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Core Review: Physician-Performed Ultrasound: The Time Has Come for Routine Use in Acute Care Medicine

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超聲在麻醉學、重症監護、急診醫學、外科等急診監護專業上的運用已從獨立的、以專科場所爲實施地點的超聲心動圖檢查發展爲即時或者床邊的臨床評估和干預。“定向”經胸超聲心動圖限於（比如跟綜合測試相比）超聲心動圖的檢查，由急性重症監護的專科醫師進行操作，目的是解決具體的臨床問題。將來，體表超聲將作爲超聲輔助檢查和超聲引導操作而納入日常臨床實踐中。這種發展會從醫學專業類學生開始，並會在整個專科培訓中加強。讓每個醫師掌握超聲技術的關鍵是進行以通俗易懂，而非過於專業、令人望而生畏爲設計目的課程教育。有證據表明超聲輔助檢查可提高診斷水準，但由此是否能管理和改善患者預後相關的資料有限，而後者是未來研究的重點領域。
（孫荔莉 譯 陳傑 校）
The use of ultrasound in the acute care specialties of anesthesiology, intensive care, emergency medicine, and surgery has evolved from discrete, office-based echocardiographic examinations to the real-time or point-of-care clinical assessment and interventions. “Goal-focused” transthoracic echocardiography is a limited scope (as compared with comprehensive examination) echocardiographic examination, performed by the treating clinician in acute care medical practice, and is aimed at addressing specific clinical concerns. In the future, the practice of surface ultrasound will be integrated into the everyday clinical practice as *ultrasound-assisted examination* and *ultrasound-guided procedures*. This evolution should start at the medical student level and be reinforced throughout specialist training. The key to making ultrasound available to every physician is through education programs designed to facilitate uptake, rather than to prevent access to this technology and education by specialist craft groups. There is evidence that diagnosis is improved with ultrasound examination, yet data showing change in management and improvement in patient outcome are few and an important area for future research.

特稿：關於阻塞性睡眠呼吸暫停（OSA）成年患者門診手術術前選擇的門診手術麻醉協會共識

Special Article: Society for Ambulatory Anesthesia Consensus Statement on Preoperative Selection of Adult Patients with Obstructive Sleep Apnea Scheduled for Ambulatory Surgery

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Anesth Analg November 2012 115:1060-1068

由於顧及日益增長的圍術期併發症，包括出院後死亡，阻塞性睡眠呼吸暫停（OSA）患者是否適合日間手術存在爭議。因此，門診麻醉協會的實踐指南工作組對擇期行門診手術的 OSA 患者的選擇提出一份共識。根據系統綜述和薈萃分析優先報告的條目（PRISMA）指南，對相關文獻進行系統綜述。儘管評估接受日間手術的 OSA 病人圍手術期預後的研究數量稀少，品質有限，但它們提供了有用的資訊便於指導臨床實踐。明確 OSA 診斷及合併症控制良好的患者，如術後可進行連續氣道正壓通氣，則考慮接受日間手術。另外，經 STOP-Bang 問卷等檢查方法診斷的疑似 OSA 患者，如術前合併症控制良好且非阿片類藥物主導治療能緩解術後疼痛，也可考慮接受日間手術。反之，合併症未經控制的 OSA 患者不宜接受日間手術。相關領域有何其他指南？美國麻醉師協會（ASA）關於 OSA 患者的外科手術管理的實踐指導於 2006 年出版。此項指南目的何在？許多近期研究提供的新資訊，如 OSA 病人臨床診斷的有效篩查工具，及日間 OSA 腹腔鏡減肥手術的安全性，反映了 ASA 指南的過時。因此，對日間手術的 OSA 病人選擇進行更新是必要的。此項指南有何獨到之處？不同于 ASA 指南，這項共識建議使用 STOP-Bang 標準來進行 OSA 術前篩查 OSA，並將合併症情況納入患者選擇程式。另外，近期文獻也不支持 ASA 推薦的上腹部手術不適合做日間手術。爲何此項指南脫穎而出？此項共識不同於 ASA 指導方針是因爲有新證據的支持。
（詹凱誕 譯 陳傑 校）

The suitability of ambulatory surgery for a patient with obstructive sleep apnea (OSA) remains controversial because of concerns of increased perioperative complications including postdischarge death. Therefore, a Society for Ambulatory Anesthesia task force on practice guidelines developed a consensus statement for the selection of patients with OSA scheduled for ambulatory surgery. A systematic review of the literature was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Although the studies evaluating perioperative outcome in OSA patients undergoing ambulatory surgery are sparse and of limited quality, they do provide useful information that can guide clinical practice. Patients with a known diagnosis of OSA and optimized comorbid medical conditions can be considered for ambulatory surgery, if they are able to use a continuous positive airway pressure device in the postoperative period. Patients with a presumed diagnosis of OSA, based on screening tools such as the STOP–Bang questionnaire, and with optimized comorbid conditions, can be considered for ambulatory surgery, if postoperative pain can be managed predominantly with nonopioid analgesic techniques. On the other hand, OSA patients with nonoptimized

comorbid medical conditions may not be good candidates for ambulatory surgery. What other guidelines are available on this topic? The American Society of Anesthesiologists (ASA) practice guidelines for management of surgical patients with OSA published in 2006. Why was this guideline developed? The ASA guidelines are outdated because several recent studies provide new information such as validated screening tools for clinical diagnosis of OSA and safety of ambulatory laparoscopic bariatric surgery in OSA patients. Therefore, an update on the selection of patients with OSA undergoing ambulatory surgery is warranted. How does this guideline differ from existing guidelines? Unlike the ASA guidelines, this consensus statement recommends the use of the STOP–Bang criteria for preoperative OSA screening and considers patients' comorbid conditions in the patient selection process. Also, current literature does not support the ASA recommendations that upper abdominal procedures are not appropriate for ambulatory surgery. Why does this guideline differ from existing guidelines? This consensus statement differs from existing ASA guidelines because of the availability of new evidence.

圖形化使用者介面簡化了輸液泵程式設定並增強了泵相關錯誤的識別

Graphical User Interface Simplifies Infusion Pump Programming and Enhances the Ability to Detect Pump-Related Faults

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背景：給藥錯誤經常發生並往往與 IV 注射泵的錯誤使用有關。發生這些錯誤的可能來源之一是注射泵的使用者介面。
方法：本研究使用失效模式與效果分析（MFEA）來分析程式設定錯誤並指導設計一個新的注射泵的使用者介面。本研究設計了新的使用者介面以清楚地在多個顯示器上同時顯示泵的操作狀態。並評估住院麻醉師在實驗室和模擬環境中分別在新使用者介面與市場上可用的注射泵的使用者介面下程式設定準確性和錯誤察覺情況。
結果：使用新使用者介面，程式設定錯誤數量減少了 81%，單個任務輸入鍵數從 9.2 ± 5.0 減少到了 7.5 ± 5.5（平均±標準差），單個任務需要的時間從 18.1 ± 14.1 秒減少到 10.9 ± 9.5 秒並顯著減少了自覺工作量。儘管沒有使用新使用者介面的經驗且對已有介面並非熟悉，住院麻醉師們仍然在新使用者介面下發現了 70 件錯誤中的 38 件（54%），而在現有介面下只發現了 70 件錯誤中的 37 件（53%）。
結論：由於使用新使用者介面對注射泵程式設定時減少了用時和輸入鍵數，程式設定錯誤數量及工作量部分減少。儘管只接受了基本培訓，住院麻醉醫師們仍然在新使用者介面下很快發現了先前存在的注射泵設定錯誤。直觀並且易於程式設計的注射泵介面可以減少用藥錯誤和注射泵相關的不良事件。
（孫曉瓊 譯 陳傑 校）

BACKGROUND: Drug administration errors are frequent and are often associated with the misuse of IV infusion pumps. One source of these errors may be the infusion pump's user interface.

METHODS: We used failure modes-and-effects analyses to identify programming errors and to guide the design of a new syringe pump user interface. We designed the new user interface to clearly show the pump's operating state simultaneously in more than 1 monitoring location. We evaluated anesthesia residents in laboratory and simulated environments on programming accuracy and error detection between the new user interface and the user interface of a commercially available infusion pump.
RESULTS: With the new user interface, we observed the number of programming errors reduced by 81%, the number of keystrokes per task reduced from 9.2 ± 5.0 to 7.5 ± 5.5 (mean ± SD), the time required per task reduced from 18.1 ± 14.1 seconds to 10.9 ± 9.5 seconds and significantly less perceived workload. Residents detected 38 of 70 (54%) of the events with the new user interface and 37 of 70 (53%) with the existing user interface, despite no experience with the new user interface and extensive experience with the existing interface.
CONCLUSIONS: The number of programming errors and workload were reduced partly because it took less time and fewer keystrokes to program the pump when using the new user interface. Despite minimal training, residents quickly identified preexisting infusion pump problems with the new user interface. Intuitive and easy-to-program infusion pump interfaces may reduce drug administration errors and infusion pump-related adverse events.

健康醫護工作者手部來源的靜脈內細菌注射的預防：導管設計和操作的重要性

Prevention of Intravenous Bacterial Injection from Health Care Provider Hands: The Importance of Catheter Design and Handling

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Abstract
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背景：在多種衛生醫療環境中，設備相關的血行感染與患者的發病及死亡率的顯著升高有關。近期，術中傳統的開放性管道三通裝置來源的細菌污染已被證實與病人死亡率升高有關。與傳統開放性管腔設備相比，術中使用滅菌無針閉合導管裝置(DNCCs)通過固有屏障減少細菌進入，並聯合活瓣裝置和/或表面滅菌技術，減少了細菌感染風險。然而在臨床環境中，DNCC 活瓣設計（固有屏障性能）相關的益處與表面消毒來抑制細菌感染相比，仍然未經測試且完全未知。本研究的主要目的是調查與傳統的開放性靜脈管腔通道設備相比，新型的滅菌三通 Ultraport zero 複合滅菌或未滅菌對抑制術中注射潛在的細菌病原體的相關效率進行比較。次要目的是爲了確定細菌性注射的危險因素和評估導管操作時注射的細菌數量。
方法：468 例手術室環境通過電腦隨機生成 3 組設備-注射設計表格：(1) Ultraport zero 螺旋塞在注射前滅菌，(2) Ultraport zero 螺旋塞在注射前不進行滅菌，(3)根據平常的操作使用滅菌蓋封閉的傳統開放性管腔螺旋塞。在全麻誘導後，術中主要麻醉實施者被要求通過

被安排的注射裝置進行 5 次滅菌生理鹽水注射，最終進入一個體外導管系統。主要結果是注射液細菌污染發生率。注射液污染的危險因素通過單變數分析來確定，並且通過一個受控的實驗室試驗來產生被污染的流出液樣本細菌估計值。
結果：在注射前滅菌的 Ultraport zero 螺旋塞組流出液細菌污染率爲 0% (0/152)，注射前未滅菌的 Ultraport zero 螺旋塞組的流出液細菌污染率爲 4% (7/162)，傳統開放性管腔螺旋塞組的流出液細菌污染率爲 3.2% (5/154)。與傳統開放性管腔螺旋塞相比，注射前滅菌的 Ultraport zero 螺旋塞與細菌性注射危險的減少有顯著相關性(RR = 8.15×10^{-8}, 95% CI, 3.39×10^{-8} to 1.96×10^{-7}, P = <0.001)，絕對危險度減少 3.2% (95% CI, 0.5% to 7.4%)。麻醉時手套的使用也是流出液感染的危險因素(RR = 10.48, 95% CI, 3.16 to 34.80, P < 0.001)。每一系列注射的細菌估計量達到了顯著的臨床閾值 50,000 菌落單位。
結論：與傳統開放性管腔螺旋塞相比，注射前滅菌的 Ultraport zero 螺旋塞與無意的細菌性注射危險減少有顯著相關。未來的研究應考察如何促進衛生人員行 DNCC 旋塞滅菌和設備操作的策略。
（瞿亦楓 譯 陳傑 校）
BACKGROUND: Device-related bloodstream infections are associated with a significant increase in patient morbidity and mortality in multiple health care settings. Recently, intraoperative bacterial contamination of conventional open-lumen 3-way stopcock sets has been shown to be associated with increased patient mortality. Intraoperative use of disinfectable, needleless closed catheter devices (DNCCs) may reduce the risk of bacterial injection as compared to conventional open-lumen devices due to an intrinsic barrier to bacterial entry associated with valve design and/or the capacity for surface disinfection. However, the relative benefit of DNCC valve design (intrinsic barrier capacity) as compared to surface disinfection in attenuation of bacterial injection in the clinical environment is untested and entirely unknown. The primary aim of the current study was to investigate the relative efficacy of a novel disinfectable stopcock, the Ultraport zero, with and without disinfection in attenuating intraoperative injection of potential bacterial pathogens as compared to a conventional open-lumen stopcock intravascular device. The secondary aims were to identify risk factors for bacterial injection and to estimate the quantity of bacterial organisms injected during catheter handling.
METHODS: Four hundred sixty-eight operating room environments were randomized by a computer generated list to 1 of 3 device-injection schemes: (1) injection of the Ultraport zero stopcock with hub disinfection before injection, (2) injection of the Ultraport zero stopcock without prior hub disinfection, and (3) injection of the conventional open-lumen stopcock closed with sterile caps according to usual practice. After induction of general anesthesia, the primary anesthesia provider caring for patients in each operating room environment was asked to perform a series of 5 injections of sterile saline through the assigned device into an ex vivo catheter system. The primary outcome was the incidence of bacterial contamination of the injected fluid column (effluent). Risk factors for effluent contamination were identified in univariate analysis, and a controlled laboratory experiment was used to generate an estimate of the bacterial load injected for contaminated effluent samples.
RESULTS: The incidence of effluent bacterial contamination was 0% (0/152) for the Ultraport zero stopcock with hub disinfection before injection, 4% (7/162) for the Ultraport zero stopcock without hub disinfection before injection, and 3.2% (5/154) for the conventional open-lumen stopcock. The Ultraport zero stopcock with hub disinfection before injection was associated with a significant reduction in the risk of bacterial injection as compared to the conventional open-

