Table of Contents

February, 2013

Cardiovascular Anesthesiology

一項 **VerifyNow®** 與 **PlateletMapping®** 的對比—檢測出的阿司匹林抵抗及其與尿血栓素的相關性

(張怡 譯 馬皓琳 李士通校)

A Comparison of VerifyNow® with PlateletMapping® -Detected Aspirin Resistance and Correlation with Urinary Thromboxane

- Roger C. Carroll,
- Robert M. Craft,
- Carolyn C. Snider,
- Venkata R. Aligeti,
- and Dale C. Wortham

Anesth Analg February 2013 116:282-286; published ahead of print January 9, 2013

經食道即時三維超聲心動圖：可改善術中二尖瓣成像

(鄧利兵譯 薛張綱校)

Real-Time Three-Dimensional Transesophageal Echocardiography: Improvements in Intraoperative Mitral Valve Imaging

- Maximilian Dominik Hien,
- Helmut Rauch,
- Artur Lichtenberg,
- Raffaele De Simone,
- Marc Weimer,
- Oriana Amanda Ponta,
- and Christian Rosendal

Anesth Analg February 2013 116:287-295; published ahead of print July 13, 2012

Ambulatory Anesthesiology

等長測力計在預測腰麻下日間手術病人的術後活動恢復情況優於 **Bromage** 評分

(詹愷誕譯　陳傑校)

Isometric Force Dynamometer Is Superior to Bromage Score in Prediction of Patients' Ambulation After Spinal Anesthesia in Ambulatory Surgeries

- Roshdi R. Al-Metwalli,
- Hany A. Mowafi,
- Haitham A. Abouzaid,
- Mohammed Al-Maghrabi,
- Talal Al-Brahim,
- and Wesam F. Mousa

Anesth Analg February 2013 116:312-316; published ahead of print January 9, 2013

Anesthetic Pharmacology

丙泊酚催眠過程中紅發和黑髮人群的腦電雙頻指數動力學是相似的

(王曉莉 譯 馬皓琳 李士通 校)

Bispectral Index Dynamics During Propofol Hypnosis Is Similar in Red-Haired and Dark-Haired Subjects

- Anthony G. Doufas,
- Mukadder Orhan-Sungur,
- Ryu Komatsu,
- Rolf Lauber,
- Ozan Akca,
- Steven L. Shafer,
- and Daniel I. Sessler

Anesth Analg February 2013 116:319-326; published ahead of print January 9, 2013

異氟醚介導的活性氧自由基抑制核因數 κB 啓動脂多糖誘導的急性肺感染

(方昕譯 薛張綱校)

Reactive Oxygen Species by Isoflurane Mediates Inhibition of Nuclear Factor κB Activation in Lipopolysaccharide-Induced Acute Inflammation of the Lung

- In Sun Chung,
- Jie Ae Kim,
- Ju A. Kim,
- Hyun Sung Choi,
- Jeong Jin Lee,
- Mikyung Yang,
- Hyun Joo Ahn,

- and Sang Min Lee

Anesth Analg February 2013 116:327-335; published ahead of print January 9, 2013

Technology, Computing, and Simulation

急診室中使用一種無創血紅蛋白監測進行容量動力學分析

(孫莉荔譯　陳傑校)

The Use of a Noninvasive Hemoglobin Monitor for Volume Kinetic Analysis in an Emergency Room Setting

- Fredrik Sjöstrand,
- Peter Rodhe,
- Ellinor Berglund,
- Niclas Lundström,
- and Christer Svensen

Anesth Analg February 2013 116:337-342; published ahead of print January 9, 2013

在不同照明水準下直接喉鏡檢查的視敏度

(趙曉 譯 馬皓琳 李士通校)

Visual Acuity During Direct Laryngoscopy at Different Illuminance Levels

- Paul A. Baker,
- Amy S. Raos,
- John M. D. Thompson,
- and Robert J. Jacobs

Anesth Analg February 2013 116:343-350; published ahead of print January 9, 2013

外周動脈灌注指數可作爲早期預測中心低血容量的指標在清醒健康志願者中的研究

(胡曉清譯 薛張綱校)

Peripheral Perfusion Index as an Early Predictor for Central Hypovolemia in Awake Healthy Volunteers

- Michel E. van Genderen,
- Sebastiaan A. Bartels,
- Alexandre Lima,
- Rick Bezemer,
- Can Ince,
- Jan Bakker,

- and Jasper van Bommel

Anesth Analg February 2013 116:351-356; published ahead of print January 9, 2013

胃鏡檢查驗證一項用於超聲評估胃容積的數學模型

(王苑譯　陳傑校)

Validation of a Mathematical Model for Ultrasound Assessment of Gastric Volume by Gastroscopic Examination

- Anahi Perlas,
- Nicholas Mitsakakis,
- Louis Liu,
- Maria Cino,
- Nidhi Haldipur,
- Liisa Davis,
- Javier Cubillos,
- and Vincent Chan

Anesth Analg February 2013 116:357-363; published ahead of print January 9, 2013

Patient Safety

困難氣道的拔管和拔管失敗

(王曉莉譯 馬皓琳 李士通校)

Review Article: Extubation of the Difficult Airway and Extubation Failure

- Laura F. Cavallone and
- Andrea Vannucci

Anesth Analg February 2013 116:368-383; published ahead of print January 9, 2013

Obstetric Anesthesiology

OPRM1和 COMT 基因型在靜脈注射芬太尼分娩鎮痛中的作用

(李麗紅譯 薛張綱校)

The Effect of *OPRM1* and *COMT* Genotypes on the Analgesic Response to Intravenous Fentanyl Labor Analgesia

- Ruth Landau,
- Shih-Kai Liu,

- Jean-Louis Blouin,
- and Brendan Carvalho

Anesth Analg February 2013 116:386-391; published ahead of print January 9, 2013

妊娠期的馬凡氏綜合征：連續16例馬凡氏綜合征分娩的麻醉管理

(馬霄雯譯　陳傑校)

Marfan's Syndrome During Pregnancy: Anesthetic Management of Delivery in 16 Consecutive Patients

- Jerome Allyn,
- Jean Guglielminotti,
- Sophie Omnes,
- Laila Guezouli,
- Michael Egan,
- Guillaume Jondeau,
- Dan Longrois,
- and Philippe Montravers

Anesth Analg February 2013 116:392-398; published ahead of print January 9, 2013

椎管內鎮痛分娩及其對哺乳的影響：目前知識的局限性

(王贇譯 馬皓琳 李士通校)

Review Article: Intrapartum Neuraxial Analgesia and Breastfeeding Outcomes: Limitations of Current Knowledge

- Ashley L. Szabo

Anesth Analg February 2013 116:399-405; published ahead of print January 9, 2013

簡報：脂肪乳劑在美國產科機構的應用

(孫莉萍譯 薛張綱校)

Brief Report: Availability of Lipid Emulsion in United States Obstetric Units

- Paloma Toledo,
- Heather C. Nixon,
- Jill M. Mhyre,
- Cynthia A. Wong,
- and Guy Weinberg

Anesth Analg February 2013 116:406-408; published ahead of print December 24, 2012

Pediatric Anesthesiology

顱面重建手術患兒中心靜脈壓監測的評估

(鄭華容譯　陳傑校)

Evaluation of Central Venous Pressure Monitoring in Children Undergoing Craniofacial Reconstruction Surgery

- Paul A. Stricker,
- Elaina E. Lin,
- John E. Fiadjoe,
- Emily M. Sussman,
- Eric Y. Pruitt,
- Huaqing Zhao,
- and David R. Jobes

Anesth Analg February 2013 116:411-419; published ahead of print January 9, 2013

Neuroscience in Anesthesiology and Perioperative Medicine

非頸動脈大血管手術中圍術期卒中的發生率、預測因數及預後

(唐瑩譯 馬皓琳 李士通校)

Incidence, Predictors, and Outcomes of Perioperative Stroke in Noncarotid Major Vascular Surgery

- Milad Sharifpour,
- Laurel E. Moore,
- Amy M. Shanks,
- Thomas J. Didier,
- Sachin Kheterpal,
- and George A. Mashour

Anesth Analg February 2013 116:424-434; published ahead of print October 31, 2012

心臟手術後認知功能恢復預測指標

(郁玲玲譯 薛張綱校)

Predictors of Cognitive Recovery After Cardiac Surgery

- Monique T. Fontes,
- R. Cameron Swift,
- Barbara Phillips-Bute,

- Mihai V. Podgoreanu,
- Mark Stafford-Smith,
- Mark F. Newman,
- Joseph P. Mathew,
- and the Neurologic Outcome Research Group of the Duke Heart Center

Anesth Analg February 2013 116:435-442; published ahead of print January 9, 2013

需手術治療的顱內出血病人酮咯酸的應用：一項佇列研究（**2001-2010**）內的病例對照研究

(孫曉瓊譯　陳傑校)

Intracranial Hemorrhage Requiring Surgery in Neurosurgical Patients Given Ketorolac: A Case-Control Study Within a Cohort (2001–2010)

- Giuseppina Magni,
- Italia La Rosa,
- Guido Melillo,
- Damiano Abeni,
- Helssy Hernandez,
- and Giovanni Rosa

Anesth Analg February 2013 116:443-447; published ahead of print January 9, 2013

Economics, Education, and Policy

影響做出參加臨床麻醉研究工作決定的主要因素

(方斌譯 馬皓琳 李士通校)

Determinants of a Subject's Decision to Participate in Clinical Anesthesia Research

- Naraida Balajonda,
- Tiffany L. Bisanar,
- Joseph P. Mathew,
- Herbert Pang,
- and Corrine I. Voils

Anesth Analg February 2013 116:448-454; published ahead of print January 9, 2013

Pain Medicine

依那西普預防腹股溝疝修補術後疼痛：一項多中心、隨機、對照研究

(周玲譯 薛張綱校)

A Multicenter, Randomized, Controlled Study Evaluating Preventive Etanercept on Postoperative Pain After Inguinal Hernia Repair

- Steven P. Cohen,
- Samuel M. Galvagno,
- Anthony Plunkett,
- Diamond Harris,
- Connie Kurihara,
- Ali Turabi,
- Scott Rehrig,
- Chester C. Buckenmaier III,
- and Jacques E. Chelly

Anesth Analg February 2013 116:455-462; published ahead of print January 9, 2013

Pain and Analgesic Mechanisms

CB_1 和 CB_2 大麻素受體激動劑通過啓動內源性去甲腎上腺素能系統誘導產生外周鎮痛作用

(諸琳婕譯　陳傑校)

CB_1 and CB_2 Cannabinoid Receptor Agonists Induce Peripheral Antinociception by Activation of the Endogenous Noradrenergic System

- Thiago R. L. Romero,
- Livia C. Resende,
- Luciana S. Guzzo,
- and Igor D. G. Duarte

Anesth Analg February 2013 116:463-472; published ahead of print January 9, 2013

糖原合酶激酶-3β 通過調節 N-甲基-d-天冬氨酸受體運輸促進瑞芬太尼誘導的術後痛覺過敏

(陳彬彬 譯， 馬皓琳、李士通 校)

Glycogen Synthase Kinase-3β Contributes to Remifentanil-Induced Postoperative Hyperalgesia via Regulating *N*-Methyl-d-Aspartate Receptor Trafficking

- Yuan Yuan,
- Jing-yao Wang,
- Fang Yuan,

- Ke-liang Xie,
- Yong-hao Yu,
- and Guo-lin Wang

Anesth Analg February 2013 116:473-481; published ahead of print December 24, 2012

鍛煉誘導熱休克蛋白72的過量表達並延遲糖尿病神經病理性疼痛大鼠痛超敏的發展。
(楊琰譯 薛張綱校)

Physical Exercise Induces Excess Hsp72 Expression and Delays the Development of Hyperalgesia and Allodynia in Painful Diabetic Neuropathy Rats

- Yu-Wen Chen,
- Pei-Ling Hsieh,
- Yu-Chung Chen,
- Ching-Hsia Hung,
- and Juei-Tang Cheng

Anesth Analg February 2013 116:482-490; published ahead of print January 9, 2013

Regional Anesthesia

技術交流：人體首次使用麥哲倫系統行機器人超聲引導下神經阻滯
(瞿亦楓譯　陳傑校)

Technical Communication: First Robotic Ultrasound-Guided Nerve Blocks in Humans Using the Magellan System

- Thomas M. Hemmerling,
- Riccardo Taddei,
- Mohamad Wehbe,
- Shantale Cyr,
- Cedrick Zaouter,
- and Joshua Morse

Anesth Analg February 2013 116:491-494; published ahead of print January 9, 2013

左布比卡因對傷口癒合的影響
(余亦南 譯 馬皓琳 李士通 校)

Effects of Levobupivacaine on Wound Healing

- Sezgin Zeren,
- Sevgi Kesici,

- Ugur Kesici,
- Salim Isbilir,
- Ulku Aygen Turkmen,
- Hulya Ulusoy,
- Vildan Karpuz,
- Omer Ozcan,
- Erdal Polat,
- Osman Metin Ipcioglu,
- and Musa Kazim Sari

Anesth Analg February 2013 116:495-499; published ahead of print January 9, 2013

一項 VerifyNow® 與 PlateletMapping® 的對比—檢測出的阿司匹林抵抗及其與尿血栓素的相關性

A Comparison of VerifyNow® with PlateletMapping® -Detected Aspirin Resistance and Correlation with Urinary Thromboxane

Roger C. Carroll, PhD*, Robert M. Craft, MD*, Carolyn C. Snider, MT*, Venkata R. Aligeti, MD† and Dale C. Wortham, MD†
From the Departments of *Anesthesiology and †Medicine, University of Tennessee Graduate School of Medicine, Knoxville, Tennessee.
Anesth Analg February 2013 116:282-286

背景：阿司匹林抵抗情況下全血中血小板啓動與一種跨細胞的通道有關，單獨的血小板聚集功能儀無法檢測。由尿血栓素水準下定義的阿司匹林抵抗增加了心肌梗死或心源性死亡的風險。全血重點照護檢驗也許也可以檢測出阿司匹林抵抗。
方法：在200名行侵入性心臟手術的患者中，我們比較了 PlateletMapping® 與 VerifyNow® 檢測阿司匹林抵抗的結果。其中包括10名未接受阿司匹林治療的患者做爲對照。檢測結果與患者術後2到8小時的尿11脫氫血栓素 B2水準相關。
結果：PlateletMapping 檢測出患者阿司匹林抵抗發生率爲32%。VerifyNow 檢測出患者阿司匹林抵抗爲6%。用光透過血小板聚集測定儀檢測對花生四烯酸的血小板聚集反應小於20%的患者被認定爲有較好的阿司匹林治療依從性。PlateletMapping 檢測出的阿司匹林抵抗患者中尿11-脫氫血栓素 B2水準明顯高於阿司匹林敏感患者($P < 0.001$)，但明顯低於未接受阿司匹林治療的患者 ($P = 0.001$)。VerifyNow 檢測出的阿司匹林抵抗患者中尿11-脫氫血栓素 B2水準與阿司匹林敏感患者無明顯差異，但可信區間跨度很大。PlateletMapping 檢測出的阿司匹林抵抗與阿司匹林服用劑量無明顯相關性。然而，聯合應用氯吡格雷(0.0006)或他汀類(0.004)藥物的患者阿司匹林敏感性明顯增高。吸煙與阿司匹林抵抗也有顯著的相關性。
結論：這些結果表明 PlateletMapping 可以作爲重點照護檢驗分析來用於鑒別阿司匹林抵抗患者，便於進行圍術期風險分層與管理。
（張怡 譯 馬皓琳 李士通校）

BACKGROUND: Aspirin-resistant platelet activation in whole blood is attributable to a transcellular pathway not detected by isolated platelet aggregometry. Aspirin resistance as

defined by urinary thromboxane levels is associated with increased risk for myocardial infarction or cardiac death. Whole blood point-of-care assays may also detect aspirin resistance.
METHODS: We compared PlateletMapping® with VerifyNow® for detecting aspirin resistance in 200 patients undergoing invasive cardiac procedures. This included 10 patients not receiving aspirin therapy for comparison. The assay results were correlated with urinary 11-dehydro-thromboxane B_2 collected 2 to 8 hours after the procedure.
RESULTS: PlateletMapping detected aspirin resistance in 32% of patients. VerifyNow detected aspirin resistance in 6% of patients. A patient's compliance with aspirin therapy was confirmed by a <20% aggregation response to arachidonic acid by light transmission aggregometry. Aspirin-resistant patients as determined by PlateletMapping had significantly ($P < 0.001$) higher urinary 11-dehydro-thromboxane B_2 levels than aspirin-sensitive patients but significantly ($P = 0.001$) lower levels than patients not receiving aspirin therapy. There was no significant difference in urinary 11-dehydro-thromboxane B_2 for aspirin-resistant compared with aspirin-sensitive patients as determined by VerifyNow, but the confidence intervals were wide. There was no significant correlation of resistance as defined by PlateletMapping with aspirin dose. However, there was significant increased aspirin sensitivity with clopidogrel (0.0006) or statin (0.004) cotherapies. There also was a significant correlation of smoking with aspirin resistance.
CONCLUSIONS: These results indicate that PlateletMapping could be a useful point-of-care assay to identify aspirin-resistant patients for better perioperative risk stratification and management.

