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再生性血小板減少和免疫性血小板減少狀態下, 纖維蛋白原和 von Willebrand 因數對血栓形成及血小板粘附的不同作用

Differential Roles of Fibrinogen and von Willebrand Factor on Clot Formation and Platelet Adhesion in Reconstituted and Immune Thrombocytopenia

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Anesth Analg 2011 112:1034-1040;

背景：免疫性血小板減少症（ITP）的出血傾向與血小板減少的數量並不總是對應關係，提示還存在著血小板功能變化。作者比較含有正常全血的血小板減少模型與 ITP 患者兩者在血小板功能和其他止血參數方面的差異。本研究進一步探討在體外實驗中加入 von Willebrand 因數（vWF）和纖維蛋白原對血小板功能及止血參數的影響。
方法：使用 Cone and Plate(let) Analyzer (CPA)測量在一定的剪切率(1200 s−1)狀態下血小板粘附（表面覆蓋度[SC]，%）和聚集（平均面積，μm2 ）功能。使用血栓彈力圖描記儀 ROTEM 測量由氯化鈣和組織因數觸發的血栓形成相關參數。
結果：血小板減少模型與 ITP 類似，血小板數量在 5 至 80 × 106/mL 範圍內,表面覆蓋度和某種程度的平均面積與血小板數量呈正相關。大部分 ITP 患者的測試樣本結果包含在血小板減少模型所設定上下界限內。全血中加入 2 U/mL von Willebrand 因數 (Haemate-P)(根據血漿容量計算），將增加 SC 及平均面積，但並不影響血栓形成。加入纖維蛋白原 100 和 300 mg/dL 不影響血小板吸附，但可改善血栓形成。
結論：含有正常全血的血小板減少模型能夠建立 CPA 法和 ROTEM 法的參考變數，並評估嚴重血小板減少狀態下血小板功能和血栓形成。結果顯示大部分 ITP 患者的血小板的功能與正常血小板相當。研究同時發現，vWF 和纖維蛋白原對初期和二期止血功能的影響存在差異。因此兩者皆對出血有效，並可用于 ITP 患者的治療。
（陳毓雯　譯　陳傑　校）

BACKGROUND: Bleeding tendencies in immune thrombocytopenia (ITP) do not always correlate with the number of platelets, suggesting platelet function variation. We used a model of normal whole blood thrombocytopenia to compare platelet function and other hemostatic variables with ITP patients. We further investigated the effect of in vitro spiking with von Willebrand factor (vWF) and fibrinogen on platelet function and hemostatic variables.
METHODS: The Cone and Plate(let) Analyzer was used to measure platelet adhesion (surface coverage [SC], %) and aggregation (average size, μm2) under defined shear rate (1200 s−1). Rotational thromboelastometry was used to determine variables of clot formation triggered by CaCl2 and tissue factor.
RESULTS: In both the model of thrombocytopenia as well as in ITP, the SC and to some extent the average size were correlated to the platelet number over a range of 5 to

80 × 106/mL. The results obtained for most ITP samples were within the boundaries of the lower and upper limits set by the whole blood model of thrombocytopenia. The addition of 2 U/mL vWF (Haemate-P) to whole blood (calculated to plasma volume) results in an increase in the SC and average size without affecting clot formation. Spiking with fibrinogen (100 and 300 mg/dL) did not affect platelet deposition but improved clot formation.
CONCLUSIONS: Using a model of whole blood thrombocytopenia enables us to establish reference variables for the Cone and Plate(let) Analyzer and rotational thromboelastometry and to assess platelet function and clot formation in the presence of severe thrombocytopenia. We demonstrated that in most cases of ITP, platelet function is comparable to normal platelets. This work also suggests that vWF and fibrinogen differentially affect primary and secondary hemostasis and therefore both may perform a function in the bleeding phenotype and possibly may be considered for treatment in patients with ITP.

綜述：高風險：心臟手術期間危險風險

Review Article: High Stakes and High Risk: A Focused Qualitative Review of Hazards During Cardiac Surgery

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心臟手術是一種由多科室團隊利用複雜儀器和技術共同完成的高風險手術。近十餘年來，大量工作致力於提高心臟手術病人的安全性，但是關於在臨床上如何識別過失以及如何提高病人安全性，文獻報導提供的相關指導有限。這篇專題的主要內容作爲 FOCUS 專案(Flawless Operative Cardiovascular Unified Systems)中的一部分，FOCUS 項目是在心血管麻醉醫生協會支持下進行的，其作用在於判別心臟手術的各種風險, 完善循證指南, 從而提高病人心臟手術的安全性。任何對病人構成潛在或真實危險的事件都被定義爲風險，包括手術中的各種過失、僥倖未發的疏漏以及不良事件。根據標題選取出 1438 篇文章，其中 390 篇根據摘要篩選，而 69 篇文獻則閱讀了全文，最後 55 篇文章符合本綜述的入選標準。形成兩大關鍵主題: 首先，文章絕大多數都是反應性的（對事件或報導的回應）而不是前瞻性的（使用前瞻性研究設計比如自身評估和外部的評論者等），而且文章中很少涉及到了干預措施。其次，小事件可能預示著大的問題：多次、往往微小的正常過程的偏離可引起級聯反應，從而導致最終變成大的不良事件。本文彌補了之前文獻報導中對心臟手術安全性評估的缺陷，對已知風險進行系統性確認和分類。文中總結了提高病人術後預後

的一些方法，如建立安全性文化，促進透明性，標準化訓練，增強團隊合作，同時密切監測手術操作過程。以後還需要更多的文獻來評估干預對於減少心臟手術固有風險的作用。

（張婷　譯　陳傑　校）

Cardiac surgery is a high-risk procedure performed by a multidisciplinary team using complex tools and technologies. Efforts to improve cardiac surgery safety have been ongoing for more than a decade, yet the literature provides little guidance regarding best practices for identifying errors and improving patient safety. This focused review of the literature was undertaken as part of the FOCUS initiative (Flawless Operative Cardiovascular Unified Systems), a multifaceted effort supported by the Society of Cardiovascular Anesthesiologists Foundation to identify hazards and develop evidence-based protocols to improve cardiac surgery safety. Hazards were defined as anything that posed a potential or real risk to the patient, including errors, near misses, and adverse events. Of the 1438 articles identified for title review, 390 underwent full abstract screening, and 69 underwent full article review, which in turn yielded 55 meeting the inclusion criteria for this review. Two key themes emerged. First, studies were predominantly reactive (responding to an event or report) instead of proactive (using prospective designs such as self-assessments and external reviewers, etc.) and very few tested interventions. Second, minor events were predictive of major problems: multiple, often minor, deviations from normal procedures caused a cascade effect, resulting in major distractions that ultimately led to major events. This review fills an important gap in the literature on cardiac surgery safety, that of systematically identifying and categorizing known hazards according to their primary systemic contributor (or contributors). We conclude with recommendations for improving patient outcomes by building a culture of safety, promoting transparency, standardizing training, increasing teamwork, and monitoring performance. Finally, there is an urgent need for studies that evaluate interventions to mitigate the inherent risks of cardiac surgery.

丙泊酚通過抑制細胞的縫隙連接降低了 X 線輻射造成的細胞毒性

Propofol Depresses the Cytotoxicity of X-ray Irradiation Through Inhibition of Gap Junctions

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背景：全身麻醉藥物（如丙泊酚）能影響手術中放療的治療效果，但原因大多未知。已有對丙泊酚能短暫抑制細胞間隙連接功能，以及功能性細胞間隙連接能增強在某些癌細胞中的放療效果的報導。但是丙泊酚抑制間隙連接的功能，以及丙泊酚對術中放療的治療效果的影響的機制目前仍未知。

方法：採用含連接素 32（Cx32）質粒轉染 Hela 細胞，通過檢測連接素的表達，縫隙連接的表達及功能，來探究臨床濃度的丙泊酚對射線輻射後 Hela 細胞的細胞毒

性的影響。縫隙連接功能，Cx32 蛋白表達以及 Cx32 mRNA 的表達分別採用“降落傘”染料耦合技術，Western 印跡法，逆轉錄-聚合酶鏈反應進行測定。
結果：只有存在功能性縫隙連接的情況下，丙泊酚才能顯著減少放射導致的細胞毒性。4 小時的丙泊酚暴露主要是通過減少 CX32 蛋白水準而非影響 Cx32 mRNA 表達水準來抑制縫隙連接的功能。
結果：這些結果提示了丙泊酚能夠通過非轉錄依賴機制減少 Cx32 蛋白水準，從而抑制了間隙連接的功能。進一步顯示了丙泊酚通過抑制細胞間隙連接的活性，來降低放射線輻射造成的細胞毒性。
（陸秉瑋　譯　陳傑　校）
BACKGROUND: General anesthetics (e.g., propofol) influence the therapeutic activity of intraoperative radiotherapy but the mechanism of the effects is largely unknown. It has been reported that propofol inhibits gap junction (GJ) function briefly, and a functional GJ enhances the efficacy of radiotherapy in some cancer cells. Yet the mechanisms underlying the inhibition of GJ function by propofol and the influence of propofol on therapeutic activity of intraoperative radiotherapy are unknown.
METHODS: The role of propofol at clinically relevant concentrations in the modulation of radiograph-induced cytotoxicity in HeLa cells transfected with connexin 32 (Cx32) plasmid was explored by manipulation of connexin expression, GJ presence, and function. GJ function, Cx32 protein level, and Cx32 mRNA expression were determined by “Parachute” dye-coupling assay, Western blotting, and reverse transcriptase–polymerase chain reaction, respectively.
RESULTS: Propofol significantly reduced radiograph-induced cytotoxicity only in the presence of functional GJ. Four-hour propofol exposure inhibited GJ function mainly by diminution of Cx32 protein levels but without influence on Cx32 mRNA expression.
CONCLUSIONS: These results suggest that propofol inhibits the function of the GJ through the reduction of Cx32 protein levels by a transcription-independent mechanism. They further indicate that propofol depresses the cytotoxicity of radiograph irradiation through inhibition of GJ activity.

