

Table of Contents

May 2012

Cardiovascular Anesthesiology

[造影剂增强超声应用于心肌灌注显像](#)

(邓利兵译 薛张纲校)

Medical Intelligence Article: Contrast-Enhanced Ultrasound for Myocardial Perfusion Imaging

- Carolien S. E. Bulte,
- Jeroen Slikkerveer,
- Rick I. Meijer,
- Dennis Gort,
- Otto Kamp,
- Stephan A. Loer,
- Stefano F. de Marchi,
- Rolf Vogel,
- Christa Boer,
- and R. Arthur Bouwman

Anesth Analg May 2012 114:938-945; published ahead of print February 24, 2012

Anesthetic Pharmacology

[利用分子对接技术对全身麻醉药与蛋白靶点的连接位点及亲和力预测](#)

(夏苏云译 陈杰校)

Binding Site and Affinity Prediction of General Anesthetics to Protein Targets Using Docking

- Renyu Liu,
- Jose Manuel Perez-Aguilar,
- David Liang,
- and Jeffery G. Saven

Anesth Analg May 2012 114:947-955; published ahead of print March 5, 2012

[幼猪氰化物毒性和它被一种新的前体药物Sulfanegen Sodium逆转](#)

(安光惠译 马皓琳 李士通 校)

Cyanide Toxicity in Juvenile Pigs and Its Reversal by a New Prodrug, Sulfanegen Sodium

- Kumar G. Belani,
- Harpreet Singh,
- David S. Beebe,
- Preeta George,
- Steven E. Patterson,
- Herbert T. Nagasawa,
- and Robert Vince

Anesth Analg May 2012 114:956-961; published ahead of print March 5, 2012

Technology, Computing, and Simulation

[气管导管套囊压力感受注射器的设计和体外测试](#)

(方昕译 薛张纲校)

Technical Communication: Design and In Vitro Testing of a Pressure-Sensing Syringe for Endotracheal Tube Cuffs

- Alexander H. Slocum, Jr.,
- Alexander H. Slocum, Sr.,
- and Joan E. Spiegel

Anesth Analg May 2012 114:967-971; published ahead of print April 4, 2012

[综述：连续无创性总体、碳氧和高铁血红蛋白浓度检测现状](#)

(范逸臣译 陈杰校)

Review Article: The Current Status of Continuous Noninvasive Measurement of Total, Carboxy, and Methemoglobin Concentration

- Micha Y. Shamir,
- Aharon Avramovich,
- and Todd Smaka

Anesth Analg May 2012 114:972-978; published ahead of print September 29, 2011

Patient Safety

[异丙酚/瑞芬太尼致呼吸暂停后的血红蛋白氧饱和度下降:
一项健康志愿者自主呼吸恢复的研究](#)

(张怡 译 马皓琳 李士通校)

Hemoglobin Desaturation After Propofol/Remifentanyl-Induced Apnea: A Study of the Recovery of Spontaneous Ventilation in Healthy Volunteers

- Tiscia Bernadette Stefanutto,
- John Feiner,
- Jens Krombach,
- Ronald Brown,
- and James E. Caldwell

Anesth Analg May 2012 114:980-986; published ahead of print April 4, 2012

[简报：女性患者中使用触诊确认环甲软骨方式的准确性:一向观察性研究](#)

(郭晨跃译 薛张纲校)

Brief Report: Accuracy of Identification of the Cricothyroid Membrane in Female Subjects Using Palpation: An Observational Study

- Anastasia Aslani,
- Su-Cheen Ng,
- Michael Hurley,
- Kevin F. McCarthy,
- Michelle McNicholas,
- and Conan Liam McCaul

Anesth Analg May 2012 114:987-992; published ahead of print February 24, 2012

[夜间血氧监测仪检测脱氧饱和指数：检测外科手术病人睡眠呼吸障碍的一个特异性和敏感性工具](#)

(俞芳译 陈杰校)

Oxygen Desaturation Index from Nocturnal Oximetry: A Sensitive and Specific Tool to Detect Sleep-Disordered Breathing in Surgical Patients

- Frances Chung,
- Pu Liao,
- Hisham Elsaid,
- Sazzadul Islam,
- Colin M Shapiro,
- and Yuming Sun

Anesth Analg May 2012 114:993-1000; published ahead of print February 24, 2012

Critical Care, Trauma, and Resuscitation

[重症监护病房里的非计划性气管拔管：系统综述、严格评估和循证建议](#)

(陈彬彬 翻译，马皓琳 李士通审校)

Medical Intelligence Article: Unplanned Endotracheal Extubations in the Intensive Care Unit: Systematic Review, Critical Appraisal, and Evidence-Based Recommendations

- Paulo Sergio Lucas da Silva and
- Marcelo Cunio Machado Fonseca

Anesth Analg May 2012 114:1003-1014; published ahead of print February 24, 2012

Pediatric Anesthesiology

[两例恶性高热家族中出现双倍和单倍诺丁受体1变异](#)

(韩旭译 薛张纲校)

Novel Double and Single Ryanodine Receptor 1 Variants in Two Austrian Malignant Hyperthermia Families

- Alexius Kaufmann,
- Birgit Kraft,
- Andrea Michalek-Sauberer,
- Marta Weindlmayr,
- Hans G. Kress,
- Ferdinand Steinboeck,
- and Lukas G. Weigl

Anesth Analg May 2012 114:1017-1025; published ahead of print March 13, 2012

Neuroscience in Anesthesiology and Perioperative Medicine

[入院时CT估计比重可预测创伤性脑损伤患者入ICU后6个月预后](#)

(俞劼晶译 陈杰校)

Computed Tomography–Estimated Specific Gravity at Hospital Admission Predicts 6-Month Outcome in Mild-to-Moderate Traumatic Brain Injury Patients Admitted to the Intensive Care Unit

- Vincent Degos,
- Thomas Lescot,
- Christian Icke,

- Yannick Le Manach,
- Katherin Fero,
- Paola Sanchez,
- Bassem Hadiji,
- Abederrezak Zouaoui,
- Anne-Laure Boch,
- Lamine Abdenour,
- Christian C. Apfel,
- and Louis Puybasset

Anesth Analg May 2012 114:1026-1033; published ahead of print February 24, 2012

[尼莫地平引起的低血压而不是硝酸甘油引起的低血压保留成年小鼠长期和短期记忆](#)

Nimodipine-Induced Hypotension but Not Nitroglycerin-Induced Hypotension Preserves Long- and Short-Term Memory in Adult Mice

- Michael Haile,
- Samuel Galoyan,
- Yong-Sheng Li,
- Barry H. Cohen,
- David Quartermain,
- Thomas Blanck,
- and Alex Bekker

Anesth Analg May 2012 114:1034-1041; published ahead of print February 24, 2012

General Articles

[一项关于麻醉师对手术室废物回收的意见的调查](#)

(贺盼译 薛张纲校)

A Survey of Anesthesiologists' Views of Operating Room Recycling

- Forbes McGain,
- Stuart White,
- Simone Mossenson,
- Eugenie Kayak,
- and David Story

Anesth Analg May 2012 114:1049-1054; published ahead of print March 13, 2012

[综述：可重复使用和一次性手术纺织品比较：2012现代可持续发展技术](#)

(龚寅译 陈杰校)

Review Article: A Comparison of Reusable and Disposable Perioperative Textiles: Sustainability State-of-the-Art 2012

- Michael Overcash

Anesth Analg May 2012 114:1055-1066; published ahead of print April 4, 2012

[一次性喉罩气道和可循环使用喉罩气道生命周期评估的比较](#)

Comparative Life Cycle Assessment of Disposable and Reusable Laryngeal Mask Airways

- Matthew Eckelman,
- Margo Mosher,
- Andres Gonzalez,
- and Jodi Sherman

Anesth Analg May 2012 114:1067-1072; published ahead of print April 4, 2012

[可重复使用和一次性使用中心静脉导管装置的使用周期评估](#)

(胡晓清译 薛张纲校)

A Life Cycle Assessment of Reusable and Single-Use Central Venous Catheter Insertion Kits

- Forbes McGain,
- Scott McAlister,
- Andrew McGavin,
- and David Story

Anesth Analg May 2012 114:1073-1080; published ahead of print April 4, 2012

[医学情报：评估麻醉气体对全球气候的影响](#)

(滕凌雅译 陈杰校)

Medical Intelligence Article: Assessing the Impact on Global Climate from General Anesthetic Gases

- Mads P. Sulbaek Andersen,
- Ole J. Nielsen,
- Timothy J. Wallington,
- Boris Karpichev,
- and Stanley P. Sander

Anesth Analg May 2012 114:1081-1085; published ahead of print April 4, 2012

[麻醉药物温室气体排放的生命周期](#)

(许辛 译 马皓琳 李士通校)

Life Cycle Greenhouse Gas Emissions of Anesthetic Drugs

- Jodi Sherman,
- Cathy Le,
- Vanessa Lamers,
- and Matthew Eckelman

Anesth Analg May 2012 114:1086-1090; published ahead of print April 4, 2012

[麻醉中的异丙酚浪费](#)

(郁玲玲译 薛张纲校)

Brief Report: Propofol Wastage in Anesthesia

- Russell F. Mankes

Anesth Analg May 2012 114:1091-1092; published ahead of print March 13, 2012

[特约文章：以减少环境污染的新鲜气体流量管理](#)

(陆秉玮译 陈杰校)

Special Article: Managing Fresh Gas Flow to Reduce Environmental Contamination

- Jeffrey M. Feldman

Anesth Analg May 2012 114:1093-1101; published ahead of print March 13, 2012

[小儿麻醉学会的雨天](#)

(安光惠译 马皓琳 李士通校)

Brief Report: Rainy Days for the Society for Pediatric Anesthesia

- Robert S. Greenberg,
- Melania Bembea,
- and Eugenie Heitmiller

Anesth Analg May 2012 114:1102-1103; published ahead of print February 24, 2012

Analgesia

Pain Mechanisms

[激活中枢大麻素2型受体系统可以预防紫杉醇引起的神经病](#)

(周玲译 薛张纲校)

Prevention of Paclitaxel-Induced Neuropathy Through Activation of the Central Cannabinoid Type 2 Receptor System

- Mohamed Naguib,
- Jijun J. Xu,
- Philippe Diaz,
- David L. Brown,
- David Cogdell,
- Bihua Bie,
- Jianhua Hu,
- Suzanne Craig,
- and Walter N. Hittelman

Anesth Analg May 2012 114:1104-1120; published ahead of print March 5, 2012

Regional Anesthesia

[超声引导下坐骨神经分叉处单次注射的腓窝坐骨神经阻滞较传统的神经刺激技术起效更快](#)

(孙晓琼译 陈杰校)

Ultrasound-Guided Popliteal Sciatic Block with a Single Injection at the Sciatic Division Results in Faster Block Onset than the Classical Nerve Stimulator Technique

- Xavier Sala-Blanch,
- Nicolás de Riva,
- Anna Carrera,
- Ana M. López,
- Alberto Prats,
- and Admir Hadzic

Anesth Analg May 2012 114:1121-1127; published ahead of print February 24, 2012

[用超声成像和经皮神经刺激来识别耳大神经](#)

(许辛译 马皓琳 李士通校)

Brief Report: Identification of the Great Auricular Nerve by Ultrasound Imaging and Transcutaneous Nerve Stimulation

- Saskia Christ,
- Reza Kaviani,
- Franziska Rindfleisch,
- and Patrick Friederich

Anesth Analg May 2012 114:1128-1130; published ahead of print February 6, 2012

简报：臂丛神经中肌皮神经的出现水平：锁骨下神经阻滞的影响因素

(杨琰译 薛张纲校)

Brief Report: The Emergence Level of the Musculocutaneous Nerve from the Brachial Plexus: Implications for Infraclavicular Nerve Blocks

- Antoine Pianezza,
- Arnaud Salces y Nedeo,
- Patrick Chaynes,
- Philip E. Bickler,
- and Vincent Minville

Anesth Analg May 2012 114:1131-1133; published ahead of print February 6, 2012

利用分子对接技术对全身麻醉药与蛋白靶点的连接位点及亲和力预测

Binding Site and Affinity Prediction of General Anesthetics to Protein Targets Using Docking

Renyu Liu, MD, PhD*, Jose Manuel Perez-Aguilar, PhD†, David Liang, BA* and Jeffery G. Saven, PhD†

From the *Department of Anesthesiology and Critical Care, Hospital of University of Pennsylvania, Philadelphia; and †Department of Chemistry, University of Pennsylvania, Philadelphia, Pennsylvania.