丙泊酚催眠過程中紅發和黑髮人群的腦電雙頻指數動力學是相似的

Bispectral Index Dynamics During Propofol Hypnosis Is Similar in Red-Haired and Dark-Haired Subjects

Anthony G. Doufas, MD, PhD*, Mukadder Orhan-Sungur, MD†, Ryu Komatsu, MD†, Rolf Lauber, PhD‡, Ozan Akca, MD§ ‖ , Steven L. Shafer, MD¶ and Daniel I. Sessler, MD†§
From the Departments of *Anesthesiology and §Anesthesiology and Perioperative Medicine, and †Outcomes Research Institute, University of Louisville, Louisville, Kentucky; ‡Department of Anesthesiology, University of Bern, Bern, Switzerland; ‖Outcomes Research Consortium, Cleveland, Ohio; and ¶Department of Anesthesiology, Columbia University, New York, New York.
Anesth Analg February 2013 116:319-326

背景:我們以前的研究顯示與黑髮人群相比，紅發人群制動所需的地氟烷量較大。紅發對靜脈麻醉藥需要量的效果仍然未知。我們測試了這樣一個假設，即最大腦電反應一半時的作用部位丙泊酚濃度(Ce50)在紅發人至少要高50%。
方法：我們，用2步法在29例接受丙泊酚輸注導致意識喪失的黑髮和紅發健康志願者中建立了丙泊酚濃度與腦電反應的關係模型。雙譜指數（BIS）是藥效的測量指標。3室藥代動力學模型的參數與測得的動脈丙泊酚濃度相符合。用 S 型 Emax 模型描述作用部位的丙泊酚濃度（Ce）與 BIS 之間的關係。用公認的指標和引導程式重採樣評估模型性能和所測參數準確性。用減少2對數可能性的閾值6.63（P<0.01）來評價最後的模型中頭髮顏色對 Ce50的 BIS 效應的影響。還評估了體重對該模型的影響。
結果：把頭髮顏色包含爲模型協同變數既不能改進藥代動力學模型，也不能改進藥效學模型。對黑髮人群和紅發人群單獨分析預測 $Ce_{50\ BIS}$ 中位數(95%可信區間)分別爲

2.71μg/mL(2.28-3.36μg/mL)和2.57μg/mL(1.68-3.60μg/mL)。對 CL1和 V1來說，體重是個明顯的協同變數。
結論：紅發表型不會影響丙泊酚的藥代動力學和藥效學。
（王曉莉 譯 馬皓琳 李士通 校）

BACKGROUND: We have previously shown that red hair is associated with increased desflurane requirement for immobility, compared with dark hair. The effect of red hair on IV anesthetic requirement remains unknown. We tested the hypothesis that the propofol concentration in the effect site associated with half maximal electroencephalogram response, Ce_{50}, is at least 50% higher in subjects with red hair.
METHODS: We modeled the propofol concentration versus electroencephalogram response relationship using a 2-step approach in 29 healthy dark- and red-haired volunteers receiving a propofol infusion to produce loss of consciousness. Bispectral Index (BIS) was the measure of drug effect. The parameters of a 3-compartment pharmacokinetic model were fit to measured arterial propofol concentrations. The relationship between effect-site propofol concentration (Ce) and BIS was characterized using a sigmoid Emax model. Model performance and accuracy of the estimated parameters were evaluated using accepted metrics and bootstrap resampling. The effect of hair color on the Ce_{50} for BIS response in the final model was assessed using a threshold of 6.63 ($P < 0.01$) in reduction of −2 log likelihood. The influence of body weight on the model was also assessed.
RESULTS: The inclusion of hair color as a model covariate did not improve either the pharmacokinetic or the pharmacodynamic model. A separate analysis for the dark- and red-haired subjects estimated a median (95% confidence interval) $Ce_{50\ BIS}$ of 2.71 μg/mL (2.28–3.36 μg/mL) and 2.57 μg/mL (1.68–3.60 μg/mL), respectively. Body weight was a significant covariate for the CL_1 and V_1.
CONCLUSIONS: Red hair phenotype does not affect the pharmacokinetics or pharmacodynamics of propofol.

在不同照明水準下直接喉鏡檢查的視敏度

Visual Acuity During Direct Laryngoscopy at Different Illuminance Levels

Paul A. Baker, MBChB, FANZCA*, Amy S. Raos, BSc, MBChB*, John M. D. Thompson, MSc, PhD†and Robert J. Jacobs, MSc, PhD, LOSc, FAAO‡
From the *Department of Paediatric Anaesthesia, Starship Children's Health, Auckland; †Department of Paediatrics, The University of Auckland, Auckland; and ‡Department of Optometry and Vision Science, New Zealand National Eye Centre, The University of Auckland, Auckland, New Zealand.
Anesth Analg February 2013 116:343-350

背景：在直接喉鏡檢查中，足夠的光線是視覺觀察的必要條件。ISO 7376:2009 標準規定喉鏡檢查的最小光照強度。還沒有研究能客觀地考察在喉鏡檢查中喉鏡光照強度與視敏度之間的關係。
方法：我們用定位在 4 個人體模型喉部上的近距視覺表在直接喉鏡檢查時測定 50 位麻醉醫師的近距離視力。用可變電壓源將喉鏡的光照強度調整爲 50 光通量密度（lux）、200lux、700lux 和 2000 lux。在進行到不同光照強度的下一個人體模型之前，參與者根據喉鏡的亮度、視覺清晰度、視覺功效和光線的合適性及充分性對他們的體驗進行評級。在相同的這幾組光線水準下用標準的字母視力表圖測量了參與者的遠距視力。

結果：在人體模型及視力表上的視敏度與 lux 水準（P<0.0001）增長相關聯。在 700lux 下的視敏度較 50lux 及 200lux 下有顯著的增加，其程度顯著超過臨床可識別的 0.1 logMAR。當光強度增加到 2000lux 時，視敏度沒有統計學上的顯著改善。在人體模型視力表上，4 種所選光通量密度水準下的 logMAR 的平均值（標準差）分別爲：50lux 0.05（0.13）、200lux 0.06（0.10）、700lux -0.05（0.11）和 2000lux -0.07（0.11）。這個結果不受喉鏡檢查時年齡、資歷、亞專業、聚焦困難史和使用透鏡的影響。對喉鏡光度的主觀評價偏愛 2000lux，因爲其視覺清晰度、喉鏡檢查光照的合適性及視覺表現。直接喉鏡檢查的平均觀察距離爲 32cm。

結論：隨著喉鏡光照強度增加到 700lux，視敏度有所改善。當光強度增加到 2000lux 時，測量的視敏度沒有統計學上的顯著改善。主觀上，在直接喉鏡檢查時麻醉學醫師更加青睞 2000lux 的光照強度。

（趙曉 譯　馬皓琳 李士通校）

BACKGROUND: Adequate light is essential for vision during direct laryngoscopy. The ISO 7376:2009 standard specifies the minimal illuminance for laryngoscopes. No studies have objectively examined the relationship between laryngoscope illumination and visual acuity during laryngoscopy.

METHODS: We measured the near visual performance of 50 anesthesiologists during direct laryngoscopy using near vision charts located at the larynx of 4 manikins. A variable voltage supply adjusted the illuminance from the laryngoscope to 50 lux, 200 lux, 700 lux, and 2000 lux. Participants also rated their experience regarding brightness of the laryngoscope, clarity of view, visual performance, and suitability and adequacy of the light, before proceeding to the next manikin with a different light level. The distance visual performance of the participants was also measured using standard letter acuity wall charts at the same light levels.

RESULTS: Visual acuity in manikins and on wall charts was associated with an increasing lux level (P < 0.0001). Visual acuity was lower at 50 lux and 200 lux compared with 700 lux by significantly more than the clinically discernible 0.1 logMAR. No statistically significant improvement in visual acuity occurred when illuminance was increased to 2000 lux. The mean (standard deviation) logMAR scores at the 4 chosen lux levels on the manikin charts were: 50 lux 0.05 (0.13), 200 lux 0.06 (0.10), 700 lux –0.05 (0.11), and 2000 lux –0.07 (0.11). This result was unaffected by age, seniority, subspecialty, history of difficulty focusing, or use of lenses for laryngoscopy. Subjective rating of laryngoscope brightness favored 2000 lux for clarity of view, suitability of the light for laryngoscopy, and visual performance. The average observation distance for direct laryngoscopy was 32 cm.

CONCLUSIONS: Visual acuity improves as the laryngoscope illuminance increases up to 700 lux. No statistically significant improvement was measured by increasing the illuminance up to 2000 lux. Subjectively, anesthesiologists favor illuminance of 2000 lux for direct laryngoscopy.

困難氣道的拔管和拔管失敗

Extubation of the Difficult Airway and Extubation Failure

Laura F. Cavallone, MD and Andrea Vannucci, MD, DEAA
From the Department of Anesthesiology, Washington University in St. Louis, St. Louis, Missouri.

Anesth Analg February 2013 116:368-383

拔管後的呼吸系統併發症伴有顯著升高的患病率和死亡率，表明需要改善在該臨床領域的操作。自從實施困難氣道管理的指南以來，插管時呼吸系統副作用的發生率降低，這支持了在提高臨床實踐中教育和指南的價值。爲了對拔管相關併發症的處理加深理解和培養教育，對解釋定義和描述不同的臨床狀況的術語準確使用是最重要的。例如，理解了拔管失敗和離線失敗的區別就可以評估預拔管試驗的必要性，這些試驗集中評估氣道通暢和自主呼吸的能力。擇期手術後拔管後再插管相對少見，有報導稱在手術室和復蘇室再插管概率爲0.1%-0.45%，但在危重病人相當常見(0.4%-25%)。一些情況（諸如肥胖症、阻塞性睡眠呼吸暫停、大的頭/頸和上氣道手術、產科操作和頸椎手術）明顯增加了拔管失敗的風險，並且常伴有困難氣道管理。拔管失敗跟隨著上呼吸道開放的喪失。水腫、軟組織損傷和喉痙攣是上氣道堵塞的最常見機制。計畫拔管是成功氣道管理策略的關鍵部分，尤其是在拔管失敗風險增加的情況下和對有困難氣道的病人處理時。充分的計畫需要識別有或者可能發展成困難氣道的病人，認清拔管後氣道塌陷風險增加的情況，並且明白拔管失敗的原因和基本機制。爲最大程度減少拔管後氣道併發症，有效的措施應包括患者狀況的預先最優化、拔管合適的時機、有訓練過較高水準氣道管理的有經驗人員及可用必須的設備和適當的拔管後監測。

（王曉莉 譯 馬皓琳 李士通 校）

Respiratory complications after tracheal extubation are associated with significant morbidity and mortality, suggesting that process improvements in this clinical area are needed. The decreased rate of respiratory adverse events occurring during tracheal intubation since the implementation of guidelines for difficult airway management supports the value of education and guidelines in advancing clinical practice. Accurate use of terms in defining concepts and describing distinct clinical conditions is paramount to facilitating understanding and fostering education in the treatment of tracheal extubation-related complications. As an example, understanding the distinction between extubation failure and weaning failure allows one to appreciate the need for pre-extubation tests that focus on assessing airway patency in addition to evaluating the ability to breathe spontaneously. Tracheal reintubation after planned extubation is a relatively rare event in the postoperative period of elective surgeries, with reported rates of reintubation in the operating room and postanesthesia care unit between 0.1% and 0.45%, but is a fairly common event in critically ill patients (0.4%–25%). Conditions such as obesity, obstructive sleep apnea, major head/neck and upper airway surgery, and obstetric and cervical spine procedures carry significantly increased risks of extubation failure and are frequently associated with difficult airway management. Extubation failure follows loss of upper airway patency. Edema, soft tissue collapse, and laryngospasm are among the most frequent mechanisms of upper airway obstruction. Planning for tracheal extubation is a critical component of a successful airway management strategy, particularly when dealing with situations at increased risk for extubation failure and in patients with difficult airways. Adequate planning requires identification of patients who have or may develop a difficult airway, recognition of situations at increased risk of postextubation airway compromise, and understanding the causes and underlying mechanisms of extubation failure. An effective strategy to minimize postextubation airway complications should include preemptive optimization of patients' conditions, careful timing of extubation, the presence of experienced personnel trained in advanced airway management, and the availability of the necessary equipment and appropriate postextubation monitoring.

椎管內鎮痛分娩及其對哺乳的影響：目前知識的局限性

Intrapartum Neuraxial Analgesia and Breastfeeding Outcomes: Limitations of Current Knowledge

Ashley L. Szabo, MD
From Case Western Reserve University School of Medicine, Cleveland, Ohio. ALS is currently a Preliminary Internal Medicine intern at University Hospitals Case Medical Center, Cleveland, Ohio.