醫學資訊學文章: 手術室外高頻通氣新用途

Medical Intelligence Article: Novel Uses of High Frequency Ventilation Outside the Operating Room

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高頻噴射通氣（HFJV）是一種常用於重症監護病房和氣管及耳鼻喉外科手術中的一項技術。本研究探討 HFJV 在重症監護室和手術室以外實施的價值。HFJV 能提供機械通氣，還可使胸部和腹部接近靜止狀態，使之成爲一個非常有吸引力的技術，應用于如房顫的肺靜脈隔離和消融術治療，肺和肝腫瘤的靶向放射治療，以及某些診斷成像技術。
（孫曉瓊　譯　陳傑　校）

High frequency jet ventilation (HFJV) is a technique that is most frequently used in the intensive care unit and during tracheal and otorhinolaryngologic surgery. The utility of HFJV for procedures performed outside of the intensive care unit and operating room is currently being explored. The ability of HFJV to provide mechanical ventilation, yet achieve near static conditions of the chest and abdomen, makes it a very appealing technique for procedures such as pulmonary vein isolation and ablation for atrial fibrillation, targeted radiation therapy for lung and liver tumors, and certain diagnostic imaging techniques.

肥胖與院前困難氣管插管的關係

The Association Between Obesity and Difficult Prehospital Tracheal Intubation

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背景：非醫師的急救人員常在入院前對出現心臟驟停及其他威脅生命情況的患者進行氣管插管，此時氣道評估及氣道管理的設備非常有限。然而，在這種情況下肥胖患者中出現困難插管的頻率卻不是很清楚。本研究通過對一隊有氣管插管經驗的急救人員的研究以確定與氣管插管成功有關的因素及體重指數對氣管插管困難的預測作用，從而用來指導未來的院前急救。

方法：針對 4 年內所有 15 歲及以上、同時在院前由西雅圖醫療系統的隨行醫務人員行過氣管插管、且被轉移至 1 級地區創傷中心的病例進行回顧性研究。所有資料匯總自患者入院前先期收集的氣道管理資料庫及醫院內的醫療記錄，其中包括了人口統計學資訊，氣管插管的嘗試次數，氣管插管成功或失敗，患者體重/身高（體重指數）。計算描述性統計參數及多元 logistic 回歸結果。作爲主要結果的困難氣管插管定義爲氣管插管嘗試次數≥4 次或者需要應用其他氣道管理技術。

結果：在 4 年的研究內 80501 例患者中有 4114 例嘗試氣管插管，823 例患者符合入圍標準。氣管插管成功率爲 98.5%（811/823），符合困難氣管插管定義的爲 6.8%（56/823）。困難氣管插管與患者的年齡、性別、琥珀膽鹼的使用、醫學診斷(創傷或非創傷)之間無顯著關聯。與偏瘦患者組（BMI＜30 kg/m^2）相比，III 級肥胖患者（BMI>40 kg/m^2）與困難氣管插管存在顯著關聯（優勢比 3.68，置信區間 2.37-10.59）。然而 I/II 級肥胖患者(40 kg/m^2＞BMI ≥30 kg/m^2)與困難氣管插管間無顯著關聯（優勢比 0.98，置信區間 0.46-2.07）。

結論：在急救人員以往記錄的成功的氣管插管中，極度肥胖患者被發現會增加氣管插管的難度，而輕度肥胖患者則不會。因爲極度肥胖是一種極易辨別的特徵，教學和臨床上，對這樣的情況進行氣道管理時應將重點放在與肥胖相關的氣道管理的

方法策略上，其中包括特殊設備、患者體位元和實際操作，這可能會是氣管插管和其他氣道管理技術變得更容易。
（曹強　譯　陳傑　校）

BACKGROUND: Nonphysician advanced life support (ALS) providers often perform tracheal intubation (TI) for cardiac arrest or other life-threatening indications in the prehospital setting, where airway assessment and airway management tools are limited. However, the frequency of difficult TI in obese patients in this setting is unclear. In this study we determined factors associated with TI success, and determined TI difficulty as a function of body mass index (BMI) in a system of ALS providers experienced in TI, to guide future prehospital education efforts.
METHODS: A retrospective review was performed of all patients ≥15 years of age who underwent prehospital TI by paramedics in the Seattle Medic One system over a 4-year period, and were transported to the regional level 1 trauma center (Harborview Medical Center). Data were abstracted from a prospectively collected prehospital airway management database and from the hospital medical records, including demographic information, number of TI attempts, TI success or failure, and body weight/height (BMI). Descriptive statistics and multivariable logistic regression were calculated, with the primary end point being difficult TI (defined as ≥4 TI attempts or the need to use an alternative airway management technique).
RESULTS: Of 80,501 patient contacts in whom 4114 TIs were attempted during the 4-year study period, 823 met study entry criteria (including a calculable BMI). The overall TI success rate in the study population was 98.5% (811 out of 823), with 6.8% (56 out of 823) meeting the predetermined definition for difficult TI. There was no significant association between difficult TI and patient age, gender, use of succinylcholine, or medical diagnosis (trauma vs. nontrauma). In comparison with the lean patient subgroup (BMI <30 kg/m2), patients with class III obesity (BMI >40 kg/m2) had a significant association with difficult TI (odds ratio 3.68; confidence interval [CI] 1.27–10.59), whereas those with class I/II obesity (BMI ≥30 kg/m2 and <40 kg/m2) did not (odds ratio 0.98; CI 0.46 –2.07).
CONCLUSIONS: Among prehospital ALS providers with previously documented and published successful TI performance, increased difficulty with TI was observed in patients with extreme obesity, but not in patients with lesser degrees of obesity. Because extreme obesity is an easily identifiable patient characteristic, didactic and clinical (e.g., operating room) airway management education for such providers should emphasize airway management challenges and strategies associated with obesity, including specific equipment, patient positioning, and practice recommendations that may facilitate both TI and alternative airway management techniques in this population.

長 QT 綜合征患兒的麻醉啓示

Implications of Anesthesia in Children with Long QT Syndrome

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背景：患有先天性長 QT 綜合征（LQTS）的患者易於發生陣發性惡性室性快速性心律失常，即通常所說的“扭轉性室速”，這將可能導致心跳驟停和死亡。當患者處於生理或情感應激以及暴露于某些藥物時，可發生嚴重的心血管事件，以至於發生昏厥、抽搐，以及心源性死亡，這其中包括暴露於麻醉藥物。作者描述了患有先天性 LQTS 的兒童在接受揮發性全身麻醉時圍術期發生心律失常相關不良事件（AEs）的發生情況，並且描述了相關的風險因素。

方法：一項回顧性佇列研究，物件是在揮發性全身麻醉下接受非心臟手術、非裝置置入術及非心臟節律轉複手術的患有先天性 LQTS 的兒童。該研究是一項回顧性病例調查，所收集的資料來源於患者電腦化或者電子化的醫學記錄。

結果：研究共納入 76 位患有先天性 LQTS 的患者，共接受 114 次麻醉。在這 114 次麻醉中，共發生 3 次 AE，其中 2 次有明確定義，1 次爲可能 AE，總發生率爲 2.6%。事件發生于 3 名男孩（年齡分別爲 11、13 和 15 歲），他們在揮發性全身麻醉下接受非心臟手術，均在圍術期接受了 β 受體阻滯劑治療。AEs 發生于應用逆轉性藥物（抗膽鹼酯酶/抗膽鹼混合藥物）及止吐藥昂丹司瓊後即刻。事件發生在麻醉蘇醒期，幾乎都發生在接受了逆轉性藥物和昂丹司瓊的患者。所有 AE 在接受短期抗心律失常藥物治療後均成功逆轉，患者均于次日晨出院。

結論：當交感神經活動增強、尤其是在麻醉蘇醒期，AE 的發生風險增加。如果在這一時期應用了延長已糾正的 QT 間期的藥物、或者延長跨壁複極離散度藥物、或者增加心動過速發生風險的藥物時，AE 發生的風險將進一步升高。在這一時期和術後，限制對離子通道產生不利影響的藥物的應用，並且時刻警惕和嚴密監測 AE，這將有效防止 AE 或者抑制其進一步惡化。

（周姝婧　譯　陳傑　校）

BACKGROUND: Patients with congenital long QT syndrome (LQTS) are susceptible to an episodic malignant ventricular tachyarrhythmia known as torsade de pointes, which can result in a cardiac arrest and death. Patients can suffer severe cardiac events resulting in syncope, seizures, and sudden cardiac death during times of physical and emotional stress and when exposed to certain drugs including anesthetics. We describe the occurrence of perioperative adverse events (AEs) related to arrhythmias in children with congenital LQTS exposed to volatile general anesthesia and describe associated risk factors.

METHODS: We performed a retrospective cohort study of children with LQTS undergoing general anesthesia for noncardiac surgery or device implant, or revision for cardiac rhythm management. This study was a retrospective chart review with data collection from computerized and electronic patient medical records.

RESULTS: Seventy-six patients with congenital LQTS were identified who had a total of 114 anesthetic encounters. Of the 114 anesthetic encounters, there were 3 AEs, 2 definite and 1 probable AE, for an incidence of 2.6%. The events occurred in boys (aged 11, 13, and 15 years) while undergoing noncardiac surgery under volatile general anesthesia. All were receiving β-blocker therapy preoperatively. The AEs occurred in close proximity to the administration of reversal drugs (anticholinesterase/anticholinergic

combinations) and the antiemetic ondansetron. The events occurred during emergence from anesthesia, and exclusively in the group of patients who received both reversal drugs and ondansetron. All were treated successfully with short-term antiarrhythmic drug therapy and discharged the next morning.
CONCLUSIONS: There is an increased risk of AEs during periods of enhanced sympathetic activity, especially emergence. This risk seems to be further enhanced if drugs are administered at this time that are known either to prolong the corrected QT interval or the transmural dispersion of repolarization or increase the incidence of tachycardia. Restriction of medications that adversely affect ion channels and intense vigilance and monitoring during this time and in the postoperative phase could help prevent occurrence or progression of AEs.

