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October 2010

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Anesth Analg October 2010 111:1072

抗凝血酶的术后活性而并非是术前活性与冠脉搭桥手术后严重心脏意外有关

Postoperative Activity, but Not Preoperative Activity, of Antithrombin Is Associated with Major Adverse Cardiac Events After Coronary Artery Bypass Graft Surgery

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Anesth Analg 2010; 111(4):862-869

背景：低水平的抗凝血酶（AT）是心脏手术后重症监护时间延长和神经系统与血栓栓子不良事件发生增加的独立危险因素。我们假设围手术期 AT 活性与冠脉搭桥（CABG）手术患者术后严重心脏意外事件（MACEs）独立相关。
方法：我们前瞻性研究了 1403 例在体外循环（CPB）下初次行 CABG 手术的患者。主要的临床观察终点是 MACE 的发生率，MACE 定义为，有一种或多种以下情况的一个混合结局：术后死亡、冠脉搭桥梗阻再次手术、心肌梗塞、中风、肺栓塞或心脏停搏一直到第一次出院。在术前、CPB 鱼精拮抗后和术后（PODs）1－5 天检测血浆 AT 活性。用多元逻辑回归模型来评估围手术期 AT 活性对 MACE 的独立效应。
结果：有 146 例（10.4%）患者发生了 MACE，包括术后死亡（n＝12）、心肌梗塞（n＝108）、中风（n＝17）、肺栓塞（n＝8）、心脏停跳（n＝16）或随后的术后或导管治疗的冠脉梗阻（n＝6）。AT 活性的基础水平在有 MACE(0.91 ± 0.13 IU/mL; n = 146)和没有 MACE(0.92 ± 0.13 IU/mL; n = 1257)之间无差异(P = 0.18)。两组的 AT 活性在 CPB 后显著下降，在接着的 5 PODs 中恢复到基础水平。有 MACE 的患者的术后 AT 活性显著低于无 MACE 的患者。调整 MACE 的临床预测因子之后，发现 PODs 2 和 3 的 AT 活性与 MACE 有关系。
结论：术前 AT 活性和 CABG 术后的 MACE 发生没有关系。MACE 的发生与术后 AT 活性独立相关，但仅仅主要是发生在 MACE 出现之后的时点。
（唐亮 译 马皓琳 李士通 校）

BACKGROUND: Low levels of antithrombin (AT) have been independently associated with prolonged intensive care unit stay and an increased incidence of neurologic and thromboembolic events after cardiac surgery. We hypothesized that perioperative AT activity is independently associated with postoperative major adverse cardiac events (MACEs) in patients undergoing coronary artery bypass graft (CABG) surgery.

METHODS: We prospectively studied 1403 patients undergoing primary CABG surgery with cardiopulmonary bypass (CPB). The primary clinical end point was occurrence of MACE, defined as a composite outcome of any one or more of the following: postoperative death, reoperation for coronary graft occlusion, myocardial infarction, stroke, pulmonary embolism, or cardiac arrest until first hospital discharge. Plasma AT activity was measured before surgery, after post-CPB protamine, and on postoperative days (PODs) 1-5. Multivariate logistic regression modeling was performed to estimate the independent effect of perioperative AT activity upon MACE.
RESULTS: MACE occurred in 146 patients (10.4%), consisting of postoperative mortality (n = 12), myocardial infarction (n = 108), stroke (n = 17), pulmonary embolism (n = 8), cardiac arrest (n = 16), or a subsequent postoperative or catheter-based treatment for graft occlusion (n = 6). AT activity at baseline did not differ between patients with (0.91 ± 0.13 IU/mL; n = 146) and without (0.92 ± 0.13 IU/mL; n = 1257) (P = 0.18) MACE. AT activity in both groups was markedly reduced immediately after CPB and recovered to baseline values over the ensuing 5 PODs. Postoperative AT activity was significantly lower in patients with MACE than those without MACE. After adjustment for clinical predictors of MACE, AT activity on PODs 2 and 3 was associated with MACE.
CONCLUSIONS: Preoperative AT activity is not associated with MACE after CABG surgery. MACE is independently associated with postoperative AT activity but only at time points occurring predominantly after the MACE.

在气管导管套囊或口腔黏膜上予以盐酸苄达明喷雾治疗术后咽喉痛的效果

The Effectiveness of Benzydamine Hydrochloride Spraying on the Endotracheal Tube Cuff or Oral Mucosa for Postoperative Sore Throat

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Anesth Analg 2010; 111(4):887-89

背景：一般认为喉镜检查、插管损伤或膨胀的气管导管套囊对于气道粘膜的挤压是术后咽喉痛（POST）的病因。在本次研究中，我们比较了盐酸苄达明（BH）用不同的方法喷雾在气管导管（ET）套囊、口咽腔或以上两处对于减轻 POST 的效果。
方法：在本次前瞻性双盲研究中，我们招募了 380 名病人，他们被随机分成以下 4 组：A 组为在口咽腔内喷 BH，在 ET 套囊上喷蒸馏水；B 组为在口咽腔内及 ET 套囊上均喷 BH；C 组为在 ET 套囊上喷 BH，在口咽腔内喷蒸馏水；D 组为在口咽腔内及 ET 套囊上均喷蒸馏水。我们检测病人们在拔管后 0、2、4 和 24 小时咽喉痛的程度（无、轻、中、重）。
结果：A、B、C 和 D 组 POST 的发生率分别为 23.2%、13.8%、14.7%和 40.4%。B 组和 C 组 POST 的发生率明显低于 D 组（OR=0.36；95%CI 为 0.21-0.60；P <

0.05）。然而，A 组和 D 组 POST 的发生率无显著差异（OR=0.62；95%CI 为 0.38-1.01）。此外，对于 POST 的发生率在口咽腔内和 ET 套囊上喷 BH 之间无显著的相互作用(P = 0.088)。与 B 组和 C 组相比，D 组 POST 显著较重(P < 0.001)。与 D 组相比，B 组的局部麻木感、烧灼感、伴或不伴有针刺感的发生率显著较高(P < 0.05)。

结论：本研究表明在气管导管套囊上予以 BH 喷雾可降低 POST 的发生率及减轻 POST 的严重性，并且不增加 BH 相关的副作用。

（毛祖旻 译 马皓琳 李士通 校）

BACKGROUND: The etiology of postoperative sore throat (POST) is considered to be the result of laryngoscopy, intubation damage, or inflated cuff compression of the tracheal mucosa. In this study, we compared the effectiveness in alleviating POST using different approaches to benzydamine hydrochloride (BH) administration by spraying the endotracheal tube (ET) cuff or the oropharyngeal cavity, or both.

METHODS: Three hundred eighty patients were included in this prospective and double-blind study, which was randomized into 4 groups: group A, oropharyngeal cavity spray of BH, and distilled water on the ET cuff; group B, both the oropharyngeal cavity and the ET cuff received BH spray; group C, the ET cuff received BH spray, and the oropharyngeal cavity received distilled water; and group D, distilled water sprayed on both the ET tube and into the oropharyngeal cavity. The patients were examined for sore throat (none, mild, moderate, severe) at 0, 2, 4, and 24 hours postextubation.

RESULTS: The incidence of POST was 23.2%, 13.8%, 14.7%, and 40.4% in groups A, B, C, and D, respectively. POST occurred significantly less frequently in groups B and C compared with group D (odds ratio: 0.36; 95% confidence interval: 0.21-0.60; P < 0.05). However, there was no significant difference between groups A and D (odds ratio: 0.62; 95% confidence interval: 0.38-1.01). Moreover, there was no significant interaction between spraying BH over the oropharyngeal cavity and the ET cuff on the incidence of POST (P = 0.088). The severity of POST was significantly more intense in group D compared with groups B and C (P < 0.001). Group B had a significantly higher incidence of local numbness, burning, and/or stinging sensation compared with patients in group D (P < 0.05).

CONCLUSIONS: This study indicates that spraying BH on the ET cuff decreases the incidence and severity of POST without increased BH-related adverse effects.

选择性 5-HT1A 受体激动剂瑞匹诺坦拮抗吗啡诱导的麻醉大鼠呼吸抑制

Repinotan, a Selective 5-HT1A-R-Agonist, Antagonizes Morphine-Induced Ventilatory Depression in Anesthetized Rats

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Anesth Analg 2010; 111(4):901-907

背景：机械通气期间的自主呼吸能改善动脉氧合和心血管功能，但是危重病医疗过程中自主呼吸常常被阿片类药物抑制。研究显示，阿片类药物诱导的麻醉大鼠呼吸抑制可以被血清素(1A)受体(5-HT1A-R)激动剂 8-OH-DPAT 所缓解，可是 8-OH-DPAT 不能用于人类。盐酸瑞匹诺坦（Repinotan）是一种选择性 5-HT1A 受体激动剂且已经用于人类研究，但是其对通气和伤害性感受的作用还不甚了解。本研究中，我们试图确定(a)瑞匹诺坦对自主呼吸和伤害性感受的效应以及(b)与标准阿片剂吗啡之间的相互作用。
方法：在保留自主呼吸的麻醉大鼠中，同时监测单独或联合吗啡的瑞匹诺坦对自主每分钟通气量(MV)和伤害感受性甩尾反射潜伏期(TFLs)的剂量依赖性效应。另外一组采用 0.9% NaCl 和 5-HT1A 受体拮抗剂 WAY 100 135 作为对照。
结果：(a)瑞匹诺坦剂量依赖性促进自主呼吸(MV, 均数[95%可信区间]; 预处理水平的 53% [29%-77%])，较大剂量瑞匹诺坦(2-200 μg/kg)抑制感受性伤害(TLF,最大可能效应的 91% [68%-114%])。相反，小剂量瑞匹诺坦增强伤害性感受(0.2 μg/kg; TFL,最大可能效应的?47% [?95% to 2%])。5-HT1A 受体拮抗剂 WAY 100 135 可以预防这些效应。(b)吗啡诱导的呼吸抑制(MV, ?72% [?100% to ?44%])被瑞匹诺坦(20 μg/kg)所逆转，使得自主通气恢复到预处理水平(MV, 18% [?40% to 77%])。吗啡诱导的伤害性感受的完全抑制持续存在于给予瑞匹诺坦和 0.9%NaCl 的整个过程。尽管平均动脉压轻微下降，没有出现由瑞匹诺坦引起的严重心血管副反应。
结论：即使在吗啡诱导呼吸抑制时，5-HT1A 受体激动剂瑞匹诺坦也能促进麻醉大鼠自主呼吸。5-HT1A 受体激动剂刺激自主呼吸和抗伤害性感受的能力有待进一步研究。
(江继宏 译 马皓琳 李士通 校)
BACKGROUND: Spontaneous breathing during mechanical ventilation improves arterial oxygenation and cardiovascular function, but is depressed by opioids during critical care. Opioid-induced ventilatory depression was shown to be counteracted in anesthetized rats by serotonin(1A)-receptor (5-HT1A-R)-agonist 8-OH-DPAT, which cannot be applied to humans. Repinotan hydrochloride is a selective 5-HT1A-R-agonist already investigated in humans, but the effects on ventilation and nociception are unknown. In this study, we sought to establish (a) the effects of repinotan on spontaneous breathing and nociception, and (b) the interaction with the standard opiate morphine.
METHODS: The dose-dependent effects of repinotan, given alone or in combination with morphine, on spontaneous minute ventilation (MV) and nociceptive tail-flick reflex latencies (TFLs) were measured simultaneously in spontaneously breathing anesthetized rats. An additional series with NaCl 0.9% and the 5-HT1A-R-antagonist WAY 100 135 served as controls.
RESULTS: (a) Repinotan dose-dependently activated spontaneous breathing (MV, mean [95% confidence interval]; 53% [29%-77%]) of pretreatment level) and suppressed nociception (TLF, 91% maximum possible effect [68%-114%]) with higher doses of repinotan (2-200 μg/kg). On the contrary, nociception was enhanced with a small dose of repinotan (0.2 μg/kg; TFL, ?47% maximum possible effect [?95% to 2%]). Effects were prevented by 5-HT1A-antagonist WAY 100 135. (b) Morphine-induced depression of ventilation (MV, ?72% [?100% to ?44%]) was reversed by repinotan (20 μg/kg), which returned spontaneous ventilation to pretreatment levels (MV, 18% [?40% to 77%]). The morphine-induced complete depression of nociception was sustained throughout

repinotan and NaCl 0.9% administration. Despite a mild decrease in mean arterial blood pressure, there were no serious cardiovascular side effects from repinotan.
CONCLUSIONS: The 5-HT1A-R-agonist repinotan activates spontaneous breathing in anesthetized rats even in morphine-induced ventilatory depression. The potency of 5-HT1A-R-agonists to stimulate spontaneous breathing and their antinociceptive effects should be researched further.

经气管氧合时的氧气输送：两种手动设备的一项比较

Oxygen Delivery During Transtracheal Oxygenation: A Comparison of Two Manual Devices

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Anesth Analg 2010; 111(4):922-924

背景：经气管供氧时，Manujet?和 ENK Oxygen Flow Modulator? (ENK)这两种设备可供氧。我们试图描述这两种设备的通气特点。
方法：本研究是在一个人工模肺中进行的，包括一条模拟气管的 15cm 环形管，连接一个流量分析仪和一个人工肺。将一根 15 号钢丝圈加强气管导管用于经气管氧合。在呼吸频率为 0、4 和 12 次/分时，分别研究 ENK 和 Manujet 3 分钟，使用或不使用人工肺，在完全或部分闭塞气道。数据分析采用基于 Fisher 精确检验的方差分析；P<0.05 时认为具有统计学意义。
结果：Manujet 的气流量和潮气量是 ENK 的 3 倍（分别约为 37 比 14 L·min ?1 和 700 比 250mL），且不依赖于呼吸频率。在无通气的情况下，ENK 传输 0.6 ±0.1 L·min-1 的恒定流量。在气道完全闭塞时，经 Manujet 3 次喷射注气法后，肺压力升至 136 cm H2O，而 ENK 有一个压力释放排气口，可在较低的呼吸频率（4 次/分）时产生合适的气压（峰压为 27.7±0.7，呼气末压为 18.8±3.8 cm H2O）。当呼吸频率为 12 次/分时，ENK 产生较高的压力（峰压为 95.9±21.2，呼气末压为 51.4±21.4 cm H2O）。在气道部分阻塞时，Manujet 产生的肺压力显著大于 ENK，而且在两种设备中，压力均随呼吸频率而增加。最后，Manujet 所产生的气流量和潮气量随驱动压按比例发生变化。
讨论：本研究证实了经气管氧合时在 2 次喷射法注气和维持低呼吸频率之间让气体呼出的绝对必要性。在气道完全阻塞时，使用 ENK 可能危害较小，因为它有一个压力释放排气口。用 Manujet 给予较低的驱动压力，可以降低气压伤的风险，使它能够在呼吸频率较高时安全使用。
（瞿亦枫 译 马皓琳 李士通校）
BACKGROUND: The Manujet? and the ENK Oxygen Flow Modulator? (ENK) deliver oxygen during transtracheal oxygenation. We sought to describe the ventilation characteristics of these 2 devices.
METHODS: The study was conducted in an artificial lung model consisting of a 15-cm ringed tube, simulating the trachea, connected via a flow analyzer and an artificial lung.

