性疼痛，導致其發展為慢性疼痛和產後抑鬱症的風險增加，並對母乳餵養和新生兒監護產生負面影響。越來越多的研究試圖尋求一些評估工具用以預測那些會經歷圍術期嚴重疼痛並需要加強術後鎮痛的患者。這些預測工具包括定量感覺測試，創傷痛覺過敏評估，局麻藥浸潤反應，以及術前心理測量評估，如有效的心理問卷和簡單的篩選工具。在這篇綜述中，對於預

測剖宮產後 48 小時內出現嚴重疼痛和/或阿片類藥物使用量的各種評估工具，作者檢索了 MEDLINE、Cochrane 資料庫和穀歌學術，納入了一些評價此類工具功效的文章。最終納入 13 篇文章：其中 5 篇使用定量感覺測試，包括患者對壓力、電和熱刺激的反應；1 篇使用痛覺過敏測試；1 篇使用局麻藥浸潤反應；4 篇使用術前心理測量評估，包括狀態-特質焦慮量表、疼痛災難量表、匹茲堡睡眠品質指數、醫院焦慮抑鬱量表以及簡單問卷；此外，有 2 篇則是將定量感覺測試和心理測量評價相結合。一些預測工具顯示出了其預測結果與剖宮產術後疼痛結果的相關性，並且具有統計學意義，但大多數工具顯示的相關性為弱到中等，並且很多預測工具臨床可行性不高。局麻藥浸潤反應和一項使用 3 個簡單問題詢問關於焦慮、預期疼痛和鎮痛需求的工具顯示了其臨床使用的潛力，但需要進一步的研究來評估這些預測試驗在臨床實踐中的價值。

（徐僑翌 譯 陳傑 校）

Cesarean delivery is one of the most common surgical procedures in the United States, with over 1.3 million performed annually. One-fifth of women who undergo cesarean delivery will experience severe pain in the acute postoperative period, increasing their risk of developing chronic pain and postpartum depression, and negatively impacting breastfeeding and newborn care. A growing body of research has investigated tools to predict which patients will experience more severe pain and have increased analgesic consumption after cesarean delivery. These include quantitative sensory testing, assessment of wound hyperalgesia, response to local anesthetic infiltration, and preoperative psychometric evaluations such as validated psychological questionnaires and simple screening tools. For this review, we searched MEDLINE, the Cochrane database, and Google Scholar to identify articles that evaluated the utility of various tools to predict severe pain and/or opioid consumption in the first 48 hours after cesarean delivery. Thirteen articles were included in the final review: 5 utilizing quantitative sensory testing, including patient responses to pressure, electrical, and thermal stimuli; 1 utilizing hyperalgesia testing; 1 using response to local anesthetic wound infiltration; 4 utilizing preoperative psychometric evaluations including the State-Trait Anxiety Inventory, the Pain Catastrophizing Scale, the Pittsburgh Sleep Quality Index, the Hospital Anxiety and Depression Scale, and simple questionnaires; and 2 utilizing a combination of quantitative sensory tests and psychometric evaluations. A number of modalities demonstrated statistically significant correlations with pain outcomes after cesarean delivery, but most correlations were weak to modest, and many modalities might not be clinically feasible. Response to local anesthetic infiltration and a tool using 3 simple questions enquiring about anxiety and anticipated pain and analgesic needs show potential for clinical use, but further studies are needed to evaluate the utility of these predictive tests in clinical practice.

頜面部手術患者可視喉鏡經鼻氣管插管時使用與不使用插管探條引導的比較:一項隨機臨床試驗

Comparison of Nasal Intubations by GlideScope With and Without a Bougie Guide in Patients Who Underwent Maxillofacial Surgeries: Randomized Clinical Trial

Pourfakhr, Pejman, MD*; Ahangari, Ailar, MD†; Etezadi, Farhad, MD*; Moharari, Reza, Shariat, MD*; Ahmadi, Ayat, PhD‡; Saeedi, Negin, BS*; Najafi, Atabak, MD*

Anesthesia & Analgesia: 2018 126 1641–1645

背景：經鼻氣管插管可提供安全氣道（的保障），在頜面部手術的全身麻醉維持中經常使用。常規全麻下經鼻氣管插管使用直接喉鏡進行操作，且常常需要麥氏插管鉗的輔助。這種方法比較耗時，且可能引起視野內出血。彈性引導探條(GEB）是一個廉價、細長且柔韌的用具，可加速經鼻氣管插管（的進程）。本研究的目的是評估 GEB 在經鼻氣管插管中的使用（是否）能否促進插管進程並減少併發症的發生。

方法：本隨機臨床試驗中，美國麻醉醫師協會（ASA）生理狀況Ⅰ~Ⅱ級，年齡 15~65 歲的 110 位患者被隨機平均分為 2 組。兩組均使用了可視喉鏡和鋼絲圈氣管導管。GEB 組使用了 GEB 輔助經鼻氣管插管，常規組則不使用。本研究的主要結果是困難插管（定義為嘗試超過 1 次的氣管插管）（次數），次要結果為插管所用時間，需要更換導管及使用麥氏插管鉗。

結果：出血的發生率在 GEB 組中為 1.81%，較常規組的 43.63%，差異具有顯著統計學意義（P<0.001）。在 GEB 組中，有 5.5%的患者需要使用麥氏插管鉗，而常規組則為 63.7%（P<0.001）。平均插管時間 GEB 組為 48.63 ± 8.53s，常規組為 55.9 ± 10.76s（P<0.001）。

結論:GEB在經鼻氣管插管中是一個非常實用的輔助用具,可減少出血的發生率，減少麥氏插管鉗的使用並在一定程度上減少插管所用時間。為此，在此種情況下推薦常規使用 GEB。

（姚雪雅 譯　陳傑 校）

Background: Nasotracheal intubation is commonly performed to provide a secure airway for the maintenance of general anesthesia in maxillofacial surgeries. Routine nasotracheal intubation is performed under general anesthesia by direct laryngoscopy, frequently with the aid of Magill forceps. This method can be time-consuming and may cause bleeding in the field of view. A gum elastic bougie (GEB) is a cheap, slender, and flexible device that could expedite nasotracheal intubation. The aim of this study

was to evaluate the use of a GEB during nasotracheal intubation to facilitate the procedure and reduce the rate of complications.

Methods: In this randomized clinical trial study, 110 patients with American Society of Anesthesiologists (ASA) physical status I-II from 15 to 65 years of age were randomized into 2 equal groups. In both groups, a GlideScope and armored tube were used. In the GEB group, GEB was used to facilitate nasal intubation while the nasal intubation was performed without the aid of GEB in the routine group. The difficult intubation (defined as >1 attempt for intubation) was the primary outcome, and the duration of the intubation, the presence of traces of bleeding, the need for a tube replacement, and the usage of Magill forceps were the secondary outcomes.

Results: The incidence of bleeding in the GEB group was 1.81% vs 43.63% in the routine group (P < .001). In 5.5% of the GEB group, Magill forceps were used to advance the tube versus 67.3% in the routine group (P < .001). The mean time for intubation in GEB group was 48.63 ± 8.53 vs 55.9 ± 10.76 seconds in the routine group (P < .001).

Conclusions: The GEB is a useful aid to nasotracheal intubation, reducing bleeding, the requirement for Magill forceps and, to a small degree, intubation time. A case exists for its routine use for this purpose.

循證品質改進新措施後手術室血漿浪費在減少

Reduction in Operating Room Plasma Waste After Evidence-Based Quality Improvement Initiative

Meyer, Matthew, J., MD; Dzik, Walter, H., MD; Levine, Wilton, C., MD

Anesthesia & Analgesia: 2018 126 1662－1665

麻醉醫師根據預計輸血量拿取血漿。術中血漿輸注量少於配給量（申請、解凍和發送）。作者提供了關於血漿使用的機構相關資料，包括麻醉醫師間血漿配給－輸注率的差異。從提供資料之前的半年（2015 年 6 月-12 月）到 7 個月後（2016 年 6 月-12 月）的逐月比較中，手術室的血漿使用量從 434.9 ± 81 個單位降至 327.3 ± 65 個單位，逐月變化 107.6 個單位（95%置信區間 CI，22-193）;血庫丟棄血漿從 109.7 ± 48 個單位降至 69.1 ± 9 個單位，逐月變化 40.6 個單位（95%CI，0.2-81）;血漿輸注量從 188.4 ± 42 個單位降至 160.7 ± 52 個單位，逐月變化 27.7 單位（95%CI，－27－83），變化並不明顯。

（楊柳 譯 陳傑 校）

Anesthesiologists request units of plasma in anticipation of transfusion. The amount of plasma transfused intraoperatively is less than that issued (requested, thawed, and sent). We presented institutional-specific data on plasma usage including anesthesiologist-specific ratios of plasma issued-to-transfused. In month-to-month comparisons from the year before the presentation (June–December 2015) to 7 months after (June–December 2016), plasma issued to the operating room was reduced from 434.9 ± 81 to 327.3 ± 65 units, a change of 107.6 units per month (95% confidence interval [CI], 22–193); plasma discarded by the blood bank was reduced from 109.7 ± 48 units to 69.1 ± 9 units, a change of 40.6 units per month (95% CI, 0.2–81); and plasma transfused went from 188.4 ± 42 units to 160.7 ± 52 units, a nonsignificant change of 27.7 units per month (95% CI, −27 to 83).

