指南建議的術前壓力測試的預測率及費用研究

Anticipated Rates and Costs of Guideline-Concordant Preoperative Stress Testing

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背景：當前的指南建議對患者的心血管風險和功能狀態進行術前評估，而且，建議心功能不佳或者心功能狀態不明的這些具有更高的心血管風險的患者進行術前壓力測試。但當前的參與測試的比例及由此產生的醫療費用尚不明了。假設美國的醫生遵循現行指南並發現當前指南中包含的 2 種風險預測方法可能產生的差異，我們的研究旨在評估術前壓力測試的預期比例及相關費用。

方法：我們將當前美國心臟病學會/美國心臟協會指南中包含的 2 種風險預測方法（修訂的心臟風險指數和心肌梗死或心臟驟停）應用于一項針對 2009 年在美國接受手術的患者的多中心前瞻性研究中。我們隨後計算了術前心臟壓力測試的預期比率，預測全過的直接醫療支出（2017 年美元），以及兩種風險預測工具之間的一致性差異。

結果：當前指南建議在術前壓力測上花費一定量的資金。根據所使用的風險預測工具和功能狀態評估的可靠性的不同，指南建議的支出會有很大差異。與“低”風險的患者相比，“高”風險患者的檢測率和由此產生的支出可能要大得多。兩項指南推薦的風險評估工具，修訂的心臟風險指數和心肌梗死或心臟驟停，與目前建議的風險閾值範圍一致性不佳。

結論：儘管無證實的益處，但術前壓力測試確是醫療支出的重要來源。臨床醫生應該使用哪種圍術期風險評估工具，哪些風險閾值適用于患者的篩選，以及功能狀態評估的可靠性都值得進一步關注。

（馬瑞華譯 潘豔、薛張綱校）

BACKGROUND: Current guidelines recommend that patients have preoperative assessment of cardiac risk and functional status, and that patients at "elevated" cardiac risk with poor or unknown functional status be referred for preoperative stress testing. Little is known about current rates of testing or resultant medical costs. We set out to estimate the expected rates of preoperative stress testing and resultant costs if physicians in the United States were to follow current guidelines and to investigate differences that would arise from 2 risk prediction methods included in current guidelines.
METHODS: We applied 2 risk prediction tools (Revised Cardiac Risk Index and Myocardial Infarction or Cardiac Arrest) included in current American College of Cardiology/American Heart Association guidelines to a multicenter prospective registry of patients undergoing surgery in the United States in 2009. We then calculated expected ratesof preoperative cardiac stress testing if physicians were to follow American College of Cardiology/American Heart Association guidelines, expected nationwide direct medical expenditures that would result (in 2017 US dollars), and agreement beyond chance between the 2 risk prediction tools.
RESULTS: Current guidelines recommend considerable spending on preoperative stress testing. Guideline-recommended spending would differ substantially depending on the risk prediction tool used and the reliability of the functional status assessment. Rates of testing and resultant spending are likely much greater among patients at "elevated" risk, compared with patients at "low" risk. Two guideline-recommended risk assessment tools, Revised Cardiac Risk Index and Myocardial Infarction or Cardiac Arrest, have poor agreement beyond chance across the currently recommended risk threshold.
CONCLUSIONS: Preoperative stress testing is likely a considerable source of medical spending, despite unproven benefit. Which perioperative risk assessment tool clinicians should use, what risk thresholds are appropriate for patient selection, and the reliability of the functional status assessment all warrant further attention.

圍手術期腦電圖與腦氧監測

Electroencephalography and Brain Oxygenation Monitoring in the Perioperative Period

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維持大腦功能和完整性是麻醉實踐的關鍵部分。本綜述旨在描述目前最常用的兩種檢測方法在圍術期腦功能評價中的作用，即腦電圖（EEG）和腦氧檢測。現有證據表明，腦電圖衍生的參數提供了更多的麻醉深度資訊用於優化麻醉滴定。對減少藥物消耗或恢復時間的影響是混雜的，但大多數研究表明，如果通過腦電圖衍生參數滴定麻醉，蘇醒時間會減少。有人假設，未來腦電圖衍生參數將使人們更好地瞭解麻醉誘導引起意識改變的神經生理學原理，而不是目前最常用的概率方法。腦氧可以通過外科鑽孔直接在腦實質中測量，也可以通過頸靜脈體從腦靜脈流出量進行估算，或者通過近紅外光譜進行無創評估。後一種方法由於易於使用，及越來越多的證據表明近紅外光譜分析得出的腦氧飽和度水準與神經性和/或一般圍手術期併發症及死亡率增加有關，因此越來越被臨床接受。此外，一個目標導向的策略，旨在避免大腦低氧飽和可能有助於減少這些併發症。最近的證據表明，這項技術還可用於評估腦血流的自動調節，從而幫助滴定動脈血壓以滿足個體需求，並用於床邊診斷腦血流的自動調節紊亂。

（龐豔蓉 譯 潘豔、薛張綱校）

Maintaining brain function and integrity is a pivotal part of anesthesiological practice. The present overview aims to describe the current role of the 2 most frequently used monitoring methods for evaluation brain function in the perioperative period, ie, electroencephalography (EEG) and brain oxygenation monitoring. Available evidence suggests that EEG-derived parameters give additional information about depth of anesthesia for optimizing anesthetic titration. The effects on reduction of drug consumption or recovery time are heterogeneous, but most studies show a reduction of recovery times if anesthesia is titrated along processed EEG. It has been hypothesized that future EEG-derived indices will allow a better understanding of the neurophysiological principles of anesthetic-induced alteration of consciousness instead of the probabilistic approach most often used nowadays.Brain oxygenation can be either measured directly in brain parenchyma via a surgical burr hole, estimated from the venous outflow

of the brain via a catheter in the jugular bulb, or assessed noninvasively by near-infrared spectroscopy. The latter method has increasingly been accepted clinically due to its ease of use and increasing evidence that near-infrared spectroscopy-derived cerebral oxygen saturation levels are associated with neurological and/or general perioperative complications and increased mortality. Furthermore, a goal-directed strategy aiming to avoid cerebral desaturations might help to reduce these complications. Recent evidence points out that this technology may additionally be used to assess autoregulation of cerebral blood flow and thereby help to titrate arterial blood pressure to the individual needs and for bedside diagnosis of disturbed autoregulation.

