Does Pregabalin Reduce Postop Pain After Gallbladder Surgery?

Use of Low-Dose Pregabalin in Patients Undergoing Laparoscopic Cholecystectomy.

Peng PWH, Li C, et al:

Br J Anaesth 2010; 105 (August): 155-161

Pregabalin may not be very effective for perioperative pain reduction in patients undergoing laparoscopic cholecystectomy.

Background: Gabapentin and the newer pregabalin have demonstrated efficacy in many circumstances as analgesic medications. The perioperative use of pregabalin has yielded mixed results, however.

Objective: To determine the effects of low-dose pregabalin on the analgesic efficacy, side effects, and recovery profile in patients undergoing laparoscopic cholecystectomy.

Design: Prospective, randomized, double-blind, placebo-controlled study.

Participants: Adult ASA I to III patients undergoing elective surgery were studied. Patients were excluded if they required emergency surgery, had analgesics in 24 hours before surgery, were morbidly obese, had acute pancreatitis, or were pregnant.

Methods: Patients were given a standard premedication of naproxen and acetaminophen. The study drug was given 1 hour before surgery and every 12 hours after surgery for 2 doses. General anesthesia was performed with propofol induction, desflurane/nitrous oxide maintenance, and fentanyl as required. Bupivacaine with epinephrine was infiltrated in the gallbladder bed and port sites by the surgeon. Fentanyl was used in the post-anesthesia care unit, and acetaminophen with codeine was used as the analgesic at home. Patients were followed up on postoperative days 1, 2, and 7 and had to complete a diary and a number of questionnaires that related to pain scores, medication side effects, and quality of recovery.

Results: Almost 150 patients were included in the study. Demographics, duration of anesthesia, and intraoperative dose of fentanyl were similar between the 3 groups. Pregabalin 75 mg resulted in lower pain scores in the first 90 minutes after surgery, and the 50-mg dose was better than placebo in the 30- to 45-minute period after surgery. Pain scores during the first week after surgery were similar between the 3 groups. The composite scores of opioid-related side effects were similar between the 3 groups overall, but 75 mg of pregabalin was associated with less fatigue on day 3, and 50 mg of pregabalin was associated with less itching on day 1. Ratings for satisfaction and sleep quality were similar between the 3 groups.

Conclusions: Multiple doses of pregabalin resulted in superior analgesia only in the first 90 minutes compared with placebo, but pregabalin did not result in a reduction in opioid consumption, clinically meaningful side effects, or an improvement in quality of recovery.

Reviewer's Comments: This was a well-done study. The authors experienced a high dropout rate, probably due to the large number of questions (almost 160) that the patients had to answer in the questionnaires. However, the intention to treat does not appear to have influenced the results. (Reviewer-Allen Miranda, MD).

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Keywords: Pregabalin, Cholecystectomy, Pain

Print Tag: Refer to original journal article
Irreversible electroporation has the potential to be an effective therapy for solid tumors.

**Background:** A number of ablative therapies other than traditional surgical excision are used in the treatment of solid tumors, including radiofrequency ablation, ultrasound, and laser coagulation. Irreversible electroporation is a new technique that uses high-voltage current to ablate cells in tumors.

**Objective:** To test the procedural and short-term safety of the AngioDynamics Low-Energy DC (LEDC) device.

**Design:** Observational study.

**Participants:** Adult patients with either primary or metastatic cancer in a variety of solid organs.

**Methods:** The procedures were performed in the CT scan suite. All patients underwent general endotracheal anesthesia with neuromuscular blockade, standard ASA monitoring plus bispectral index, and arterial line monitoring. Lower body hot-air blankets were used to maintain normothermia. Pre-procedure scans were obtained, and then insulated needle electrodes 15 cm long were placed in the designated treatment areas with ultrasound or CT guidance. The treatment involved the delivery of approximately 2000 to 3000 volts of direct current between 20 and 50 amps. Pulses were delivered in groups of 10 at intervals of 70 and 100 microseconds for bipolar and unipolar electrodes, respectively. By comparison, nerve stimulators typically use approximately 50 mA delivered over 200 microseconds. Apnea was required during the scans to maintain an unchanged organ position. Most of the procedures were performed on liver tumors, but kidney and lung tumors were also treated.

**Results:** These procedures tended to last about 3 hours. Many of the procedures required the arms to be extended above the head, and almost 20% of these patients developed significant but transient neuropraxia. The electrical stimulation produced muscle contraction, and, if the patients were inadequately paralyzed, they had contractions of the upper body resembling seizures. Cardiac arrhythmia in the form of ventricular tachycardia occurred in one-fourth of the patients. Synchronization of the pulses to the ECG had variable success. In more than half of these patients, the blood pressure dropped significantly. The arrhythmia resolved spontaneously with the termination of the 10 pulse treatment group. Approximately 10% developed a pneumothorax, most commonly in the group with lung lesions. A 20 to 30 mm Hg increase in blood pressure occurred in all patients, and 2 patients with renal lesions developed significant hypertension. One patient was found to have an electrode in the adrenal gland. Postoperative pain was present in almost one-half the patients, and a minority of patients had mild acid-base disturbances with hyperkalemia. All patients had hyperchloremic acidosis from either renal impairment or normal saline administration.

**Conclusions:** Irreversible electroporation presents a number of anesthetic challenges.

**Reviewer’s Comments:** The potential multi-system complications of these electroporation procedures are likely to provide significant challenges to the anesthesia team. This appears to be even more complex than radiofrequency ablation treatments, which we perform relatively often at our institution. (Reviewer-Allen Miranda, MD).

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Keywords: Irreversible Electroporation, Ventricular Arrhythmia, General Anesthesia

Print Tag: Refer to original journal article
Parental presence at the time of separation may reduce anxiety in children undergoing outpatient surgery.

**Background:** The presence of a parent in the operating room (OR) for pediatric patients is becoming more common. Various studies have looked at whether anxiety in the child is reduced with a parent, but findings have been inconsistent.

**Objective:** To examine whether parental presence would lower anxiety levels in pediatric patients during the time of separation and at the time of anesthesia induction in the OR.

**Participants/Methods:** 61 children aged 3 to 6 years undergoing outpatient surgery were randomly assigned to 2 groups. Of these children, 30 had a parent present, and 31 did not. All members of the study team (child, parent, anesthesiologist, and research assistant) were blinded until meeting with the anesthesiologist and leaving the preoperative area. Two research assistants rated the children's anxiety using the modified Yale Preoperative Anxiety Scale (mYPAS). The mYPAS is a valid and reliable scale consisting of 27 items measuring a child's anxiety level in the preoperative setting. Five categories are included: activity, vocalizations, emotional expressiveness, state of arousal, and parental presence. Parental presence was omitted from the scale since it was part of the study design. The mYPAS was assessed at 5 time points, including 90 minutes before surgery, 5 minutes before surgery, at separation, at induction, and at recovery. The focus of this study was placed on the 2 most stressful time points of separation and induction because the authors thought they were of most clinical interest. Standardized inhalational induction was performed, and no premedication was given.

