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

Mudi Misgav, MD*, Boris Shenkman, MD, PhD*, Ivan Budnik, MD*, Yulia Einav, PhD† and Uri Martinowitz, MD*

From the *Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel; †Holon Institute of Technology, Holon, Israel.
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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
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.

Review Article: High Stakes and High Risk: A Focused Qualitative Review of Hazards During Cardiac Surgery
Elizabeth A. Martinez, MD, MHS*, David A. Thompson, DNSc, MS, RN†, Nicole A. Errett, BA‡, George R. Kim, MD§, Laura Bauer, MPH†, Lisa H. Lubomski, PhD†, Ayse P. Gurses, PhD†‡, Jill A. Marsteller, PhD, MPP‡, Babak Mohit, MPH, MHA, MBA‡, Christine A. Goeschel, MPA, ScD, RN†‡ and Peter J. Pronovost, MD, PhD†‡
From the *Department of Anesthesia, Critical Care and Pain Medicine, Massachusetts General Hospital, Harvard University, Cambridge, Massachusetts; †Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland; ‡Department of Health Policy and Management, Johns Hopkins University Bloomberg School of Public Health; §Johns Hopkins University School of Medicine, Baltimore, Maryland.
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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
Yuping Zhao, BS*, Bing Liu, BS†, Qin Wang, PhD†, Dongdong Yuan, BS†, Yan Yang, BS†, Xiaoting Hong, BS†, Xudong Wang, MD* and Liang Tao, PhD†
From the *Department of Anaesthesia, Cancer Center, Sun Yat-Sen University, Guangzhou; and †Department of Pharmacology, Zhongshan School of Medicine, Sun Yat-Sen University, Guangzhou, People's Republic of China.
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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。但是丙泊酚抑制間隔連接的功能，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（C.x32）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
性的影响。缝隙连接功能，Cx32 蛋白表达以及 Cx32 mRNA 的表达分别採用“降落伞”染料耦合技术，Western 印迹法，逆轉錄-聚合酶链反應进行测定。
结果：只有存在功能性缝隙连接的情况下，丙泊酚才能显著减少放射導致的細胞毒性。4 小時的丙泊酚暴露主要是通过减少 Cx32 蛋白水準而非影響 Cx32 mRNA 表達水準来抑制缝隙连接的功能。
结果：这些结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

Jesse Raiten, MD*, Nabil Elkassabany, MD*, William Gao† and Jeff E. Mandel, MD, MS*

From the *Department of Anesthesiology and Critical Care, University of Pennsylvania School of Medicine; and †University of Pennsylvania, Philadelphia, Pennsylvania. Anesth Analg May 2011 112:1110-1113

高頻噴射通気（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外實施的價值。HFJV 能提供機械通気，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.

The Association Between Obesity and Difficult Prehospital Tracheal Intubation
Timothy J. Holmberg, MD*, Stephen M. Bowman, PhD†, Keir J. Warner, BS‡, Monica S. Vavilala, MD*, Eileen M. Bulger, MD‡, Michael K. Copass, MD§ and Sam R. Sharar, MD*
From the *Department of Anesthesiology, University of Washington, Seattle, Washington; †Departments of Pediatrics and Health Policy & Management, University of Arkansas for Medical Sciences, Little Rock, Arkansas; and ‡Department of Surgery, and §Department of Emergency Services, University of Washington.
Timothy J. Holmberg is currently affiliated with the Department of Anesthesiology, University of Utah, Salt Lake City, Utah.
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背景：非醫療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元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進行氣管插管、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。作為主要結果的困難氣管插管定義為氣管插管嘗試次數≥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。氣管插管成功率為98.5%(811/823)，符合困難氣管插管定義的為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/m²)相比，III級肥胖患者(BMI>40 kg/m²)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/m²>BMI≥30 kg/m²)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
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.
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
Lisbeth Evered, BSc, MBiostat*, David A. Scott, MB, BS, PhD, FANZCA*, Brendan Silbert, MB, BS, FANZCA* and Paul Maruff, PhD†
From the *Department of Anaesthesia, Centre for Anaesthesia and Cognitive Function, St. Vincent’s Hospital, Melbourne; and †Department of Pathology and Centre for Neuroscience, University of Melbourne, Parkville, Australia.
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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：研究分為四組：分別為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，分別為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發生率為17%（輕度鎮靜下CA為21%，THJR手術為16%，冠狀動脈搭橋手術為16%）。各組間POCD比例的差異的平均值（95%可信區間）為：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為：0.94，1.55，P = 0.13）。
BACKGROUND: Postoperative cognitive 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.
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為“虛弱”。其中 25%的患者經譫妄評定法（confusion assessment method, CAM）確認為術後譫妄。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抑鬱症狀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。