左啡諾的藥理學特徵，一種 G 蛋白偏向性阿片類鎮痛藥

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

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背景:左啡諾作為一種有效的鎮痛藥,已使用數十年,最常用於急性和癌症疼痛，它也有效對抗神經性疼痛。 最近對功能性偏倚的重要性以及多種阿片 μ 受體剪接變體的揭示的認識可能有助於解釋患者對不同阿片類藥物的反應的可變性。

方法：在這裡，我們評估了左啡諾在各種傳統的體外受體結合和功能測定，通過使用敲除（KO）小鼠行輻射熱甩尾試驗的體內鎮痛研究，選擇性拮抗劑和病毒拯救方法探索了回應的受體選擇性。

結果：受體結合研究顯示左啡諾對所有 μ， δ 和 κ 阿片受體都具有高的親和力。左啡諾在 S-GTPγS 結合測定中，除了 MOR-10 之外，是 μ 受體亞型的完全激動劑，但在 β-抑制蛋白 2 募集測定中顯示出很少的活性，表明 G 蛋白是優先轉導機制。KO 小鼠和選擇性拮抗劑證實左啡諾鎮痛是通過經典 μ 受體介導的，但是 6 跨膜受體做出了一定的貢獻,如用病毒轉染的 6 跨膜受體剪接可以改善外顯子 11 KO 小鼠的較低反應。與嗎啡相比，左啡諾在等劑量時的呼吸抑制較少。

結論：雖然左啡諾與經典的阿片類藥物嗎啡具有許多相同的特性，但它顯示出微妙的差異，可能對其臨床應用有幫助。其 G 蛋白信號偏倚與其減少的呼吸抑制一致，而其與嗎啡的不完全交叉耐受性表明它可能在臨床上對阿片類藥物逆轉有價值。

（許智鴻 譯 潘豔、薛張綱校）

BACKGROUND: Levorphanol is a potent analgesic that has been used for decades. Most commonly used for acute and cancer pain, it also is effective against neuropathic pain. The recent appreciation of the importance of functional bias and the uncovering of multiple μ opioid receptor splice variants may help explain the variability of patient responses to different opioid drugs.
METHODS: Here, we evaluate levorphanol in a variety of traditional in vitro receptor binding and functional assays. In vivo analgesia studies using the radiant heat tail flick assay explored the receptor selectivity of the responses through the use of knockout (KO) mice, selective antagonists, and viral rescue approaches.
RESULTS: Receptor binding studies revealed high levorphanol affinity for all the μ, δ, and κ opioidreceptors. In S-GTPγS binding assays, it was a full agonist at most μ receptor subtypes, with the exception of MOR-1O, but displayed little activity in β-arrestin2 recruitment assays, indicating a preference for G-protein transduction mechanisms. A KO mouse and selective antagonists confirmed that levorphanol analgesia was mediated through classical μ receptors, but there was a contribution from 6 transmembrane targets, as illustrated by a lower response in an exon 11 KO mouse and its rescue with a virally transfected 6 transmembrane receptor splice variant. Compared to morphine, levorphanol had less respiratory depression at equianalgesic doses.
CONCLUSIONS: While levorphanol shares many of the same properties as the classic opioidmorphine, it displays subtle differences that may prove helpful in its clinical use. Its G-protein signaling bias is consistent with its diminished respiratory depression, while its incomplete cross tolerance with morphine suggests it may prove valuable clinically with opioid rotation.

冠狀動脈搭橋術後血紅蛋白水準和 30 天再入院率

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

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背景：大量隨機試驗支持的限制性輸血策略導致心臟手術中血液利用率下降。然而，仍有待確定的是，較低的血紅蛋白水準對再入院率的影響。我們評估了出院時血紅蛋白水準較高和較低的患者，比較冠狀動脈旁路移植術（CABG）後 30 天的再入院率。

方法:我們回顧性評估了我院 2013 年 1 月至 2016 年 5 月接受單獨的 CABG 的 1552 例患者。我們評估了 2 個血紅蛋白佇列：“高”（高於）和“低”（低於）平均出院血紅蛋白水準（為 9.4g/dl），比較了患者特徵、血液利用率和臨床結果，包括 30 天的再入院率。我們進一步評估了最低（<8 g/dl）出院血紅蛋白水準對 30 天再入院率的影響，根據出院血紅蛋白水準將患者分為 4 組:“無貧血”（>12 g/dl）、“輕度貧血”（10–11.9 g/dl）、“中度貧血”（8–9.9 g/dl）和“重度貧血”（<8 g/dl）。風險調整包括年齡、性別、查爾森合併症指數、術前併發症、胸骨翻修術、患者血液管理計畫的實施。

結果：除血紅蛋白水準外，“高”組和“低”組的患者特徵相似（平均出院血紅蛋白分別為 10.4±0.9 和 8.5±0.6 g/dl）。值得注意的是，沒有證據表明“高”（76/746；10.2%）和“低”（97/806；12.0%）（p=0.25）Hb 組 30 天再入院率之間存在差異。這 4 組貧血患者的年齡、胸骨翻修發生率、血紅蛋白水準、某些

患者合併症和再入院時間存在差異。在多變數分析中，“低”血紅蛋白組（比值比 1.16；95%置信區間 0.84-1.61；P=0.36）的經風險調整的再入院率與“高”血紅蛋白組相比差異不顯著。與出院時 Hb≥8g/dl 患者相比，Hb <8g/dl 患者的再入院率更高（22/129；17.1%比 151/1423；10.6%；P=0.036）。多變數分析顯示,出院時 Hb<8g/dl 可預測會再入院(比值比為 1.77;95%可信區間為 1.05-2.88; P=0.03）。再入院的最常見原因是容量過度負荷，其次是感染和心律失常。

結論：沒有證據表明 CABG 患者的出院 Hb 水準低於機構平均值與 30 天再入院率增加相關。在少數出院時 Hb<8g/dl 患者中，有跡象表明再入院的風險增加，需要更多的對照研究來證實或反駁這一發現。

（湯潔 譯 潘豔、薛張綱校）

BACKGROUND: Restrictive transfusion strategies supported by large randomized trials are resulting in decreased blood utilization in cardiac surgery. What remains to be determined, however, is the impact of lower discharge hemoglobin (Hb) levels on readmission rates. We assessed patients with higher versus lower Hb levels on discharge to compare 30-day readmission rates after coronary artery bypass grafting (CABG).
METHODS: We retrospectively evaluated 1552 patients undergoing isolated CABG at our institution from January 2013 to May 2016. We evaluated 2 Hb cohorts: “high” (above) and “low” (below) the mean discharge Hb level of 9.4 g/dL, comparing patient characteristics, blood utilization, and clinical outcomes including 30-day readmission rates. We further evaluated the effects of the lowest (<8 g/dL) discharge Hb levels on 30-day readmission rates by dividing the patients into 4 anemia cohorts based on discharge Hb levels: “no anemia” (>12 g/dL), “mild anemia” (10–11.9 g/dL), “moderate anemia” (8–9.9 g/dL), and “severe anemia” (<8 g/dL).Risk adjustment accounted for age, sex, Charlson comorbidity index, preoperative comorbidities, revision sternotomy, and patient blood management program implementation.
RESULTS: The “high” and “low” groups had similar patient characteristics except for Hb levels (mean discharge Hb was 10.4 ± 0.9 vs 8.5 ± 0.6 g/dL, respectively). Notably, no evidence for a difference in 30-day readmission rates was noted between the “high” (76/746; 10.2%) and “low” (97/806; 12.0%) (P = .25) Hb cohorts. The 4 anemia cohorts had differences in age, revision sternotomy incidence, Hb levels, certain

patient comorbidities, and time to readmission. On multivariable analysis, the risk-adjusted odds of readmission in the “low” Hb cohort (odds ratio, 1.16; 95% confidence interval, 0.84–1.61; P = .36) was not significant compared to the “high” Hb cohort. Compared to patients with discharge Hb ≥8 g/dL, patients with Hb <8 g/dL had a higher incidence of readmission (22/129; 17.1% vs 151/1423; 10.6%; P = .036). On multivariable analysis, Hb <8 g/dL on discharge was predictive of readmission (odds ratio, 1.77; 95% confidence interval, 1.05–2.88; P = .03). The most common reason for readmission was volume overload, followed by infection and arrhythmias. **CONCLUSIONS:** A discharge Hb level below the institution mean for CABG patients does not
provide evidence for an association with an increased 30-day readmission rate. In the small
number of patients discharged with Hb <8 g/dL, there is a suggestion of increased risk for readmission and larger more controlled studies are needed to verify or refute this finding.