Anesth Analg May 2012 114:947-955

背景

全身麻醉药的蛋白作用位点仍未明确，因此首先需要一种工具来预测全麻药结合的潜在结合位点。此项研究对AutoDock这一计算方法能否作为此类工具进行了探讨。

方法

获得水溶性蛋白（细胞色素C，去铁蛋白，人血清白蛋白）和膜蛋白（从无类囊体蓝藻GLIC中提取的五聚体配体门控离子通道）的高分辨率晶体结构数据。采用等温滴定量热（ITC）实验，测定溶液中麻醉药对去铁蛋白的亲和力。使用拉马克遗传算法及solis和wets局域搜索方法的分子对接服务器进行分子对接的计算（<http://www.dockingserver.com/web>）。发现20种全身麻醉药可与去铁蛋白对接。将预测的结合常数与从ITC实验获得的数据进行比较以明确其可能的联系。在与去铁蛋白对接时，将得到的具体结合位点和它们之间的相互作用与最新共晶数据进行了比较。对目前临床使用的已明确50%有效浓度值（EC50值）的六种全麻药（异氟醚，七氟醚，地氟醚，氟烷，异丙酚，依托咪酯）同样进行了与所有测试蛋白的对接计算。并将从对接试验得出的六种全麻药的结合常数与已知的EC50值和辛醇/水分配系数进行比较。

结果

所有20种全身麻醉药都明确地与从去铁蛋白的晶体结构中发现的麻醉药结合位点对接。利

用对接计算获得的20种麻醉药的结合常数与从ITC实验获得的数据相关 ($p = 0.04$)。GLIC的晶体结构中鉴定出的结合位点被包含在对接技术预测的位点之内，但并非最佳位点。对接计算表明最有可能的结合位点位于GLIC的胞外分子域。在GLIC中鉴定出来的结合位点上，预测得到的亲和力与已知的 EC_{50} 值一致($P = 0.006$)。然而，预测的六种全麻药与去铁蛋白、人血清白蛋白、细胞色素C的亲和力和已知的 EC_{50} 值并不一致。在GLIC的结合位点上，预测的亲和力和辛醇/水分配系数之间的相关性较低。

结论

本研究证实，可通过自动化的分子对接服务器 (AutoDock) 对水溶性和膜蛋白进行对接计算来预测麻醉药结合位点及相对亲和力。预测出6种常用麻醉药的亲和力和 EC_{50} 仅在GLIC,这一与麻醉机制相关的蛋白家族成员中有相关性。

(夏苏云 译 陈杰 校)

BACKGROUND: The protein targets for general anesthetics remain unclear. A tool to predict anesthetic binding for potential binding targets is needed. In this study, we explored whether a computational method, AutoDock, could serve as such a tool.

METHODS: High-resolution crystal data of water-soluble proteins (cytochrome C, apoferritin, and human serum albumin), and a membrane protein (a pentameric ligand-gated ion channel from *Gloeobacter violaceus* [GLIC]) were used. Isothermal titration calorimetry (ITC) experiments were performed to determine anesthetic affinity in solution conditions for apoferritin. Docking calculations were performed using DockingServer with the Lamarckian genetic algorithm and the Solis and Wets local search method (<http://www.dockingserver.com/web>). Twenty general anesthetics were docked into apoferritin. The predicted binding constants were compared with those obtained from ITC experiments for potential correlations. In the case of apoferritin, details of the binding site and their interactions were compared with recent cocrystallization data. Docking calculations for 6 general anesthetics currently used in clinical settings (isoflurane, sevoflurane, desflurane, halothane, propofol, and etomidate) with known 50% effective concentration (EC_{50}) values were also performed in all tested proteins. The binding constants derived from docking experiments were compared with known EC_{50} values and octanol/water partition coefficients for the 6 general anesthetics.

RESULTS: All 20 general anesthetics docked unambiguously into the anesthetic binding site identified in the crystal structure of apoferritin. The binding constants for 20 anesthetics obtained from the docking calculations correlate significantly with those obtained from ITC experiments ($P = 0.04$). In the case of GLIC, the identified anesthetic binding sites in the crystal structure are among the docking predicted binding sites, but not the top ranked site. Docking calculations suggest a most probable binding site located in the extracellular domain of GLIC. The predicted affinities correlated significantly with the known EC_{50} values for the 6 frequently used anesthetics in GLIC for the site identified in the experimental crystal data ($P = 0.006$). However, predicted affinities in apoferritin, human serum albumin, and cytochrome C did not correlate with these 6 anesthetics' known experimental EC_{50} values. A weak correlation between the predicted affinities and the octanol/water partition coefficients was observed for the sites in GLIC.

CONCLUSION: We demonstrated that anesthetic binding sites and relative affinities can be predicted using docking calculations in an automatic docking server (AutoDock) for both water-soluble and membrane proteins. Correlation of predicted affinity and EC_{50} for 6 frequently used

general anesthetics was only observed in GLIC, a member of a protein family relevant to anesthetic mechanism.

综述：连续无创性总体、碳氧和高铁血红蛋白浓度检测现状

Review Article: The Current Status of Continuous Noninvasive Measurement of Total, Carboxy, and Methemoglobin Concentration

Micha Y. Shamir, MD, Aharon Avramovich, MD and Todd Smaka, MD

From the Department of Anesthesiology, Perioperative Medicine and Pain Management, Miller School of Medicine, Miami, Florida.

Anesth Analg May 2012 114:972-978

围术期贫血的早期发现，一氧化碳暴露后碳氧血红蛋白毒性水平的确定和药物剂量滴定以预防高铁血红蛋白毒性水平，这些都是非常重要的。脉氧仪通过向组织照射光并感应光的吸收量而发挥作用。这种相同的原理也被用在实验室血红蛋白仪中，来测量血红蛋白浓度。由于这两个仪器有相同的工作原理，可进行脉氧仪改造，使其也能监测血红蛋白浓度。目前，有两种商业化的脉氧仪(Masimo Rainbow SET 和 OrSense NBM-200MP)可检测总体血红蛋白浓度，其中(Masimo)还可以检测高铁血红蛋白和碳氧血红蛋白。此综述讨论了关于此类仪器精确性的同行评议文章。

(范逸臣 译 陈杰 校)

Intraoperative early detection of anemia, identifying toxic levels of carboxyhemoglobin after carbon monoxide exposure and titrating drug dosage to prevent toxic levels of methemoglobin are important goals. The pulse oximeter works by illuminating light into the tissue and sensing the amount of light absorbed. The same methodology is used by laboratory hemoglobinometers to measure hemoglobin concentration. Because both devices work in the same way, efforts were made to modify the pulse oximeter to also measure hemoglobin concentration. Currently there are 2 commercial pulse oximeters (Masimo Rainbow SET and OrSense NBM-200MP) that measure total hemoglobin concentration and one (Masimo) that also measures methemoglobin and carboxyhemoglobin. In this review, we describe the peer-reviewed literature addressing the accuracy of these monitors.

夜间血氧监测仪检测脱氧饱和指数：检测外科手术病人睡眠呼吸障碍的一个特异性和敏感性工具

Oxygen Desaturation Index from Nocturnal Oximetry: A Sensitive and Specific Tool to Detect Sleep-Disordered Breathing in Surgical Patients

Frances Chung, FRCPC*†, Pu Liao, MD*, Hisham Elsaid, MD*, Sazzadul Islam, MSc*, Colin M Shapiro, FRCPC‡ and Yuming Sun, MD*

From the *Department of Anesthesia, University Health Network, Toronto, ON, Canada;

†Department of Anesthesia, University of Toronto, Toronto, Canada; and ‡Department of Psychiatry, University Health Network, Toronto, ON, Canada.

Anesth Analg May 2012 114:993-1000

引言：给所有疑有睡眠呼吸障碍（sleep disordered breathing, SDB）的外科手术病人检测多导睡眠图（polysomnography, PSG）是不现实的。因此本研究探讨夜间血氧监测仪在手术病人中诊断SDB的作用。

方法：所有在术前门诊就诊而将行择期手术的病人（大于等于18岁）都纳入到本项研究中。剔除有异常脑电图发现的病人。所有病人通过可携带性装置和一个脉氧仪在家中监测夜间PSG。所有的PSG结果由有资质的睡眠技师进行评分。对脉氧仪记录进行电子化处理。

结果：共475位病人完成了本项研究：其中217位是男性，258位女性，平均年龄在 60 ± 11 岁，平均BMI为 $31 \pm 7 \text{ kg/m}^2$ 。呼吸暂停低通气指数（apnea-hypopnea index, AHI），即每小时内呼吸暂停和低通气次数的平均值，为9.1（2.8~21.4）[中位数（四分位间距）]，且64%的病人AHI>5。脱氧饱和指数（oxygen desaturation index, ODI,即单位小时内减饱和次数的平均值）和夜间脉氧仪显示的 $\text{SpO}_2 < 90\%$ （CT90）累计次数百分比与PSG记录的睡眠呼吸障碍参数之间均有显著的相关性。但和CT90相比较，ODI有更显著的相关性，且是个更好的AHI预测指标。ODI预测AHI>5、AHI>15和AHI>30的受试者工作特征曲线下面积（the area under the receiver operating characteristic curve, AUC）分别是0.908（可信区间：0.880--0.936）、0.931（可信区间：0.090 to 0.952）和0.958（可信区间：0.937 to 0.979）。ODI预测AHI>5、AHI >15和AHI >30最大准确度的截断值分别是：ODI>5、ODI >15和ODI >30。准确度分别是：86%（可信区间：83%–88%）、86%（可信区间：83%–89%）和94%（可信区间：92%–96%）。ODI>10检测中重度SDB的敏感性和特异性分别为93%和75%。

结论：高分辨率夜间血氧监测仪来源的ODI应用于外科手术病人中，是一项具有敏感性和特异性检测未经诊断SDB的工具。

（俞芳 译 陈杰 校）

INTRODUCTION: It is impractical to perform polysomnography (PSG) in all surgical patients suspected of having sleep disordered breathing (SDB). We investigated the role of nocturnal oximetry in diagnosing SDB in surgical patients.

METHOD: All patients 18 years and older who visited the preoperative clinics for scheduled inpatient surgery were approached for study participation. Patients expected to have abnormal electroencephalographic findings were excluded. All patients underwent an overnight PSG at home with a portable device and a pulse oximeter. The PSG recordings were scored by a certified sleep technologist. The oximetry recordings were processed electronically.

RESULT: Four hundred seventy-five patients completed the study: 217 males and 258 females, aged 60 ± 11 years, and body mass index $31 \pm 7 \text{ kg/m}^2$. The apnea-hypopnea index (AHI), the average number of episodes of apnea and hypopnea per hour of sleep, was 9.1 (2.8 to 21.4) [median (interquartile range)] and 64% patients had AHI >5. There was a significant correlation between oxygen desaturation index (ODI, hourly average number of desaturation episodes) and cumulative time percentage with $\text{SpO}_2 < 90\%$ (CT90) from nocturnal oximetry, with the parameters measuring sleep breathing disorders from PSG. Compared to CT90, ODI had a stronger correlation and was a better predictor for AHI. The area under receiver operator characteristics curve for ODI to predict AHI >5, AHI >15, and AHI >30 was 0.908 (CI: 0.880 to 0.936), 0.931 (CI: 0.090 to 0.952), and 0.958 (CI: 0.937 to 0.979), respectively. The cutoff value based on the maximal accuracy for ODI to predict AHI >5, AHI >15, and AHI >30 was ODI >5, ODI >15, and ODI >30. The accuracy was 86% (CI: 83%–88%), 86% (CI: 83%–89%), and 94% (CI: 92%–96%), respectively. The ODI >10 demonstrated a sensitivity of 93% and a specificity of 75% to detect moderate and severe SDB.

CONCLUSIONS: ODI from a high-resolution nocturnal oximeter is a sensitive and specific tool to detect undiagnosed SDB in surgical patients.

入院时CT估计比重可预测创伤性脑损伤患者入ICU后6个月预后

Computed Tomography–Estimated Specific Gravity at Hospital Admission Predicts 6-Month Outcome in Mild-to-Moderate Traumatic Brain Injury Patients Admitted to the Intensive Care Unit

Vincent Degos, MD, PhD*†, Thomas Lescot, MD, PhD*, Christian Icke, MD*, Yannick Le Manach, MD*, Katherin Fero, BS†, Paola Sanchez, MD, PhD*, Bassem Hadiji, MD*, Abederrezak Zouaoui, MD, PhD‡, Anne-Laure Boch, MD§, Lamine Abdennour, MD*, Christian C. Apfel, MD, PhD† and Louis Puybasset, MD, PhD*

From the Departments of *Anesthesiology and Critical Care, †Neuroradiology, and ‡Neurosurgery, Groupe Hospitalier Pitié-Salpêtrière, Paris, France; and †Perioperative Clinical Research Core, Department of Anesthesia and Perioperative Care, University of California at San Francisco, San Francisco, California.