Anesth Analg February 2013 116:399-405

儘管大量的研究闡釋了椎管內鎮痛分娩（特別是硬膜外使用芬太尼）和哺乳之間的關係，但是研究設計的主要局限妨礙了當前的文獻提供有力的有臨床意義的結論。缺乏隨機對照實驗，研究過程中對於哺乳缺乏標準化評價，及無法控制的混雜變數都構成很大問題。椎管內阿片藥使用與哺乳之間的具體關係仍需要進一步研究來闡釋。如果兩者之間有顯著關係，那麼是否這些藥物直接作用於新生兒的腦組織從而減少哺乳行爲的表現。在本綜述中，我將具體指出目前文獻的不足並對今後的研究提出建議。
（王贇 譯 馬皓琳 李士通 校）

Although numerous studies have addressed the relationship between intrapartum neuraxial analgesia, particularly epidural fentanyl, and breastfeeding, substantial study design limitations have precluded the current literature from furnishing strong, clinically significant conclusions. Lack of randomized controlled trials, nonstandardization of breastfeeding evaluations across studies, and failure to control for confounding variables all pose significant problems. Further research is needed to elucidate the specific relationship between neuraxial opioids and breastfeeding and, if there are significant associations, whether these drugs act directly on neonatal brain tissue to attenuate exhibition of breastfeeding behaviors. In this review, I will detail the deficiencies of the current literature and make recommendations for future research.

非頸動脈大血管手術中圍術期卒中的發生率、預測因數及預後

Incidence, Predictors, and Outcomes of Perioperative Stroke in Noncarotid Major Vascular Surgery

Milad Sharifpour, MD, MS*, Laurel E. Moore, MD*, Amy M. Shanks, MS*, Thomas J. Didier, MD*, Sachin Kheterpal, MD, MBA*and George A. Mashour, MD, PhD*
From the *Department of Anesthesiology, University of Michigan Medical School, Ann Arbor, MI.

Anesth Analg February 2013 116:424-434

背景：圍術期卒中是手術的一個潛在的災難性的併發症。行血管手術的病人遭受著全身動脈粥樣硬化，並且預計此併發症風險增加。我們使用美國外科學院國家品質改進專案資料庫來研究非頸動脈大血管手術後圍術期卒中的發生率、預測因數及預後。
方法：我們從美國外科學院國家品質改進專案資料庫中確認了2005至2009年間在非退伍軍人管理醫院中行非頸動脈血管手術的47750名病人。我們對行擇期下肢截肢、下肢血管重建或開放性主動脈手術的病人進行了分析，以確定圍術期卒中的發生率、獨立預測因數以及30天死亡率。
結果：手術後30天圍術期卒中（n = 37,927）的總體發生率爲0.6%。多變數分析顯示年齡每增加1歲[比值比 1.02，95%可信區間(CI) (1.01~1.04)]、心臟病史[1.42，(1.07~1.87)]、女性[1.47，(1.12~1.93)]、腦血管疾病史[1.72，(1.29~2.29)]、以及急性腎功能衰竭或透析依

賴[2.03，(1.39~2.97)]是卒中的獨立預測因數。只有15%(95% CI, 11%–20%)的卒中發生在手術後的第0或1天。在一個對比研究評估中，圍術期卒中使30天全因死亡率[3.36，(1.77至 6.36)] 增加3倍，並使平均外科住院時間由6 (95% CI，2~28) 天增加到13 (95% CI，3~43)天(P < 0.001，WMWodds 2.5，95% CI，2.0~3.2)。

結論：顯著增加的平均外科住院時間和30天全因死亡率反映出圍術期卒中是發病率和死亡率的一個重要來源。在這個群體中，我們已確定卒中的獨立預測因數不容易改變以及大多數的卒中發生在術後第一天。還需要進一步研究來確定潛在的可改變的圍術期卒中的術中及術後風險因素。

（唐瑩 譯 馬皓琳 李士通 校）

BACKGROUND: Perioperative stroke is a potentially catastrophic complication of surgery. Patients undergoing vascular surgery suffer from systemic atherosclerosis and are expected to be at increased risk for this complication. We studied the incidence, predictors, and outcomes of perioperative stroke after noncarotid major vascular surgery using the American College of Surgeons National Quality Improvement Program database.

METHODS: Forty-seven thousand seven hundred fifty patients undergoing noncarotid vascular surgery from 2005 to 2009 at nonVeterans Administration hospitals were identified from the American College of Surgeons National Quality Improvement Program database. An analysis of patients undergoing elective lower extremity amputation, lower extremity revascularization, or open aortic procedures was performed to determine the incidence, independent predictors, and 30-day mortality of perioperative stroke.

RESULTS: The overall incidence of perioperative stroke within 30 days of surgery (n = 37,927) was 0.6%. Multivariate analysis revealed that each 1-year increase in age [odds ratio 1.02, 95% confidence interval (CI) (1.01 to 1.04)], cardiac history [1.42, (1.07 to 1.87)], female sex [1.47, (1.12 to 1.93)], history of cerebrovascular disease [1.72, (1.29 to 2.29)], and acute renal failure or dialysis dependence [2.03, (1.39 to 2.97)] were independent predictors of stroke. Only 15% (95% CI, 11%–20%) of strokes occurred on postoperative day 0 or 1. Perioperative stroke was associated with a 3-fold increase in 30-day all-cause mortality [3.36, (1.77 to 6.36)] and an increased median surgical length of stay from 6 (95% CI, 2 to 28) to 13 (95% CI, 3 to 43) days (P < 0.001, WMWodds 2.5, 95% CI, 2.0 to 3.2) in a matched-cohort assessment.

CONCLUSION: Perioperative stroke is an important source of morbidity and mortality, as reflected by significant increases in median surgical length of stay and all-cause 30-day mortality. The independent predictors of stroke that we have identified in this population are not readily modifiable and the majority of strokes occurred after postoperative day 1. Additional studies are required to identify potentially modifiable intraoperative or postoperative risk factors of perioperative stroke.

影響做出參加臨床麻醉研究工作決定的主要因素

Determinants of a Subject's Decision to Participate in Clinical Anesthesia Research

Naraida Balajonda, MD, MHSc, Tiffany L. Bisanar, RN, Joseph P. Mathew, MD, MHSc, Herbert Pang, PhD and Corrine I. Voils, PhD

From the Department of Anesthesiology, Duke University Medical Center, Durham, North Carolina.

Anesth Analg February 2013 116:448-454

背景：調查研究中最優先考慮的事是確保潛在的參于者得到充分的資訊以做出有見識的決定。理解招募過程中的患者經歷可能明確知情同意過程中的改進部分。我們調查哪些因素與做出參加臨床調查研究決定有關。
方法：那些被安排行擇期手術的患者在正要同意參加麻醉相關調查研究後立刻被要求完成一份關於知情同意過程的問卷。該問卷收集了社會人口特徵、術前焦慮壓抑水準、醫學合併症、可能影響做出參加一項調查研究的決定的因素以及研究的設計特徵。估計出一個多變數的邏輯回歸模型以鑒別與取得同意有關的影響因素。使用受試者工作特徵曲線評估預測模型的表現。用引導程式分析來評估內部有效性。
結果：總共有282名參試者完成了問卷。其中，有179名(63%)患者已同意參加研究，103名(37%)患者已拒絕參加。在多變數邏輯回歸模型中，男性同意參加的比例高於女性(優勢比[OR] [95%可信區間] = 2.49 [1.29–4.79])，舒適患者同意參加的比例也較高(OR = 1.84 [1.22–2.78])。對於需要附加測試的方案(OR = 0.15 [0.06–0.39])、對取血樣關注度較高患者(OR = 0.70 [0.54–0.90])以及擔憂研究風險的患者(OR = 0.72 [0.55–0.95])，同意參加的比例均較低。引導程式分析證實了這是個有較高內部有效性的穩定模型。
結論：取得知情同意的最強的兩個預測因素是男性和舒適度，拒絕的預測因素包括需要附加測試的方案類型、對采血樣和研究風險的較高關注以及參加研究可導致的較低的總體患者舒適度。這些患者和研究的特點可能提示需修改臨床調查研究的知情同意過程和促進更精確的入選設想和策略的改進。
（方斌 譯 馬皓琳 李士通校）

BACKGROUND: A top priority for research studies is to ensure that potential participants receive adequate information to make a truly informed decision. Understanding patient experiences with the recruitment process may identify areas for improvement in the consent process. We examined which factors were associated with the decision to consent in a clinical research study.
METHODS: Patients scheduled for elective surgery were asked to complete a questionnaire about the consent process, immediately after being approached to participate in an anesthesia-related research study. Sociodemographic characteristics, preoperative levels of anxiety and depression, medical comorbidities, factors that may affect decision to participate in a research study, and study design features were collected. A multivariable logistic regression model was estimated to identify factors associated with providing consent. Performance of the prediction model was assessed using the receiver operating characteristic curve. Internal validity was assessed by a bootstrap analysis.
RESULTS: In all, 282 participants completed the questionnaire. Of those, 179 (63%) had consented to participate in research, and 103 (37%) had declined to participate. In the multivariable logistic regression model, the odds of providing consent were higher for males (odds ratio [OR] [95% confidence interval] = 2.49 [1.29–4.79]) and for patients with higher levels of patient comfort (OR = 1.84 [1.22–2.78]). The odds of providing consent were lower for protocols that require additional testing (OR = 0.15 [0.06–0.39]) and patients with higher levels of concern about blood sampling (OR = 0.70 [0.54–0.90]) or worry about study risks (OR = 0.72 [0.55–0.95]). Bootstrap analysis revealed a stable model with high internal validity.
CONCLUSIONS: The 2 strongest predictors of consent were male gender and comfort; predictors of refusal were protocol type that requires additional testing, greater concern about blood sampling and study risks, and lower overall patient comfort with the study. These patient

and study characteristics may inform modification of the consent process for clinical research studies and facilitate the development of more accurate enrollment projections and strategies.

糖原合酶激酶-3β 通過調節 N-甲基-d-天冬氨酸受體運輸促進瑞芬太尼誘導的術後痛覺過敏

Glycogen Synthase Kinase-3β Contributes to Remifentanil-Induced Postoperative Hyperalgesia via Regulating N-Methyl-d-Aspartate Receptor Trafficking

Yuan Yuan, MD, PhD, Jing-yao Wang, MD, Fang Yuan, MD, Ke-liang Xie, MD, Yong-hao Yu, MD, PhD and Guo-lin Wang, MD
From the Department of Anesthesiology, Tianjin Medical University General Hospital, Tianjin, China.
Anesth Analg February 2013 116:473-481

背景：儘管瑞芬太尼有極佳的術中鎮痛效果，但給予瑞芬太尼後的術後痛覺過敏對麻醉醫師而言可能是個棘手的問題。N-甲基-d-天冬氨酸（NMDA）受體的運輸和活化對瑞芬太尼誘導的術後痛覺過敏的發生和維持起關鍵作用。然而，關於痛覺過敏的基礎機制尚未明確闡明。本研究旨在驗證如下假說：糖原合酶激酶-3β（GSK-3β）可通過調節脊髓 NMDA 受體運輸促進瑞芬太尼誘導的術後痛覺過敏。
方法：本研究使用大鼠瑞芬太尼誘導的術後痛覺過敏模型，首先測試了基線（切皮前24小時）以及瑞芬太尼輸注後2、6、24和48小時時的熱刺激和機械刺激痛覺過敏。隨後，用即時聚合酶鏈反應和蛋白質印跡分析來檢測脊髓 L4到 L6節段中的 GSK-3β mRNA 和蛋白表達水準，以及 NMDA 受體亞單位（NR1、NR2A 和 NR2B）的運輸。此外，我們還研究了 TDZD-8（一種選擇性 GSK-3β 抑制劑）對瑞芬太尼誘導的術後痛覺過敏和 NMDA 受體亞單位運輸的作用。
結果：瑞芬太尼導致了顯著的術後痛覺過敏，表現爲熱刺激和機械刺激縮足反應潛伏期和閾值增加，TDZD-8預處理顯著改善這一效應。此外，瑞芬太尼輸注增加了脊髓中 GSK-3β 的活性及其 mRNA 和蛋白質的表達。更重要的是，術中輸注瑞芬太尼增加了脊髓 NMDA 受體亞單位（NR1和 NR2B）從細胞內池到細胞表面池的運輸，TDZD-8明顯減弱這一效應。
結論：以上結果提示，脊髓中 GSK-3β 的活化可通過調節 NMDA 受體亞單位（NR1和 NR2B）運輸來促進瑞芬太尼誘導的術後痛覺過敏。抑制 GSK-3β 可能成爲治療瑞芬太尼誘導的術後痛覺過敏的有效新選擇。
（陳彬彬 譯， 馬皓琳、李士通 校）

BACKGROUND: Although remifentanil provides perfect analgesia during surgery, postoperative hyperalgesia after remifentanil administration might be a challenge to anesthesiologists. The trafficking and activation of N-methyl-d-aspartate (NMDA) receptors have a pivotal role in the development and maintenance of remifentanil-induced postoperative hyperalgesia. However, the underlying mechanisms of hyperalgesia are poorly elucidated. We designed the present study to examine the hypothesis that glycogen synthase kinase (GSK)-3β could contribute to remifentanil-induced postoperative hyperalgesia via regulating NMDA receptor trafficking in the spinal cord.
METHODS: Using a rat model of remifentanil-induced postoperative hyperalgesia, we first tested thermal and mechanical hyperalgesia at baseline (24 hours before incision) and 2, 6, 24, and 48 hours after remifentanil infusion. GSK-3β mRNA and protein expression and NMDA

receptor subunits (NR1, NR2A, and NR2B) trafficking in the spinal cord L4-L6 segments were then measured using real-time polymerase chain reaction and Western blot analysis. Furthermore, we investigated the effects of TDZD-8, a selective GSK-3β inhibitor, on remifentanil-induced postoperative hyperalgesia and NMDA receptor subunits trafficking.
RESULTS: Remifentanil induced significant postoperative hyperalgesia, as indicated by increased paw withdrawal latencies and thresholds to thermal and mechanical stimulation, which were markedly improved by pretreatment with TDZD-8. Moreover, remifentanil infusion increased the expression of GSK-3β mRNA and protein as well as the GSK-3β activity in the spinal cord. More importantly, intraoperative infusion of remifentanil increased NMDA receptor subunits (NR1 and NR2B) trafficking from the intracellular pool to surface pool in the spinal cord, which was significantly attenuated by TDZD-8.
CONCLUSION: The above results suggest that activation of GSK-3β contributes to remifentanil-induced postoperative hyperalgesia via regulating NMDA receptor subunits (NR1 and NR2B) trafficking in the spinal cord. Inhibition of GSK-3β may be an effective novel option for the treatment of remifentanil-induced postoperative hyperalgesia.