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 function 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

Laura Biddlestone Thorpe, PhD, Michelle Goldie, BSc and Sharron Dolan, PhD
From the Department of Biological and Biomedical Sciences, Glasgow Caledonian University, Glasgow, United Kingdom.
Anesth Analg May 2011 112:1226-1231

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 hypersensitivity. 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
Giovanna A. Lurati Buse, MD*, Michael T. Koller, MD, MSc†, Christoph Burkhart, MD*, Manfred D. Seeberger, MD* and Miodrag Filipovic, MD*
From the *Department of Anesthesia and Intensive Care Medicine, and †Basel Institute of Clinical Epidemiology, University Hospital Basel, Basel, Switzerland.
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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。研究終點為任何原因導致的≥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隨機走馬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為 4.11（95% 可信區間為 2.22-
7.60），陽性預測值為 0.17（95% 貝葉斯可信區間為 0.07-0.36），陰性預測值為 0.96（95% 可信區間為 0.90-0.98）。非心臟術後，≥6 個月死亡率的利鉻肽診斷比值為 4.97（95% 可信區間為 3.06-8.07），相應的陽性預測值為 0.24（95% 可信區間為 0.14-0.38），陰性預測值為 0.94（95% 可信區間為 0.88-0.97）。≤90 天的死亡率的結果是相似的。

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

（滕凌雅譯 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
Viachaslau M. Barodka, MD, Brijen L. Joshi, MD, Dan E. Berkowitz, MD, Charles W. Hogue Jr., MD and Daniel Nyhan, MD
From the Department of Anesthesiology/Critical Care Medicine, The Johns Hopkins Medical Institutions, Baltimore, Maryland.
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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良好預後。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
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.

The Effect of Suggestion on Unpleasant Dreams Induced by Ketamine Administration

Soon Ho Cheong, MD, PhD*, Kun Moo Lee, MD, PhD†, Se Hun Lim, MD‡, Kwang Rae Cho, MD†, Myoung Hun Kim, MD†, Myoung Jin Ko, MD†, Joo Cheol Shim, MD, PhD‡, Min Kyung Oh, PhD§, Yong Han Kim, MD∥ and Sang Eun Lee, MD

From the *Department of Anesthesiology, Medical Device Clinical Trial Center, Paik Hospital, Paik Institute for Clinical Research, Inje University, Busan, Korea; †Department of Anesthesiology, Inje University, Busan, Korea; ‡Department of Psychiatry and Clinical Pharmacology, Clinical Trial Center, Paik Hospital, Inje University, Busan, Korea; §Clinical Trial Center, Paik Hospital, Inje University, Busan, Korea; ∥ Department of Anesthesiology, Haeundae Paik Hospital, Inje University, Busan, Korea.

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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

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

Soon Ho Cheong, MD, PhD*, Kun Moo Lee, MD, PhD†, Se Hun Lim, MD‡, Kwang Rae Cho, MD†, Myoung Hun Kim, MD†, Myoung Jin Ko, MD†, Joo Cheol Shim, MD, PhD‡, Min Kyung Oh, PhD§, Yong Han Kim, MD∥ and Sang Eun Lee, MD

From the *Department of Anesthesiology, Medical Device Clinical Trial Center, Paik Hospital, Paik Institute for Clinical Research, Inje University, Busan, Korea; †Department of Anesthesiology, Inje University, Busan, Korea; ‡Department of Psychiatry and Clinical Pharmacology, Clinical Trial Center, Paik Hospital, Inje University, Busan, Korea; §Clinical Trial Center, Paik Hospital, Inje University, Busan, Korea; ∥ Department of Anesthesiology, Haeundae Paik Hospital, Inje University, Busan, Korea.