術後認知功能障礙與手術和麻醉類型無關

Postoperative Cognitive Dysfunction Is Independent of Type of Surgery and Anesthetic

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背景：已經證實心臟和非心臟手術後存在術後認知功能障礙（POCD）。手術和麻醉的類型已被假定與其發病率相關，但很少有前瞻性研究資料來比較不同過程的發病率。此項研究試圖確定手術和麻醉的類型與 POCD 發生率的關係，包括輕度鎮靜，非心臟手術全身麻醉，以及存在體外迴圈的心臟手術全身麻醉。
方法：研究分爲四組：分別爲三個不同手術和麻醉類型的試驗組和一個未進行手術的對照組。在研究最初、術後 7 天和術後 3 個月，每個受試者分別進行 8 項神經心理測試。使用可信改變指數計算 POCD。這項研究樣本所包括 3 個獨立的試驗組，分別爲輕度鎮靜下的冠狀動脈造影（CA）（經皮穿刺診斷），全身麻醉下非心臟手術（全髖關節置換術[THJR]手術）和全身麻醉下冠狀動脈搭橋術（CABG）手術。
結果：收集了 644 例手術組患者和 34 例對照組患者的資料。THJR 手術（n = 162）和冠脈搭橋手術（n = 281）術後第 7 天的神經心理學結果是有效的。THJR 手術和冠狀動脈搭橋手術在術後第 7 天 POCD 的發生率分別是 17%和 43%（調整後優勢比= 0.2，95%可信區間[CI]：0.1，0.4，P <0.01）。術後 3 個月，所有組（n = 636）總的 POCD 發生率爲 17%（輕度鎮靜下 CA 爲 21%，THJR 手術爲 16%，冠狀動脈搭橋手術爲 16%）。各組間 POCD 比例的差異的平均值（95%可信區間）爲：冠狀動脈搭橋術與 THJR 比較 0.00（-0.07，0.07）（P = 0.91），冠狀動脈搭橋術與 CA 比較 -0.05（-0.12，0.03）（P = 0.21），和 THJR 與 CA 比較 -0.05（-0.13，0.03）（p= 0.24）。各組間無顯著性差異（調整後優勢比= 1.21，95%CI 爲：0.94，1.55，P = 0.13）。

結論：老年和高齡患者在術後第 7 天， 冠狀動脈搭橋術後 POCD 的發生率比 THJR 手術後的發生率高，但術後 3 個月 CA、THJR 和 CABG 組之間 POCD 的發生率相當，與所接受的手術和麻醉類型無關。心血管危險因素對任何過程之後 POCD 的發生沒有預測作用。

（懷曉蓉　譯　陳傑　校

BACKGROUND: Postoperative c）ognitive dysfunction (POCD) has been documented after cardiac and noncardiac surgery. The type of surgery and anesthetic has been assumed to be associated with the incidence but there are few prospective data comparing the incidence after different procedures. In this study, we sought to determine the association of the type of surgical procedure and anesthesia on the incidence of POCD after procedures involving light sedation, general anesthesia for noncardiac surgery, and general anesthesia for cardiac surgery involving cardiopulmonary bypass.

METHODS: Eight neuropsychological tests were administered at baseline and at 7 days and 3 months postoperatively to subjects from 3 procedure groups and a nonoperative control group. Reliable change index was used to calculate POCD. The study sample consisted of subjects involved in 3 separate trials investigating coronary angiography (CA) (percutaneous diagnostic procedure) under sedation, major noncardiac surgery (total hip joint replacement [THJR] surgery) under general anesthesia, and coronary artery bypass graft (CABG) surgery under general anesthesia.

RESULTS: Data were collected from 644 patients in the patient groups and 34 subjects in the control group. Neuropsychological results were available for POCD at day 7 for THJR surgery (n = 162) and CABG surgery (n = 281). The incidence of POCD at day 7 was 17% for THJR surgery and 43% for CABG surgery (adjusted odds ratio = 0.2, 95% confidence interval [CI]: 0.1, 0.4; $P < 0.01$). At 3 months, the incidence of POCD for all groups combined (n = 636) was 17% (21% for CA under sedation, 16% for THJR surgery, and 16% for CABG surgery). The mean (95% CI) for the difference in proportions of POCD among groups was 0.00 (−0.07, 0.07) (P = 0.91) for CABG versus THJR; −0.05 (−0.12, 0.03) (P = 0.21) for CABG versus CA; and −0.05 (−0.13, 0.03) (P = 0.24) for THJR versus CA. There were no significant differences among groups (adjusted odds ratio = 1.21, 95% CI: 0.94, 1.55; P = 0.13).

CONCLUSIONS: The incidence of POCD in old and elderly patients at day 7 was higher after CABG surgery than THJR surgery, but POCD at 3 months was independent of the nature or the type of procedure or anesthetic when comparing CA, THJR, and CABG surgery groups. Cardiovascular risk factors were not predictive of POCD after any procedure.

簡報: 老年手術患者術前虛弱狀態與術後早期譫妄有關

Brief Report: Preoperative Frailty in Older Surgical Patients Is Associated with Early Postoperative Delirium

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此次研究調查除傳統老年患者危險因素以外，術前虛弱狀態是否與老年非心臟手術患者術後譫妄的發生有關。1/3 患者術後虛弱評分≥3，這一數值在其他相關研究中被定義爲“虛弱”。其中 25%的患者經譫妄評定法（confusion assessment method,CAM）確認爲術後譫妄。多因素 logistic 回歸分析資料顯示：年齡、日常生活能力、工具性日常生活能力及術前認知功能與老年患者術後譫妄的發生並無明顯相關性。然而，術前抑鬱症症狀(優勢率 = 1.42; 95% 可信區間 = 1.06–1.91; *P* = 0.018)及虛弱評分(優勢比 = 1.84; 95% 可信區間 = 1.07–3.1; *P* = 0.028)是術後譫妄發生的兩個獨立相關因素。
（趙嫣紅　譯　陳傑　校）
We investigated whether preoperative frailty among older noncardiac surgical patients provides information about the development of postoperative delirium that is in addition to traditional geriatric risk factors. One-third of patients had a frailty score ≥3, which is considered “frail” in others' research. Twenty-five percent of patients developed postoperative delirium, which was measured using the confusion assessment method. Multivariable logistic regression showed that age, activities of daily living dependence, instrumental activities of daily living dependence, and cognitive functioning did not contribute significantly to the prediction of postoperative delirium. Only preoperative symptoms of depression (odds ratio = 1.42; 95% confidence interval = 1.06–1.91; *P* = 0.018) and the frailty score (odds ratio = 1.84; 95% confidence interval = 1.07–3.1; *P* = 0.028) were independently associated with the development of postoperative delirium.

中樞或局部給予角叉菜膠模型大鼠銀杏針提取物 EGb 761® 可以抑制熱痛覺過敏和抗炎

Central and Local Administration of Gingko Biloba Extract EGb 761® Inhibits Thermal Hyperalgesia and Inflammation in the Rat Carrageenan Model
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背景 口服標準銀杏針提取物 EGb 761® 已在齧齒類動物的炎症和術後疼痛模型上證實可以抑制熱痛覺過敏，但其機制不明。本研究試圖通過局部或中樞給予角叉菜膠炎症模型的大鼠 EGb 761 後, 觀察此藥抗痛覺過敏和抗炎特性來確定其作用部位。
方法 成年雄性 Wistar 大鼠左後肢足底注射 3%的角叉菜膠或生理鹽水，3 小時後左爪足底注射 EGb 761 (30, 100, or 300 μg)或媒介物，或者在腰椎鞘內注射 EGb 761 (0.5, 1, 3, 10, or 100 μg) 或媒介物。給予 100ug 雙氯酚酸作爲陽性對照。在注射角叉菜膠後 0、2、4、6、24 小時記錄後肢對熱刺激的潛伏期（以秒計）、對機械刺激的反應閾值（以克表示）以及足趾體積。
結果 足底注射（30, 100, and 300 μg）和鞘內注射(0.5 and 1 μg) EGb 761 可顯著抑制角叉菜膠產生的熱痛覺過敏，作用效果和雙氯酚酸一樣，但對機械過敏症沒有作用。脊髓內應用≥3 μg EGb 761 會對行動產生不良影響，妨礙進一步的傷害性測試。足底注射 300ug 和鞘內注射 1ug EGb 761 可以顯著減輕足趾水腫。

結論 這項研究表明 EGb 761 在外周和脊髓水準都有抗炎和抑制熱痛覺過敏的作用，可能有助於炎性疼痛的治療。
（黃丹　譯　陳傑　校）
BACKGROUND: Oral administration of the standardized Ginkgo biloba extract EGb 761® has been shown to inhibit thermal hyperalgesia in rodent models of inflammatory and postsurgical pain, but the mechanism underlying these effects is not known. We sought to determine the site of action of EGb 761 by investigating the antihyperalgesic and antiinflammatory properties of EGb 761 after local and central drug administration in the rat carrageenan model of inflammation.
METHODS: Adult male Wistar rats received an intraplantar injection of carrageenan (3%) or saline into the left hindpaw followed 3 hours later by an intraplantar injection of EGb 761 (30, 100, or 300 μg) or vehicle into the left paw; or intrathecal injection of EGb 761 (0.5, 1, 3, 10, or 100 μg) or vehicle into the lumbar spinal cord region. Diclofenac (100 μg) was administered as a positive control. Hindpaw withdrawal latency (in seconds) to thermal stimulation, response threshold (in grams) to mechanical stimulation, and paw volume were measured at 0, 2, 4, 6, and 24 hours after carrageenan injection.
RESULTS: Both intraplantar (30, 100, and 300 μg) and intrathecal (0.5 and 1 μg) EGb 761 significantly inhibited carrageenan-induced thermal hyperalgesia and were equally as effective as diclofenac, but had no effect on mechanical hypersenitivity. Application ≥3 μg EGb 761 to the spinal cord induced adverse behavioral effects, which precluded further nociceptive testing. Intraplantar (300 μg) and intrathecal (1 μg) EGb 761 also significantly reduced paw edema.
CONCLUSION: These studies show that EGb 761 acts both at the site of inflammation and centrally at the spinal cord level to inhibit inflammation and thermal hyperalgesia, and may be useful in the treatment of inflammatory pain.