美國急診科氣道管理的職責

.Emergency Department Airway Management Responsibilities in the United States

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背景：在 20 世紀 90 年代，急診醫學（EM）醫生負責對急診室中需要氣道管理的患者進行大約一半的插管。從那時起，沒有研究揭示急診室的氣道管理職責的特點。

方法： 通過郵件調查東部外科和創傷協會以及創傷麻醉學會以及直接徵集進行了調查。收集有關創傷中心水準，地理位置，負責急診室氣管插管的部門，創傷區氣管插管部門，兒科是否有這些角色，是否每天 24 小時“內部”有麻醉師待命，以及麻醉師是否有協議作為插管期間的備用力量。回復被收集，審查，按城市連結，並使用 Python 進行映射。

結果：大多數答覆來自東部創傷外科協會（84.6％）。 在受訪者中，72.6％來自

一級創傷中心，大多數位於美國東半部。在急診室，急診科醫生主要負責 81%的被調查機構的氣管插管。在創傷區，急診醫生主要負責 61.4%的氣管插管。在接受調查的機構中，負責管理氣道的人員似乎沒有地理模式。

結論：大多數機構都有急診醫生在急診室和創傷區管理他們的呼吸道。與 20 年前相比，這可能支持急診醫生在急診室和創傷區設置中增加氣道管理百分比的觀察結果。

（彭孟圓 譯 潘豔、薛張綱校）

BACKGROUND: In the 1990s, emergency medicine (EM) physicians were responsible for intubating about half of the patients requiring airway management in emergency rooms. Since then, no studies have characterized the airway management responsibilities in the emergency room.
METHODS:A survey was sent via the Eastern Association for Surgery and Trauma and the Trauma Anesthesiology Society listservs, as well as by direct solicitation. Information was collected on trauma center level, geographical location, department responsible for intubation in the emergency room, department responsible for intubation in the trauma bay, whether these roles differed for pediatrics, whether an anesthesiologist was available "in-house" 24 hours a day, and whether there was a protocol for anesthesiologists to assist as backup during intubations. Responses were collected, reviewed, linked by city, and mapped using Python.
RESULTS: The majority of the responses came from the Eastern Association for Surgery of Trauma (84.6%). Of the respondents, 72.6% were from level-1 trauma centers, and most were located in the eastern half of the United States. In the emergency room, EM physicians were primarily responsible for intubations at 81% of the surveyed institutions. In trauma bays, EM physicians were primarily responsible for 61.4% of intubations. There did not appear to be a geographical pattern for personnel responsible for managing the airway at the institutions surveyed.
CONCLUSIONS: The majority of institutions have EM physicians managing their airways in both emergency rooms and trauma bays. This may support the observations of an increased percentage of airway management in the emergency room and trauma bay setting by EM physicians compared to 20 years ago.

髖關節骨折術前超聲心動圖檢查

Preoperative Echocardiography for Patients With Hip Fractures Undergoing

Surgery

A Retrospective Cohort Study Using a Nationwide Database

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背景：術前經胸超聲心動圖對擬接受手術治療的髖部骨折患者臨床結局的影響仍有爭議。我們假設術前超聲心動圖與降低髖部骨折修復手術術後發病率和提高患者生存率有關。

方法：從全國性資料庫中選取 2008 年 4 月 1 日至 2016 年 12 月 31 日進行髖部骨折手術的患者。我們使用傾向評分匹配來檢驗術前超聲心動圖與住院死亡率的關係。次要結果包括術後併發症、術後重症監護病房入住率和住院時間。為了進行敏感性分析，整個佇列僅限於入院後 2 天內進行的髖部骨折手術。

結果：66620 例手術患者中，術前行超聲心動圖篩查 34679 例（52.1%）。篩查患者（平均年齡 84.3 歲，[標準差 7.7 歲]；女性占 79.0%）傾向評分與 31941 名非篩查患者（平均年齡 82.1 歲，[標準差 8.7 歲]；女性占 78.2%）相匹配。傾向匹配前的總住院死亡率為 1.8%(1227 例患者)。傾向評分匹配創建了包含 25205 對患者的匹配佇列。兩組患者的院內死亡率無差異（篩查組與非篩查組：417 例（1.65%)對 439 例(1.74%)，優勢比為 0.95；95%置信區間：0.83-1.09；p=0.45）。術前超聲心動圖檢查與減少術後併發症和重症監護病房入院率無關。在敏感性分析中，我們從整個佇列（38.5%）中確定了 25637 名患者，這些患者在入院後 2 天內進行了髖部骨折手術。兩組的住院死亡率無差異(篩選組與非篩選組：1.67%比 1.80%；優勢比為 0.93；95%置信區間：0.72-1.18；p=0.53)。結果也與其他敏感性分析和亞組分析一致。

結論：此項大規模、回顧性、全國性佇列研究表明，術前超聲心動圖與降低住院

死亡率或術後併發症無關。

（吳潔譯 李士通校）

BACKGROUND: The effect of preoperative transthoracic echocardiography on the clinical outcomes of patients with hip fractures undergoing surgical treatment remains controversial. We hypothesized that preoperative echocardiography is associated with reduced postoperative morbidity and improved patient survival after surgical repair of hip fractures.
METHODS: Drawing from a nationwide administrative database, patients undergoing hip fracture surgeries between April 1, 2008 and December 31, 2016 were included. We examined the association of preoperative echocardiography with the incidence of in-hospital mortality using propensity score matching. Secondary outcomes included postoperative complications, the incidence of postoperative intensive care unit admissions, and length of hospital stay. For sensitivity analyses, we restricted the overall cohort to include only hip fracture surgeries performed within 2 days from admission.
RESULTS: Overall, 34,679 (52.1%) of 66,620 surgical patients underwent preoperative echocardiography screening. The screened patients (mean [SD] age, 84.3 years [7.7 years]; 79.0% female) were propensity score matched to 31,941 nonscreened patients (mean [SD] age, 82.1 years [8.7 years]; 78.2% female). The overall in-hospital mortality, before propensity matching, was 1.8% (1227 patients). Propensity score matching created a matched cohort of 25,205 pairs of patients. There were no in-hospital mortality differences between the 2 groups (screened versus nonscreened: 417 [1.65%] vs 439 [1.74%]; odds ratio, 0.95; 95% confidence interval, 0.83–1.09; P =.45). Preoperative echocardiography was not associated with reduced postoperative complications and intensive care unit admissions. In sensitivity analysis, we identified 25,637 patients from the overall cohort (38.5%) with hip fracture surgeries performed within 2 days of admission. There were no in-hospital mortality differences between the 2 groups (screened versus nonscreened: 1.67% vs 1.80%; odds ratio, 0.93; 95% confidence interval, 0.72–1.18; P =.53). Findings were also consistent with other sensitivity analyses and subgroup analyses.
CONCLUSIONS: This large, retrospective, nationwide cohort study demonstrated that preoperative echocardiography was not associated with reduced in-hospital mortality or postoperative complications.