lumen stopcock (RR = 8.15×10^{-8}, 95% CI, 3.39×10^{-8} to 1.96×10^{-7}, P = <0.001), with an absolute risk reduction of 3.2% (95% CI, 0.5% to 7.4%). Provider glove use was a risk factor for effluent contamination (RR = 10.48, 95% CI, 3.16 to 34.80, $P < 0.001$). The estimated quantity of bacteria injected reached a clinically significant threshold of 50,000 colony-forming units per each injection series.

CONCLUSIONS: The Ultraport zero stopcock with hub disinfection before injection was associated with a significant reduction in the risk of inadvertent bacterial injection as compared to the conventional open-lumen stopcock. Future studies should examine strategies designed to facilitate health care provider DNCC hub disinfection and proper device handling.

兒童鎮靜和麻醉中的沒被臨床試驗認可藥物的應用

Off-Label Use of Medications in Children Undergoing Sedation and Anesthesia

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背景：很多兒童麻醉和鎮痛的藥物沒被臨床試驗認可。本研究審核了小兒麻醉中的常用藥,判定這些藥物中哪些是被美國食品藥物管理局（FDA）標示爲小兒科使用,哪些是年齡限制使用,哪些是未被臨床試驗認可而用於兒科的.

方法: 本研究檢查手術室藥房中用於兒童病人麻醉的藥物。通過 Thomson Micromedex® 臨床循證醫學資料庫檢測 FDA 的批准和指示的藥物。對未經 FDA 批准使用的藥物用資料庫進一步檢測其是否具有強有效證據並且強烈推薦用於兒童。在 2010 年 1 月 1 日到 2011 年 8 月 31 日期間, 本研究調查了沒被臨床試驗認可藥物在小於 18 歲的年輕病人中的使用率。

結果:共檢測 106 種藥物, 其中 36 種(34%)未被 FDA 標示爲可用于任何小兒的年齡組, 40 種(38%)被 FDA 標示可用于所有小兒的年齡組, 其餘 30 種(28%)被 FDA 標示僅可用於特別的年齡組。沒被臨床試驗認可藥物使用率占 73.4%。在這些未被標記爲可用于任何小兒的藥物中,大部分是常用于小兒麻醉,包括新斯的明，氫嗎啡酮和多巴胺。

結論：許多已用於小兒麻醉的藥物是缺少 FDA 標記的。標示外藥物被使用是因爲其優於它們的替代物。爲了這些易感人群，有必要繼續研究這些標示外使用藥物的安全性和有效性。

（王苑 譯 陳傑 校）

BACKGROUND: Many drugs used for anesthesia and analgesia in children are administered "off-label." We undertook an audit of drugs commonly used for pediatric anesthesia to determine which drugs have United States Food and Drug Administration (FDA) labeling for pediatric use, which drugs are age-restricted, and which have no labeling for pediatric use.

METHODS: We identified drugs administered during anesthesia to pediatric patients from the operating room pharmacy. FDA approval and indications were determined by using the Thomson Micromedex® online database. Drugs without FDA approval for pediatric use were further examined for strength of evidence and strength of recommendation for their listed indications in the database. We then examined the rate of off-label drug administration to patients younger than the age of 18 years between July 1, 2010, and August 31, 2011.
RESULTS: One hundred six drugs were identified. Thirty-six (34%) were not FDA-labeled for use in any pediatric age group, 40 (38%) were FDA-labeled for use in all pediatric age groups, and 30 (28%) were FDA-labeled for use in only specific age groups. Drugs were administered off-label in 73.4% of cases. Of those not labeled for any pediatric age group, some were among the most commonly used drugs in pediatric anesthesia, including neostigmine, hydromorphone, and dopamine.
CONCLUSIONS: Many drugs used for children during anesthesia continue to lack FDA labeling for pediatric use. Off-label use of these drugs is an accepted practice that is considered superior to the alternative of withholding needed medications. Studies are still needed to determine the safety and efficacy of drugs that lack FDA labeling for this vulnerable patient population.

動畫可緩解兒童麻醉誘導期焦慮

Cartoon Distraction Alleviates Anxiety in Children During Induction of Anesthesia

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背景：本研究通過讓 3~7 歲的小兒在手術室麻醉誘導前看一部動畫片和玩喜愛的玩具，來觀察這種做法是否能有效緩解術前焦慮。
方法：本實驗入選 130 名 3~7 歲 ASA1~2 級的小兒。隨機分爲 3 組：第 1 組（對照組），第 2 組（玩具組），第 3 組（動畫組）。第 2 組的兒童被要求帶著他們最喜歡的玩具並玩耍直到麻醉誘導前。第 3 組的兒童在麻醉誘導前可觀看他們選的動畫片。在術前晚上，在麻醉準備室，以及麻醉誘導前通過改良的耶魯術前焦慮量表（mYPAS）和由父母記錄的焦慮視覺評分量表對孩子們的術前焦慮程度進行評分。
結果：在麻醉準備室內，第 2 組的 mYPAS 和父母記錄的焦慮視覺評分都明顯比 1 組和 2 組的低（mYPAS: $P = 0.007$; 父母記錄的焦慮視覺評分：$P = 0.02$）。在手術室內， 第 3 組的這兩個評分在三組中是最低的。第 3 組分別有 3 個和 5 個小兒，在手術室內的這兩個焦慮評分要高於麻醉前準備室的。但是第 1 組中分別有 32 個和 34 個的兒童數；第 2 組中分別有 25 個和 32 個的兒童兩項焦慮評分是高於的($P < 0.001$)，第 1 組，第 2 組和第 3 組在

手術室內不焦慮(mYPAS 評分 <30)的兒童人數分別爲 3 人 (7%), 9 人 (23%), and 18 人 (43%) ($P < 0.001$)。

結論：在小兒術前允許其觀看動畫片可以有效地改善其術前焦慮狀態。本研究認爲這項措施對於改善小兒術前焦慮是一項低成本，易操作的綜合性方法。

（馬霄雯 譯 陳傑 校）

BACKGROUND: We performed this study to determine the beneficial effects of viewing an animated cartoon and playing with a favorite toy on preoperative anxiety in children aged 3 to 7 years in the operating room before anesthesia induction.

METHODS: One hundred thirty children aged 3 to 7 years with ASA physical status I or II were enrolled. Subjects were randomly assigned to 1 of 3 groups: group 1 (control), group 2 (toy), and group 3 (animated cartoon). The children in group 2 were asked to bring their favorite toy and were allowed to play with it until anesthesia induction. The children in group 3 watched their selected animated cartoon until anesthesia induction. Children's preoperative anxiety was determined by the modified Yale Preoperative Anxiety Scale (mYPAS) and parent-recorded anxiety Visual Analog Scale (VAS) the night before surgery, in the preanesthetic holding room, and just before anesthesia induction.

RESULTS: In the preanesthetic holding room, the group 2 mYPAS and parent-recorded anxiety VAS scores were significantly lower than those of groups 1 and 3 (mYPAS: $P = 0.007$; parent-recorded anxiety VAS: $P = 0.02$). In the operating room, the children in group 3 had the lowest mYPAS and parent-recorded anxiety VAS scores among the 3 groups (mYPAS: $P < 0.001$; parent-recorded anxiety VAS: $P < 0.001$). In group 3, the mYPAS and parent-recorded anxiety VAS scores of only 3 and 5 children were increased in the operating room compared with their scores in the preanesthetic holding room, whereas the anxiety scores of 32 and 34 children in group 1 and 25 and 32 children in group 2 had increased ($P < 0.001$). The number of children whose scores indicated no anxiety (mYPAS score <30) in the operating room was 3 (7%), 9 (23%), and 18 (43%) in groups 1, 2, and 3, respectively ($P < 0.001$).

CONCLUSIONS: Allowing the viewing of animated cartoons by pediatric surgical patients is a very effective method to alleviate preoperative anxiety. Our study suggests that this intervention is an inexpensive, easy to administer, and comprehensive method for anxiety reduction in the pediatric surgical population.

日間手術 1 周內的排程及取消的描述性研究

Descriptive Study of Case Scheduling and Cancellations Within 1 Week of the Day of Surgery

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背景：本研究對手術室的 1 周內日間手術排程進行描述性分析。

方法：所使用的資料來自醫院的麻醉科和手術室的資訊管理系統中的日間手術日程表和交易處理表。手術室資訊系統中安排好的手術情況的每次更改都會交易處理表記錄下來，包括更改的日期和時間。時間標記可允許在每個手術日之前(如 2 個工作日前)對手術室的

擇期日程表進行重建。樣本量 n=17，連續 4 周。手術室使用的時間分配，手術間銜接和安排周幾手術是依手術室時間使用低效率最小化，並加權評估手術室使用不足時間和過度使用時間。以平均值±標準差形式描述資料。

結果：更改預訂手術日期並至少增加一例手術占 24.1%±0.3%。最近一次增加手術發生在手術前一天爲 22.3% ± 0.4%。至少有一半(51.5% ± 0.5%)的手術室在手術日前 2 日內有手術時序的改變。此外，當手術室分配時間已完成且科室開始規劃額外手術時，每個規劃的中位時間爲提前 2.2±0.2 個工作日。因此，管理人員可以高效地專注於手術前 2 個工作日之內的手術日。一旦分配時間滿了，淨額外手術數量比總手術數爲 1.2%±0.6%。然而，總數的 11.1%±1.7%是額外手術。因此安排者們應以分配好的時間爲基礎來預測手術當天的可能會發生的實際工作負荷。因此，同一工作日預訂病例的額外工作時對基於先前預訂手術時是不均勻的。

結論：計畫的麻醉任務、手術指標等應該在手術前 2 個工作日內有效地完成。最後 2 天手術室排程會有很多的變化，所以麻醉團隊應在這一階段與排程團隊很好的合作。主要預測計畫外額外工作時數是指定手術時間與當時預訂時間的差異。

（鄭華容 譯 陳傑 校）

BACKGROUND: We performed a descriptive study of operating room (OR) case scheduling within 1 week of the day of surgery.

METHODS: The data used were from the case scheduling and transaction audit tables of a hospital's anesthesia and OR information management systems. Each change to a scheduled case in the OR information system was captured in an audit table, including the date and time when the change was made. The timestamps allowed reconstruction of the elective OR schedule for each date of surgery at preceding dates (e.g., 2 workdays ahead). The sample size was $n = 17$ consecutive 4-week periods. The allocated OR time, for each combination of service and day of the week, was the number of hours that minimized the inefficiency of use of OR time, a weighted combination of the hours of underutilized OR time and the more expensive hours of overutilized OR time. Data are reported as mean ±SE.