Anesth Analg May 2012 114:1026-1033

背景:

众所周知严重创伤性脑损伤(TBI)病人可发生致命性神经性退化。但对于轻中度创伤性脑损伤(MM-TBI)病人,

即使入住ICU,也难以预测6个月后哪些患者有不良预后。标准CT成像扫描能提供信息来评估比重(eSG)。之前研究已证明标准CT读片后更高的比重测值与严重TBI后预后不良有关。本研究目的在于确定颅内内容物比重是否能预测轻中度TBI的6个月后预后。

方法:本研究分析了66例收入神经外科ICU的轻中度TBI病人入院时临床和CT扫描数据(包括eSG)。主要预后指标定义为6个月后患者的Glasgow 预后评分(1-3分)。计算eSG预测6个月后不良预后的辨别力(受试者特征曲线下面积[ROC-AUC], 95%置信区间)。随后比较了eSG和主要ICU特征的相关性。

结果:单因素和逐步多元分析表明eSG与6个月后不良预后独立相关($p = 0.001$)。用来预测6个月后预后eSG的ROC-AUC为0.87(置信区间为0.77–0.96)。入院时eSG值与主要ICU特征,尤其是14天死亡率($P=0.004$),机械通气的时间($P=0.01$),ICU停留时间($P=0.045$),和ICU住院操作如颅内压监测($P<0.001$)相关。

结论:

对于此项收入ICU的轻中度TBI队列,常规CT扫描得出的eSG与死亡率,ICU严重度相关,且能预测6个月后不良预后。需要进一步的研究,包括对TBI严重度的分类,来确认此项研究结果。

(俞劼晶 译 陈杰 校)

BACKGROUND: It is clear that patients with a severe traumatic brain injury (TBI) develop secondary, potentially lethal neurological deterioration. However, it is difficult to predict which patients with mild-to-moderate TBI (MM-TBI), even after intensive care unit (ICU) admission, will experience poor outcome at 6 months. Standard computed tomography (CT) imaging scans provide information that can be used to estimate specific gravity (eSG). We have previously demonstrated that higher eSG measurements in the standard CT reading were associated with poor outcomes after severe TBI. The aim of this study was to determine whether eSG of the intracranial content predicts 6-month outcome in MM-TBI. **METHODS:** We analyzed admission clinical and CT scan data (including eSG) of 66 patients with MM-TBI subsequently admitted to our neurosurgical ICU. Primary outcome was defined as a Glasgow Outcome Scale

score of 1 to 3 after 6 months. Discriminating power (area under the receiver operating characteristic curve [ROC-AUC], 95% confidence interval) of eSG to predict 6-month poor outcome was calculated. The correlation of eSG with the main ICU characteristics was then compared.

RESULTS: Univariate and stepwise multivariate analyses showed an independent association between eSG and 6-month poor outcome ($P = 0.001$). ROC-AUC of eSG for the prediction of 6-month outcomes was 0.87 (confidence interval: 0.77–0.96). Admission eSG values were correlated with the main ICU characteristics, specifically 14-day mortality ($P = 0.004$), length of mechanical ventilation ($P = 0.01$), length of ICU stay ($P = 0.045$), and ICU procedures such as intracranial pressure monitoring ($P < 0.001$).

CONCLUSIONS: In this MM-TBI cohort admitted to the ICU, eSG of routine CT scans was correlated with mortality, ICU severity, and predicted 6-month poor outcome. An external validation with studies that include the spectrum of TBI severities is warranted to confirm our results.

综述：可重复使用和一次性手术纺织品比较：2012现代可持续发展技术

Review Article: A Comparison of Reusable and Disposable Perioperative Textiles: Sustainability State-of-the-Art 2012

Michael Overcash, PhD

From the Industrial and Manufacturing Engineering and Department of Mechanical Engineering, Wichita State University, Wichita, Kansas.

Anesth Analg May 2012 114:1055-1066

现今对重复使用和一次性使用围术期纺织品（手术衣和铺巾等）的比较反映出生产和再利用此类产品技术的重大变革。可重复使用和一次性使用手术衣和铺巾由人工合成的轻薄面料制造，不仅满足医务工作者和患者保护的新标准，同时价格也具有竞争力。在基于多元科学的生命周期环境研究中，可重复使用手术衣与铺巾相对于同类一次性产品，显示了极大的可持续收益，具体在自然资源能源（200%-300%），水(250%–330%)，碳元素（200%–300%），挥发性有机物，固体废物(750%)和仪器回收方面。因为所有其他因素（成本，保护和舒适）是相似的，作为卫生保健可持续发展项目的一部分，可重复使用手术衣和铺巾所带来的环境收益对于此工业是重要的。因此，不再认为可重复使用对某些环境下更有利而一次性使用在其他情况下更好。同样重要的是我们认识到，在过去的五至十年，对舒适、保护和经济大规模研究未能得到积极推行，因此对提高可重复使用和一次性使用系统的因素难以评估。此外，职业相关比较研究较少，但可能会进一步支持可重复使用。总之，现有的围术期纺织品舒适、安全，成本相似，但可重复使用而非一次性使用的纺织品为护士、医生和医院提供了减少对环境影响的机会。对环境因素比较的循证医学支持这个结论：可重复使用的手术衣和铺巾对可持续发展提供了极大的支持。可重复使用系统的益处与麻醉领域中其他的再利用方面类似，如喉罩通气道或吸引器，但需要生命周期研究来证实这些益处。

（龚寅 译 陈杰 校）

Contemporary comparisons of reusable and single-use perioperative textiles (surgical gowns and drapes) reflect major changes in the technologies to produce and reuse these products. Reusable and disposable gowns and drapes meet new standards for medical workers and patient protection,

use synthetic lightweight fabrics, and are competitively priced. In multiple science-based life cycle environmental studies, reusable surgical gowns and drapes demonstrate substantial sustainability benefits over the same disposable product in natural resource energy (200%–300%), water (250%–330%), carbon footprint (200%–300%), volatile organics, solid wastes (750%), and instrument recovery. Because all other factors (cost, protection, and comfort) are reasonably similar, the environmental benefits of reusable surgical gowns and drapes to health care sustainability programs are important for this industry. Thus, it is no longer valid to indicate that reusables are better in some environmental impacts and disposables are better in other environmental impacts. It is also important to recognize that large-scale studies of comfort, protection, or economics have not been actively pursued in the last 5 to 10 years, and thus the factors to improve both reusables and disposable systems are difficult to assess. In addition, the comparison related to jobs is not well studied, but may further support reusables. In summary, currently available perioperative textiles are similar in comfort, safety, and cost, but reusable textiles offer substantial opportunities for nurses, physicians, and hospitals to reduce environmental footprints when selected over disposable alternatives. Evidenced-based comparison of environmental factors supports the conclusion that reusable gowns and drapes offer important sustainability improvements. The benefit of reusable systems may be similar for other reusables in anesthesia, such as laryngeal mask airways or suction canisters, but life cycle studies are needed to substantiate these benefits.

医学情报：评估麻醉气体对全球气候的影响

Medical Intelligence Article: Assessing the Impact on Global Climate from General Anesthetic Gases

Mads P. Sulbaek Andersen, PhD*, Ole J. Nielsen, PhD†, Timothy J. Wallington, PhD‡, Boris Karpichev, PhD* and Stanley P. Sander, PhD*

From the *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California;

†Department of Chemistry, University of Copenhagen, Copenhagen, Denmark; and

‡Atmospheric Oceanic and Space Sciences, University of Michigan, Ann Arbor, Michigan.

Anesth Analg May 2012 114:1081-1085

虽然目前卤族有机化合物在大气中的混合浓度比二氧化碳（被认为人类活动引起气候变化的主要原因）低10万倍，但从工业时代开始（约1750年），它占了人类活动引起全球变暖效应总体效应的10-

15%。麻醉气体家族包括几种卤族有机化合物，都是强大的温室气体。此报告提供了关于麻醉气体释放对环境影响的概述，特别注重辐射对气候变化的影响。

（滕凌雅 译 陈杰 校）

Although present in the atmosphere with a combined concentration approximately 100,000 times lower than carbon dioxide (i.e., the principal anthropogenic driver of climate change), halogenated organic compounds are responsible for a warming effect of approximately 10% to 15% of the total anthropogenic radiative forcing of climate, as measured relative to the start of the industrial era (approximately 1750). The family of anesthetic gases includes several halogenated organic compounds that are strong greenhouse gases. In this short report, we provide an overview of the state of knowledge regarding the impact of anesthetic gas release on the environment, with particular focus on its contribution to the radiative forcing of climate change.

特约文章：以减少环境污染的新鲜气体流量管理

Special Article: Managing Fresh Gas Flow to Reduce Environmental Contamination

Jeffrey M. Feldman, MD, MSE

From the Department of Anesthesiology and Critical Care Medicine, Children's Hospital of Philadelphia; and Department of Anesthesiology and Critical Care Medicine, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, Pennsylvania.

Anesth Analg May 2012 114:1093-1101

麻醉药物可能造成全球气候变暖。虽然麻醉药对二氧化碳排放的总体影响目前尚存争议，但不同的用药模式确实可以减少环境污染的程度。尤其密切注意新鲜气体流量管理可使麻醉药物作用更高效，即对患者起到相同药效又可减少浪费。单个病例对环境的影响可能极小，但放眼至整个麻醉行业，若每个从业者都能对新鲜气体流量进行管理，则能显著影响麻醉气体在大气中的排放。麻醉维持期是减少新鲜气体流量的最佳时期，因为此期呼吸回路中的气体浓度相对稳定且为整个手术过程中时间最长的时期。同时，诱导期和初始期的新鲜气体流量管理能减少麻醉挥发药物的浪费。本文阐述了关于新鲜气体流量管理的背景信息，讨论了在使用麻醉回路系统时，麻醉各阶段新鲜气体流量管理的策略，以期减少药物浪费。氧气以及麻醉气体浓度的监测对于安全且有效的执行这些策略而言是必须的。未来，新鲜气体流量难度的管理需倚靠麻醉供应系统的技术改进。

(陆秉玮 译 陈杰 校)

Anesthetic drugs have the potential to contribute to global warming. There is some debate about the overall impact of anesthetic drugs relative to carbon dioxide, but there is no question that practice patterns can limit the degree of environmental contamination. In particular, careful attention to managing fresh gas flow can use anesthetic drugs more efficiently—reducing waste while achieving the same effect on the patient. The environmental impact of a single case may be minimal, but when compounded over an entire career, the manner in which fresh gas flow is managed by each individual practitioner can make a significant difference in the volume of anesthetic gases released into the atmosphere. The maintenance phase of anesthesia is the best opportunity to reduce fresh gas flow because circuit gas concentrations are relatively stable and it is often the longest phase of the procedure. There are, however, methods for managing fresh gas flow during induction and emergence that can reduce the amount of wasted anesthetic vapor. This article provides background information and discusses strategies for managing fresh gas flow during each phase of anesthesia with the goal of reducing waste when using a circle anesthesia system. Monitoring oxygen and anesthetic gas concentrations is essential to implementing these strategies safely and effectively. Future technological advances in anesthetic delivery systems are needed to make it less challenging to manage fresh gas flow.

超声引导下坐骨神经分叉处单次注射的腓窝坐骨神经阻滞较传统的神经刺激技术起效更快

Ultrasound-Guided Popliteal Sciatic Block with a Single Injection at the Sciatic Division Results in Faster Block Onset than the Classical Nerve Stimulator Technique

Xavier Sala-Blanch, MD*, Nicolás de Riva, MD*, Anna Carrera, MD†, Ana M. López, MD*, Alberto Prats, MD, PhD‡ and Admir Hadzic, MD, PhD§ //

From the *Department of Anesthesiology, Hospital Clinic Barcelona, Barcelona; †Department of Anatomy, School of Medicine, University of Girona, Girona; ‡Laboratory of Surgical

NeuroAnatomy, Human Anatomy and Embryology Unit, Faculty of Medicine, Universitat de Barcelona, Barcelona, Spain; [§]Department of Anesthesiology, St. Luke's-Roosevelt Hospital Center, New York; and ^{||}College of Physicians and Surgeons, University Hospital of Columbia University, New York, New York.

Anesth Analg May 2012 114:1121-1127

背景：为了达到成功的且起效迅速的腓窝坐骨神经阻滞（SPB），推荐在坐骨神经分叉上单次注射，或分2次注射阻滞胫神经（TN）和腓总神经（CPN）。此项研究中将传统的神经刺激（NS）引导下坐骨神经分叉水平上阻滞与超声（US）引导下于分叉水平胫神经和腓总神经间单次注射局部麻醉剂（LA）进行比较。推测，US-SPB下TN及CPN间单次注射较NS-SPB下单次注射起效更快。

方法：52例患者随机接受NS-SPB或US-

SPB。对于这两种神经阻滞，为了控制注射力度，使用自动注射泵给予1.5%20毫升甲哌卡因单次注射。NS-SPB要求在腓窝折痕上7厘米引出在低于0.5

mA刺激下的胫神经反应（靠近TN和腓总神经的分支处），并在此处注射局麻药。对于US-

SPB，超声引导针在分叉水平插入胫神经和腓总神经之间给予注射局麻药。运动反应不一定能引出但若存在即被记录下来。两组中局麻药的定位和扩散均由超声进行评估。每隔5分钟对胫神经和腓总神经进行运动和感觉阻滞情况的连续评估并做组间比较。

结果：两组患者均在注射30分钟后阻滞完全，定义为不需其他干预手段，感觉阻滞完全达到手术要求。US-SPB组发生完全感觉阻滞（80%比4%，P

<0.01）和运动阻滞的比例（60%和8%，P

<0.01）较高，定义为在注射后15分钟所有神经分布范围都发生了感觉缺失和麻痹。超声显示神经内注射在NS-SPB组有19位患者(73%)而在US-SPB组有25位患者(100%) ($P < 0.001$)。

结论：US-

SPB组在超声引导下于分叉水平胫神经和腓总神经之间给予单次注射局麻药，在30min时阻滞成功率与NS-SPB相似；然而，US-SPB组有更多的患者在15分钟内被完全阻滞。

（孙晓琼 译 陈杰 校）

BACKGROUND: For successful, fast-onset sciatic popliteal block (SPB), either a single injection above the division of the sciatic nerve, or 2 injections to block the tibial nerve (TN) and common peroneal nerve (CPN) separately have been recommended. In this study, we compared the traditional nerve stimulator (NS)-guided SPB above the division of the sciatic nerve with the ultrasound (US)-guided block with single injection of local anesthetic (LA) between the TN and CPN at the level of their division. We hypothesized that US-SPB with a single injection between TN and CPN would result in faster block onset than a single-injection NS-SPB.