A 15-gauge transtracheal wire reinforced catheter was used for transtracheal oxygenation. The ENK and Manujet were studied for 3 minutes at respiratory rates of 0, 4, and 12 breaths/min, with and without the artificial lung, in a totally and a partially occluded airway. Statistical analysis was performed using analysis of variance followed by a Fisher exact test; $P < 0.05$ was considered significant.

RESULTS: Gas flow and tidal volume were 3 times greater with the Manujet than the ENK (approximately 37 vs 14 L ·min?1 and 700 vs 250 mL, respectively) and were not dependent on the respiratory rate. In the absence of ventilation, the ENK delivered a 0.6 ± 0.1 L ·min?1 constant gas flow. In the totally occluded airway, lung pressures increased to 136 cm H2O after 3 insufflations with the Manujet, whereas the ENK, which has a pressure release vent, generated acceptable pressures at a low respiratory rate (4 breaths/min) (peak pressure at 27.7 ± 0.7 and end-expiratory pressure at 18.8 ± 3.8 cm H2O). When used at a respiratory rate of 12 breaths/min, the ENK generated higher pressures (peak pressure at 95.9 ± 21.2 and end-expiratory pressure at 51.4 ± 21.4 cm H2O). In the partially occluded airway, lung pressures were significantly greater with the Manujet compared with the ENK, and pressures increased with the respiratory rate with both devices. Finally, the gas flow and tidal volume generated by the Manujet varied proportionally with the driving pressure.

DISCUSSION: This study confirms the absolute necessity of allowing gas exhalation between 2 insufflations and maintaining low respiratory rates during transtracheal oxygenation. In the case of total airway obstruction, the ENK may be less deleterious because it has a pressure release vent. Using a Manujet at lower driving pressures may decrease the risk of barotrauma and allow the safe use of higher respiratory rates.

高仿真模拟表明麻醉医生的年龄和自住院医师以来的年份对急诊环甲膜切开技术的影响

High-Fidelity Simulation Demonstrates the Influence of Anesthesiologists' Age and Years from Residency on Emergency Cricothyroidotomy Skills

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Anesth Analg 2010; 111(4):955-960

背景：大量研究表明随着年龄增长，认知功能和对精细活动的控制力会逐渐衰退。然而对于复杂的临床麻醉技能，这种衰退并未被阐明。环甲膜切开是临床一种复杂的、可以挽救病人生命的操作，并且需要麻醉医生同时具备良好的认识过程和精细活动控制力。精通此项技术在"无法插管，无法通气"的情况下，对于重建病人吸氧通道极其重要。在这项前瞻性、对照、单盲研究中，我们在高仿真模拟"无法插管、无法通气"的情况下，验证年龄对经皮环甲膜切开学习和操作的影响。

方法：36 名麻醉医生（19 名小于 45 岁，17 名大于 45 岁）在接受 1 小时的标准化培训之前和之后分别处理在高仿真模拟器模拟的"无法插管、无法通气"情境。基于

入选前我们的受试者样本的年龄中位数，将分组的年龄界限定位 45 岁。模拟的情境是需要麻醉医生立行急诊经皮环甲膜穿刺术。我们通过评价操作时间、5 分特定任务量表评分、整体等级评分比较高年资组与低年资组的环甲膜穿刺技术能力。比较两组的年龄、住院医师之后的年数、每周临床工作时间、之前接受气道管理的继续医学教育及之前的模拟经验。
结果：标准化培训前后，操作时间、特定任务量表评分、整体等级评分均与麻醉医生的年龄和住院医师之后的年份相关。平均年龄为 37 岁的低年资组与平均年龄为 58 岁的高年资组比较，低年资组的基础值和培训前的变量均好于高年资组。培训前低年资组与高年资组相比，操作时间为 100 (72-128)秒比 152 (120-261)秒，特定任务量表评分为 7.0 (6.1-8.0)比 6.0 (4.8-8.0)，整体等级评分为 22.0 (17.8-29.8)比 17.5 (10.4-20.6)。经过一小时的规范化培训后，低年资组的表现仍比高年资组好，操作时间为 75 (66-91)秒比 87 (78-123)秒，特定任务量表评分为 10.0 (9.1-10.0)比 9.0 (8.0-10.0)，整体等级评分为 35.0 (32.1-35.0)比 32.0 (29.0-33.8)。对规范化培训后的数据进行回归分析。麻醉医生的年龄和住院医师之后的年数均独立地影响评价操作时间、特定任务量表评分和整体等级评分（所有 P 均小于 0.05）。
结论：对模拟的急诊环甲膜穿刺操作熟练程度的基础值与麻醉医生的年龄和住院医师之后的年数有关。尽管进行了规范化培训，操作的熟练程度仍随麻醉医生年龄和住院医师之后年数的增加呈下降趋势。对年龄和住院医师之后的年数作为完成周期性继续医学教育的因素之一的可能性必须进行进一步研究。
（刘伍 译 马皓琳 李士通 校）
BACKGROUND: Age-related deterioration in both cognitive function and the capacity to control fine motor movements has been demonstrated in numerous studies. However, this decline has not been described with respect to complex clinical anesthesia skills. Cricothyroidotomy is an example of a complex, lifesaving procedure that requires competency in the domains of both cognitive processing and fine motor control. Proficiency in this skill is vital to minimize time to reestablish oxygenation during a "cannot intubate, cannot ventilate" scenario. In this prospective, controlled, single-blinded study, we tested the hypothesis that age affects the learning and performance of emergency percutaneous cricothyroidotomy in a high-fidelity simulated cannot intubate/cannot ventilate scenario.
METHODS: Thirty-six staff anesthesiologists (19 aged younger than 45 years and 17 older than 45 years) managed a high-fidelity cannot intubate/cannot ventilate scenario in a high-fidelity simulator before and after a 1-hour standardized training session. The group division cutoff age of 45 years was based on the median age of our sample subject population before enrollment. The scenarios required the insertion of an emergency percutaneous cricothyroidotomy. We compared cricothyroidotomy skills in the older group with those in the younger group using procedural time, 5-point task-specific checklist score, and global rating scale score. Correlation based on age, years from residency, weekly clinical hours worked, previous continuing medical education in airway management, and previous simulation experience was also performed.
RESULTS: In both prestandardization and poststandardization, age and years from residency correlated with procedural time, checklist scores, and global rating scores. Baseline, prestandardization variables were all better for the younger group, with a mean age of 37 years, compared with the older group, with a mean age of 58 years. Procedural

time was 100 (72-128) seconds versus 152 (120-261) seconds. Checklist scores were 7.0 (6.1-8.0) versus 6.0 (4.8-8.0). Global rating scale scores were 22.0 (17.8-29.8) versus 17.5 (10.4-20.6). After the 1-hour standardized training session, the younger group continued to perform better than the older group with procedural time of 75 (66-91) seconds versus 87 (78-123) seconds, checklist scores of 10.0 (9.1-10.0) versus 9.0 (8.0-10.0), and global rating scale scores of 35.0 (32.1-35.0) versus 32.0 (29.0-33.8). Regression analysis was performed on the poststandardization data. Both age and years from residency independently affected procedural time, checklist scores, and global rating scale scores (all $P < 0.05$).
CONCLUSIONS: Baseline proficiency with simulated emergency cricothyroidotomy is associated with age and years from residency. Despite standardized training, operator age and years from residency were associated with decreased proficiency. Further research should explore the potential of using age and years from residency as factors for implementing periodic continuing medical education.

时间生物学的缺陷：以鞘内注射布比卡因麻醉为例的一个被建议的分析

Pitfalls in Chronobiology: A Suggested Analysis Using Intrathecal Bupivacaine Analgesia as an Example

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Anesth Analg 2010; 111(4):980-985

背景：已有研究显示产妇硬膜外给予局部麻醉药的镇痛持续时间随着不同的给药时间呈现一定的节律模式。我们的研究是为了确定产妇鞘内注射布比卡因后是否会遵循同样的模式。分析的过程中，我们逐渐发现，一些与医护人员交接班相一致的数据点会受到非生物、医疗保健制度因素的影响，因此才错误地提示了分娩镇痛持续时间的周期信号。我们开发了图形和分析工具以助于评估个别数据点对时间生物学分析的影响。
方法：单胎足月妊娠、顶先露、宫口扩张 3-5cm、疼痛评分>50mm（最痛为 100mm）且要求分娩镇痛的产妇入组本研究。应用腰硬联合麻醉技术，先给予患者鞘内注射 2.5mg 布比卡因 2mL，从鞘内注药到第一次要求额外镇痛的时间记为镇痛持续时间。镇痛持续时间的分析采用数据目视检测、光滑函数（超光平滑法；LOWESS 和 LOESS【局部加权回归散点光滑函数】）、方差分析、余弦（时间吻合）、Excel 和 NONMEM（非线性混合效应模型法）。利用 PLT 工具对可信区间（CIs）进行引导分析（用取代进行 1000 次复制抽样）。
结果：82 名妇女被纳入研究。利用 3 阶平滑函数检查的原始数据，呈现一个双峰模式，一个峰大约位于 06:30，随后一个峰位于下午或晚上，取决于其平滑度。午夜至 06:00 鞘内注射时的镇痛持续时间与其他时间鞘内注射后的镇痛持续时间相比

方差分析并没有明显的统计学差异。余弦分析、Excel 和 NONMEM 都得到了一致的结果：镇痛持续时间平均为 38.4 分钟（95%可信区间：35.4-41.6 分钟），波形周期为 8 小时，振幅为 5.8 分钟（95%可信区间：2.1-10.7 分钟），相位偏差为 6.5 小时（95%可信区间：5.4-8.0 小时）。在 40%的引导分析中 8 小时周期模型并没有统计学意义，提示 8 小时周期模型的统计学意义取决于数据子集。在 07:00 换班前的两个数据点对周期波形的统计学意义的影响最大。没有这些数据点，就没有证据证明鞘内注射布比卡因镇痛呈 8 小时周期波形。

结论：时间生物学包括所在环境中外界昼夜节律（例如护理交班）和人体生物节律的影响。我们可以联合几种新的分析方法来区分外界节律的影响：（1）叠加原始数据、外界节律（比如，护理和麻醉交接班）和光滑函数的图示；（2）每一个数据点对统计学意义的影响的图示；（3）用来判断统计学意义是否高度依赖于数据子集的引导分析。这些方法提示，两个数据点的变化可能与护理和麻醉交接班有关。如果去掉这些点，即无法证明鞘内注射布比卡因镇痛持续时间有生物学节律。（徐妍君 译　马皓琳 李士通 校）

BACKGROUND: The duration of analgesia from epidural administration of local anesthetics to parturients has been shown to follow a rhythmic pattern according to the time of drug administration. We studied whether there was a similar pattern after intrathecal administration of bupivacaine in parturients. In the course of the analysis, we came to believe that some data points coincident with provider shift changes were influenced by nonbiological, health care system factors, thus incorrectly suggesting a periodic signal in duration of labor analgesia. We developed graphical and analytical tools to help assess the influence of individual points on the chronobiological analysis.

METHODS: Women with singleton term pregnancies in vertex presentation, cervical dilation 3 to 5 cm, pain score >50 mm (of 100 mm), and requesting labor analgesia were enrolled in this study. Patients received 2.5 mg of intrathecal bupivacaine in 2 mL using a combined spinal-epidural technique. Analgesia duration was the time from intrathecal injection until the first request for additional analgesia. The duration of analgesia was analyzed by visual inspection of the data, application of smoothing functions (Supersmoother; LOWESS and LOESS [locally weighted scatterplot smoothing functions]), analysis of variance, Cosinor (Chronos-Fit), Excel, and NONMEM (nonlinear mixed effect modeling). Confidence intervals (CIs) were determined by bootstrap analysis (1000 replications with replacement) using PLT Tools.

RESULTS: Eighty-two women were included in the study. Examination of the raw data using 3 smoothing functions revealed a bimodal pattern, with a peak at approximately 0630 and a subsequent peak in the afternoon or evening, depending on the smoother. Analysis of variance did not identify any statistically significant difference between the duration of analgesia when intrathecal injection was given from midnight to 0600 compared with the duration of analgesia after intrathecal injection at other times. Chronos-Fit, Excel, and NONMEM produced identical results, with a mean duration of analgesia of 38.4 minutes (95% CI: 35.4-41.6 minutes), an 8-hour periodic waveform with an amplitude of 5.8 minutes (95% CI: 2.1-10.7 minutes), and a phase offset of 6.5 hours (95% CI: 5.4-8.0 hours) relative to midnight. The 8-hour periodic model did not reach statistical significance in 40% of bootstrap analyses, implying that statistical significance of the 8-hour periodic model was dependent on a subset of the data. Two data points before the change of shift at 0700 contributed most strongly to the statistical

significance of the periodic waveform. Without these data points, there was no evidence of an 8-hour periodic waveform for intrathecal bupivacaine analgesia.
CONCLUSION: Chronobiology includes the influence of external daily rhythms in the environment (e.g., nursing shifts) as well as human biological rhythms. We were able to distinguish the influence of an external rhythm by combining several novel analyses: (1) graphical presentation superimposing the raw data, external rhythms (e.g., nursing and anesthesia provider shifts), and smoothing functions; (2) graphical display of the contribution of each data point to the statistical significance; and (3) bootstrap analysis to identify whether the statistical significance was highly dependent on a data subset. These approaches suggested that 2 data points were likely artifacts of the change in nursing and anesthesia shifts. When these points were removed, there was no suggestion of biological rhythm in the duration of intrathecal bupivacaine analgesia.