RESULTS: (1) The percentage of OR date combinations with at least 1 add-on case was 24.1% ± 0.3%. The most recent addition of a case to an OR occurred 1 working day before surgery for 22.3% ± 0.4% of OR date combinations. At least half (51.5% ± 0.5%) of ORs had its last case scheduled or changed within 2 working days of surgery. In addition, when allocated OR time was filled and the service scheduled additional case(s), the median time ahead when each such case was scheduled was 2.2 ± 0.2 workdays. Thus, managers can productively focus on the day of surgery starting 2 working days before surgery. (2) Once allocated time was full, the ratio of the *net* additional cases scheduled to the total number performed was 1.2% ± 0.6%. However, 11.1% ± 1.7% of the total were additional cases. Thus, schedulers should rely on the allocated time to be predictive of the actual (net) workload that will occur in the future, on the day of surgery. (3) For service and day combinations for which 2 working days ahead the scheduled hours exceeded the allocated hours, there was no significant net increase in minutes of cases scheduled ($P = 0.79$), unlike when the scheduled hours were less than allocated ($P < 0.0001$). Thus, additional hours of cases scheduled within the same number of workdays are heterogeneous both within and among services based on the prior hours of cases scheduled.

CONCLUSIONS: Planning anesthesia assignments, ORs to target, etc., can be done productively starting 2 working days ahead of surgery. There are so many changes to the OR schedule those last 2 workdays that anesthesia groups should be engaged with the scheduling

office during that period. The primary predictor of additional net hours of cases to be scheduled is the difference between the allocated (i.e., forecasted) OR time and the hours scheduled so far. (Anesth Analg 2012;115:–95)

關於新型雙氯芬酸注射劑與酮咯酸或安慰劑在腹部或盆腔手術後急性中重度疼痛中作用比較的一項多中心，雙盲，隨機，多劑量研究

A Novel Injectable Formulation of Diclofenac Compared with Intravenous Ketorolac or Placebo for Acute Moderate-to-Severe Pain After Abdominal or Pelvic Surgery: A Multicenter, Double-Blind, Randomized, Multiple-Dose Study

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背景：歐洲及其他國使用雙氯芬酸注射劑的歷史悠久，常規用法是在 30~120min 內靜脈滴注或一次性肌肉注射 75mg 雙氯芬酸。而新型的注射劑 Dyloject® 將雙氯芬酸鈉溶解於羥丙基 β-環糊精（HPβCD），以便於小劑量靜脈注射或肌肉注射。這項多中心、多劑量、多日、隨機、雙盲的研究分爲 3 個平行組，調查低劑量的 Dyloject® 以小劑量注射是否能有效減輕腹部或盆腔手術術後的急性疼痛。
方法：術後 6 小時內出現中重度疼痛的成人患者(定義：視覺類比量表（VAS）[0~100mm] 50mm）按 1:1:1:1 隨機分組，分別接受 Dyloject®（18.75 或 37.5mg）靜脈注射；酮咯酸 30mg 靜脈注射，或安慰劑。所有治療組的病人每 6 小時接受一次靜脈注射直至出院。至少觀察病人 48 小時，但最長至 5 天。可以隨時靜脈注射嗎啡來進行解救鎮痛，3 小時內總量不超過 7.5mg。主要有效指標是實驗藥物給予後 48 小時內疼痛強度差異之和（SPID）。
結果：331 名患者接受了大於等於一次劑量的藥物研究。在第一個 48 小時內，與安慰劑相比，兩種劑量組 Dyloject® 和酮咯酸都明顯減輕了術後疼痛的程度（P<0.05），也使需要嗎啡解救鎮痛的病人數銳減。兩種劑量組的 Dyloject® 和酮咯酸與安慰劑相比明顯減少了嗎啡的需要劑量（P<0.0001)，在使用 Dyloject® 18.75mg 劑量組和酮咯酸組中，嗎啡解救鎮痛的時間間隔也得到顯著延長。所有的治療相關的副作用發生率爲 20.2%。Dyloject® 劑量組均無治療相關嚴重副作用，酮咯酸組則有 1 例。
結論：對於腹部或盆腔手術術後出現急性中重度疼痛的患者，在接受劑量爲 18.75 mg 和 37.5 mg 的 Dyloject® 治療後，與安慰劑組相比有明顯的鎮痛作用。同時 Dyloject® 和酮咯酸都明顯減少了患者對阿片類藥物的需要量。
（諸琳婕 譯 陳傑 校）
BACKGROUND: Injectable formulations of diclofenac have long been available in Europe and other countries. These formulations use a default dose of 75 mg of diclofenac delivered IV over 30 to 120 minutes or as an IM injection. A novel formulation of injectable diclofenac sodium, Dyloject®, is solubilized with hydroxypropyl β-cyclodextrin (HPβCD) so that it can be given IV

or IM in a small volume bolus. In this multicenter, multiple-dose, multiple-day, randomized, double-blind, parallel-group phase 3 study, we investigated whether lower doses of HPβCD diclofenac delivered as a small volume bolus would be effective for the management of acute pain after abdominal or pelvic surgery.

METHODS: Adults with moderate and severe pain, defined as ≥50 mm on a 0 to 100 mm visual analog scale, within 6 hours after surgery were randomly assigned (1:1:1:1 ratio) to receive HPβCD diclofenac, 18.75 mg or 37.5 mg; ketorolac tromethamine 30 mg; or placebo. Patients in all treatment arms received a bolus IV injection every 6 hours until discharged. They were observed for at least 48 h, and for up to 5 days. Rescue IV morphine was available any time, up to a total of 7.5 mg over a 3-hour period. The primary efficacy measure was the sum of pain intensity differences from 0 to 48 hours after study drug initiation.

RESULTS: Three hundred thirty-one patients received ≥1 dose of study drug. Over the first 48 hours, both IV HPβCD diclofenac doses, as well as ketorolac, produced significant reductions in pain intensity over placebo (all $P < 0.05$), as well as significant reductions in the need for rescue morphine administration. Both doses of HPβCD diclofenac, as well as ketorolac, significantly reduced rescue morphine dosages, as compared to placebo ($P < 0.0001$), and time to rescue morphine administration was significantly increased by treatment with 18.75 mg diclofenac and ketorolac. The overall incidence of treatment-related adverse events was 20.2%. No treatment-related serious adverse events were reported in either diclofenac dose group, whereas only 1 was reported in the ketorolac group.

CONCLUSIONS: For patients with acute moderate and severe pain after abdominal or pelvic surgery, repeated 18.75 mg and 37.5 mg doses of HPβCD diclofenac provided significant analgesic efficacy, as compared to placebo. Significant analgesic efficacy was also provided by the active comparator ketorolac. Both HPβCD diclofenac and ketorolac significantly reduced the need for opioids.

布比卡因和羅呱卡因環糊精複合物的局部神經毒性和肌細胞毒性評估

Local Neurotoxicity and Myotoxicity Evaluation of Cyclodextrin Complexes of Bupivacaine and Ropivacaine

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背景：布比卡因（BVC）和羅呱卡因（RVC）是廣泛應用於臨床的局麻藥。以往研究顯示，比起單純的 BVC 或 RVC，它們的羥丙基-β-環糊精（HP-β-CD）製劑增加了神經阻滯

作用。本項研究評估了 0.5%BVC 或 RVC 環糊精製劑($BVC_{HP-β-CD}$和 $RVC_{HP-β-CD}$)對局部神經和肌肉的細胞毒性。
方法：通過線粒體脫氫酶活性判定 Schwann 細胞的生存率，並且通過對大鼠坐骨神經的組織病理學檢驗確定局部神經毒性（處理後 48 小時和 7 天）。同時進行大鼠腓腸肌（治療後 48 小時）的肌酸激酶水準和組織病理學的測定。
結果：評估提示複合製劑和單純局麻藥對 Schwann 細胞神經毒性無顯著差異。然而，比起單純局麻藥，複合製劑降低血清肌酸激酶 5.5 倍。差異具有顯著性 $P < 0.05$ (BVC)和 $P < 0.01$ (RVC)。比較 BVC 組和 RVC 組，複合製劑組中的肌肉組織病理學測定存在顯著差異 ($P < 0.05$)。
結論：比起單純的局麻藥，新配方具有更低的肌細胞毒性和近似的細胞毒性。
（黃萍 譯 陳傑 校）

BACKGROUND: Bupivacaine (BVC) and ropivacaine (RVC) are local anesthetics widely used in surgical procedures. In previous studies, inclusion complexes of BVC or RVC in hydroxypropyl-β-cyclodextrin (HP-β-CD) increased differential nervous blockade, compared to the plain anesthetic solutions. In this study we evaluated the local neural and muscular toxicity of these new formulations containing 0.5% BVC or RVC complexed with HP-β-CD ($BVC_{HP-β-CD}$ and $RVC_{HP-β-CD}$).
METHODS: Schwann cell viability was assessed by determination of mitochondrial dehydrogenase activity, and histopathological evaluation of the rat sciatic nerve was used to identify local neurotoxic effects (48 hours and 7 days after the treatments). Evaluations of serum creatine kinase levels and the histopathology of rat gastrocnemius muscle (48 hours after treatment) were also performed.
RESULTS: Schwann cell toxicity evaluations revealed no significant differences between complexed and plain local anesthetic formulations. However, use of the complexed local anesthetics reduced serum creatine kinase levels 5.5-fold, relative to the plain formulations. The differences were significant at $P < 0.05$ (BVC) and $P < 0.01$ (RVC). The histopathological muscle evaluation showed that differences between groups treated with local anesthetics (BVC or RVC) and their respective complexed formulations ($BVC_{HP-β-CD}$ or $RVC_{HP-β-CD}$) were significant ($P < 0.05$).
CONCLUSIONS: We concluded that the new formulations presented a lower myotoxicity and a similar cytotoxic effect when compared to plain local anesthetic solutions.

模擬經胸超聲心動圖是用於訓練麻醉醫生經胸超聲心動圖基本技能的有效方法

Transthoracic echocardiography simulation is an efficient method to train anesthesiologists in basic transthoracic echocardiography skills.

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背景：圍術期臨床使用經胸超聲心動圖（TTE)正在被越來越多的人所認識及關注。然而由於麻醉醫生缺乏相關訓練，這項操作的使用受到局限。最爲有效的訓練方式至今尚未確定。我們假定類比 TTE 訓練相對于傳統的講課方式教授 TTE 基本操作技巧對於麻醉住院醫生來說更爲有效。
方法：在這項前瞻性的隨機對照研究中，我們將 61 位麻醉住院醫生（經過麻醉臨床訓練 1-3 年）隨機分爲對照組（n=30）和模擬組（n=31）進行 TTE 訓練，每個 TTE 訓練階段的前 45 分鐘會有一個標準化的預備考試。在第一階段中，對照組使用講課模式的視屏教學，模擬組使用模擬 TTE。課程結束後，用筆試及對志願者行 TTE 檢查來瞭解兩組人對於課程的理解。通過 TTE 檢查是否獲得正確的圖像、圖像品質、解剖標誌以及獲得適合的圖像所需的時間這幾項，由兩位盲評的專家進行 TTE 檢查能力分級評分。在第二個階段中，我們取了之前分組中的 21 位醫生（11 位對照，10 位模擬）來進行與志願者合作的“實踐”訓練。模擬組的醫生有額外的模擬 TTE 訓練。第二階段結束後，再進行一次對志願受試者行 TTE 檢查的考試。
結果：預備考試揭示了住院醫生在干預前具有相同的醫學知識（對照組與模擬組分別爲：56.0% ± 11.9% vs 59.3% ± 11.0%, P = 0.25）。模擬組在第一階段訓練後的測試中各項分數均較高：筆試(57.9% ± 8.8% vs 68.2% ± 10.1%; P < 0.001)、志願者操作測試圖像品質分數 (分級區間 0 至 25 級)(6.4 ± 3.5 vs 12.4 ± 4.2; P = 0.003)、解剖學識別(分級區間 0 至 25 級) (8.3 ± 6.6 vs 17.8 ± 6.6; P = 0.003)以及正確圖像百分比(50 ± 19 vs 78 ± 21; P < 0.001)。第二階段後，模擬組的得分進一步提高。圖像品質分數 (9.6 ± 3.3 vs 15.6 ± 2.8; P = 0.002)、解剖學識別(17.6 ± 3.8 vs 22.8 2.4; P = 0.003)、正確圖像百分比(80 ± 16 vs 96 ± 8; P = 0.007)。
結論：這項前瞻性隨機研究表明：對於接受模擬 TTE 訓練的麻醉學住院醫生，在志願者受試者上進行 TTE 圖像採集以及解剖標誌識別有更好的技巧。即使引入了志願受試者協助實踐教學，兩組中模擬組的教育效益依然較高。而將這一在短期教學上的明顯作用運用於長期教學以及實際臨床應用的價值仍值得進一步研究。
（郭晨躍譯 薛張綱校）
BACKGROUND: The clinical utility of focused transthoracic echocardiography (TTE) is increasingly recognized in perioperative medicine. However its use is limited among anesthesiologists because of a lack of training. The most efficient training methods have not been determined. We hypothesized that simulation-based TTE training would be more effective than traditional lecture-based methods for teaching basic TTE skills to the anesthesiology residents.
METHODS: In this prospective randomized study, 61 anesthesiology residents (in anesthesia clinical training years 1 to 3) were randomized to either control (n = 30) or simulation groups (n = 31) for TTE training. A standardized pretest was administered before TTE training sessions of 45 minutes each. The first training session used a lecture-based video didactic in the control group or a TTE simulator in the simulation group. Comprehension in both groups was then assessed using a written posttest and by performing a TTE examination on a volunteer subject. TTE examinations were graded on the ability to acquire the correct image, image quality, anatomy identification, and time required to attain proper imaging by 2 blinded experts. A second training session incorporating "hands-on" training with a volunteer subject was conducted in a subset of 21 residents (n = 11 control, n = 10 simulation). The simulation group included additional simulator training. After the second session, another posttest on a volunteer subject was administered.