**Results:** At the time of separation from parents immediately before entering the OR, the anxiety scores of the children in the parental absence group were significantly higher than those in the parental presence group. The anxiety scores between groups at the other 4 time points were not significant, including at the time of anesthesia induction.

**Conclusions:** Parents may be effective in reducing anxiety at the time of separation in children aged 3 to 6 years undergoing outpatient surgery but not at the time of anesthesia induction. These findings can help with the development of coping strategies and interventions for that time period if parental presence is not an option.

**Reviewer's Comments:** The purpose of this study was to examine whether parental presence alleviates preoperative child anxiety. However, parental presence alone cannot be the sole factor, and it is imperative that the behavior of the parent is effective. If the parents are anxious, it may lead to increased levels of anxiety in the child. Often times, a premedication such as midazolam given to the patient is more effective in reducing anxiety in the child and the parent. The decisions on how to make the preoperative experience as easy as possible for the patient and whether it includes parental presence are best left up to the anesthesiologist involved in the patient's care. (Reviewer-Anjali Panjwani, MD).

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Keywords: Child Anxiety, Separation Anxiety, Parental Presence

Print Tag: Refer to original journal article
Does IV Lidocaine for Abdominal Hysterectomy Reduce Hospital Stay?

Intravenous Lidocaine Does Not Reduce Length of Hospital Stay Following Abdominal Hysterectomy.

Bryson G, Charapov I, et. al:

Can J Anesth 2010; 57 (8): 759-766

Intravenous lidocaine infusion versus placebo does not decrease length of stay, pain score, or quality of recovery in patients undergoing abdominal hysterectomy.

Background: The use of intravenous lidocaine infusion for various abdominal surgeries has been shown to decrease pain scores, postoperative nausea and vomiting (PONV), duration of ileus, and length of hospital stay. Abdominal hysterectomy is the most common surgery in women aged >35 years. The use of lidocaine infusion may have a significant impact on perioperative care for these patients given its prevalence. In addition, the use of lidocaine can be used as a multimodal analgesic technique, potentially decreasing side effects of IV opioids, thereby improving quality of recovery.

Objective: To determine if intravenous lidocaine infusion used intraoperatively for abdominal hysterectomy reduces hospital length of stay and improves quality of recovery.

Design/Participants: This randomized, blinded, placebo-controlled trial included 90 ASA I and II women aged 30 to 69 years who were undergoing abdominal hysterectomy with or without oophorectomy.

Methods: Of these 90 women, 44 were randomized to the lidocaine group and 46 to the control group. Research personnel, patients, and anesthesiologists were blinded to group allocation. One hour before surgery, all patients were premedicated with celecoxib 400 mg and acetaminophen 975 mg. All patients received a standardized balanced general anesthetic and then either 2% lidocaine or saline bolus at 0.075 mL/kg (equivalent to 1.5 mg/kg lidocaine), followed by an infusion of 0.15 mL/kg per hour (equivalent to 3 mg/kg per hour lidocaine) until the end of surgery. Postoperative pain management was also standardized. The primary outcome, looking at the proportion of patients discharged on or before postoperative day 2 (POD2), was defined by the date the patient left the hospital. Secondary outcomes included discharge fitness, length of hospital stay, pain scores, opioid consumption, recovery of bowel function, and quality of recovery.

Results: No difference was found in demographic characteristics between the study groups, and there was no difference in the length of hospital stay or the proportion of patients discharged on or before POD2. Time to meet discharge criteria was also similar between the lidocaine and the control groups. Narcotic consumption, pain scores, and quality of recovery scores also showed no difference.

Conclusions: Intraoperative IV lidocaine infusion for abdominal hysterectomy did not affect hospital length of stay, discharge fitness in patients, pain scores, narcotic consumption, or quality of recovery.

Reviewer’s Comments: This study was well performed. There is literature evidence that IV lidocaine infusion is beneficial in decreasing pain scores, improving analgesia, and reducing hospital stay for patients undergoing abdominal surgery. So why did this study show no difference? Perhaps it was due to the use of only intraoperative lidocaine infusion compared to a longer duration of infusion in the other studies. A shorter time of infusion with lower levels of systemic lidocaine may have led to clinically insignificant findings and, therefore, no benefit in this patient population. (Reviewer-Anjali Panjwani, MD).

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Keywords: IV Lidocaine, Time to Discharge, Pain, Recovery, Opioid Use

Print Tag: Refer to original journal article
Preoperative Statin Therapy Is Not Associated With a Reduced Incidence of Postoperative Acute Kidney Injury After Cardiac Surgery.

Argalious M, Xu M, et al:

Anesth Analg 2010; 111 (August): 324-330

The reduction of perioperative mortality in cardiac surgery with cardiopulmonary bypass is not related to a decrease in acute kidney injury.

**Background:** Acute kidney injury occurs frequently (7% to 30%) after cardiac surgery and is associated with significant morbidity and mortality. Multiple mechanisms have been suggested, such as embolisms, hypoperfusion of superficial renal cortex, ischemia-reperfusion injury, and systemic inflammatory response. There is evidence that statins decrease morbidity and mortality after cardiac surgery.

**Objective:** To investigate whether preoperative statin therapy affects the incidence of acute kidney injury and mortality after cardiac surgery with cardiopulmonary bypass.

**Methods:** This retrospective study involved a review of the Cardiothoracic Anesthesia Patient Registry with 10,648 consecutive patients who underwent cardiac surgery with cardiopulmonary bypass (including valve surgery) between January 2002 and December 2006. Exclusion criteria included the use of off-bypass cardiac surgery and the presence of end-stage renal disease. The primary outcome was the occurrence of acute kidney injury; secondary outcomes included the need for postoperative dialysis and hospital mortality.

**Results:** Acute kidney injury occurred in 13.31% of patients on statin therapy and 10.41% of patients without statin therapy. Postoperative dialysis was needed in 1.75% of patients on statin therapy and 1.65% of those without statin therapy. The incidence of mortality in patients on statin therapy and those without statins was the same, 1.71%. Multivariate logistic regression analysis did not identify an association of statin therapy with acute kidney injury (OR, 0.97; 95% CI, 0.84 to 1.12). In propensity-matched pairs, the incidence of acute kidney injury, dialysis, and mortality was not significantly different ($P = 0.38$; $P = 0.22$; $P = 0.19$).

**Conclusions:** Statin therapy is not associated with a decrease in acute kidney injury, dialysis, or mortality after cardiac surgery with cardiopulmonary bypass.

**Reviewer's Comments:** Several considerations must be taken into account with this study. It is a retrospective cohort study in which the dose, duration, and formulation of statin therapy were not addressed. Based on the literature, the statin effects appear to be dose specific, so conclusions of this study may not be applicable to all patients. As the authors point out, the study was also underpowered to detect the statistical difference in investigated outcomes. Therefore, the question of statin effects must be investigated further before we make any final conclusions on their effects. (Reviewer-Mojca Remskar Konia, MD).