術前服用抗抑鬱藥和抗焦慮藥物與術後住院時長間的關係

Relationship Between Preoperative Antidepressant and Antianxiety

Medications and Postoperative Hospital Length of Stay
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背景：服用抗抑鬱藥物或抗焦慮藥物的患者，由於疼痛管理困難、應激機制改變或藥物相關問題，通常圍手術期情況複雜。本研究在控制混雜因素的同時，研究了術前應用抗抑鬱藥和抗焦慮藥物與術後住院時長的關係。

方法：從 2011 年至 2014 年在一個大型城市學術機構接受非心臟手術的 48435 名成人患者的管理資料庫中，對年齡、性別、醫學合併症和手術類型進行多變數零截斷負二項回歸分析，以評估術前暴露於抗抑鬱或抗焦慮藥物與術後住院時間的相關關係。

結果：抗抑鬱藥組 5111 例（10.5%），抗焦慮藥組 4912 例（10.1%）。平均住院時間為 3 天（四分位間距=2-6）。在控制了混雜因素後，術前服用抗抑鬱藥物與住院時間增加有關，發病率比率為 1.04（99%置信區間：1.0-1.08，p<0.001），抗焦慮藥物的發病率比率為 1.1（99%置信區間：1.06-1.14；p<0.001）。

結論：抗抑鬱藥或抗焦慮藥物與術後住院時間增加之間的關係表明，這類患者為了加速術後恢復可能需要在圍手術期投入更大的注意力，這可能涉及將術前諮詢、術後精神諮詢或整體康復方法整合到加速康復流程中。

（吳潔譯 李士通校）

BACKGROUND: Patients on antidepressant or antianxiety medications often have complex perioperative courses due to difficult pain management, altered coping mechanisms, or medication-related issues. This study examined the relationship between preoperative antidepressants and antianxiety medications on postoperative hospital length of stay while controlling for confounding variables.
METHODS: From an administrative database of 48,435 adult patients who underwent noncardiac surgery from 2011 to 2014 at a single, large urban academic institution, multivariable zero-truncated negative binomial regression analyses controlling for age, sex, medical comorbidities, and

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

迴圈死亡後器官捐獻

Organ Donation AfterCirculatory Death
Ethical Issues and International Practices
Jericho, Barbara G., MD, FASA
Anesthesia & Analgesia: 2019 128 280 – 285

迴圈死亡後捐獻（DCD）是一種越來越廣泛使用的做法，有助於減少器官供應和器官移植需求之間的差異。隨著來自 DCD 供體的移植器官數量不斷增加，有必要在機構 DCD 方案和臨床實踐中解決 DCD 的倫理問題。尊重潛在捐助者的臨終願望、尊重接受者的願望和解決潛在利益衝突的倫理問題是制定 DCD 專案政策和程式的重要考慮因素。儘管歐洲、澳大利亞、以色列、中國、美國和加拿大的 DCD 專案可能存在多樣性，但在器官捐贈的利他和慷慨行為中，解決這些 DCD 專案中的倫理問題對於尊重捐助者和接受者都至關重要。

（吳潔譯 李士通校）

Donation after circulatory death (DCD) is an increasingly utilized practice that can contribute to reducing the difference between the supply of organs and the demand for organs for transplantation. As the number

of transplanted organs from DCD donors continues to increase, there is an essential need to address the ethical aspects of DCD in institutional DCD protocols and clinical practice. Ethical issues of respecting the end-of-life wishes of a potential donor, respecting a recipient's wishes, and addressing potential conflicts of interest are important considerations in developing policies and procedures for DCD programs. Although there may be diversity among DCD programs in Europe, Australia, Israel, China, the United States, and Canada, addressing ethical considerations in these DCD programs is essential to respect donors and recipients during the altruistic and generous act of organ donation.

脊麻下剖宮產術中膠體預負荷與晶體聯合應用與單純晶體補液的比較

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

A Randomized Controlled Trial

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背景:脊髓麻醉下剖宮產的最佳液體治療策略尚不清楚。下腔靜脈超聲檢查(IVC)最近已被用來評估容量狀態和預測液體反應性。在此項雙盲、隨機對照研究中，我們使用 500ml 膠體預負荷配合 500ml 晶體液與 1000ml 晶體液的組合比較了產婦的血流動力學情況。我們評估了在基初狀態和脊髓麻醉後各時間點下腔靜脈情況。

方法：200 名 ASA 分級 II 級的足月單胎妊娠產婦，擬在腰麻下行擇期剖宮產，隨機分配使用加壓輸液器接受 500ml 膠體液預負荷，聯合 500ml 晶體補液（聯合組）或單純 1000ml 晶體補液（晶體補液組）。當收縮壓分別低於基礎值的 90%、80%（低血壓）和 70%（嚴重低血壓）時，給予麻黃堿 3、5 和 10 mg。在腰麻前時、鞘內注射後 1 分鐘和 5 分鐘以及分娩後即刻肋緣下長軸水準評估 IVC；測量最大和最小 IVC 直徑，並使用公式：IVC-CI=（最大 IVC 直徑-最小 IVC 直徑）/最大 IVC 直徑計算 IVC 塌陷指數（CI）。主要結果是麻黃堿總劑量。

結果：對 198 例患者（每組 99 例）的資料進行分析。聯合組麻黃堿總劑量的中位數為 11（範圍：0-60）mg，晶體補液組中位數為 13（0-61）mg；差異中位數為－2（95%非參數置信區間：－5-0.00005）mg，P=0.22。兩組患者需要使用麻黃堿的人數、低血壓和嚴重低血壓的發生率、第一次麻黃堿的劑量以及新生兒 1 分鐘和 5 分鐘時的 Apgar 評分均無顯著差異。兩組的最大和最小下腔靜脈直徑在腰麻後和分娩後均增大，而聯合組此直徑增大。晶體補液組分娩後 IVC-CI 值較高。

結論：與 1000 毫升晶體補液相比，500 毫升膠體預負荷聯合 500 毫升晶體液的組合並沒有減少麻黃堿總使用劑量或改善產婦其他預後。在剖宮產前和剖宮產過程中均能可靠地觀察到 IVC，其直徑隨時間變化明顯，兩組之間也存在差異。

（吳潔譯 李士通校）

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

METHODS: Two hundred American Society of Anesthesiologists physical status II parturients with full-term singleton pregnancies scheduled for elective cesarean delivery under spinal anesthesia were randomly allocated to receive either 500-mL colloid preload followed by 500-mL crystalloid coload (combination group) or 1000-mL crystalloid coload (crystalloid coload group) administered using a pressurizer. Ephedrine 3, 5, and 10 mg boluses were administered when the systolic blood pressure decreased below 90%, 80% (hypotension), and 70% (severe hypotension) of the baseline value, respectively. The IVC was assessed using the subcostal long-axis view at baseline, at 1 and 5 minutes after intrathecal injection, and immediately after delivery; the maximum and minimum IVC diameters were measured, and the IVC collapsibility index (CI) was calculated using the formula: IVC-CI = (maximum IVC diameter − minimum IVC diameter)/maximum IVC diameter. The primary outcome was the total ephedrine dose.