RESULTS: Pretest scores revealed similar preintervention knowledge among residents (56.0% ± 11.9% vs 59.3% ± 11.0%, P = 0.25; control versus simulator group, respectively). The simulation group scored higher on all criteria after the first training session: written posttest (57.9% ± 8.8% vs 68.2% ± 10.1%; P < 0.001), volunteer subject posttest image quality scores (0 to 25 scale) (6.4 ± 3.5 vs 12.4 ± 4.2; P = 0.003), anatomy identification scores (0 to 25 scale) (8.3 ± 6.6 vs 17.8 ± 6.6; P = 0.003), and percentage correct views (50 ± 19 vs 78 ± 21; P < 0.001). After the second session, all scores were again improved in the simulation group: volunteer subject posttest image quality scores (9.6 ± 3.3 vs 15.6 ± 2.8; P = 0.002), anatomy identification scores: (17.6 ± 3.8 vs 22.8 2.4; P = 0.003), and percentage correct views (80 ± 16 vs 96 ± 8; P = 0.007).
DISCUSSION: This prospective randomized study demonstrated that anesthesiology residents trained with simulation acquired better skills in TTE image acquisition and anatomy identification on volunteer subjects. The educational benefit of simulation persisted even with introduction of hands-on instruction with volunteer subjects in both groups. The impact of these short-term educational approaches on longer-term retention and actual clinical application warrants further investigation.

健康志願者吸入芬太尼噴霧劑：藥效動力學及藥代動力學研究

Inhaled Fentanyl Aerosol in Healthy Volunteers: Pharmacokinetics and Pharmacodynamics

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背景：快速全身給予阿片類藥物可以有效治療急性或慢性疼痛。不同的阿片類藥物經肺臟代謝不相同，從而導致較低的生物利用度。Staccato® Fentanyl 是一種吸入的芬太尼製劑。吸入特定尺寸 (1 到 3.5 微米)的高純度(≥98%)芬太尼能使藥物在肺內很好吸收。
方法：我們對志願者分兩階段研究。在交叉研究階段，10 名志願者分別隨機靜脈給予 25ug 芬太尼或吸入 25ug 芬太尼。在擴大研究階段，大劑量、隨機、雙盲、安慰劑對照、單週期吸入芬太尼 50 至 300ug。在給藥後 8 小時抽取靜脈血測定藥代動力學參數，並評估藥效。
結果：在交叉研究階段，靜脈或吸入芬太尼後，動脈血芬太尼峰濃度及曲線下面積相似。相比於靜脈給藥，吸入芬太尼達到峰濃度時間較短，分別爲 20.5 和 31.5 秒。在擴大研究階段，芬太尼血清濃度呈現可預見的劑量依賴性增高。
結論：研究表明，單次吸入芬太尼和靜脈給予芬太尼在藥代動力學方面是可比的。
（韓敘譯 薛張綱校）

BACKGROUND: Rapid delivery of potent opioid to the systemic circulation is an important feature for the effective treatment of acute and acute-on-chronic breakthrough pain. The delivery of different opioids by the pulmonary route has been inconsistent, usually resulting in low bioavailability of the drug. Staccato® Fentanyl for Inhalation is a handheld inhaler producing a

single metered dose of aerosolized fentanyl during a single inspiration. The aerosol is of high purity (≥98%) at a particle size (1 to 3.5 microns) shown to be best for pulmonary absorption.
METHODS: We conducted the study in healthy volunteers in 2 stages. In the crossover stage, 10 subjects received IV fentanyl 25 μg and inhaled fentanyl 25 μg on separate occasions. The dose escalation stage was a multidose, randomized, double-blind, placebo-controlled, single-period dose escalation study of inhaled fentanyl (50 to 300 μg). Serial blood sampling was performed over an 8-hour period after drug administration to determine the pharmacokinetic profile, and serial pupillometry was performed as a measure of pharmacodynamic effect.
RESULTS: In the crossover stage the pharmacokinetic profiles of the inhaled and IV fentanyl showed similar peak arterial concentrations and areas under the curve. The time to maximum concentration was slightly shorter for the inhaled than IV fentanyl, 20.5 and 31.5 seconds, respectively. In the dose escalation stage the administration of repeated doses resulted in predictable, dose-dependent serum concentrations.
CONCLUSIONS: This study has demonstrated that the pharmacokinetic profile of single doses of inhaled fentanyl is comparable to IV administration.

在模擬麻醉誘導時發言與更好的團隊績效有關:一項觀察性研究

Speaking up is related to better team performance in simulated anesthesia inductions: an observational study.

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背景：在這項研究中，我們的目標是測試在麻醉中發言，即，質疑,糾正或闡明當前程式和技術團隊績效的關係。假設 1:團隊成員更高水準的發言與更高水準的技術團隊績效有關。假設 2:團隊成員將發言，闡明自己的程式或一個啓動程式的變化。假設 3:在團隊合作的早期階段更高水準的發言將和以後的階段更高水準的發言有關。
方法：這種前瞻性觀察研究涉及 2 人專案麻醉團隊在一個大型教學醫院中模擬全麻誘導中小的非常規事件(如,心動過緩)。受試者註冊麻醉護士和居民。每組由一個護士和一個居民組成。記錄同步視頻和重要參數。在 12 個不同的類別中,兩個訓練有素的觀察員忽略了假設編碼和進一步的團隊溝通和協調的行爲。在團隊各自的類別中，所有的團隊測量被量化爲占總時間的百分比。兩位經驗豐富的工作人員使用一個 Delphi 驗證評級檢查表，在麻醉醫師不知情的情況下評估團隊的技術績效。採用線性回歸與居民和護理水準的發言，對假設 1 和假設 3 使用兩個單獨的預測變數進行了測試。假設 2 使用滯後序列分析 Z 值變化， 在有條件和無條件轉換中觀測值有顯著不同。
結果:共有 31 個護士和 31 居民參與。技術團隊的績效可以通過預測護士的發言(R(2)= 0.18,P = 0.017),而不是居民的(R(2)= 0.19,P = 0.053);這個結果支持護士的假設 1。支援假設 2，通過提供資訊(Z = 18.08,P < 0.001) 進行澄清, 居民對發言有反應，通過啓動程式上改變給指令(Z = 4.74,P < 0.001)和團隊成員監控(Z = 3,P = 0.0013)。同樣，護士與澄清的過程，

通過提供或評估資訊（Z=16.09，P <0.001; Z= 3.72，P <0.001）和啓動程式的變化提供援助（Z= 0.57，P<0.001）。假設 3 表明一種趨勢，護士在插管前的發言水準預測插管時的發言水準（R（2）= 0.15，P= 0.034），雖然這並不能達到的 Bonferroni 校正的顯著性水準 P = 0.025。在居民中沒有這種關係(R(2)= 0.15,P = 0.096)。
結論：這個研究表明經驗證據和顯示機制在發言行爲和技術團隊績效中有正面的關聯。（賀盼譯 薛張綱校）

BACKGROUND:Our goal in this study was to test the relationship between speaking up-i.e., questioning, correcting, or clarifying a current procedure-and technical team performance in anesthesia. Hypothesis 1: team members' higher levels of speaking up are related to higher levels of technical team performance. Hypothesis 2: team members will react to speaking up by either clarifying their procedure or initiating a procedural change. Hypothesis 3: higher levels of speaking up during an earlier phase of teamwork will be related to higher levels of speaking up during a later phase.
METHODS: This prospective observational study involved 2-person ad hoc anesthesia teams performing simulated inductions of general anesthesiawith minor nonroutine events (e.g., bradycardia) in a large teaching hospital. Subjects were registered anesthesia nurses and residents. Each teamconsisted of 1 nurse and 1 resident. Synchronized video and vital parameter recordings were obtained. Two trained observers blinded to the hypotheses coded speaking up and further team communication and coordination behavior on the basis of 12 distinct categories. All teamwork measures were quantified as percentage of total time spent on the respective teamwork category. Two experienced staff anesthesiologists blinded to the hypotheses evaluated technical team performance using a Delphi-validated rating checklist. Hypotheses 1 and 3 were tested using linear regression with residents' and nurses' levels of speaking up as 2 separate predictor variables. Hypothesis 2 was analyzed using lag sequential analysis, resulting in Z values representing the extent to which the observed value for a conditional transition significantly differs from its unconditional value.
RESULTS: Thirty-one nurses and 31 residents participated. Technical team performance could be predicted by the level of speaking up from nurses (R(2) = 0.18, P = 0.017) but not from residents (R(2) = 0.19, P = 0.053); this result supports Hypothesis 1 for nurses. Supporting Hypothesis 2, residents reacted to speaking up with clarifying the procedure by providing information (Z = 18.08, P < 0.001), initiating procedural change by giving instructions (Z = 4.74, P < 0.001) and team member monitoring (Z = 3, P = 0.0013). Likewise, nurses reacted with clarifying the procedure by providing or evaluating information (Z = 16.09, P < 0.001; Z = 3.72, P < 0.001) and initiating procedural change by providing assistance (Z = 0.57, P < 0.001). Indicating a trend for Hypothesis 3, nurses' level of speaking up before intubation predicted their level of speaking up during intubation (R(2) = 0.15, P = 0.034), although this did not reach the Bonferroni-corrected significance level of P = 0.025. No respective relationship was found for residents (R(2) = 0.15, P = 0.096).
CONCLUSIONS: This study provides empirical evidence and shows mechanisms for the positive relationship between speaking-up behavior and technical team performance.

類比案例顯示心肺復蘇在產科急救危機中的不足：來自以色列麻醉醫師

Deficits in the provision of cardiopulmonary resuscitation during simulated obstetric crises: results from the israeli board of anesthesiologists.

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背景：在臨產婦出現心臟驟停是致命的，但是在這種情況下進行適當的心肺復蘇可以拯救孕婦和胎兒的生命。應用適當的技術對這類患者進行心肺復蘇是有效的。以色列的麻醉醫生通過模擬測試評估醫生的這項技術。
方法：25 名高年資麻醉科醫生對模擬先兆子癇患者硫酸鎂治療後中毒出現心臟驟停患者進行心肺復蘇。通過問卷回答相應問題並打分。
結果：通過試驗發現，對於普通孕婦心肺復蘇完成較好（包括胸外按壓、面罩通氣和除顫），但是對於臨產婦完成不太理想。子宮左傾，面罩通氣過程中按壓環狀軟骨，在 5 分鐘內中止妊娠的完成率分別爲 68%, 48%和 40%。面罩通氣過程中按壓環狀軟骨的比例爲 48％ ，但仍低於要求 80％（要求達到 53％）。5 分鐘內中止妊娠的比例也低於要求的 80％（要求達到 53％）。
結論：高年資醫生對於孕產婦進行心肺復蘇的知識仍比較缺乏。該結果提示，尚需經一步研究。
（胡曉晴譯 薛張綱校）
BACKGROUND: Cardiac arrest in the parturient is often fatal, but appropriate resuscitation in this special situation may save the lives of the mother and/or unborn baby. Concern has arisen as to application of recommended techniques for resuscitation in the obstetric patient. The Israel Board of Anesthesiology has incorporated simulation assessment into accreditation examinations. The candidates represent a unique national cohort in which we were able to assess competence in the simulated scenario of cardiorespiratory arrest in the parturient.
METHODS：A simulated scenario of preeclampsia with magnesium toxicity leading to cardiac arrest in a pregnant patient was performed by 25 senior anesthesiology residents. A unique two-stage simulation examination consisting of high fidelity simulation followed immediately by oral debriefing was conducted. The assessment was scored using a predetermined checklist of key actions and answers to clarifying questions. Simulation performance was compared to debriefing performance.
RESULTS：During the board examination, resuscitation not specific to the pregnant patient was performed well (commencing chest compressions, bag-mask ventilation, cardiac defibrillation); however actions specific to the parturient were performed poorly. Left uterine displacement, cricoid pressure during bag-mask ventilation, and instructing preparations to be made for perimortem cesarean delivery within 5 minutes were performed by 68%, 48%, and 40% of candidates respectively (lower 99% confidence limit 42%, 25%, and 19%, respectively). Cricoid pressure during bag-mask ventilation was performed by 48% (25%) but described in debriefing by 80% of candidates (53%) (P = 0.08), and time setting for perimortem cesarean delivery was performed by 40% (29%) but described by 80% (53%) (P = 0.05) of examinees.