METHODS: Fifty-two patients were randomized to receive either an NS-SPB or a US-SPB. For both blocks, a single injection of 20 mL mepivacaine 1.5% was given using an automated injection pump while controlling for injection force. For NS-SPB, a TN response below 0.5 mA was sought 7 cm above the popliteal fossa crease (and proximal to the divergence of the TN and peroneal nerves). For US-SPB, the injection was made after a US-guided needle was inserted between the TN and CPN at the level of their separation. Motor response was not actively sought but registered if present. The location and spread of LA were evaluated by US in both groups.

Onset of motor and sensory blocks was serially assessed in 5-minute intervals in the TN and CPN divisions and compared between the groups.

RESULTS: All patients in both groups had successful block at 30 minutes after the injection, defined as sensory block to allow surgery without supplementation. A higher proportion of patients in the US-SPB group had a complete sensory (80% vs 4%, $P < 0.001$) and motor block (60% vs 8%, $P < 0.001$), defined as anesthesia and paralysis in all nerve territories, at 15 minutes after injection. US signs of intraepineural injection were present in 19 patients (73%) in the NS-SPB group and 25 patients (100%) in the US-SPB group ($P < 0.001$).

CONCLUSIONS: A single injection of LA in US-SPB with needle insertion at the separation of the TN and CPN results in a similar success rate at 30 minutes; however, more patients in the US-SPB group than in the NS-SPB group had complete block at 15 minutes.

造影剂增强超声应用于心肌灌注显像

Medical intelligence article: contrast-enhanced ultrasound for myocardial perfusion imaging

Carolien S. E. Bulte, MD*, Jeroen Slikkerveer, MD†, Rick I. Meijer, MD‡, Dennis Gort, BSc†, Otto Kamp, MD, PhD†, Stephan A. Loer, MD, PhD*,

Stefano F. de Marchi, MD§, Rolf Vogel, MD, PhD§||, Christa Boer, PhD* and R. Arthur Bouwman, MD, PhD*

From the *Department of Anesthesiology, †Department of Cardiology, and ‡Department of Internal Medicine, Institute for Cardiovascular Research, VU University Medical Center, Amsterdam, The Netherlands; §Department of Cardiology, Bern University Hospital, Bern, Switzerland; and ||ARTORG Cardiovascular Engineering, University of Bern, Bern, Switzerland. Anesth Analg May 2012 114:938-945

在造影剂增强超声（CEUS）应用中，那些由气体填充的微细气泡型超声造影剂可以增强检测心肌结构，功能及血流方面的可视度。增强超声在心血管方面的一个有趣的应用是它可以对心肌灌注方面实时成像。尽管在过去有一些研究证实了它的临床价值，但目前对这项成像技术的质疑限制了其在围术期的应用。所以就目前的情况，我们想做一些关于CEUS在心肌灌注成像应用方面的基本原理概要及其方法学和技术方面的讨论。

（邓利兵译 薛张纲校）

Ultrasound contrast agents are gas-filled microbubbles that enhance visualization of cardiac structures, function and blood flow during contrast-enhanced ultrasound (CEUS). An interesting cardiovascular application of CEUS is myocardial contrast echocardiography, which allows real-time myocardial perfusion imaging. The intraoperative use of this technically challenging imaging method is limited at present, although several studies have examined its clinical utility during cardiac surgery in the past. In the present review we provide general information on the basic principles of CEUS and discuss the methodology and technical aspects of myocardial perfusion imaging.

气管导管套囊压力感受注射器的设计和体外测试

Design and In Vitro Testing of a Pressure-Sensing Syringe for Endotracheal Tube Cuffs

Alexander H. Slocum Jr., SM*, Alexander H. Slocum Sr., PhD* and Joan E. Spiegel, MD†

From the *Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge; and †Department of Anesthesia, Critical Care and Pain Medicine, Beth Israel Deaconess Medical Center, Boston, Massachusetts.

Anesth Analg May 2012 114:967-971

摘要:气管插管是一项经常用在院前，重症监护室和手术中的操作。气管导管套囊必须充气达到一定压力以防止空气泄漏而不有损气管粘膜血流。为了同步气管导管套囊的膨胀与测量，我们设计并测试了一个全新的体外压力感受注射器。它的原型是使用一个标准10mL装配了一个活塞，一个硅胶波纹管和一个压感元件的聚碳酸酯注射器。波纹管的可行性是使用有限元分析确定和模拟的。各个波纹管（压力vs挠曲度）在不同压力下的可重复性试验在0.3cm至1.61cm（1%-5%的误差）平均标准偏差之内。使用一个无液压力计来作比较，得出了一个相当于30cm H₂O，斯皮尔曼等级为0.99（P < 0.001）极佳的线性相关关系。

（方昕译 薛张纲校）

Abstract : Endotracheal intubation is a frequently performed procedure in the prehospital setting, intensive care unit, and for patients undergoing surgery. The endotracheal tube cuff must be inflated to a pressure that prevents air leaks without compromising tracheal mucosal blood flow. For simultaneous endotracheal tube cuff inflation and measurement, we designed and tested a novel pressure-sensing syringe in vitro. The prototype was developed using a standard 10-mL polycarbonate syringe body that houses a plunger and a silicone rubber bellows, the pressure-sensing element. Bellow feasibility was determined and modeled using finite element analysis. Repeatability testing at each pressure measurement for each bellows (pressure versus deflection) was within an average standard deviation of 0.3 cm to 1.61 cm (1%–5% error). Using an aneroid manometer for comparison, there was excellent linear correlation with a Spearman rank of 0.99 (P < 0.001), up to 30 cm H₂O .

简报：女性患者中使用触诊确认环甲软骨方式的准确性：一向观察性研究

Brief report: accuracy of identification of the cricothyroid membrane in female subjects using palpation: an observational study.

Anastasia Aslani, MD*, Su-Cheen Ng, FCARCSI*, Michael Hurley, MB*, Kevin F. McCarthy, FCARCSI*, Michelle McNicholas, FFR. RCSI† and Conan Liam McCaul, FFARCSI*‡

From the *Department of Anaesthesia, The Rotunda Hospital, Dublin, Ireland; †Division of Radiology, The Mater Misericordiae University Hospital, Dublin, Ireland; and ‡School of Medicine and Medical Sciences, University College Dublin, Ireland.

Anesth Analg May 2012 114:987-992

背景:环甲软骨(CTM)是环甲软骨切开行紧急气道供氧的推荐位置。尽管这一技术十分简便，临床急救时常常达不到其目标，且并发症多多。气管切开失败的原因仍然未知，因此我们想了解临床医生正确识别女性环甲软骨的能力。

方法：要求临床医生在患者仰卧颈正中位通过使用荧光“隐形”墨水标记环甲软骨，之后患者改变为颈过伸位进行标记。我们使用超声确定环甲软骨的准确位置，并且测量了准确的位置与医生标记的位置之间的距离。准确的估计范围是在环甲软骨的上下缘之间，且距正

中线5mm之内的范围。研究参与者同时要求用10-cm视觉模拟评分（VAS）评价环甲软骨触诊。

结果：56位患者参与本研究其中15位为肥胖患者。在仰卧颈正中位时，非肥胖与肥胖患者环甲软骨确定率分别为10/41和0/15（ $P=0.048$ ）。在46位没有准确确定环甲软骨的患者中，与标准位置相比24位定位过高（最大3cm），22位过低（最大3cm）。在颈过伸位时我们得到了类似的结果；非肥胖与肥胖分别为12/41和1/15。差距范围也更大；过高最大达2.5cm，过低最大达4cm，偏离正中最大达1.6cm。参与的医生发现环甲软骨的触诊在肥胖患者中比非肥胖患者组更难以确认；触诊难度的VAS评分分别为 5.25 ± 2.5 和 3.3 ± 2.5 ， $P=0.005$ 。应用多元线性回归，触诊准确率的VAS评分与患者升高增长和甲颞间距增加负相关（分别 $P<0.001$ 和 $P=0.006$ ），与颞胸间距以及颈围正相关（分别 $P=0.011$ 和 $P=0.001$ ）。

结论：女性患者的环甲软骨误定位十分常见且在肥胖患者中定位的准确度更低，这项研究暗示了经环甲软骨行气道通气的可行性。

（郭晨跃译 薛张纲校）

BACKGROUND:The cricothyroid membrane (CTM) is the recommended site of access to the airway during cricothyroidotomy to provide emergency oxygenation. Despite the apparent simplicity of the technique, this rescue maneuver frequently fails to achieve its goals and complications are numerous. The reasons for this failure are unclear. We sought to determine the ability of physicians to correctly identify the CTM in female patients.

METHODS:Using fluorescent "invisible" ink, the physician was asked to mark the CTM with the patient in the supine neutral position and then with the head extended. The actual level was identified using ultrasound and the distance between the actual and estimated margin of the CTM was measured. A correct estimation was defined as a mark made between the upper and lower limits of the membrane and within 5 mm of midline. Participants were also asked to assess the ease of CTM palpation using a 10-cm visual analog scoring (VAS) scale.

RESULTS:Fifty-six patients participated of whom 15 were obese. In the supine neutral neck position, the CTM was identified in 10/41 vs 0/15 ($P = 0.048$) in nonobese versus obese, respectively. Of the 46 incorrectly identified CTMs in this position, 24 were above (maximum 3 cm) and 22 below (maximum 3 cm) the actual level. Similar results were observed when the patients were placed with the neck in the extended position; the CTM was identified correctly in 12/41 vs 1/15 nonobese and obese patients, respectively. The range of values was also extensive; the estimation of the position of the membrane was as high as 2.5 cm above and 4 cm below the actual level, and up to 1.6 cm laterally. Participating doctors found palpation of the CTM subjectively more difficult in the obese than nonobese groups; VAS score for palpation difficulty was 5.25 ± 2.5 vs 3.3 ± 2.5 , respectively, $P = 0.005$. Using multiple linear regression, VAS scores for palpation correlated negatively with increased patient height ($P < 0.001$) and greater thyromental distance ($P = 0.006$), and correlated positively with increased sternomental distance ($P = 0.011$) and neck circumference ($P = 0.001$).

CONCLUSIONS:Misidentification of the CTM in female patients is common and its localization is less precise in those who are obese. This has implications for the likely success of invasive airway access via the CTM.

两例恶性高热家族中出现双倍和单倍诺丁受体1变异

Novel double and single ryanodine receptor 1 variants in two austrian malignant hyperthermia families.

Alexius Kaufmann, PhD*, Birgit Kraft, MD*, Andrea Michalek-Sauberer, MD*, Marta Weindlmayr, PhD*, Hans G. Kress, MD*, Ferdinand Steinboeck, PhD† and Lukas G. Weigl, PhD*

From the *Department of Special Anaesthesia and Pain Therapy, Medical University Vienna, Vienna, Austria; †Department of Medicine I, Institute of Cancer Research, Medical University Vienna, Vienna, Austria.

Anesth Analg May 2012 114:1017-1025

背景：恶性高热是一种与挥发性麻醉药和去极化肌松药有关的潜在的致死性疾病。欲证明恶性高热引起显著基因变异，必须先证明诺丁受体1的钙通道的敏感性。故我们选定这两个出现严重恶性高热并有明显基因变异的家族做研究。

方法：我们首先按顺序排好两个奥地利家庭每个人的RYR1基因编码区，分离基因型并记录基因变化进程；功能正常情况下，含有突变基因的个体在f2酸酶作用下释放钙离子，而非易感个体无释放。特异的钙离子激动剂有：咖啡因、4-CmC、氟烷等。

结果：家庭A，恶性高热易感型，存在A612P突变，表现为细胞对促钙离子释放物质的敏感性增高；家庭B，存在两种突变型（p.R2458H/p.R3348C），p.R2458H型和p.R2458H/p.R3348C突变型都提示恶性高热易感，p.R3348C型是否为MH易感还不确定。与阴性对照组相比，钙离子释放试验提示：除了存在p.R2458H/p.R3348C突变的4-CmC以外，机体储存的氨基酸能增加实验物质的敏感性。

结论：这些突变基因是MH新的变异。

(韩旭译 薛张纲校)

BACKGROUND: Malignant hyperthermia (MH) is a potentially lethal genetic disorder in response to volatile anesthetics and depolarizing muscle relaxants. To support the claim that a novel genetic variant causes MH, it is necessary to demonstrate that it has significant effects on the sensitivity of the ryanodine receptor (RYR1) calcium channel. In this study we focused on 2 Austrian families with strong MH disposition and new RYR1 variants.