RESULTS: Data from 198 patients (99 patients in each group) were analyzed. The median (range) of the total ephedrine dose was 11 (0–60) mg in the combination group and 13 (0–61) mg in the crystalloid coload group; the median of the difference (95% nonparametric confidence interval) was −2 (−5 to 0.00005) mg, P = .22. There were no significant differences between the 2 groups in the number of patients requiring ephedrine, the incidence of hypotension and severe hypotension, the time to the first ephedrine dose, and neonatal Apgar scores at 1 and 5 minutes. The maximum and minimum IVC diameters in each group increased after spinal anesthesia and after delivery, and they were larger in the combination group. The IVC-CI after delivery was higher in the crystalloid coload group.

CONCLUSIONS:

The combination of 500-mL colloid preload and 500-mL crystalloid coload did not reduce the total ephedrine dose or improve other maternal outcomes compared with 1000-mL crystalloid coload. The IVC was reliably viewed before and during cesarean delivery, and its diameters significantly changed over time and differed between the 2 groups.

術前唾液皮質醇 AM/PM 比值預測老年患者非心臟手術後早期術後認知功能障礙

Preoperative Salivary Cortisol AM/PM Ratio Predicts Early Postoperative Cognitive Dysfunction After Noncardiac Surgery in Elderly Patients

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背景：術後認知功能障礙（POCD）的診斷需要複雜的神經心理測試，往往會使診斷延遲。具有早期檢測或預測作用的可能生物標誌物對於預防和治療 POCD 至關重要。術前對唾液皮質醇水準的篩查可能有助於確定 POCD 高危患者。

方法：120 名年齡大於 60 歲並接受非心臟大手術的患者在手術前 1 天和手術後 1 周接受了神經心理學測試。術前 1 天分別採集患者早上和晚上唾液樣本。POCD 被定義為在至少 2 個不同的測試中 z 分數≤−1.96。主要結果是出現 POCD。本研究的主要目的是評估 AM（早上）與 PM（晚上）唾液皮質醇水準之比與 POCD

的發生之間的關係。第二個目的是評估 POCD 與早晚唾液皮質醇絕對值之間的關係。

結果：術後 1 周，17.02%（94 例中的 16 例；95%置信區間（CI）為 9.28%-24.76%）的患者觀察到 POCD。術前 AM/PM 唾液皮質醇比值較高可預測早期 POCD 發病（比值比[OR]為 1.56；95%可信區間為 1.20-2.02；P=0.001），即使在調整了最小精神狀態檢查評分後（比值比為 1.55；95%可信區間為 1.19-2.02；P=0.001）。POCD 患者唾液皮質醇 AM/PM 比值受試者操作特徵曲線下面積為 0.72（95%CI 為 0.56－0.88；P=0.006）。最佳臨界值為 5.69，靈敏度為 50%，特異性為 91%。

結論：術前唾液皮質醇 AM/PM 比值與早期 POCD 的存在顯著相關。這種生物標誌物對於篩查患者是否存在 POCD 風險增加以及進一步闡明 POCD 的病因可能具有潛在的價值。

（吳潔譯 李士通校）

BACKGROUND: The diagnosis of postoperative cognitive dysfunction (POCD) requires complicated neuropsychological testing and is often delayed. Possible biomarkers for early detection or prediction are essential for the prevention and treatment of POCD. Preoperative screening of salivary cortisol levels may help to identify patients at elevated risk for POCD.
METHODS: One hundred twenty patients >60 years of age and undergoing major noncardiac surgery underwent neuropsychological testing 1 day before and 1 week after surgery. Saliva samples were collected in the morning and the evening 1 day before surgery. POCD was defined as a Z-score of ≤－1.96 on at least 2 different tests. The primary outcome was the presence of POCD. The primary objective of this study was to assess the relationship between the ratio of AM (morning) to PM (evening) salivary cortisol levels and the presence of POCD. The secondary objective was to assess the relationship between POCD and salivary cortisol absolute values in the morning or in the evening.
RESULTS: POCD was observed in 17.02% (16 of 94; 95% confidence interval [CI], 9.28%－24.76%) of patients 1 week after the operation. A higher preoperative AM/PM salivary cortisol ratio predicted early POCD onset (odds ratio [OR], 1.56; 95% CI, 1.20－2.02; P = .001), even after

adjusting for the Mini-Mental Sate Examination score (odds ratio, 1.55; 95% CI, 1.19–2.02; P = .001). The area under the receiver operating characteristic curve for the salivary cortisol AM/PM ratio in individuals with POCD was 0.72 (95% CI, 0.56–0.88; P = .006). The optimal cutoff value was 5.69, with a sensitivity of 50% and specificity of 91%.

CONCLUSIONS:

The preoperative salivary cortisol AM/PM ratio was significantly associated with the presence of early POCD. This biomarker may have potential utility for screening patients for an increased risk and also for further elucidating the etiology of POCD.

統計程序控制

Statistical Process Control

No Hits, No Runs, No Errors?

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新的干預或新的臨床計畫必須實現並維持其運用和臨床目標。為了證明其成功優化醫療保健價值，提供者和其他利益相關人員必須縱向衡量和報告這些跟蹤的相關結果。這包括臨床醫生和圍手術期醫療服務研究人員，他們選擇參與這些過程和品質的改進工作（“在此領域中發揮作用”）。統計程序控制是統計學的一個分支，它將嚴格的順序、基於時間的分析方法與性能和質量數據的圖形表示相結合。統計程序控制及其主要工具-控制圖為研究人員和從業人員提供了一種更好地理解和交流醫療保健績效和品質改進工作資料的方法。統計程序控制以一種通常更易於臨床醫生、管理人員和醫療保健決策者理解的格式呈現績效和質量數據，並且通常更容易產生可操作的見解和結論。衛生保健品質的改進是以統計程序控制為基礎的。在麻醉學、重症監護、圍術期醫學和急慢性疼痛管理方面進行、實現和報告持續的品質改進，從根本上均依賴于應用統計程序控制的方法和工具。因此，本基本統計教程重點介紹統計程序控制的日爾曼主題，包括隨機（常見）變化原因與可分配（特殊）變化原因：六西格瑪（）與精益生產與精益六西