CONCLUSIONS Senior anesthesiology residents have poor knowledge of resuscitation of the pregnant patient. The results suggest 2-stage simulation including an oral component may reveal disparities in knowledge not assessed by simulation alone, but definitive conclusions require further study.

美國 2008 年兒科住院病人對鎮痛、麻醉和 鎮靜藥物的應用

Use of Analgesic, Anesthetic, and Sedative Medications During Pediatric Hospitalizations in the United States 2008

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背景：由於兒童對鎮痛,麻醉劑鎮靜藥的大量需要及兒科藥品核准標示缺乏導致在兒童中由於疼痛及鎮靜而使得核准標示外藥品大量使用。任何企圖解決標示缺乏的問題都將需要國家對使用每種藥物的數量的兒童人數，他們的年齡及其他因素進行評估以瞭解這些藥物的使用情況。我們描述了鎮痛，麻醉劑鎮靜藥物在兒科住院病人中的應用，從>800,000 例美國兒科住院者的調查中獲得了藥物統計分析資料。目的是爲國家評估接受特殊鎮痛，麻醉和鎮靜住院兒童百分比及他們的年齡段提供證據。

方法：資料來自美國最大的醫院，最主要的資料庫。在 2008 年住院兒童中我們統計了所有使用特定藥物的孩子，每一個孩子用的第一種藥並且計算了特殊藥物的使用偏好，在這些住院兒童中每 100 個病人中就有一個應用這些藥物。在這些分析中沒有考慮藥物的劑量及數量。

結果：該資料集包含了 877201 住院治療的在使用藥物時年齡不超過 18 歲的兒童。在這一人群中使用了 33 種藥物和其他 11 種混合藥物，包括非甾體類抗炎藥，局部阻滯藥物，阿片類藥物，苯二氮卓類藥物，鎮靜催眠藥，巴比妥類，及其它藥物。其中 10 種最常用的陣痛，麻醉或鎮靜藥物有對乙醯氨基酚（14.7％），利多卡因（11.0％），芬太尼（6.6％），布洛芬（6.3％），嗎啡（6.2％），咪達唑侖（4.5 ％），丙泊酚（4.1％），利多卡因/丙胺卡因（2.5％），氫可酮/對乙醯氨基酚（2.1％），對乙醯氨基酚/可待因（2.0％）。年齡的變化，改變得方向（增加或減少）及變化的類型（線性，u 形，或其他）表現出藥物特徵性。

結論：在住院兒童中藥物種類及個性化藥物的變化被用來鎮痛及鎮靜。使用模式的變化反映了資料庫的異質性，包括一個年齡上的廣範圍和條件需要的變化，其中鎮痛，麻醉和鎮靜可能是必須的。除了要注意在年齡組中沒有兒童標籤外，我們無法評估一個特定的藥物在臨床的使用是否適當。

（李麗紅譯 薛張綱校）

Background: The wide need for analgesia, anesthesia, and sedation in children and the lack of pediatric labeling leads to widespread off-label use of medications for pain and sedation in children. Any attempt to address the lack of labeling will require national estimates of the numbers of children using each medication, their ages, and other factors, to understand the

overall use of these medications. We describe use of analgesics, anesthetics, and sedatives in pediatric inpatients by result of conducting a statistical analysis of medication data from >800,000 pediatric hospitalizations in the United States. The purpose was to provide national estimates for the percentage of hospitalized children receiving specific analgesics, anesthetics, and sedatives and their use by age group.
Methods: Data from the Premier Database, the largest hospital-based, service-level comparative database in the country, were used. We identified all uses of a given medication, selected the first use for each child, and calculated the prevalence of use of specific medications among hospitalized children in 2008 as the number of hospitalizations in which the drug was used per 100 hospitalizations. Dose and number of doses were not considered in these analyses.
Results: The dataset contained records for 877,201 hospitalizations of children younger than 18 years of age at the time of admission. Thirty-three medications and an additional 11 combinations were administered in this population, including nonsteroidal antiinflammatory drugs, local and regional anesthetics, opioids, benzodiazepines, sedative-hypnotics, barbiturates, and others. The 10 most frequently administered analgesic, anesthetic, or sedative medications used in this population were acetaminophen (14.7%), lidocaine (11.0%), fentanyl (6.6%), ibuprofen (6.3%), morphine (6.2%), midazolam (4.5%), propofol (4.1%), lidocaine/ prilocaine (2.5%), hydrocodone/acetaminophen (2.1%), and acetaminophen/codeine (2.0%). Use changed with age, and the direction of change (increases and decreases) and the type of change (linear, u-shaped, or other) appeared to be specific to each drug.
Conclusions: A variety of drug classes and individual medications were used to manage pain and sedation in hospitalized children. The variation in patterns of use reflects the heterogeneity of the dataset, comprising a wide range of ages and conditions in which analgesia, anesthesia, and sedation might be required. It was not possible to assess whether use of a specific medication was clinically appropriate, except to note use of medications in age subgroups without pediatric labeling.

全身麻醉：調節突觸的形成和神經可塑性的方法

General Anesthesia: A Gateway to Modulate Synapse Formation and Neural Plasticity?
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保持興奮和抑制神經活動模式的平衡是維持神經內穩態極重要的。通常麻醉誘導藥物不僅在臨時的意識喪失干擾這種平衡結果而且也同樣可以長期改變大腦功能。最初這些改變被認爲是有害的，但最近的研究表明，至少在某些特定的條件下，他們可能最終改善神經功能。這篇綜述的目的是提供洞察這些雙重效應的潛在機制。基礎科學問題在關鍵時期的重要作用將在神經回路大會上更好的討論，瞭解到甚至短暫接觸全身麻醉藥時可以啓動在文中提到的持久的神經元結構和功能的改變。最近的一系列觀察表明這些發展階段的依賴性藥物在突觸發生中總結了目前已知的分子機制一起潛在的影響。重點將放在麻醉藥在成人大腦中如何調節神經可塑性和在一些病理狀態下如何改善神經功能。這些新的觀察強烈表

明麻醉藥物不應該僅僅被視作毒性藥品也應該被公認爲上下文相關的強勁的神經可塑性調節器。
（孫莉萍譯 薛張綱校）
Appropriate balance between excitatory and inhibitory neural activity patterns is of utmost importance in the maintenance of neuronal homeostasis. General anesthetic–induced pharmacological interference with this equilibrium results not only in a temporary loss of consciousness but can also initiate long-term changes in brain function. Although these alterations were initially considered deleterious, recent observations suggest that at least under some specific conditions, they may eventually improve neural function. The goal of this review is to provide insights into the mechanisms underlying these dual effects. Basic science issues on the important role of critical periods during neural circuitry assembly will be discussed to better understand how even brief exposures to general anesthetics could initiate context-dependent lasting changes in neuronal structure and function. Recent series of observations suggesting a developmental stage–dependent impact of these drugs on synaptogenesis will then be summarized together with currently known molecular mechanisms underlying these effects. Particular emphasis will be placed on how anesthetic drugs modulate neural plasticity in the adult brain and how this may improve neural function under some pathological states. The ensemble of these new observations strongly suggests that general anesthetics should not merely be considered toxic drugs but rather acknowledged as robust, context-dependent modulators of neural plasticity.

創傷手術麻醉與非創傷手術麻醉的所曾擔的責任相似：一項公開索賠案例分析

Similar liability for trauma and nontrauma surgical anesthesia: a closed claims analysis.

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背景：創傷治療面臨眾多挑戰，包括麻醉科以外的醫生認爲創傷治療增加醫療責任的風險。我們利用美國麻醉醫師協會終審投訴專案資料庫和全國住院患者抽樣來比較創傷麻醉治療的索賠率和全國創傷手術的資料。我們也通過美國麻醉醫師協會終審投訴專案資料庫來評估創傷麻醉醫療事故索賠和非創傷手術麻醉索賠的損害和責任的特徵。
方法：本研究分析了 1980 年至 2005 年間美國麻醉醫師協會終審投訴專案資料庫中的 8954 例手術麻醉傷害索賠。我們根據全國創傷登記中的損傷評定標準來限定創傷，包括出院病例。爲了評估全國創傷麻醉的比例，我們應用全國住院患者取樣中界定創傷出院的傷害代碼除以手術程式碼。比較自 1990 至 2001 年創傷麻醉損傷的發生率與美國麻醉醫師協會終審投訴的發生率，根據創傷結局以及系統的結果行多元回歸分析，計算其年度調整的比值比及 P 值。分別採用卡方檢驗、Fisher 精確檢驗以及 K-S 檢驗比較解決索賠的賠償率、賠償比例以及賠償額。
結果: 本研究期間共 6215 例手術麻醉索賠中，創傷手術引起的索賠占 6%。從 1990 年至 2001 年期間，住院創傷手術索賠率一直低於非創傷手術的索賠率。根據年度調整的比值比與創傷手術與非創傷手術索賠比例的比值爲 0.62（95%置信區間，0.53－0.72；P <

0.001,似然比檢驗）。在治療是否恰當，是否賠償原告損失以及賠償額上，創傷手術與非創傷手術的索賠並無差異。
結論: 儘管有報導認爲創傷治療的醫療責任風險較大，但是本研究中，對創傷手術的住院病人實施麻醉並未明顯增加責任風險。與非創傷手術麻醉相比，創傷手術麻醉並不增加醫療過失索賠的比例。從法醫學上的責任來講，本結果支持麻醉從業者參與多發性創傷的救治組織系統。
（郁玲玲譯 薛張綱校）
BACKGROUND: Trauma care has many challenges, including the perception by nonanesthesia physicians of increased medical malpractice liability. We used the American Society of Anesthesiologists' Closed Claims Project database and the National Inpatient Sample (NIS) to compare the rate ofclaims for trauma anesthesia care to national trauma surgery data. We also used the American Society of Anesthesiologists' Closed Claims Project database to evaluate injury and liability profiles of trauma anesthesia malpractice claims compared to nontrauma surgical anesthesia claims.
METHODS: Surgical anesthesia claims for injuries that occurred between 1980 and 2005 in the American Society of Anesthesiologists' ClosedClaims Project database of 8954 claims were included in this analysis. Trauma was defined using cause of injury criteria in state trauma registries, including out-of-hospital falls. To estimate national trauma anesthesia rates, we used injury codes in NIS reports to define trauma discharges and NIS discharges with surgical procedure codes for the denominator. The year-adjusted odds ratio and P value comparing the national trauma anesthesiainjury rates and American Society of Anesthesiologists' Closed Claims Project inpatient claim rates in the 1990 to 2001 time period were calculated by a multivariate logistic regression of the injury/trauma outcome on year and the NIS/Closed Claims Project indicator. Payments in claim resolution between trauma claims and nontraumatic surgical anesthesia claims were compared by $\chi(2)$ analysis, Fisher exact test for proportions, and Kolmogorov-Smirnov test for payment amounts.
RESULTS: Trauma claims represented 6% of the total 6215 surgical anesthesia claims in the study period. The inpatient trauma claims rates were consistently lower than the NIS injury rates for 1990 to 2001. The year-adjusted odds ratio comparing the trauma claims rates to the NIS injury rates was 0.62 (95% confidence interval [CI], 0.53 to 0.72; $P < 0.001$, likelihood ratio test). Trauma claims and nontrauma surgical anesthesia claims did not differ in appropriateness of care, whether or not a payment was made to the plaintiff, or size of payments.
CONCLUSION: Despite reported perceptions that trauma care involves a high risk of medical liability, there was no apparent increased risk of liabilityamong inpatients presenting for trauma anesthesia care. The proportion in malpractice claims in trauma anesthesia care was not increased compared to nontraumatic surgical anesthesia care. With respect to medicolegal liability, these results support participation of anesthesia providers in multidisciplinary trauma care and organized systems.