低收入國家新生兒呼吸窘迫綜合征診斷模式與臨床結果:一項來自孟加拉的報告

Treatment Patterns and Clinical Outcomes in Neonates Diagnosed With Respiratory Distress Syndrome in a Low-Income Country: A Report From Bangladesh

Hubbard, Richard, M., MD*; Choudhury, Kamal, M., MBBS, MS†; Lim, Grace, MD, MS*

Anesthesia & Analgesia: 2018 126 1684–1686

呼吸窘迫綜合征仍然是全球新生兒死亡的主要原因。這項回顧性研究描述了在資源有限的環境中呼吸窘迫綜合征的實踐模式,並試圖找出死亡率和有益治療方式的風險因素。收集健康狀況,人口和治療的資料。使用單變數和多變數邏輯回歸分析潛在關聯。納入分析的 104 名兒童中,有 38 人死亡。儘管大多數兒童最初接受無創呼吸支持治療,但 59 例進展為有創通氣。有創通氣的要求與死亡有關。在使用表面活性劑的情況下,機械通氣患者的生存率明顯提高。

(俞蘇洋 譯 陳傑 校)

Respiratory distress syndrome remains a leading cause of neonatal mortality worldwide. This retrospective study describes practice patterns for respiratory distress syndrome in a resource-limited setting and seeks to identify both risk factors for mortality and beneficial treatment modalities. Health, demographic, and treatment data were collected. Potential associations were analyzed using univariable and multivariable logistic regression. Of 104 children included for analysis, 38 died. Although most children were initially treated with noninvasive respiratory support, 59 progressed to invasive ventilation. Requirement

for invasive ventilation was associated with death. A clear trend toward improved survival in mechanically ventilated patients was seen with surfactant administration.

術前應用大劑量甲強龍對腹腔鏡闌尾切除術後靜息疼痛的隨機臨床研究

Randomized Clinical Trial of Preoperative High-Dose Methylprednisolone on Postoperative Pain at Rest After Laparoscopic Appendectomy

Kleif, Jakob, MD*; Hauge, Camilla, I., MD†; Vilandt, Jesper, MD*; Gögenur, Ismail, MD, DMSc‡

Anesthesia & Analgesia: 2018 126 1712–1720

背景：術前靜脈給予甲強龍可以減輕病人擇期手術後的疼痛，噁心和乏力。本研究旨在探討在腹腔鏡下行闌尾炎手術前 30 分鐘靜脈給予 125mg 甲強龍是否能減輕患者術後 3 天的靜息疼痛。

方法：作者開展了一項多中心，平行，雙盲，安慰劑對照研究，納入 ASA 評分 I-III 級，通過腹腔鏡手術治療疑似闌尾炎的 18 歲及以上患者。主要結果是在 11 點數位量表上評估 5 次術後 3 天的靜息疼痛。採用以時間和干預作為主要效應的混合效應模型，評估 125 mg 甲基強的松龍對術後 3 天靜息疼痛的影響。

結果：2016 年 4 月至 2016 年 8 月，共納入 78 例患者。125 mg 甲強龍治療後，患者術後 3 天靜息疼痛的 11 分數字評分量表提高 0.2，無統計學意義（95%置信區間，-0.5 至 0.9; P = 0.571）。術後第一天，兩組對阿片類激動劑的需求沒有差異（P = 0.381）。

結論：在腹腔鏡闌尾炎手術前 30 分鐘靜脈給予 125mg 甲強龍，與安慰劑組相比，並不能減輕術後疼痛。

（翟小竹 譯 陳傑 校）

BACKGROUND: Methylprednisolone administered intravenously preoperatively has been shown to reduce pain, nausea, and fatigue after elective surgery. We aimed to show that 125 mg of methylprednisolone given intravenously 30 minutes before laparoscopic surgery for suspected appendicitis would reduce pain at rest during the first 3 postoperative days.

METHODS: A multicenter, parallel-group, double-blind, placebo-controlled study was conducted including patients 18 years of age and older with an American Society of Anesthesiologist class of I-III undergoing laparoscopic surgery for suspected appendicitis. The primary

outcome was pain at rest measured on the 11-point numerical rating scale 5 times during the first 3 days after surgery. The effect of 125 mg of methylprednisolone on postoperative pain at rest during the first 3 days was assessed using a mixed-effects model with time and intervention as main effects.

RESULTS: From April 2016 to August 2016, 78 patients were included, and all were eligible for analysis of the primary outcome. The estimated effect of 125 mg of methylprednisolone on pain at rest during the first 3 days after surgery was a nonsignificant increase of 0.2 (95% confidence interval, −0.5 to 0.9; P = .571) on the 11-point numerical rating scale. There was no difference between the 2 groups regarding the need for opioid agonists during hospital stay on the first postoperative day (P = 0.381).

CONCLUSIONS: A 125-mg dose of methylprednisolone given intravenously 30 minutes before laparoscopic surgery for appendicitis seemed no better than placebo at providing a clinical meaningful reduction in postoperative pain at rest.

多巴胺加入可增強並延長丙美卡因或奧布卡因溶液在大鼠中皮膚抗傷害作用

Adding Dopamine to Proxymetacaine or Oxybuprocaine Solutions Potentiates and Prolongs the Cutaneous Antinociception in Rats

Chen, Yu-Wen, PhD[*,†]; Chiu, Chong-Chi, MD[‡,§]; Lin, Heng-Teng, MS, MD[‖,¶]; Wang, Jhi-Joung, MD, PhD[#]; Hung, Ching-Hsia, PhD[**,††]

Anesthesia & Analgesia: 2018 126 1721－1728

背景：作者使用等效線圖評估了多巴胺-丙美卡因和多巴胺-奧布卡因抗傷害感受的相互作用。

方法：本實驗在大鼠背部皮下注射藥物（丙美卡因，奧布卡因和多巴胺），從而類比滲透阻滯。建立單獨和聯合多巴胺的代謝卡他定和奧布卡因的劑量相關抗傷害感受曲線，然後使用等效線圖分析局部麻醉劑和多巴胺之間的抗傷害感受相互作用。

結果：皮下丙美卡因，奧布卡因和多巴胺以劑量依賴性方式對局部皮膚針刺產生感覺阻滯。效能的等級順序為丙美卡因（0.57 [0.52-0.63] μmol/ kg）>奧布卡因（1.05 [0.96-1.15] μmol/ kg）>多巴胺（165 [154-177] μmol/ kg; P <0.01比較），結果基於 50％有效劑量值。在等量麻醉的基礎上（25％有效劑量，50％有效劑量和 75％有效劑量），應用丙美卡因或奧布卡因的傷害性阻滯持續時間短于多巴胺（P <0.01）。與多巴胺共同注射的丙美卡因或奧布卡因引起協同鎮痛作用並延長作用持續時間。

結論：與多巴胺相比，丙美卡因或奧布卡因注射液具有更高的效力並引起感覺阻滯持續時間更短。多巴胺的使用增加了奧布卡因和丙美卡因引起的皮膚抗傷害感受的品質和持續時間。

（張松 譯 陳傑 校）

BACKGROUND: We evaluated the interaction of dopamine-proxymetacaine and dopamine- oxybuprocaineantinociception using isobolograms.

METHODS: This experiment uses subcutaneous drug (proxymetacaine, oxybuprocaine, and dopamine) injections under the skin of the rat's back, thus simulating infiltration blocks. The dose-related antinociceptive curves of proxymetacaine and oxybuprocaine alone and in combination with dopamine were constructed, and then the antinociceptive interactions between the local anesthetic and dopamine were analyzed using isobolograms.

RESULTS: Subcutaneous proxymetacaine, oxybuprocaine, and dopamine produced a sensory block to local skin pinpricks in a dose-dependent fashion. The rank order of potency was proxymetacaine (0.57 [0.52-0.63] μmol/kg) >oxybuprocaine (1.05 [0.96-1.15] μmol/kg) > dopamine (165 [154-177] μmol/kg; P < .01 for each comparison) based on the 50% effective dose values. On the equianesthetic basis (25% effective dose, 50% effective dose, and 75% effective dose), the nociceptive block duration of proxymetacaine or oxybuprocaine was shorter than that of dopamine (P < .01). Oxybuprocaine or proxymetacainecoinjected with dopamine elicited a synergistic antinociceptive effect and extended the duration of action.