METHODS: We sequenced the entire coding region of the RYR1 from 2 Austrian MH individuals. Genotype-phenotype segregation and evolutionary conservation of the variants were considered. On a functional level, Ca(2+) release experiments with fura-2-acetoxymethyl ester were performed in cultured skeletal muscle cells derived from individuals carrying the new variants and compared with control cells from nonsusceptible individuals. Caffeine, 4-chloro-m-cresole (4-CmC), and halothane were used as specific Ca(2+) releasing agents.

RESULTS: The variant p.A612P in family A segregated with an MH-susceptible phenotype and cells showed an increased sensitivity for all Ca(2+)-releasing substances tested. In family B, 2 variants (p.R2458H/p.R3348C) were identified. While p.R2458H and p.R2458H/p.R3348C segregated with an MH-susceptible diagnosis, p.R3348C alone showed an MH equivocal diagnosis. Ca(2+)-release experiments showed that exchanges of these highly conserved amino acids increased the sensitivities for the substances tested (except 4-CmC with p.R2458H and p.R3348C) when compared with the MH-negative control group.

CONCLUSIONS: Our results suggest that these variants are new causative MH variants.

一项关于麻醉师对手术室废物回收的意见的调查

A survey of anesthesiologists' views of operating room recycling.

Forbes McGain, MBBS, FANZCA, FCICM*, Stuart White, FRCA, BSc, MA†,

Simone Mossenson, MBBS, FANZCA[‡], Eugenie Kayak, BSc, MSc, MBBS, FANZCA[§] and David Story, MBBS, BMedSci, FANZCA, MD^{||}

From ^{*}Departments of Anaesthesia and Intensive Care Medicine, Western Health, Melbourne, Australia; [†]Department of Anaesthesia, Royal Sussex County Hospital, East Sussex, United Kingdom; [‡]Department of Anaesthesia and Pain Medicine, Royal Women's Hospital and Alfred Hospital, Melbourne, Australia; [§]Department of Anaesthesia and Pain Medicine, Austin Health and Alfred Health, Melbourne, Australia; ^{||}Department of Anaesthesia and Pain Medicine, Austin Health, and the University of Melbourne, Melbourne, Australia.

Anesth Analg May 2012 114:1049-1054

背景：手术室能显著增加医院废物的体积和成本。然而，很少有人知道医生关于医院废物回收的意见，尽管他们对改善回收计划有潜在影响。我们研究在澳大利亚，新西兰和英格兰的城镇或大都市，公立医院或私人诊所工作的麻醉师对医院废物回收的观点。我们提出以下几点：（1）认为手术室废物回收重要的麻醉科医生的比例占多少？

（2）受访者认为阻碍手术室回收的识别障碍是什么？

方法：我们对麻醉师对手术室废物回收的态度进行网络调查，共11个问题。试点后，调查通过电子邮件发送给500个随机选择的澳大利亚和新西兰麻醉师学院的研究员。英国国民健康服务的所有麻醉部门也收到电子邮件，并由英语顾问麻醉师完成调查。

结果：我们共收到780份麻醉师的回应，210份来自澳大利亚和新西兰（41%的回应率），570份来自英格兰（在最坏的情况下只有11%的回应率）。无论地域或工作的性质，大部分（725，93%，95%可信区间[CI]为：91%至95%）回应的麻醉师愿意增加手术室废物的回收利用，并愿意花时间，但不是自己的钱这样做。只有87（11%，95%CI：9%至14%）的受访者同意/非常同意，废物回收已经发生在他们的手术室。受访者认为，废物回收的最大障碍是：（1）回收设施不足，381（49%）；（2）消极的工作人员的态度，133（17%）；（3）如何回收废物信息不足，121

（16%）。及时，安全，回收容器空间不足和成本分别被<5%的受访者认为是回收的最大障碍

结论：大多数麻醉师支持更大的手术室废物回收，但他们认为有识别障碍。麻醉医师可以发挥领导作用，并与医院其他员工合作来提高手术室回收。我们建议研究提高手术室回收设施，文化程度，和工作人员态度的影响因素

（贺盼译 薛张纲校）

BACKGROUND: Operating rooms contribute significantly to the increasing volumes and costs of hospital waste. Little is known, however, about doctors' views of hospital waste recycling despite their potential influence in improving recycling programs. We surveyed the waste recycling views held by anesthesiologists in Australia, New Zealand, and England in regional or metropolitan and public or private practice. We asked the following: (1) What proportion of anesthesiologists consider recycling operating room waste to be important? (2) What do respondents consider to be identifiable barriers preventing operating room recycling?

METHODS: We performed a Web-based survey of 11 questions of attitudes to operating room waste recycling held by anesthesiologists. After piloting, the survey was e-mailed to 500 randomly selected Fellows of the Australian and New Zealand College of Anesthetists. All anesthetic departments of the National Health Service of England also received the e-mail with a request that English consultant anesthesiologists complete the survey.

RESULTS: We received 780 responses from anesthesiologists, 210 (41% response rate) from Australia and New Zealand and 570 (11% response rate at worst) from England. Regardless of location or type of practice, most (725, 93%; 95% confidence interval [CI]: 91% to 95%) responding anesthesiologists would like to increase recycling of operating room waste and would commit their time, but not their money to doing so. Only 87 (11%; 95% CI: 9% to 14%) respondents agreed/strongly agreed that waste recycling occurred in their operating rooms already. Survey respondents thought that the greatest barriers to recycling waste were (1) inadequate recycling facilities, 381 (49%); (2) negative staff attitudes, 133 (17%); and (3) inadequate information on how to recycle waste, 121 (16%). Time, safety, inadequate space for recycling receptacles, and cost were each thought by <5% of respondents to be the greatest barrier to recycling.

CONCLUSIONS: Most responding anesthesiologists supported greater operating room waste recycling but thought that there were identifiable barriers. Anesthesiologists could take a leadership role and work with other hospital employees to improve operating room recycling. We suggest studies of the effect of improving operating room recycling facilities, education, and staff attitudes.

可重复使用和一次性使用中心静脉导管装置的使用周期评估

A Life Cycle Assessment of Reusable and Single-Use Central Venous Catheter Insertion Kits

Forbes McGain, MBBS, FANZCA, FCICM*, Scott McAlister, BSc, PGradDipSci, MWaterRM†, Andrew McGavin, RN, PGrad Dip. Emerg Med, Pgrad. Dip. Bus.‡ and David Story, MBBS, MD, FANZCA§||

From the *Departments of Anaesthesia and Intensive Care, Western Health, Melbourne, Australia; †Ecoquantum Consulting, Melbourne, Victoria; ‡Department of Bioengineering, Western Health, Melbourne, Australia; §Department of Anaesthesia and Pain Medicine, Austin Health; || University of Melbourne, Melbourne, Australia.

Anesth Analg May 2012 114:1073-1080

背景：对于手术室中很多使用的项目来说，可重复使用的项目是否比一次性使用的项目更具备环保和经济效益并不十分清楚。我们研究了可重复使用的和一次性使用的中心静脉导管装置。我们没有研究中心静脉导管装置本身的性能。我们评估了装置总的环境和经济成本，包括消毒所需的能源消耗。

方法：对于可重复使用的中心静脉导管装置，在澳大利亚墨尔本的健康中心，我们运作了一个“时间动量”研究来计算劳力耗损和计算在清洗和消毒中使用的能源和水。对于大部分的一次性使用装置的投入，我们依据行业和采购数据。我们将可重复使用和一次性使用中心导管装置做成了蒙特卡罗分析模型。

结果：包含劳力，可重复使用中心静脉导管装置花费\$6.35澳大利亚（\$A）（95%可信区间\$A5.89到\$A6.86），而一次性装置花费\$8.65。可重复使用装置，CO₂排放量1211g（95%可信区间1099到1323克），而一次性装置排放407g（95%可信区间379到442克）。水的耗用对于可重复使用装置是27.7升（95%可信区间27到28.6升），而一次性使用装置是2.5升（95%可信区间2.1到2.9升）。对于可重复使用的装置，消毒耗费巨大的环境成本，而对于一次性使用装置，制造所使用的塑料和金属则是其最大的环境成本。不同来源的电造成可重复使用装置使病人再次受到CO₂排放的影响：医院燃气产电导

致436gCO₂排放（95%可信区间410到473gCO₂），美国电网排放764gCO₂（95%可信区间509到1174gCO₂），欧洲电网排放572g（95%可信区间470到713gCO₂）。

结论：包含劳力，可重复使用中心静脉导管装置比一次性使用装置昂贵。对于我们医院，使用煤源电力来说，环境成本消耗方面，可重复使用装置比一次性使用装置花费要贵许多。努力减少可重复使用环境成本最直关键的是降低清洁和消毒的水和能源消耗。医院的电力来源相对反映着循环使用项目的环境影响。

（胡晓清译 薛张纲校）

BACKGROUND: For most items used in operating rooms, it is unclear whether reusable items are environmentally and financially advantageous in comparison with single-use variants. We examined the life cycles of reusable and single-use central venous catheter kits used to aid the insertion of single-use, central venous catheters in operating rooms. We did not examine the actual disposable catheter sets themselves. We assessed the entire financial and environmental costs for the kits, including the influence of the energy source used for sterilization.

METHODS: For the reusable central venous catheter kit, we performed a “time-in-motion” study to determine the labor costs and measured the energy and water consumption for cleaning and sterilization at Western Health, Melbourne, Australia. For the majority of the inputs for the single-use kit, we relied upon industry and inventory-sourced databases. We modeled the life cycles of the reusable and single-use central venous catheter kits with Monte Carlo analysis.

RESULTS: Inclusive of labor, the reusable central venous catheter insertion kits cost \$6.35 Australian (\$A) (95% confidence interval [CI], \$A5.89 to \$A6.86), and the single-use kits cost \$A8.65. For the reusable kit, CO₂ emissions were 1211 g (95% CI, 1099 to 1323 g) and for the single-use kit 407 g (95% CI, 379 to 442 g). Water use was 27.7 L (95% CI, 27.0 to 28.6 l) for the reusable kit and 2.5 L (95% CI, 2.1 to 2.9 l) for the single-use kit. For the reusable kit, sterilization had the greatest environmental cost, and for the single-use kit, the manufacture of plastic and metal components had the largest environmental costs. Different sources of electricity to make the reusable kits patient-ready again affected the CO₂ emissions: electricity from hospital gas cogeneration resulted in 436 g CO₂ (95% CI, 410 to 473 g CO₂), from the United States electricity grid 764 g CO₂ (95% CI, 509 to 1174 g CO₂), and from the European electricity grid 572 g (95% CI, 470 to 713 g CO₂).

CONCLUSIONS: Inclusive of labor, the reusable central venous catheter insertion kits were less expensive than were the single-use kits. For our hospital, which uses brown coal-sourced electricity, the environmental costs of the reusable kit were considerably more expensive than those of the single-use kit. Efforts to reduce the environmental footprint of reusable items should be directed towards decreasing the water and energy consumed in cleaning and sterilization. The source of hospital electricity significantly alters the relative environmental effects of reusable items.

麻醉中的异丙酚浪费

Propofol Wastage in Anesthesia

Russell F. Mankes, PhD, Retired

From the Albany Medical Center/Albany Medical College, Albany, New York.

Anesth Analg. 2012 May;114(5):1091-2.

背景：药品浪费已被认为是环境污染和不必要的医疗保健费用的一个重要因素。

方法：我们在8个手术室中手工整理每个医药废物收集器中的内容，并将结果汇总。能返回到药店的异丙酚，不计入浪费药物。

结果：浪费或丢弃的异丙酚，占有所有药物浪费的45%。

结论：异丙酚在自然界中不会降解，在体内脂肪中积聚，对水生生物有毒。我们以最小尺寸（20毫升）的异丙酚代替50和100毫升瓶装异丙酚可以减少浪费。

（郁玲玲译 薛张纲校）

BACKGROUND: Drug waste has been implicated as a significant contributor to environmental contamination and unnecessary health care costs.

METHODS: We collected the contents of pharmaceutical waste collection containers in each of 8 operating rooms, sorted them by hand, and tabulated the results. Propofol returned to the pharmacy was not counted as wasted drug.

RESULTS: Wasted or discarded propofol accounted for 45% of all the drug waste.

CONCLUSIONS: Propofol does not degrade in nature, accumulates in body fat, and is toxic to aquatic life. We reduced wastage by removing 50 and 100 mL vials of propofol from the pharmacy, retaining only the smallest size (20 mL).

激活中枢大麻素2型受体系统可以预防紫杉醇引起的神经病

Prevention of Paclitaxel-induced neuropathy through activation of the central cannabinoid type 2 receptor system.

Mohamed Naguib, MB, BCh, MSc, FCARCSI, MD*, Jijun J. Xu, MD, PhD*,

Philippe Diaz, PhD‡, David L. Brown, MD*, David Cogdell, MS‡,

Bihua Bie, MD, PhD*, Jianhua Hu, PhD§, Suzanne Craig, DVM, DACLAM|| and Walter N.

Hittelman, PhD¶

Author affiliations are provided at the end of the article.

Anesth Analg. 2012 May;114(5):1104-20.