外周絲裂原活化蛋白激酶對卡拉膠誘導的大鼠關節痛和關節炎的不同作用

Different roles of peripheral mitogen-activated protein kinases in carrageenan-induced arthritic pain and arthritis in rats.

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背景：越來越多的證據表明，細胞外信號調節蛋白激酶（ERK），p38 和 c-Jun N-末端激酶（JNK）可能參與各種疼痛。然而，目前缺乏直接證據證明，外周的 ERK，p38 和 JNK 實際可誘發和延續關節疼痛和關節炎的發展。
方法：預先和治療性地關節內給予選擇性 p38 抑制劑（SB203580）和 JNK（SP600125），以及通過啓動 ERK（例如，MEK，有絲分裂原活化的蛋白激酶 ERK[MAPK]/ ERK 激酶）的激酶阻斷劑（PD98059），間接抑制 ERK，評估用藥對後關節疼痛相關行爲的影響，例如減少重量負荷和炎症反應，如中性粒細胞浸潤到滑膜和大鼠膝關節直徑。此外，還對關節炎誘發膝關節滑膜中 ERK，p38 和 JNK 的磷酸化進行了研究。
結果：預先給予 PD98059，SB203580，SP600125 不能避免注入膝關節腔內的卡拉膠引起的重量負荷，但其影響表現出不同時程。治療性給予 PD98059 和 SB203580 能部分逆轉卡拉膠引起的重量負荷，其影響表現出類似的時程。但是，治療性給予 SP600125 並不能減少重量負荷。蘇木精和伊紅染色結果顯示，預先給予 SB203580 或 SP600125 能抑制卡拉膠所致的中性粒細胞浸潤滑膜，但 PD98059 不能。 Western blot 檢測結果表明，在卡拉膠注射後不同時間點上滑膜上表達不同的磷酸化 ERK，p38 和 JNK。
結論：這些結果表明，在膝關節疼痛和關節炎方面，外周水準的 ERK，p38 和 JNK 信號通路扮演了不同的角色。
（周玲譯 薛張綱校）

BACKGROUND: Accumulating evidence suggests that extracellular signal-regulated protein kinase (ERK), p38, and c-Jun N-terminal kinase (JNK) might be involved in hypersensitivity of various pain models. However, there is a lack of direct evidence for actual involvement of peripheral ERK, p38, and JNK in induction and maintenance of arthritic pain and the development of arthritis.
METHODS: We evaluated the effects of preemptive and therapeutic intra-articular administration of selective inhibitors of p38 (SB203580) and JNK (SP600125), and indirect inhibition of ERK with a blocker (PD98059) of the kinase that activates ERK (i.e., MEK, the mitogen-activated protein kinase [MAPK]/ERK kinase), on arthritic pain-related behavior such as reduction of weight load and the inflammatory responses such as neutrophil infiltration into the synovium and knee joint diameter in rats. In addition, arthritis-induced phosphorylation of ERK, p38, and JNK in synovium of knee joint was examined.
RESULTS: Pretreatments with PD98059, SB203580, and SP600125 prevented the reduction of weight load induced by the carrageenan injected into the knee joint cavity, but their effects showed different time course patterns. Therapeutic administration of PD98059 and SB203580 partially reversed carrageen-induced reduction of weight load, and their effects showed a similar time course pattern. However, therapeutic administration of SP600125 had no effect on the reduction of weight load. Hematoxylin and eosin staining revealed that carrageenan-induced

neutrophil infiltration into the synovium was inhibited by pretreatment with SB203580 or SP600125, but not PD98059. Western blot measurements showed distinct expression of phosphorylated ERK, p38, and JNK in the synovium at different time points after carrageenan injection.
CONCLUSION: These results suggest that ERK, p38, and JNK signaling pathways at the peripheral level may play different roles in arthritic pain and arthritis of the knee joint.

簡報：喉上神經超聲可視下注射的方法：志願者研究及屍體模擬

Brief report: a method for ultrasonographic visualization and injection of the superior laryngeal nerve: volunteer study and cadaver simulation.

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喉上神經阻滯是上呼吸道麻醉有效的技術。對 20 名志願者進行雙側神經掃描後我們發明了一種超聲技術，使用曲棍球棒樣 8-15MHz 感測器（HST15 至 8/20 線性探頭，Ultrasonix，Richmond，BC，加拿大）視覺化喉上神經以及主要的解剖結構。隨後，我們對 2 具屍體類比了喉上神經掃描並對雙側喉上神經注射。在超聲引導下我們對 4 具屍體朝向喉上神經的方向抬高穿刺針的角度並注射 1ml 綠色染料均獲得成功，隨之的解剖可證實。我們得出結論，超聲引導下對喉上神經進行阻滯是可行的。
（楊琰譯 薛張綱校）
Superior laryngeal nerve block is a valuable technique for provision of upper airway anesthesia. In bilateral scans of 20 volunteers, we developed a technique for ultrasonographic visualization of the superior laryngeal nerve and key anatomical structures using a hockey stick-shaped 8 to 15 MHz transducer (HST15 to 8/20 linear probe, Ultrasonix, Richmond, BC, Canada). Subsequently, we simulated superior laryngeal nerve scanning and injection in bilateral injections in 2 cadavers. Ultrasound-guided in-plane advancement of a needle toward the superior laryngeal nerve and injection of 1 mL of green dye was achieved in all 4 attempts and confirmed by a postprocedural dissection performed by an anatomist. We conclude that ultrasound-guided superior laryngeal nerve block in humans may be feasible.

椎旁阻滯在日間隆胸術的應用：一項隨機臨床試驗

Paravertebral Blockade for Day-Case Breast Augmentation: A Randomized Clinical Trial

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背景：雙側隆胸術是越來越流行的一項日間手術。相對於更複雜、潛在危險性更大的椎旁阻滯（PVB），鎮靜狀態下予以局部浸潤麻醉由於操作的簡單性而被常規應用于此項手術中。我們假設羅呱卡因，經由有經驗的麻醉醫生注射到椎旁間隙作爲 PVB，相較于經由手術醫生（整形外科醫生）直接注射到手術解剖區域將提供更好的麻醉效果。

方法： 40 名 ASA 分級 I－II 級、進行雙側胸大肌下美容隆胸手術的女性患者被招募進入此項前瞻性、隨機、單盲研究。患者被隨機分入兩組：羅呱卡因 PVB 途徑組和羅呱卡因術區局部浸潤組。手術醫生在兩組患者的術區都將進行局部浸潤，使用生理鹽水（PVB 組）或者羅呱卡因（局部浸潤組）。兩組患者都使用丙泊酚維持鎮靜狀態，滴定達到作用。整形外科醫生對注射的溶液種類不知情。收集的資料包括人口特徵、術中合作評分、復蘇室內術後噁心嘔吐、鎮痛藥使用情況以及視覺類比尺規疼痛評分。要求所有患者完成術前焦慮和恢復品質的問卷，並記錄在出院時她們的疼痛評分以及鎮痛藥需求。觀察指標爲（i）由整形外科醫生對患者術中合作情況評分，（ii）丙泊酚用量，（iii）術後疼痛，以及（iv）恢復品質。

結果：40 名患者完成了本次研究。PVB 提高了術中合作情況（差異的顯著性 P <0.001，WMWodds = 6.69，單面 95％可信區間 CI≥2.85），減少了丙泊酚用量（差異顯著性 P = 0.005，WMWodds = 0.35，CI <0.69），並且減少了家庭環境下的平均術後疼痛（差異顯著性 P= 0.007，WMWodds = 0.38, CI <0.73)。未發生 PVB 併發症。僅有來自術區局部浸潤組的患者有鎮痛藥需求(30%, 差異顯著性 = 0.01)。

結論：在有限數量的患者中，我們發現對於在同一天進行的雙側隆胸術，羅呱卡因 PVB 優於經由直接術區局部浸潤。PVB 的這些益處仍需與其潛在危險性進行權衡，特別是在辦公環境中。

（余亦南 譯 馬皓琳 李士通 校）

BACKGROUND: Bilateral breast augmentation is an increasingly popular day-case procedure. Local infiltration with sedation is routinely used for its ease of application compared with the more complex and potentially riskier paravertebral blockade (PVB). We hypothesized that ropivacaine injected by experienced anesthesia providers into the paravertebral space as a PVB was more effective than ropivacaine injected by the operating surgeon (plastic surgeon) directly into the zone of surgical dissection.

METHODS: Forty female patients who were ASA physical status I or II and undergoing bilateral subpectoral cosmetic breast augmentation were recruited for participation in a prospective, randomized, single-blind study. Patients were randomized to 1 of 2 groups: ropivacaine via PVB, or surgical infiltration of ropivacaine. In both groups, the surgeon was asked to infiltrate the appropriate area with either saline (PVB group) or ropivacaine (local infiltration group). Both groups were sedated with propofol, titrated to effect. The plastic surgeon was blinded to the solution injected. Data collected included demographic characteristics, intraoperative cooperation scores, recovery room postoperative nausea and vomiting, analgesia use, and visual analog scale pain scores. All patients were asked to complete a preoperative anxiety and quality of recovery questionnaire and to record their pain scores and analgesia requirements on discharge. The outcome measures were (i) intraoperative patient cooperation as assessed by the plastic surgeon, (ii) propofol requirement, (iii) postoperative pain, and (iv) quality of recovery.

RESULTS: Forty patients completed the study. PVB improved intraoperative cooperation (significance of difference P < 0.001, WMWodds = 6.69 with 95% 1-sided confidence interval CI ≥2.85), reduced propofol requirement (significance of difference P = 0.005, WMWodds =

0.35, CI <0.69), and decreased average postoperative pain in the home environment (significance of difference *P* = 0.007, WMWodds = 0.38, CI <0.73). There were no PVB complications. Only patients from the surgical infiltration group required rescue analgesics (30%, significance of difference = 0.01).
CONCLUSIONS: In a limited number of patients, we found that PVB is superior to direct surgical infiltration of ropivacaine for bilateral breast augmentation in same-day surgery. These advantages need to be balanced against the potential risks of PVB, especially in an office setting.

圍手術期靜脈注射利多卡因和氯胺酮對於腹式子宮切除術後恢復的影響

The Effect of Perioperative Intravenous Lidocaine and Ketamine on Recovery After Abdominal Hysterectomy

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背景：圍術期輸注氯胺酮可以減輕術後疼痛，圍術期輸注利多卡因可以減少術後麻醉性鎮痛藥的使用，加快腸道功能恢復，改善術後疲乏，並縮短住院時間。然而，但是對於圍術期靜脈注射利多卡因和/或氯胺酮對於急性的功能恢復是否有影響仍然是未知的。因此，我們檢驗了這樣的假設，即對於行開腹全子宮切除的病人，圍術期靜脈輸注利多卡因和/或氯胺酮提高了患者康復速度，康復速度使用術後第二天早上的 6 分鐘步行距離（6-MWD）來描述。
方法：行開腹全子宮切除手術的女性病人，七氟醚麻醉，隨後使用病人自控嗎啡泵。病人隨即分到以下幾組中的一組：（1）利多卡因和安慰劑組，（2）安慰劑和氯胺酮，（3）安慰劑和安慰劑，（4）利多卡因和氯胺酮。利多卡因先給予一次單次劑量（1.5mg/kg），然後開始的 2 小時按 2 mg/kg/h 的劑量靜脈輸注，隨後術後 24 小時按照 0.12 mg/kg/h 的劑量輸注。雙盲的主要結果是術後第二天清晨的 6-MWD；次要結果包括疼痛評分、阿片類藥物用量、術後噁心嘔吐情況以及疲勞評分。
結果：當 64 名病人的中期分析顯示利多卡因超過預期的疲勞邊界時，就終止了研究。此時，利多卡因與安慰劑組分別爲 202 ± 66 m 和 202 ± 73 m，平均差（臨時調整爲 97.5%可信區間）爲 0.93m (−52, 54) (*P* = 0.96)。氯胺酮的效果也超過了疲勞邊界，與安慰組分別爲 193 ± 77 m 和 210 ± 61 m，平均差（臨時調整爲 97.5%可信區間）爲-11m (−65, 44) (*P* = 0.54)。2 種干預效果之間沒有交互影響（*P* = 0.96）。兩種干預措施都沒有顯著影響次要結果。
結論：我們的研究結果不支援利多卡因或氯胺酮用於改善開腹全子宮切除術後第二天的 6-MWD。
（安光惠 譯 馬皓琳 李士通 校）

BACKGROUND: Perioperative ketamine infusion reduces postoperative pain; perioperative lidocaine infusion reduces postoperative narcotic consumption, speeds recovery of intestinal function, improves postoperative fatigue, and shortens hospital stay. However, it is unknown whether perioperative IV lidocaine and/or ketamine enhances acute functional recovery. We therefore tested the primary hypothesis that perioperative IV lidocaine and/or ketamine in patients undergoing open abdominal hysterectomy improves rehabilitation as measured by a 6-minute walk distance (6-MWD) on the second postoperative morning.