CONCLUSIONS: Oxybuprocaine and proxymetacaine had a higher potency and provoked a shorter duration of sensory block compared with dopamine. The use of dopamine increased the quality and duration of skin antinociception caused by oxybuprocaine and proxymetacaine.

膠體液和微循環

Colloids and the Microcirculation

He, Huaiwu, PhD*; Liu, Dawei, PhD*; Ince, Can, PhD†,‡

Anesthesia & Analgesia: 2018 126 1747－1754

膠體溶液在治療低血容量時被提倡使用，因為它們相對於晶體溶液能更好地維持血容量。由於液體復蘇的最終效果是提高微循環灌注和組織氧合，對於膠體和晶體在治療休克和液體復蘇時改善微循環的療效的研究，以及探討在治療低血容量時使用膠體液對微循環的潛在保護作用的研究都是熱點。本文回顧了各種類型的

膠體溶液的理化性質（如明膠、右旋糖、羥乙基澱粉和白蛋白）以及它們在實驗室研究和臨床研究中對各種低血容量狀況的療效。

（張金源 譯 陳傑 校）

Colloid solutions have been advocated for use in treating hypovolemia due to their expected effect on improving intravascular retention compared with crystalloid solutions.Because the ultimate desired effect of fluid resuscitation is the improvement of microcirculatory perfusion and tissue oxygenation, it is of interest to study the effects of colloids and crystalloids at the level of microcirculation under conditions of shock and fluid resuscitation, and to explore the potential benefits of using colloids in terms of recruiting the microcirculation under conditions of hypovolemia. This article reviews the physiochemical properties of the various types of colloid solutions (eg, gelatin, dextrans, hydroxyethylstarches, and albumin) and the effects that they have under various conditions of hypovolemia in experimental and clinical scenarios.

對做過心臟手術的患者，我們經過 7 年的跟蹤隨訪發現，輸注少量去除白細胞的紅細胞懸液和患者死亡率不存在明顯關係：傾向匹配劃分分析顯示

No Significant Association Between the Transfusion of Small Volumes of Leukocyte-Depleted Red Blood Cells and Mortality Over 7 Years of Follow-up in Patients Undergoing Cardiac Surgery: A Propensity Score Matched Analysis

Koster, Andreas, MD, PhD[*]; Zittermann, Armin, PhD[†]; Börgermann, Jochen, MD, PhD[†]; Gummert, Jan, F., MD, PhD[†]

Anesthesia & Analgesia: 2018 126 1469–1475

背景：輸入紅細胞懸液對遠期臨床轉歸的影響存在爭議

方法：我們對 6124 個心臟手術的患者進行了前瞻性研究的跟蹤隨訪，記錄資料，將其分為非紅細胞輸入組和紅細胞輸入組（1-2 單位去除白細胞的紅細胞懸液）。本研究首要目的是統計經歷心臟手術後 7 年內患者的總體死亡率；其次是觀察隨訪期間患者的冠脈血管再生情況。傾向匹配劃分方法的應用是為了糾正非隨機化分配的誤差。亞組分析也用於術前貧血的病人。

結果：4118 個病人應用了傾向匹配劃分方法，在平均跟蹤隨訪的時間為 4.05(0-7.3)年間，非紅細胞懸液輸入組 140（14.6%）人死亡，而紅細胞懸液輸入組 173（17.2%）人死亡.輸入組與非輸入組的風險比為 1（95%可信區間，0.79-1.25，*P*=0.969）；且二者的血管再建數量分別是 96（9.9%）和 125（10.6%），其風險比為 1.21（95%可信區間，0.92-1.58，*P*=0.166）。術前貧血並非術後死亡的危險因素，即使患者曾經輸過血。

總結：傾向匹配劃分分析並未說明心臟手術的患者輸入去除白細胞紅細胞懸液與術後死亡率的發生有明顯聯繫。而且，術前貧血並不被認為是增加術後死亡率的危險因素。

（蔣湘雲譯 李士通校）

BACKGROUND: The impact of red blood cell (RBC) transfusion on long-term clinical outcome is controversial.

METHODS: We prospectively recorded follow-up data of 6124 cardiac surgical patients who received no transfusion (RBC− group) or 1–2 units of leukocyte-depleted RBC (RBC+ group) at our institution. The primary end point was overall mortality up to 7 years after cardiac surgery; secondary end point was coronary artery revascularization during follow-up. To correct for nonrandomized group assignment, propensity score (PS) matching was performed. A subgroup analysis was also performed in patients with preoperative anemia.

RESULTS: PS matching was possible in 4118 patients. During a mean follow-up of 4.05 years (range, 0.0–7.3 years), 140 patients (14.6%) died in the RBC− group and 173 (17.2%) died in the RBC+ group. The hazard ratio for the RBC+ group versus the RBC− group was 1.00 (95% confidence interval, 0.79–1.25; *P* = .969). The number of revascularizations was 96 (9.9%) and 125 (10.6%), respectively, with a hazard ratio of 1.21 (95% confidence interval, 0.92–1.58; *P* = .166) for the RBC+ group.

Preoperative anemia was not a risk factor for postoperative mortality, even when patients were transfused.

CONCLUSIONS: This PS-matched analysis does not provide evidence for an association of the transfusion of small volumes of leukocyte-depleted RBCs with an increased postoperative mortality in cardiac surgical patients. Moreover, preoperative anemia could not be identified as a risk factor for increased postoperative mortality.

舒更葡糖引發過敏反應的發生率研究

Incidence of Anaphylaxis Associated With Sugammadex

Miyazaki, Yusuke, MD[*]; Sunaga, Hiroshi, MD[*]; Kida, Kotaro, MD[*]; Hobo, Shotaro, MD[†]; Inoue, Nobuyoshi, MD[*]; Muto, Masayuki, MD[*]; Uezono, Shoichi, MD[*]

Anesthesia & Analgesia: 2018 126 1505–1508

我們對日本一家獨立中心三年多所發生的舒更葡糖誘發過敏反應的現象進行了回顧性的研究。術中高敏性的總體發生率為 0.22%（95%可信區間，0.17%-0.29%），過敏反應的發生率為 0.059%（95%可信區間，0.032%-0.10%）。研究期間，使用舒更葡糖的病人數為 15479，過敏反應的發生與使用舒更葡糖的發生率為 0.039（n=6;95%可信區間，0.014%-0.084%）。結果暗示與舒更葡糖有關的過敏反應可能與琥珀膽鹼或羅庫溴銨所致的過敏反應發生率相差無幾。前瞻性研究，包括對誘因的檢測，對於確定舒更葡糖導致過敏反應的發生率是必要的；然而，目前的研究只是引起人們對該潛在過敏反應的注意。

（蔣湘雲譯 李士通校）

We retrospectively investigated the incidence of potential sugammadex-induced anaphylaxis at a single center in Japan over a period of 3 years. The overall incidence of intraoperative hypersensitivity reaction was 0.22% (95% confidence interval [CI], 0.17%–0.29%), and the incidence of anaphylaxis was 0.059% (95% CI, 0.032%–0.10%). The total number of patients who received sugammadex during the study period was 15,479, and the incidence of anaphylaxis associated with sugammadex was 0.039% (n = 6; 95% CI, 0.014%–0.084%). This result implies that the incidence of sugammadex-associated anaphylaxis could be as high as that for succinylcholine or rocuronium. A prospective study, including testing for identification of cause, is necessary to confirm the exact incidence of sugammadex-induced anaphylaxis; however, the present finding calls attention to this potential.

預防白內障手術中的不良事件：來自麻塞諸塞州的專家共識

Preventing Adverse Events in Cataract Surgery: Recommendations From a Massachusetts Expert Panel

Nanji, Karen, C., MD, MPH[*]; Roberto, Sarah, A., MPP[†]; Morley, Michael, G., MD, ScM[‡]; Bayes, Joseph, MD[§]

Anesthesia & Analgesia: 2018 126 1537–1547

麻塞諸塞州的衛生機構報導了近年來一系列白內障手術相關的不良事件，包括一天內由一名麻醉醫生至5例眼球破裂的事件。貝琪雷曼中心，麻塞諸塞州的一個自由組織，通過召集了一些相關專家制定了一些共識，以此來減輕白內障手術中的患者傷害。本文的目的是認清白內障手術中不良事件的危害因素，這些在馬塞諸塞州的專家共識中有說明，且有相應的方法來預防。來自州委託事件報告的資料通過馬塞諸塞州白內障手術患者的網上調研和對相關人員的調查研究來補充。專家組列出了致白內障手術術中不良事件的的 2 個主要因素：系統錯誤和麻醉技術的選擇。系統錯誤包括不科學的安全協定（總因素的 48.7%）、交流不足（總因素的 18.4%）、人員訓練不足（總因素的 17.1%）和非標準化（總因素的 15.8%）。麻醉技術的選擇包括日益增加的眼部神經阻滯相關風險。麻塞諸塞州白內障手術的調查表明麻醉操作廣泛的不同。而據 45.5%的外科醫生傳達和69.6%的設備顯示相較於過去的十年局部麻醉應用的日益增加，白內障手術有47%由外科醫生施行的神經阻滯，40.9%在儀器下引導完成。應用改進的德爾菲方法，專家組提供了幾條建議來減少白內障手術術中不良事件的發生。包括在阻滯之前，至少兩組人員的校對、程式的標準化、設備的安全有效，包括統計的標準，以及加強任何對病人進行操作的人員的培訓，開始獨立操作前，至少 10 次在監督下進行，減少有創的麻醉操作，最後調整麻醉方法，包括最優的技術。接下來的研究將會著手評估這些專家建議的有效性。