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Keywords: Statin, Cardiac Surgery, Acute Kidney Injury

Print Tag: Refer to original journal article
Hypothermia, Brain Protection, and Cardiac Issues -- More Studies Are Needed

Perioperative Hypothermia (33°C) Does Not Increase the Occurrence of Cardiovascular Events in Patients Undergoing Cerebral Aneurysm Surgery: Findings From the Intraoperative Hypothermia for Aneurysm Surgery Trial.

Nguyen HP, Zaroff JG, et al:

Anesthesiology 2010; 113 (August): 327-342

Perioperative hypothermia is not associated with an increase in cardiovascular events during cerebral aneurysm surgery.

Background: Hypothermia is continuously used to decrease neurologic insult after stroke, out-of-hospital cardiac arrest, and head trauma. The use of hypothermia is inhibited by reports that cardiovascular events are increased with hypothermia by 2- to 6-fold. The presented data are part of the post hoc analysis of the Intraoperative Hypothermia for Aneurysm Surgery Trial (IHAST) with regard to cardiovascular events.

Objective: To explore the association between intraoperative hypothermia and cardiovascular events.

Participants: The study was a multicenter, prospective, randomized, partially blinded trial; 1001 patients were included into the IHAST trial.

Methods: 499 patients underwent hypothermia (33°C), and 501 patients were kept normothermic (36.5°C). Cardiovascular events were defined as hypotension or hypertension, vasopressor use, arrhythmias, myocardial infarction, congestive heart failure, cardiopulmonary resuscitation, coronary angiography, cardiac surgery, or vascular surgery. A smaller subset of 62 patients (33 hypothermia, 29 normothermia) had cardiac troponin I and transthoracic echocardiography (TTE) performed no more than 24 hours before surgery and again 8 to 24 hours after surgery. TTE reported left ventricular ejection fraction and regional wall motion abnormalities using a 16-segment wall motion score. Patients who were hypothermic at the end of surgery were kept intubated postoperatively and were extubated once normothermia was re-established.

Results: The incidence of cardiovascular events did not differ between hypothermic and normothermic patients. No difference was noticed between groups with regard to regional wall motion abnormalities and left ventricular ejection fraction. The hypothermic group had no postoperative increase in troponin I, and the normothermic group had a slight postoperative increase in troponin I (P=0.038).

Conclusions: In patients undergoing cerebral aneurysm surgery, perioperative hypothermia was not associated with an increased cardiovascular morbidity.

Reviewer’s Comments: Since hypothermia is one of the only measures that has proven to decrease neurologic injury, the question of the effects of hypothermia on cardiovascular complications remains interesting and actively investigated. Previous studies have reported increased cardiovascular morbidity and mortality related to hypothermia. The presented report, in contrast, shows no negative effects of hypothermia. Let’s look at the presented study. It is a post hoc analysis, so the patient selection was not designed to answer the presented question. Furthermore, the study population had a very low rate of cardiovascular complications, which is significantly lower from the previously reported numbers. The post hoc studies also cannot determine the extent to which cardiovascular events have affected outcome. The results of the presented study, therefore, need to be viewed with some caution. (Reviewer-Mojca Remskar Konia, MD).

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Keywords: Perioperative Hypothermia, Cardiovascular Events, Cerebral Aneurysm Surgery

Print Tag: Refer to original journal article
Does Local Anesthesia for Laparoscopic Surgery Decrease Postop Pain?


Surg Endosc 2010; May 20 (): epub ahead of print

For laparoscopic surgery, there is no advantage to performing pre-emptive local infiltration at the incision site versus infiltration at the end of surgery.

Objective: To determine if the timing of local anesthetic administration had any effect on postoperative pain following laparoscopic surgery.

Design: A literature search was performed aimed at locating randomized, controlled studies involving laparoscopic surgery and the use of local anesthetic for infiltration at the incision site or intraperitoneally. Local anesthetic administration was considered as either pre-emptive or postoperative. The additional inclusion criteria consisted of at least one or more outcome measures related to pain, quality of life, postoperative complications, or hospital length of stay.

Methods: A total of 26 studies met the inclusion criteria and were used in the final meta-analysis. These studies were published between 1993 and 2007, with sample population sizes ranging from 28 to 190 patients. The most common surgeries performed were laparoscopic cholecystectomy or gynecologic-related procedures. The 3 local anesthetics used in the studies were lidocaine, ropivacaine, and bupivacaine, with bupivacaine being the most frequently used. The local anesthetic was either infiltrated at the incision site or administered intraperitoneally. Comparisons were made between pre-emptive and postoperative administration performed at the conclusion of surgery. Visual analog pain scores and opioid and non-opioid analgesic usage for the first 24 hours after surgery completion were the main outcomes that had sufficient data for analysis.

Results: Compared to placebo, both pre-emptive administration of local anesthetic at the incision site and intraperitoneal administration decreased pain scores at the 4-hour and 24-hour markers. However, neither showed any decrease in supplemental analgesic usage. When comparing the pre-emptive administration of the local anesthetic versus the postoperative infiltration at the incision site, there were no significant differences in either pain scores or supplemental analgesic usage. However, this was not the case with intraperitoneal infiltration. With the pre-emptive intraperitoneal administration of local anesthetic versus postoperative administration, pain scores were lower at the 8-, 12-, and 24-hour markers. Yet, despite the lower pain scores, there was no difference in supplemental analgesic usage.

Conclusions: The timing of local anesthetic infiltrated at the incision site has no effect on postoperative pain control after laparoscopic surgery. The use of pre-emptive intraperitoneal administration decreases reported pain scores; however, this is not associated with a decrease in supplemental analgesic usage.

Reviewer's Comments: I am not sure it is worth giving any local anesthetic if it doesn't have any effect on supplemental analgesic usage. The main purpose of using local anesthesia from a regional standpoint is to decrease opioid usage to alleviate the problematic associated side effects. Perhaps a difference would have been found in studies in which the prolonged administration of local anesthetic via disposable pumps was utilized. (Reviewer-Michelle L. Schlunt, MD).

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Keywords: Local Anesthesia, Laparoscopy

Print Tag: Refer to original journal article
Does Thoracic Epidural Worsen Oxygenation During One-Lung Ventilation?

The Effect of Thoracic Epidural Anesthesia on Pulmonary Shunt Fraction and Arterial Oxygenation During One-Lung Ventilation.

Jung SM, Cho CK, et al:

J Cardiothorac Vasc Anesth 2010; 24 (June): 456-462

When comparing the use of thoracic epidural local anesthetic, epidural opioid, and intravenous opioid, all techniques produce similar effects on oxygenation and pulmonary shunt fraction during one-lung ventilation.

Objective: To assess and compare the effects of thoracic epidural local anesthetic, epidural opioid, and intravenous opioid on pulmonary shunt fraction, oxygenation, and hemodynamics during one-lung ventilation.

Design: Prospective, randomized, double-blinded study.

Participants: The participants were adult patients scheduled for elective pulmonary resection requiring intraoperative one-lung ventilation.