METHODS: Women having open hysterectomy were anesthetized with sevoflurane, followed by patient-controlled morphine. Patients were factorially randomized to one of the following groups: (1) lidocaine and placebo, (2) placebo and ketamine, (3) placebo and placebo, or (4) lidocaine and ketamine. Lidocaine was given as a bolus (1.5 mg/kg), followed by lidocaine infusion of 2 mg/kg/h for the first 2 hours, and then 1.2 mg/kg/h for 24 postoperative hours. Ketamine was given as a bolus (0.35 mg/kg), followed by ketamine infusion of 0.2 mg/kg/h for the first 2 hours, and then 0.12 mg/kg/h for 24 postoperative hours. The primary double-blind outcome was 6-MWD on the second postoperative morning; secondary outcomes included pain scores, opioid consumption, postoperative nausea and vomiting, and fatigue score.
RESULTS: The study was stopped after a planned interim analysis of 64 patients showed that lidocaine crossed the preplanned futility boundary, with mean ± SD of 202 ± 66 m versus 202 ± 73 m for lidocaine versus placebo, respectively, and mean difference (interim adjusted 97.5% confidence interval) of 0.93 m (−52, 54) (P = 0.96); the ketamine effect also crossed the futility boundary, with mean ± SD of 193 ± 77 m versus 210 ± 61 m for ketamine versus placebo, respectively, and mean difference (interim adjusted 97.5% confidence interval) of −11 m (−65, 44) (P = 0.54). No interaction between the 2 intervention effects was observed (P = 0.96). Neither intervention significantly influenced any of the secondary outcomes.
CONCLUSION: Our results do not support use of lidocaine or ketamine for improving 6-MWD on the second postoperative day after open hysterectomy.

產後出血的風險與母體種族性之間的相關性

The Association of Maternal Race and Ethnicity and the Risk of Postpartum Hemorrhage

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背景：在美國，產科預後與患者種族有很大相關性，但是我們對於產後出血(PPH)的風險與種族差異的關係知之甚少。我們探討了因子宮收縮乏力導致的產後出血與種族差異的相關性，並連續對可能的相關因素進行了調整。
方法：本文分析樣本基於 2005 至 2008 年間全國住院病人。我們計算出了宮縮乏力性產後出血及其導致的輸血或子宮切除的概率。我們建立了多變數邏輯回歸分析模型，通過連續添加潛在相關因素來計算這些意外事件在不同種族組別孕婦中發生的優勢。
結果：雖然對潛在的相關因素（依白種人作爲參考，西班牙裔調整後比值比：1.21,99%可信區間[1.18, 1.25]；亞太島民裔爲 1.31 [1.25, 1.38]）做出了調整，但是相對於白種人，西班牙裔種族和亞太島民裔種族在宮縮乏力性產後出血的發生概率上有明顯的統計學增長。在宮縮乏力性產後出血導致的輸血和子宮切除方面也有類的結果。

結論：西班牙裔和亞太島民裔對於宮縮乏力性產後出血是獨立於已測定的潛在相關因素的顯著風險因素；生物學差異可能起作用。
（張怡 譯 馬皓琳 李士通校）
BACKGROUND: There are profound racial and ethnic disparities in obstetric outcomes in the United States, but little is known about disparities in risk of postpartum hemorrhage (PPH). We explored the association of race and ethnicity on the risk of PPH due to uterine atony with sequential adjustment for possible mediating factors.
METHODS: This analysis was based on the Nationwide Inpatient Sample, from between 2005 and 2008. The frequencies of atonic PPH and atonic PPH resulting in transfusion or hysterectomy were estimated. We developed multivariable logistic regression models to estimate the odds of these outcomes in maternal racial/ethnic groups by sequentially adding potential mediators.
RESULTS: Hispanic ethnicity and Asian/Pacific Islander race were associated with a statistically significant increased odds of atonic PPH in comparison with Caucasians, despite adjustment for potential mediators (adjusted odds ratio [OR] for Hispanics: 1.21, 99% confidence interval [1.18, 1.25]; for Asians/Pacific Islanders: 1.31 [1.25, 1.38], with Caucasians as reference). Similar results were observed for these racial/ethnic groups for atonic PPH resulting in transfusion or hysterectomy.
CONCLUSION: Hispanic ethnicity and Asian/Pacific Islander race are significant risk factors for atonic PPH independent of measured potential mediators; biological differences may play a role.

2011 年產科麻醉新進展：降低產婦不良結局，提高產科麻醉醫療品質

What's New in Obstetric Anesthesia in 2011? Reducing Maternal Adverse Outcomes and Improving Obstetric Anesthesia Quality of Care

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本文對 2012 年 5 月產科麻醉及圍生醫學協會年會上發表的有關"產科麻醉新進展"的演講做一簡述。被邀請的演講者回顧了 2011 年產科、產科麻醉、圍生醫學的發展及發表的重要醫學文獻。通過對 2011 年有關產科麻醉及產婦跨學科醫療的理論知識及臨床實踐的文獻回顧，提出了重點論題及主題，具體包括影響妊娠婦女的保健政策內容、產婦死亡率及發病率的更新資料以及與剖腹產婦女麻醉實踐有關的臨床及實證研究。
（王贇 譯 馬皓琳 李士通 校）
This article accompanied the "What's New in Obstetric Anesthesia?" lecture presented at the Society for Obstetric Anesthesia and Perinatology Annual Meeting in May 2012. The invited lecturer reviewed the obstetric, obstetric anesthesiology, perinatology, and key medical literature published in 2011. This review identifies key topics and themes from the 2011 literature relevant to the science and clinical practice of obstetric anesthesiology and the interdisciplinary care of obstetric patients. Specific topics include health care policy issues that affect pregnant women, updated information on maternal mortality and morbidity, and clinical and outcomes-based research related to anesthetic practices for women undergoing cesarean delivery.

變化的視訊短片可以減少兒童在吸入麻醉誘導時的焦慮

Streamed Video Clips to Reduce Anxiety in Children During Inhaled Induction of Anesthesia

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背景：兒童的麻醉誘導通常通過吸入氧化亞氮和七氟醚來完成。小兒麻醉醫生通常使用干擾技術，如幽默或非手術程式談話來減少焦慮並促進平穩過渡這關鍵階段。有大量關於使用視頻和電視等分散方法對於小診療和牙科手術的成功分心的研究。但關於這種方法用於日間手術的研究卻極少。在這個隨機對照試驗研究中我們檢測了視頻分心是否能夠有效地減少兒童在日間手術前吸入麻醉誘導時的焦慮。
方法：2-10 歲接受日間手術的孩子（對照=47，視頻=42）被隨機分配到視頻分心組和對照組。在視頻分心組中，誘導期間播放孩子偏好剪輯視頻。在對照組中，在誘導期間給予傳統的分心方法。用調整的耶魯術前焦慮評分來評價兒童接受吸入麻醉藥過程前和過程中的焦慮。
結果：在進入手術室之前，所有受試者的年齡和焦慮評分都相似。與對照組比較，在視頻分心組中的孩子在誘導時的焦慮顯著較少，並且從準備到誘導時的焦慮變化顯著較小。
結論：接受日間手術的兒童吸入麻醉誘導期間，播放視訊短片是一種有效的減少焦慮的方法。因此，小兒麻醉醫生可能會考慮使用視頻分心法作爲一種有用的、有效的、可替代的策略，實現平穩過渡到麻醉狀態。
（崔曉娜 譯 馬皓琳李士通 校）

BACKGROUND: Anesthesia induction in children is frequently achieved by inhalation of nitrous oxide and sevoflurane. Pediatric anesthesiologists commonly use distraction techniques such as humor or nonprocedural talk to reduce anxiety and facilitate a smooth transition at this critical phase. There is a large body of successful distraction research that explores the use of video and television distraction methods for minor medical and dental procedures, but little research on the use of this method for ambulatory surgery. In this randomized control trial study we examined whether video distraction is effective in reducing the anxiety of children undergoing inhaled induction before ambulatory surgery.
METHODS: Children (control = 47, video = 42) between 2 and 10 years old undergoing ambulatory surgery were randomly assigned to a video distraction or control group. In the video distraction group a video clip of the child's preference was played during induction, and the control group received traditional distraction methods during induction. The modified Yale Preoperative Anxiety Scale was used to assess the children's anxiety before and during the process of receiving inhalation anesthetics.

RESULTS: All subjects were similar in their age and anxiety scores before entering the operating rooms. Children in the video distraction group were significantly less anxious at induction and showed a significantly smaller change in anxiety from holding to induction than did children in the control group.
CONCLUSIONS: Playing video clips during the inhaled induction of children undergoing ambulatory surgery is an effective method of reducing anxiety. Therefore, pediatric anesthesiologists may consider using video distraction as a useful, valid, alternative strategy for achieving a smooth transition to the anesthetized state.

病人送至復蘇室的多重交接現象

Multitasking During Patient Handover in the Recovery Room

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背景：患者移交至復蘇室的過程中常發生的資訊丟失影響到監護的連續性。因此。改善移交工作是保證患者安全的重要環節。術後，患者轉移至麻醉後監護室（PACU），並移交給護士，包括監護設備的移交（連接心電圖、校準動脈管線、輸液泵等）和患者/手術特殊情況交接。多重交接可能會增加交接過程中資訊丟失的風險。在日常工作中設備和資訊移交過程中同時或先後發生的缺失程度目前仍尚未知。
方法：一項關於患者從手術室（OR）到 PACU 交接工作的全國範圍調查問卷由 494 名保健醫生回饋。此外，對 101 個在 2 所高等醫院（*n*=20），3 所教學醫院（*n*=43）和一所社區醫院（*n*=38）由 OR 到 PACU 的交接過程進行了錄影。由兩名獨立的觀察員分別記錄同時或先後進行的設備和資訊交接過程。
結果：這項全國性調查中同時交接設備和資訊是少數受訪者的偏好（11%，95%可信區間 8%至 14%）。自我報告同時交接的發生率爲 43%（39%至 47%）。在錄影到的交接中，同時交接的發生率爲 65%（56%至 74%），這種現象在高等院校的醫學中心發生率更高。同時交接比先後交接快的時間不超過 0.2 分鐘（*P*=0.38）。
結論：錄影到的由 OR 到 PACU 的交接過程中同時交接設備和資訊占大多數。儘管多數保健員沒有意識到這點，然而在 PACU 患者交接過程中的這種多工處理形式是很常見的。進一步的研究應該評估這種多工處理是否也會導致危重患者資訊的缺失和患者安全性的下降。
（許辛 譯， 馬皓琳 李士通 校）

BACKGROUND: Loss of information occurs frequently during handover and affects the continuity of care. Improving handovers is therefore a key patient safety goal. After surgery, the patient is transferred to the postanesthesia care unit (PACU), and handover to the nurse includes both handover of monitoring equipment (connecting electrocardiogram, calibrating arterial lines, infusion pumps, etc.) and patient/procedure-specific information. Multitasking is likely to

increase the risk of information loss during handover. It is unknown to what extent the transfer of equipment and information occurs simultaneously or sequentially in daily practice.
METHODS: A nationwide questionnaire on the subject of patient handover was returned by 494 health care practitioners concerned with handovers from operating room (OR) to PACU. In addition, 101 handovers from the OR to the PACU were videotaped in 2 academic hospitals (n = 20), 3 teaching hospitals (n = 43) and 1 community hospital (n = 38). The occurrence of simultaneous or sequential transfer of equipment and information was recorded by two independent observers.
RESULTS: Simultaneous handover of equipment and information was the preference for a minority of respondents to the national survey (11%, 95% confidence interval, 8% to 14%). Self-reported simultaneous handover was 43% (39% to 47%). In the videotaped handovers, simultaneous handover was used for 65% (56% to 74%), which was even higher in the academic centers. The simultaneous handovers were no more than 0.2 minute faster than sequential handovers (P = 0.38).
CONCLUSIONS: In most videotaped handovers from OR to the PACU, there was simultaneous transfer of equipment and information. Although most health care providers are unaware of it, this form of multitasking during patient handover in the PACU is common. Future studies should evaluate whether this multitasking also leads to loss of critical patient information and reduced patient safety.