左布比卡因對傷口癒合的影響

Effects of Levobupivacaine on Wound Healing

Sezgin Zeren, MD*, Sevgi Kesici, MD†, Ugur Kesici, MD‡, Salim Isbilir, MD§, Ulku Aygen Turkmen, MD ‖ , Hulya Ulusoy, MD¶, Vildan Karpuz, MD#, Omer Ozcan, MD**, Erdal Polat, MD††, Osman Metin Ipcioglu, MD**and Musa Kazim Sari, MD*
Affiliations From the *Department of General Surgery, Okmeydani Training and Research Hospital, Istanbul; †Department of Anaesthesiology and Reanimation, Kanuni Training and Research Hospital, Trabzon; ‡Department of General Surgery, Akcaabat Hackali Baba State Hospital, Trabzon; §Department of Biochemistry, Gulhane Military Medical Academy, Haydarpasa Training Hospital, Istanbul; ‖ Department of Anesthesiology and Reanimation, Okmeydani Training and Research Hospital, Istanbul; ¶Department of Anesthesiology and Reanimation, Faculty of Medicine, Karadeniz Technical University, Trabzon, Turkey; #Department of Pathology, University of Science, Istanbul; **Department of Biochemistry, Gulhane Military Medical Academy, Haydarpasa Training Hospital, Istanbul; and ††Department of Microbiology and Clinical Microbiology, University of Istanbul, Cerrahpasa Faculty of Medicine, Istanbul, Turkey.
Anesth Analg February 2013 116:495-499

背景：沿手術切口注射局麻藥可用於提供外科手術麻醉或者術後鎮痛。然而，局麻藥對於傷口癒合的影響仍存在爭議。在此項研究中，我們評估了左布比卡因對於傷口癒合的影響。
方法：我們將 60 只體重在 230±20g 的 Wistar 白化雌性大鼠進行分組，每組 10 只：早期 C（早期對照）組：3ml 等滲鹽水；早期 L1.25（早期左布比卡因 1.25）組：3ml 中含 1.25 mg/kg 左布比卡因；早期 L2.5（早期左布比卡因 2.5）組：3ml 中含 2.5 mg/kg 左布比卡因；晚期 C（晚期對照）組：3ml 等滲鹽水；晚期 L1.25（晚期左布比卡因 1.25）組：3ml 中含 1.25 mg/kg 左布比卡因；晚期 L2.5（晚期左布比卡因 2.5）組：3ml 中含 2.5 mg/kg 左布比卡因。早期 C 組至早期 L2.5 組的大鼠在第八天處以安樂死。晚期 C 組至晚期 L2.5 組的大鼠在第 21 天被處以安樂死。我們分別檢測了傷口張力強度、組織羥基脯氨酸以及組

織樣本中的纖維化指數水準，早期 C 至早期 L2.5 組在第 8 天時、晚期 C 組至晚期 L2.5 組在第 21 天時檢測。
結果：左布比卡因在第 8 天時降低了傷口張力強度，尤以劑量在 2.5mg/kg 爲著（P < 0.001)，而在第 21 天時會使得其增加(P < 0.001)。無論是在第 8 天還是第 21 天，它也都會增加炎症反應(P < 0.001)以及膠原合成（第 8 天，P = 0.109; 第 21 天, P = 0.103)。
結論：雖然左布比卡因在傷口癒合的早期具有正面效應，但此後被觀察到有負面效應。要確定這些明顯相反效應發生的原因需要在分子水準上的進一步研究。
（余亦南 譯 馬皓琳 李士通 校）

BACKGROUND: Local anesthetic infiltration along the incision may be used to provide surgical anesthesia or postoperative analgesia. However, the effect of local anesthetics on wound healing remains controversial. In this investigation, we evaluated the effects of levobupivacaine on wound healing.
METHODS: Sixty Wistar albino female rats weighing 230 ± 20 g were included, with 10 rats in each group: group early c (early control): 3 mL isotonic saline; group early $l_{1.25}$ (early levobupivacaine 1.25): 1.25 mg/kg per 3 mL levobupivacaine; group early $l_{2.5}$ (early levobupivacaine 2.5): 2.5 mg/kg per 3 mL levobupivacaine; group late c (late control): 3 mL isotonic saline; group late $l_{1.25}$ (late levobupivacaine 1.25): 1.25 mg/kg per 3 mL levobupivacaine; and group late $l_{2.5}$ (late levobupivacaine 2.5): 2.5 mg/kg per 3 mL levobupivacaine. Rats in groups early c to early $l_{2.5}$ were euthanized on the 8th day. Rats in groups late c to late $l_{2.5}$ were euthanized on the 21st day. Wound tension strength, tissue hydroxyproline, and fibrotic index levels of the tissue samples from the early c and early $l_{2.5}$ and late c and late $l_{2.5}$ groups, respectively, on the 8th and 21st days were examined.
RESULTS: Levobupivacaine decreased wound tension strength on the 8th day, especially a 2.5 mg/kg dose (P < 0.001), and increased it on the 21st day (P < 0.001). It also increased the inflammatory response (P < 0.001) and collagen synthesis (8th day, P = 0.109; 21st day, P = 0.103) on both the 8th and 21st days.
CONCLUSIONS: While levobupivacaine had a positive effect on wound healing during the early period, negative effects were observed thereafter. Additional studies at the molecular level are necessary to determine the cause of these apparently opposite effects.

等長測力計在預測腰麻下日間手術病人的術後活動恢復情況優於 Bromage 評分

Isometric Force Dynamometer Is Superior to Bromage Score in Prediction of Patients' Ambulation After Spinal Anesthesia in Ambulatory Surgeries

Roshdi R. Al-Metwalli, MD, Hany A. Mowafi, MD, Haitham A. Abouzaid, MD, Mohammed Al-Maghrabi, MD, Talal Al-Brahim, MBBch and Wesam F. Mousa, MD
From the Department of Anesthesiology, Faculty of Medicine, University of Dammam, Dammam, Saudi Arabia.
Anesth Analg February 2013 116:312-316;

背景：本文研究目的是用一個肌力定量測量方法來確定病人是否可以在鞘內麻醉後進行安全獨立活動。
方法：20名 ASA I 和 II 級、接受腰麻下擇期會陰部手術或下腹部手術的病人被選作研究物件。選用重比重布比卡因10mg 進行腰麻。每隔15min 分別使用 Bromage 評分和膝、

髖、踝屈肌等長收縮測量來定性和定量評估運動阻滯的恢復情況，直至患者能夠獨立活動。
結果：在所有測試的關節中，Bromage 評分的恢復速度較等長收縮力的恢復速度更快。當 Bromage 評分中位數達到0（沒有運動阻滯時），膝、髖、踝肌力恢復的平均值±標準差分別爲28.2% ± 16%、 45.5% ± 24%和 56.3% ± 28 %，只有6名患者（30%，95%可信區間10%-53%）能夠獨立行走。75min 後，90%患者（95%可信區間56%-99%）能夠獨立行走，此時膝、髖、踝肌力恢復值分別是63.6% ± 20%、82.1% ± 27%和 90.2% ± 24%。在不同關節水準，等長收縮得出的受試者工作特性曲線下面積較 Bromage 評分得出的更高（P<0.001）。另一方面，在蛛網膜下腔阻滯後通過不同關節等長收縮的測量來預測病人獨立行走方面是有效的，膝、髖、踝的預測概率分別是0.901,0.948和0.958，而相比之下，Bromage 評分的預測概率只有0.752（P<0.001）
結論：作爲腰麻後預測病人安全活動能力的方法，定量測量膝、髖、踝屈肌肌力的恢復程度比定性測量的 Bromage 評分更精確、更優。此方法應被推薦用於小劑量麻醉劑使用後對運動阻滯的評估。
（詹愷誕　譯　陳傑　校）
BACKGROUND: The aim of our study was to use a quantitative measure of muscle strength to identify the muscle power at which the patient can safely ambulate unassisted after spinal anesthesia.
METHODS: Twenty ASA physical status I and II patients undergoing elective perineal or lower abdominal surgery under spinal anesthesia were enrolled in the study. Spinal anesthesia was conducted using 10 mg heavy bupivacaine. The regression of motor block was assessed both qualitatively using the Bromage score and quantitatively by measuring the isometric contraction of the knee, hip, and ankle flexors every 15 minutes until the patient was able to ambulate unassisted.
RESULTS: The rate of regression of the Bromage score was faster than regression of the isometric forces at all tested joints. As the median Bromage score reached 0 (no motor blockade), the mean ± SD motor power recoveries at the knee, hip, and ankle were 28.2% ± 16%, 45.5% ± 24%, and 56.3% ± 28 %, respectively, and only 6 of 20 patients (30%, 95% confidence interval 10%–53%) were able to walk unassisted. After 75 minutes passed, 90% of the patients (95% confidence interval 56%–99%) were able to walk unassisted with mean motor power recovery of 63.6% ± 20%, 82.1% ± 27%, and 90.2% ± 24% at the knee, hip, and ankle, respectively. The area under the receiver operating characteristic curves was significantly higher with isometric contraction at different joints than the Bromage score ($P < 0.001$). In addition, isometric contraction at different joints was effective in predicting the patients' ability to walk unassisted after subarachnoid block with prediction probabilities of 0.901, 0.948, and 0.958 for the knee, hip, and ankle, respectively, as compared with 0.752 for the Bromage score ($P < 0.001$).
CONCLUSION: Quantitative measurement of the degree of recovery of the motor power of the knee, hip, or ankle flexors is more accurate and superior to the qualitative Bromage score, as a predictor of the patient's ability to safely ambulate after spinal anesthesia. This may be recommended when assessing motor block when small-dose anesthetic solutions are used.

急診室中使用一種無創血紅蛋白監測進行容量動力學分析

The Use of a Noninvasive Hemoglobin Monitor for Volume Kinetic Analysis in an Emergency Room Setting

Fredrik Sjöstrand, MD, PhD*†, Peter Rodhe, PhD, MSc‡, Ellinor Berglund, RN‡, Niclas Lundström, Research Fellow‡ and Christer Svensen, MD, PhD‡
From the *Karolinska Institutet, Department of Clinical Science and Education, Södersjukhuset and Section of Emergency Medicine, Södersjukhuset, Stockholm, Sweden; †Department of Geriatrics & Internal Medicine, Södertälje Hospital, Stockholm, Sweden; and ‡Karolinska Institutet, Södersjukhuset, Stockholm.
Anesth Analg February 2013 116:337-342

背景：單次快速注射液體的分佈和清除可以通過基於容量動力學方程的重複採樣觀察血紅蛋白（tHb）變化來研究。Pulse CO-oximetry，一項新的監測手段，即連續無創監測血紅蛋白濃度（SpHb），將極大地促進容量動力學參數在科學研究和臨床上的應用。本研究考察在急診室設置中 SpHb 的連續測量是否可以用來計算單次快速注射液體的分佈容積（V）和清除率（CL）。
方法：本文對因各種病因收治於一家三級醫療中心急診室，含2個年齡組的患者進行的一項前瞻性、觀察性的研究。在患者雙臂置入靜脈導管分別用於通過一個緩衝的晶體葡萄糖液輸注誘導血漿容量擴張，及在輸注開始後第0, 5, 10, 15, 30, 45, 60, 75,90min 抽取靜脈血標本進行 tHb 分析。在進行這些干預措施同時，採用 Pulse CO-oximetry 監測儀觀察 SpHb（Masimo Radical-7, Rev E ReSposable 感測器）。使用 Bland-Altman 圖來計算偏倚、精度和一致性界限，比較 SpHb 和有創 tHb 測量的準確性差異。使用容量動力學（液體藥代動力學）方程，測定分佈容積和清除率。
結果：30名患者（14名來自平均年齡30歲的青年組患者和16名來自平均年齡84歲的老年組患者）納入此次研究。當所有的資料匯總在一起，產生242個資料對且 SpHb 和 tHb 間偏倚爲-0.47（95%置信區間，-0.62到-0.32）。然而，其中5名患者因爲信號品質過低而被忽略，將剩下的193個血紅蛋白資料對做進一步分析。此時偏倚爲-0.24（95%置信區間，-0.39到-0.09）。偏倚表明該監測儀對 tHb 值略有低估。當低信號品質指示出現時，提示 SpHb 精確度下降。對27名物件進行了分佈容積和清除率計算。使用 tHb 或 SpHb 值來估計分佈容積，兩者沒有顯著差異。對清除率常數也進行了估計，但精確度比較低。
結論：本研究資料表明，在急診室使用 pulse CO-oximetry 監測儀測量的 SpHb 可用來計算液體的容量分佈。
（孫莉荔　譯　陳傑　校）
BACKGROUND: Distribution and clearance of an infused bolus can be studied by repetitive sampling of invasive total hemoglobin (tHb) using volume kinetic equations. Pulse CO-oximetry, a recent advancement in patient monitoring that allows for the continuous and noninvasive estimation of hemoglobin concentration (SpHb), would greatly facilitate the scientific and clinical use of the volume kinetic parameters. In the present study, we examined whether serial measurements of SpHb in an emergency room setting can be used to calculate distribution volume (V) and clearance (Cl) rate of an infused bolus.
METHODS: This was a prospective, observational study of patients in 2 age groups admitted for various reasons to the emergency room of a tertiary care center. IV catheters were placed in both arms of the subjects to induce plasma volume expansion by infusion of a buffered crystalloid glucose solution and for withdrawing venous blood samples for analysis of tHb at 0, 5, 10, 15, 30, 45, 60, 75, and 90 minutes after start of infusion. During these interventions, subjects were simultaneously monitored by pulse CO-oximetry for measurement of SpHb (Masimo Radical-7, Rev E ReSposable Sensor). Bias, precision, and limits of agreement were calculated

in Bland-Altman plots to compare the accuracy of SpHb with invasive tHb measurements. Using volume kinetic (pharmacokinetics for fluids) equations, V and Cl were determined.
RESULTS: Thirty patients (14 from the young group with a mean age of 30 years, and 16 from the geriatric group with mean age of 84 years) were enrolled in the study. When all data were included, this yielded 242 data pairs with a bias of −0.47 (95% confidence interval, −0.62 to −0.32) between SpHb and tHb. However, 5 patients were omitted because of low quality signals, leaving 193 hemoglobin data pairs for further analysis. Bias was then −0.24 (95% confidence interval, −0.39 to −0.09). The biases show that the device on average slightly underestimates tHb values. The precision of SpHb decreases when the low signal quality indicator is present. For the 27 subjects for whom the V and Cl were calculated, there were no significant differences in the estimation of the distribution volumes using either tHb or SpHb values. Clearance constants were also estimated, but with less accuracy.
CONCLUSIONS: Our data show that SpHb by pulse CO-oximetry may be used to calculate volume of distribution in an emergency room setting.