Methods: All patients received preoperative pulmonary function testing and room air arterial blood gas sampling. On the day of surgery, patients underwent thoracic epidural placement followed by a standardized general anesthetic with propofol. Patients were randomized to 1 of 3 groups: the first group entailed the use of epidural bupivacaine; the second group entailed the use of epidural sufentanil; and the third group received an intravenous remifentanil infusion. The epidural bupivacaine group received a loading dose of 50 mg bupivacaine followed by a continuous infusion of 0.25% bupivacaine at 0.1 mL/kg per hour along with an intravenous normal saline infusion at 0.2 mL/kg per hour. The epidural sufentanil group received a loading dose of 50 μg sufentanil followed by a continuous infusion of sufentanil 1 μg/mL at 0.1 mL/kg per hour along with an intravenous normal saline infusion at 0.2 mL/kg per hour. The final group received a continuous intravenous infusion of remifentanil 20 μg/mL at 0.2 mL/kg per hour along with an epidural normal saline infusion at 0.1 mL/kg per hour. The values for arterial and venous gas sampling with concurrent hemodynamics were recorded at 5 particular study points: during 2-lung ventilation; 15, 30, and 60 minutes after the beginning of one-lung ventilation; and 15 minutes after resuming 2-lung ventilation. After the completion of all measurements, all 3 groups had their epidural infusion changed to 0.2% ropivacaine combined with sufentanil 1 μg/mL infused at 0.05 mL/kg per hour.

Results: 39 patients were included for the final analysis. The only significant hemodynamic-related finding was the higher mean arterial pressure in the remifentanil group compared to the epidural sufentanil group at 15 and 30 minutes after the beginning of one-lung ventilation. There were no significant differences in arterial and venous oxygenation or in pulmonary shunt fraction between the 3 groups.

Conclusions: All 3 anesthetic methods had comparable effects on hypoxic pulmonary vasoconstriction, resulting in similar changes in pulmonary shunt fraction and oxygenation during one-lung ventilation.

Reviewer’s Comments: It was interesting that the epidural sufentanil group had the reportedly lower mean arterial pressure during one-lung ventilation, especially considering the large loading dose of bupivacaine that was administered. Many anesthesiologists do not want to use a thoracic epidural intraoperatively and blame the local anesthetic as the problem for any hypotension that occurs. However, as demonstrated in this study, when one is diligent to maintain original central venous pressure values with judicious fluid administration, the decrease in mean arterial pressure is not significant. (Reviewer-Michelle L. Schlunt, MD).

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Keywords: Thoracic Epidural, One-Lung Ventilation, Hypoxic Pulmonary Vasoconstriction

Print Tag: Refer to original journal article
Perioperative Seizures -- What to Look For

Perioperative Seizures in Patients With a History of a Seizure Disorder.

Niesen AD, Jacob AK, et al:

Anesth Analg 2010; 111 (September): 729-735

The anesthetic technique does not affect the risk of perioperative seizures.

Background: Data are limited on the incidence and risk factors for seizures in the perioperative period in patients with a history of a seizure disorder. Several perioperative conditions (such as decreased gastrointestinal absorption, drug interactions, skipping anti-seizure medications, stress, electrolyte disturbances, or sleep deprivation) may change seizure threshold.

Objective: To assess the incidence of perioperative seizures as well as risk factors in patients with a history of seizures undergoing any type of anesthesia.

Methods: The charts of patients with a history of seizures who were >2 years of age and who received any anesthetic (general, regional, or MAC) between 2002 and 2007 were reviewed. The mean age was 52.8 years. Excluded conditions were outpatient and intracranial surgeries, ASA class V, pregnancy, and <24 hours since hospital admission. The following information was derived from the patients' charts: demographics, details of the seizure disorder (type, frequency, most recent episode, and medications), surgical procedure details, type of anesthetic used for induction and maintenance, use of benzodiazepine in the anesthesia, and details of any postoperative seizures that occurred within 3 days after surgery. The triggering mechanism of seizures was determined from the preoperative frequency, anti-seizure drug levels, EEG and radiographic imaging results, neurology consultation, and seizure details. Associations between baseline characteristics and perioperative seizures were analyzed.

Results: The majority of patients (73%) received general anesthesia; in the remaining patients, the methods were almost equally divided between regional, regional-general, and monitored anesthesia care. The incidence of perioperative seizures was 3.4% (22 from 641 patients). The majority of patients experienced their usual type of seizures. Subtherapeutic drug levels were found in 6 of the 22 patients, and 2 patients had missed their anti-seizure medications. Younger age, the use of multiple anti-seizure medications, more frequent seizures, more recent seizure activity, and hospital admission were associated with a higher risk of perioperative seizures. Neither the anesthetic technique nor the type of surgical procedure was found to be related to perioperative seizures. Two patients had regional anesthesia, but their seizures were unrelated to the regional block.

Conclusions: The risk of perioperative seizures is not influenced by the anesthetic technique and the type of surgical procedure. However, the severity of the patient's underlying seizure condition places him or her at increased risk for recurrence of seizures in the perioperative period. A higher frequency of seizures, the recent occurrence of seizures, and the use of multiple medications are found to be risk factors.

Reviewer's Comments: The likelihood of perioperative seizures is low in patients with a pre-existing seizure disorder. However, we need to be cautious and be prepared to treat seizures in patients with a recent seizure event, those with an increased frequency of seizure, and those who are on multiple medications. (Reviewer-Ioanna Apostolidou, MD).

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Keywords: Seizures, History, Perioperative, Anesthesia

Print Tag: Refer to original journal article
Jugular Vein Cross-Sectional Area Changes Occur in Response to Trendelenburg, PEEP


Marcus HE, Bonkat E, et al:

Anesth Analg 2010; 111 (August): 432-436

Trendelenburg produces the greatest increase of the right jugular vein cross-sectional area.

**Background:** Internal jugular vein cannulation is often performed by physicians and is facilitated by the use of ultrasound. The success rate of central line placement depends on the cross-sectional area (CSA) of the vein. Therefore, several maneuvers or their combinations have been used to increase the CSA of the right internal jugular vein, the vein most often used to obtain central access. These maneuvers include the Trendelenburg position, the Valsalva maneuver, hepatic compression, humming a tune, carotid palpation, needle advancement, and several combinations of these maneuvers.

**Objective:** To determine the changes of the CSA of the right internal jugular vein in response to different levels of positive end-expiratory pressure (PEEP), the Trendelenburg position, and their combinations.

**Design:** Prospective observational study.

**Methods:** The study sample consisted of 50 ASA physical status III patients scheduled to undergo cardiothoracic surgery. Patients with pulmonic or tricuspid valve disease, pulmonary hypertension, congestive heart failure, severe COPD, obesity, or hemodynamic instability were excluded. After anesthesia induction and starting mechanical ventilation, 500 mL of fluids were given, and the patients were placed in the supine position with 0 PEEP and 5° to 10° head rotation to the left. The CSA of the right internal jugular vein was assessed by ultrasound (SonoSite®) at the level of the incision of the thyroid cartilage and with the least pressure to avoid vein compression. Images were obtained at end-expiration after applying 5 different maneuvers in random order: a PEEP of 5 cm H₂O; a PEEP of 10 cm H₂O; 20° Trendelenburg with 0 PEEP; Trendelenburg with a PEEP of 5 cm H₂O; and Trendelenburg with a PEEP of 10 cm H₂O. A 20% increase in the CSA was defined as clinically significant.