格瑪（精益生產管理）、品質管制水準、運行圖、控制圖、選擇適用的控制圖類型。以及分析控制圖。重點是准實驗研究設計，特別適用於工藝改進和品質改進工作。

（吳潔譯 李士通校）

A novel intervention or new clinical program must achieve and sustain its operational and clinical goals. To demonstrate successfully optimizing health care value, providers and other stakeholders must longitudinally measure and report these tracked relevant associated outcomes. This includes clinicians and perioperative health services researchers who chose to participate in these process improvement and quality improvement efforts (“play in this space”). Statistical process control is a branch of statistics that combines rigorous sequential, time-based analysis methods with graphical presentation of performance and quality data. Statistical process control and its primary tool—the control chart—provide researchers and practitioners with a method of better understanding and communicating data from health care performance and quality improvement efforts. Statistical process control presents performance and quality data in a format that is typically more understandable to practicing clinicians, administrators, and health care decision makers and often more readily generates actionable insights and conclusions. Health care quality improvement is predicated on statistical process control. Undertaking, achieving, and reporting continuous quality improvement in anesthesiology, critical care, perioperative medicine, and acute and chronic pain management all fundamentally rely on applying statistical process control methods and tools. Thus, the present basic statistical tutorial focuses on the germane topic of statistical process control, including random (common) causes of variation versus assignable (special) causes of variation: Six Sigma versus Lean versus Lean Six Sigma, levels of quality management, run chart, control charts, selecting the applicable type of control chart, and analyzing a control chart. Specific attention is focused on quasi-experimental study designs, which are particularly applicable to process improvement and quality improvement efforts.

.區域阻滯麻醉在門診膝關節鏡手術和前交叉韌帶重建術中作用的循證學依據：

第二部分

Evidence Basis for Regional Anesthesia in Ambulatory Arthroscopic Knee

Surgery and Anterior Cruciate Ligament Reconstruction Part II

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

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背景：在過去十年中，內收肌管阻滯（ACB）已成為大型膝關節手術的一種有效區域鎮痛技術。由於其運動保留的特性，ACB 在門診膝關節手術中較有吸引力，但支援其在門診膝關節鏡手術中應用的證據存在矛盾。該系統評價和薈萃分析評估了 ACB 對門診膝關節鏡手術的鎮痛作用。

方法：作者對電子資料庫中，關於分析 ACB 與對照或任何其他方式相比的鎮痛作用方面的隨機對照臨床試驗，進行了全面檢索。納入小型關節鏡和前交叉韌帶重建（ACLR）手術。實驗評估休息時和活動時的疼痛評分、阿片類藥物消耗、阿片類藥物相關不良反應、首次解救藥物時間、患者滿意度、股四頭肌強度和阻滯相關併發症。使用隨機效應建模匯總資料。

結果:作者檢索到了 10 項隨機對照試驗,比較 ACB 與安慰劑或股神經阻滯(FNB);根據膝關節手術的類型分亞組。對於小型膝關節鏡手術，與對照相比，ACB 組術後靜息疼痛評分更低，平均差異（95%置信區間）在 0、6 和 8 小時分別為-1.46 cm（-2.03 至-0.90）（P <.00001），－0.51 cm（-0.92 至-0.10），（P = .02）和-0.48cm（-0.93 至-0.04）（P = .03）。與對照相比，ACB 組動態疼痛評分更低,平均差異(95%置信區間)在 0、6 和 8 小時分別為-1.50 cm(-2.10 至-0.90）（P <.00001），－0.50 cm（-0.95 至-0.04）（P = .03）和-0.59cm（-1.12 至-0.05）（P = .03）。與對照組相比，ACB 組 24 小時累積口服嗎啡當量消耗量更低，減少-7.41 mg（-14.75 至-0.08）（P = .05）。對於 ACLR 手術，與對

照組相比，ACB 沒有提供任何鎮痛益處，也沒有改善任何檢查結果。對於這些結果，ACB 也與 FNB 沒有區別。

結論:小型門診膝關節鏡手術後，ACB 可提供適度的鎮痛效果，包括改善靜息疼痛，減少術後 8 小時和 24 小時內阿片類藥物的消耗。在門診 ACLR 後，ACB 的麻醉獲益與安慰劑或 FNB 沒有差別，表明兩種阻滯在該過程中的作用有限。研究數量有限決定了應謹慎地解釋此類研究結果。需要進一步的研究來確定 ACB 在局麻藥滴注和/或移植供體部位鎮痛中的作用。

（張驍 譯 陳傑 校）

Background: Adductor canal block (ACB) has emerged as an effective analgesic regional technique for major knee surgeries in the last decade. Its motor-sparing properties make it particularly attractive for ambulatory knee surgery, but evidence supporting its use in ambulatory arthroscopic knee surgery is conflicting. This systematic review and meta-analysis evaluates the analgesic effects of ACB for ambulatory arthroscopic knee surgeries.
Methods: We conducted a comprehensive search of electronic databases for randomized controlled trials examining the analgesic effects of ACB compared to control or any other analgesic modality. Both minor arthroscopic and anterior cruciate ligament reconstruction (ACLR) surgeries were considered. Rest and dynamic pain scores, opioid consumption, opioid-related adverse effects, time to first analgesic request, patient satisfaction, quadriceps strength, and block-related complications were evaluated. Data were pooled using random-effects modeling.
Results: Our search yielded 10 randomized controlled trials comparing ACB with placebo or femoral nerve block (FNB); these were subgrouped according to the type of knee surgery. For minor knee arthroscopic surgery, ACB provided reduced postoperative resting pain scores by a mean difference (95% confidence interval) of -1.46 cm (-2.03 to -0.90) ($P < .00001$), -0.51 cm (-0.92 to -0.10) ($P = .02$), and -0.48 cm (-0.93 to -0.04) ($P = .03$) at 0, 6, and 8 hours, respectively, compared to control. Dynamic pain scores were reduced by a mean difference (95% confidence interval) of -1.50 cm (-2.10 to -0.90) ($P < .00001$), -0.50 cm (-0.95 to -0.04) ($P = .03$), and -0.59 cm (-1.12 to -0.05) ($P = .03$) at 0, 6, and 8 hours, respectively, compared to control. ACB also reduced the cumulative 24-hour oral morphine equivalent consumption by -7.41 mg (-14.75 to -0.08) ($P = .05$) compared

to control. For ACLR surgery, ACB did not provide any analgesic benefits and did not improve any of the examined outcomes, compared to control. ACB was also not different from FNB for these outcomes.
Conclusions: After minor ambulatory arthroscopic knee surgery, ACB provides modest analgesic benefits, including improved relief for rest pain, and reduced opioid consumption for up to 8 and 24 hours, respectively. The analgesic benefits of ACB are not different from placebo or FNB after ambulatory ACLR, suggesting a limited role of both blocks in this procedure. Paucity of trials dictates cautious interpretation of these findings. Future studies are needed to determine the role of ACB in the setting of local anesthetic instillation and/or graft donor-site analgesia