胃鏡檢查驗證一項用於超聲評估胃容積的數學模型

Validation of a Mathematical Model for Ultrasound Assessment of Gastric Volume by Gastroscopic Examination

Anahi Perlas, MD, FRCPC*, Nicholas Mitsakakis, M.Sc, PhD†, Louis Liu, MD, FRCPC‡, Maria Cino, MD, FRCPC‡, Nidhi Haldipur, BSc†, Liisa Davis, BSc, RDMS†, Javier Cubillos, MD† and Vincent Chan, MD, FRCPC, FRCA*
From the *Department of Anesthesia, University Health Network, University of Toronto, Toronto, Ontario, Canada; †Department of Anesthesia and Pain Management, University Health Network, Toronto, Ontario, Canada; and ‡Department of Medicine, Division of Gastroeneterology, University of Toronto, Toronto, Ontario, Canada. NM is currently at Toronto Health Economics and Technology Assessment Collaborative, University of Toronto, Toronto, Ontario, Canada.
Anesth Analg February 2013 116:357-363

背景：胃內容物返流誤吸是一種嚴重的圍術期併發症。先前超聲評估胃容積的模型只是些雛形，且未被 “金標準”所驗證。基於108位接受床邊胃超聲和上消化道內窺鏡檢查（UGE）患者的回顧性資料，本研究提出了一項更精確的模型。
方法：接受擇期 UGE 患者在禁食8小時後隨機從6個預定量的蘋果汁中攝取一種。在標準掃描協定指導下，一位元對研究不知情的超聲醫師對右側臥位患者進行胃竇部橫截面積（右側 CSA 位）測量。隨後，一位對研究不知情的胃腸病專家在 UGE 操作中在胃鏡直視下吸引胃內液體，並測量其體積，精確至毫升。
結果：108例患者資料表明以前報導的實驗模型過高估計胃容積，特別在低胃容量情況下。基於右側 CSA 體位的測量，提出了一項預計胃液量的最佳數學模型。這種新模型建立在更準確的金標準上，可以用於估計體重指數<40kg/m^{2}非妊娠成人0到500ml 的胃容量。
結論：本研究通過標準二維床邊超聲檢查，提出了一個評估胃液量體積的新型數學模型，與以前的模型相比此模型有一些優勢。
（王苑　譯　陳傑　校）

INTRODUCTION: Pulmonary aspiration of gastric contents is a serious perioperative complication. Previous models of ultrasound gastric volume assessment are preliminary and have not been validated by an external "gold standard." In the present study we propose a more accurate model based on prospective data obtained from 108 patients undergoing bedside gastric sonography and upper gastrointestinal endoscopy (UGE).
METHODS: Patients undergoing elective UGE were randomized to ingest one of 6 predetermined volumes of apple juice after an 8-hour fasting period. A cross-sectional area of the antrum in the right lateral decubitus position (Right lat CSA) was measured by a blinded sonographer following a standardized scanning protocol. Gastric fluid was subsequently suctioned under gastroscopic vision during UGE performed by a blinded gastroenterologist and measured to the nearest milliliter.
RESULTS: Data from 108 patients suggest that a previously reported model tends to overestimate gastric volume particularly at low volume states. A new best fit mathematical model to predict gastric fluid volume based on measurements of Right lat CSA is presented. This new model built on a more accurate gold standard can be used to estimate gastric volumes from 0 to 500 mL, in nonpregnant adults with body mass index < 40 kg/m^2.
CONCLUSIONS: We report a new prediction model to assess gastric fluid volume using standard 2-dimentional bedside ultrasound that has several advantages over previously reported models.

妊娠期的馬凡氏綜合征：連續16例馬凡氏綜合征分娩的麻醉管理

Marfan's Syndrome During Pregnancy: Anesthetic Management of Delivery in 16 Consecutive Patients

Jerome Allyn, MD*†, Jean Guglielminotti, MD*†, Sophie Omnes, MD‡, Laila Guezouli, MD*, Michael Egan, MD*, Guillaume Jondeau, MD, PhD§, Dan Longrois, MD, PhD*† and Philippe Montravers, MD, PhD*†
From the *Département Anesthésie Réanimation, ‡Service de Gynécologie et Obstétrique, and §Service de Cardiologie, AP-HP, Hop Bichat-Claude Bernard, Paris; and †Univ Paris Diderot, Sorbonne Paris Cité, Paris, France.
Anesth Analg February 2013 116:392-398

背景：馬凡氏綜合征的特點是主動脈根部進行性的擴張。而妊娠則會加速主動脈擴張進程，從而增加病人患主動脈夾層的風險。而關於馬凡氏綜合征患者分娩的麻醉管理方面的文獻只有一些病例報導。因此本研究著立于在一個國立轉診中心對馬凡氏綜合征患者在分娩過程中麻醉管理的醫療記錄進行一項回顧性綜述
方法：對該機構所有馬凡氏綜合征孕婦隨訪6年的醫療記錄進行回顧。
結果：分析15名病人的16次妊娠過程，9名病人的主動脈根部最初的直徑大於40mm,而1名是超過45mm,而有2名病人由於耐受性差而在孕期沒有服用β受體阻滯劑，有1名主動脈根部直徑47mm的病人因爲轉送較晚而在懷孕33周後才服用的β受體阻滯劑。這名女患者在懷孕37周時發展爲急性I型主動脈夾層，被要求在全麻下接受急診剖宮產手術，之後同時接受主動脈修復手術。其他13名剖宮產的患者中，有1名接受鞘內麻醉，而其餘12名則是全麻。全麻管理包括密切的主動脈壓監測，避免高血壓，在分娩前給予阿片類藥物，和尼卡地平滴定給藥。有兩名患者（其中一名胎兒宮內死亡）在硬膜外鎮痛下進行陰道分娩。沒有孕產婦死亡。

結論:馬凡氏綜合征的孕婦如果在多學科三級醫療機構接受包括圍術期麻醉醫生積極參與下的治療，則預後較好。
（馬霄雯　譯　陳傑　校）
BACKGROUND: Marfan's syndrome is characterized by progressive dilatation of the aortic root. This dilatation is accelerated by pregnancy, exposing patients to an increased risk of aortic dissection. Literature on the anesthetic management of delivery in patients with Marfan's syndrome consists only of case reports. We therefore conducted a retrospective review of medical records focusing on anesthetic management of delivery in patients with Marfan's syndrome in a national referral center.
METHODS: We reviewed the medical records of all pregnant women with Marfan's syndrome who were followed at their institution over a 6-year period.
RESULTS: Sixteen pregnancies in 15 patients were analyzed. The initial aortic root diameter was larger than 40 mm in 9 patients and larger than 45 mm in 1 patient. Two patients did not receive β-blockers throughout pregnancy because of poor tolerance. One patient with an aortic root diameter of 47 mm did not receive β-blocker before 33 weeks' gestation because of late referral. This woman developed acute type 1 aortic dissection at 37 weeks, requiring emergency cesarean delivery under general anesthesia followed by aortic repair. Thirteen other patients underwent cesarean delivery, 1 under spinal anesthesia and 12 under general anesthesia. General anesthesia management included close arterial blood pressure monitoring, avoidance of high blood pressure, administration of opioids before delivery, and titrated nicardipine administration. Two patients (including one with intrauterine fetal death) underwent vaginal delivery under epidural analgesia. There were no maternal deaths.
CONCLUSIONS: Pregnant women with Marfan's syndrome who received care in a multidisciplinary tertiary care setting that included active peripartum involvement of anesthesiologists had good clinical outcomes.

顱面重建手術患兒中心靜脈壓監測的評估

Evaluation of Central Venous Pressure Monitoring in Children Undergoing Craniofacial Reconstruction Surgery

Paul A. Stricker, MD*, Elaina E. Lin, MD*, John E. Fiadjoe, MD*, Emily M. Sussman, BA*, Eric Y. Pruitt, BA*, Huaqing Zhao, PhD† and David R. Jobes, MD*
From the *Department of Anesthesiology and Critical Care Medicine, The Children's Hospital of Philadelphia, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, Pennsylvania, and †Biostatistics and Data Management Core, The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania.
Anesth Analg February 2013 116:411-419;

背景：顱面外科手術中大出血是常見的，往往導致血容量不足和低血壓。這項研究評估增加中心靜脈壓（CVP）的常規監測對術中低血壓發生率的影響並評價此人群中 CVP 和低血壓的關係。
方法：把從作者單位的前瞻性顱面圍術期登記表中所獲得的關於6至24個月，接受顱面重建並接受 CVP 監測的兒童資料與從一個歷史性佇列並未接受 CVP 監測獲得的資料進行比較。比較兩佇列中的低血壓的發生率和持續時間。觀察接受 CVP 監測佇列中發生過低血壓的患者，把其在低血壓發生時的 CVP（T0）、發生低血壓5分鐘前 CVP（T–5）和5分

鐘後 CVP（t + 5）與基線 CVP 進行比較。對低於基線值的不同 CVP 水準的持續時間和相關低血壓發生率同時進行考察。

結果：57名登記表受試者的資料與來自115名歷史佇列研究受試者的資料進行比較。CVP 佇列中經歷低血壓患者的低血壓平均總持續時間爲278秒而歷史佇列爲165秒；平均差異爲98秒（95%的可信區間，–45到345秒）。低血壓的發生率在 CVP 佇列中爲18%而歷史佇列爲21%；低血壓發生率的差異有-3%（95%的可信區間，-10%~15%）。採用線性混合效應模型分析顯示從 T-5到 T0，CVP 明顯降低（95% 的可信區間，-0.9至-2.2mmHg）；從 T0 到 T+5，CVP 顯著升高（95% 的可信區間，1-2.4mmHg）, 而 T–5和 T + 5兩點間的 CVP 無顯著差異（95% 的可信區間，–0.9-0.9mmHg）；從基線到 T0，CVP 顯著降低 (95%的可信區間，-3.4~-2.1mmHg)。在發生低血壓的案例中有97%是 T0時 CVP 低於基線 CVP。研究所有情況，CVP 低於基線水準≥3 mm Hg 占了研究總時間的16%，具有關聯性低血壓的發生率爲2%。

結論：常規 CVP 監測的實施並不降低大量出血人群低血壓發生率和低血壓持續時間。低血壓與 CVP 降低相關，低血壓的解決與升高 CVP 到低血壓前的水準有關。然而，CVP 顯著低於基線以下是常見的，並且通常不伴有低血壓。在這些兒童中把常規使用 CVP 監測作爲一種降低低血壓發生率和減少低血壓持續時間的手段，其作用是可疑的。

（鄭華容　譯　陳傑　校）

BACKGROUND: Massive hemorrhage during craniofacial surgery is common and often results in hypovolemia and hypotension. We conducted this study to assess the effect of the addition of routine central venous pressure (CVP) monitoring on the incidence of intraoperative hypotension and to evaluate the relationship between CVP and hypotension in this population.

METHODS: Data from our prospective craniofacial perioperative registry for children 6 to 24 months of age undergoing cranial vault reconstruction with CVP monitoring were compared with data from a historical cohort without CVP monitoring. The incidence and duration of hypotension in the 2 cohorts were compared. In the cohort of subjects with CVP monitoring who experienced hypotension, CVP at the onset of hypotension (T0) was compared with CVP 5 minutes before (T – 5) and 5 minutes after (T + 5) the onset of hypotension and with the baseline CVP. The amount of time spent at various CVP levels below the baseline, and the associated incidence of hypotension were also determined.

RESULTS: Data from 57 registry subjects were compared with data from 115 historical cohort subjects. The median total duration of hypotension in subjects experiencing hypotension was 278 seconds in the CVP cohort versus 165 seconds in the historical cohort; the median difference was 98 seconds (95% confidence interval [CI], –45 to 345 seconds). The incidence of hypotension was 18% in the CVP cohort versus 21% in the historical cohort; the difference in the incidence of hypotension was –3% (95% CI, –10% to 15%). Analysis using a linear mixed effects model showed a significant decrease in CVP from T – 5 to T0 (95% CI, –0.9 to –2.2 mm Hg), a significant increase in CVP from T0 to T + 5 (95% CI, 1.0–2.4 mm Hg), no significant difference in CVP between T – 5 and T + 5 (95% CI, –0.9 to 0.9 mm Hg), and a significant decrease in CVP from baseline to T0 (95% CI, –3.4 to –2.1 mm Hg). CVP at T0 was less than the baseline CVP in 97% of hypotensive episodes. When all cases were examined, CVP was ≥3 mm Hg below the baseline for 16% of the total time studied, with an associated incidence of hypotension of 2%.

CONCLUSIONS: The implementation of routine CVP monitoring was not associated with a decreased incidence and likely was not associated with a decreased duration of hypotension in

this population experiencing massive hemorrhage. Hypotension was associated with a decrease in CVP, and resolution of hypotension was associated with an increase in CVP to prehypotensive levels. However, significant decreases in CVP below the baseline were common and usually not associated with hypotension. The routine use of CVP monitoring in these children is of questionable utility as a means to decrease the incidence and duration of hypotension.

需手術治療的顱內出血病人酮咯酸的應用：一項佇列研究（2001-2010）內的病例對照研究

Intracranial Hemorrhage Requiring Surgery in Neurosurgical Patients Given Ketorolac: A Case-Control Study Within a Cohort (2001–2010)

Giuseppina Magni, MD, PhD*, Italia La Rosa, MD*, Guido Melillo, MD†, Damiano Abeni, MD, MPH†, Helssy Hernandez, MD* and Giovanni Rosa, MD*
From the *Department of Anesthesia and Intensive Care, Policlinico Umberto 1, University of Rome, La Sapienza, Rome; and †Istituto Dermopatico dell'Immacolata IRCCS, Rome, Italy.
Anesth Analg February 2013 116:443-447

背景：酮咯酸氨丁三醇（酮咯酸）是一種具有強力鎮痛和中等消炎作用的非鎮靜類藥物，且該效果不會提高鎮靜程度。針對其可能造成顱內出血的風險，酮咯酸的安全性已經由相當大數量經歷普外科手術的患者所驗證，但是缺乏對於神經外科病人的安全性可比資料。對正接受擇期神經外科治療並且使用酮咯酸作爲鎮痛治療的此類患者，本文研究其出現需手術治療出血症狀的風險。
方法：本研究將從2001年1月至2010年8月接受擇期顱內手術患者（剔除緊急手術，凝血疾病，有使用抗凝血劑或者非甾體類消炎藥歷史的患者）納入佇列分析，同時核實使用或未使用酮咯酸患者開顱術後顱內出血（ICH，由電腦斷層攝影術發現並且需要進行手術）的發生率。然後爲了控制潛在的混雜因素，在佇列研究中再進行一項"嵌套"的病例對照研究：研究病例爲定義爲 ICH 的患者；對照設爲以2:1比率匹配的非 ICH 患者。
結果：該佇列包含4086名開顱手術患者（平均年齡52.4 ± 14.3 歲, 2124 名男性, 占52%）。在1571名使用酮咯酸的患者中（平均劑量50 ± 15 mg/d），8名（0.5%）患者發生 ICH；在2515名沒有使用酮咯酸的患者中，35（1.3%）名患者發生 ICH（相對風險，0.37；95%置信區間爲0.17-0.79; *P* = 0.007）.在嵌套的病例對照研究中，組間酮咯酸給藥的校正比值比爲1.09（95%置信區間0.35-3.44；*P* = 0.88）。
結論：儘管對需手術治療的症狀性出血風險的校正估計和酮咯酸的使用幾乎沒有關係，但此研究結果可能無法重複，且置信區間的寬度也不能成爲擇期神經外科治療後酮咯酸安全性的有力證據。
（孫曉瓊　譯　陳傑　校）
BACKGROUND: Ketorolac tromethamine (ketorolac) is a nonsedating drug with potent analgesic and moderate anti-inflammatory activity, which does not increase the sedation level. The safety of ketorolac with respect to risk of bleeding has been demonstrated in large numbers of patients undergoing general surgery, yet comparable safety data for neurosurgical patients are lacking. We studied the risk of symptomatic bleeding requiring surgery in patients undergoing elective neurosurgical procedures who received ketorolac as analgesic therapy.
METHODS: We established a cohort of patients who had elective intracranial procedures from January 2001 to August 2010 (excluding patients with urgent surgery, coagulopathy, history of anticoagulant or nonsteroidal, anti-inflammatory drug therapy) and verified the occurrence of

postcraniotomy intracranial hemorrhage (ICH; detected by computed tomography and requiring surgery) in patients who received or did not receive ketorolac. Then, to control for potential confounders, we conducted a "nested" case-control study within the cohort: cases were defined as patients with ICH; controls were patients without ICH matched in a 2:1 ratio.
RESULTS: The cohort included 4086 craniotomy patients (mean age, 52.4 ± 14.3 years, 2124 male, 52%). Of the 1571 patients who received ketorolac (mean dosage, 50 ± 15 mg/d), 8 (0.5%) suffered ICH; of the 2515 patients who did not receive ketorolac, 35 (1.3%) had ICH (relative risk, 0.37; 95% confidence interval, 0.17–0.79; $P = 0.007$). In the nested case-control study, the adjusted odds ratio for ketorolac administration between the 2 groups was 1.09 (95% confidence interval, 0.35–3.44; $P = 0.88$).
CONCLUSION: Although the adjusted estimate for risk of symptomatic bleeding requiring surgery and ketorolac use is very close to the null effect, it may be not reproducible, and the width of the confidence interval is not conclusive evidence of the safety of ketorolac after elective neurosurgical procedures.