**Results:** PEEP resulted in a clinically significant increase in the CSA in only one-third of patients, while the Trendelenburg position produced a significant increase in the majority of patients; 54% with 0 PEEP, 52% with a PEEP of 5 cm H₂O, and 68% with a PEEP of 10 cm H₂O. The combination of Trendelenburg with a PEEP of 10 cm H₂O resulted in the largest increase of the CSA of the vein (49.7%) compared to the control, while the combination of Trendelenburg with a PEEP of 5 cm H₂O did not further increase the CSA compared to Trendelenburg with 0 PEEP.

**Conclusions:** The authors attributed the greater increase produced by Trendelenburg to the higher position of the right atrium. Since the Trendelenburg position is so effective, the authors recommend use of the Trendelenburg position alone in hemodynamically unstable or hypovolemic patients.

**Reviewer's Comments:** Placing a central vein catheter can be difficult, especially in patients with small vessels. Venipuncture may lead to vein collapse and make placement more difficult. Therefore, the Trendelenburg position should be used when placing a right internal jugular vein catheter to increase vessel size in anesthetized patients. Adding a PEEP of 10 cm H₂O can be used in hemodynamically stable patients. (Reviewer-Ioanna Apostolidou, MD).

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Keywords: Internal Jugular, Vein Cross-Sectional Area, PEEP, Trendelenburg

Print Tag: Refer to original journal article
Can ASA Be Safely Continued Without Risk of Bleeding?

To Continue or Discontinue Aspirin in the Perioperative Period: A Randomized, Controlled Clinical Trial.

Oscarsson A, Gupta A, et al:

Br J Anaesth 2010; 104 (3): 305-312

Major adverse cardiac events may be prevented in high-risk patients who are continued on aspirin in the perioperative period without a significant risk of bleeding.

Background: 40 million patients undergoing non-cardiac surgery every year have coronary artery disease or are at risk for it. Up to 10% of these patients may have a major adverse cardiac event (MACE) including cardiac arrest, nonfatal myocardial infarction (MI), and death. Aspirin (ASA) decreases MI, cerebrovascular accident (CVA), and vascular events in patients with ischemic heart or cerebrovascular disease. Therefore, high-risk patients are often placed on ASA as a means to prevent MI or CVA. Despite all of these benefits, patients are often asked to discontinue ASA therapy before surgery due to the risk of perioperative bleeding.

Objective: To determine whether low-dose ASA would reduce the incidence of myocardial damage and MACE (MI, death, arrhythmia, cardiac arrest) without an increase in bleeding.

Design: Randomized, double-blind, placebo-controlled multicenter trial.

Participants/Methods: 220 patients undergoing elective high- or intermediate-risk surgery who had at least 1 cardiac risk factor were enrolled and received either ASA 75 mg (n=109) or placebo (n=111) in the perioperative period, which included 7 days before surgery until the 3rd postoperative day. The primary end point measured was postoperative myocardial damage defined as a troponin T (TnT) level ≥0.04 µg/L at least once in the perioperative period. Secondary end points were MACE or CVA/transient ischemic attack (TIA) within the first 30 postoperative days, perioperative blood loss and major bleeding within 30 days of surgery, and packed red blood cell (PRBC), plasma, and platelet transfusion.

Results: The incidence of a TnT level ≥0.04 was greater in the placebo group compared to the ASA group, but this result was not statistically significant. The relative risk of MACE and cardio-cerebrovascular disease within 30 days was significantly higher in the placebo group compared to the ASA group. No significant difference in perioperative bleeding or blood product transfusion was seen between the 2 groups.

Conclusions: Low-dose ASA therapy continued in the perioperative period may reduce the risk of a major cardiac event within 30 days of surgery in high-risk patients without an increased risk of bleeding.

Reviewer's Comments: Although this study has some interesting results, the authors indicate that it is underpowered to make any conclusions about whether aspirin can be safely continued in the perioperative period. A total of 540 patients were required to analyze these data to statistical significance, and this study included less than half that number. Another hurdle may have been due to exclusion of high-risk patients with intracoronary stents or patients undergoing vascular surgery, both instances in which continuing ASA is recommended. (Reviewer-Anjali Panjwani, MD).

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Keywords: Non-Cardiac Surgery, Cardiac Complications, Bleeding

Print Tag: Refer to original journal article
Surgery Location Is Important Consideration

Outpatient Surgery Performed in an Ambulatory Surgery Center Versus a Hospital: Comparison of Perioperative Time Intervals.

Trentman TL, Mueller JT, et al:


Outpatient breast surgery performed at an ambulatory surgery center (versus the hospital) has shorter perioperative time intervals, which could contribute to greater productivity and efficiency.

Background: There is a common perception that outpatient surgery can be more efficiently performed in a dedicated ambulatory surgery center (ASC) rather than in a hospital. The authors of this study evaluated perioperative time intervals for outpatient breast surgery when their ASC closed and these surgeries were integrated into the hospital. Decreasing time intervals could potentially increase operating room (OR) efficiency and productivity, begging the question of whether the location really matters.

Objective: To compare perioperative time intervals of outpatient unilateral segmental mastectomies performed in an ASC versus a hospital setting.

Participants/Methods: This retrospective review included 92 patients undergoing unilateral segmental mastectomy with or without sentinel lymph node biopsy, with or without axillary dissection in an ASC over a 2-year period. Ninety-two patients undergoing the same procedure in a hospital OR were then reviewed. The procedures were performed by 2 staff surgeons without productivity bonuses. The following perioperative time intervals were recorded: preoperative time, defined as the time from entry into holding area to entrance into OR; entry into the OR to surgical incision time; incision to surgical closure time; closure to OR exit time; PACU time; and total facility time, which was entrance into holding area to exit from the PACU. Anesthetic technique, medication use, and adverse events were also recorded.

Results: Significantly shorter preoperative time (time from entry into holding area to entrance into OR), OR entry to incision time, and total facility time was observed when surgery was performed in the ASC. There was no difference in surgical times, closure to OR exit times, and PACU times in either location. The use of a laryngeal mask airway (LMA) and propofol infusion was also more frequent in the ASC. There was no difference in adverse events or PACU problems in either setting.

Conclusions: Shorter perioperative time intervals have been demonstrated when surgery is performed in a dedicated outpatient surgery center and could possibly lead to greater OR efficiency, productivity, and patient satisfaction.

Reviewer's Comments: I found this study interesting because I work predominantly in an outpatient ambulatory setting within a large academic institution. Our breast surgery patients undergo their procedure in this area away from the main operating rooms of the hospital. It appears that turnover time and time to entry into the OR is shorter in our ASC than our main hospital. This may be due to cases going longer than anticipated or emergency cases leading to delays in the hospital. We also have a dedicated nursing staff (circulator, scrub nurse, surgical first assist nurse) who work with the surgeons on a regular basis to help with efficiency. Our surgeons prefer the ASC location to that of the main hospital and it has improved patient satisfaction. (Reviewer-Anjali Panjwani, MD).