输注右美托咪定用于接受增殖腺扁桃体切除术的阻塞性睡眠呼吸暂停综合征患儿的术后镇痛以及预防躁动

Dexmedetomidine Infusion for Analgesia and Prevention of Emergence Agitation in Children with Obstructive Sleep Apnea Syndrome Undergoing Tonsillectomy and Adenoidectomy

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Anesth Analg 2010; 111(4):1004-1010

背景：右美托咪定是一种特异性α2 激动剂，具有节省镇痛药的作用并且能减少躁动。我们在接受增殖腺扁桃体切除术（T&A）的阻塞性睡眠呼吸暂停综合征患儿中比较了术中输注右美托咪定与单次剂量的芬太尼对围术期阿片类药物的使用及苏醒期躁动的减少作用。
方法：122 名年龄 2 至 10 岁，接受 T&A（增殖腺扁桃体切除术）的阻塞性睡眠呼吸暂停综合征患者完成了这项前瞻性、随机性的美国食品和药物管理局许可的研究。通过面罩七氟烷诱导后，D 组接受静脉输注右美托咪定 2 μg · kg?1 10 分钟后改为 0.7 μg · kg?1 · h-1，F 组接受单次静脉注射芬太尼 1 μg · kg?1 。麻醉由七氟烷、氧气一氧化亚氮维持。术中心率或收缩压比手术前水平高 30%并持续超过 5 分钟则给予芬太尼 0.5~1 μg · kg?1 。麻醉后恢复室（PACU）中的观察者对于组别是盲法的。用客观疼痛评分评估患者送至 PACU 当刻、5 分钟、15 分钟以及随后的 120 分钟内每 15 分钟时刻的疼痛评分。相同的时间间隔内通过两种尺度评估苏醒期躁动：小儿麻醉的苏醒谵妄量表以及科尔描述的 5 分制量表。若疼痛评分超过四分或者严重躁动（4 分或 5 分）持续超过 5 分钟则给予吗啡 0.05~0.1mg · kg?1 。
结果：D 组中 9.8%的患者需要术中增加芬太尼，而 F 组则是 36%（P = 0.001）。D 组平均收缩压以及心率明显较低（P < 0.05）。最低肺泡有效浓度在两组之间有显著差异（P = 0.015）。D 组客观疼痛评分中位数是 3，而 F 组为 5 (P = 0.001)。D

组中 10 位患者（16.3%）需要接受吗啡，而 F 组则 29 位（47.5%）需要吗啡治疗(P = 0.002)。到达 PACU 当刻发生严重苏醒期躁动的发生率 D 组为 18%，而 F 组为 45.9% (P = 0.004)；在 5 分钟以及 15 分钟时，D 组躁动的发生率较低(P = 0.028)。科尔量表上躁动的持续时间 D 组明显较短(P = 0.004)。18%的 D 组患者以及 40.9%的 F 组患者发生脉搏氧饱和度低于 95%的事件。

结论：术中输注右美托咪定联合吸入麻醉药可为 T&A（增殖腺扁桃体切除术）提供满意的手术条件，且无血流动力学的不良反应。术后阿片类药物需求显著减少，苏醒期严重躁动的发生减少以及持续时间缩短，而且较少数病人发生了氧饱和度下降的事件。

（龚寅 译 马皓琳 李士通 校）

BACKGROUND: Dexmedetomidine, a specific α2 agonist, has an analgesic-sparing effect and reduces emergence agitation. We compared an intraoperative dexmedetomidine infusion with bolus fentanyl to reduce perioperative opioid use and decrease emergence agitation in children with obstructive sleep apnea syndrome undergoing adenotonsillectomy (T&A).

METHODS: One hundred twenty-two patients with obstructive sleep apnea syndrome undergoing T&A, ages 2 to 10 years, completed this prospective, randomized, U.S. Food and Drug Administration-approved study. After mask induction with sevoflurane, group D received IV dexmedetomidine 2 μg · kg?1 over 10 minutes, followed by 0.7 μg · kg?1 · h-1, and group F received IV fentanyl bolus 1 μg · kg?1. Anesthesia was maintained with sevoflurane, oxygen, and nitrous oxide. Fentanyl 0.5 to 1 μg · kg?1 was given to subjects in both groups for an increase in heart rate or systolic blood pressure 30% above preincision values that continued for 5 minutes. Observers in the postanesthesia care unit (PACU) were blinded to treatment groups. Pain was evaluated using the objective pain score in the PACU on arrival, at 5 minutes, at 15 minutes, then every 15 minutes for 120 minutes. Emergence agitation was evaluated at the same intervals by 2 scales: the Pediatric Anesthesia Emergence Delirium scale and a 5-point scale described by Cole. Morphine (0.05 to 0.1 mg ·kg?1) was given for pain (score >4) or severe agitation (score 4 or 5) lasting more than 5 minutes.

RESULTS: In group D, 9.8% patients needed intraoperative rescue fentanyl in comparison with 36% in group F (P = 0.001). Mean systolic blood pressure and heart rate were significantly lower in group D (P < 0.05). Minimum alveolar concentration values were significantly different between the 2 groups (P = 0.015). The median objective pain score was 3 for group D and 5 for group F (P = 0.001). In group D, 10 (16.3%) patients required rescue morphine, in comparison with 29 (47.5%) in group F (P = 0.002). The frequency of severe emergence agitation on arrival in the PACU was 18% in group D and 45.9% in group F (P = 0.004); at 5 minutes and at 15 minutes, it was lower in group D (P = 0.028). The duration of agitation on the Cole scale was statistically lower in group D (P = 0.004). In group D, 18% of patients and 40.9% in group F had an episode of SPO2 below 95% (P = 0.01).

CONCLUSIONS: An intraoperative infusion of dexmedetomidine combined with inhalation anesthetics provided satisfactory intraoperative conditions for T&A without adverse hemodynamic effects. Postoperative opioid requirements were significantly reduced, and the incidence and duration of severe emergence agitation was lower with fewer patients having desaturation episodes.

比较七氟烷和异丙酚麻醉下入肝血流阻断肝叶切除术后的肝功能

A Comparison of Liver Function After Hepatectomy with Inflow Occlusion Between Sevoflurane and Propofol Anesthesia

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Anesth Analg 2010; 111(4):1036-1041

背景：本次研究中，我们比较了异丙酚 VS 七氟烷麻醉对入肝血流阻断肝叶切除术后肝功能的影响。
方法：一百名择期入肝血流阻断肝叶切除术患者随机分成七氟烷组或异丙酚组。全身麻醉诱导使用 3 μg/kg 芬太尼、0.2 mg/kg 顺阿曲库铵和靶控输注异丙酚(血浆靶浓度设为 4~6 μg/mL)或者起始浓度为 8%的七氟烷。麻醉维持用靶控输注异丙酚（2-4 μg/mL）或者七氟烷(1.5%-2.5%)。通过肝脏转氨酶峰值评估术后肝损伤，把术后肝损伤作为主要终点事件。
结果：转氨酶峰值出现在术后第一天和第三天之间。七氟烷组和异丙酚组丙氨酸氨基转移酶峰值分别是 504 和 507 U/L。七氟烷组天冬氨酸氨基转移酶峰值为 435U/L，异丙酚组为 581 U/L。两组的丙氨酸氨基转移酶峰值或天冬氨酸氨基转移酶峰值均无明显差异。两组其他肝功能检测包括胆红素和碱性磷酸酶及白细胞计数峰值和肌酐也无差异。
结论：在入肝血流阻断肝叶切除术后，七氟烷和异丙酚麻醉药有类似的肝脏功能检测结果。这些数据表明，在临床情况下两个麻醉药是等效的。
（王海涛 译，马皓琳，李士通 校）

BACKGROUND: In this study, we compared liver function tests after hepatectomy with inflow occlusion as a function of propofol versus sevoflurane anesthesia.
METHODS: One hundred patients undergoing elective liver resection with inflow occlusion were randomized into a sevoflurane group or a propofol group. General anesthesia was induced with 3 μg/kg fentanyl, 0.2 mg/kg cisatracurium, and target-controlled infusion of propofol, set at a plasma target concentration of 4 to 6 μg/mL, or sevoflurane initially started at 8%. Anesthesia was maintained with target-controlled infusion of propofol (2-4 μg/mL) or sevoflurane (1.5%-2.5%). The primary end point was postoperative liver injury assessed by peak values of liver transaminases.
RESULTS: Transaminase levels peaked between the first and the third postoperative day. Peak alanine aminotransferase was 504 and 571 U/L in the sevoflurane group and the propofol group, respectively. Peak aspartate aminotransferase was 435 U/L after sevoflurane and 581 U/L in the propofol group. There were no significant differences in peak alanine aminotransferase or peak aspartate aminotransferase between groups. Other liver function tests including bilirubin and alkaline phosphatase, and peak values of white blood cell counts and creatinine, were also not different between groups.

CONCLUSIONS: Sevoflurane and propofol anesthetics resulted in similar patterns of liver function tests after hepatectomy with inflow occlusion. These data suggest that the 2 anesthetics are equivalent in this clinical context.

正中神经和尺神经阻滞的最低有效麻醉药容积的评估和药效动力学结果：一项比较超声和神经刺激引导下进行的随机、双盲、对照研究

Estimation and Pharmacodynamic Consequences of the Minimum Effective Anesthetic Volumes for Median and Ulnar Nerve Blocks: A Randomized, Double-Blind, Controlled Comparison Between Ultrasound and Nerve Stimulation Guidance

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Anesth Analg 2010; 111(4):1059-1064

背景：神经刺激和超声引导是外周神经阻滞最常用的技术。然而，两种技术下特定神经的最低有效麻药容积（MEAV）和降低局部麻醉药容积引起的神经阻滞药效学特征至今未被研究。我们对神经刺激和超声引导进行随机、双盲、对照的比较，以评估在正中神经及尺神经阻滞中 1.5%甲哌卡因的 MEAV 和药效动力学。
方法：预定行腕管松解的患者被随机分为超声引导（UG）或神经刺激（NS）组。用一个逐步升降式研究模型（Dixon 方法），即根据前一患者结果进行的非概率序贯定量，来确定 MEAV。1.5%的甲哌卡因在肱骨的正中神经和尺神经处的初始剂量是 13 和 11ml。阻滞成功/失败则减少/增加 2ml。安排一位不知情的医生在 20 分钟内每 2 分钟评估一次感觉阻滞效果。记录阻滞起效时间和持续时间。
结果：正中神经 MEAV50（SD），在 UG 组为 2(0.1)ml(95% 置信区间[CI] = [1, 96]到[2, 04])，比 NS 组的 4（3.8）ml(95% CI = [2, 4]到[5, 6]) 要低(P = 0.017)。而尺神经 MEAV50（SD），UG 组为 2 (0.1) mL (95% CI = [1, 96]到[2, 04]) ，NS 组为 2.4 (0.6) mL (95% CI = [2, 1]到[2, 7])，两组无差异。局部麻醉药容积与感觉阻滞持续时间显著相关，而与起效时间无关。
结论：与神经刺激方法相比，超声引导可选择性地使用于正中神经感觉阻滞的 1.5%甲哌卡因 MEAV 降低 50%。减小局部麻醉药容积能减少感觉阻滞持续时间，但对起效时间无影响。
（杨秀娟 译 李士通 马皓琳 校）
BACKGROUND: Nerve stimulation and ultrasound guidance are the most popular techniques for peripheral nerve blocks. However, the minimum effective anesthetic volume (MEAV) in selected nerves for both techniques and the consequences of

decreasing the local anesthetic volume on the pharmacodynamic characteristics of nerve block remain unstudied. We designed a randomized, double-blind controlled comparison between neurostimulation and ultrasound guidance to estimate the MEAV of 1.5% mepivacaine and pharmacodynamics in median and ulnar nerve blocks.
METHODS: Patients scheduled for carpal tunnel release were randomized to ultrasound guidance (UG) or neurostimulation (NS) groups. A step-up/step-down study model (Dixon method) was used to determine the MEAV with nonprobability sequential dosing based on the outcome of the previous patient. The starting dose of 1.5% mepivacaine was 13 and 11 mL for median and ulnar nerves at the humeral canal. Block success/failure resulted in a decrease/increase of 2 mL. A blinded physician assessed sensory blockade at 2-minute intervals for 20 minutes. Block onset time and duration were noted.
RESULTS: The MEAV50 (SD) of the median nerve was lower in the UG group 2 (0.1) mL (95% confidence interval [CI] = [1, 96] to [2, 04]) than in the NS group 4 (3.8) mL (95% CI = [2, 4] to [5, 6]) (P = 0.017). There was no difference for the ulnar nerve between UG group 2 (0.1) mL (95% CI = [1, 96] to [2, 04]) and NS group 2.4 (0.6) mL (95% CI = [2, 1] to [2, 7]). The duration of sensory blockade was significantly correlated to local anesthetic volume, but onset time was not modified.
CONCLUSION: Ultrasound guidance selectively provided a 50% reduction in the MEAV of mepivacaine 1.5% for median nerve sensory blockade in comparison with neurostimulation. Decreasing the local anesthetic volume can decrease sensory block duration but not onset time.

比较加温加湿器和热量湿度交换器用于通气的成人和儿童

Heated Humidification Versus Heat and Moisture Exchangers for Ventilated Adults and Children

M Kelly, D Gillies, DA Todd, C Lockwood .
Cochrane Database Syst Rev 2010, Issue 4. Art. No.: CD004711.
Anesth Analg 2010; 111(4):1072

背景：在机械通气过程中上呼吸道为旁路时，必须通过人工方法给予加湿。在这种情况下，加热加湿器（HH）和热量湿度交换器（HMEs）是最常用的人工湿化类型。
目的：确定 HHs 和 HMEs 哪种加湿方法能够更有效地预防机械通气患者死亡和其他并发症。
检索方法：我们搜索了 Cochrane 的对照试验中央寄存器(Cochrane 书库 2010, 第 4 期)、MEDLINE、EMBASE 和 CINAHL（2010 年 1 月）来辨别出相关的随机对照试验。
选择标准：我们入选了在机械通气的成人和新生儿中比较 HMEs 和 HHs 的随机对照试验。我们也入选了随机交叉研究。
数据收集和分析：我们评估了每个研究的质量并提取有关数据。对从合适的有关研究得到的结果进行荟萃分析以得出个别结果。
主要结果：我们入选了 33 项试验，共 2833 例。25 项研究（n=2710）是平行组设计，8 项研究（n=123）是交叉组设计。只有 3 项入选的研究报导了婴儿或儿童的

数据。没有关于人工气道阻塞、死亡率、肺炎或呼吸系统并发症的总效应；但是，HMEs 与 HHs 比较，PaCO2 和分钟通气量增加且体温较低。在所有报道费用的研究中 HMEs 的费用较低。有一些证据表明，忌水性的 HMEs 可能降低了肺炎的风险，而人工气道堵塞的增多可能与某些亚组患者应用 HMEs 有关。
作者的结论：几乎无证据证明 HMEs 和 HHs 之间有总体差异。而忌水性 HMEs 可能降低了肺炎的风险，也可能增加了某些亚组患者人工气道阻塞的发生。因此，HMEs 可能并不适用于呼吸储备有限或易发生气道阻塞的患者。关于忌水性和吸湿性 HMEs 的比较以及 HMEs 在儿童和新生儿人群中的使用还需要进一步的研究。由于 HMEs 的设计进展，还需要进行对新一代 HMEs 的评估。
（滕凌雅 译 马皓琳 李士通 校）
BACKGROUND: Humidification by artificial means must be provided when the upper airway is bypassed during mechanical ventilation. Heated humidification (HH) and heat and moisture exchangers (HMEs) are the most commonly used types of artificial humidification in this situation.
OBJECTIVES: To determine whether HHs or HMES are more effective in preventing mortality and other complications in people who are mechanically ventilated.
SEARCH STRATEGY: We searched the Cochrane Central Register of Controlled Trials (The Cochrane Library 2010, Issue 4) and MEDLINE, EMBASE and CINAHL (January, 2010) to identify relevant randomized controlled trials.
SELECTION CRITERIA: We included randomized controlled trials comparing HMEs to HHs in mechanically ventilated adults and children. We included randomized crossover studies.
DATA COLLECTION AND ANALYSIS: We assessed the quality of each study and extracted the relevant data. Where appropriate, results from relevant studies were meta-analyzed for individual outcomes.
MAIN RESULTS: We included 33 trials with 2833 participants; 25 studies were parallel group design (n = 2710) and 8 crossover design (n = 123). Only 3 included studies reported data for infants or children. There was no overall effect on artificial airway occlusion, mortality, pneumonia, or respiratory complications; however, the PaCO2 and minute ventilation were increased when HMEs were compared to HHs and body temperature was lower. The cost of HMEs was lower in all studies that reported this outcome. There was some evidence that hydrophobic HMEs may reduce the risk of pneumonia and that blockages of artificial airways may be increased with the use of HMEs in certain subgroups of patients.
AUTHORS' CONCLUSIONS: There is little evidence of an overall difference between HMEs and HHs. However, hydrophobic HMEs may reduce the risk of pneumonia and the use of an HMEs may increase artificial airway occlusion in certain subgroups of patients. Therefore, HMEs may not be suitable for patients with limited respiratory reserve or prone to airway blockage. Further research is needed relating to hydrophobic versus hygroscopic HMEs and the use of HMEs in the pediatric and neonatal populations. As the design of HMEs evolves, evaluation of new generation HMEs will also need to be undertaken.