CB_1和 CB_2大麻素受體激動劑通過啓動內源性去甲腎上腺素能系統誘導產生外周鎮痛作用

CB_1 and CB_2 Cannabinoid Receptor Agonists Induce Peripheral Antinociception by Activation of the Endogenous Noradrenergic System

Thiago R. L. Romero, PhD, Livia C. Resende, MD, Luciana S. Guzzo, PhD and Igor D. G. Duarte, PhD
From the Department of Pharmacology, Institute of Biological Sciences, ICB-UFMG, Belo Horizonte, Minas Gerais, Brazil.
Anesth Analg February 2013 116:463-472

背景：大麻素受體激動劑引起去甲腎上腺素在中樞、脊髓及外周部位的釋放。前期研究表明大麻素和腎上腺素能反應系統在鎮痛方面存在相互作用。此項研究試圖驗證 CB_1、CB_2大麻素受體激動劑和 N-棕櫚醯乙醇胺（PEA），是否可以分別地通過腎上腺素能機制產生外周鎮痛作用。
方法：在雄性 Wistar 大鼠的右後爪局部給藥。大鼠爪壓力試驗通過足墊注射2ug 前列腺素 E2產生痛覺增敏來實現。
結果：大麻素劑量在12.5ng/爪, 25ng/爪和50ng/爪產生的局部外周鎮痛作用可分別被20μg/爪,40μg/爪和80μg/爪的 CB_1受體拮抗劑 AM251拮抗，但即使100 μg/爪的 CB_2受體拮抗劑 AM630也無法拮抗大麻素的鎮痛作用。而 PEA 劑量在5μg/爪,10μg/爪和20μg/爪產生的鎮痛作用可被25 μg/爪，50 μg/爪和100 μg/爪的 CB_2受體拮抗劑 AM630拮抗，但80 μg/爪的 AM251卻無法拮抗。上述劑量的大麻素或 PEA 產生的鎮痛作用可分別被5μg/爪, 10μg/爪和20μg/爪的非選擇性 α_2腎上腺素能受體拮抗劑育亨賓和10μg/爪, 15μg/爪和20μg/爪的選擇性 α_{2C} 受體拮抗劑蘿芙藤拮抗，但卻不能被20μg/爪的選擇性 α_{2A},α_{2B} 和 α_{2D} 受體亞型拮抗劑拮抗。同時相同劑量的大麻素的鎮痛作用也可以被0.5μg/爪，1μg/爪和2μg/爪的非選擇性 α_1受體拮抗劑呱唑嗪及150ng/爪, 300ng/爪和 600ng/爪的非選擇性 β 受體拮抗劑普萘洛爾拮抗。胍乙啶可使外周擬交感神經遞質耗竭（每只大鼠30 mg/kg，一天一次，持續3天），還原約70%的大麻素和 PEA 的外周鎮痛作用。此外，快速注射30 μg/爪的去甲腎上腺素再吸收抑制劑瑞波西汀，可增強小劑量大麻素（12.5ng/爪）和 PEA（5μg/paw）的鎮痛作用。

結論：這項研究爲大麻素和 PEA 通過分別啓動 CB_1和 CB_2大麻素受體，刺激內源性去甲腎上腺素的釋放，啓動外周腎上腺素能受體產生鎮痛作用提供依據。
（諸琳婕　譯　陳傑　校）

BACKGROUND: Cannabinoid agonists induce norepinephrine release in central, spinal, and peripheral sites. Previous studies suggest an interaction between the cannabinoid and adrenergic systems on antinociception. In this study, we sought to verify whether the CB_1 and CB_2 cannabinoid receptor agonists anandamide and N-palmitoyl-ethanolamine (PEA), respectively, are able to induce peripheral antinociception via an adrenergic mechanism.
METHODS: All drugs were administered locally into the right hindpaw of male Wistar rats. The rat paw pressure test was used, with hyperalgesia induced by intraplantar injection of prostaglandin E_2 (2 μg).
RESULTS: Anandamide, 12.5 ng/paw, 25 ng/paw, and 50 ng/paw elicited a local peripheral antinociceptive effect that was antagonized by CB_1 cannabinoid receptor antagonist AM251, 20 μg/paw, 40 μg/paw, and 80 μg/paw, but not by CB_2 cannabinoid receptor antagonist AM630, 100 μg/paw. PEA, 5 μg/paw, 10 μg/paw, and 20 μg/paw, elicited a local peripheral antinociceptive effect that was antagonized by AM630, 25 μg/paw, 50 μg/paw, and 100 μg/paw, but not by AM251, 80 μg/paw.
Antinociception induced by anandamide or PEA was antagonized by the nonselective α_2 adrenoceptor antagonist yohimbine, 05 μg/paw, 10 μg/paw, and 20 μg/paw, and by the selective α_{2C} adrenoceptor antagonist rauwolscine, 10 μg/paw, 15 μg/paw, and 20 μg/paw, but not by the selective antagonists for α_{2A}, α_{2B}, and α_{2D} adrenoceptor subtypes, 20 μg/paw. The antinociceptive effect of the cannabinoids was also antagonized by the nonselective α_1 adrenoceptor antagonist prazosin, 0.5 μg/paw, 1 μg/paw, and 2 μg/paw, and by the nonselective β adrenoceptor antagonist propranolol, 150 ng/paw, 300 ng/paw, and 600 ng/paw. Guanethidine, which depletes peripheral sympathomimetic amines (30 mg/kg/animal, once a day for 3 days), restored approximately 70% the anandamide-induced and PEA-induced peripheral antinociception. Furthermore, acute injection of the norepinephrine reuptake inhibitor reboxetine, 30 μg/paw, intensified the antinociceptive effects of low-dose anandamide, 12.5 ng/paw, and PEA, 5 μg/paw.
CONCLUSIONS: This study provides evidence that anandamide and PEA induce peripheral antinociception activating CB_1 and CB_2 cannabinoid receptors, respectively, stimulating an endogenous norepinephrine release that activates peripheral adrenoceptors inducing antinociception. (Anesth Analg 2013;116:–72)

技術交流：人體首次使用麥哲倫系統行機器人超聲引導下神經阻滯

Technical Communication: First Robotic Ultrasound-Guided Nerve Blocks in Humans Using the Magellan System

Thomas M. Hemmerling, MD, DEAA*†, Riccardo Taddei, MD‡, Mohamad Wehbe, MSc*, Shantale Cyr, PhD*, Cedrick Zaouter, MD* and Joshua Morse§
From the *Department of Anesthesia, McGill University, Montreal; † Institute of Biomedical Engineering, University of Montreal, Montreal, QC, Canada;‡ Department of Anesthesia, University of Pisa, Pisa, Italy; and § Department of Computer Engineering, McGill University, Montreal, QC, Canada.
Anesth Analg February 2013 116:491-494

背景：超聲引導下神經阻滯正成爲現代麻醉的一個標準。本文作者研發了一款機器人系統-麥哲倫，利用一個遠端控制中心來進行神經阻滯。

方法：13例病人納入此項飛行試驗。麥哲倫系統有3個主要部件構成：操縱杆，一個機械臂和一個軟體控制系統。操縱杆可以模擬操作人員的手腕或手臂活動。在定位坐骨神經後，注射0.25%布比卡因35ml。記錄坐骨神經阻滯成功率以及操作時間（操作時間=超聲開始搜索坐骨神經到注藥結束的時間間隔；機器人時間=確定坐骨神經到注藥結束的時間間隔）。數據以中位數(25th,75th 百分位數；最小值，最大值)和分類資料表示。
結果：年齡爲34歲的8例男性和5例女性納入本研究。神經阻滯在所有病人均取得成功。成功的定義爲針尖進入神經鞘；並未使用運動或感覺阻滯來決定成功率。神經阻滯時間爲189秒（150,233；90,305），而機器人時間爲164秒（121,210；73,271）。
結論：本文首次介紹了機器人超聲引導下神經阻滯。成功率爲100%，總操作時間大約爲3到4min。
（瞿亦楓　譯　陳傑　校）

BACKGROUND: Ultrasound-guided nerve blocks are becoming a standard of modern anesthesia. We developed a robotic system, Magellan, to perform nerve blocks using a remote control center.
METHODS: Thirteen patients were enrolled in this pilot study. The Magellan system consists of 3 main components: a joystick, a robotic arm, and a software control system. The joystick allows simulation of wrist or arm movements of the proceduralist. After localization of the sciatic nerve, 35 mL of bupivacaine 0.25% was injected. The success rate of sciatic nerve blocks and block performance times (performance time = interval of time from the start of the ultrasound search for the nerve to the end of the injection of the drug; robotic time = interval of time from the identification of the nerve to the end of the injection of the drug) were determined. Data are presented as median (25th, 75th; minimal, maximal) and categorical data.
RESULTS: Eight men and 5 women aged 34 years were included in this study. Nerve blocks were successful in all patients. A successful attempt was defined as the introduction of the needle into the nerve sheath; motor or sensory block was not used to determine the success rate. The nerve performance time was 189 seconds (150, 233; 90, 305), whereas the robotic time was 164 seconds (121, 210; 73, 271).
CONCLUSIONS: We present the first human testing of a robotic ultrasound-guided nerve block system. The success rate was 100%. The total performance time was approximately 3 minutes to 4 minutes.

經食道即時三維超聲心動圖：可改善術中二尖瓣成像

Real-Time Three-Dimensional Transesophageal Echocardiography: Improvements in Intraoperative Mitral Valve Imaging

Maximilian Dominik Hien, MD*, Helmut Rauch, MD†, Artur Lichtenberg, MD‡,Raffaele De Simone, MD§, Marc Weimer, DSc ‖ , Oriana Amanda Ponta, MSc ‖ and Christian Rosendal, MD, DESA†
From the *Department of Pediatrics, Research Training Group 1126, Heidelberg University, and Departments of †Anesthesiology and ‡Cardiovascular Surgery, and §Division of Cardiovascular Surgery, Heidelberg University, Heidelberg, Germany; and ‖ German Cancer Research Center (DKFZ), Department of Biostatistics, Heidelberg, Germany.
Anesth Analg February 2013 116:287-295

背景：二尖瓣反流修復手術的成功依賴對其複雜解剖的綜合評。在二尖瓣手術中對經食道即時三維心動圖技術應用的可行性及準確性循證有限，但全世界應用卻增加。我們設計這個前瞻性觀察性研究， 在二尖瓣反流的病人中 應用即時三維食道超聲心動圖初步檢測其二尖瓣的脫垂及腱索斷裂情況 並與二維食道超聲比較來評估即時三維食道超聲對瓣膜的解剖定位。

方法：取得食道超聲資格證書的麻醉醫生對62個行二尖瓣手術的病人進行監測 並獲得其二維食道超聲的標準圖像片段和三維超聲結果記錄，事後，這些二維及三維的圖像單獨及隨機的分配給2名專家解析，並應用外科探查情況作爲金標準

結果：通過外科手術探查確定了52例二尖瓣脫垂，與二維食道超聲相比 ，即時三維食道超聲在診斷和定位二尖瓣脫垂方面（差異比例爲33.9 %,P＜0.001）及腱索斷裂方面（差異比例爲25.8%，P＜0.001）與外科探查結果更相關。經食道即時三維超聲心動圖在監測二尖瓣脫垂患者的二尖瓣前葉 A2部分，後葉 P1及 P2部分，及腱索斷裂監測患者的前葉 A2及後葉 P2部分更優越。在22個病人中，瓣膜行外科修補，三維食道超聲在評價更靈敏（κ = 0.65,可行區間[0.44,0.81]）在22個病人中，同時行瓣膜外科修補，三維食道超聲在評價更靈敏（κ = 0.65,可行區間[0.44,0.81]）

結論：雖然在二尖瓣手術術中成像二維食道超聲是作爲目前的一個標準工具，即時三維食道超聲促進二尖瓣病理學的可視性和通過改善空間定位增加介入治療的準確性，特別是哪些致力於其效價比調查的結果。

（鄧利兵譯 薛張綱校）

Background: Successful surgical repair of a regurgitant mitral valve (MV) is dependent on a comprehensive assessment of its complex anatomy. Although there is limited evidence of the feasibility and accuracy of intraoperative real-time 3-dimensional transesophageal echocardiography (RT3DTEE) in MV surgery, its use is increasing worldwide. We designed this prospective observational study of patients with mitral regurgitation to test initial findings on the accuracy of RT3DTEE images in the diagnosis of MV prolapse and chordal rupture relative to 2D imaging and to assess the potential of RT3DTEE for visualizing leaflet clefts.

Methods: TEE-certified anesthesiologists examined 62 consecutive patients undergoing MV surgery by acquiring a full standard set of 2D TEE sections and 3D zoom recordings. Offline, 2D and 3D images were presented independently and in randomized order to 2 expert interpreters. Accuracy was determined using the surgical findings as the “gold standard.”

Results: Surgical inspection identified 52 cases of MV prolapse (MVP). RT3DTEE correlated stronger with the surgical findings than 2D TEE for detection and localization of MVP (difference in proportions = 33.9%, $P < 0.001$) and chordal rupture (difference in proportions = 25.8%, $P < 0.001$). The superiority of RT3DTEE was significant for scallops A2, P1, P2 in MVP and A2, P2 in chordal rupture (all $P < 0.05$). In 22 patients, leaflet clefts were also surgically repaired, and RT3DTEE was feasible in accessing them (κ = 0.65, confidence interval [0.44, 0.81]).

Conclusion: Although 2D TEE is currently the standard tool for intraoperative imaging in MV surgery, RT3DTEE improves the visualization of MV pathology and increases the accuracy of interpretation by facilitating spatial orientation. Further investigations, particularly those aimed at establishing its cost effectiveness, are indicated.