不同脂肪乳劑方案在布比卡因誘導的大鼠心臟停搏模型中復蘇效果的比較

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

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背景：目前尚不清楚通過外周靜脈或中心靜脈給予脂質乳劑（LE）對於搶救布比卡因誘導的心臟停搏孰優孰劣；也不清楚通過外周靜脈施用不同的 LE 方案是否具有相似的治療效果。本研究利用布比卡因誘導的大鼠心臟停搏模型比較了各種脂質給藥方案的治療效果。

方法：選取 45 只成年雄性 SD 大鼠，給予布比卡因誘導其出現心臟停搏，並隨機將其分為 3 組：（1）通過頸內靜脈持續輸注 20%LE（CV 輸注組）；（2）通過尾靜脈持續輸注 20%LE（PV 輸注組）；（3）通過尾靜脈間斷推注 20%LE（PV-推注組）。各實驗組 LE 的最大使用劑量不超過 10 mL/kg-1。在藥物處理期間仍需對大鼠行胸外按壓直至自主迴圈恢復（ROSC）或搶救時長達 40min。

結果：CV 輸注組和 PV 推注組在 2～40min 內的存活率、ROSC 率、收縮壓、心率、心率-血壓乘積和冠狀動脈灌注壓方面均顯著高於 PV 輸注組（P <.01）；同時其

血漿總布比卡因濃度和心肌布比卡因含量也均顯著降低（P <.05）。在心臟複跳時間和 ROSC 時間方面 CV 輸注組和 PV 推注組也明顯短於 PV 輸注組（P <.05）。

結論：在布比卡因誘導的大鼠心臟停搏模型中，通過外周靜脈間斷推注 LE 比外周靜脈連續輸注 LE 可產生更好的復蘇結果，並且其與通過中心靜脈連續輸注 LE 具有類似的效果。

（周江平 譯　陳傑 校）

BACKGROUND: It is currently unknown whether bupivacaine-induced asystole is better resuscitated with lipid emulsion (LE) administered peripherally or centrally, and whether different LE regimens administered peripherally demonstrated similar effects. In this study, we compared the effects of various regimens of lipid administration in a rat model of bupivacaine-induced asystole.
METHODS: Forty-five adult male Sprague-Dawley rats were subjected to bupivacaine-induced asystole and randomly divided into 3 lipid regimens groups: (1) 20% LE was administered continuously via the internal jugular vein (CV-infusion group); (2) 20% LE was administered continuously via the tail vein (PV-infusion group); and (3) 20% LE was administered as divided boluses via the tail vein (PV-bolus group). The maximum dose of LE did not exceed 10 mL·kg－1. External chest compressions were administered until the return of spontaneous circulation (ROSC) or the end of a 40-minute resuscitation period.
RESULTS: The survival rate, rate of ROSC, systolic blood pressure, heart rate, heart rate－blood pressure product, and coronary perfusion pressure during 2－40 minutes in the CV-infusion and PV-bolus groups were significantly higher than those in the PV-infusion group (P < .01), and the plasma total bupivacaine concentration and myocardial bupivacaine content were significantly lower (P < .05). Time to heartbeat return and time to ROSC in the CV-infusion and PV-bolus groups were significantly shorter than those in the PV-infusion group (P < .05).
CONCLUSIONS: In the rat model of bupivacaine-induced asystole, a divided LE bolus regimen administered peripherally provided a better resuscitation outcome than that of a continuous LE infusion regimen peripherally, and performed in a similar fashion as the continuous LE infusion regimen administered centrally.

血小板預防性輸注對於血小板減少危重病人的作用

Prophylactic Platelet Transfusions for Critically Ill Patients With Thrombocytopenia

A Single-Institution Propensity-Matched Cohort Study

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背景：重症患者經常伴發血小板減少症，通常會預防性輸注血小板以減少出血併發症。 然而，此種做法的功效仍不清楚。本研究目的是確定危重病人預防性血小板輸注與出血併發症之間的關係。

方法：此項回顧性佇列研究納入 2009 年 1 月 1 日至 2013 年 12 月 31 日期間在單一學術機構入住外科、內科或綜合重症監護病房（ICU）的成人。納入標準包括年齡≥18 歲和 ICU 入住時進行血小板計數。傾向性匹配分析用於評估預防性血小板輸注和相關結果之間的關聯，其中主要觀察結果是隨後的 24 小時內紅細胞輸注情況，次要觀察結果是非 ICU 和非住院天數以及連續器官衰竭評估評分的變化。

結果：這項調查共納入 40,693 例患者，3227 例（7.9％）接受過血小板輸注，其中 1065 例（33.0％）為預防性輸注。在傾向性匹配分析中，994 例預防性血小板輸注患者與未輸注患者相匹配。在隨後的 24 小時內接受預防性血小板治療的患者紅細胞輸注率明顯增高（比值比為 7.5 [5.9-9.5]; P <0.001），非 ICU 天數明顯減少（平均[標準差] 20.8 [9.1] vs 22.7 [8.3]天; P = 0.004），非住院天數明顯減少（13.0 [9.7] vs 15.8 [9.4]天; P <0.001），連續器官衰竭評估評分的改善更少（平均下降 0.2 [3.6] vs 1.8 [3.3] ）; P <0.001）。 這些發現較為確定，持續存在於多個預定義的敏感性分析中。

結論：雖然存在一些混雜因素，但危重病人血小板的預防性輸注給藥與改善的臨床結果並無無關。有必要進一步調查這一人群中的血小板輸注策略。

(宋英才 譯　陳傑 校)

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

微創漏斗胸糾治術的圍術期管理及院內轉歸：兒科麻醉改善協會的多中心註冊報告

Perioperative Management and In-Hospital Outcomes After Minimally Invasive Repair of Pectus Excavatum
A Multicenter Registry Report From the Society for Pediatric Anesthesia Improvement Network

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背景：目前微創漏斗胸糾治術（minimally invasive repair of pectus excavatum, MIRPE）患者的鎮痛管理相關的對照研究較少。建立兒科麻醉改善網路協會以調查那些存在顯著管理差異的操作的預後。作者在首次研究中建立一個多中心觀察資料庫來描述用於 MIRPE 患兒的鎮痛策略。各中心的預後資料用於評估鎮痛策略與疼痛預後之間的關係。

方法：從 2014 年 6 月至 2015 年 8 月，共有 14 個醫療機構招募患者。研究成員均同意採用同一種觀察方法，每個機構根據各自的標準及協定管理病人，沒有要求標準化監護。根據鎮痛策略對患者進行分組：硬膜外置管（EC）、椎旁置管（PVC）、切口置管（WC）、非區域鎮痛（NR）、鞘內嗎啡應用。在使用多變數模型對以下 5 項協變數（年齡、性別、植入鋼板數、胸科指數及術前疼痛用藥）進行混雜因素調整後，以術後某日（POD）的疼痛評分和阿片類藥物消耗量作為主要預後指標，進行組間比較。疼痛評分採用 Bonferroni 校正的重複測量方差分析。使用多變數分位元數回歸分析阿片類藥物消耗量。