冠状动脉搭桥术中使用低浓度肝素患者肝素剂量反应与术前抗凝血酶活性无关

Heparin Dose Response Is Independent of Preoperative Antithrombin Activity in Patients Undergoing Coronary Artery Bypass Graft Surgery Using Low Heparin Concentrations

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Anesth Analg October 2010 111:856-861;

背景：普通肝素主要作用为提高抗凝血酶（AT）的活性。作者推测冠脉搭桥术患者术前的 AT 活性与肝素剂量反应（HDR）及肝素敏感指数（HSI）有关。
方法：收集 304 例首次接受冠状动脉搭桥术患者的个人信息及围手术期的数据。全身麻醉诱导后测定 AT 的活性，用比色测定法（Siemens Healthcare Diagnostics, Tarrytown, NY）。激活凝血酶原时间（ACT），肝素剂量反应（HDR），以及 HSI 均采用 Hepcon HMS Plus 系统（Medtronic, Minneapolis, MN）检测。根据相同系统测出的 HDR 来设定相应肝素剂量。采用多元线性回归分析来确定肝素剂量反应（HDR）的独立危险因素。并选取可能出现肝素抵抗的 AT 活性较低患者（<正常的 80%; <0.813 U/mL）作为亚组进行分析。
结果： 基础激活凝血酶原时间（ACT）平均值为 135 ± 18 秒。肝素剂量反应（HDR）平均值为 98 ± 21 s/U/mL。AT 活性平均值为 0.93 ± 0.13 U/mL，基础 AT 活性与 ACT, HDR,或 HIS 基础值及肝素化值没有明显关联。在包含 HDR 及 HIS 的多变量线性回归模型中增加 AT 活性因素，并没有显著提高模型的性能。亚组 49 例 AT 活性<正常的 80%分析结果为较低 AT 活性与 HDR 或 HIS 没有明显关联。术前 AT 活性，HDR 及 HSI 与术后第一天心肌肌钙蛋白 I 水平，ICU 时间，或住院时间没有关联。
结论：虽然提高 AT 活性是肝素促进体外循环抗凝的主要机制，但是 ACTs 为 300 至 350 秒时，术前较低的 AT 活性与肝素反应受损或临床结果没有相关性。
（陈毓雯　译　陈杰　校）
BACKGROUND: Unfractionated heparin's primary mechanism of action is to enhance the enzymatic activity of antithrombin (AT). We hypothesized that there would be a direct association between preoperative AT activity and both heparin dose response (HDR) and heparin sensitivity index (HSI) in patients undergoing coronary artery bypass graft surgery.
METHODS: Demographic and perioperative data were collected from 304 patients undergoing primary coronary artery bypass graft surgery. AT activity was measured after induction of general anesthesia using a colorimetric method (Siemens Healthcare Diagnostics, Tarrytown, NY). Activated coagulation time (ACT), HDR, and HSI were measured using the Hepcon HMS Plus system (Medtronic, Minneapolis, MN). Heparin dose was calculated for a target ACT using measured HDR by the same system. Multivariate linear regression was performed to identify independent predictors of HDR.

Subgroup analysis of patients with low AT activity (<80% normal; <0.813 U/mL) who may be at risk for heparin resistance was also performed.
RESULTS: Mean baseline ACT was 135 ± 18 seconds. Mean calculated HDR was 98 ± 21 s/U/mL. Mean baseline AT activity was 0.93 ± 0.13 U/mL. Baseline AT activity was not significantly associated with baseline or postheparin ACT, HDR, or HSI. Addition of AT activity to multivariable linear regression models of both HDR and HSI did not significantly improve model performance. Subgroup analysis of 49 patients with baseline AT <80% of normal levels did not reveal a relationship between low AT activity and HDR or HSI. Preoperative AT activity, HDR, and HSI were not associated with cardiac troponin I levels on the first postoperative day, intensive care unit duration, or hospital length of stay.
CONCLUSION: Although enhancing AT activity is the primary mechanism by which heparin facilitates cardiopulmonary bypass anticoagulation, low preoperative AT activity is not associated with impaired response to heparin or to clinical outcomes when using target ACTs of 300 to 350 seconds.

在气管导管套囊上分别喷射盐酸消炎痛、10%利多卡因和 2%利多卡因对术后喉痛的作用

Effect on Postoperative Sore Throat of Spraying the Endotracheal Tube Cuff with Benzydamine Hydrochloride, 10% Lidocaine, and 2% Lidocaine

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Anesth Analg October 2010 111:882-886;

背景：术后喉痛（POST）是气管插管后的常见并发症。本研究的目的是比较气管导管套囊上喷射盐酸消炎痛、10%利多卡因或 2%利多卡因后术后因气管插管引起的喉痛的差异。
方法：372 例患者随机分成 4 组。4 组患者分别在插管前于气管导管套囊上喷射盐酸消炎痛、10%利多卡因、2%利多卡因或生理盐水。插管后，给套管充气使气道压力在 20cmH2O。丙泊酚维持麻醉。分别于拔管后 1、6、12、24h 测试病人的喉痛程度（没有，轻微，中度或者重度）。
结果： 4 组患者插管后喉痛发生率最高的时间均在拔管后 6h]。在各个观察点上，消炎痛组患者喉痛发生率均显著低于 10%利多卡因组、2%利多卡因组和生理盐水组（p<0.05）。拔管后 6h，消炎痛组术后喉痛的发生率（17%）也低于 10%利多卡因组（53.7%）、2%利多卡因组（37%）和生理盐水组（40.8%）（p<0.05）。与其他 3 组相比，在各个观察时间点上，消炎痛组术后喉痛的严重程度低于其它组（p<0.05）。另外，本研究发现，在拔管后 1、6 和 12h 这 3 个观察点上，与 2%利多卡因组和生理盐水组相比，10%利多卡因组明显增加了喉咙痛的严重程度。局部和全身副反应，各组间无明显差别。

结论：为了减少术后喉痛的发生率和严重程度，于气管导管套囊上喷盐酸消炎痛是一种简单有效的方法。
（张婷　译　陈杰　校）

BACKGROUND: Postoperative sore throat (POST) is a common complication after endotracheal intubation. We compared the effectiveness on POST of spraying the endotracheal tube (ETT) cuff with benzydamine hydrochloride, 10% lidocaine, and 2% lidocaine.
METHODS: Three hundred seventy-two patients were randomly allocated into 4 groups. The ETT cuffs in each group were sprayed with benzydamine hydrochloride, 10% lidocaine hydrochloride, 2% lidocaine hydrochloride, or normal saline before endotracheal intubation. After insertion, the cuffs were inflated to an airway leak pressure of 20 cm H2O. Anesthesia was maintained with propofol. The patients were examined for sore throat (none, mild, moderate, or severe) at 1, 6, 12, and 24 hours after extubation.
RESULTS: The highest incidence of POST occurred at 6 hours after extubation in all groups. There was a significantly lower incidence of POST in the benzydamine group than 10% lidocaine, 2% lidocaine, and normal saline groups ($P < 0.05$) at each observation time point. At 6 hours after extubation, the incidence of POST was significantly lower in the benzydamine group (17.0%) compared with 10% lidocaine (53.7%), 2% lidocaine (37.0%), and normal saline (40.8%) groups ($P < 0.05$). The benzydamine group had significantly decreased severity of POST compared with the 10% lidocaine, 2% lidocaine, and normal saline groups ($P < 0.05$) at each observation time point. Compared with the 2% lidocaine and normal saline groups, the 10% lidocaine group had significantly increased severity of POST at 1, 6, and 12 hours after extubation. There were no significant differences among groups in local or systemic side effects.
CONCLUSIONS: Spraying benzydamine hydrochloride on the ETT cuff is a simple and effective method to reduce the incidence and severity of POST.

吸入氟替卡松丙酸酯减少术后喉痛、咳嗽、声音嘶哑

Inhaled Fluticasone Propionate Reduces Postoperative Sore Throat, Cough, and Hoarseness

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Anesth Analg October 2010 111:895-898;

背景：喉痛是术后常见并发症。术后咳嗽及声音嘶哑也会使患者感到痛苦。作者拟确定吸入甾体类化合物对术后 24h 内喉痛、咳嗽、声嘶的影响。
方法：研究纳入了 120 名妇女，为单胎妊娠，ASA I－II 级，择期全麻下行剖宫产术。随机分为 2 组，F 组产妇到达手术室后取坐位，在 2 次深呼吸间通过一个隔离装置吸入 500ug 氟替卡松丙酸酯，C 组产妇为空白对照。术后 1h 和术后 24h 接受调查者有关术后喉痛、咳嗽、声嘶的询问。
结果：两组在年龄、身高、体重、体重指数、手术时间、插管及喉部暴露程度上没有显著差异。术后 1 小时 F 组喉痛、咳嗽、声嘶的发生率（分别为 3.33%,3.33%,3.33%）较 C 组（分别为 36.67%,18.33%,35%）显著降低(P < 0.05)，

术后 24 小时 F 组（13.33%,13.33%,25%）也比 C 组(40%,41.67%,50%)低。术后 1h F 组中重度声嘶的发生率比 C 组也显著降低（P < 0.05）。
结论：吸入氟替卡松丙酸酯能降低全麻下行剖宫产术患者的术后喉痛、咳嗽、声音嘶哑的发生率和严重程度。
（唐颖　译　陈杰　校）

BACKGROUND: Sore throat is a common complication after surgery. Postoperative cough and hoarseness can also be distressing to patients. We sought to determine the effect of an inhaler steroid on sore throat, cough, and hoarseness during the first 24 hours of the postoperative period.
METHODS: We enrolled 120 women with ASA physical status I or II and term singleton pregnancy who were scheduled for elective cesarean delivery under general anesthesia. Patients were randomized into 2 groups: in the sitting position, group F patients received 500 μg inhaled fluticasone propionate via a spacer device during 2 deep inspirations, after arrival in the operating room, and group C had no treatment. The patients were interviewed by a blinded investigator for postoperative sore throat, cough, and hoarseness at 1 and 24 hours after surgery.
RESULTS: There were no significant differences in age, height, weight, body mass index, duration of surgery, intubation, and grade of laryngeal exposure between the 2 groups. The incidence of sore throat, cough, and hoarseness was significantly lower in group F (3.33%, 3.33%, and 3.33%) compared with the control group (36.67%, 18.33%, and 35%) ($P < 0.05$ for all comparisons), not only in the first postoperative hour but also 24 hours after surgery (13.33%, 13.33%, and 25% in group F vs 40%, 41.67%, and 50% in the control group). The incidence of moderate and severe hoarseness in group F at the first hour was significantly less than the control group ($P < 0.05$).
CONCLUSIONS: Inhaled fluticasone propionate decreases the incidence and severity of postoperative sore throat, cough, and hoarseness in patients undergoing cesarean delivery under general anesthesia.

一项对辅助控制通气期间使用 Autoflow 模式的远期临床评估：随机对照研究

A Long-Term Clinical Evaluation of AutoFlow During Assist-Controlled Ventilation: A Randomized Controlled Trial

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Anesth Analg October 2010 111:915-921;

背景：许多新机械通气模式并未经过任何临床研究。“双控模式”，例如自由呼吸的开放模式(AutoFlow)，用于促进人机协调并减少报警。作者设计了一项长期的临床研究，来评估辅助通气模式下采用 AutoFlow 的安全性和有效性，其中以报警为关注点。
方法：将 42 例使用 Dräger Evita 4 呼吸机，机械通气大于两天的成年人，随机分为两组，分别使用常规通气模式（n=21）和 AutoFlow 模式（n=21）。由护士根据指

南给予镇静。将呼吸机日志中所有的报警数据记录在电脑上。记录每天的血气分析和通气结果。
结果：研究 403 天 8074 个小时机械通气记录和 45022 个报警数据。呼吸频率，分钟通气量，吸入氧浓度，呼气末正压，氧合指数，动脉血二氧化碳分压，血液酸碱度，镇静药剂量和持续时间，在两组间没有显著差异。各患者转归（持续性机械通气，呼吸机相关肺炎，SOFA 评分，或死亡）也无显著差异。AutoFlow 每小时报警量（3.3【1.5~19】）较常规辅助通气为（9.1【5~19】），P<0.0001（中位数【四分位间距】）少。通过多元分析，报警率降低与 AutoFlow 和高剂量咪达唑仑的使用相关。
结论：这次远期临床研究证明 AutoFlow 模式在气体交换和患者转归方面均比较安全，且可显著降低通气报警次数。
（杨秋娟　译　陈杰　校）

BACKGROUND: Many new mechanical ventilation modes are proposed without any clinical evaluation. “Dual-controlled” modes, such as AutoFlow™, are supposed to improve patient– ventilator interfacing and could lead to fewer alarms. We performed a long-term clinical evaluation of the efficacy and safety of AutoFlow during assist-controlled ventilation, focusing on ventilator alarms.
METHODS: Forty-two adult patients, receiving mechanical ventilation for more than 2 days with a Dräger Evita 4 ventilator were randomized to conventional (*n* = 21) or AutoFlow (*n* = 21) assist-controlled ventilation. Sedation was given using a nurse-driven protocol. Ventilator-generated alarms were exhaustively recorded from the ventilator logbook with a computer. Daily blood gases and ventilation outcome were recorded.
RESULTS: A total of 403 days of mechanical ventilation were studied and 45,022 alarms were recorded over a period of 8074 hours. The course of respiratory rate, minute ventilation, Fio2, positive end-expiratory pressure, Pao2/Fio2, Paco2, and pH and doses and duration of sedation did not differ between the 2 groups. Outcome (duration of mechanical ventilation, ventilator-associated pneumonia, course of Sequential Organ Failure Assessment score, or death) was not different between the 2 groups. The number of alarms per hour was lower with AutoFlow assist-controlled ventilation: 3.3 [1.5 to 17] versus 9.1 [5 to 19], $P < 0.0001$ (median [quartile range]). In multivariate analysis, a low alarm rate was associated with activation of AutoFlow and a higher midazolam dose.
CONCLUSIONS: This first long-term clinical evaluation of the AutoFlow mode demonstrated its safety with regard to gas exchange and patient outcome. AutoFlow also allowed a very marked reduction in the number of ventilator alarms.