成人術前利鈉肽濃度的預測價值:一項系統回顧和薈萃分析

The Predictive Value of Preoperative Natriuretic Peptide Concentrations in Adults Undergoing Surgery: A Systematic Review and Meta-Analysis
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背景：已有幾項研究評估了術前 B 型利鈉肽濃度對於預測術後死亡率的價值；但每個研究的死亡數較少，限制了這些研究的影響力。我們進行了一項系統回顧和薈萃分析，旨在分析術前利鈉肽水準與預測心臟手術和非心臟手術後的死亡率。
方法：我們使用“利鈉肽”、“手術”等詞條，結合預後指標和診斷方面的詞條，檢索了 MEDLINE 和 EMBASE。有兩名調查員獨立評估研究資格和提取資料。研究終點爲任何原因導致的≥6 個月或 ≤90 天的死亡率。我們使用了雙變數模型推導其預後的準確性和特異性。我們使用貝葉斯定理馬爾科夫鏈蒙地卡羅方法計算了混合的陽性預測值（PPV）和陰性預測值（NPV）。
結果：檢索到的 1558 篇文章中，有 23 篇研究符合先前定義的資格標準。在心血管手術後，≥6 個月死亡率的利鈉肽診斷比值比爲 4.11（95%可信區間爲 2.22-

7.60），陽性預測值爲 0.17（95%貝葉斯可信區間爲 0.07-0.36），陰性預測值爲 0.96（95%可信區間爲 0.90-0.98）。非心臟術後，≥6 個月死亡率的利鈉肽診斷比值比爲 4.97（95%可信區間爲 3.06-8.07），相應的陽性預測值爲 0.24（95%可信區間爲 0.14-0.38），陰性預測值爲 0.94（95%可信區間爲 0.88-0.97）。≤90 天的死亡率的結果是相似的。

結論：術前利鈉肽濃度水準與心臟手術和非心臟手術後的死亡率有關。在兩種手術中利鈉肽都表現較高的陽性預測值，這表明術前利鈉肽濃度用於術前風險分層可能具有很大的幫助。

（滕淩雅譯 馬皓琳 李士通校）

BACKGROUND: Several studies have evaluated preoperative B-type natriuretic peptides (NPs) for predicting mortality after surgery; however, the number of deaths in each study was small, limiting the power of these studies. We conducted a systematic review and meta-analysis of studies addressing preoperative NP levels to predict mortality after cardiac and noncardiac surgery.

METHODS: We searched MEDLINE and EMBASE using the terms “natriuretic peptides,” “surgery or surgical procedures,” and a validated combination of prognostic and diagnostic terms. Two investigators independently assessed studies for eligibility and extracted data. The end points were all-cause mortality at ≥6 months and at ≤90 days. We used a bivariate model to derive measures of prognostic accuracy and their heterogeneity. We calculated the pooled positive predictive value (PPV) and negative predictive value (NPV) by Bayesian Markov chain Monte Carlo methods.

RESULTS: Of the 1558 retrieved articles, 23 studies satisfied the predefined eligibility criteria. After cardiac surgery, the diagnostic odds ratio of NP was 4.11 (95% confidence interval, 2.22–7.60) for ≥6-month mortality, the PPV 0.17 (95% Bayesian confidence interval, 0.07–0.36), and the NPV 0.96 (0.90–0.98). After noncardiac surgery, the diagnostic odds ratio of NP was 4.97 (3.06–8.07) for ≥6-month mortality. The corresponding PPV was 0.24 (0.14–0.38) and the NPV 0.94 (0.88–0.97). Results were similar for ≤90-day mortality.

CONCLUSIONS: Preoperative NP concentrations were associated with mortality after cardiac and noncardiac surgery. NP had high NPVs for both types of surgery suggesting that preoperative NP concentrations may be helpful in preoperative risk stratification.

血管老化的暗示

Implications of Vascular Aging

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年齡是一個完全明確了的心血管疾病發展的危險因素。然而這些隨著年齡在脈管系統中積聚的病變是高度變異的。現在越來越多地認識到，血管健康指數比年齡本身更能可靠地預測心血管的不良預後。年齡相關血管病變進展的變異是由多種遺傳以及環境因素造成的。在本綜述中，筆者著重闡述了表現血管老化表型特徵的一些病

理生理機制。此外，我們提供了一個對主要預後研究的回顧，這些研究大體概述了這些血管健康指數的價值，並討論了其對圍術期心血管預後的潛在影響。
（瞿亦楓 譯 馬皓琳 李士通校）
Chronological age is a well-established risk factor for the development of cardiovascular diseases. The changes that accumulate in the vasculature with age, however, are highly variable. It is now increasingly recognized that indices of vascular health are more reliable than age per se in predicting adverse cardiovascular outcomes. The variation in the accrual of these age-related vascular changes is a function of multiple genetic and environmental factors. In this review, we highlight some of the pathophysiological mechanisms that characterize the vascular aging phenotype. Furthermore, we provide an overview of the key outcome studies that address the value of these vascular health indices in general and discuss potential effects on perioperative cardiovascular outcomes.

暗示對氯胺酮引起的不愉快夢境的作用

The Effect of Suggestion on Unpleasant Dreams Induced by Ketamine Administration

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應用氯胺酮鎮靜後會伴隨著對不愉快夢境的回憶，我們假設鎮靜前給予正面的暗示能減少氯胺酮誘導的噩夢的發生率。爲了證明這一假設，我們將納入研究的 100 例接受氯胺酮鎮靜的患者隨機分爲 2 組，1 組患者在氯胺酮給藥前由一名麻醉醫生給予一定情緒上正面的暗示（暗示組），對照組則不給予暗示。然後根據夢中的心情對患者進行評級，分爲夢境極度不愉悅（1 級），很不愉悅（2 級），兩者都無或兩者都有（3 級），很愉悅（4 級），極度愉悅（5 級）。在失去意識的患者中，暗示組 1、2、3、4 和 5 級的發生率分別爲 0%、0%、46%、24%和 30%，對照組分別爲 6%、2%、70%、12%和 10%（P= 0.01）；而在以治療爲目的的患者中兩組間整體的發生率相似。本研究表明，當氯胺酮作爲部分鎮靜用藥時，正面的暗示能夠幫助減少對不愉快夢境的回憶。
（徐妍君 譯， 馬皓琳 李士通 校）
The use of ketamine may be associated with the recall of unpleasant dreams after sedation. We hypothesized that a positive suggestion before sedation could reduce the incidence of ketamine-induced unpleasant dreams. To test this hypothesis, we randomized 100 patients receiving sedation with ketamine for their procedure into 2

groups with 1 group having an anesthesiologist provide a mood-elevating suggestion to the patient before ketamine administration (suggestion group), whereas in the control group no suggestion was provided. Patients were provided with a pleasantness/unpleasantness scale to rate “the overall mood of the dream” as very unpleasant (grade 1), quite unpleasant (grade 2), neither or mixed (grade 3), quite pleasant (grade 4), and very pleasant (grade 5). In those patients who lost consciousness, the frequencies of grades 1, 2, 3, 4, and 5 were 0%, 0%, 46%, 24%, and 30% in the suggestion group and were 6%, 2%, 70%, 12%, and 10%, respectively, in the control group ($P = 0.01$). In the intent-to-treat population the overall frequency between groups was very similar. This study implies that when administering ketamine as part of a sedation regimen, positive suggestion may help reduce the recall of unpleasant dreaming.

對使用一種新的纖維光學感測器從腸道獲得的光體積描記術信號和初步脈搏血氧定量法評估的一個活體內研究

An In Vivo Investigation of Photoplethysmographic Signals and Preliminary Pulse Oximetry Estimation from the Bowel Using a New Fiberoptic Sensor

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背景：內臟器官血氧飽和度的連續監測使組織氧合不充分的早期檢測成爲可能，從而減少了血流灌注不足、嚴重缺血、多器官衰竭和最終死亡的風險。當前評估內臟灌注的方法在臨床治療中並沒有被廣泛接受使用。爲了克服當前技術的局限性，一種新的纖維光學光體積描記術（PPG）/脈搏血氧定量法的感測器被研製成功，作爲在人類手術過程中評估內臟器官灌注的一種方法。
方法：開發出了一種新的纖維光學內臟脈搏血氧計和與其光學性質相同的纖維光學手指脈搏血氧計。同時從腸道（小腸和大腸）和手指獲得的 PPG 信號和動脈血氧飽和度的初步估計值來自於進行開腹手術的 17 個病人（男/女：3/14）。
結果：所有病人從大腸、小腸和手指都獲得了高品質的 PPG 信號（比率的 95%可信區間低限是 0.64）。使用內臟和手指纖維光學感測器獲得的血氧飽度值與使用商用手指脈搏血氧計獲得的血氧飽和度值相比較表明，它們之間的差異無統計學意義（所有的 $P>0.454$）。描述從腸道纖維光學脈搏血氧計和纖維光學手指脈搏血氧計獲得的血氧飽和度均值與其平均值的比例之間的差異的 Bland and Altman 曲線顯示小腸測量結果的一致區間是[−3.8%，4.2%]，大腸測量結果的一致區間是[−3.4%，4.3%]。2 種設備之間差異的 95%預測區間是[−4.2%，4.7%]。
結論：本研究表明使用新的纖維光學感測器可以從腸道獲得高品質的 PPG 信號。尚需進一步的評估來確定腸道纖維光學脈搏血氧定量法是否可以爲監測內臟灌注提供一種適合的方法。
（周潔 譯，馬皓琳 李士通 校）

BACKGROUND: The continuous monitoring of splanchnic organ oxygen saturation could make the early detection of inadequate tissue oxygenation feasible, reducing the risk of hypoperfusion, severe ischemia, multiple organ failure, and, ultimately, death. Current methods for assessing splanchnic perfusion have not been widely accepted for use in the clinical care environment. In an attempt to overcome the limitations of the current techniques, a new fiberoptic photoplethysmographic (PPG)/pulse oximetry sensor was developed as a means of assessing splanchnic organ perfusion during surgery in humans.
METHODS: A new fiberoptic splanchnic pulse oximeter and an optically identical fiberoptic finger pulse oximeter have been developed. Simultaneous PPG signals and preliminary estimates of arterial oxygen saturation from the bowel (small and large) and finger were obtained in 17 patients (3 men and 14 women) undergoing open laparotomy.
RESULTS: Good quality PPG signals were obtained from the small and large bowel and from the finger in all patients (lower 95% confidence limit for the proportion was 0.64). Comparisons of blood oxygen saturation values acquired when using the splanchnic and the finger fiberoptic sensors and a commercial finger pulse oximeter indicated that there was no statistically significant difference between them (all $P > 0.454$). A Bland and Altman plot of the difference between blood oxygen saturation values from the bowel fiberoptic pulse oximeter and the fiberoptic finger pulse oximeter against their mean showed that the limits of agreement between the 2 pulse oximeters were −3.8% and 4.2% for small bowel measurements, and −3.4% and 4.3% for large bowel measurements. The 95% prediction interval for the difference between the 2 devices was between −4.2% and 4.7%.
CONCLUSION: This study demonstrated that good quality PPG signals can be obtained from the bowel using a new fiberoptic sensor. Further evaluation is required to determine whether fiberoptic pulse oximetry of the bowel may provide a suitable method for monitoring splanchnic perfusion.