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Keywords: Outpatient Surgery, Ambulatory Care Center, Hospital, Efficiency

Print Tag: Refer to original journal article
The Solus™ laryngeal mask airway produces a better oropharyngeal seal and a better fiberoptic view of the cords than does the i-gel mask.

**Background:** The i-gel is a single-use device made from a medical grade thermoplastic elastomer. It is noninflatable and anatomically seals the pharyngeal and the peripharyngeal structures.

**Objective:** To compare the performance of the i-gel with that of the Solus™ laryngeal mask airway (LMA) during general anesthesia.

**Design:** Prospective, randomized clinical study.

**Participants:** 120 ASA I to II patients scheduled for elective surgery under general anesthesia.

**Methods:** Patients were randomly assigned to either the Solus™ LMA or the i-gel. Anesthetic management was standardized and cisatracurium 0.15 mg/kg was given to facilitate insertion of the supraglottic airway device. The Solus LMA 3 was used for patients weighing 40 to 60 kg and 4 for those between 60 and 90 kg. The i-gel 3 was used for patients weighing 30 to 60 and size 4 was used for the others. Three attempts were allowed, and manipulations were allowed to achieve a good airway. Effective ventilation was defined as a proper chest expansion, a square wave capnograph trace, absence of audible leak, and lack of gastric insufflation. The total time from grasping the device to recording a square wave capnograph trace was recorded. After connection to the breathing circle, peak pressure was recorded at a tidal volume of 8 mL/kg, a respiratory rate of 12 breaths/minute, and an I:E ratio of 1:2. The oropharyngeal leak pressure was measured, and the position of the device was assessed and graded by the investigators using the fiberoptic bronchoscope (1 to 4 grading the visualization of the vocal cords). Once the patient was awake, the device was removed and inspected for traces of blood. The patients were interviewed in the postanesthesia care unit regarding their comfort (pain, dysphagia, and dysphonia). For statistics, Student’s t-test, chi-squared, or Fisher’s exact test were used, and a $P$ value <0.05 was considered significant.

**Results:** 115 patients completed the study. One patient in the LMA group and 4 in the i-gel group needed tracheal intubation because adequate ventilation could not be achieved. Successful placement at first attempt was achieved in 80% of the LMA group versus 77% of the i-gel group. Insertion time was similar in both groups (24.2 seconds in the LMA group vs 20.0 seconds in the i-gel group). The oropharyngeal leak pressure was significantly higher in the LMA group (22.6 cm H$_{2}$O) compared to the i-gel group (19.3 cm H$_{2}$O), as was the fiberoptic view. No significant differences were found in the peak pressure, blood on the device, or in the postoperative interviews regarding sore throat and dysphagia.

**Conclusions:** The Solus LMA produces a better oropharyngeal seal and a better fiberoptic view of the cords than the i-gel mask.

**Reviewer’s Comments:** The limitation of the study is that the investigators had less experience with the i-gel mask. The length of the i-gel mask is important to achieve a good seal rather than choosing the size according to the weight as recommended. Therefore, more experience is needed. (Reviewer-Olga Plattner, MD).

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Keywords: Laryngeal Mask Airway, i-gel, Solus™

Print Tag: Refer to original journal article
Reproducibility of the Cormack–Lehane classification is limited among both anesthesiology specialists and residents.

**Background:** The Cormack–Lehane (CL) classification is a grading system commonly used to describe laryngeal view during direct laryngoscopy. However, despite its widespread use, the CL classification has not been fully validated.

**Objective:** To test that the CL classification system is poorly known in detail among anesthesiologists.

**Design:** Randomly assigned prospective study.

**Participants:** 120 anesthetists at the European Society of Anaesthesiology annual meeting.

**Methods:** A questionnaire was randomly handed out to attendees, who were recruited on a voluntary and anonymous basis. The first question asked whether any classifications of the CL were known to describe the visibility of the glottis and laryngeal structures during laryngoscopy. Subsequently, participants were interviewed regarding the CL classification and their ability to define all 4 grades. The last part consisted of demographic items. The CL classification was tested on the SimMan™ (normal and difficult airway). The 4 settings were obtained and were found the CL grades 1 to 4 by 2 other staff anesthesiologists. Twenty anesthetists were asked to perform 5 laryngoscopies (grade 2 was performed twice) in random order with the Macintosh blade size 3. Participants were allowed to look without time limit, and no external laryngeal manipulations were allowed. After each laryngoscopy, the participants announced the observed CL grade, which was documented by the research team. Categorical data were compared using Fisher’s exact test, and the CL grade in the SimMan was assessed by Cohen’s κ coefficient for 2 raters.

**Results:** Data from 117 participants were analyzed; 93 were specialists and 24 were residents. Among the participants, 89% claimed to know the classification and to describe the structures, but only 53% named the correct classification. Knowledge did not differ between anesthesiology specialists and residents (\( P > 0.05 \)) and did not differ between European and non-European countries. In 56 of the laryngoscopies, the observed grade conformed to the preset grade, whereas no agreement was observed in 44 cases. Furthermore, 10 of the 20 participants agreed in their first and second assessment, 6 participants assigned a lower grade and 4 assigned a higher grade at the second evaluation.

**Conclusions:** Reproducibility of the CL classification is limited among anesthesiology specialists and residents despite a widespread use of the CL classification.

**Reviewer’s Comments:** The results of this study question the validity of the use of the CL classification in clinical and research settings. (Reviewer-Olga Plattner, MD).

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Keywords: Laryngoscopy, Laryngeal View, Cormack–Lehane Classification System

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Glidescope vs Karl Storz DCI Videolaryngoscopes

A Comparison of the Glidescope® and Karl Storz DCI® Videolaryngoscopes in a Paediatric Manikin.

Hurford DM, White MC:

Anaesthesia 2010; 65 (August): 781-784

The efficacy of the Glidescope® and Storz® are equal in the Simbaby model for normal and difficult airway conditions.

**Background:** A new disposable pediatric videolaryngoscope became available, the Glidescope® Cobalt GVL Stat. A study showed that the laryngeal view was better, but the intubation time was longer in children.

**Objective:** To compare the efficacy between the pediatric Glidescope and the pediatric Karl Storz DCI® videolaryngoscope in a manikin model under difficult and normal airway conditions.

**Design:** Nonclinical randomized study.

**Participants:** 32 anesthetists who completed their training in pediatric anesthesia.

**Methods:** A Simbaby® manikin (simulating a 3- to 6-month-old infant) was used for the normal condition, and the difficult condition was achieved using a combination of tongue oedema and pharyngeal obstruction. The pediatric size 2 Glidescope Cobalt GVL Stat blade and the Karl Storz Miller 1 blade were used. Four intubations were performed in a random order determined by 2 tosses of a coin. The first toss determined which device was to be used, and the second toss determined the level of the airway difficulty. Participants were blinded to the level of airway difficulty. A size 4 uncuffed and unstyletted tracheal tube was used for all intubations. The time from the laryngoscope entering the oral cavity until the successful inflation of the lungs was the primary outcome. Participants evaluated both devices using a visual analogue scale (field of view, ease of use, willingness to use in an emergency, and overall satisfaction. Results were analyzed using a paired t-test.