个人防护装备用于大流行流感病人的护理：空气净化呼吸器应用培训

Special Article: Personal Protective Equipment for Care of Pandemic Influenza Patients: A Training Workshop for the Powered Air Purifying Respirator

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Anesth Analg October 2010 111:933-945;

呼吸道病毒传染性疾病对于专业医护人员可以有生命威胁，可发生在他们进行产生气溶胶的操作时，其中包括气管插管。2009 年的甲型 HINI 流感大流行把这个关注提到了当时的最前线。疾病控制与预防中心已表示，在呼吸道病毒传染性疾病患者身上进行或者参加产生气溶胶操作时，专业医护人员最低必须佩戴 N95 防护口罩，同时他们也推荐考虑使用空气动力净化呼吸器（PAPR）。对于流感或者其他通过呼吸道及接触传播的疾病，防护性口罩必须属于接触性预防的一部分。

在职业安全与卫生管理局遵循的呼吸道防护计划中，使用 PAPR 能够提供大于 N95 2.5 到 100 倍的保护。使用指定的保护系数来量化口罩的相对防护能力。防护的水平要达到指定的 APF 只能在进行适当的训练和正确使用口罩的前提下。

端面密封泄漏限制了 N95 防护口罩的防护能力，拟合试验并不能保证端面密封的不泄漏。不适当使用被污染的设备、错误的装配和持续使用，不正确的开启和关闭程序都可能使 PAPR 的防护能力失效。压迫，不适和对于身体的累赘可能损害其性能。通过培训能够减轻这些影响。

强烈建议在需要使用 PAPR 之前进行培训。在大流行流感期间，“临时”的培训不可能为需要特殊专业保护装备的从业群体提供充分的准备。医院职工保健部门目前也许没有一个适当的 PAPR 培训计划。麻醉科和重症监护室将被考虑带头与医院职工保健部门合作来建立一个 PAPR 培训计划。

用户指南说明 PAPR 不能在手术中使用，因为它会产生确定的外向气流，增加伤口的感染。当前欠缺澄清这一禁令和适当的解决并需要解决。手术室通风系统不是一个可以接受的选择。

作者提供了一个在线的 PAPR 学习班。在这里发表支持信息。麻醉和重症监护室可以利用这个平台，但不能替代制造商的详细使用和维修说明。

（张蕾　译　陈杰　校）

Virulent respiratory infectious diseases may present a life-threatening risk for health care professionals during aerosol-generating procedures, including endotracheal intubation. The 2009 Pandemic Influenza A (H1N1) brings this concern to the immediate forefront. The Centers for Disease Control and Prevention have stated that, when performing or participating in aerosol-generating procedures on patients with virulent contagious respiratory diseases, health care professionals must wear a minimum of the N95 respirator, and they may wish to consider using the powered air purifying respirator (PAPR). For influenza and other diseases transmitted by both respiratory and contact modes, protective respirators must be combined with contact precautions.

The PAPR provides 2.5 to 100 times greater protection than the N95, when used within the context of an Occupational Safety and Health Administration–compliant respiratory protection program. The relative protective capability of a respirator is quantified using the assigned protection factor. The level of protection designated by the APF can only be achieved with appropriate training and correct use of the respirator.

Face seal leakage limits the protective capability of the N95 respirator, and fit testing does not assure the ability to maintain a tight face seal. The protective capability of the PAPR will be defeated by improper handling of contaminated equipment, incorrect assembly and maintenance, and improper don (put on) and doff (take off) procedures. Stress, discomfort, and physical encumbrance may impair performance. Acclimatization through training will mitigate these effects.

Training in the use of PAPRs in advance of their need is strongly advised. “Just in time” training is unlikely to provide adequate preparation for groups of practitioners requiring specialized personal protective equipment during a pandemic. Employee health departments in hospitals may not presently have a PAPR training program in place. Anesthesia and critical care providers would be well advised to take the lead in working with their hospitals' employee health departments to establish a PAPR training program where none exists.
User instructions state that the PAPR should not be used during surgery because it generates positive outward airflow, and may increase the risk of wound infection. Clarification of this prohibition and acceptable solutions are currently lacking and need to be addressed. The surgical hood system is not an acceptable alternative.
We provide on line a PAPR training workshop. Supporting information is presented here. Anesthesia and critical care providers may use this workshop to supplement, but not substitute for, the manufacturers' detailed use and maintenance instructions.

肺复张和呼气末正压在健康肺和病肺有不同的 CO2 清除作用

Lung Recruitment and Positive End-Expiratory Pressure Have Different Effects on CO2 Elimination in Healthy and Sick Lungs

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Anesth Analg October 2010 111:968-977;

背景：作者研究了肺复张手法和 PEEP 对每次呼吸的 CO2 清除量的影响 (Vtco2,br)。
方法：分别对 7 例健康和 7 例肺灌洗猪肺施以恒定潮气量通气，每隔 10 分钟，以 6 cm H2O 为间隔，其 PEEP 从 0 增加至 18 cm H2O 后再降至 0。在 18 cm H2O PEEP 间隔间对健康肺和灌洗肺分别予以 2 分钟的周期性肺复张，其平台压/PEEP 分别对应为 40/20cm H2O 、50/25cm H2O . 需要记录的数据包括容积二氧化碳图、呼吸力学、血气分析以及血液动力学数据。
结果：在未行肺复张的健康肺， Vtco2,br 与 PEEP 成相反比例：在 0-PEEP 水平，Vtco2,br 为 4.0ml (3.6–4.4) mL（对应为中位数，四分位数间距），在 18-PEEP 水平，则降为 3.1 (2.8–3.4) mL ($P < 0.05$). 在肺复张后， Vtco2,br 增加至 18-PEEP 的 3.3 (3–3.6) mL 以及 0-PEEP 的 4.0 (3.5–4.5) mL($P < 0.05$). 灌洗肺行肺复张前，Vtco2,br 最初从 0-PEEP 水平的 2.0 (1.7–2.3) mL 增加至 12-PEEP 水平的 2.6 (2.2–3) mL ($P < 0.05$) ，但当 PEEP 增加至 18 cm H2O 时，其 Vtco2,br 降为 2.4 (2–2.8) mL ($P < 0.05$). 肺复张后，最高的 Vtco2,br 出现在 12-PEEP，其值为 2.9 (2.1–3.7) mL，而在 0-PEEP 则减至 2.5 (1.9–3.1) mL ($P < 0.05$). Vtco2,br 与肺灌注、气体交换面积、肺泡通气量的变化正相关，与死腔量负相关。

结论：肺的 CO2 清除作用依赖于 PEEP 以及肺复张，且这种作用在健康肺与病肺有很大区别。
（邹巧群　译　陈杰　校）
BACKGROUND: We studied the effects that the lung recruitment maneuver (RM) and positive end-expiratory pressure (PEEP) have on the elimination of CO2 per breath (Vtco2,br).
METHODS: In 7 healthy and 7 lung-lavaged pigs at constant ventilation, PEEP was increased from 0 to 18 cm H2O and then decreased to 0 in steps of 6 cm H2O every 10 minutes. Cycling RMs with plateau pressure/PEEP of 40/20 (healthy) and 50/25 (lavaged) cm H2O were applied for 2 minutes between 18-PEEP steps. Volumetric capnography, respiratory mechanics, blood gas, and hemodynamic data were recorded.
RESULTS: In healthy lungs before the RM, Vtco2,br was inversely proportional to PEEP decreasing from 4.0 (3.6–4.4) mL (median and interquartile range) at 0-PEEP to 3.1 (2.8–3.4) mL at 18-PEEP ($P < 0.05$). After the RM, Vtco2,br increased from 3.3 (3–3.6) mL at 18-PEEP to 4.0 (3.5–4.5) mL at 0-PEEP ($P < 0.05$). In lavaged lungs before the RM, Vtco2,br increased initially from 2.0 (1.7–2.3) mL at 0-PEEP to 2.6 (2.2–3) mL at 12-PEEP ($P < 0.05$) but then decreased to 2.4 (2–2.8) mL when PEEP was increased further to 18 cm H2O ($P < 0.05$). After the RM, the highest Vtco2,br of 2.9 (2.1–3.7) mL was observed at 12-PEEP and then decreased to 2.5 (1.9–3.1) mL at 0-PEEP ($P < 0.05$). Vtco2,br was directly related to changes in lung perfusion, the area of gas exchange, and alveolar ventilation but inversely related to changes in dead space.
CONCLUSIONS: CO2 elimination by the lungs was dependent on PEEP and recruitment and showed major differences between healthy and lavaged lungs.

同侧腹横肌平面阻滞可为小儿阑尾术后提供有效的镇痛：一项随机对照实验

Ipsilateral Transversus Abdominis Plane Block Provides Effective Analgesia After Appendectomy in Children: A Randomized Controlled Trial

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Anesth Analg October 2010 111:998-1003

背景：腹横肌平面阻滞（TAP）在成人的腹部外科手术中能提供有效的镇痛效果，它的效果在小儿中还不清楚，并且在这些人群中还没有随机的临床试验。在这项随机，对照，双盲的临床研究中，作者评估 TAP 对阑尾手术的腹部切口在第一个术后 48 小时的镇痛效果。
方法：40 例阑尾切除术的小儿随机分为罗哌卡因组(n = 19) 和安慰剂组 (n = 21)，单侧行 TAP 阻滞。除此之外，标准的术后镇痛包括静脉吗啡和定时使用双氯芬酸及对乙酰氨基酚。所有患者均接受标准的全身麻醉，在麻醉诱导后，使用 0.75%的罗哌卡因或是等量的盐水在切口同侧通过体表解剖定位法来行 TAP 阻滞。

结果：在术后第一个 48 小时内用罗哌卡因 TAP 组比安慰剂组吗啡的需要量降低 (10.3 ± 12.7 vs 22.3 ± 14.7 mg; $P < 0.01$) 。与安慰剂相比，TAP 组也可以降低睡眠时和休息时的视觉模拟疼痛评分。在这两组中镇静或是恶心呕吐的发生率无显著差异，TAP 组无相关并发症。
结论：单侧腹横肌平面阻滞，作为多元镇痛方法的一种，与安慰剂相比，在小儿阑尾手术的术后第一个 48h 期间能提供良好的镇痛。
（张磊　译　陈杰　校）

BACKGROUND: The transversus abdominis plane (TAP) block provides effective postoperative analgesia in adults undergoing major abdominal surgery. Its efficacy in children remains unclear, with no randomized clinical trials in this population. In this study, we evaluated its analgesic efficacy over the first 48 postoperative hours after appendectomy performed through an open abdominal incision, in a randomized, controlled, double-blind clinical trial.
METHODS: Forty children undergoing appendectomy were randomized to undergo unilateral TAP block with ropivacaine ($n = 19$) versus placebo ($n = 21$) in addition to standard postoperative analgesia comprising IV morphine analgesia and regular diclofenac and acetaminophen. All patients received a standard general anesthetic, and after induction of anesthesia, a TAP block was performed using the landmark technique with 2.5 mg · kg−1 ropivacaine 0.75% or an equal volume (0.3 mL · kg−1) of saline on the ipsilateral side to the incision.
RESULTS: The TAP block with ropivacaine reduced mean (±SD) morphine requirements in the first 48 postoperative hours (10.3 ± 12.7 vs 22.3 ± 14.7 mg; $P < 0.01$) compared with placebo block. The TAP block also reduced postoperative visual analog scale pain scores at rest and on movement compared with placebo. Interval morphine consumption was reduced over the first 24 postoperative hours. There were no between-group differences in the incidence of sedation or nausea and vomiting. There were no complications attributable to the TAP block.
CONCLUSIONS: Unilateral TAP block, as a component of a multimodal analgesic regimen, provided superior analgesia compared with placebo in the first 48 postoperative hours after appendectomy in children.

小儿气管支气管异物麻醉的思考： 12979 例的文献回顾

Review Article: The Anesthetic Considerations of Tracheobronchial Foreign Bodies in Children: A Literature Review of 12,979 Cases

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Anesth Analg October 2010 111:1016-1025;

吸入异物造成的窒息是小于 4 岁儿童意外事故死亡的一个主要原因。作者分析了有关吸入异物的最新流行病学，并回顾了其诊断和处理的当前趋势。在这篇文章中，作者讨论了支气管镜取出异物的麻醉管理。本综述包括 12979 例儿科支气管镜的文

献。大多数吸入异物是有机材料（81％可信区间[CI] = 77％-86％），以坚果和种子最常见。多数异物（88％CI 为 85％-91％）在支气管，其余在喉部或气管。右侧支气管异物的发生率（52％，CI 为 48％-55％）比左侧（33％CI 为 30％-37％）高。小部分的异物分裂为碎片并出现在呼吸道的不同部位。只有 11％（CI 为 80％-16％）的异物能通过 X 线显影， 17％（CI 为 13％-22％）的儿童胸片检查显示为正常。尽管硬支气管镜是传统诊断的“金标准”，但 CT，虚拟支气管镜，软支气管镜的应用正在增加。据报导支气管镜检查的死亡率为 0.42％。尽管当场窒息或紧急支气管镜检查可引起一部分患者死亡，但院内死亡的大部分原因为取异物时的低氧性心搏骤停，支气管痿，以及当时病情平稳但出现未料的术中并发症。主要并发症包括需行气管切开或气管插管的严重喉水肿、支气管痉挛，气胸，纵膈气肿，心跳骤停，气管支气管撕裂伤，低氧性脑损伤(0.96%)。胃内容物的误吸未见报导。术前评估必须确认异物所在的位置，异物的性质和异物吸入的时间（性质，位置，时间）。是否行吸入或者静脉诱导，保留自主呼吸或控制通气，以吸入或静脉维持应根据病人情况行个体化选择。虽然多数麻醉技术对吸入异物的麻醉管理都有效，但是文献中没有提及最佳选择。为尽量减少部分梗阻转换为完全梗阻的危险性，常用保留自主通气的诱导方式。控制通气结合静脉麻醉药，肌松为硬支气管镜检查和平稳麻醉创造良好的条件。麻醉医生与支气管镜检查者及助手的密切沟通是必不可少的。

（舒慧刚　译　陈杰　校）

Asphyxiation by an inhaled foreign body is a leading cause of accidental death among children younger than 4 years. We analyzed the recent epidemiology of foreign body aspiration and reviewed the current trends in diagnosis and management. In this article, we discuss anesthetic management of bronchoscopy to remove objects. The reviewed articles total 12,979 pediatric bronchoscopies. Most aspirated foreign bodies are organic materials (81%, confidence interval [CI] = 77%–86%), nuts and seeds being the most common. The majority of foreign bodies (88%, CI = 85%–91%) lodge in the bronchial tree, with the remainder catching in the larynx or trachea. The incidence of right-sided foreign bodies (52%, CI = 48%–55%) is higher than that of left-sided foreign bodies (33%, CI = 30%–37%). A small number of objects fragment and lodge in different parts of the airways. Only 11% (CI = 8%–16%) of the foreign bodies were radio-opaque on radiograph, with chest radiographs being normal in 17% of children (CI = 13%–22%). Although rigid bronchoscopy is the traditional diagnostic “gold standard,” the use of computerized tomography, virtual bronchoscopy, and flexible bronchoscopy is increasing. Reported mortality during bronchoscopy is 0.42%. Although asphyxia at presentation or initial emergency bronchoscopy causes some deaths, hypoxic cardiac arrest during retrieval of the object, bronchial rupture, and unspecified intraoperative complications in previously stable patients constitute the majority of in-hospital fatalities. Major complications include severe laryngeal edema or bronchospasm requiring tracheotomy or reintubation, pneumothorax, pneumomediastinum, cardiac arrest, tracheal or bronchial laceration, and hypoxic brain damage (0.96%). Aspiration of gastric contents is not reported. Preoperative assessment should determine where the aspirated foreign body has lodged, what was aspirated, and when the aspiration occurred (“what, where, when”). The choices of inhaled or IV induction, spontaneous or controlled ventilation, and inhaled or IV maintenance may be individualized to the circumstances. Although several

anesthetic techniques are effective for managing children with foreign body aspiration, there is no consensus from the literature as to which technique is optimal. An induction that maintains spontaneous ventilation is commonly practiced to minimize the risk of converting a partial proximal obstruction to a complete obstruction. Controlled ventilation combined with IV drugs and paralysis allows for suitable rigid bronchoscopy conditions and a consistent level of anesthesia. Close communication between the anesthesiologist, bronchoscopist, and assistants is essential.