磁共振成像技術在用可編程植入鞘內給藥系統的患者中的安全性：一項爲期 3 年的前瞻性研究

The Safety of Magnetic Resonance Imaging in Patients with Programmable Implanted Intrathecal Drug Delivery Systems: A 3-Year Prospective Study

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背景：在臨床上對留置可編程鞘內給藥系統（IDD）的患者實施磁共振成像（MRI）是很常見的做法，雖然該過程安全與否從未被文獻記錄。我們進行了一項單中心、爲期 3 年的研究，該研究前瞻性地評估可編程植入 IDD 的患者的不適、IDD 的技術故障以及暴露於 MRI 期間和之後的不良反應。

方法：連續選擇 43 例植入可編程 IDD 系統（SynchroMed® EL 植入式輸液泵，型號 8626L-18，和 SynchroMed® II，型號 8637-20、8637-40；Medtronic, Inc., 明尼阿波利斯,明尼蘇達州）並需要預定 MRI 評估的患者，進行了 3 年的研究。所有的 MRI 掃描均採用一個 1.5-tesla 的臨床應用的磁體和不超過 0.9W/kg 的比吸收率。用 X 線顯像控制來確認暴露後泵轉子運動和檢測系統的混亂。記錄 IDD 系統故障、病人滿意度和不適。
結果：沒有患者出現因過量注入藥物而導致迴圈、呼吸和神經系統改變的現象。MRI 後的射線評估證實鞘內導管尖或泵體沒有發生空間位移，並且程式師遙測證實了輸注復蘇。病人術後的滿意度很高。
結論：對已協定的植入美敦力可編程 IDD 的患者實行 MRI 掃描，幾乎可以避免任何技術和醫療併發症。
（楊秀娟 譯 李士通 馬皓琳 校）

BACKGROUND: It is common clinical practice to perform magnetic resonance imaging (MRI) in patients with indwelling programmable intrathecal drug delivery (IDD) systems, although the safety of the procedure has never been documented. We performed a single-center, 3-year, prospective evaluation in patients with a programmable implanted IDD to assess patient discomfort, IDD technical failures, and adverse effects during and after exposure to MRI.
METHODS: Forty-three consecutive patients with an implanted programmable IDD system (SynchroMed® EL Implantable Infusion Pump, Model 8626L-18, and SynchroMed® II Model 8637-20, 8637-40; Medtronic, Inc., Minneapolis, MN) requiring a scheduled MRI evaluation were studied during a 3-year period. All MRI scans were performed with a 1.5-tesla clinical use magnet and a specific absorption rate of no more than 0.9 W/kg. Radiograph control was used to confirm postexposure pump rotor movement and detect system dislocations. IDD system failures, patient satisfaction, and discomfort were recorded.
RESULTS: None of the patients experienced signs of drug overinfusion that could lead to hemodynamic, respiratory, or neurologic alterations. Radiologic evaluation after MRI revealed no spatial displacements of the intrathecal catheter tip or body pump, and programmer telemetry confirmed the infusion recovery. Patients' satisfaction after the procedure was high.
CONCLUSION: Performing an MRI scan with the proposed protocol in patients with an implanted Medtronic programmable IDD system resulted in virtually no technical or medical complications.

改善大手術的預後——從病理生理學角度考慮

Improving Outcome After Major Surgery: Pathophysiological Considerations

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外科和麻醉相關的操作可以減少進行高風險手術的患者的機體應激，但是有越來越多的有大量合併症的患者需要進行大手術。改善此類患者預後的措施包括增加組織氧輸送和減少代謝需要這兩方面。然而，這些措施會引起矛盾的結果。爲理解這些嘗試對改善預後的成敗，應分析圍術期的血流動力學、代謝和免疫改變的病理生理學。本綜述的目的是提供用於改善大手術術後預後的各種方法的一個調查。本文從3個不同的角度闡述該內容：病人的角度、外科干預的角度和麻醉的角度。尤其關注圍術期的炎症及免疫應答之間的相互作用的結果。

（毛祖旻 譯 馬皓琳 李士通 校）

Surgical and anesthesia-related techniques may reduce physical stress for patients undergoing high-risk surgery, but major surgery is increasingly performed in patients with substantial comorbidities. Strategies for improving the outcome for such patients include approaches that both increase tissue oxygen delivery and reduce metabolic demand. However, these strategies have produced conflicting results. To understand the success and failure of attempts to improve postoperative outcome, the pathophysiology of perioperative hemodynamic, metabolic, and immunological alterations should be analyzed. Our aim in this review is to provide a survey of fields of opportunities for improving outcome after major surgery. The issues are approached from 3 different angles: the view of the patient, the view of the surgical intervention, and the view of the anesthesia. Special attention is also given to what could be considered the result of the interaction among the 3: perioperative inflammation and immune response.

鎂對琥珀醯膽鹼誘導的惡性高熱的臨床過程無影響

Magnesium Does Not Influence the Clinical Course of Succinylcholine-Induced Malignant Hyperthermia

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背景：惡性高熱（MH）是潛在致命的代謝亢進綜合征。吸入麻醉藥和/或琥珀醯膽鹼可致細胞內鈣離子濃度增加，進而導致細胞內一系列反應的啓動。二氧化碳的產生，繼而是乳酸鹽，是細胞能量消耗增加的早期信號。從細胞水準上看，鎂作爲生理性鈣離子拮抗劑，導致肌漿網釋放鈣離子程度下降。在本次實驗中，我們研究了靜脈注射鎂對惡性高熱危象的臨床過程的影響。

方法：10只皮特蘭豬（10只爲惡性高熱易感型[MHS]和6只惡性高熱不敏感型[MHN]）使用不觸發惡性高熱的藥物進行麻醉。給予4mg/kg琥珀醯膽鹼之前建立有創血流動力學監測。4只易感型豬10分鐘之後給予硫酸鎂10mg/kg。連續監測血流動力學變化（心率、平均動脈壓和脈搏血氧飽和度）。每隔15分鐘抽取靜脈和動脈血氣（pH、PCO_2、PO_2、剩餘堿和乳酸鹽）。實驗資料採用 *H* 核對總和 *U* 檢驗進行統計，$P < 0.05$ 爲組間差異有顯著性意義。

結果：給予琥珀醯膽鹼之前兩組實驗豬體重、血流動力學和代謝水準無顯著差異。對於所有惡性高熱易感型豬，琥珀醯膽鹼均導致平均動脈壓的顯著下降和心率

的增加。兩組易感型豬均發生了代謝性合併呼吸性酸中毒。琥珀醯膽鹼對惡性高熱不敏感組無影響。血流動力學和代謝水準在兩組易感型豬之間無顯著差異，但在易感型和不敏感型兩組有顯著差異。

結論：琥珀醯膽鹼僅在惡性高熱易感型豬體內導致血流動力學和代謝水準的變化。鎂劑治療不影響惡性高熱的臨床過程。這種干預對惡性高熱危象的急性期治療無有利的影響。

（劉伍 譯 馬皓琳 李士通 校）

BACKGROUND: Malignant hyperthermia (MH) is a potentially lethal hypermetabolic syndrome. Volatile anesthetics and/or succinylcholine lead to an increase of the intracellular calcium concentration resulting in activation of various intracellular processes. A production of carbon dioxide, and later lactate, are early signs of increased cellular energy consumption. On a cellular level, magnesium acts as a physiological calcium inhibitor resulting in less-intense calcium liberation from the sarcoplasmic reticulum. In this study, we examined the effects of IV magnesium administration on the clinical course of an MH crisis.

METHODS: Sixteen Pietrain pigs (10 MH-susceptible [MHS] and 6 MH-nonsusceptible [MHN]) were anesthetized without an MH trigger substance. Invasive hemodynamic monitoring was established before 4 mg/kg succinylcholine was administered. Four of the MHS pigs received 10 mg/kg magnesium sulfate 10 minutes later. Hemodynamic changes (heart rate, mean arterial blood pressure, and oxygen saturation as measured by pulse oximetry) were continuously monitored. Venous and arterial blood gases (pH, PCO_2, PO_2, base excess, and lactate) were taken at 15-minute intervals. The *H* test and *U* test were used with $P < 0.05$ for significant differences among the groups.

RESULTS: No differences among the groups were seen for weight, hemodynamic, and metabolic variables before administration of succinylcholine. In all MHS animals, succinylcholine led to a marked decrease of mean arterial blood pressure and increase of heart rate. Animals in both MHS groups developed combined metabolic and respiratory acidosis. Succinylcholine had no effect on animals in the MHN group. Hemodynamic and metabolic values were not different between the 2 MHS groups but were between groups MHS and MHN.

CONCLUSION: Succinylcholine led to a hemodynamic and metabolic reaction in only MHS pigs. Treatment with magnesium did not influence the clinical course. The intervention had no beneficial effect in the acute phase of an MH crisis.