（蔣湘雲譯 李士通校）

Massachusetts health care facilities reported a series of cataract surgery–related adverse events (AEs) to the state in recent years, including 5 globe perforations during eye blocks performed by 1 anesthesiologist in a single day. The Betsy Lehman Center for Patient Safety, a nonregulatory Massachusetts state agency, responded by convening an expert panel of frontline providers, patient safety experts, and patients to recommend strategies for mitigating patient harm during cataract surgery. The purpose of this article is to identify contributing factors to the cataract surgery AEs reported in Massachusetts and present the panel's recommended strategies to prevent them. Data from state-mandated serious reportable event reports were supplemented by online surveys of Massachusetts cataract surgery providers and semistructured interviews with key stakeholders and frontline staff. The panel identified 2 principal categories of contributing factors to the state's cataract surgery–related AEs: systems failures and choice of anesthesia technique. Systems failures included inadequate safety protocols (48.7% of contributing factors), communication challenges (18.4%), insufficient provider training (17.1%), and lack of standardization (15.8%). Choice of anesthesia technique involved the increased relative risk of needle-based eye blocks. The panel's surveys of Massachusetts cataract surgery providers show wide variation in anesthesia practices. While 45.5% of surgeons and 69.6% of facilities reported increased use of topical anesthesia compared to 10 years earlier, needle-based blocks were still used in 47.0% of cataract surgeries performed by surgeon respondents and 40.9% of those performed at respondent facilities. Using a modified Delphi approach, the panel recommended several strategies to prevent AEs during cataract surgery, including performing a distinct time-out with at least 2 care-team members before block administration; implementing standardized, facility-wide safety protocols, including a uniform site-marking policy; strengthening the credentialing and orientation of new, contracted and locum tenens anesthesia staff; ensuring adequate and documented training in block administration for any provider who is new to a facility, including at least 10 supervised blocks before practicing independently; using the least invasive form of anesthesia appropriate to the patient; and finally, adjusting

anesthesia practices, including preferred techniques, as evidence-based best practices evolve. Future research should focus on evaluating the impact of these recommendations on patient outcomes.

基於醫生的院前急救氣管內插管使用 A.P Advance，C-MAC 系統，KingVision：對不同的葉片類型進行一項前瞻性、隨機、多中心研究

Videolaryngoscopy for Physician-Based, Prehospital Emergency Intubation: A Prospective, Randomized, Multicenter Comparison of Different Blade Types Using A.P. Advance, C-MAC System, and KingVision

Cavus, Erol, MD[*,†]; Janssen, Sebastian, MD[*]; Reifferscheid, Florian, MD[‡]; Caliebe, Amke, PhD[§]; Callies, Andreas, MD[‖]; von der Heyden, Martin, MD[¶]; Knacke, Peer, G., MD[#]; Doerges, Volker, MD[‡]

Anesthesia & Analgesia: 2018 126 1565–1574

背景：可視喉鏡是氣管插管的一種有價值的技術，當在圍術期使用時，不同的可視喉鏡在技術使用和插管成功率方面都有所不同。然而，在院前環境中，不同的可視喉鏡的相對表現尚未得到充分的研究。

方法：我們在德國 4 所院前急救醫學中心進行了這項前瞻性隨機多中心研究。 168 名需要院前急診插管的成年患者由急診醫師進行治療，隨機分配到 3 種具有不同鏡片類型的可攜式可視喉鏡（A.P. Advance，C-MAC PM 和有管槽葉片的 KingVision）中的一種。主要結局變數是整體插管成功率，次要結果包括首次插管成功率，聲門視覺化以及操作設備的難度。 成對比較的 *P* 值通過 Bonferroni 方法對 3 次測試（*P* [BF]）進行校正。 所有呈現的 *P* 值均調整為中心。

結果：聲門暴露視覺化方面 3 種設備相當。 總體而言 AP Advance，C-MAC 和 KingVision 的整體插管成功率分別為 96％，97％和 61％（*P* <0.001，AP Advance 與 C-MAC 的比值比[OR]為 0.97,95％置信區間[CI]為 0.13-7.42，*P* [BF]> 0.99; AP Advance 與 KingVision 比較：OR，0.043,95％CI，0.0088-0.21，*P*[BF] <0.001; C-MAC 與 KingVision 比較：OR，0.043 ，95％CI，0.0088-0.21，*P* [BF] <0.001）。在 AP Advance，C-MAC 和 KingVision 的第一次嘗試中插管成功率分別為 86％，85％和 48％（總體：*P* <0.001，AP Advance 與 C-MAC：OR，0.89,95％CI ，0.31，*P* [BF]> 0.99，AP Advance 與 KingVision 比較 OR, 0.24, 95% CI, 0.055–0.38,*P* [BF] = 0.0054; C-MAC 與 KingVision 比較: OR, 0.21, 95% CI, 0.043–.34, *P* [BF] < 0.003）。直接喉鏡檢查對於使用視頻喉鏡設備進行成功插管是必要的，其中 5 例患者使用 A.P. Advance，4 例使用 C-MAC。在 KingVision 組中，在 KingVision 組中有 21 例患者使用替代裝置插管。

結論：在急診醫生進行院前緊急氣管插管期間，3 種商用視頻喉鏡 A.P. Advance，C-MAC PM 和 KingVision 的成功率顯著不同。 我們還發現，雖然任何視頻喉鏡都能提供足夠的視野，但通過有管葉片的 KingVision 進行實際插管更為困難。（陶強譯 李士通校）

BACKGROUND: Videolaryngoscopy is a valuable technique for endotracheal intubation. When used in the perioperative period, different videolaryngoscopes vary both in terms of technical use and intubation success rates. However, in the

prehospital environment, the relative performance of different videolaryngoscopic systems is less well studied

METHODS: We conducted this prospective, randomized, multicenter study at 4 German prehospital emergency medicine centers. One hundred sixty-eight adult patients requiring prehospital emergency intubation were treated by an emergency physician and randomized to 1 of 3 portable videolaryngoscopes (A.P. Advance, C-MAC PM, and channeled blade KingVision) with different blade types. The primary outcome variable was overall intubation success and secondary outcomes included first-attempt intubation success, glottis visualization, and difficulty with handling the devices. *P* values for pairwise comparisons are corrected by the Bonferroni method for 3 tests (*P* [BF]). All presented *P* values are adjusted for center

RESULTS: Glottis visualization was comparable with all 3 devices. Overall intubation success for A.P. Advance, C-MAC, and KingVision was 96%, 97%, and 61%, respectively (overall: *P* < .001, A.P. Advance versus C-MAC: odds ratio [OR], 0.97, 95% confidence interval [CI], 0.13–7.42, *P* [BF] > 0.99; A.P. Advance versus KingVision: OR, 0.043, 95% CI, 0.0088–0.21, *P* [BF] < 0.001; C-MAC versus KingVision: OR, 0.043, 95% CI, 0.0088–0.21, *P*[BF] < 0.001). Intubation success on the first attempt with A.P. Advance, C-MAC, and KingVision was 86%, 85%, and 48%, respectively (overall: *P* < .001, A.P. Advance versus C-MAC: OR, 0.89, 95% CI, 0.31–2.53, *P*[BF] > 0.99; A.P. Advance versus KingVision: OR, 0.24, 95% CI, 0.055–0.38, *P* [BF] = 0.0054; C-MAC versus KingVision: OR, 0.21, 95% CI, 0.043–.34, *P* [BF] < 0.003). Direct laryngoscopy for successful intubation with the videolaryngoscopic device was necessary with the A.P. Advance in 5 patients, and with the C-MAC in 4 patients. In the KingVision group, 21 patients were intubated with an alternative device

CONCLUSIONS: During prehospital emergency endotracheal intubation performed by emergency physicians, success rates of 3 commercially available videolaryngoscopes A.P. Advance, C-MAC PM, and KingVision varied markedly. We also found that although any of the videolaryngoscopes provided an adequate view, actual intubation was more difficult with the channeled blade KingVision