氯胺酮麻醉对术后有败血病小鼠免疫功能的影响

The Effect of Ketamine Anesthesia on the Immune Function of Mice with Postoperative Septicemia

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Anesth Analg October 2010 111:1051-1058;

背景：目前尚未阐明氯胺酮对免疫方面作用如何影响术后败血症患者的预后。作者通过调查氯胺酮麻醉对剖腹手术小鼠术后用脂多糖或埃希氏大肠杆菌激发败血症，观察肝巨噬细胞和细胞因子的产生。
方法：C57BL/6 小鼠接受氯胺酮或者七氟醚麻醉下行剖腹手术，小鼠用埃希大肠菌属或者是脂多糖激发败血症，随后检查小鼠的生存率和细胞因子的分泌，评估 β 受体阻滞剂纳多洛尔对氯胺酮麻醉的效应，用来阐明氯胺酮引起的免疫抑制效应的机制。
结果：与七氟醚麻醉相比，氯胺酮麻醉提高了剖腹手术后脂多糖激发败血症小鼠的生存率，但是在埃希大肠菌属激发组，氯胺酮没有发现有上述作用。在脂多糖和埃希大肠菌属注射后，氯胺酮抑制 TNF 和 IFN-r 分泌物，当用抗生素抑制细菌的生长，与七氟醚麻醉相比，氯胺酮麻醉可以有效提高注射埃希大肠菌属小鼠的生存率。在使用抗生素的七氟醚麻醉组，中和 TNF 可以提高生存率和减少 IFN-r 分泌，表明氯胺酮对 TNF 的抑制可以提高生存率。在脂多糖激发组氯胺酮可以抑制活体肝巨噬细胞对微球体内的吞噬作用。在脂多糖激发组，使用麻醉剂量的氯胺酮联合使用纳多洛尔不会恢复 TNF 的抑制，这表明和 β-肾上腺素能通路无关。然而，它恢复在低剂量氯胺酮（10%的麻醉剂量）TNF 的分泌。与此相反，麻醉剂量的氯胺酮通过 β-肾上腺素能通路，纳多洛尔恢复了肝巨噬细胞的吞噬功能。
结论：氯胺酮抑制 TNF 的产生和枯否细胞/巨噬细胞的吞噬功能。因此 除非细菌的生长被很好的控制（用抗生素），尽管减少了炎症反应但是术后感染不会很好的控制。
（刘世文　译　陈杰　校）

BACKGROUND: It is unknown how ketamine anesthesia immunologically affects the outcome of patients with postoperative septicemia. We investigated the effects of ketamine anesthesia on mice with an *Escherichia coli* or lipopolysaccharide (LPS) challenge after laparotomy, focusing on phagocytosis by liver macrophages (Kupffer cells) and cytokine production.
METHODS: C57BL/6 mice received ketamine or sevoflurane anesthesia during laparotomy, which was followed by an *E. coli* or LPS challenge; thereafter, mouse survival rates and cytokine secretions were examined. The effects of a β-adrenoceptor antagonist, nadolol, on ketamine anesthesia were also assessed to clarify the mechanisms of ketamine-induced immunosuppressive effects.
RESULTS: Ketamine anesthesia increased the mouse survival rate after LPS challenge after laparotomy compared with sevoflurane anesthesia, whereas such an effect of ketamine was not observed after *E. coli* challenge. Ketamine suppressed tumor necrosis factor (TNF) and interferon (IFN)-γ secretion after LPS and *E. coli* challenge. When bacterial growth was inhibited using an antibiotic, ketamine anesthesia effectively improved mouse survival after *E. coli* challenge compared with sevoflurane anesthesia. Neutralization of TNF also improved survival and decreased IFN-γ secretion after bacterial challenge in antibiotic-treated mice with sevoflurane anesthesia, suggesting that ketamine's suppression of TNF may improve survival. Ketamine also suppressed in vivo phagocytosis of microspheres by Kupffer cells in LPS-challenged mice. Concomitant use of nadolol with an anesthetic dose of ketamine did not restore TNF suppression in LPS-challenged mice, suggesting a mechanism independent of the β-adrenergic pathway. However, it restored TNF secretion under low-dose ketamine (10% anesthetic dose). In contrast, nadolol restored the decrease in phagocytosis by Kupffer cells, which was induced by the anesthetic dose of ketamine via the β-adrenergic pathway, suggesting distinct mechanisms.
CONCLUSION: Ketamine suppresses TNF production and phagocytosis by Kupffer cells/macrophages. Therefore, unless bacterial growth is well controlled (by an antibiotic), postoperative infection might not improve despite reduction of the inflammatory response.

Cochrane Corner：锁骨下臂丛神经阻滞用于下臂手术的局部麻醉

Cochrane Corner: Infraclavicular Brachial Plexus Block for Regional Anaesthesia of the Lower Arm

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Anesth Analg October 2010 111:1072;

背景：臂丛神经阻滞有多种不同的路入。尽管锁骨下法臂丛神经阻滞（简称 ICB）有几个优势技术，但目前尚不清楚下臂手术臂丛麻醉哪一径路为首选。因此，研究者对 ICB 和其他臂丛神经阻滞（BPBs）做了系统回顾评价。
目的：评价 ICB 和其他 BPBs 在下臂区域麻醉中的疗效和安全性。
搜索策略：研究者检索了 CENTRAL（Cochrane 图书馆 2008 年，第 3 期），MEDLINE（1950 年至 2008 年 9 月 22 日）和 EMBASE（1980 年至 2008 年 9 月 22 日）。研究者还检索会议论文集（2004 年至 2008 年）和 www.clinicaltrials.gov 的资料。检索过程中没有对论文语言进行限制。

遴选准则：研究者选取了以 ICB 或其他 BPBs 作为下臂外科手术唯一的麻醉方式并两者做对比的随机对照试验（RCTs）。
数据采集与分析：主要结果是麻醉后 30min 内能阻滞完全并能够行手术的情况。次要结果包括阻滞不全，止血带疼痛，感觉阻滞起效时程，阻滞持续时间，阻滞伴随疼痛及阻滞引起的相关并发症。
主要结果：研究者确定了 15 项研究共计 1020 名受试者，其中 510 例接受 ICB，510 例接受其他 BPBs。对照组是 10 项腋路阻滞的研究，两项肱正中阻滞的研究，两项锁骨上阻滞的研究，一项肌间沟阻滞的研究。三项研究采用超声引导下 ICB 技术，麻醉失败和出现并发症的风险远低于同类 ICB 和所有其他 BPBs。ICB 后止血带疼痛可能少一些（风险比（RR）0.47，95%CI 为 0.24～0.92，P 值 0.03）。与单次腋路阻滞相比，ICB 在肌皮神经感觉阻滞（失败率 0.46，95%CI 为 0.27 至 0.60，P 值 0.0001）与腋神经阻滞（失败率 0.37，95%CI 为 0.24 至 0.58，P 值 0.0001）上更完全。与腋路多点阻滞（平均差（MD）为-2.7 分，95%CI 为-4.2 到-1.1，P 值 0.0006）和肱正中阻滞相比（平均差为-4.8 分，95%CI 为-6.0 至-3.6 ，P 值 0.00001），ICB 起效更迅速，但 ICB 有更长的感觉阻滞起效时间（MD3.9min，95%CI 为 3.2 至 4.5，P 值 0.00001）。
作者的结论：与其他 BPBs 的阻滞疗效相比较，ICB 是下臂手术的一种安全、简便的麻醉方式。ICB 的优点包括手术中止血带疼痛的可能性降低，相比单点腋路神经阻滞具有更可靠的肌皮神经和腋神经阻滞。在允许注射量大于 40ml、足够的阻滞时间（至少 30min）的条件下，ICB 的疗效可能会改善。由于许多出版文章包括在本次检索内容中的随机对照研究已经证实，远端运动后束反应是电刺激引导下 ICB 的端点，作者推荐在今后比较研究中可以利用这一点。尚需另外随机对照试验来对比超声引导下 ICB 与其他 BPBs 的区别。
（丁俊云　译　陈杰　校）
BACKGROUND: Several approaches exist to produce local anaesthetic blockade of the brachial plexus. It is not clear which is the technique of choice for providing surgical anaesthesia of the lower arm although infraclavicular blockade (ICB) has several purported advantages. We therefore performed a systematic review of ICB compared to the other brachial plexus blocks (BPBs).
OBJECTIVES: To evaluate the efficacy and safety of ICB compared to other BPBs in providing regional anaesthesia of the lower arm.
SEARCH STRATEGY: We searched CENTRAL (*The Cochrane Library* 2008, Issue 3), MEDLINE (1950 to September 22nd 2008) and EMBASE (1980 to September 22nd 2008). We also searched conference proceedings (from 2004 to 2008) and the www.clinicaltrials.gov registry. No language restriction was applied.
SELECTION CRITERIA: We included any randomized controlled trials (RCTs) that compared ICB with other BPBs as the sole anaesthetic techniques for surgery on the lower arm.
DATA COLLECTION AND ANALYSIS: The primary outcome was adequate surgical anaesthesia within 30 minutes of block completion. Secondary outcomes included sensory block of individual nerves, tourniquet pain, onset time of sensory blockade, block performance time, block-associated pain and complications related to the block.

MAIN RESULTS: We identified 15 studies with 1020 participants, of whom 510 received ICB and 510 received other BPBs. The control group intervention was the axillary block in 10 studies, mid-humeral block in two studies, supraclavicular block in two studies and parascalene block in one study. Three studies employed ultrasound-guided ICB. The risk of failed surgical anaesthesia and of complications were low and similar for ICB and all other BPBs. Tourniquet pain was less likely with ICB (risk ratio (RR) 0.47, 95% CI 0.24 to 0.92, P = 0.03). When compared to a single-injection axillary block, ICB was better at providing complete sensory block of the musculocutaneous nerve (RR for failure 0.46, 95% CI 0.27 to 0.60, P < 0.0001) and the axillary nerve (RR of failure 0.37, 95% CI 0.24 to 0.58, P < 0.0001). ICB was faster to perform than multiple-injection axillary (mean difference (MD) −2.7 min, 95% CI −4.2 to −1.1, P = 0.0006) or midhumeral blocks (MD −4.8 min, 95% CI −6.0 to −3.6, P < 0.00001) but this was offset by a longer sensory block onset time (MD 3.9 min, 95% CI 3.2 to 4.5, P < 0.00001).
AUTHORS' CONCLUSIONS: ICB is a safe and simple technique for providing surgical anaesthesia of the lower arm, with an efficacy comparable to other BPBs. The advantages of ICB include a lower likelihood of tourniquet pain during surgery, and more reliable blockade of the musculocutaneous and axillary nerves when compared to a single-injection axillary block. The efficacy of ICB is likely to be improved if adequate time is allowed for block onset (at least 30 minutes) and if a volume of at least 40 ml is injected. Since publication of many of the trials included in this review, it has become clear that a distal posterior cord motor response is the appropriate endpoint for electrostimulation-guided ICB; we recommend it be used in all future comparative studies. There is also a need for additional RCTs comparing ultrasound-guided ICB with other BPBs.

心脏手术抗凝所需的肝素浓度不能可靠预测肝素的注射剂量

Heparin Concentration-Based Anticoagulation for Cardiac Surgery Fails to Reliably Predict Heparin Bolus Dose Requirements.

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Anesth Analg. 2009 Oct; 111(4):849-55.

背景：先进的床旁诊断检验信息系统现已逐步成为止血管理的新技术，其通过对抗凝所需肝素浓度的计算为患者提供个性化的肝素注射方案。Hepcon 止血管理系统（美敦力公司，明尼阿波利斯，明尼苏达州）可对肝素剂量、活化凝血时间（ACT）及肝素剂量响应（HDR）进行评估。然而在大样本人群中，此类测试的系统性评价并未开展与实施。
方法：此次研究共调查了 2005 年 2 月至 2008 年 7 月间所有于我院行体外循环术下心脏手术患者的数据资料。在此期间，Hepcon 止血管理系统专用于肝素剂量与凝血监测的评估。研究所需记录的数据信息包括详尽的人口统计学资料、手术情况、

实验室检查及肝素的单次注射剂量等。此外，ACT、计算所得与实际测定的 HDR 及肝素浓度等也需记录在案。通过比较实际与目标 ACT 及计算所得与实际测定 HDR 间的关系，对 Hepcon 止血管理系统的临床运用作一评价。
结果：在 3880 名实施心脏手术的患者中，针对目标 ACT 给予的肝素注射剂量导致肝素化后患者的 ACT 呈现出巨大差异（r(2) = 0.03）。其中，有 7.4%的患者其肝素化后的 ACT 值未达到 300 秒的目标 ACT；而未达到 350 秒目标 ACT 的患者更占 16.9%。同样，经统计后发现，根据 HDR 所计算得到的目标肝素浓度与注射后的实际肝素浓度间并无关联，甚至有 18.5%的病例在测定中出现了相差超过 2 倍的情况。而计算所得与实际测定的 HDR 在任一肝素浓度均无线性相关性。
结论：在体外循环前，Hepcon 止血管理系统不能充分评估肝素的注射剂量。进一步的前瞻性研究需阐明构建体外循环所需抗凝的具体因素及在手术室内临床医生该如何切实可靠地评价抗凝效应。
（范羽译 薛张纲校）

BACKGROUND: Hemostasis management has evolved to include sophisticated point-of-care systems that provide individualized dosing through heparin concentration-based anticoagulation. The Hepcon HMS Plus system (Medtronic, Minneapolis, MN) estimates heparin dose, activated clotting time (ACT), and heparin dose response (HDR). However, the accuracy of this test has not been systematically evaluated in large cohorts.
METHODS: We examined institutional databases for all patients who underwent cardiac surgery with cardiopulmonary bypass (CPB) at our institution from February 2005 to July 2008. During this period, the Hepcon HMS Plus was used exclusively for assessment of heparin dosing and coagulation monitoring. Detailed demographic, surgical, laboratory, and heparin dosing data were recorded. ACT, calculated and measured HDR, and heparin concentrations were recorded. Performance of the Hepcon HMS Plus was assessed by comparison of actual and target ACT values and calculated and measured HDR.
RESULTS: In 3880 patients undergoing cardiac surgery, heparin bolus dosing to a target ACT resulted in wide variation in the postheparin ACT (r(2) = 0.03). The postheparin ACT did not reach the target ACT threshold in 7.4% (i.e., when target ACT was 300 s) and 16.9% (i.e., when target ACT was 350 s) of patients. Similarly, the target heparin level calculated from the HDR did not correlate with the postbolus heparin level, with 18.5% of samples differing by more than 2 levels of the assay. Calculated and measured HDR were not linearly related at any heparin level.
CONCLUSIONS: The Hepcon HMS Plus system poorly estimates heparin bolus requirements in the pre-CPB period. Further prospective studies are needed to elucidate what constitutes adequate anticoagulation for CPB and how clinicians can reliably and practically assess anticoagulation in the operating room.