**Results:** There was no difference in time taken to tracheal intubation between both devices in the manikin-simulated normal condition or the difficult airway condition. There was no difference in the visual analogue scores for field of view, ease of use, willingness to use in an emergency, and overall satisfaction.

**Conclusions:** The efficacy of both devices was equal in the Simbaby model for normal and difficult airway conditions.

**Reviewer’s Comments:** A manikin model is not transferable to real life. The Glidescope might cause more trauma in difficult intubations though the view of the larynx might be equally good as with the Storz laryngoscope; however, positioning the tube can be more difficult due to the lifting and rocking technique required. (Reviewer-Olga Plattnner, MD).

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Keywords: Glidescope®, Karl Storz DCI®, Videolaryngoscope

Print Tag: Refer to original journal article
Incidence of PAS Increased With Higher Doses of Remifentanil

Intraoperative High-Dose Remifentanil Increases Post-Anaesthetic Shivering.

Nakasuji M, Nakamura M, et al:

Br J Anaesth 2010; 105 (August): 162-167

The higher incidence of postanesthesia shivering (PAS) with high doses of remifentanil probably reflects the mechanism of remifentanil-induced PAS, that is, acute opioid tolerance and stimulation of N-methyl-D-aspartate receptors as in hyperalgesia.

**Background:** Anesthesia with remifentanil often leads to postoperative shivering, which might be related to activation of N-methyl-D-aspartate (NMDA) receptor. **Objective:** To examine the effects of high- and low-dose remifentanil on postanesthesia shivering (PAS) in surgical patients. **Design:** Prospective, randomized, blinded study. **Participants:** 50 patients undergoing gynecological laparotomy. **Methods:** All patients were premedicated with midazolam, and an epidural was placed. Anesthesia was induced with propofol, remifentanil, and vecuronium. After, intubation anesthesia was maintained with propofol and, based on randomization, with remifentanil 0.1 or 0.25 µg/kg per minute. Pain control was achieved with titration of ropivacaine. Systolic blood pressure in a range between -20% and 0% of the preanesthetic value, and a bispectral index between 30 and 50 was the goal. However, an operation exceeding 4 hours was discontinued from the study. Vital signs were recorded routinely; before skin closure, 100 µg of fentanyl were administered via the epidural catheter. After emergence from anesthesia, the patients were kept 30 minutes in the operating department and another 30 minutes in the wards. PAS was checked by the operating theater staff and by a nurse in the wards using a 5-point rating scale (0, no shivering; 1, peripheral vasoconstriction; 2, visible muscular shivering to 1 muscle group; 3, visible muscular shivering in >1 muscle group; and 4, gross muscular activity. Scores of 3 and 4 represented PAS. PAS was treated with a warm blanket, and when shivering persisted >15 minutes, pentazocine 15 mg was administered. Data were expressed as mean and Student’s t-test, chi-squared, and Fisher’s exact test were used to compare the 2 groups. A P value <0.05 was considered significant. **Results:** 50 patients were analyzed. During the first hour, PAS occurred more frequently in the high-dose group (60%) compared to the low-dose group (20%; P <0.009). The temperature was normotherm in both groups, and patients in both groups were pain free. **Conclusions:** Intraoperative body temperature does not correlate with remifentanil-induced PAS. The higher incidence of PAS with high doses of remifentanil probably reflects the mechanism of remifentanil-induced PAS, that is, acute opioid tolerance and stimulation of NMDA receptors as in hyperalgesia. **Reviewer’s Comments:** Due to the stimulation of the NMDA receptors through remifentanil, postanesthesia shivering could be avoided by intraoperative ketamine. (Reviewer-Olga Plattner, MD).

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Keywords: Postanesthesia Shivering, Remifentanil

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Objective: To evaluate the effects of the menstrual cycle, particularly the follicular and the luteal phases, on the rate pressure product (RPP) response to tracheal intubation (TI).

Design/Participants: Prospective, clinical, double-blind study involving 62 adult women (ASA I and II) scheduled for elective surgery under general anesthesia and requiring TI.

Methods: Patients were assigned to 1 of 2 groups according to the phase of their menstrual cycle. The follicular group (group F) included patients who were on the 1st to 12th day after the first day of their last menstruation. The luteal group (group L) included patients on the 20th to 24th after the first day of their last menstruation. Patients between the 13th and 19th day of the last menstrual cycle were excluded to better discriminate between the follicular and the luteal phases. Patients on the 24th or more days of their menstrual cycle were also excluded because progesterone levels start decreasing after day 24. All TIs were performed by the same anesthesiologist who was blinded to study groups. Intubation time and vital signs were recorded at 1, 2, 3, 4, 5, and 10 minutes after TI. RPP was calculated for each time point. The primary hypothesis was that the luteal phase results in a larger increase in RPP at 1 minute after endotracheal intubation.

Results: Study groups were similar in regard to demographic data and intubation times. Before administration of the IV anesthetic, hemodynamic variables were also similar between the groups. RPP values at minute 1 after intubation were significantly higher in group L than in group F ($P<0.001$). Intergroup and intragroup analysis of oxygen saturation, end-tidal carbon dioxide, and requirements of atropine, ephedrine, or fentanyl were similar between the groups. No patients experienced laryngospasm or bronchospasm.

Conclusions: Female patients had significantly increased RPP response to TI in the luteal phase of their menstrual cycle.

Reviewer's Comments: A limitation of the study is that serum estrogen and progesterone levels along with serum catecholamines were not measured. The authors could have also studied RPP in a response to surgical incision. (Reviewer-K. George Bojanov, MD).

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Keywords: Laryngoscopy, Hemodynamics, Menstrual Cycle, Tracheal Intubation

Print Tag: Refer to original journal article
The noninvasive transcutaneous carbon dioxide monitor is reliable for predicting arterial carbon dioxide pressure during prolonged carbon dioxide pneumoperitoneum.

**Objective:** To assess the efficacy of transcutaneous carbon dioxide (PTCCO$_2$) noninvasive monitoring in predicting arterial carbon dioxide (PACO$_2$) values during prolonged pneumoperitoneum in laparoscopic surgeries.

**Design/Participants:** Prospective, clinical study involving 16 ASA I to III patients scheduled for either laparoscopic radical gastrectomy or laparoscopic radical proctectomy.

**Methods:** An arterial catheter was inserted in each patient for arterial blood gas (ABG) sampling. Ptcco$_2$ was monitored using a V-SignTM system. Calibration was performed with standard gas before the start of measurements. A Ptcco$_2$ probe was attached to an ear lobe after both the probe and the ear lobe were cleaned with alcohol. ABG, Ptcco$_2$ and PACO$_2$ were recorded simultaneously at baseline and at 30 and 60 minutes after establishment of pneumoperitoneum using intraperitoneal carbon dioxide at pressure of 14 mm Hg. The patient’s blood pressure, heart rate, tidal volume, and respiratory rate were kept constant for at least 5 minutes before measurements.