吸入性麻醉藥不會對人體神經元樣細胞引起顯著毒性

Volatile Anesthetics May Not Induce Significant Toxicity to Human Neuron-Like Cells

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背景：離體實驗和動物體內研究提示了吸入性麻醉藥（包括異氟烷）對腦細胞的的有害效應。現在吸入性麻醉藥是否會導致人腦細胞損傷還不是很清楚。
方法：人神經母細胞瘤細胞系的 SH-SY5Y 細胞經誘導分化成終末神經元樣細胞。這些分化的細胞和 HCN-2 細胞（一種皮質神經元細胞系）在 37℃ 溫度下暴露於 2%至 5%的異氟烷、6%七氟烷或 12%地氟烷 48 小時。測量釋放的乳酸脫氫酶(LDH)和半胱天冬酶 3、突觸囊泡蛋白和肌聯腦蛋白的表達。
結果：暴露於 2%至 4%異氟烷的分化 SH-SY5Y 和 HCN-2 細胞不會增加 LDH 的釋放和半胱天冬酶 3 的表達，半胱天冬酶 3 的啓動作用會導致細胞凋亡。突觸囊泡蛋白（一種突觸的蛋白）和肌聯腦蛋白（一種樹突棘蛋白）在分化的 SH-SY5Y 細胞中的表達也不受 2%至 4%的異氟烷影響。暴露於 6%七氟烷或 12%地氟烷不會影響 LDH 從分化的 SH-SY5Y 細胞的釋放量。然而，5%的異氟烷顯著增加了 LDH 從這些細胞的釋放量。
結論：我們的結果提示了吸入性麻醉藥在臨床應用的相關濃度水準上，並不會造成人類神經元樣細胞的損傷。異氟烷也不會改變在這些人體細胞中樹突棘和突觸的數量。
（唐亮 譯 馬皓琳 李士通 校）

BACKGROUND: In vitro experiments and in vivo animal studies suggest detrimental effects of volatile anesthetics including isoflurane on brain cells. It is not clear whether volatile anesthetics can cause human brain cell injury.
METHODS: The SH-SY5Y cells, a human neuroblastoma cell line, were induced to differentiate into terminal neuron-like cells. These differentiated cells and the HCN-2 cells, a human cortical neuronal cell line, were exposed to 2% to 5% isoflurane, 6% sevoflurane, or 12% desflurane for 48 hours at 37℃. Lactate dehydrogenase (LDH) release and the expression of caspase 3, synaptophysin, and drebrin were then measured.
RESULTS: Exposure of the differentiated SH-SY5Y and HCN-2 cells to 2% to 4% isoflurane did not increase LDH release and the expression of caspase 3 whose activation leads to apoptosis. The expression of synaptophysin, a synaptic protein, and drebrin, a dendritic spine protein, in the differentiated SH-SY5Ycells was also not affected by 2% to 4% isoflurane. Exposure to 6% sevoflurane or 12% desflurane did not affect LDH release from differentiated SH-SY5Y cells. However, 5% isoflurane significantly increased LDH release from those cells.
CONCLUSIONS: Our results suggest that volatile anesthetics at clinically relevant concentrations do not cause human neuron-like cell injury. Isoflurane also may not alter the quantity of dendritic spines and synapses in these human cells.

圍手術期和重症監護室鎮靜對腦器官功能障礙的影響

The Effects of Perioperative and Intensive Care Unit Sedation on Brain Organ Dysfunction

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爲了允許進行有創操作、預防疼痛和焦慮、減少應激和氧耗、便於機械通氣、以及舒適性和安全性等原因，治療室、手術室以及重症監護室中的患者常規需接受鎮痛和鎮靜治療。然而，越來越多的研究和證據顯示，普通處方鎮靜劑是許多意外事件的危險因素，並且使病人轉歸惡化，包括表現爲譫妄和昏迷的腦器官功能障礙。鎮靜劑對轉歸的影響也受鎮靜深度的影響，這迫使我們必須減少這類藥物的用藥總量。對比鎮靜藥物廣泛使用的必要性和因鎮靜劑使用導致的患者及社會急性和長期認知功能障礙所付出的代價，目前醫生必須在遵守醫學誓言不傷害病人的前提下，力爭平衡病人需求量和產生舒適的必須量。幸運的是，我們的鎮靜方法和藥物選擇有可能減輕這種認知功能障礙的風險。在本綜述中，我們詳述了圍手術期間和 ICU 中鎮靜對譫妄和認知損害的進展的影響，並且提供一個循證方式的鎮靜和鎮痛規範來改善病人轉歸。
(江繼宏 譯 馬皓琳 李士通 校）

Analgesia and sedation are routinely administered to patients in procedural suites, operating rooms, and intensive care units to permit invasive procedures, prevent pain and anxiety, reduce stress and oxygen consumption, allow mechanical ventilation, and for numerous other patient comfort and safety reasons. Increasing research and evidence, however, has implicated commonly prescribed sedative medications as risk factors for untoward events and worse patient outcomes, including brain organ dysfunction manifested as delirium and coma. The effect of sedatives on outcomes is also influenced by the depth of sedation, making it imperative to reduce total exposure to this class of medications. Juxtaposing the widespread necessity and use of sedation with the cost of acute and long-term cognitive dysfunction to patients and society, physicians must now strive to balance patients' demands and requisite for comfort with their own oath to do no harm. Fortunately, our methods of sedation and choice of medications can likely mitigate this cognitive risk. In this review, we detail the effects of perioperative and intensive care unit sedation on the development of delirium and cognitive impairment and provide an evidence-based approach towards analgesia and sedation paradigms to improve patient outcomes.

即時超聲引導下 Taylor 路徑脊麻

Real-Time Ultrasound-Guided Spinal Anesthesia Using Taylor's Approach

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超聲掃描在脊麻中的應用主要受限於操作前成像和解剖結構的辨別。本實驗介紹了在即時超聲技術下進行視覺化脊麻操作的經驗。早期的屍體研究對 5 位未腐屍體進行脊麻操作，從而促進了即時超聲引導下通過 Taylor 路徑（L5-S1 間隙旁正中路徑）脊麻操作技術的發展。其後，對 10 名擇期關節成形術的患者俯臥位下進行即時超聲引導下脊麻。相關解剖結構和針尖均順利地被顯示，且所有用於關節成形手術的脊麻均有效。
（王海濤 譯 馬皓琳 李士通 校）

The role of ultrasound scanning in spinal anesthesia is principally limited to preprocedure imaging and identification of anatomical structures. We describe our experience with a real-time ultrasound technique for visualization and performance of spinal anesthesia. An initial cadaver study was performed in 5 un embalmed cadavers to develop a technique for real-time performance of ultrasound-guided spinal anesthesia via Taylor's approach (paramedian approach to the L5–S1 interspace). Subsequently, 10 patients scheduled for joint arthroplasty underwent real-time ultrasound-guided spinal anesthesia in the prone position. The relevant anatomy and the needletip were visualized easily and all spinals were effective for joint arthroplasty.

擇期剖宮產手術患者血栓彈力圖參數與總體估計失血量的關係

The association between thromboelastographic parameters and total estimated blood loss in patients undergoing elective cesarean delivery.

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.Anesth Analg 2011 112:1041-1047

背景：此項研究旨在評估擇期剖宮產手術（CD）患者白陶土活化血栓彈力圖（TEG®）凝血參數與總體估計失血量（EBL）之間的關係。
方法：此項研究共記錄了 52 名擇期剖宮產手術患者手術前後的血栓彈力圖參數。其中，21 名患者同時接受了實驗室凝血指標（凝血酶原時間、活化部分凝血酶時間、纖維蛋白原）的測定。運用相關與線性回歸分析對血栓彈力圖參數、相關臨床變數及總體估計失血量的相互關係進行評估。將手術前後血栓彈力圖參數與凝血資料的比較進行二次分析。
結果：估計失血量與最大振幅的變化百分率（r=0.3; P=0.04）及剖宮產術後血栓生成的最大比率（r=0.31; P=0.02）呈弱相關性。將剖宮產術後的檢測值爲分割點，則反應時間、最大比率凝血酶生成時間、凝血酶原時間及活化部分凝血酶時間均較基線值明顯延長（P<0.05）。而剖宮產術後的 α 角、最大振幅、總血栓生成、纖維蛋白原及血小板計數則較基線值明顯減少（P<0.05）。

結論：在椎管內麻醉下行擇期剖宮產手術的患者其凝血強度（通過白陶土活化血栓彈力圖評定）與估計失血量呈弱相關性；但在擇期剖宮產術的產後早期，產婦的高凝狀態可發生中等程度的弱化。
（范羽譯 薛張綱校）

Background: In this study, we assessed the relationship between coagulation parameters using kaolin-activated thromboelastography (TEG®) and total estimated blood loss (EBL) in patients undergoing elective cesarean delivery (CD).
Methods: TEG® parameters were recorded in 52 patients before and after elective CD. Laboratory markers of coagulation (prothrombin time, activated partial thromboplastin time, fibrinogen) were also assessed in a smaller subset (21 patients). Correlation and linear regression analysis was used to assess the relationship among TEG® parameters, relevant clinical variables, and total EBL. Secondary analysis included comparisons of TEG® and coagulation profiles pre-CD versus post-CD.
Results: EBL weakly correlated with percentage change in maximum amplitude (r=0.3; P=0.04) and post-CD maximum rate of thrombus generation (r=0.31; P=0.02). Post-CD values for split point, reaction time, time to maximum rate of thrombin generation, prothrombin time, and activated partial thromboplastin time were significantly increased compared with baseline values (P<0.05). Post-CD α angle, maximum amplitude, total thrombus generation, fibrinogen, and platelet counts were significantly decreased compared with baseline values (P<0.05).
Conclusions: There is a weak association between clot strength (as assessed by kaolin-activated TEG®) and EBL in patients undergoing elective CD under neuraxial anesthesia, and a modest reduction in the degree of maternal hypercoagulability occurs in the early postpartum period after elective CD.

輸注丙泊酚與咪達唑侖對椎管內麻醉進行鎮靜過程中做夢的比較的研究

Dreaming in sedation during spinal anesthesia: a comparison of propofol and midazolam infusion

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背景:儘管在椎管內麻醉過程中經常進行鎮靜，但是術中做夢的具體情況至今仍無報導。我們設計這項前瞻性研究目的在於比較兩組靜脈鎮痛方法（輸注丙泊酚和咪達唑侖）在鎮靜過程中對做夢方面的影響。
方法:將 220 名行椎管內麻醉的成年患者隨機分成兩組，分別予以輸注丙泊酚或咪達唑侖進行深鎮靜。在患者出現夢境及其後 30 分鐘時隨訪病人，以確定做夢的概率、內容、性質。術後也要對做夢的滿意度進行評估。
結果:有 215 名患者進入了最後的分析中（丙泊酚組及咪達唑侖組分別爲 108 和 107 名）。丙泊酚組做夢的比例爲 39.8%（43/108），而咪達唑侖組爲 12.1%（13/107）(優勢比=4.78；95%可信區間：2.38 到 9.60）。相比接受咪達唑侖的患

者，接受丙泊酚的患者的夢境更爲難忘和生動。多數夢是對日常生活的簡單而愉快的思維反芻（56 個做夢者中有 36 位，占 64.3%）。兩組患者都同樣的對鎮靜非常滿意。

結論:對椎管內麻醉進行深鎮靜，雖然接受丙泊酚輸注的患者做夢的幾率是咪達唑侖的 5 倍之多，但這並不影響鎮靜的滿意度。因此，當我們爲椎管內麻醉的病人選擇丙泊酚或咪達唑侖作爲鎮靜藥時，我們沒必要考慮術中做夢的情況。

（侯文婷譯 薛張綱校）

BACKGROUND:Although sedation is often performed during spinal anesthesia, the details of intraoperative dreaming have not been reported. We designed this prospective study to compare 2 different IV sedation protocols (propofol and midazolam infusion) with respect to dreaming during sedation.