異氟醚介導的活性氧自由基抑制核因數 κB 啓動脂多糖誘導的急性肺感染

Reactive Oxygen Species by Isoflurane Mediates Inhibition of Nuclear Factor κB Activation in Lipopolysaccharide-Induced Acute Inflammation of the Lung

In Sun Chung, MD*, Jie Ae Kim, MD, PhD†, Ju A. Kim, MS‡, Hyun Sung Choi, MD, PhD†, Jeong Jin Lee, MD, PhD†, Mikyung Yang, MD, PhD†, Hyun Joo Ahn, MD, PhD† and Sang Min Lee, MD, PhD†

From the *Department of Anesthesiology and Pain Medicine, Asan Medical Center, University of Ulsan College of Medicine, Songpa-gu, Seoul; †Department of Anesthesiology and Pain Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul; and ‡Samsung Biomedical Research Institute, Seoul, South Korea.

Anesth Analg February 2013 116:327-335

背景: 雖然麻醉誘導抑制脂多糖（LPS）誘導的急性肺損傷已被大家公認，但其基本機制是不清楚的。有些研究提出異氟醚的活性氧自由基（ROS）在麻醉誘導對大腦和心臟的保護作用扮演了一個至關重要的角色；然而，它仍是有爭議的。在這個研究中，我們檢驗了異氟醚衍生的 ROS 在異氟醚誘導抑制肺損傷及核因數 κB（NFκB）啓動 LPS 刺激鼠肺。
方法: 雄性大白鼠吸入1.0最低肺泡有效濃度異氟醚60分鐘，60分鐘後氣管內注射 LPS 0.1mg。某些情況下，在異氟醚前30分鐘給予 ROS 清除劑，2-巯基丙醯基甘氨酸或 N-乙醯半胱氨酸。在 LPS 刺激前和4小時後分別用螢光測定 ROS 生成量。在支氣管肺泡灌洗液和肺組織用組織學檢查，蛋白質含量，中性粒細胞集落，並測定腫瘤壞死因數(TNF)-α，白細胞介素(IL)-1β 和 IL-6水準來評估異氟醚預處理效果。Western 印跡法測得磷酸化的抑制性 κB α (ser 32/36), NFκB p65,和誘導型一氧化氮合酶（iNOS）。同時評估 TNF-α ，IL-6 mRNA 的表達和 iNOS 免疫螢光染色。
結果： 異氟醚預處理減少肺內的炎症性肺損傷和 TNF-α, IL-1β, and IL-6的釋放。異氟醚在 LPS 前增加 ROS 生成量但是在 LPS 刺激後抑制 ROS 爆發。在異氟醚前給予 ROS 清除劑能消除在急性 LPS 刺激肺時異氟醚預處理影響及異氟醚誘導的磷酸化的抑制性 κBα, NFκB p65, iNOS 活化性和 TNF-α and IL-6 mRNA 的表達。
結論： 這項研究表明在急性肺感染中爲了異氟醚預處理改變炎性通路，異氟醚增加 ROS 生成量扮演了一個至關重要的角色。
（方昕譯 薛張綱校）

BACKGROUND: Although anesthetic-induced inhibition of lipopolysaccharide (LPS)-induced lung injury has been recognized, the underlying mechanism is obscure. Some studies suggest that reactive oxygen species (ROS) by isoflurane play a crucial role for anesthetic-induced protective effects on the brain or the heart; however, it still remains controversial. In this study, we examined the role of isoflurane-derived ROS in isoflurane-induced inhibition of lung injury and nuclear factor κB (NFκB) activation in LPS-challenged rat lungs.
METHODS: Male Sprague-Dawley rats were subjected to inhalation of 1.0 minimum alveolar concentration of isoflurane for 60 minutes, and intratracheal LPS 0.1 mg was administered 60 minutes later. In some cases, ROS scavenger, 2-mercaptopropinyl glycine or N-acetylcysteine was given 30 minutes before isoflurane. ROS generation was measured by fluorometer before LPS challenge and 4 hours after. Isoflurane's preconditioning effect was assessed by histologic examination, protein content, neutrophil recruitment, and determination of tumor necrosis factor (TNF)-α, interleukin (IL)-1β, and IL-6 levels in bronchoalveolar lavage fluid and lung tissue. Western blotting measured phosphorylation of inhibitory κB α (ser 32/36), NFκB p65, and

inducible nitric oxide synthase (iNOS). TNF-α and IL-6 mRNA expression and immunofluorescence staining for iNOS were also assessed.
RESULTS: Isoflurane preconditioning reduced inflammatory lung injury and TNF-α, IL-1β, and IL-6 release in the lung. Isoflurane upregulated ROS generation before LPS but inhibited a ROS burst after LPS challenge. ROS scavenger administration before isoflurane abolished the isoflurane preconditioning effect as well as isoflurane-induced inhibition of phosphorylation of inhibitory κBα, NFκB p65, iNOS activation, and mRNA expression of TNF-α and IL-6 in acute LPS-challenged lungs.
CONCLUSIONS: This study suggests a crucial role of upregulated ROS generation by isoflurane for modification of inflammatory pathways by isoflurane preconditioning in acute inflammation of the lung.

外周動脈灌注指數可作爲早期預測中心低血容量的指標在清醒健康志願者中的研究

Peripheral perfusion index as an early predictor for central hypovolemia in awake healthy volunteers.

Michel E. van Genderen, MSc*, Sebastiaan A. Bartels, MD, PhD*††, Alexandre Lima, MD*, Rick Bezemer, PhD*†, Can Ince, PhD*†, Jan Bakker, MD, PhD* and Jasper van Bommel, MD, PhD*
From the *Department of Intensive Care, Erasmus Medical Center, Rotterdam; †Department of Translational Physiology, Academic Medical Center, University of Amsterdam, Amsterdam; and ‡Department of Intensive Care, Medisch Centrum Alkmaar, Alkmaar, The Netherlands.
Anesth Analg February 2013 116:351-356

背景：在健康志願者中，我們調查脈搏血氧飽和度衍生的周邊動脈灌注指數（PPI）來檢測中心血液量的逐步減少。
方法：使25個清醒的，自主呼吸的，健康男性志願者經歷中央的血液量逐步減少，通過感受逐步下體負壓（LBNP）每5分鐘增加20毫米汞柱，從0至-20，-40，- 60，恢復到0毫米汞柱。在整個過程中，每搏輸出量（SV），心臟心率（HR），平均動脈血壓被體積描記法記錄下來。通過脈搏血氧飽和度評估 PPI。此外，還測量了前臂的指尖皮膚溫度梯度式改變。資料以平均值±SE 表示。 PPI 經歷了數轉換，以中位數呈現出來（25th – 75th）。
結果：25例研究，有一例因爲心血管功能衰竭而沒能夠完成。 LBNP 後的第一個步驟（-20毫米汞柱），PPI 從2.2（1.6-3.3）下降至1.2（0.8-1.6）（P = 0.007），SV 從116±3.0毫下降至104±2.6毫升（P = 0.02 ）。觀察 SV（9％±1.3％）和 HR（3％±1.9％），PPI 下降的幅度（41％±6.0％）差異有統計學意義。在 LBNP 期間，隨著增加施加的負壓，SV 下降且 HR 上升，然而 PPI 始終保持低平，當 LBNP 被釋放時返回基線水準。在-60毫米汞柱 LBNP，SV 下降和 HR 增加分別爲36％±0.9％和33％±2.4％。平均動脈壓在整個實驗過程中保持在相同的範圍內。
結論：這些結果表明，在健康志願者中，脈搏血氧飽和度衍生的 PPI 可能成爲一個有價值的輔助診斷工具來檢測早期臨床的中心血容量不足，在發展成爲心血管功能失代償之前。
(胡曉清譯 薛張綱校)
BACKGROUND: In healthy volunteers, we investigated the ability of the pulse oximeter-derived peripheral perfusion index (PPI) to detect progressive reductions in central blood volume.

METHODS: Twenty-five awake, spontaneously breathing, healthy male volunteers were subjected to progressive reductions in central blood volume by inducing stepwise lower body negative pressure (LBNP) with 20 mm Hg for 5 minutes per step, from 0 to -20, -40, -60, and back to 0 mm Hg. Throughout the procedure, stroke volume (SV), heart rate (HR), and mean arterial blood pressure were recorded using volume-clamp finger plethysmography. Assessment of the PPI was done by pulse oximetry. Additionally, the forearm-to-fingertip skin-temperature gradient was measured. Data are presented as mean ± SE. PPI underwent log transformation and is presented as median (25th-75th).
RESULTS: Of the 25 subjects, one did not complete the study because of cardiovascular collapse. After the first LBNP step (-20 mm Hg), PPI decreased from 2.2 (1.6-3.3) to 1.2 (0.8-1.6) (P = 0.007) and SV decreased from 116 ± 3.0 mL to 104 ± 2.6 mL (P = 0.02). The magnitude of the PPI decrease (41% ± 6.0%) was statistically different from that observed for SV (9% ± 1.3%) and HR (3% ± 1.9%). During progression of LBNP, SV decreased and HR increased progressively with the increased applied negative pressure, whereas the PPI remained low throughout the remainder of the protocol and returned to baseline values when LBNP was released. At -60 mm Hg LBNP, SV decreased and HR increased by 36% ± 0.9 % and 33% ± 2.4% from baseline, respectively. Mean arterial blood pressure remained in the same range throughout the experiment.
CONCLUSIONS: These results indicate that the pulse oximeter-derived PPI may be a valuable adjunct diagnostic tool to detect early clinically significant central hypovolemia, before the onset of cardiovascular decompensation in healthy volunteers.

OPRM1和 COMT 基因型在靜脈注射芬太尼分娩鎮痛中的作用

The Effect of OPRM1 and COMT Genotypes ontheAnalgesic Response to Intravenous FentanylLabor Analgesia

Ruth Landau, MD*, Shih-Kai Liu, MD†‡, Jean-Louis Blouin, PhD§ and Brendan Carvalho, MD ||

From the *Department of Anesthesiology and Pain Medicine, University of Washington, Seattle; †Department of Anesthesiology, University of Washington, Seattle, Washington; ‡Department of Anesthesia Pain Service and Critical Care Medicine, China Medical University Hospital, Taichung, Taiwan; §Genetic Medicine, University Hospitals of Geneva, Geneva, Switzerland; and ||Department of Anesthesiology, Stanford University Medical Center, Palo Alto, California.
Anesth Analg February 2013 116:386-391

背景:靜脈注射芬太尼被用於分娩鎮痛; 但是，很少有研究報導靜脈注射芬太尼對早期分娩鎮痛中的作用。在此我們通過在需要分娩鎮痛的女性中靜脈注射芬太尼對單核苷酸多態性μ-阿片受體基因（OPRM1）rs1799971 (c.118A/G, p. 40Asn/Asp)和兒茶酚-O-甲基轉移酶基因(COMT)rs4680 (c.472G/A, p.158Val/Met) 的綜合作用的比較評估了靜脈注射芬太尼的鎮痛效果。
方法：分娩鎮痛在靜脈注射1.5 μg/kg 芬太尼後起效。注射一定劑量芬太尼15分鐘後疼痛量表評分≤10/100定義爲靜脈鎮痛成功。對於 OPRM1 和 COMT 基因型的鎮痛作用及副作用進行了比較。
結果：160位女性接受靜脈注射芬太尼進行分娩鎮痛測試。Asn/Asn-Met/Met 混合基因型女性鎮痛成功率爲6% (n = 17)，其餘非 Asn/Asn-Met/Met 混合基因型鎮痛成功率爲20% (not Asn/Asn-Met/Met; P = 0.30; difference = 14%; 95% confidence interval [CI], -10% to

26%)。118A/A (Asn/Asn)基因型女性靜脈鎮痛成功率爲21%，與之比較的 A/G and G/G of OPRM1基因 型鎮痛成功率爲10% (P = 0.82; difference = 2%; 95% CI, -17% to 19%)；472A (Met/Met)型女性靜脈鎮痛成功率爲10%，與之比較 A/G (Met/Val) and G/G (Val/Val) of COMT 型靜脈鎮痛成功率爲22% (P = 0.24; difference = 12%; 95% CI, -6% to 26%)。Met/Met158 基因型女性(n = 31)與 Met/Val or Val/Val of COMT 基因型比較疼痛量表評分僅有輕度下降(24 ± 18 vs 37 ± 23; P = 0.005; mean difference = -13; 99% CI, -25 to -1)。

結論：本研究在 OPRM1和 COMT 基因型對靜脈注射芬太尼在分娩鎮痛中的影響上還不能得出確切結論。進一步開展更大規模的研究是必要的，以評估單獨 COMT 基因分型及 COMT 結合 OPRM1基因型在臨床中是否有潛在的臨床意義，如在分娩早期沒有進行靜脈注射芬太尼的女性中誰最有可能從中受益等。

(李麗紅譯 薛張綱校)

BACKGROUND:IV fentanyl is used as a labor analgesic; however, few studies have reported the effects of IV fentanyl for earlylabor analgesia. We evaluated the analgesic response to IV fentanyl according to the combined effect of the single-nucleotide polymorphisms rs1799971 (c.118A/G, p. 40Asn/Asp) of the μ-opioid receptor gene (OPRM1) and rs4680 (c.472G/A, p.158Val/Met) of the catechol-O-methyltransferase (COMT) gene in women requesting labor analgesia.

METHODS: Labor analgesia was initiated with IV fentanyl 1.5 μg/kg. The primary outcome was analgesic success, defined as Numerical Verbal Pain Scale score ≤ 10/100 15 minutes after the dose of fentanyl. Analgesic and side effect outcomes were compared according to OPRM1 and COMT genotypes.

RESULTS: One hundred six women were enrolled and received IV fentanyl. IV analgesic success was 6% in women with the combination Asn/Asn-Met/Met (n = 17) versus 20% in all other women combined (not Asn/Asn-Met/Met; P = 0.30; difference = 14%; 95% confidence interval [CI], -10% to 26%). IV analgesic success was 20% in women 118A/A (Asn/Asn) versus 21% for A/G and G/G of OPRM1 (P = 0.82; difference = 2%; 95% CI, -17% to 19%), and 10% in women 472A (Met/Met) versus 22% for A/G (Met/Val) and G/G (Val/Val) of COMT (P = 0.24; difference = 12%; 95% CI, -6% to 26%). Met/Met158 (n = 31) versus Met/Val or Val/Val of COMT was associated with a smaller decrease in Numerical Verbal Pain Scale (24 ± 18 vs 37 ± 23; P = 0.005; mean difference = -13; 99% CI, -25 to -1).

CONCLUSION: This study was underpowered to draw firm conclusions on the influence of OPRM1 and COMT genotypes onlabor analgesia with IV fentanyl. Further larger studies are needed to evaluate whether genotyping COMT alone or in combination with OPRM1 may have potentially useful clinical implications, such as not offering IV fentanyl in early labor to women who will most likely not benefit from it.

簡報：脂肪乳劑在美國產科機構的應用

Brief report: availability of lipid emulsion in United States obstetric units.