女性要求硬膜外分娩鎮痛的意向、分娩後硬膜外鎮痛和產後 6 周抑鬱的關係：前瞻性觀察研究

The Relationship Between Women's Intention to Request a Labor Epidural Analgesia, Actually Delivering With Labor Epidural Analgesia, and Postpartum Depression at 6 Weeks: A Prospective Observational Study

Orbach-Zinger, Sharon, MD[*,†]; Landau, Ruth, MD[‡]; Harousch, Avi, Ben, MD[§]; Ovad, Oren, MD[*,†]; Caspi, Liron, MD[*,†]; Kornilov, Evgeniya, MD[*,†]; Ioscovich, Alexander, MD[‖]; Bracco, Danielle, BA[*,†]; Davis, Atara, BA[*,†]; Fireman, Shlomo, MD[*,†]; Hoshen, Moshe, PhD[¶]; Eidelman, Leonid, A., MD[*]

Anesthesia & Analgesia: 2018 126 1590–1597

背景：產後抑鬱症（PPD）與分娩期間和分娩後的疼痛有關，研究顯示硬膜外鎮痛（LEA）分娩的婦女發生率降低。 我們推測，由於未經治療的分娩疼痛和分娩期間無法比擬的

期望的聯合經驗，並評估了與 LEA 有關方法之間的相互關係，分娩時使用 LEA 實際疼痛控制的滿意度，以及在分娩後 6 周的 PPD，打算接受 LEA 但未接受治療的婦女在 6 周時發生 PPD 的風險較高。

方法：共有 1497 名陰道分娩婦女參加了這項前瞻性佇列研究。 在產後第 1 天記錄了女性最初打算使用或不用 LEA 進行分娩，隨後分娩方式以及對疼痛緩解的滿意度。主要目標是在起初打算進行分娩鎮痛但隨後在沒有LEA的情況下進行分娩的女性中選出6周內 PPD 的女性與其餘佇列進行比較。 主要終點是產後 6 周使用愛丁堡產後抑鬱量表評價 PPD; PPD 定義為分數≥10（從 0 到 30 分）。 記錄人口和產科資料。 Fisher 確切概率法用於組間比較。 對 LEA 和 PPD 方面的意向和實際使用之間的相互作用進行了測試。

結果：總體而言，在 6 周內完成研究的 1326 名女性中有 87 人發生 PPD（6.6%）。對於主要目標，439（29.3%）在沒有 LEA 的情況下分娩，其中 193（12.9%）計畫使用 LEA;這些女性的 PPD 發生率為 8.1%，與其餘佇列組的差異無統計學意義(6.3%;[OR]，1.30,95%[CI]，0.72-2.38; *P* = 0.41） 。使用 LEA 的共有 1058 名女性（70.7%）和 439 名（29.3%）未使用;因此，1169（78.1%）按預期使用，328（21.9%）沒有（未匹配的預期）。評估效應之間的相互作用，意圖在沒有 LEA 的情況下分娩和實際使用 LEA 分娩（風險差異= -8.6%，95%CI，16.2%-1.6%; *P* =0 .014）之間存在強烈的負相加作用，表明不匹配意向效應與消極結果顯著相關。在多元回歸分析中，在打算使用 LEA（OR 1.06; 95%CI 1.01-1.11; *P* = 0.029），並實際使用 LEA（OR，1.07; 95%CI，1.01-1.13; *P* =0.018）都增加了 PPD 的可能性，在調整輔因數之後，乘法相互作用是保護性的（OR，0.92; 95%CI，0.86-0.99; *P* =0 .022）。

結論：我們的研究結果並未表明打算用 LEA 分娩但隨後未用的婦女 6 周內 PPD 幾率明顯增加。 然而，我們確定了預期使用 LEA 與實際使用 LEA，PPD 發生率之間的保護性相互作用。 我們的資料表明，婦女如果不按預期分娩，特別是當最初不打算使用 LEA 的，PPD 的風險會增加。 計畫外 LEA 和 PPD 之間的關係除了與未滿足期望或個人失敗感有關的消極情緒外還可能與身體原因的困難分娩有關， 因此，在分娩後向婦女提供諮詢以解決任何消極看法可能是有益的。

（陶強譯 李士通校）

BACKGROUND: Postpartum depression (PPD) is associated with pain during and after delivery, with studies showing reduced rates among women delivering with labor epidural analgesia (LEA). We hypothesized that women who intend to deliver with LEA but do not receive it are at higher risk for PPD at 6 weeks due to the combined experience of untreated labor pain and unmatched expectations during labor, and evaluated the interaction between labor plans related to LEA, satisfaction with pain control when actually delivering with LEA, and PPD at 6 weeks after delivery.

METHODS: A total of 1497 women with a vaginal delivery were enrolled into this prospective longitudinal study. Women's initial intention to deliver with or without LEA, how they subsequently delivered, and satisfaction with pain relief were recorded on postpartum day 1. Primary aim was selected as PPD at 6 weeks among women intending to deliver with but subsequently delivering without LEA compared with the rest of the cohort. Primary outcome was PPD at 6 weeks using the Edinburgh Postnatal Depression Scale; PPD was defined with a score ≥10 (scale from 0 to 30). Demographic and obstetric data were recorded. Fisher exact test was used for comparisons between groups. The interaction between intention and actual delivery with regard to LEA and PPD was tested.

RESULTS: Overall, 87 of 1326 women completing the study at 6 weeks had PPD (6.6%). For the primary aim, 439 (29.3%) delivered without LEA, of which 193 (12.9%) had intended to deliver with LEA; the PPD rate among these women was 8.1%, which was not statistically different from the rest of the cohort (6.3%; odds ratio [OR], 1.30; 95% confidence interval [CI], 0.72–2.38; $P = .41$). A total of 1058 women (70.7%) delivered with LEA and 439 (29.3%) delivered without; therefore, 1169 (78.1%) delivered as intended and 328 (21.9%) did not (unmatched expectations). Evaluating the interaction between effects, there was a strong negative additive interaction between intending to deliver without LEA and actually delivering with LEA (risk difference = −8.6%, 95% CI, 16.2%–1.6%; $P = .014$) suggesting that unmatched intention effect is significantly associated with negative outcome. In multiple regression analysis, while intending to deliver with LEA (OR, 1.06; 95% CI, 1.01–1.11; $P = .029$) and actually delivering with LEA (OR, 1.07; 95% CI, 1.01–1.13; $P = .018$) both increased the odds for PPD, the multiplicative interaction was protective (OR, 0.92; 95% CI, 0.86–0.99; $P = .022$), after adjusting for cofactors.

CONCLUSIONS: Our study results did not demonstrate a significant increase in the odds for PPD at 6 weeks among women who intended to deliver with LEA but subsequently delivered without. However, we identified a protective interaction between intended LEA use and actual use on the incidence of PPD. Our data suggest an increased risk when women do not deliver as intended, particularly when not initially intending to deliver with LEA. The relationship between unplanned LEA and PPD may be mediated by a physically difficult delivery rather than or in addition to negative emotions related to unmet expectations or a sense of personal failure; therefore, counseling women after delivery to address any negative perceptions may be useful.

預測體外迴圈之前兒童的肝素反應:回顧性佇列研究

Predicting Heparin Responsiveness in Children Before Cardiopulmonary Bypass: A Retrospective Cohort Study

Nakamura, Sayaka, MD[*]; Honjo, Osami, MD, PhD[†]; Crawford-Lean, Lynn, BSc, CPC, CCP[‡]; Foreman, Celeste, BA, CPC, CCP[‡]; Sano, Minako, MD[§,‖]; O'Leary, James, D., MBBCh, MM, MD[§,‖]

Anesthesia & Analgesia: 2018 126 1617–1623

背景：在體外迴圈(CPB)中過多或者過少的使用普通肝素都會造成嚴重的損害。與年齡相關肝素的藥效學和藥物動力學的差異導致兒童肝素反應多變性的增加。本研究的目的[1]在於研究在使用止血管理系統(HMS)Plus（Medtronic, Minneapolis, MN）[2]之前的體外迴圈中預期的與觀察到的肝素反應之間的相關性；描述兒童中肝素敏感性指數（HSI）的年齡特異性參考區間以及使用臨床術前和實驗室資料測試 HSI 指數的預測模型[3]。

方法：在本次回顧性佇列研究中，選取在 2010 年 9 月至 2010 年 12 月這四個月中進行體外迴圈時需要肝素化處理的年齡≤17 歲的兒童作為研究物件。排除體重≥45 公斤或高度≥142 釐米的兒童。HSI 定義為每公斤體重肝素化後活化凝血時間與基礎活化凝血時間之差除以肝素負荷量（IU）。使用林氏一致性相關係數初步分析預測與實際觀測的

HSI 之間的相關性。HSI 的參考區間計算按照臨床和實驗室標準建立的指導方針使用中位數以及 2.5%和 97.5%百分位數。採用非參數回歸分析類比 HSI(因變數)和術前協變數(引數)之間的關係。