β2受体偶联的磷酸肌醇3激酶通过磷酸二酯酶4的激活表现出cAMP依赖式的心肌收缩力增强

β2-adrenergic receptor-coupled phosphoinositide 3-kinase constrains cAMP-dependent increases in cardiac inotropy through phosphodiesterase 4 activation.
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Anesth Analg. 2010 Oct;111(4):870-7.

背景：众多的证据表明磷酸肌醇-3-激酶(PI3K)可以调节心肌收缩力，然而其机制尚不明了。我们认为，β2肾上腺能受体偶联PI3K可以通过激活cAMP依赖的磷酸二酯酶从而增强心肌收缩力。
方法：我们测试了在离体的鼠心肌细胞中PI3K和PDE4抑制剂对心肌收缩力的影响，从而了解其生理功能(肌纤维节缩短和钙离子向细胞内流动)以及cAMP和PDE活性。
结果：PI3K抑制剂辅以可逆的LY294002抑制剂可以使得肌纤维节明显缩短并且提高对钙离子的处理能力，从而增加心肌细胞的收缩力。这一反应依赖于G蛋白的激活。因为百日咳毒素具有不可逆的G蛋白抑制作用,而当与百日咳毒素共同培养时，LY介导的收缩力增强反应便会消失。此外，PI3K抑制剂对于肌纤维节的收缩作用弱于PDE3,4抑制剂(米力农)联合LY。并且，LY可以剂量依赖性地削弱PDE4的活性(当LY浓度达到10uM时，只有58%的PDE4具有活性)。特别需要指出，当PI3K(γ)与PDE4D会发生免疫反应产生沉淀。所诱导出的心肌细胞收缩力加强这一反应可以被β 2受体逆向激动剂所抵制。
结论：PI3K通过cAMP依赖的机制规律地激活PDE4从而调节心肌细胞收缩力。并且，底物水平上β2受体依赖于激动剂的激活并由此引起cAMP的扩增以及通过PI3K催化增强PDE4的活性，这些呈现了一个完整的细胞信号转导机制。这一机制控制cAMP的量化从而控制心肌细胞的收缩力。这一结果可以帮助解释米力农为何可以在缺乏直接的β受体激动的情况仍然可以增强心肌收缩力，以及为何它可以在加入大剂量β受体激动剂后可以显著增加心肌收缩力。
（黄剑译 薛张纲校）
BACKGROUND: Emerging evidence suggests that phosphoinositide 3-kinase (PI3K) may modulate cardiac inotropy; however, the underlying mechanism remains elusive. We hypothesized that β(2)-adrenergic receptor (AR)-coupled PI3K constrains increases in cardiac inotropy through cyclic adenosine monophosphate (cAMP)-dependent phosphodiesterase (PDE) activation.
METHODS: We tested the effects of PI3K and PDE4 inhibition on myocardial contractility by using isolated murine cardiac myocytes to study physiologic functions (sarcomere shortening [SS] and intracellular Ca(+) transients), as well as cAMP and PDE activity.
RESULTS: PI3K inhibition with the reversible inhibitor LY294002 (LY) resulted in a significant increase in SS and Ca(2+) handling, indicating enhanced contractility. This response depended on G(iα) protein activity, because incubation with pertussis toxin (an irreversible G(iα) inhibitor) abolished the LY-induced hypercontractility. In addition, PI3K inhibition had no greater effect on SS than both a PDE3,4 inhibitor (milrinone) and LY combined. Furthermore, LY decreased PDE4 activity in a concentration-dependent manner (58.0% of PDE4 activity at LY concentrations of 10 μM). Notably, PI3K(γ) coimmunoprecipitated with PDE4D. The β(2)-AR inverse agonist, ICI 118,551 (ICI), abolished induced increases in contractility.
CONCLUSIONS: PI3K modulates myocardial contractility by a cAMP-dependent mechanism through the regulation of the catalytic activity of PDE4. Furthermore, basal

agonist-independent activity of the β(2)-AR and its resultant cAMP production and enhancement of the catalytic activity of PDE4 through PI3K represents an example of integrative cellular signaling, which controls cAMP dynamics and thereby contractility in the cardiac myocyte. These results help to explain the mechanism by which milrinone is able to increase myocardial contractility in the absence of direct β-adrenergic stimulation and why it can further augment contractility in the presence of maximal β-adrenergic stimulation.

Strepsils® 用于减轻气管插管后喉部疼痛和声音嘶哑的研究

Strepsils® Tablets Reduce Sore Throat and Hoarseness After Tracheal Intubation

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Anesth Analg October 2010 111:892-894

背景：Strepsils已成功用于预防和治疗口腔炎症，但用于插管后喉部疼痛和声嘶疗效未知。进行此项研究即为评估Strepsils对气管插管术后减轻咽喉疼痛和声嘶的疗效。
方法：对150名ASA分级Ⅰ级和Ⅱ级需行择期整形或妇产科手术的病人给予全身麻醉，受试者被随机分为2组。入手术室前，一组给予Strepsils，另一组给相似的安慰剂。然后评估术后即刻和术后24小时咽喉疼痛和声嘶的发病率和严重度。
结果：术后早期咽喉疼痛发病率Strepsils组和对照组分别是13.7%和33.3%；声嘶的发病率在受试组和对照组分别是12.3%和26.4% (P＜0.05)；术后24小时，在受试组和对照组咽喉疼痛发病率分别降低到6.8% 和18.1%，而声嘶症状在受试组和对照组分别降到8.2%和19.4% (P＜0.05)。
结论：围手术期应用 Strepsils 可以减轻术后咽喉疼痛及声嘶症状。
（毛慧译，薛张刚校）
BACKGROUND: Amyl-m-cresol (Strepsils_) has been successfully used in the prophylaxis andtreatment of oral inflammations, but its effects on postintubation sore throat and hoarseness are
unknown. We conducted this study to evaluate the effects of Strepsils in reducing postintubation sore throat and hoarseness.
METHODS: One hundred fifty patients, ASA physical status I to II, scheduled to undergo general anesthesia and elective orthopedic or gynecologic surgery were enrolled. Participants were randomly allocated to receive either Strepsils or identical-looking placebo tablets immediately before arrival to the operating room. The incidence and severity of postoperative sore throat and hoarseness were evaluated immediately and 24 hours after surgery.
RESULTS: The incidence of early postoperative sore throat was 13.7% and 33.3% and hoarseness was 12.3% and 26.4% in the Strepsils and placebo groups, respectively (P＜0.05).One day after surgery, the incidence of sore throat decreased to 6.8% and 18.1% in the Strepsils and control groups, respectively. The incidence of hoarseness 1 day after the operation decreased to 8.2% in the Strepsils group and 19.4% in the placebo group, but the difference remained statistically significant (P＜0.05).

CONCLUSION: Perioperative use of Strepsils tablets reduces postoperative sore throat and hoarseness of voice. (Anesth Analg 2010;111:892–4)

脉搏血氧饱和度变异指数指导的液体管理减少了乳酸水平并促进了液体管理

Goal-directed fluid management based on the pulse oximeter-derived pleth variability index reduces lactate levels and improves fluid management.

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Anesth Analg. 2010 Oct;111(4):910-4.

背景：一些动态变量预测了液体的反应性，这可能会促进术中液体管理。我们通过显示脉搏血氧饱和度描记图的变异性(体积描记图变异指数，PVI)来研究这是否能指导液体管理，并在乳酸水平上改善了循环。
方法：82 名主要进行择期腹部手术的病人被随机分为 2 组，术中 PVI 指导的液体管理组和对照组。全身麻醉诱导后，试验组输注晶体液负荷量 500ml 并维持输注 $2ml \cdot kg^{-1} \cdot h^{-1}$。当 PVI 大于 13%时输注胶体液 250ml。使用血管活性药物使动脉压维持在 65mmHg 以上。对照组先给予晶体液负荷量 500ml，之后以液体冲击疗法为基础进行液体管理，并根据其对平均动脉压和中心静脉压的影响进行调整。试验记录了围术期乳酸水平、血流动力学数据和术后并发症发生情况。
结果：在试验组，术中使用晶体液和总液体量均显著小于对照组。试验组在术中和术后 48 小时的乳酸水平也显著低于对照组($P < 0.05$)。
结论：PVI 为基础的目标指导的液体管理减少了术中液体输注量并降低了术中和术后的乳酸水平。
（任云译 薛张纲校））

BACKGROUND: Dynamic variables predict fluid responsiveness and may improve fluid management during surgery. We investigated whether displaying the variability in the pulse oximeter plethysmogram (pleth variability index; PVI) would guide intraoperative fluid management and improve circulation as assessed by lactate levels.
METHODS: Eighty-two patients scheduled for major abdominal surgery were randomized into 2 groups to compare intraoperative PVI-directed fluid management (PVI group) versus standard care (control group). After the induction of general anesthesia, the PVI group received a 500-mL crystalloid bolus and a crystalloid infusion of 2 mL · kg(-1) · h(-1). Colloids of 250 mL were administered if the PVI was >13% Vasoactive drug support was given to maintain the mean arterial blood pressure above 65 mm Hg. In the control group, an infusion of 500 mL of crystalloids was followed by fluid management on the basis of fluid challenges and their effects on mean arterial blood and central venous pressure. Perioperative lactate levels, hemodynamic data, and postoperative complications were recorded prospectively.
RESULTS: Intraoperative crystalloids and total volume infused were significantly lower in the goal-directed PVI group. Lactate levels were significantly lower in the PVI group during surgery and 48 hours after surgery ($P < 0.05$).

CONCLUSIONS: PVI-based goal-directed fluid management reduced the volume of intraoperative fluid infused and reduced intraoperative and postoperative lactate levels.

全凭静脉麻醉中两个连续的单向阀能降低静脉通路中的交叉感染

Two serial check valves can prevent cross-contamination through intravenous tubing during total intravenous anesthesia.

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Anesth Analg October 2010 111:925-928.

背景：在麻醉中带有细菌的丙泊酚往往与严重的脓毒血症和死亡联系在一起。在静脉通路中仅放置一个单向阀并不能防止不断升高的病原体进入充满丙泊酚的注射器，所以我们设计了一套静脉通路带有多个单向阀。为了评估这个设计的有效性，我们在静脉通路的上游检测病原菌的浓度，这与被污染病人模型中的病原菌浓度有关。

方法：在一个玻璃容器中充满了细菌或吞噬细胞的混悬液，瓶口用橡胶密封，并保存在 37℃（这是“被污染病人模型”）。一袋正常的生理盐水连接着一条静脉通路，从中刺入被橡胶密封的“病人模型”。另外有两条侧流分别与两个标准的注射泵连接。一个注射器装有丙泊酚，另外一个装有标准的生理盐水以此来代替阿片类药物。经过 5 个小时的输注之后，我们在静脉通路和注射器的各个不同部位采集标本。将标本在血琼脂平板上面划片，然后在 37℃的条件下培育 24 个小时。我们用 6 种不同的病原菌来重复这个实验。

结果：我们培育了 825 块平板。虽然在任何一块平板上都没有发现有细菌生长，但是与对照组相比，在 5 个小时的实验中，“被污染病人模型”中的细菌或吞噬细胞的浓度均明显上升。

结论：从这个实验的数据可以看出，在静脉通路中设计多个单向阀能够避免不断恶化的交叉感染。但是如果你反复使用同一支丙泊酚并不能保证避免感染，因为这也是生产厂家不推荐的。

（翁梅琳译 薛张纲校）

BACKGROUND: Nonsterile handling of propofol for anesthesia has been linked with severe sepsis and death. Placing a single check valve in the IV tubing does not prevent retrograde ascension of pathogens into propofol-filled syringes, so we designed an IV tubing set with multiple check valves. To estimate the efficacy of this design, we measured the concentration of pathogens detected upstream in the IV tubing in relation to the pathogen concentration in a model of a contaminated patient.

METHODS: A glass container with a rubber sealed port was filled with a suspension of either bacteria or phagocytes and kept at 37°C ("contaminated patient" model). A bag of normal saline was connected to an IV cannula, punctured through the rubber sealed port of the patient model. Two additional sidestream infusion lines were connected to syringes in 2 standard infusion pumps. One of the syringes contained propofol and the other contained normal saline as a substitute for an opioid preparation. After 5 hours of infusion, we obtained samples from different parts of the infusion lines and syringes. The

samples were streaked out on blood agar plates and incubated at 37℃ for 24 hours. We repeated this experiment with 6 different pathogens.
RESULTS: We incubated 825 agar plates. Whereas the concentration of bacteria and phagocytes in the "patient" had significantly increased during the 5-hour experiments (positive control), no bacterial growth could be detected in any of the incubated plates.
CONCLUSION: The data from this experimental setting suggest that the design with multiple check valves in paired configuration prevents retrograde contamination. Of note, this does not permit the reuse of propofol syringes because reusing is against the manufacturer's recommendations.

标准化流程降低或提高自适应辅助通气比例不能加快非快速通道心胸手术患者术后的气管拔管

Adaptive support ventilation with protocolized de-escalation and escalation does not accelerate tracheal extubation of patients after nonfast-track cardiothoracic surgery.

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Anesth Analg October 2010 111: 961-967

背景：自适应辅助通气（adaptive support ventilation，ASV）能否加快非快通道心胸手术患者的脱机尚不清楚。降低呼吸机设定的 ASV 分钟通气量的百分比可能会使患者更早从控制通气转化为辅助通气，可能加快气管拔管。我们假定，在接受非快通道冠脉搭桥术且术后没有并发症的患者中，与标准 ASV（设置固定的 ASV 分钟通气量百分比）相比，可变 ASV（ASV-DE，即通过标准化流程降低或者提高呼吸机设定的 ASV 分钟通气量百分比）可以缩短拔管时间。
方法：我们进行了随机对照试验来比较 ASV-DE 和标准 ASV。在 ASV-DE 组，只要机体体温＞35.0℃且 pH＞7.25，呼吸机设定的 ASV 通气百分比逐步降低至最低 70%。
结果：63 例患者随机分入 ASV-DE 组，另外 63 例患者分入标准 ASV 组。两组的机械通气时间无统计学差异（ASV-DE 组为 10.8 [6.5-16.1] 小时， 标准 ASV 组为 10.7 [6.6-13.9] 小时，P = 0.32）。ASV-DE 组的控制通气到第一次辅助通气的时间更短（3.1 [2.0-6.7] vs 3.9 [2.1-7.5] 小时），辅助通气的次数更多（78 [34-176] vs 57 [32-116]次），但两者均没有达到统计学意义。到气管拔管为止，两组的辅助通气次数有统计学差异（ASV-DE 组为 2.5 [0.9-4.6]小时，而标准 ASV 组为 1.4 [0.3-3.5] 小时，P < 0.05）。
结论：在行非快通道的冠脉搭桥术的患者中，与标准 ASV 相比，通过标准化流程降低或提高 ASV 的分钟通气量百分比（ASV-DE）不能缩短患者的拔管时间。
（吴少勇译 薛张纲校）

BACKGROUND: It is uncertain whether adaptive support ventilation (ASV) accelerates weaning of nonfast-track cardiothoracic surgery patients. A lower operator set %-minute ventilation with ASV may allow for an earlier definite switch from controlled to assisted ventilation, potentially hastening tracheal extubation. We hypothesized that ASV using protocolized de-escalation and escalation of operator set %-minute ventilation (ASV-DE) reduces time until tracheal extubation compared with ASV using a fixed operator set %-minute ventilation (standard ASV) in uncomplicated patients after nonfast-track coronary artery bypass graft.
METHODS: We performed a randomized controlled trial comparing ASV-DE with standard ASV. With ASV-DE, as soon as body temperature was >35.0°C with pH >7.25, operator set %-minute ventilation was decreased stepwise to a minimum of 70%.
RESULTS: Sixty-three patients were randomized to ASV-DE, and 63 patients to standard ASV. The duration of mechanical ventilation was not different between groups (10.8 [6.5–16.1] vs 10.7 [6.6–13.9] hours, ASV-DE versus standard ASV; P = 0.32). Time until the first assisted breathing period was shorter (3.1 [2.0–6.7] vs 3.9 [2.1–7.5] hours) and the number of assisted ventilation episodes was higher (78 [34–176] vs 57 [32–116] episodes), but differences did not reach statistical significance. The duration of assisted ventilation episodes that ended with tracheal extubation was different between groups (2.5 [0.9–4.6] vs 1.4 [0.3–3.5] hours, ASV-DE versus standard ASV; P < 0.05).
CONCLUSION: Compared with standard ASV, weaning of patients after nonfast-track coronary artery bypass graft using ASV with protocolized de-escalation and escalation does not shorten time to tracheal extubation.