METHODS:Two hundred twenty adult patients were randomly assigned to 2 groups and received IV infusion of propofol or midazolam for deep sedation during spinal anesthesia. Patients were interviewed on emergence and 30 minutes later to determine the incidence, content, and nature of their dreams. Postoperatively, patient satisfaction with the sedation was also evaluated.

RESULTS:Two hundred fifteen patients (108 and 107 in the propofol and midazolam groups, respectively) were included in the final analysis. The proportion of dreamers was 39.8% (43/108) in the propofol group and 12.1% (13/107) in the midazolam group (odds ratio = 4.78; 95% confidence interval: 2.38 to 9.60). Dreams of the patients receiving propofol were more memorable and visually vivid than were those of the patients receiving midazolam infusion. The majority of dreams (36 of 56 dreamers, 64.3%) were simple, pleasant ruminations about everyday life. A similarly high level of satisfaction with the sedation was observed in both groups.

CONCLUSIONS:In cases of spinal anesthesia with deep sedation, dreaming was almost 5 times more common in patients receiving propofol infusion than in those receiving midazolam, although this did not influence satisfaction with the sedation. Thus, one does not need to consider intraoperative dreaming when choosing propofol or midazolam as a sedative drug in patients undergoing spinal anesthesia.

人胚腎細胞表達的α(1)β(2)γ(2)L 和α(1)β(2)γ(2)S GABA(A)受體中咪唑安定和異丙酚的相互作用

Interactions of Midazolam and Propofol on {alpha}1{beta}2{gamma}2L and {alpha}1{beta}2{gamma}2S Gamma Aminobutyric Acid Type A Receptors Expressed in Human Embryonic Kidney Cells.

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背景：咪唑安定和異丙酚等多種麻醉藥物均作用於GABA的A型受體。它們通過啓動GABA(A)受體，產生鎮靜催眠的作用，但是作用靶點相同的麻醉藥物之間的相

互作用，仍然缺乏研究。爲此我們研究了咪唑安定和異丙酚對於α(1)β(2)γ(2)L和α(1)β(2)γ(2)S GABA(A)受體的相互作用。
方法：將α(1)β(2)γ(2)L 和α(1)β(2)γ(2)S GABA(A)受體轉染至人的胚胎腎293T細胞，然後使用全細胞膜片鉗技術檢測了咪唑安定和異丙酚與其發生作用時所產生的電流。
結果：咪唑安定和異丙酚均可各自加強GABA(A)受體的反應，並且呈現劑量相關性。對於α(1)β(2)γ(2)S GABA(A)受體，還具有附加效應，但是在α(1)β(2)γ(2)L GABA(A)受體中則無此額外作用。但是在抑制了蛋白激酶C之後可以觀察到咪唑安定和異丙酚之間對於 α(1)β(2)γ(2)L GABA(A)受體具有相互作用。
結論：咪唑安定和異丙酚之間的相互作用在不同受體亞型間有差異。蛋白磷酸化激酶會影響它們之間對於 α(1)β(2)γ(2)L受體的相互作用。
（黃劍譯 薛張綱校）

BACKGROUND:The gamma aminobutyric acid type A (GABA(A)) receptor is a prime target of many anesthetics, including midazolam and propofol. Although these anesthetics have sedative and hypnotic properties by enhancing GABA(A) receptor activity, their interactions at the GABA(A) receptors have not been explored. We investigated the interaction of midazolam and propofol with α(1)β(2)γ(2)L and α(1)β(2)γ(2)S GABA(A) receptors.
METHODS:Using the whole-cell patch clamp technique, we tested the effects of midazolam and propofol on GABA-induced currents in human embryonic kidney 293 T cells transfected with α(1)β(2)γ(2)L and α(1)β(2)γ(2)S GABA(A) receptors.
RESULTS:Midazolam and propofol on their own enhanced the amplitude of GABA(A) receptor responses in a dose-dependent manner, and they had additive effects on α(1)β(2)γ(2)S GABA(A) receptors, but not on α(1)β(2)γ(2)L GABA(A) receptors. However, additive interactions of midazolam and propofol on the α(1)β(2)γ(2)L GABA(A) receptors were observed when protein kinase C was inhibited.
CONCLUSIONS:The interaction between midazolam and propofol is affected by receptor subtype, and protein kinase phosphorylation influences their interaction on the α(1)β(2)γ(2)L receptor.

1987 年至 2006 年丹曲林相關併發症：一項來自美國惡性高熱組織關於北美惡性高熱的報導

Complications Associated with the Administration of Dantrolene 1987 to 2006: A Report from the North American Malignant Hyperthermia Registry of the Malignant Hyperthermia Association of the United States

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背景：丹曲林 是唯一一種針對由於吸入麻醉藥和琥珀醯膽鹼誘導而引起的致命的、基因紊亂所致的惡性高熱的特異性治療。由於惡性高熱沒有特異性的症狀，且延誤治療的後果是致命的，一旦懷疑是惡性高熱應儘快給予丹曲林治療。我們已經在 AMRA（麻醉中不利於代謝、肌肉的反應）中報導了丹曲林的併發症並提交給北美惡性高熱註冊表。
方法：AMRA 的報告分析了個體伴或不伴有與丹曲林併發症之間的相關性。文獻已將丹曲林的劑量和個體的體重納入標準。由於一些已報導的併發症可能歸咎於其他因素而與丹曲林無關，還確定有一些剔除的標準。我們使用了 χ 2 and Mann–Whitney 的方法測試。用邏輯回歸法分析與併發症的風險增加的相關的因素。
結果：在 368 個的受試者中，最常見的與丹曲林相關的併發症是肌無力（21.7%），靜脈炎（9%），胃腸道不適（4.1%），呼吸衰竭（3.8%）。邏輯回歸法顯示任何時候，丹曲林的劑量增加了一倍時，併發症的危險因素增加 29%，若液體的管理成爲治療的一部分，危險因素增加 144%。而在神經外科則發生率下降 83%，在口腔外科則下降 74%。在資料組中，移除一些被認爲可能是已經存在的疾病或惡性高熱的嚴重 併發症後，還剩下 349 位被試者。最常見的與丹曲林相關的併發症是肌無力（14,6），靜脈炎（9.2%），胃腸不適（4.3%）。在剔除過的資料組中，用邏輯回歸法分析，任何時候當丹曲林的劑量加倍，增加併發症的危險因素會增加 25%。在婦科或產科手術中，危險因素會增加 572%。若給予呋塞米，危險因素會減少 56%，而這些與液體管理和或手術的類型無關。
結論：丹曲林併發症較常見的，但很少有危及生命。在外科的手術中不確定因素與併發症的發生有關。作爲惡性高熱治療的一部分，液體管理與丹曲林的使用後的併發症緊密相關，應該嚴密監控。
（劉玨瑩譯 薛張綱校）
BACKGROUND: Dantrolene is the only specific treatment for malignant hyperthermia (MH), a genetic disorder in which life-threatening temperature increase has been induced by inhalation anesthetics and succinylcholine. Because MH presents with nonspecific signs and delay of treatment can be fatal, dantrolene may be given as soon as MH is suspected. We report the complications associated with dantrolene administration as documented in AMRA (adverse metabolic/musculoskeletal reaction to anesthesia) reports submitted to the North American Malignant Hyperthermia Registry.
METHODS: AMRA reports were analyzed for differences between subjects with and without complications attributed to dantrolene. Documentation of dantrolene dose and subject weight were inclusion criteria. Because some reported complications were likely due to factors other than dantrolene, a reduced set of cases was also defined. We used χ2 and Mann–Whitney tests. Logistic regression was applied to describe factors associated with increased risk of complications.
RESULTS: In the full dataset of 368 subjects, the most frequent complications associated with dantrolene were muscle weakness (21.7%), phlebitis (9%), gastrointestinal upset (4.1%), and respiratory failure (3.8%). Logistic regression described a 29% increase in risk of any complication when the total dantrolene dose was doubled, a 144% increase in risk when fluid administration was part of treatment, an 83% decrease in risk in the presence of neurosurgery, and a 74% decrease in risk in the presence of oral surgery. In the dataset reduced by removal of some serious

complications that were judged likely to have been due to preexisting disease or the MH event, there were 349 subjects. The most frequent complications associated with dantrolene were muscle weakness (14.6%), phlebitis (9.2%), and gastrointestinal upset (4.3%). In this reduced dataset, logistic regression described a 25% increase in risk of any complication when the total dantrolene dose was doubled, a 572% increase in risk in the presence of obstetric or gynecologic surgery, a 56% decrease in risk if furosemide was given, and no relationship with fluid administration or other types of surgery.
CONCLUSIONS: Complications after dantrolene are common, but rarely life threatening. Unidentified factors in the surgical environment are associated with changes in the risk of complications. Fluid management, as part of the treatment of MH, has an important association with the risk of complications after dantrolene administration and should be monitored closely.