結果：在最後分析中總共有 1281 個符合條件的兒童。總的來說，在使用 HMS Plus 系統測量的預測和觀察到的 HSI 之間存在一定的相關性（rho_c = 0.46;95%置信區間,0.41-0.50;P <.001）。百分之六十五（1281 中的 829 例）的預測 HSI 小於觀測值。從調整後的回歸模型中看，術前的國際標準化比率、血小板計數和體重能最好的預測 HSI,但這個模型僅占 25%HSI 的方差。

結論：在一個大樣本兒童中，使用 HMS Plus 系統或者常見的術前臨床和實驗室資料兩者都不能夠可靠的預測在 CPB 之前的肝素反應。我們描述了在兒童中年齡相關性的參考區間，預計這些資料可以說明識別肝素抵抗的人口。

（方怡嬌譯 李士通校）

BACKGROUND: Inadequate or excess administration of unfractionated heparin for cardiopulmonary bypass (CPB) can cause significant harm. Age-dependent differences in the pharmacodynamics and pharmacokinetics of heparin contribute to increased variability of heparin responsiveness in children. The aims of the current study were to (1) examine the correlation between predicted and observed heparin responsiveness in children before CPB measured using the Hemostasis Management System (HMS) Plus (Medtronic, Minneapolis, MN), (2) describe age-specific reference intervals for heparin sensitivity index (HSI) observed in children, and (3) test predictive models of HSI using preoperative clinical and laboratory data.

METHODS: In this retrospective cohort study, children (ages ≤17 years) who required therapeutic heparinization for CPB in a 40-month period between September 2010 and December 2013 were investigated. Children weighing ≥45 kg or with a height ≥142 cm were excluded. HSI was defined as the difference between activated clotting time after heparin administration and the baseline activated clotting time divided by the heparin-loading dose (IU) per kilogram. Lin's concordance correlation coefficient was used for the primary analysis of the relationship between predicted and observed HSI. Reference intervals were calculated for HSI using medians and 2.5% and 97.5% percentiles according to established guidelines for clinical and laboratory standards. Nonparametric regression analyses were used to model the relationship between HSI (dependent variable) and preoperative covariates (independent variables).

RESULTS: A total of 1281 eligible children were included in the final analysis. Overall, there was a moderate correlation between predicted and observed HSI measured using HMS Plus System (rho_c = 0.46; 95% confidence interval, 0.41–0.50; $P < .001$). Sixty-five percent (829 of 1281) of predicted HSI values were less than observed. From adjusted regression models, HSI was best predicted by preoperative international normalized ratio, platelet count, and weight, but this model accounted for only 25% of the variance in HIS.

CONCLUSIONS: In a large cohort of children, heparin responsiveness before CPB was not reliably predicted by either in vitro measurement using the HMS Plus System or commonly available preoperative clinical and laboratory data. We describe age-specific reference intervals for HSI in children, and we anticipate that these data will aid the identification of heparin resistance in this population.

使用線上學習對術前戒煙患者的干預性研究

Utilizing Patient E-learning in an Intervention Study on Preoperative Smoking Cessation

Wong, Jean, MD, FRCPC[*,†]; Raveendran, Raviraj, MBBS[*]; Chuang, Junior, MSc[‡]; Friedman, Zeev, MD, FRCPC[§]; Singh, Mandeep, MBBS, FRCPC[*,‖]; Patras, Jayadeep, PhD[*,¶]; Wong, David, T., MD, FRCPC[*]; Chung, Frances, MBBS, FRCPC[*]

Anesthesia & Analgesia: 2018 126 1646–1653

背景：吸煙的患者出現嚴重手術併發症的風險增加，但是由於吸煙而導致併發症風險增加並不是目前患者教育的常規操作流程。基於電腦的戒煙計畫在普通人群中的應用不斷增加，也許可以克服缺少時間、知識和培訓提供的干預措施這些障礙。我們的目標是為手術患者開發和實施一個病人電子學習項目作為旨在幫助他們戒煙的多方面專案中的一部分和確定戒煙相關的橫向和縱向的因素。

方法：在這個前瞻性多中心研究中，選擇行擇期非心臟手術的吸煙患者參與由電子學習專案、簡短的建議、教育小冊子、煙草戒煙熱線諮詢、寫信給主治醫師和藥物治療組成的病人術前戒煙計畫。病人電子學習專案中描述（1）手術前戒煙的好處；（2）如何戒煙和（3）如何應對戒煙。戒煙後 7 天的患病率(PP)在當天手術以及術後 1，3，6 個月分別進行評估，用多變數邏輯回歸分析確定與戒煙最相關的影響因素。用廣義估計方程的方法估計與戒煙縱向相關的影響因素。項目的範圍通過參與該項目的吸煙者的數量相對于傾向於該項目的患者數量來進行評估。

結果：共有 459 名患者(68.9%的符合條件的患者)參加。戒煙後的 7 天患病率在手術當天，術後 1 個月，3 個月和 6 個月分別為 22%,29%,25%,和 22%。預測戒煙 6 月內使用藥物治療（優勢比[OR]:7.32；95%可信區間(CI):3.71-14.44；P <.0001)和撥打煙草戒煙熱線的數量(OR:1.60；95%置信區間:1.35-1.90;P <.0001)。存在其他吸煙者的家庭(OR：0.39；95%置信區間：0.21-0.72；P = .0030)和每週花在香煙的最低限額(每增加 10 美元)(OR：0.73；95%置信區間：0.61-0.87；P = .0004)都是戒煙的障礙。

結論:術前戒煙項目導致了在 6 個月內戒煙的 7 天患病率為 22%。多方面的干預包括病人電子學習項目可能是一個幫助外科病人克服一些戒煙障礙的有價值的工具。

（方怡嬌譯 李士通校）

BACKGROUND: Patients who smoke put themselves at increased risk for serious surgical complications, yet it is not currently routine practice to educate patients about the risk of complications due to smoking. Computer-based smoking cessation programs are increasingly being utilized in the general population and may overcome some of the barriers such as lack of time, knowledge, and training to provide interventions. Our objective was to develop and implement a patient e-learning program designed for surgical patients as part of a multifaceted program aimed at assisting them to quit smoking and to determine the factors cross-sectionally and longitudinally associated with abstinence.

METHODS: In this prospective multicenter study, smokers undergoing elective noncardiac surgery participated in a preoperative smoking cessation program

consisting of a patient e-learning program, brief advice, educational pamphlet, tobacco quitline referral, letter to the primary care physician, and pharmacotherapy. The patient e-learning program described (1) the benefits of quitting smoking before surgery; (2) how to quit smoking; and (3) how to cope while quitting. The 7-day point prevalence (PP) abstinence on the day of surgery and at 1, 3 and 6 six months after surgery was separately assessed, and factors most associated with abstinence were identified using multivariable logistic regression analysis. Generalized estimating equation methods were used to estimate effect of the factors associated with abstinence longitudinally. The reach of the program was assessed with the number of smokers who participated in the program versus the number of patients who were referred to the program.

RESULTS: A total of 459 patients (68.9% of eligible patients) participated. The 7-day PP abstinence at day of surgery, 1 month, 3 months, and 6 months was 22%, 29%, 25%, and 22%, respectively. The variables predicting abstinence at 6 months were use of pharmacotherapy (odds ratio [OR], 7.32; 95% confidence interval [CI], 3.71–14.44; $P < .0001$) and number of contacts with a tobacco quitline (OR, 1.60; 95% CI, 1.35–1.90; $P < .0001$). Presence of other smokers in the household (OR, 0.39; 95% CI, 0.21–0.72; $P = .0030$) and amount spent on cigarettes weekly at baseline (per $10 increase) (OR, 0.73; 95% CI, 0.61–0.87; $P = .0004$) were barriers to abstinence.

CONCLUSIONS: Our preoperative smoking cessation program resulted in a 7-day PP abstinence of 22% at 6 months. A multifaceted intervention including a patient e-learning program may be a valuable tool to overcome some of the barriers to help surgical patients quit smoking.