Paloma Toledo, MD, MPH*, Heather C. Nixon, MD†, Jill M. Mhyre, MD‡, Cynthia A. Wong, MD§ and Guy Weinberg, MD ||

From the *Department of Anesthesiology and Center for Healthcare Equity/Institute for Healthcare Studies, Northwestern University Feinberg School of Medicine, Chicago; †Department of Anesthesiology, University of Illinois Hospital and Health Science System, Chicago, Illinois; ‡Department of Anesthesiology, the University of Michigan Health System, Ann Arbor, Michigan; §Department of Anesthesiology, Northwestern University Feinberg

School of Medicine, Chicago; and ‖Department of Anesthesiology, University of Illinois College of Medicine and Jesse Brown VA Medical Center, Chicago, Illinois.
Anesth Analg February 2013 116:406-408

背景：脂肪乳劑被推薦用於局麻藥全身中毒指南。這項研究中，我們試圖確定脂肪乳劑在美國產科機構當前水準。
方法：一項調查用於開發解決脂肪乳劑的可用性並於2011年6月發送給美國麻醉主管。採用一元統計學
結果：反應率爲69%。88%的機構可以獲得脂肪乳劑（95%可靠區間，73%~94%）。至少95%的調查對象在<30分鐘的時間裡獲得脂肪乳劑（100% of n = 68）。
結論：美國產科和麻醉機構都具備管理全身性局麻藥中毒的脂肪乳劑。
（孫莉萍譯 薛張綱校）
BACKGROUND: Lipid emulsion is recommended in the guidelines for the management of local anesthetic systemic toxicity. In this study, we sought to identify the current level of lipid emulsion availability in U.S. obstetric units.
METHODS: A survey was developed addressing lipid emulsion availability and sent to U.S. obstetric anesthesia directors in June 2011. Univariate statistics were used.
RESULTS: The response rate was 69%. Lipid emulsion was available in 88% of the units (95% confidence interval, 73%-94%). At least 95% of respondents had lipid emulsion available in <30 minutes (100% of n = 68).
CONCLUSIONS: U.S. academic obstetric anesthesia units are equipped to administer lipid emulsion in the setting of local anesthetic systemic toxicity.

心臟手術後認知功能恢復預測指標

Predictors of Cognitive Recovery After Cardiac Surgery.

Monique T. Fontes, BA, R. Cameron Swift, MD, Barbara Phillips-Bute, PhD, Mihai V. Podgoreanu, MD, Mark Stafford-Smith, MD, Mark F. Newman, MD, Joseph P. Mathew, MD, the Neurologic Outcome Research Group of the Duke Heart Center
From the Division of Cardiothoracic Anesthesiology and Critical Care Medicine, Duke University Medical Center, Durham, North Carolina.
Anesth Analg February 2013 116:435-442

背景：術後神經認知功能降低經常發生。儘管認知損害的預測指標已得到了很好的研究，但調節恢復的因素研究尚不完全。我們試圖確定心臟手術後認知恢復的預測指標。
方法：將心臟手術6周後有認知能力下降的281例患者納入認知研究，進行回顧性研究。符合條件的患者分別在開始、術後6周和術後1年完成了一連串的神經認知功能的檢測，以及生活品質的評估。通過因素分析進行認知指數（CI）計算，一個統一的認知功能的連續測定。認知恢復被定義爲1年 CI 大於基礎 CI。認知功能恢復的潛在預測指標，包括病人的特點、生活品質的因素、合併症、藥物治療以及術中變化。這些通過多因素回歸模型進行評估；P＜0.05被認爲是具有顯著差異。
結果：在我們最後收集的229例中，103（45%）在最初6周 CI 下降後表現出認知功能的恢復。多因素分析揭示教育程度高（比值比[OR] 1.332 [1.131-1.569], P < 0.001), 基礎 CI (OR 0.987 [0.976-0.998], P = 0.02) ，6周時 CI 下降少(OR 1.044 [1.014-1.075], P = 0.004)，6周日常活動度高(OR 0.891 [0.810-0.981], P = 0.02)，這些都是認知恢復的重要預測指標。

結論：約一半心臟外科手術的患者經歷早期的認知功能下降後認知功能會得以恢復。6周時認知功能的恢復和日常生活活動評分工具之間的關係值得進一步研究，這是唯一可能修改的認知恢復的預測指標。

（郁玲玲譯 薛張綱校）

BACKGROUND: Postoperative neurocognitive decline occurs frequently. Although predictors of cognitive injury have been well examined, factors that modulate recovery have not. We sought to determine the predictors of cognitive recovery after initial injury following cardiac surgery.

METHODS: Two hundred eighty-one patients previously enrolled in cognitive studies who experienced cognitive decline 6 weeks after cardiac surgery were retrospectively evaluated. Eligible patients completed a battery of neurocognitive measures and quality-of-life assessments at baseline, 6 weeks, and 1 year after surgery. Factor analysis was conducted to calculate the cognitive index (CI), a unified, continuous measure of cognitive function.Cognitive recovery was defined as 1-year CI greater than baseline CI. Potential predictors of cognitive recovery including patient characteristics, quality-of-life factors, comorbidities, medications, and intraoperative variables were assessed with multivariable regression modeling; $P < 0.05$ was considered significant.

RESULTS: Of the 229 patients in our final data set, 103 (45%) demonstrated cognitive recovery after initial decline in CI at 6 weeks. Multivariable analyses revealed that more education (odds ratio [OR] 1.332 [1.131-1.569], $P < 0.001$), baseline CI (OR 0.987 [0.976-0.998], $P = 0.02$), less decline in CI at 6 weeks (OR 1.044 [1.014-1.075], $P = 0.004$), and greater activities of daily living at 6 weeks (OR 0.891 [0.810-0.981], $P = 0.02$) were significant predictors of cognitive recovery.

CONCLUSION: Cognitive recovery occurred in approximately one half of the cardiac surgical patients experiencing early decline. The association between cognitive recovery and Instrumental Activities of Daily Living scores at 6 weeks merits further investigation as it is the only potentially modifiable predictor of recovery.

依那西普預防腹股溝疝修補術後疼痛：一項多中心、隨機、對照研究

A Multicenter, Randomized, Controlled Study Evaluating Preventive Etanercept on Postoperative Pain After Inguinal Hernia Repair

Steven P. Cohen, MD*†, Samuel M. Galvagno, DO, PhD‡, Anthony Plunkett, MD§, Diamond Harris, MD ‖ , Connie Kurihara, RN*, Ali Turabi, MD*, Scott Rehrig, MD**, Chester C. Buckenmaier III, MD*¶ and Jacques E. Chelly, MD ‖

From the Departments of *Anesthesiology and **Surgery, Walter Reed National Military Medical Center, Bethesda; †Department of Anesthesiology & Critical Care Medicine, Johns Hopkins School of Medicine, Baltimore; ‡Department of Anesthesiology, University of Maryland Medical Center, Baltimore; Joint Base Andrews, Maryland; §Department of Anesthesiology, Womack Army Medical Center, Fort Bragg, North Carolina; ‖Department of Anesthesiology, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania; and ¶Defense and Veteran's Center for Integrative Pain Management, Rockville, Maryland.

Anesth Analg February 2013 116:455-462

背景：慢性術後疼痛（CPSP）依據手術的不同，影響著5%至70%的手術病人。目前CPSP 還沒有可靠的治療方法，因此更加強調預防。在這項研究中，我們試圖確定，預防性應用依那西普是否可以減少術後疼痛程度和減少 CPSP 的發病率。
方法：我們在77名病人中進行了一項多中心、隨機研究，在腹股溝疝手術前90分鐘皮下注射依那西普50毫克和生理鹽水。患者、外科醫生、麻醉醫生、注射醫師、護理人員和評估者對用藥情況均不知情。主要轉歸指標是24小時的數值評定疼痛評分量表。次要結果是術後監護室的疼痛評分、24小時阿片類藥物的需求、第一次鎮痛的時間以及1個月、3個月、6個月和12個月的疼痛評分記錄。
結果：依那西普組平均24小時疼痛評分爲3.3（95%自信區間[CI]，3.2-4.6），對照組爲3.9（95%CI，2.6-4.0）（P = 0.22）。在治療組中第一個24小時內使用鎮痛藥的平均次數爲4.0（SD2.8），對照組爲5.8（SD4.2）（P = 0.03）。1個月時，治療組中10例（29%）仍有疼痛，而對照組有21例（49%）（P = 0.08）。 1個月時的疼痛比3個月時疼痛明顯（危險比爲0.74，99%CI，0.52-0.97，P= 0.03）。
結論：雖然在某些方面預防性應用依那西普與鹽水相比，可減輕術後疼痛，但其影響小、短暫並且沒有統計學上的顯著差異。將來可在一個更大的試驗人群中探索不同劑量的給藥方案。
（周玲譯 薛張綱校）

BACKGROUND: Chronic postsurgical pain (CPSP) affects between 5% and 70% of surgical patients, depending on the surgery. There is no reliable treatment for CPSP, which has led to an increased emphasis on prevention. In this study, we sought to determine whether preventive etanercept can decrease the magnitude of postoperative pain and reduce the incidence of CPSP.
METHODS: We performed a multicenter, randomized study in 77 patients comparing subcutaneous etanercept 50 mg administered 90 minutes before inguinal hernia surgery with saline. Patients, surgeons, anesthesiologists, the injecting physician, nursing staff, and evaluators were blinded. The primary outcome measure was a 24-hour numerical rating scale pain score. Secondary outcome measures were postanesthesia care unit pain scores, 24-hour opioid requirements, time to first analgesic, and pain scores recorded at 1 month, 3 months, 6 months, and 12 months.
RESULTS: Mean 24-hour pain scores were 3.3 (95% confidence interval [CI], 3.2-4.6) in the etanercept and 3.9 (95% CI, 2.6-4.0) in the control group (P = 0.22). The mean number of analgesic pills used in the first 24 hours was 4.0 (SD, 2.8) in the treatment versus 5.8 (SD, 4.2) in the control group (P = 0.03). At 1 month, 10 patients (29%) in the treatment group reported pain versus 21 (49%) control patients (P = 0.08). The presence of pain at 1 month was significantly associated with pain at 3 months (hazard ratio, 0.74; 99% CI, 0.52-0.97; P = 0.03).
CONCLUSION: Although preventive etanercept was superior to saline in reducing postoperative pain on some measures, the effect sizes were small, transient, and not statistically significant. Different dosing regimens in a larger population should be explored in future studies.

鍛煉誘導熱休克蛋白72的過量表達並延遲糖尿病神經病理性疼痛大鼠痛超敏的發展。

Physical exercise induces excess hsp72 expression and delays the development of hyperalgesia and allodynia in painful diabetic neuropathy rats.

Yu-Wen Chen, PhD[*], Pei-Ling Hsieh, MS[†], Yu-Chung Chen, MS[†], Ching-Hsia Hung, PhD[†] and Juei-Tang Cheng, PhD§‖

From the [*]Department of Physical Therapy, China Medical University, Taichung; [†]Institute & Department of Physical Therapy, National Cheng Kung University, Tainan; [‡]Division of Physical Therapy, Department of Physical Medicine and Rehabilitation, Cheng Hsin General Hospital, Taipei; [§]Department of Medical Research, Chi-Mei Medical Center, Tainan; and [|] Department of Pharmacology, College of Medicine, National Cheng Kung University, Tainan, Taiwan.
Anesth Analg February 2013 116:482-490

背景：鍛煉與糖尿病相關性神經病理性疼痛發展的關係目前尚未明確，我們假定鍛煉能調節鏈脲佐菌素（STZ）導致的糖尿病大鼠的功能恢復以及熱休克蛋白72（Hsp72）、腫瘤壞死因數（TNF）-α 和白介素（IL）-6的表達。
方法：雄性 Wistar 大鼠分4組：正常久坐不動大鼠，正常鍛煉大鼠， STZ-糖尿病（SS）久坐不動大鼠，和 STZ-糖尿病鍛煉大鼠。注射 STZ（65 mg/kg IV）誘導糖尿病的產生。訓練大鼠每日於跑步機上鍛煉30-60分鐘-天，訓練強度爲20-25米/分鐘。觀察熱退縮潛伏期和機械痛閾值以及脊髓和外周神經 Hsp72、TNF-α、和 IL-6的表達。
結果：注射 STZ 兩周後，久坐不動的大鼠對測痛儀和熱刺激表現出顯著和持續的高敏性。與之成對比的，是鍛煉狀態下的糖尿病大鼠延遲了對測痛儀和熱刺激的高敏性。儘管與對照組相比其恢復水準尚不如前者，但鍛煉顯著抑制了糖尿病導致的血糖水準以及體重的增長。與正常久坐不動大鼠相比，SS 大鼠脊髓和外周神經有更顯著的 TNF-α 和 IL-6的釋放。在 STZ 使用後14天，鍛煉的 STZ 糖尿病大鼠與 SS 組大鼠相比，脊髓和外周神經有顯著的 Hsp72的表達，而 TNF-α 和 IL-6水準的表達基本相似。
結論：實驗結果表明持續鍛煉能顯著降低糖尿病相關性神經病理性疼痛，包括溫度覺超敏和機械性異常疼痛。在大鼠，該保護性效果與 STZ 誘導的糖尿病脊髓和外周神經 Hsp72表達的增加有關，但與 TNF-α 和 IL-6的表達無關。
（楊琰譯 薛張綱校）

BACKGROUND: The underlying mechanism of exercise on the development of diabetes-associated neuropathic pain is not well understood. We investigated in rats whether exercise regulates the functional recovery and heat shock protein 72 (Hsp72), tumor necrosis factor (TNF)-α, and interleukin (IL)-6 expression in streptozotocin (STZ)-induced diabetes.
METHODS: Male Wistar rats were divided into 4 groups: normal sedentary rats, normal rats with exercise, sedentary STZ-diabetic (SS) rats, and STZ-diabetic rats with exercise. Diabetes was induced with STZ (65 mg/kg IV). The trained rats ran daily on a treadmill 30 to 60 min/d with an intensity of 20 to 25 m/min. We monitored thermal withdrawal latency and mechanical withdrawal threshold as well as Hsp72, TNF-α, and IL-6 expression in the spinal cord and peripheral nerves.
RESULTS: Two weeks after STZ injection, sedentary rats exhibited a marked and sustained hypersensitivity to von Frey tactile and heat stimuli. In contrast, diabetic rats undergoing exercise demonstrated delayed progress of tactile and thermal hypersensitivity. Exercise significantly suppressed diabetes-induced blood glucose levels and body weight loss, although they were not restored to control levels. Compared with normal sedentary rats, SS rats displayed significantly higher TNF-α and IL-6 levels in the spinal cord and peripheral nerves. The STZ-diabetic rats with exercise group showed greater Hsp72 expression and similar TNF-α or IL-6 level compared with the SS group in the spinal cord and peripheral nerves on day 14 after STZ treatment.

CONCLUSIONS: These results suggest that progressive exercise training markedly decreases diabetes-associated neuropathic pain, including thermal hyperalgesia and mechanical allodynia. In rats, this protective effect is related to the increase of Hsp72, but not TNF-α and IL-6, expression in the spinal cord and peripheral nerves of STZ-induced diabetes.