三種急性肺損傷大鼠實驗模型的生理和生物學特性

Physiologic and Biologic Characteristics of Three Experimental Models of Acute Lung Injury in Rats

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背景：試圖減輕通氣相關性肺損傷的方法已經在各種急性肺損傷（ALI）的試驗中測試過。結論往往來自生理和生物學效應，但是模型對這些結果的影響尚不清楚。我們在這一研究的目的是描述急性肺損傷常用實驗模型的生理生物學特性。
方法：取 20 只 SD 級被麻醉的大鼠，肺部機械通氣 5 小時。三個急性肺損傷實驗模型（表面活性劑沖洗，酸性環境，高潮氣量通氣）進行了血流動力學，呼吸力學，氣體交換，肺病理學，和炎症反應方面的研究。沒有急性肺損傷動物作爲對照組。
結果：對每組五隻動物進行了分析。所有組在 1 小時後動態順應性及吸氧率 Pao2/fraction 下降至少 50%。所有模型順應性均降低，5 個小時後灌洗組的基線值氧返回。彌漫性肺泡損害是在高潮氣量組最糟，對照組和灌洗組沒有區別。白介 6 在支氣管肺泡灌洗組和高潮氣量模型組增加了。
結論：雖然所有模型都會出現相似的急性呼吸窘迫綜合征的生理影響。但生物反應在不相同肺損傷模型中是不同的。酸環境急性肺損傷模型的建立通常都出現呼吸和炎症反應，這些資料表明，它可能是臨床上最適用的模型來研究通氣相關肺損傷對大鼠的中遠期影響。
（陸麗虹譯 薛張綱校）
BACKGROUND: Strategies to attenuate ventilator-associated lung injury have been tested in various experimental methods of acute lung injury (ALI). Conclusions are often drawn from physiologic and biologic effects, but the influence of the model on these

results is not known. Our aim in this study was to characterize frequently used models of experimental ALI.
METHODS: Twenty Sprague Dawley rats were anesthetized and their lungs mechanically ventilated for 5 hours. Three models of ALI (surfactant washout, acid aspiration, and high tidal volume ventilation) were investigated with regard to hemodynamics, respiratory mechanics, gas exchange, lung pathology, and inflammatory reactions. Animals without ALI served as controls.
RESULTS: Five animals in each group were analyzed. Dynamic compliance and Pao2/fraction of inspired oxygen ratio decreased by at least 50% in all groups after 1 hour. Whereas compliance remained decreased in all models, oxygenation returned to baseline values in the lavage group after 5 hours. Diffuse alveolar damage was worse in the high tidal volume model and was not different between the control and lavage animals. Interleukin-6 was increased in bronchoalveolar lavage fluid in the aspiration and high tidal volume models.
CONCLUSIONS: Although comparable physiologic effects meeting acute respiratory distress syndrome criteria were achieved in all models, the biologic responses varied among lung injury models. The acid aspiration model created both respiratory and inflammatory responses typically seen in ALI; these data suggest that it may be the most clinically applicable model to study the intermediate-term effects of ventilator-associated lung injury in rats.

在以異丙酚爲基礎的兒科病人麻醉時大劑量的瑞芬太尼抑制竇房傳導和竇房結自律性

High-dose remifentanil suppresses sinoatrial conduction and sinus node automaticity in pediatric patients under propofol-based anesthesia

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背景：我們在行射頻消融術的兒科病人中研究了瑞芬太尼對竇房結功能和心房-希氏束間期的作用。
方法：60 例預激綜合征兒科病人入選這項前瞻性研究。全身麻醉由異丙酚誘導和維持。我們在平穩的麻醉狀態下分別記錄了計算的竇房傳導時間(CSACT)、校正的竇房結恢復時間(CSNRT)和心房-希氏束間期，並且在使用中等(0.2 μg・kg(-1)・min(-1))和大劑量(0.4 μg・kg(-1)・min(-1))瑞芬太尼時比較了這些數值。資料由平均值表示(95%置信區間)。
結果：中等劑量的瑞芬太尼延長了校正的竇房結恢復時間(用藥後 177[117-237]毫秒到 245[167-322]毫秒；P=0.016)，但對計算的竇房傳導時間(P=0.59)和心房-希氏束間期(P=0.11)沒有作用。大劑量的瑞芬太尼延長了校正的竇房結恢復時間(用藥後從 201[144-260]毫秒到 307[232-382]毫秒；P=0.019)和計算的竇房傳導時間(用藥後從 48[31-65]毫秒到 78[59-96]毫秒；P=0.038)，但對心房-希氏束間期沒有作用

(P=0.058)。瑞芬太尼的使用與其劑量對校正的竇房結恢復時間的作用不同(P=0.44)。

結論：瑞芬太尼抑制了心房內的傳導和竇房結自律性，但對房室結傳導沒有作用。我們使用 0.2 到 0.4 μg・kg(-1)・min(-1)範圍內瑞芬太尼時沒有觀察到劑量相關性。

（任雲譯 薛張綱校）

BACKGROUND: We sought to determine the effect of remifentanil on sinus node function and the atrial-His (AH) interval in pediatric patients undergoing radiofrequency catheter ablation.

METHODS: Sixty pediatric patients with Wolff-Parkinson-White syndrome were prospectively enrolled in this study. General anesthesia was induced and maintained with a continuous infusion of propofol. We recorded the calculated sinoatrial conduction time (CSACT), corrected sinus node recovery time (CSNRT), and AH interval when the patients were in a stable anesthetic state and compared the values before and during remifentanil administration at a moderate dose (0.2 μg • kg(-1) • min(-1)) or a high dose (0.4 μg • kg(-1) • min(-1)). Data are expressed as mean (95% confidence interval).

RESULTS: At the moderate dose, remifentanil prolonged CSNRT (from 177 [117-237] milliseconds to 245 [167-322] milliseconds after administration; P = 0.016), but had no effect on either CSACT (P = 0.59) or AH interval (P = 0.11). However, high-dose remifentanil prolonged both CSNRT (from 201 [144-260] milliseconds to 307 [232-382] milliseconds after administration; P = 0.019) and CSACT (from 48 [31-65] milliseconds to 78 [59-96] milliseconds after administration; P = 0.038), but had no effect on the AH interval (P = 0.058). The interaction in CSNRT between remifentanil administration and its dose was not different (P = 0.44).

CONCLUSIONS: Remifentanil may inhibit both intraatrial conduction and sinus node automaticity, but it has no effect on conduction through the atrioventricular node. Dose dependency was not observed within the range of 0.2 to 0.4 μg • kg(-1) • min(-1) of remifent anil.

在高齡患者行關節成形術後發生譫妄的情況和預測譫妄發生的因素

Cognitive and functional predictors and sequelae of postoperative delirium in elderly patients undergoing elective joint arthroplasty.

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背景：術後譫妄在老年病人中很普遍，常常與不良的預後有關。在外科擇期手術後發生術後譫妄的發生情況也並不清楚。我們試圖去發現（1）如果敏感的神經認知測試得分低是否是老年病人發生術後譫妄的獨立風險因素。（2）發生術後譫妄的病人在術後 3 個月後認知和功能狀態是否會下降。

方法：我們進行了一項前瞻性的佇列研究，研究物件爲年齡≥65 歲，行全膝或者全髖關節成形術的患者。我們使用意識混亂評價方法來診斷術後譫妄。患者發生了譫妄並接受了治療，術後 3 個月後將重複認知和功能的評估。

結果：有 418 名患者符合我們的標準，其中 42%的患者發生了術後譫妄。經過組間比較我們發現兩組在心理狀態評分，濫用酒精，抑鬱，口頭表達能力方面沒有差異。術後譫妄的獨立預測因素包括年齡，精神疾病史，降低的功能狀態，降低的言語記憶。對於所有的測試來說，發生術後譫妄的病人術前評估和術後 3 個月再評估都是很相似的。

結論：術前神經認知和功能狀態的微妙減低預示著術後會發生譫妄。然而，在術後發生譫妄的小部分病人中，術後 3 個月再評估認知和功能狀態與之前相似。在老年病人中發生術後譫妄與術前認知功能減低有關，但是對術後 3 個月後的認知功能無不良影響。

（翁梅琳譯 薛張綱校）

BACKGROUND: Postoperative delirium (POD) is common in the elderly and associated with adverse outcomes. The cognitive and functional sequelae of POD in elective surgical patients are not known. We sought to determine whether (1) lower scores on sensitive neurocognitive tests are an independent risk factor for POD in elderly surgical patients, and (2) POD predicts cognitive and functional decline 3 months postoperatively.

METHODS: We conducted a prospective, cohort study on patients ≥65 years old undergoing total hip or knee arthroplasty. Participants underwent preoperative neurocognitive and functional testing. POD was diagnosed using the Confusion Assessment Method. Patients who developed POD and matched controls underwent repeat neurocognitive and functional testing 3 months after surgery.

RESULTS: Four hundred eighteen patients met entry criteria, and 42 (10%) developed POD. There were no differences in baseline Mini-Mental State Examination scores, alcohol abuse, depression, and verbal intelligence between groups. Independent predictors of POD included age, history of psychiatric illness, decreased functional status, and decreased verbal memory. For all tests, changes from before to 3 months after surgery were similar between those patients with POD and matched controls.

CONCLUSIONS: Subtly reduced preoperative neurocognitive and functional status predict POD. However, in the small group that developed POD, there was no evidence of cognitive and functional decline 3 months after surgery. POD is associated with decreased preoperative cognitive reserve but, in elderly elective surgical patients, may be without adverse cognitive or functional sequelae 3 months postoperatively.

術後譫妄:具有長期危害的急性改變

Postoperative Delirium: Acute Change with Long-Term Implications

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摘要:譫妄是認知功能和注意力的急性改變,其中可能包括了意識改變和思維瓦解。雖然譫妄在各年齡段均可發生，其在老年人中最常見，特別是術前存在認知功能損害者。譫妄病人相較無譫妄病人術後恢復更緩慢，並且住院時間和費用增加。術後譫妄的發生依據手術類型、是否急診手術和譫妄評價方法敏感程度而各有不同。雖然譫妄被認爲是一個短期改變，但是它能持續數月，且與不良認知改變和功能損害相關。本文中，我們提供了術前評估譫妄發生危險度的方法和預防、診斷、治療這一常見的併發症。對這類病人關懷的進步體現在術前識別譫妄發生的危險、訓練有素的外科醫生、麻醉醫生和護士篩查譫妄的發生；應用預防譫妄發生的程式和開發標準譫妄治療方案可能使譫妄發生下降並且減少相關的併發症。
（姚敏敏譯 薛張綱校）

Delirium is an acute change in cognition and attention, which may include alterations in consciousness and disorganized thinking. Although delirium may affect any age group, it is most common in older patients, especially those with preexisting cognitive impairment. Patients with delirium after surgery recover more slowly than those without delirium and, as a result, have increased length of stay and hospital costs. The measured incidence of postoperative delirium varies with the type of surgery, the urgency of surgery, and the type and sensitivity of the delirium assessment. Although generally considered a short-term condition, delirium can persist for months and is associated with poor cognitive and functional outcomes beyond the immediate postoperative period. In this article, we provide a guide to assess delirium risk preoperatively and to prevent, diagnose, and treat this common and morbid condition. Care improvements such as identifying delirium risk preoperatively; training surgeons, anesthesiologists, and nurses to screen for delirium; implementing delirium prevention programs; and developing standardized delirium treatment protocols may reduce the risk of delirium and its associated morbidity.