圍術期管理能夠改善肺癌手術後患者的長期生存:回顧性佇列研究

Perioperative Management May Improve Long-term Survival in Patients After Lung Cancer Surgery: A Retrospective Cohort Study

Huang, Wen-Wen, MD[*]; Zhu, Wen-Zhi, MD[*,†]; Mu, Dong-Liang, MD[*]; Ji, Xin-Qiang, MD[‡]; Nie, Xiao-Lu, MSc[§]; Li, Xue-Ying, MSc[‖]; Wang, Dong-Xin, MD, PhD[*]; Ma, Daqing, MD, PhD, FRCA[¶]

Anesthesia & Analgesia: 2018 126 1666–1674

背景：手術是非小細胞肺癌的主要治療方法，但是患者的長期生存仍然是一項挑戰。本研究的目的是確定肺癌手術後患者長期生存的預測因數

方法：從 2006 年 1 月 1 日到 2009 年 12 月 31 日經歷非小細胞肺癌手術的患者被納入這項回顧性佇列研究。主要的結果是患者術後的生存時間。長期生存的預測因數採用多變數 Cox 比例風險模型進行篩選。

結果：術後隨訪 588 例，中位隨訪期 5.2 年（四分位數範圍，2—6.8 年）。291 位患者（49.5%）隨訪結束後存活，中位生存期為 64.3 個月（四分位數範圍 28.5–81.6 月）。術後第 1、第三、第五年總生存率分別為 90.8%、70%、57.1%。有限切除術（危害比，1.46；95%置信區間，1.08 - 1.98；p＝013）和更大的腫瘤尺寸（危害比，1.29；95%置信區間，1.17–1.42; P < .001）與短的生存時間有關。反之高體重指數等級(危害比,

0.59; 95%置信區間，0.37–0.93; P = .024)，高分化腫瘤(危害比，0.59; 95%置信區間, 0.37–0.93; P = .024)，外科縱隔淋巴結清掃術(危害比，0.45; 95%置信區間， 0.30–0.67; P < .001)和圍術期使用地塞米松(危害比， 0.70；95%置信區間, 0.54–0.90; P = .006) 與長期生存相關。氟比洛芬酯的圍手術期使用與長期生存無相關性(危害比， 0.80; 95%置信區間, 0.62–1.03; P = .086)。然而，地塞米松和氟比洛芬酯聯合給藥可延長生存期（和兩個都不運用相比：調整危害比 0.57;95%置信區間， 0.38–0.84; P = .005）。

結論：某些特別的因素：圍手術期使用地塞米松和氟比洛芬酯治療可提高非小細胞肺癌術後患者的長期生存率。鑒於較小的樣本量，這些發現應該謹慎解讀，需要進一步的隨機臨床試驗來進一步闡明。

(韓穆佳譯 李士通校)

BACKGROUND: Surgical resection is the main treatment for patients with non–small-cell lung cancer (NSCLC), but patients' long-term outcome is still challenging. The purpose of this study was to identify predictors of long-term survival in patients after lung cancer surgery.

METHODS: Patients who underwent surgery for NSCLC from January 1, 2006, to December 31, 2009, were enrolled into this retrospective cohort study. The primary outcome was the survival length after surgery. Predictors of long-term survival were screened with the multivariable Cox proportional hazard model.

RESULTS: Postoperative follow-up was completed in 588 patients with a median follow-up duration of 5.2 years (interquartile range, 2.0–6.8). Two hundred ninety-one patients (49.5%) survived at the end of follow-up with median survival duration of 64.3 months (interquartile range, 28.5–81.6). The overall survival rates were 90.8%, 70.0%, and 57.1% at the end of the first, third, and fifth year after surgery, respectively. Limited resection (hazard ratio [HR], 1.46; 95% confidence interval [CI], 1.08–1.98; *P* = .013) and large tumor size (HR, 1.29; 95% CI, 1.17–1.42; *P* < .001) were associated with short survival; whereas high body mass index grade (HR, 0.82; 95% CI, 0.69–0.97; *P* = .021), highly differentiated tumor (HR, 0.59; 95% CI, 0.37–0.93; *P* = .024), dissection of mediastinal lymph node during surgery (HR, 0.45; 95% CI, 0.30–0.67; *P* < .001), and perioperative use of dexamethasone (HR, 0.70; 95% CI, 0.54–0.90; *P* = .006) were associated with long survival. No association was found between perioperative use of flurbiprofen axetil and long survival (HR, 0.80; 95% CI, 0.62–1.03; *P* = .086). However, combined administration of dexamethasone and flurbiprofen axetil was associated with longer survival (compared to no use of both: adjusted HR, 0.57; 95% CI, 0.38–0.84; *P* = .005).

CONCLUSIONS: Certain factors in particular perioperative dexamethasone and flurbiprofen axetil therapy may improve patients' long-term survival after surgery for NSCLC. Given the small sample size, these findings should be interpreted with caution, and randomized clinical trials are needed for further clarification.

外周神經阻滯用於髖部骨折：一項循證綜述

Peripheral Nerve Blocks for Hip Fractures: A Cochrane Review

Guay, Joanne, MD[*,†]; Parker, Martyn, J., MD[‡]; Griffiths, Richard, MD[§]; Kopp, Sandra, L., MD[‖]

Anesthesia & Analgesia: 2018 126 1695–1704

背景：本次綜述聚焦于使用外周神經阻滯作為術前鎮痛，作為術後鎮痛，或作為全髖關節手術的全身麻醉的補充，並試圖確定它們是否能在阻滯後 30 分鐘內運動的疼痛，術後譫妄、心肌梗死/缺血、肺炎、死亡率、首次活動時間和止痛藥消耗方面提供任何益處。

方法：試驗通過電腦檢索循證中心對照試驗記錄（2016 重要問題 8）MEDLINE（1966 年到 2016 年 8 月的第一周）Embase（1988 年到 2016 年 8 月的第一周）護理和聯合衛生文獻累積索引（EBCSCO 1982 年到 2016 年 8 月的第一周）試驗註冊和相關文章的參考清單。隨機對照試驗包括在 16 歲及以上的患者使用神經阻滯作為治療的一部分。根據 Cochrane 工具對研究的品質進行評價。兩位元作者獨立提取資料。證據品質由建議、評估、發展和評價工作組規模的等級來判斷。

結果：根據 373 名參與者的 8 項試驗，周圍神經阻滯減輕了阻滯區域內 30 分鐘內的運動疼痛：標準平均差−1.41（95%置信區間[CI]，2.14～0.67，相當於從 0 到 10 的刻度為 3.4，統計= 90%；高品質證據）效應大小與局部使用的麻醉藥濃度成正比（P < .00001)。根據 676 名受試者的 7 項試驗，術後譫妄的風險沒有差異。危害比, 0.69 (95%置信區間, 0.38–1.27; I 統計 = 48%;非常低品質的證據)。根據 131 名參與者的 3 項試驗，肺炎的風險降低了：危害比 0.41（95%置信區間, 0.19–0.89，統計值=3%,需要治療的數量以獲得額外的有益結果,7[95%j 可信區間, 5–72]；中等品質的證據）。在 6 個月內沒有發現心肌缺血或死亡的危險性，但參與者的數量遠低於這 2 個結果的最佳資訊大小。根據 2 個試驗，155 個參與者，外周神經阻滯縮短了手術後第一次活動的時間：中位時間 11.25 小時(95%可信區間,8.15 到 14.34 小時， 統計值 = 52%;中等品質的證據). 從一項實驗的 75 名受試者中得出術需要更少的單次追加注射鎮痛藥，標準平均差，3.48 (95% 可信區間, 4.23 to 2.74;中等品質的證據)。

結論：高品質的證據表明，區域阻滯減可減輕阻滯區域的 30 分鐘內的運動疼痛。有證據表明，單次神經阻滯可以減輕術後出現肺炎的風險，縮短第一次活動的時間，較少止痛藥的消耗。

(韓穆佳譯 李士通校)

BACKGROUND: This review focuses on the use of peripheral nerve blocks as preoperative analgesia, as postoperative analgesia, or as a supplement to general anesthesia for hip fracture surgery and tries to determine if they offer any benefit in terms of pain on movement at 30 minutes after block placement, acute confusional state, myocardial infarction/ischemia, pneumonia, mortality, time to first mobilization, and cost of analgesic.

METHODS: Trials were identified by computerized searches of Cochrane Central Register of Controlled Trials (2016, Issue 8), MEDLINE (Ovid SP, 1966 to 2016 August week 1), Embase (Ovid SP, 1988 to 2016 August week 1), and the Cumulative Index to Nursing and Allied Health Literature (EBSCO, 1982 to 2016 August week 1), trials registers, and reference lists of relevant articles. Randomized controlled trials involving the use of nerve blocks as part of the care for hip fractures in adults aged 16 years and

older were included. The quality of the studies was rated according to the Cochrane tool. Two authors independently extracted the data. The quality of evidence was judged according to the Grading of Recommendations, Assessment, Development, and Evaluations Working Group scale.

RESULTS: Based on 8 trials with 373 participants, peripheral nerve blocks reduced pain on movement within 30 minutes of block placement: standardized mean difference, −1.41 (95% confidence interval [CI], −2.14 to −0.67; equivalent to −3.4 on a scale from 0 to 10; I^2 statistic = 90%; high quality of evidence). The effect size was proportional to the concentration of local anesthetic used ($P < .00001$). Based on 7 trials with 676 participants, no difference was found in the risk of acute confusional state: risk ratio, 0.69 (95% CI, 0.38–1.27; I^2 statistic = 48%; very low quality of evidence). Based on 3 trials with 131 participants, the risk for pneumonia was decreased: risk ratio, 0.41 (95% CI, 0.19–0.89; I^2 statistic = 3%; number needed-to-treat for additional beneficial outcome, 7 [95% CI, 5–72]; moderate quality of evidence). No difference was found for the risk of myocardial ischemia or death within 6 months but the number of participants included was well below the optimum information size for these 2 outcomes. Based on 2 trials with 155 participants, peripheral nerve blocks also reduced the time to first mobilization after surgery: mean difference, −11.25 hours (95% CI, −14.34 to −8.15 hours; I^2 statistic = 52%; moderate quality of evidence). From 1 trial with 75 participants, the cost of analgesic drugs when used as a single-shot block was lower: standardized mean difference, −3.48 (95% CI, −4.23 to −2.74; moderate quality of evidence).