**Results:** 11 patients had laparoscopic proctectomy and the rest underwent laparoscopic radical gastrectomy. The mean pneumoperitoneum time was 83 ± 16 minutes. The Ptcco$_2$ was correlated with the Paco$_2$ at each time point (P <0.05). The partial pressure of the expired carbon dioxide (Petco$_2$) were closely correlated with Paco$_2$ at baseline (P <0.05) but not at 30 minutes and at 60 minutes after pneumoperitoneum (P >0.05). Using Bland–Altman analysis, the average Paco$_2$ - Petco$_2$ difference was 7.5 ± 7.0 mm Hg, while the average Paco$_2$ - Ptcco$_2$ difference was -0.9 ± 6.4 mm Hg.

**Conclusions:** During laparoscopic radical gastrectomy or proctectomy utilizing prolonged carbon dioxide pneumoperitoneum, PTCCO$_2$ is more accurate in predicting Paco$_2$ than is Petco$_2$.

**Reviewer's Comments:** For people not familiar with Ptcco$_2$ monitoring, I would like to point some of the technical limitations of the method. These include a very slow response time and a constant need for readjustment for good contact between the sensor and the patient’s skin. Last, but not least, is the very long warm-up time before the sensor can be used. (Reviewer-K. George Bojanov, MD).

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Keywords: Transcutaneous Carbon Dioxide, Laparoscopic Surgery

Print Tag: Refer to original journal article
There is no advantage to the routine use of ropivacaine over bupivacaine for labor epidural analgesia.

**Objective:** To assess whether there is an advantage to the use of either bupivacaine or ropivacaine for epidural labor analgesia.

**Design:** Systemic review of existing study literature. **Pharmacology:** Ropivacaine is an amide local anesthetic containing just a pure levorotatory enantiomer. It is a homolog of bupivacaine and mepivacaine, differing in the group attached to the piperidino ring. Mepivacaine has a methyl group, bupivacaine has a butyl group, and ropivacaine has a propyl group attached to the ring. **Potency:** The 2 studies used for this review compared potency of epidural ropivacaine and bupivacaine in parturients in early labor and established that the potency of ropivacaine was approximately 60% that of bupivacaine. Effective concentrations of both drugs are different, but studies show that similar doses were consumed during the course of long labor secondary to other factors. **Toxicity:** Models suggest that the convulsive dose of ropivacaine is 1.5 to 2.5 times larger than bupivacaine on an mg/kg basis. The fatal dose for cardiac toxicity was larger in animals given ropivacaine. Pregnancy in animals did not enhance local anesthetic toxicity. In humans, central nervous system symptoms occurred at a lower dose of bupivacaine, and study participants tolerated approximately 25% more ropivacaine than bupivacaine. Both local anesthetics depress conductivity and contractility, but effects are more pronounced with bupivacaine. **Maternal Outcome:** 3 randomized controlled trials did not find any difference between the study drugs in the duration of the second stage of labor, kind of delivery, maternal analgesia, maternal satisfaction, and onset of analgesia. In all of these studies, there was an increased incidence of motor block with bupivacaine; this is consistent with a meta-analysis of 23 randomized controlled trials. **Neonatal Outcome:** The incidence of low Apgar scores at 5 minutes is approximately 2% for both drugs, and the need for neonatal resuscitation was low, and similar, for both drugs. **Cost:** Ropivacaine is 10 times more expensive on a milligram base than bupivacaine. One estimate is that the cost to switch from bupivacaine to ropivacaine for all deliveries in the U.S. will approximate $15,000,000 per year.

**Conclusions:** Both animal and human studies found either no difference or a very small advantage of ropivacaine in regard to toxicity. At the concentrations used for labor analgesia (0.0625% to 0.1%), cardiac toxicity is highly unlikely, even when inadvertently administered intravenously. Both drugs are equally effective epidural labor analgesics, with possibly a small reduction in the incidence of motor block with longer labors using ropivacaine. It is difficult to justify routine use of ropivacaine for labor analgesia.

**Reviewer's Comments:** The presented article is an excellent review of current studies comparing ropivacaine versus bupivacaine. All reviewed studies support that there is little or no advantage to the use of ropivacaine instead of bupivacaine for labor analgesia via epidural route. (Reviewer-K. George Bojanov, MD).

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**Keywords:** Ropivacaine, Bupivacaine, Epidural Labor Analgesia

**Print Tag:** Refer to original journal article
There were no significant differences in postoperative morphine requirements and sedation among the four different treatment groups.

**Objective:** To determine the effects of intraoperative dexmedetomidine on postoperative recovery in pediatric patients undergoing tonsillectomy and adenoidectomy.

**Design/Participants:** Prospective, randomized, double-blind, clinical study, including 109 pediatric patients for tonsillectomy and adenoidectomy.

**Methods:** Participating children were randomized to 1 of 4 study groups: dexmedetomidine 0.75 µg/kg; dexmedetomidine 1 µg/kg; morphine 50 µg/kg; and morphine 100 µg/kg; all doses were administered as a single IV dose. The study drug was administered intraoperatively over a 10-minute period immediately after endotracheal intubation. Duration of oxygen supplementation was recorded as the time from tracheal extubation to cessation of oxygen delivery in the postanesthesia care unit (PACU), when each patient was able to sustain room air saturations of >95%. Duration of anesthesia, duration of surgery, time to first postoperative rescue analgesic, amount of rescue analgesics, need for antiemetics, sedation score, and duration of PACU stay were recorded and analyzed. The primary outcome was the amount of postoperative rescue morphine administration while the patient was in the PACU. Secondary outcomes included the number of patients requiring >1 rescue analgesia dosing, degree of sedation, oxygen requirement, vital signs, complications, and discharge readiness.

**Results:** There were no differences among the groups with regard to demographic characteristics, duration of surgery and anesthesia, time to tracheal extubation, duration of oxygen supplementation, vital signs, sedation, and time to discharge to readiness. The mean amount of supplemental rescue opioid required was similar among the 4 groups. However, the median time to first postoperative rescue analgesic was significantly longer in the dexmedetomidine 1 µg/kg and morphine 100 µg/kg groups compared to the rest of the groups. The number of patients requiring >1 rescue analgesic dose was significantly higher in the dexmedetomidine 0.75 µg/kg group compared to dexmedetomidine 1 µg/kg and morphine 100 µg/kg groups but not the morphine 50 µg/kg group.

**Conclusions:** Total postoperative rescue opioid requirements were similar in tonsillectomy patients receiving intraoperative dexmedetomidine or morphine. However, the use of dexmedetomidine 1 µg/kg and morphine 100 µg/kg provided increased time to the first analgesic and reduced the need for additional rescue analgesics.

**Reviewer's Comments:** This study showed that there is no advantage in the use of dexmedetomidine in the studied patient population. As a matter of fact, the benefits of larger doses of dexmedetomidine were limited only to the secondary outcome variables as defined by the study. (Reviewer-K. George Bojanov, MD).

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Keywords: Dexmedetomidine, Postoperative Analgesia, Sedation, Tonsillectomy/Adenoidectomy

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