背景：周围神经病是化疗的一个重要的剂量限制性毒性反应，特别是在应用了多个疗程的紫杉醇之后。由紫杉醇引起的神经病，其发展与激活小胶质细胞后导致星形胶质细胞的活化和增殖，以及在脊髓背角表达和释放前炎性细胞因子密切相关。在神经退行性病变的模型中，小胶质细胞表达了大麻素2型（CB（2））受体。

方法：为了探索CB（2）激动剂预防紫杉醇引起的神经病的能力，我们设计并合成了一种新型CB（2）选择性激动剂，即MDA7。在大鼠和CB（2）（+/+）及CB（2）（-/-）小鼠身上，我们评估了MDA7在预防紫杉醇引起痛觉异常方面的效果。我们假设CB（2）受体在负反馈回路起作用，因此早期应用MDA7可以削弱紫杉醇引起的神经炎症反应，并且能通过干扰特定的信号通路从而预防机械性痛觉异常。

结果：我们发现，MDA7在不影响紫杉醇的抗肿瘤作用的同时，能够以剂量和时间依赖的方式预防紫杉醇在小鼠与大鼠身上引起的机械性痛觉异常。MDA7的神经保护作用在CB（2）（-/-

）小鼠中缺失，并且能够被CB（2）拮抗剂阻断，表明MDA7的作用直接涉及CB（2）受体的激活。MDA7治疗能够在早期干预紫杉醇引起的神经炎症反应，这是因为目前已经证实了它能够相对减少Toll样受体及CB（2）在脊髓的表达，降低细胞外信号调节激酶1/2的活性水平，减少激活的小胶质细胞和神经胶质细胞的数量，减少在体内和体外模型中前炎症介质的分泌。

结论：我们的研究表明这是一种新的预防化疗引起的神经病的治疗方法。有了这种方法，可以在更加积极应用化疗方案的同时，减少长期的后遗症。

（周玲译 薛张纲校）

BACKGROUND: Peripheral neuropathy is a major dose-limiting toxicity of chemotherapy, especially after multiple courses of paclitaxel. The development of paclitaxel-induced neuropathy is associated with the activation of microglia followed by the activation and proliferation of astrocytes, and the expression and release of proinflammatory cytokines in the spinal dorsal horn. Cannabinoid type 2 (CB(2)) receptors are expressed in the microglia in neurodegenerative disease models.

METHODS: To explore the potential of CB(2) agonists for preventing paclitaxel-induced neuropathy, we designed and synthesized a novel CB(2)-selective agonist, namely, MDA7. The effect of MDA7 in preventing paclitaxel-induced allodynia was assessed in rats and in CB(2)(+/+) and CB(2)(-/-) mice. We hypothesized that the CB(2) receptor functions in a negative-feedback loop and that early MDA7 administration can blunt the neuroinflammatory response to paclitaxel and prevent mechanical allodynia through interference with specific signaling pathways.

RESULTS: We found that MDA7 prevents paclitaxel-induced mechanical allodynia in rats and mice in a dose- and time-dependent manner without compromising paclitaxel's antineoplastic effect. MDA7's neuroprotective effect was absent in CB(2)(-/-) mice and was blocked by CB(2) antagonists, suggesting that MDA7's action directly involves CB(2) receptor activation. MDA7 treatment was found to interfere with early events in the paclitaxel-induced neuroinflammatory response as evidenced by relatively reduced toll-like receptor and CB(2) expression in the lumbar spinal cord, reduced levels of extracellular signal-regulated kinase 1/2 activity, reduced numbers of activated microglia and astrocytes, and reduced secretion of proinflammatory mediators in vivo and in in vitro models.

CONCLUSIONS: Our findings suggest an innovative therapeutic approach to prevent chemotherapy-induced neuropathy and may permit more aggressive use of active chemotherapeutic regimens with reduced long-term sequelae.

简报：臂丛神经中肌皮神经的出现水平：锁骨下神经阻滞的影响因素

Brief report: the emergence level of the musculocutaneous nerve from the brachial plexus: implications for infraclavicular nerve blocks.

Antoine Pianezza, MD*†, Arnaud Salces y Nedeo, MD*, Patrick Chaynes, MD, PhD‡, Philip E. Bickler, MD, PhD§ and Vincent Minville, MD, PhD*

From the *Department of Anesthesiology and Intensive Care, Toulouse University Hospital, Toulouse, France; †Département d'Anesthésie, Clinique du Parc, Castelnau le Lez, France;

‡Department of Anatomy, University Hospital of Toulouse, Toulouse, France; §Department of Anesthesia and Perioperative Care, University of California at San Francisco, San Francisco, California.

Anesth Analg May 2012 114:1131-1133

背景：在这项针对尸体的研究中，我们测量在锁骨下入路的神经阻滞中针尖刺入部位与肌皮神经出现点的距离

方法：我们研究了20例成人防腐尸体的40例臂丛神经。暴露肌皮神经从其侧线起源至喙肱肌。测量肌皮神经在侧线的出现点至喙肱肌的内侧角的直线距离。将穿刺针按之前描述的方法放置，并测量针尖位置至肌皮神经出现点的距离。

结果：肌皮神经经常出现在喙肱肌行程的远端。在针尖刺入部位，80%的肌皮神经早已出现在侧线上。此距离至喙肱肌为近端8.5厘米至远端12厘米。

结论：本解剖研究提示横向入针行锁骨下神经阻滞时单次注射技术阻滞肌皮神经不全的原因可能与肌皮神经的出现点的变异有关。

（杨琰译 薛张纲校）

BACKGROUND: In this cadaveric study we assessed the level of the emergence of the musculocutaneous nerve (MCN) relative to needle insertion site during infraclavicular block.

METHODS: Forty brachial plexi from 20 embalmed adult cadavers were dissected. The MCN was exposed from its origin on the lateral cord to its penetration into the coracobrachialis muscle. The point of emergence of the MCN from the lateral cord relative to a line drawn directly caudad from the anteromedial tip of the coracoid process was measured. A needle was placed predissection using our previously described technique, and the distance from the needle tip to the emergence of the MCN was measured.

RESULTS: MCN often emerged distal to the coracoid process. At the needle insertion site, 80% of MCN had already emerged from the lateral cord. The distance of emergence ranged from 8.5 cm proximal to 12 cm distal to the coracoid process.

CONCLUSION: This anatomical study suggests that MCN may be one of the factors explaining MCN block failure for the single-injection technique of infraclavicular block using lateral needle trajectory.

幼猪氰化物毒性和它被一种新的前体药物Sulfanegen Sodium逆转

Cyanide Toxicity in Juvenile Pigs and Its Reversal by a New Prodrug, Sulfanegen Sodium

Kumar G. Belani, MBBS, MS*, Harpreet Singh, MBBS*, David S. Beebe, MD*, Preeti George, MBBS, MD*, Steven E. Patterson, PhD†, Herbert T. Nagasawa, PhD‡ and Robert Vince, PhD†
From the *Department of Anesthesiology, †Center for Drug Design, and ‡Department of Medicinal Chemistry, University of Minnesota, Minneapolis, Minnesota.

Anesth Analg May 2012 114:956-961

背景：氰化物（CN）中毒时一种比较严重的临床问题，可能会发生在给予硝普钠（SNP）、意外烟吸入、工业事故以及生化恐怖活动时。本研究中，我们分别对幼猪使用硝普钠或者是氰化钠(NaCN)单独制造严重氰化物中毒的模型，从而证明严重的氰化物中毒可以被一种新型解毒剂——3-巯基丙酮酸的前体药物sulfanegen sodium的逆转作用。

方法：SNP研究：在11只麻醉机械通气状态下的幼猪中进行预实验，来决定诱导产生CN中毒的SNP剂量。监测血CN、血清乳酸盐和血气。CN中毒的定义为出现严重的乳酸性酸中毒伴随血CN水平明显升高。基于这个预实验，8只麻醉后的猪使用高剂量静脉输注SNP（100 mg/h），维持2h以诱导产生CN中毒。然后随机将它们分为2组，使用sulfanegen sodium组和使用安慰剂组。4只猪在诱导严重CN中毒后每小时使用3个剂量的sulfanegen sodium（2.5g IV），4只猪使用安慰剂。NaCN

研究：预实验4只猪，在异丙酚和氯胺酮镇静下自主呼吸，在数小时内确保血流动力学和代谢稳定。之后，6只猪采用同样的镇静方式，间断使用等剂量NaCN以产生CN中毒，最

终导致死亡。随访血流动力学和代谢变量来定义CN中毒的峰值。另外6只猪，采用这种方式诱导产生严重的CN中毒，并且在毒性峰值时，给予动物sulfanegen sodium（2.5g IV），60min后在存活的动物中重复使用此剂量。

结果：SNP组：预实验表明，高剂量SNP组均发生了显著的血CN水平升高（ $P < 0.05$ ）和严重的乳酸性酸中毒（ $P < 0.05$ ）。使用sulfanegen sodium引起血乳酸盐以及CN水平的逐步显著下降，存活率100%（ $P < 0.05$ ），而安慰剂组猪恶化且无存活（ $P < 0.05$ ）。

NaCN研究：NaCN注射在所有猪均导致CN中毒，伴严重的乳酸性酸中毒以及死亡。Sulfanegen sodium逆转了这种毒性，并且这个解毒药防止了所有猪的死亡。

结论：使用SNP或NaCN在幼猪模型中可成功诱导产生CN中毒。前体药物sulfanegen sodium，能有效逆转SNP或NaCN诱导产生的CN毒性。

（安光惠译 马皓琳 李士通校）

BACKGROUND: Cyanide (CN) toxicity is a serious clinical problem and can occur with sodium nitroprusside (SNP) administration, accidental smoke inhalation, industrial mishaps, and bio-terrorism. In this study, we induced severe CN toxicity independently with SNP or sodium cyanide (NaCN) in a juvenile pig model to demonstrate reversal of severe CN toxicity with a new antidote, sulfanegen sodium, a prodrug of 3-mercaptopyruvate.

METHODS: SNP study: A pilot study in 11 anesthetized, mechanically ventilated juvenile pigs allowed us to determine the dose of SNP to induce CN toxicity. Blood CN, serum lactates, and blood gases were monitored. CN toxicity was defined as the occurrence of severe lactic acidosis accompanied by significant elevation in blood CN levels. Based on this pilot study, 8 anesthetized pigs received a high-dose IV infusion of SNP (100 mg/h) for 2 hours to induce CN toxicity. They were then randomized to receive either sulfanegen sodium or placebo. Four pigs received 3 doses of sulfanegen sodium (2.5 g IV) every hour after induction of severe CN toxicity, and 4 pigs received placebo. NaCN study: A pilot study was conducted in 4 spontaneously ventilating pigs sedated with propofol plus ketamine to demonstrate hemodynamic and metabolic stability for several hours. After this, 6 pigs were similarly sedated and given NaCN in bolus aliquots to produce CN toxicity ultimately resulting in death. Hemodynamics and metabolic variables were followed to define peak CN toxicity. In another group of 6 pigs, severe CN toxicity was induced by this method, and at peak toxicity, the animals were given sulfanegen sodium (2.5 g IV) followed by a repeat dose 60 minutes later in surviving animals.

RESULTS: SNP study: The pilot study demonstrated the occurrence of a significant increase in blood CN levels ($P < 0.05$) accompanied by severe lactic acidemia ($P < 0.05$) in all pigs receiving a high dose of SNP. Administration of the sulfanegen antidote resulted in progressive significant reduction in blood lactate and CN levels with 100% survival ($P < 0.05$), whereas the placebo-treated pigs deteriorated and did not survive ($P < 0.05$). NaCN study: NaCN injection resulted in CN toxicity accompanied by severe lactic acidosis and mortality in all the pigs. Sulfanegen sodium reversed this toxicity and prevented mortality in all the pigs treated with this antidote.

CONCLUSIONS: CN toxicity can be successfully induced in a juvenile pig model with SNP or NaCN. The prodrug, sulfanegen sodium, is effective in reversing CN toxicity induced by SNP or NaCN.

异丙酚/瑞芬太尼致呼吸暂停后的血红蛋白氧饱和度下降:

一项健康志愿者自主呼吸恢复的研究

Hemoglobin Desaturation After Propofol/Remifentanyl-Induced Apnea: A Study of the Recovery of Spontaneous Ventilation in Healthy Volunteers

Tiscia Bernadette Stefanutto, MB, ChB, John Feiner, MD, Jens Krombach, MD, Ronald Brown, BS and James E. Caldwell, MB, ChB

From the Department of Anesthesia and Perioperative Care, University of California, San Francisco, San Francisco, California.