CONCLUSIONS: There is high-quality evidence that regional blockade reduces pain on movement within 30 minutes after block placement. There is moderate quality of evidence for a decreased risk of pneumonia, reduced time to first mobilization, and reduced cost of analgesic regimen (single-shot blocks).

胰腺癌的神經侵襲通過神經根傳播巨噬細胞相關的異常性疼痛

Neural Invasion Spreads Macrophage-Related Allodynia via Neural Root in Pancreatic Cancer

Miura, Tomofumi, MD, PhD[*,†]; Mitsunaga, Shuichi, MD, PhD[*,‡]; Ikeda, Masafumi, MD[‡]; Ohno, Izumi, MD, PhD[‡]; Takahashi, Hideaki, MD[‡]; Kuwata, Takeshi, MD, PhD[§]; Ochiai, Atsushi, MD, PhD[*]

Anesthesia & Analgesia: 2018 126 1729–1738

背景：胰腺癌（PCa）對神經的侵襲（N-inv）導致神經損傷和疼痛。 在 PCa 中，良性神經損傷通過誘導神經根的炎症引起異常性疼痛。 在神經損傷後，巨噬細胞可能通過釋放興奮性細胞因數，在慢性神經性疼痛的形成中發揮作用。 本研究的目的是描繪 PCa 患者 N-inv 誘導的異常性疼痛並在 N-inv 動物模型（N-inv 模型）中以背根神經節（DRG）的巨噬細胞積聚描述異常性疼痛相關的神經炎症。

方法：臨床研究納入晚期 PCa 未使用阿片類藥物治療的初治患者。 為了評估異常疼痛，我們測量了上腹部皮膚的感知閾值和來自問卷的疼痛評分；並且，評估了 N-inv 放射學程度與異常性疼痛之間的關聯。 在動物實驗中，我們通過將人類 PCa 細胞系接種到小

鼠的左側坐骨神經中，模擬人類 PCa 的侵襲行為而建立了 N-inv 模型。在 N-inv 模型和假手術模型中，每週測量小鼠右後爪的感覺改變，並在 6 周時對 DRG 進行 mRNA 和蛋白質表達的研究。 在 N-inv 模型中，對使用脂質體包裹氯膦酸鹽（Lp-CLD）誘導的巨噬細胞消耗效果進行評估， 並對腫瘤大小和 DRG 及其周圍的巨噬細胞積聚程度進行研究。

結果：臨床研究納入 43 例患者。與沒有嚴重 N-inv 的患者相比，重度 N-inv 患者上腹部皮膚的 2000Hz 觸覺和壓力感覺閾值降低。嚴重 N-inv 患者表現出較高的疼痛評分。在動物實驗中，N-inv 模型小鼠在 5 周和 6 周時右後爪感覺閾值降低。巨噬細胞相關基因表達和 F4 / 80 陽性巨噬細胞在左 DRG 中增加。 Lp-CLD 誘導的巨噬細胞耗竭導致右後爪閾值的增加。在左側 DRG 中，CD206 陽性巨噬細胞積聚減少。 Lp-CLD 對腫瘤大小沒有影響。

結論：本研究首次顯示了在 PCa 患者和 N-inv 模型中 N-inv 誘導的異常性疼痛的傳播。在 N-inv 模型中，異常性疼痛與 DRG 的巨噬細胞數量有關。神經炎症可能是研究 N-inv 誘導的疼痛機制和開發新型鎮痛藥的目標。

（毛玉林譯 李士通校）

BACKGROUND: Neural invasion (N-inv) induces the neural damage and pain in pancreatic cancer (PCa). Benign nerve injury evokes allodynia through neuroinflammation in the neural root, which might be seen in PCa. Macrophages have the potential to release excitatory cytokines after nerve injury and so may play a role in the generation of chronic neuropathic pain. The aim of this study is to represent N-inv–induced allodynia in patients with PCa and to characterize allodynia-related neuroinflammation as macrophage accumulation on dorsal root ganglion (DRG) in the N-inv animal model (N-inv model).

METHODS: Treatment-naïve patients with advanced PCa with no opioid use were enrolled in the clinical study. To evaluate allodynia, the current perception threshold on epigastric skin and pain score from questionnaire were measured. The association between the degrees of radiological N-inv and allodynia was evaluated. In the animal experiments, we used the N-inv model, which is established by the inoculation of the human PCa cell line into the left sciatic nerve of mice and mimics the invasion behavior of human PCa. The change of sensation was weekly measured at right hind paw, and the expressions of mRNA and protein were investigated on DRG at 6 weeks in the N-inv and sham models. The effect of macrophage depletion using liposome-encapsulated clodronate (Lp-CLD) was evaluated in the N-inv model. Tumor size and the degree of macrophage accumulation on DRG or around the tumor were investigated.

RESULTS: In the clinical study, 43 patients were analyzed. The threshold of epigastric skin at 2000 Hz touch and pressure sensation was decreased in patients with severe N-inv, compared to patients without severe N-inv. Patients with severe N-inv showed a high pain score. In the animal experiments, the N-inv model decreased the threshold of right hind paw at 5 and 6 weeks. The macrophage-related gene expression and F4/80-positive macrophages were increased in the left DRG. Lp-CLD–induced macrophage depletion induced an increase of the threshold in the right hind paw and a decrease of CD206-positive macrophages accumulation in the left DRG. Lp-CLD had no effect for tumor size.

CONCLUSIONS: The present study first showed that the N-inv–induced allodynia was spread in patients with PCa and in the N-inv model. Allodynia was related to the amount of macrophages at DRG in the N-inv model. The neuroinflammation may be a target for researching the N-inv-induced pain mechanism and developing novel analgesics.

針對麻醉醫師的敘述性概述：研究前後的偏倚

Bias in Before–After Studies: Narrative Overview for Anesthesiologists

Ho, Anthony M., H., MD, FRCPC, FCCP[*]; Phelan, Rachel, MSc[*]; Mizubuti, Glenio, B., MD, MSc[*]; Murdoch, John A., C., MBChB, FRCA, FRCPC[*]; Wickett, Sarah, BSc, MLIS[†]; Ho, Adrienne, K., MBBS[‡]; Shyam, Vidur, MBBS, FRCPC[*]; Gilron, Ian, MD, FRCPC[*]

Anesthesia & Analgesia: 2018 126 1755–1762

研究前後的設計是有效的研究工具，在某些情況下，改變了實踐。但是，這些設計不可避免容易受到偏差（如系統誤差）的影響，這些誤差有時很微妙，但可能會使結論失效。本概述提供了與麻醉醫師相關的研究前後的例子，以說明潛在的偏倚來源，包括選擇/分配，歷史，平均回歸，重測，成熟度，觀察者，回顧性，霍桑，儀器儀錶，磨損和報告/發表偏倚。緩解策略包括使用對照組，盲法，在佇列前後分別進行匹配，最小化佇列之間的時滯，使用一致的測量/報告標準收集前瞻性資料，時間序列資料收集，和/或可能的替代研究設計。通過執行提高健康研究品質和透明度（EQUATOR）清單的改進報告將有助於提高透明度並有助於說明。通過強調潛在偏見的類型和應對策略以提高透明度和減少缺陷，本概述旨在更好地幫助麻醉醫師設計研究，和/或批判性評估研究設計。

（毛玉林譯 李士通校）

Before–after study designs are effective research tools and in some cases, have changed practice. These designs, however, are inherently susceptible to bias (ie, systematic errors) that are sometimes subtle but can invalidate their conclusions. This overview provides examples of before–after studies relevant to anesthesiologists to illustrate potential sources of bias, including selection/assignment, history, regression to the mean, test–retest, maturation, observer, retrospective, Hawthorne, instrumentation, attrition, and reporting/publication bias. Mitigating strategies include using a control group, blinding, matching before and after cohorts, minimizing the time lag between cohorts, using prospective data collection with consistent measuring/reporting criteria, time series data collection, and/or alternative study designs, when possible. Improved reporting with enforcement of the Enhancing Quality and Transparency of Health Research (EQUATOR) checklists will serve to increase transparency and aid in interpretation. By highlighting the potential types of bias and strategies to improve transparency and mitigate flaws, this overview aims to better equip anesthesiologists in designing and/or critically appraising before–after studies.