結果：收集 348 例 MIPRE 患者的資料並按主要鎮痛策略進行分類：EC（122），PVC（57），WC（41），NR（120），和鞘內嗎啡應用（8）。與 EC 相比，PVC(POD 0)、WC(POD 0,1,2,3,)、和 NR(POD 0,1,2)組的日疼痛評分中位數更高（各組間

P<0.001-0.024）。PVC(POD 0)、WC(POD 0,1,2,3,)和 NR(POD 0,1,2)組的日阿片需求量均較 EC 組患者更多（P<0.001）。

結論：資料表明，本研究網路中 MIRPE 患者的鎮痛策略多樣。結果表明，無論採用何種方式，多數患者術後出現輕至中度疼痛。與其他策略相較，EC 治療的患者在康復早期疼痛評分及阿片類藥物消耗更低。

(金夏 譯　陳傑 校)

BACKGROUND: There are few comparative data on the analgesic options used to manage patients undergoing minimally invasive repair of pectus excavatum (MIRPE). The Society for Pediatric Anesthesia Improvement Network was established to investigate outcomes for procedures where there is significant management variability. For our first study, we established a multicenter observational database to characterize the analgesic strategies used to manage pediatric patients undergoing MIRPE. Outcome data from the participating centers were used to assess the association between analgesic strategy and pain outcomes.
METHODS: Fourteen institutions enrolled patients from June 2014 through August 2015. Network members agreed to an observational methodology where each institution managed patients based on their institutional standards and protocols. There was no requirement to standardize care. Patients were categorized based on analgesic strategy: epidural catheter (EC), paravertebral catheter (PVC), wound catheter (WC), no regional (NR) analgesia, and intrathecal morphine techniques. Primary outcomes, pain score and opioid consumption by postoperative day (POD), for each technique were compared while adjusting for confounders using multivariable modeling that included 5 covariates: age, sex, number of bars, Haller index, and use of preoperative pain medication. Pain scores were analyzed using repeated-measures analysis of variance with Bonferroni correction. Opioid consumption was analyzed using a multivariable quantile regression.
RESULTS: Data were collected on 348 patients and categorized based on primary analgesic strategy: EC (122), PVC (57), WC (41), NR (120), and intrathecal morphine (8). Compared to EC, daily median pain scores were higher in patients managed with PVC (POD 0), WC (POD 0, 1, 2, 3), and NR (POD 0, 1, 2), respectively (P < .001-.024 depending on group). Daily opioid requirements were higher in patients managed with PVC (POD 0, 1), WC (POD 0, 1, 2), and NR (POD 0, 1, 2) when compared to patients managed with EC (P < .001).

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

一項關於“關節和脊柱手術後阿片類藥物處方過量的前瞻性佇列研究

Opioid Oversupply After Joint and Spine Surgery
A Prospective Cohort Study

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背景：許多患者在術後出院時接受阿片類藥物的處方，但對阿片類藥物的剩餘情況知之甚少。作者對門診和住院手術後剩餘阿片類藥物的發生率，非阿片類鎮痛藥的使用以及此類藥物的儲存和處置方法進行評估。

方法：此項前瞻性佇列研究招募物件為一所大型市級三級醫院自 2016 年 8 月至 11 月期間擇期接受門診或住院關節和脊柱外科手術的 18 歲以上患者。通過電話調查，作者評估了患者術後 2 天，2 周，1 個月和 6 個月時的預後情況，評估內容包括：(1) 停止阿片類藥物治療和擁有的剩餘阿片類藥物（主要結果），(2) 停止使用阿片類藥物後剩餘的阿片類藥物數量（3）非阿片類藥物疼痛治療方式和（4）對於安全儲存和處置阿片類藥物的知識和實踐情況。

結果：在 141 名符合條件的患者中，獲得 140 名（99%）知情同意（其中 35% 的患者術前服用阿片類藥物;平均年齡56歲[標準差16歲]; 其中47%為女性）。對 115 名（82%）和 110 名患者（80%）分別進行了 1 個月和 6 個月的隨訪。在停止阿片類藥物治療的患者中，在術後 1 個月隨訪時，還擁有剩餘阿片類藥物的患者比例為 73%（置信區間為 95%，62%-82%），術後 6 個月者為 34%（置信區間為 24%-45%）。在術後 1 月時，有 46%的患者還擁有超過 20 片剩餘阿片類

藥物，有 37%的患者擁有大於 200mg 嗎啡當量的藥品，而只有 6%的患者使用多種非阿片類藥物。許多患者在術後 1 個月（分別為 91%和 96%）和 6 個月（分別為 92%和 47%）隨訪時表現出未能安全儲存和處置阿片類藥物。

結論：作者研究發現，在關節和脊柱手術後，許多患者擁有剩餘阿片類藥物、不常用的鎮痛藥替代物，並缺乏安全儲存和處置阿片類藥物的知識。亟需一些干預手段以更好地定制術後鎮痛方案，並改善處方阿片類藥物的安全儲存和處置情況。

(謝婷婷 譯　陳傑 校)

BACKGROUND: Many patients receive prescription opioids at hospital discharge after surgery, yet little is known regarding how often these opioids go unused. We estimated the prevalence of unused opioids, use of nonopioid analgesics, and storage and disposal practices after same-day and inpatient surgery.
METHODS: In this prospective cohort study at a large, inner-city tertiary care hospital, we recruited individuals ≥18 years of age undergoing elective same-day or inpatient joint and spine surgery from August to November 2016. Using patient surveys via telephone calls, we assessed patient-reported outcomes at 2-day, 2-week, 1-month, and 6-month intervals, including: (1) stopping opioid treatment and in possession of unused opioid pills (primary outcome), (2) number of unused opioid tablets reported after stopping opioids, (3) use of nonopioid pain treatments, and (4) knowledge and practice regarding safe opioid storage and disposal.
RESULTS: Of 141 eligible patients, 140 (99%) consented (35% taking preoperative opioids; mean age 56 years [standard deviation 16 years]; 47% women). One- and 6-month follow-up was achieved for 115 (82%) and 110 patients (80%), respectively. Among patients who stopped opioid therapy, possession of unused opioids was reported by 73% (95% confidence intervals, 62%-82%) at 1-month follow-up and 34% (confidence interval, 24%-45%) at 6-month follow-up. At 1 month, 46% had ≥20 unused pills, 37% had ≥200 morphine milligram equivalents, and only 6% reported using multiple nonopioid adjuncts. Many patients reported unsafe storage and failure to dispose of opioids at both 1-month (91% and 96%, respectively) and 6-month (92% and 47%, respectively) follow-up.
CONCLUSIONS: After joint and spine surgery, many patients reported unused opioids, infrequent use of analgesic alternatives, and lack of knowledge regarding safe opioid storage and disposal. Interventions are needed to

better tailor postoperative analgesia and improve the safe storage and disposal of prescription opioids.