Anesth Analg May 2012 114:980-986

背景:一项较早的调查“不能通气/不能插管”的临床情况的研究表明,应用硫喷妥钠5 mg/kg和琥珀胆碱1.0mg/kg的麻醉诱导引起血红蛋白饱和度下降的显著风险。琥珀胆碱导致的呼吸暂停可能是延长的呼吸暂停的原因。我们假设在气管插管时使用异丙酚和瑞芬太尼也许可以避免由于肌肉松弛而导致的长时间呼吸暂停和随后的氧饱和度下降。

方法:有24位健康志愿者参与了实验,年龄分布在18到45岁。在吸氧达到呼气末氧浓度大于90%后,志愿者们接受了异丙酚2mg/kg及分别为2 mcg/kg (组1; n=12)或1.5 mcg/kg (group 2; n =

12)的瑞芬太尼。测量了手指、耳垂和前额的氧饱和度(SpO₂)。如果氧饱和度降低于了80%,则托起志愿者下颌,如果此情况持续,则进行辅助通气。

结果:5名志愿者出现了饱和度降低(SpO₂ < 80%):4名在高剂量(2

mcg/kg)瑞芬太尼组,1名在低剂量(1.5

mcg/kg)瑞芬太尼组。3名志愿者需要托下颌和辅助通气。在高剂量瑞芬太尼组中,最低的氧饱和度是 82.4 ± 10.5 (均值±

标准差),而在低剂量瑞芬太尼组中,最低的氧饱和度是92.4 ± 8.6 (P =

0.019)。低剂量组的呼吸暂停时间(4.7 ± 1.5)比高剂量组的呼吸暂停时间(6.1 ± 1.0)要短(P = 0.0093)。在高剂量组中,有良好或者可接受的插管条件的志愿者为11名(92;

95%可信区间, 65-

99%);在低剂量组中,有良好或者可接受的插管条件的志愿者为8名(67%; 95%可信区间, 39%-86%)。

结论:在同时给予异丙酚2

mg/kg的情况下,为了产生可接受的插管条件所需的瑞芬太尼剂量2

mcg/kg,会导致呼吸暂停同时有降低氧饱和的显著风险,然而 1.5 mcg/kg

剂量的瑞芬太尼无法可靠地提供可接受的插管条件,也没有减少氧饱和降低的风险。

(张怡译 马皓琳 李士通校)

BACKGROUND: In an earlier study investigating the “can't ventilate/can't intubate” clinical scenario, induction of anesthesia with thiopental 5 mg/kg and succinylcholine 1.0 mg/kg was associated with a significant risk of hemoglobin desaturation. It appeared that succinylcholine-induced apnea was responsible for the prolonged apnea. Our hypothesis was that using propofol and remifentanyl for tracheal intubation might avoid prolonged apnea and subsequent desaturation attributable to muscle relaxation.

METHODS: Twenty-four healthy volunteers ages 18 to 45 years participated. After oxygen administration to end-tidal oxygen >90%, volunteers received 2 mg/kg propofol and remifentanyl

either 2 mcg/kg (group 1; $n = 12$) or 1.5 mcg/kg (group 2; $n = 12$). Oxygen saturation (SpO_2) was measured at a finger, an ear lobe, and the forehead. If SpO_2 decreased below 80%, volunteers received chin lift and, if persistent, assisted ventilation.

RESULTS: Desaturation ($SpO_2 < 80\%$) occurred in 5 volunteers: 4 in the higher remifentanyl dose (2 mcg/kg) group and 1 in the lower dose (1.5 mcg/kg) group. Chin lift and assisted ventilation was necessary in 3 volunteers. The lowest SpO_2 was 82.4 ± 10.5 (mean \pm SD) in the higher-dose group vs. 92.4 ± 8.6 with the lower dose of remifentanyl ($P = 0.019$). Apnea time was shorter ($P = 0.0093$) with the lower dose (4.7 ± 1.5) than with the higher dose of remifentanyl (6.1 ± 1.0). Conditions for intubation were excellent or acceptable in 11 volunteers (92%; 95% confidence interval [CI], 65%–99%) in the higher-dose group, and in 8 (67%; 95% CI, 39%–86%) with the lower dose.

CONCLUSIONS: Administered with propofol 2 mg/kg, the remifentanyl dose necessary to produce acceptable intubating conditions, 2 mcg/kg, produces apnea that carries a significant risk of desaturation, whereas a remifentanyl dose of 1.5 mcg/kg does not reliably produce acceptable intubating conditions and does not eliminate the risk of desaturation.

重症监护病房里的非计划性气管拔管：系统综述、严格评估和循证建议

Unplanned Endotracheal Extubations in the Intensive Care Unit: Systematic Review, Critical Appraisal, and Evidence-Based Recommendations

Paulo Sergio Lucas da Silva, MD, MSc* and Marcelo Cunio Machado Fonseca, MD, MSc†

From the *Department of Intensive Care Medicine, Hospital do Servidor Público Municipal, São Paulo; and †Department of Intensive Care Medicine, Universidade Federal de São Paulo, São Paulo, Brazil.

Anesth Analg May 2012 114:1003-1014

背景：在本研究中，我们更新了重症监护病房对非计划性气管拔管的认知状态。重点探讨以下主题：发生率、危险因素、非计划性拔管后重插管、结果以及预防。根据本综述提出预防非计划性拔管的建议。

方法：搜索1950年1月1日到2011年6月30日有关出版物的电子数据库，包括MEDLINE、EMBASE、CINAHL、SciELO、LILACS和Cochrane系统。得到50篇适合提取数据的文章。用Newcastle-Ottawa标度评价研究质量。根据牛津循证医学中心评价推荐等级。

结果：非计划性拔管发生率为0.1-

3.6次/100插管日。与非计划性拔管相关的危险因素包括男性（优势比[OR]4.8）、APACHE评分 ≥ 17 （OR 9.0）、COPD、多动/激动（OR 3.3-30.6）、低镇静水平（OR 2.0-5.4）、高清醒水平（OR 1.4-2.0）以及使用身体约束物品（OR

3.1）。非计划性拔管的重插管率为1.8%-

88%。13项研究评估了避免非计划性拔管的预防措施。这些研究集中在数据收集工具、标准化流程、工作人员教育、工作人员监视以及高危患者的确认和处理。这些研究报道非计划性拔管减少了22%-53%。气管导管最佳固定方法和身体约束物品的使用仍存在争议。

结论：虽然关于非计划性拔管的出版物很多，但极少有研究评价不良事件的预防措施，且极少有临床试验评价非计划性拔管。根据现有文献提出建议。

（陈彬彬 翻译，马皓琳 李士通 审校）

BACKGROUND: In this study, we updated the state of knowledge on unplanned tracheal extubations in the intensive care unit. We focused on the following topics: incidence, risk factors, reintubation after unplanned extubation, outcomes, and prevention. Based on this review, recommendations were made for preventing unplanned extubations.

METHODS: Electronic databases were searched for relevant publications from January 1, 1950 through June 30, 2011 on the MEDLINE, EMBASE, CINAHL, SciELO, LILACS, and Cochrane systems. Fifty articles were eligible for data abstraction. Study quality was assessed using the Newcastle-Ottawa Scale. Grades of recommendation were assessed according to the Oxford Centre for Evidence-Based Medicine.

RESULTS: Unplanned extubations occur at a rate of 0.1 to 3.6 events per 100 intubation days. Risk factors associated with unplanned extubations included male gender (odds ratio [OR] 4.8), APACHE score ≥ 17 (OR 9.0), chronic obstructive pulmonary disease, restlessness/agitation (OR 3.3–30.6), lower sedation level (OR 2.0–5.4), higher consciousness level (OR 1.4–2.0), and use of physical restraints (OR 3.1). Reintubation rates ranged from 1.8% to 88% of unplanned extubations. Thirteen studies assessed preventive measures for avoiding unplanned extubations. These studies focused on data collection tools, standardization of procedures, staff education, staff surveillance, and identification and management of high-risk patients. These studies reported reductions in unplanned extubation rate from 22% to 53%. The best methods of securing the endotracheal tube and use of physical restraints remain controversial issues.

CONCLUSIONS: Despite numerous publications on unplanned extubation, few studies assess preventive strategies for adverse events, and few clinical trials have assessed unplanned extubations. Recommendations are proposed based on the currently available literature.

尼莫地平引起的低血压而不是硝酸甘油引起的低血压保留成年小鼠长期和短期记忆

Nimodipine-Induced Hypotension but Not Nitroglycerin-Induced Hypotension Preserves Long- and Short-Term Memory in Adult Mice

Michael Haile, MD*, Samuel Galoyan, PhD*, Yong-Sheng Li, MD†, Barry H. Cohen, PhD‡, David Quartermain, PhD†, Thomas Blanck, MD, PhD* and Alex Bekker, MD, PhD*

From the *Department of Anesthesiology, New York University Langone Medical Center, New York, NY; †Department of Neurology, New York University Langone Medical Center, New York, NY; ‡Department of Psychology, New York University, New York, NY.

Anesth Analg May 2012 114:1034-1041

背景：急性低血压可能引起认知功能障碍。L-

型钙通道阻断剂在低氧条件下保护学习和记忆。我们验证尼莫地平(NIMO)和尼卡地平(NICA)诱发的低血压对比硝酸甘油(NTG)诱发的低血压将产生保护长期和短期记忆作用。

方法：40只S-W小鼠(30-35g, 6-

8周)随机分为4组,手术当日被动逃避(PA)学习后立即腹腔内注射药物:(1)

硝酸甘油(30 mg/kg);(2)尼卡地平(40 mg/kg);(3)尼莫地平(40

mg/kg);(4)生理盐水。记录PA训练等待时间(s)从悬吊的平台到进入一个有机玻璃管,

在这里电击(0.3毫安,持续时间2秒)自动传送。在第二天无电击进行传输的复核试验过程

中记录等待时间。等待时间大于900s被指定为此数值。更低的测试等待时间显示出损害

长期相关记忆。另外49只小鼠随机分为类似分组用于物体辨识测试(ORT),并且在手术当

日给予腹腔注射。ORT测量短期记忆通过探索在有熟悉物体的情况下小鼠倾向喜欢新颖物

体。在训练的第5天，2个相同的物体被放置在一个圆形舞台，并且小鼠进行探索15分钟。用新颖物体替换熟悉的物体后1小时，进行3分钟的试验。具有完整记忆的小鼠花大约65%的时间探索新物体。记忆损害的小鼠花了相同时间探索新老物体。辨识指数(RI)定义为花在探索新事物与花在探索两个物体的时间比值。在小鼠两个独立组进行平均动脉压(MAP)、脑血流和身体及脑氧合饱和度(PO_2)研究，用来确定每次处理生理情况和低血压程度的对应剂量。

结果：不同情况下中位PA等待时间如下：NTG， 219.5 ± 93.5

s四分位距 (SIQR)；NICA， 372.5 ± 75.5 s SIQR；NIMO， 540 ± 200 s

SIQR和生理盐水， 804 ± 257.5 s

SIQR。用等级方法来分析PA等待时间的显著性差异。NTG等待时间明显短于NIMO等待时间($P = 0.012$)和生理盐水等待时间($P = 0.006$)，但不短于NICA等待时间($P =$

0.126)。ORT RI值显示出类似模式。我们发现NTG RI ($47.2 \pm 5.9\%$ SEM) 不同于NIMO RI ($60.2 \pm 4.6\%$ SEM, $P = 0.031$)，并且不同于生理盐水RI ($66.9 \pm 3.7\%$ SEM, $P =$

0.006)。生理实验显示，在注射10-

15分钟内变得对外界刺激的反应微弱的所有动物中平均动脉压降至45- 50 mm

Hg。组间差异在平均动脉压，体和脑氧合和脑血流没有统计学意义。

结论：NIMO诱发的急性低血压保护与临床后处理阶段有关的两类记忆形成。由PA学习模式测得的瞬间长期相关记忆结构和由ORT模式测得的延迟性短期工作记忆功能与NTG诱发的低血压相应水平比较，有显著改善。这些结果显示对L-

型钙通道阻断剂作为低血压和低流率状态下保护认知功能的一种潜在方式的进一步研究的实用性。

BACKGROUND: Acute hypotension may be implicated in cognitive dysfunction. L-Type calcium channel blockers in the setting of hypoxia are protective of learning and memory. We tested the hypothesis that hypotension induced by nimodipine (NIMO) and nicardipine (NICA) would be protective of long- and short-term memory compared to hypotension induced by nitroglycerin (NTG).

METHODS: Forty Swiss-Webster mice (30 to 35 g, 6 to 8 weeks) were randomized into 4 groups for IP injection immediately after passive avoidance (PA) learning on day 0: (1) NTG (30 mg/kg); (2) NICA (40 mg/kg); (3) NIMO (40 mg/kg); and (4) saline. PA training latencies (seconds) were recorded for entry from a suspended platform into a Plexiglas tube where a shock (0.3 mA; 2-second duration) was automatically delivered. On day 2 latencies were recorded during a testing trial during which no shock was delivered. Latencies >900 seconds were assigned this value. Lower testing latency is indicative of an impairment of long-term associative memory. Forty-nine additional mice were randomized into similar groups for object recognition testing (ORT) and given IP injections on day 0. ORT measures short-term memory by exploiting the tendency of mice to prefer novel objects where a familiar object is present. On day 5 during training, 2 identical objects were placed in a circular arena and mice explored both for 15 minutes. A testing trial was conducted 1 hour later for 3 minutes after a novel object replaced a familiar one. Mice with intact memory spend about 65% of the time exploring the novel object. Mice with impaired memory devote equal time to each object. Recognition index (RI) is defined as the ratio of time spent exploring the novel object to time spent exploring both objects was the measure of memory. Mean arterial blood pressure (MAP), cerebral bloodflow, and body and brain oxygenation (PO_2) studies were done in separate groups of mice to determine the dosages for matched degrees of hypotension and the physiological profile of each treatment.