開放性結腸手術中局部吹入溫暖濕潤的 CO_2 會增加開放性創傷和核心溫度：一個隨機臨床試驗

Local Insufflation of Warm Humidified CO_2 Increases Open Wound and Core Temperature During Open Colon Surgery: A Randomized Clinical Trial

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背景：開放性手術傷口暴露在寒冷乾燥的周圍空氣中會導致熱量以輻射、對流和蒸發的形式散失。同樣，全身麻醉和椎管內麻醉也會降低患者的核心溫度。儘管有常規的預防措施，但術中輕度低體溫仍然是常見的並且是導致術後發病率和死亡率的原因之一。我們假設局部吹入溫暖的足夠濕潤的 CO_2 會使開放性手術創傷和核心溫度都增加。
方法：83 名行開放性結腸手術的病人平均的、平行的隨機接受標準保溫措施（包括充氣式保溫法、溫暖液體法和四肢頭部隔絕法），或者額外在層流（10L/min）中通過氣體擴散方式向局部傷口吹入溫暖（37℃）濕潤（100%相對濕度）的 CO_2。用熱敏紅外攝像機和鼓膜溫度計跟蹤記錄傷口表面和核心的溫度。
結果：與對照組 29.6℃ 相比較，溫暖濕潤 CO_2 組術中傷口區域平均溫度是 31.3℃（P < 0.001,，95% 可信區間[CI]，1.2℃ 至 2.3℃）。同樣的，相對於對照組 28.5℃，術中傷口邊緣平均溫度是 30.1℃（P < 0.001， 95% CI，0.2℃ 至 0.7℃）。手術開始前的平均核心溫度溫暖濕潤 CO_2 組 36.7℃ ± 0.5℃ 與對照組的 36.6℃ ± 0.5℃ 相近（95% CI，0.4 至

−0.1℃）。到手術結束時，兩組有顯著差異，溫暖濕潤 CO_2 組是 36.9 ± 0.5℃ 比對照組的 36.3 ± 0.5℃（P < 0.001，95% CI，0.38℃ 至 0.82℃）。此外，溫暖濕潤 CO_2 組 40 名病人中只有 8 名病人的核心溫度<36.5℃（20%，95% CI，7 至 33%)。然而，在對照組 39 名病人中有 24 名是這樣的情況（兩組之間的差異百分比爲 42%，95% CI，22%至 61%，P < 0.001）。以<36.0℃ 爲分界點，在手術結束時相對於對照組 7 名病人（18%，95% CI，5% 至 31%，P = 0.005）低體溫，溫暖濕潤 CO_2 組沒有病人低體溫（兩組之間的差異百分比爲 18%，95% CI, 6% to 30%, P = 0.005）。溫暖濕潤 CO_2 組手術時間的中位數（第 25/75 百分位）是 181.5（147.5/288）分鐘，對照組 217（149/288）分鐘（P = 0.312）。兩組間的臨床變數沒有顯著差異。

結論：在開放性手術傷口吹入溫暖的足夠濕潤的 CO_2 可增加手術創傷和核心的溫度，並有助於維持正常體溫。

（ 唐 瑩 譯 馬皓琳 李士通 校）

BACKGROUND: The open surgical wound is exposed to cold and dry ambient air resulting in heat loss through radiation, evaporation, and convection. Also, general and neuraxial anesthesia decrease the patient's core temperature. Despite routine preventive measures mild intraoperative hypothermia is still common and contributes to postoperative morbidity and mortality. We hypothesized that local insufflation of warm fully humidified CO_2 would increase both the open surgical wound and core temperature.

METHODS: Eighty-three patients undergoing open colon surgery were equally and parallelly randomized to either standard warming measures including forced-air warming, warm fluids, and insulation of limbs and head, or to additional local wound insufflation of warm (37℃) humidified (100% relative humidity) CO_2 at a laminar flow (10 L/min) via a gas diffuser. Wound surface and core temperatures were followed with a heat-sensitive infrared camera and a tympanic thermometer.

RESULTS: The mean wound area temperature during surgery was 31.3℃ in the warm humidified CO_2 group compared with 29.6℃ in the control group (P < 0.001, 95% confidence interval [CI], 1.2℃ to 2.3℃). Also, the mean wound edge temperature during surgery was 30.1℃ compared with 28.5℃ in the control group (P < 0.001, 95% CI, 0.2℃ to 0.7℃). Mean core temperature before start of surgery was similar with 36.7℃ ± 0.5℃ in the warm humidified CO_2 group versus 36.6℃ ± 0.5℃ in the control group (95% CI, 0.4 to −0.1℃). At end of surgery, the 2 groups differed significantly with 36.9 ± 0.5℃ in the warm humidified CO_2 group versus 36.3 ± 0.5℃ in the control group (P < 0.001, 95% CI, 0.38℃ to 0.82℃). Moreover, only 8 patients of 40 in the warm humidified CO_2 group had a core temperature <36.5℃ (20%, 95% CI, 7 to 33%), whereas in the control group this was the case in 24 of 39 (62%, 95% CI, 46% to 78%, P = 0.001) patients (difference of the percentages between the groups 42%, 95% CI, 22% to 61%, P < 0.001). With a cutoff at <36.0℃ none of the patients in the warm humidified CO_2 group compared with 7 patients (18%, 95% CI, 5% to 31%, P = 0.005) in the control group was hypothermic at end of surgery (difference of the percentages between the groups 18%, 95% CI, 6% to 30%, P = 0.005). The median (25th/75th percentile) operating time was 181.5 (147.5/288) minutes in the warm humidified CO_2 group versus 217 (149/288) minutes in the control group (P = 0.312). Clinical variables did not show any significant differences between the groups.

CONCLUSIONS: Insufflation of warm fully humidified CO_2 in an open surgical wound cavity increases surgical wound and core temperatures and helps to maintain normothermia.

銀杏葉提取物可減輕長春新城致周圍神經病變大鼠模型的疼痛過敏

Ginkgo biloba Extract Attenuates Hyperalgesia in a Rat Model of Vincristine-Induced Peripheral Neuropathy

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背景：化療誘導的周圍神經病變是抗腫瘤化療藥物的一個常見的且呈劑量限制性的副作用。疼痛超敏是神經病理性疼痛的常見現象。銀杏葉提取物（GBE）是一種東方草本藥物，具有多種藥理學療效。本研究旨在評價口服 GBE 對長春新城誘導神經病變大鼠模型疼痛過敏的作用。

方法：雄性 SD 大鼠(200-250g)每天腹腔內注射長春新城或生理鹽水（0.1mg/kg/d），共 5 天后，停止 2 天，然後重複迴圈一次。注射長春新城前對大鼠進行機械性、冷刺激和熱刺激疼痛過敏的所有行爲學測試。長春新城注射後 14 天發展到疼痛超敏的大鼠隨機分爲 4 組，分別給予蒸餾水和不同劑量（50、100 和 150 mg/kg）的 GBE。口服前、口服後 15、30、60、90、120、150 和 180min 測定痛覺超敏。

結果：注射生理鹽水對機械刺激、冷刺激和熱刺激所致的痛覺過敏無任何顯著作用。而注射長春新城可以導致機械和冷刺激所致的痛覺超敏。GBE 組大鼠，對於機械刺激所致的縮爪反應的閾值顯著提高，對冷刺激的退縮頻率顯著降低($P < 0.05$)。

結論：這項研究提示在長春新城致周圍神經病變的大鼠模型中，口服 GBE 可以劑量依賴性地減輕機械刺激和冷刺激所致的痛覺超敏現象。

（邱鬱薇 譯 馬皓琳 李士通 校）

BACKGROUND: Chemotherapy-induced peripheral neuropathy is a common, dose-limiting side effect of cancer chemotherapeutic drugs. Hyperalgesia is a common component of neuropathic pain. *Ginkgo biloba* extract (GBE) is an oriental herbal medicine that has various pharmacological actions. In this study, we evaluated the effects of oral GBE on hyperalgesia in a rat model of vincristine-induced neuropathy.

METHODS: Male Sprague-Dawley rats (200–250 g) were injected intraperitoneally with vincristine or saline (0.1 mg/kg/d) using a 5-day-on, 2-day-off schedule over 12 days. All the behavioral tests for mechanical, cold, and heat hyperalgesia were conducted before the daily injection during the course of vincristine treatment. Rats that developed hyperalgesia 14 days after vincristine injection were randomly assigned into 4 groups. Distilled water and GBE (50, 100, and 150 mg/kg) were administered, respectively, to the individual groups. We examined the hyperalgesia at preadministration and at 15, 30, 60, 90, 120, 150, and 180 minutes after oral drug administration.

RESULTS: Saline injection did not have any significant effect on mechanical, cold, and heat hyperalgesia. Vincristine injection produced mechanical and cold hyperalgesia. For the GBE groups, the paw withdrawal threshold to mechanical stimuli was significantly increased and

withdrawal frequency to cold stimuli was significantly reduced versus the control group dose-dependently ($P < 0.05$).
CONCLUSIONS: This study demonstrates that oral administration of GBE is associated with a dose-dependent antihyperalgesic effect on mechanical and cold stimuli in a rat model of vincristine-induced neuropathy.

胸椎旁阻滞相關解剖結構的體三維超聲成像

Volumetric Three-Dimensional Ultrasound Imaging of the Anatomy Relevant for Thoracic Paravertebral Block

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背景：胸椎旁間隙的二維超聲成像可以在橫斷面和矢狀面上檢查椎旁解剖結構，而體三維超聲成像在一些正交（垂直）面提供了多維的圖像，可能會提供更多的解剖結構資訊。在本次成像研究中我們評估了胸椎旁阻滞相關解剖結構的三維超聲成像的可行性。
方法：招募了四位健康年輕志願者。志願者取坐位，識別頸 7 椎體棘突和胸椎 1-5 的棘突。用帶有高頻體三維、四維線陣探頭（13-5 兆赫茲）的飛利浦 iU22 超聲系統獲得所有圖像。把右胸椎旁區域的矢狀面作爲資料獲取平面，完成其體三維超聲掃描。
結果：通過三維多平面超聲掃描，在所有受試者可以同時看到椎旁的矢狀面、橫斷面和冠狀面解剖結構。不像二維圖像，肋骨頸和脊椎橫突之間的關節接合處在多平面掃描超聲成像上的矢狀面和冠狀面顯示較清楚。這種所描繪的體三維技術使得所有側面（例如頂部、底部、前面、背部、左面、右面）的椎旁間隙結構成像都更加清晰。
結論：胸椎旁間隙的體三維超聲成像是可行的，其比二維超聲成像提供了更詳細的空間解剖的資訊。
（方斌 譯 馬皓琳 李士通校）

BACKGROUND: While ultrasound imaging of the thoracic paravertebral space in 2-dimensional (D) mode allows examination of the paravertebral anatomy in the transverse or sagittal axis, volumetric 3D ultrasound imaging provides multiplanar images in several orthogonal (perpendicular) planes and may provide additional anatomical information. In this imaging study we assessed the feasibility of 3D ultrasound imaging of the anatomical area relevant to the thoracic paravertebral block.
METHODS: Four healthy young adult volunteers were recruited. With the volunteer in the sitting position, the C7 spinous process and the spinous processes of the T1 to 5 vertebra were identified. All images were obtained using a Philips iU22 ultrasound system with a high-frequency 3D 4D volume linear array transducer (13 to 5 MHz). A 3D volumetric scan of the right thoracic paravertebral region was performed with the sagittal plane as the data acquisition plane.
RESULTS: With 3D multiplanar scanning, the sagittal, transverse, and coronal views of the paravertebral anatomy were simultaneously visualized in all subjects. Unlike 2D images, the

articulation between the neck of the rib and the transverse process was well delineated in the sagittal and coronal images of the multiplanar scans. The rendered 3D volume allowed an in-depth view of the paravertebral anatomy from all sides (i.e., top, bottom, front, back, left, and right).

CONCLUSIONS: Volumetric 3D ultrasound imaging of the thoracic paravertebral space is feasible and provides more detailed spatial anatomical information than 2D ultrasound imaging.