Anesth Analg 2011 112:1082-1085

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
Michelle Hickey, PhD*, Neal Samuels, BSc(Pharm), MBBS, FRCA†, Nilesh Randive,
MBBS, MD, FRCA†, Richard M. Langford, MMBS, FRCA† and Panayiotis A. Kyriacou,
PhD *
From the *School of Engineering and Mathematical Sciences, City University London;
and †Anaesthetic Laboratory, St. Bartholomew's Hospital, Bart's and The London NHS
Trust, London, United Kingdom.
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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為可能，
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。為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和度值與使用商
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
獲得的血氧飽和度值均與其平均值的比率之間的差異的 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為監測內臟灌注提
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：一項為期 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
Jose De Andres, MD, PhD, EDRA, FIPP*, Vicente Villanueva, MD*, Stefano Palmisani, MD†, German Cerda-Olmedo, MD, PhD*, Maria Dolores Lopez-ALARCON, MD*, Vicente Monsalve, PhD*, Ana Minguez, PhD* and Vicente Martinez-Sanjuan, MD*
From the Departments of *Anesthesia, Critical Care, and Multidisciplinary Pain Management, and Magnetic Resonance, Valencia University General Hospital, Valencia, Spain; and †Department of Anesthesia, Critical Care and Pain Management, “La Sapienza” University of Rome, Rome, Italy.
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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、為期 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 間隔和之後的不良反應。
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.
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
Thomas Metterlein, MD, Frank Schuster, MD, Peter Kranke, MD, MBA, Martin Hager, MD, Norbert Roewer, MD, PhD and Martin Anetseder, MD
From the Department of Anesthesiology, University Hospital Wuerzburg, Wuerzburg, Germany.
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背景：惡性高熱（MH）是潛在致命的代謝亢進綜合征。吸入麻醉劑和/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啟動。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 只為惡性高熱易感型[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、PCO₂、PO₂、剩餘域和乳酸酸）。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
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, PCO₂, PO₂, 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.

吸人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

Daowei Lin, MD*†, Chenzhuo Feng, PhD*, Minghui Cao, MD† and Zhiyi Zuo, MD, PhD*
From the *Department of Anesthesiology, University of Virginia, Charlottesville, Virginia; and †Department of Anesthesiology, Sun Yat-Sen Memorial Hospital, Sun Yat-Sen University, Guangzhou, China.
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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°C. 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-SY5Y cells 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.

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

Christopher G. Hughes, MD* and Pratik P. Pandharipande, MD, MSCI*†
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.

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

Peter J. Lee, MB, FCARCSI, MD*, Raymond Tang, MSc, MD, FRCP*, Andrew Sawka, MD, FRCP*, Claudia Krebs, MD, PhD† and Himat Vaghadia, MBBS, FRCP* From the *Department of Anesthesiology, Pharmacology, and Therapeutics, and †Department of Cellular and Physiological Sciences, University of British Columbia, Vancouver, British Columbia, Canada.
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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 unembalmed 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.

Alexander Butwick, FRCA, Vicki Ting, MD, Lindsey Atkinson Ralls, MD, Scott Harter, MD and Edward Riley, MD

From the Department of Anesthesia, Stanford University School of Medicine, Stanford, California.

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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。將剖宮產術後的検測值為分割點，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）。
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.
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.

Background: 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
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)L GABA(A) receptors, but not on α(1)β(2)γ(2)S 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.
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

Dietrich Henzler, MD, PhD, Nadine Hochhausen, MD, Raymond Chankalal, MD, MSc, Zhaolin Xu, MD, Sara C. Whynot, MLT, Arthur S. Slutsky, MD and Haibo Zhang, MD, PhD

From the Department of Anesthesiology and Critical Care, Dalhousie University Halifax, Nova Scotia, Canada.

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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.

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

Keisuke Fujii, MD*, Hiroshi Iranami, MD*, Yoshihide Nakamura, MD* and Yoshio Hatano, MD†
From the *Department of Anesthesiology, Japanese Red Cross Society Wakayama Medical Center; and †Department of Anesthesiology, Wakayama Medical University, Wakayama, Japan.
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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例預激綜合徵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。
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 remifentanil.

在高齡患者行關節成形術後發生譫妄的種種情況與預測譫妄發生的因子
Cognitive and functional predictors and sequelae of postoperative delirium in elderly patients undergoing elective joint arthroplasty.

Christopher J. Jankowski, MD*, Max R. Trenerry, PhD†, David J. Cook, MD*, Shonie L. Buenvenida, RN‡, Susanna R. Stevens, MS§, Darrell R. Schroeder, MS§ and David O. Warner, MD*

From the Departments of *Anesthesiology, †Psychology, and §Biostatistics; and ‡Department of Anesthesiology, Anesthesiology Clinical Research Unit, Mayo Clinic, Rochester, Minnesota.

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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。在外科擇期手術術後發生術後譫妄的情況也並不清楚。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。
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
James L. Rudolph, MD, SM Edward R. Marcantonio, MD, SM
From the Geriatric Research, Education, and Clinical Center, VA Boston Healthcare System; Division of Aging, Brigham and Women's Hospital; Divisions of General Medicine and Primary Care and Gerontology, Beth Israel Deaconess Medical Center; and §Harvard Medical School, Boston, Massachusetts.
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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.