RESULTS: The median PA latencies for the different conditions were as follows: NTG (219.5 ± 93.5 second semi-interquartile range [SIQR]), NICA (372.5 ± 75.5 second SIQR), NIMO (540 ± 200 second SIQR) and saline (804 ± 257.5 second SIQR). Rank methods were used to analyze the PA latencies for significant differences. NTG latency was significantly shorter than NIMO latency ($P = 0.012$) and saline latency ($P = 0.006$), but not NICA latency ($P = 0.126$). ORT RI values showed a similar pattern. We found that NTG RI ($47.2 \pm 5.9\%$ SEM) was different from NIMO RI ($60.2 \pm 4.6\%$ SEM, $P = 0.031$) and different from saline RI ($66.9 \pm 3.7\%$ SEM, $P = 0.006$). Physiological experiments showed that MAP decreased to 45 to 50 mm Hg in all animals who became minimally responsive to external stimuli within 10 to 15 minutes of injection. Intergroup differences for MAP, body and brain oxygenation, and cerebral bloodflow were not statistically significant.

CONCLUSION: Acute hypotension induced by NIMO was protective of 2 categories of memory formation relevant to the clinical posttreatment period. Both immediate long-term associative memory consolidation as measured by the PA learning paradigm and delayed short-term working memory function as measured by the ORT paradigm were significantly improved compared to matched levels of hypotension induced by NTG. These results indicate the utility of further investigation of L-type calcium channel blockers as a potential means of preserving cognition in the setting of hypotensive and low flow states.

一次性喉罩气道和可循环使用喉罩气道生命周期评估的比较

Comparative Life Cycle Assessment of Disposable and Reusable Laryngeal Mask Airways

Matthew Eckelman, PhD*, Margo Mosher†, Andres Gonzalez† and Jodi Sherman, MD‡

From the *Department of Civil and Environmental Engineering, College of Engineering, Northeastern University, Boston, MA; †School of Forestry and Environmental Studies, Yale University, New Haven, CT; ‡Department of Anesthesiology, Yale School of Medicine/Yale–New Haven Hospital, New Haven, CT.

Anesth Analg May 2012 114:1067-1072

背景: 在环境和公共卫⽣的卫⽣保健实践中，人们越来越认识到其带来的负面影响。这就要求我们需从生命周期标准的日常筛选过程进入到设备选择的决策过程。这里我们对两种类型的喉罩气道进⽣使用周期的评估：使用一次即丢弃的新型喉罩气道和可重复使用40次的传统型喉罩气道。

方法: 在生命周期评估中，我们将比较的基础称为“功能单位”。本研究将使用40个一次性喉罩气道或使用40次同一个可循环使用喉罩气道维持气道通畅定义为功能单位。本文对喉罩气道的研究包括了喉罩的输⽣和输出、运输、使用和废弃处理的全过程。两种喉罩对环境的影响用Simapro生命周期评估软件和对建筑环境和经济可持续性影响评定方法来评估。为了帮助解释本研究的结果，我们还进⽣灵敏度和简单生命周期成本的分析。

结果: 在耶鲁纽海文医院，使用可循环使用喉罩气道对环境影响比使用一次性喉罩气道更有利。使用一次性喉罩气道对环境最重要的影响是聚合物的生产、包装以及废物处理，而使用可循环使用喉罩气道主要是清洗和消毒。

讨论: 就对环境的影响来说，可循环使用喉罩气道优于一次性喉罩气道，但是这种益处必须与是否会造成感染的传播相权衡。卫⽣保健设施可以通过使用可循环使用喉罩气道、使用可降解塑料的一次性喉罩气道型号、从当地代理商散装进货的方法来减少其环境影响。

一些措施能进一步减少可循环使用喉罩气道对环境的影响，诸如增加高压蒸汽灭菌装置的使用次数（从单次使用到使用10次）可减少25%温室气体的排放，提高10%压蒸汽机的能源效益可减少8%温室气体的排放。从环境和成本两方面考虑，在管理和操作过程中我们都应付之于行动以确保“不过早丢弃可循环使用喉罩气道”。

BACKGROUND: Growing awareness of the negative impacts from the practice of health care on the environment and public health calls for the routine inclusion of life cycle criteria into the decision-making process of device selection. Here we present a life cycle assessment of 2 laryngeal mask airways (LMAs), a one-time-use disposable Unique™ LMA and a 40-time-use reusable Classic™ LMA.

METHODS: In life cycle assessment, the basis of comparison is called the “functional unit.” For this report, the functional unit of the disposable and reusable LMAs was taken to be maintenance of airway patency by 40 disposable LMAs or 40 uses of 1 reusable LMA. This was a cradle-to-grave study that included inputs and outputs for the manufacture, transport, use, and waste phases of the LMAs. The environmental impacts of the 2 LMAs were estimated using SimaPro life cycle assessment software and the Building for Environmental and Economic Sustainability impact assessment method. Sensitivity and simple life cycle cost analyses were conducted to aid in interpretation of the results.

RESULTS: The reusable LMA was found to have a more favorable environmental profile than the disposable LMA as used at Yale New Haven Hospital. The most important sources of impacts for the disposable LMA were the production of polymers, packaging, and waste management, whereas for the reusable LMA, washing and sterilization dominated for most impact categories.

DISCUSSION: The differences in environmental impacts between these devices strongly favor reusable devices. These benefits must be weighed against concerns regarding transmission of infection. Health care facilities can decrease their environmental impacts by using reusable LMAs, to a lesser extent by selecting disposable LMA models that are not made of certain plastics, and by ordering in bulk from local distributors. Certain practices would further reduce the environmental impacts of reusable LMAs, such as increasing the number of devices autoclaved in a single cycle to 10 (–25% GHG emissions) and improving the energy efficiency of the autoclaving machines by 10% (–8% GHG emissions). For both environmental and cost considerations, management and operating procedures should be put in place to ensure that reusable LMAs are not discarded prematurely.

麻醉药物温室气体排放的生命周期

Life Cycle Greenhouse Gas Emissions of Anesthetic Drugs

Jodi Sherman, MD*, Cathy Le†, Vanessa Lamers†‡ and Matthew Eckelman, PhD§

From the *Department of Anesthesiology, Yale School of Medicine /Yale-New Haven Hospital, New Haven, Connecticut; †School of Public Health, Yale University, New Haven, Connecticut; ‡School of Forestry & Environmental Studies, Yale University, New Haven, Connecticut; and §Department of Civil & Environmental Engineering, College of Engineering, Northeastern University, Boston, Massachusetts.

Anesth Analg May 2012 114:1086-1090

背景：麻醉医师必须考虑药物的整个生命周期，以便将其对环境的影响纳入临床决策。在本研究中，我们用生命周期评价来研究以下五种麻醉药品对气候变化的影响：七氟醚、地氟醚、异氟醚、笑气和异丙酚。

方法：本研究采取完整的全程方法，包括原料选取、药物制造、药物运输到健康保健设施、药物输送至病人以及药物清理或排放至环境。生命周期的每个阶段，能量、物质的投入和排放以及每种药物使用的特殊影响均被考虑在内。这4种吸入麻醉气体是温室气体（GHGg），所以温室气体排放的生命周期包括废麻醉气体排放至大气和起于其他生命周期阶段的排放物（主要是二氧化碳）。

结果：当在氧气/空气混合气体中给予时，地氟醚每MAC-小时麻醉气体的生命周期温室气体影响在这些麻醉药物中最大，是异氟醚的15倍，七氟醚的20倍。当混吸笑气/氧气时，所有药物的温室气体排放量显著增加。对于所有吸入麻醉药物，温室气体影响主要由于废麻醉气体的无节制排放引起。丙泊酚的温室气体影响相对较小，比地氟醚和氧化亚氮低了近4个数量级。不同于吸入药物，丙泊酚的温室气体影响主要来自注射泵所需的电力而非源于药物产生或直接释放至环境。

讨论：本研究结果在提供这些吸入药物整个生命周期温室气体效果的同时重申了先前公布的数据。对此，有几个实际的环境影响缓解策略。地氟醚和笑气应该密封在容器中，这样可降低发病率和死亡率超过替代药物。临床医生在使用所有吸入药物时应避免不必要的高新鲜气体流速。有废麻醉气体采集系统，即使在再生麻醉气体使用前，应充分考虑废气采集系统的应用。本研究表明吸入麻醉外的其他麻醉技术，如全凭静脉麻醉，椎管内，或外周神经阻滞麻醉，可能对环境的影响最小。

（许辛 译 马皓琳 李士通校）

BACKGROUND: Anesthesiologists must consider the entire life cycle of drugs in order to include environmental impacts into clinical decisions. In the present study we used life cycle assessment to examine the climate change impacts of 5 anesthetic drugs: sevoflurane, desflurane, isoflurane, nitrous oxide, and propofol.

METHODS: A full cradle-to-grave approach was used, encompassing resource extraction, drug manufacturing, transport to health care facilities, drug delivery to the patient, and disposal or emission to the environment. At each stage of the life cycle, energy, material inputs, and emissions were considered, as well as use-specific impacts of each drug. The 4 inhalation anesthetics are greenhouse gases (GHGs), and so life cycle GHG emissions include waste anesthetic gases vented to the atmosphere and emissions (largely carbon dioxide) that arise from other life cycle stages.

RESULTS: Desflurane accounts for the largest life cycle GHG impact among the anesthetic drugs considered here: 15 times that of isoflurane and 20 times that of sevoflurane on a per MAC-hour basis when administered in an O₂/air admixture. GHG emissions increase significantly for all drugs when administered in an N₂O/O₂ admixture. For all of the inhalation anesthetics, GHG impacts are dominated by uncontrolled emissions of waste anesthetic gases. GHG impacts of propofol are comparatively quite small, nearly 4 orders of magnitude lower than those of desflurane or nitrous oxide. Unlike the inhaled drugs, the GHG impacts of propofol primarily stem from the electricity required for the syringe pump and not from drug production or direct release to the environment.

DISCUSSION: Our results reiterate previous published data on the GHG effects of these inhaled drugs, while providing a life cycle context. There are several practical environmental impact mitigation strategies. Desflurane and nitrous oxide should be restricted to cases where

they may reduce morbidity and mortality over alternative drugs. Clinicians should avoid unnecessarily high fresh gas flow rates for all inhaled drugs. There are waste anesthetic gas capturing systems, and even in advance of reprocessed gas applications, strong consideration should be given to their use. From our results it appears likely that techniques other than inhalation anesthetics, such as total IV anesthesia, neuraxial, or peripheral nerve blocks, would be least harmful to the environment.

小儿麻醉学会的雨天

Rainy Days for the Society for Pediatric Anesthesia

Robert S. Greenberg, MD, Melania Bembea, MD and Eugenie Heitmiller, MD

From the Departments of Anesthesiology/Critical Care Medicine and Pediatrics, The Johns Hopkins Medical Institutions, Baltimore, Maryland.

Anesth Analg May 2012 114:1102-1103

儿科麻醉学（SPA）委员发现47%的降雨率比预期的要多影响其全国性会议。我们将1987年开始每次SPA会议第一天的天气情况的与用日、月及每次会议地点的历史数据进行了对比。使用广义估计方程模型，比较会议与非会议日期的下雨比值为2.63（ $P=0.006$ ，95%可信区间1.32-

5.22）。这些结果进一步证实了：在全国SPA会议期间，下雨的实际概率的要比预期高。

（安光惠 译 马皓琳 李士通 校）

Members of the Society for Pediatric Anesthesia (SPA) perceive the 47% rain rate has burdened its national meetings more than would be expected. We compared weather conditions on the first day of each national SPA meeting since 1987 with historical data using the day, month, and location of each meeting. Using a generalized estimating equations model, the odds ratio of rain comparing meeting and nonmeeting days was 2.63 (P value 0.006, 95% confidence interval 1.32–5.22). These results confirm a significantly higher frequency of rain at national SPA meetings than would be anticipated.

用超声成像和经皮神经刺激来识别耳大神经

Identification of the Great Auricular Nerve by Ultrasound Imaging and Transcutaneous Nerve Stimulation

Saskia Christ, MD, Reza Kaviani, DESA, EDRA, Franziska Rindfleisch, MD and Patrick Friederich, MD

From the Department of Anesthesiology, Critical Care Medicine and Pain Therapy, Bogenhausen Hospital, Academic Hospital of the Technical University Munich, Munich, Germany.

Anesth Analg May 2012 114:1128-1130

约8%患者在肌间沟臂丛神经阻滞术后发生颈浅丛神经病变。耳大神经是参与发生颈浅丛神经病变的其中一个神经。本文报道在大多数病例中（95%置信区间下限63%）通过超声和经皮神经电刺激成功识别了耳大神经。女性和肥胖患者的神经识别显著较难。进一步的研究将考虑确定这些信息是否将有助于减少颈浅丛神经病变。

(许辛 译 马皓琳 李士通校)

Superficial cervical plexus neuropathy after interscalene brachial plexus block affects about 8% of patients postoperatively. One of the nerves involved in superficial cervical plexus neuropathy is the great auricular nerve. We report success in identification of the great auricular nerve with ultrasound and transcutaneous nerve stimulation in a clinical setting in the majority of cases (95% lower confidence limit 63%). Identification of the nerve is significantly more difficult in female and in obese patients. Further studies will allow determination of whether this information will help to reduce the incidence of superficial cervical plexus neuropathy.