注入时间对于阿片类药物分娩阵痛的持续时间的影响

The Influence of Time of Day of Administration on Duration of Opioid Labor Analgesia

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Anesth Analg October 2010 111:986-991

背景: 分娩镇痛中注入硬膜外腔或蛛网膜下腔的药物可能会因为注入的时间而产生不同的效应,而这可能会影响到临床研究中特殊药物药理学的观察.在这个回顾性研究中, 我们对一天内不同时间在蛛网膜下腔注入芬太尼和全身使用氢吗啡酮后的效应进行评估,资料来源于观察镇痛方法对于分娩结局影响的随机临床试验。
方法:六百九十二名临产妇在分娩早期提出第一次镇痛需求时随机进入腰硬联合分娩镇痛（蛛网膜下倾 25ug 芬太尼，随后注入一个利多卡因混合肾上腺素的硬膜外试验剂量）或者全身性的分娩镇痛（氢吗啡酮 1mg 静脉注射，1mg 肌肉注射）。除非病人再提出镇痛需求（第二次镇痛需求），否则不再给予镇痛药物。如果初始镇痛药物（区域或是全身）是在 7:01 和 23:00 之间注入的，则受试者进入日间组，如在 23：01 至 7：00 之间注入则进入夜间组。在每一种镇痛模式中（区域或是全身）对日间组和夜间组进行比较。主要的结局变量是镇痛持续时间，定义为首次注入镇痛药物至第二次提出镇痛需求的时间间隔。同时在两组间比较第一次镇痛需求

和第二次镇痛需求时的宫颈扩张程度、第一次镇痛需求时的疼痛评分、首次注入镇痛药物和第二次镇痛需求间平均疼痛程度。对镇痛持续时间、宫颈扩张和疼痛评分进行节奏分析。
结果:日间和夜间组中无论是区域性或是全身性镇痛中位镇痛时间无显著性差异。组间未观察到镇痛持续时间的调和差异。节奏分析显示首次镇痛需求后 24 小时宫颈扩张的谐波周期最大值在 17：00 左右，最小值在 05：00 左右，但是差异的幅度很小。节奏分析中，在区域镇痛组病人首次注入镇痛药物至第二次镇痛需求间平均疼痛评分的 24 小时谐波分析显示最大值在 2：00 左右，最小值在 10：00 左右，但是差异幅度很小。
结论: 在这些研究条件下，注入药物的时间似乎不能影响腰硬联合或全身性分娩镇痛的持续时间。
（姚敏敏译 薛张纲校）
BACKGROUND: Medications administered into the epidural or intrathecal space for labor analgesia may demonstrate variable effects dependent on time of day, and this may affect clinical research trials investigating the pharmacology of specific drugs. In this retrospective study, we evaluated the effect of time of day of administration of intrathecal fentanyl and systemic hydromorphone labor analgesia from data collected as part of a randomized clinical trial examining the influence of analgesia method on labor outcome.
METHODS: Six hundred ninety-two healthy parturients were randomized early in labor to receive combined spinal-epidural (intrathecal fentanyl 25 μg followed by a lidocaine and epinephrine containing epidural test dose) versus systemic (hydromorphone 1 mg IV and 1 mg IM) labor analgesia at first analgesia request. No further analgesics were administered until the patient requested additional analgesia (second analgesia request). Subjects were assigned to the daytime group (DAY) if initial analgesia (neuraxial or systemic) was administered between the hours of 07:01 and 23:00 and to the nighttime group (NIGHT) if it was administered between 23:01 and 07:00. Within each mode of analgesia study arm (neuraxial or systemic), the DAY and NIGHT groups were compared. The primary outcome variable was analgesia duration, defined as the time interval from administration of labor analgesia until the second analgesia request. Cervical dilation at first and second analgesia requests, pain score at first analgesia request, and average amount of pain between analgesia administration and second analgesia request were also compared between DAY and NIGHT groups. Rhythm analyses for duration of analgesia, cervical dilation, and pain scores were performed.
RESULTS: There was no difference in the median duration of either neuraxial or systemic analgesia in DAY versus NIGHT subjects, and no harmonic variation was observed for analgesia duration. Rhythm analysis demonstrated a 24-h harmonic cycle for cervical dilation at first analgesia request with maximum values occurring near 17:00 and minimum values near 05:00, but the amplitude of the difference was very small. Rhythm analysis demonstrated a 24-h harmonic cycle with maximum values occurring near 22:00 and minimum values near 10:00 for the average amount of pain between analgesia administration and second analgesia request in neuraxial group patients, but amplitude was small.
CONCLUSIONS: Time of day of administration did not seem to influence combined spinal-epidural or systemic labor analgesia duration under these study conditions.

美国儿童门诊麻醉的流行病学研究：2006 年和 1996 年

Epidemiology of Ambulatory Anesthesia for Children in the United States: 2006 and 1996

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Anesth Analg October 2010 111:1011-1015

背景：有一些描述在美国接受门诊麻醉的儿童的数据，包括频率、麻醉类型、执行者和地点。 自 20 世纪 80 年代初以来，由于医疗技术的进步和付款模式的变化，门诊手术频率急剧增加。 我们这个研究的主要目的是要计数每年的儿科门诊麻醉量和研究十年中儿科麻醉监护使用中的变化。
方法：美国国家卫生统计中心分别于 1994 年和 2006 年进行了全国门诊手术调查研究。 这项调查是基于一项外科门诊手术中心的全国性的样本，并通过对所有年龄阶段手术和非手术病人进行访问提供数据。 我们提取其中与接受过门诊全麻、局麻或监护的儿童的相关访问数据。我们从 1996 年和 2006 年的数据库中获取信息，并用人口普查数据来估计美国每年每 1000 名儿童中接受门诊麻醉的人数。
结果：在 2006 年，估计有 230 万门诊麻醉护理供给了小于 15 岁的美国儿童（1000 中有 38）。 相比而言， 1996 年同一年龄组的儿童 1000 中仅有 26 名。 在两段时间中的大多数情况下，麻醉师均参与其中，参与率为 2006 年 74%和 1996 年 85%。 这些儿童中，14200 人术后住进了医院，即每 1000 例门诊麻醉中有 6 例。
结论：美国儿童接受门诊麻醉的数量和频率在十年中显著增加。 这项研究提供了一个榜样，显示数据库如何为健康维护政策制定者和教育者提供有关儿童门诊手术中心的使用方面的有用的信息。
（张玥琪译，薛张纲校）

BACKGROUND: There are few data that describe the frequency, anesthetic type, provider, or disposition of children requiring outpatient anesthesia in the United States (US). Since the early 1980s, the frequency of ambulatory surgery has increased dramatically because of advances in medical technology and changes in payment arrangements. Our primary aim in this study was to quantify the number of ambulatory anesthetics for children that occur annually and to study the change in utilization of pediatric anesthetic care over a decade.
METHODS: The US National Center for Health Statistics performed the National Survey of Ambulatory Surgery in 1994 through 1996 and again in 2006. The survey is based on data abstracted from a national sample of ambulatory surgery centers and provides data on visits for surgical and nonsurgical procedures for patients of all ages. We abstracted data for children who had general anesthesia, regional anesthesia, or monitored anesthesia care during the ambulatory visit. We obtained the information from the 2006 and 1996 databases and used population census data to estimate the annual utilization of ambulatory anesthesia per 1000 children in the US.
RESULTS: In 2006, an estimated 2.3 million ambulatory anesthesia episodes of care were provided in the US to children younger than 15 years (38 of 1000 children). This

amount compares with 26 per 1000 children of the same age group in 1996. In most cases, an anesthesiologist was involved in both time periods (74% in 2006 and 85% in 1996). Of the children, 14,200 were admitted to the hospital postoperatively, a rate of 6 per 1000 ambulatory anesthesia episodes.
CONCLUSION: The number and rate of ambulatory anesthesia episodes for US children increased dramatically over a decade. This study provides an example of how databases can provide useful information to health care policy makers and educators on the utilization of ambulatory surgical centers by children.

较大择期手术后延伸急性疼痛服务对临床预后作用的成本与收益

The Costs and Benefits of Extending the Role of the Acute Pain Service on Clinical Outcomes After Major Elective Surgery

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Anesth Analg October 2010 111:1042-1050

背景：急性疼痛服务已被广泛接受，并得到学院和组织的正式支持，但是关于成本与收益的有效证据极少。尽管在对多数较大手术后给予急性疼痛服务方面已达成一致，但是对其它手术的益处还不清楚。需要数据来证明急性疼痛服务任何扩展的合理性。在这项随机对照临床试验中，我们将急性疼痛服务对临床预后的成本和效应与传统的病房内疼痛处理进行比较。试验中的患者都由他们的麻醉医生为其决定选择其中一种适合于手术方式的疼痛处理方法。
方法：423 名实施较大择期手术的患者随机分入由一位麻醉医生领导的以护士为基础的患者自控镇痛急性疼痛服务组，或分入单次肌注或静注阿片类镇痛药的对照组。两组均用药物治疗阿片类相关副作用，并接受健康专家为病房设计的常规护理。主要的预后测量指标是恢复评分质量、疼痛强度测量、治疗有效性的总体测量以及全部的疼痛处理成本。画出成本-效应可接受曲线来检测两组间成本-效应关系连接点的不同。
结果：处理组与对照组之间术后一天的恢复评分质量无差别（平均差值，0；95%可信区间，−0.7～0.7;P=0.94)，或者恢复评分质量提高率无差别（平均差值，-0.1；95%可信区间，−0.4～0.1;P=0.34)。急性疼痛服务组中获得一天或数天高效疼痛治疗的患者比例较对照组高(86%比 75%;P<0.01)。急性疼痛服务组所耗成本更高（平均差值，46 美元；95%可信区间, 每位患者 44～48 美元;P<0.001)。成本-效应可接受曲线显示，如果决策者愿意为每个患者每天付多于 546 美元来获得更有效的治疗，急性疼痛服务在提供更有效的疼痛治疗时较对照具有更高的成效。
结论：在对接受较大手术的特殊患者群体延伸急性疼痛服务作用过程中，急性疼痛服务可能是有成效的。
（朱兰芳译，薛张纲校）

BACKGROUND: Acute pain services have received widespread acceptance and formal support from institutions and organizations, but available evidence on their costs and benefits is scarce. Although there is good agreement on the provision of acute pain services after many major surgical procedures, there are other procedures for which the benefits are unclear. Data are required to justify any expansion of acute pain services. In this randomized, controlled clinical trial we compared the costs and effects of acute pain service care on clinical outcomes with conventional pain management on the ward. Patients included in the trial were considered by their anesthesiologist to have either arm be suitable for the procedure.
METHODS: Four hundred twenty-three patients undergoing major elective surgery were randomized either to an anesthesiologist-led, nurse-based acute pain service group with patient-controlled analgesia or to a control group with IM or IV boluses of opioid analgesia. Both groups were treated with medications to treat opioid-related adverse effects and received the usual care from health professionals assigned to the ward. The main outcome measures were quality of recovery scores, pain intensity measures, global measure of treatment effectiveness, and overall pain treatment cost. Cost-effectiveness acceptability curves were drawn to detect a difference in the joint cost-effect relationship between groups.
RESULTS: There was no difference in quality of recovery score on postoperative day 1 between treatment and control groups (mean difference, 0; 95% confidence interval [CI], −0.7 to 0.7; P = 0.94) or in the rate of improvement in quality of recovery score (mean difference, −0.1; 95% CI, −0.4 to 0.1; P = 0.34). The proportion of patients with 1 or more days of highly effective pain management was higher in the acute pain service group than in the control group (86% vs. 75%; P < 0.01). Costs were higher in the acute pain service group (mean difference, US$46; 95% CI, $44 to $48 per patient; P < 0.001). A cost-effectiveness acceptability curve showed that the acute pain service was more cost effective than was control for providing highly effective pain management if the decision maker was willing to pay more than US$546 per patient per 1 day with highly effective treatment.
CONCLUSION: In extending the role of the acute pain service to a specific group of major surgical procedures, the acute pain service was likely to be cost effective.

通过脉搏氧饱和度测定丙胺卡因区域麻醉导致的高铁血红蛋白血症水平

Pulse-Oximetric Measurement of Prilocaine-Induced Methemoglobinemia in Regional Anesthesia

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Anesth Analg October 2010 111:1065-1068

背景：Masimo Radical 7®是一种新的测定高铁血红蛋白水平的脉搏 CO 饱和度的仪器。但是这种设备在临床上还没有进行评估。

方法：在这项前瞻性观察试验中，我们比较了丙胺卡因区域麻醉下动脉高铁血红蛋白水平及 Radical 7® 测定的脉搏 CO 饱和度水平。
结果：我们分析了 360 对高铁血红蛋白水平达到 6.6%的数据。这种仪器的平均偏移及限度(±1.96 SD)为 0.27% (±1.33%)。
结论：我们发现两种方法测定的高铁血红蛋白水平高度一致。
（陈珺珺译 薛张纲校）

BACKGROUND: The Masimo Radical 7® is a new pulse CO oximeter designed to measure methemoglobin. The device has not been evaluated in a clinical setting.
METHODS: In this prospective observational study we compared the arterial methemoglobin levels and the corresponding pulse CO-oximetric values of the Radical 7® in regional anesthesia with prilocaine.
RESULTS: We analyzed 360 data pairs with methemoglobin values up to 6.6%. The mean bias and limits (±1.96 SD) of the device were 0.27% (±1.33%).
CONCLUSION: We found a high degree of agreement in measurement of methemoglobin between the 2 methods.