

## Peripheral Nerve Blocks in Major Orthopedic Surgeries

*A Pre-Emptive Multimodal Pathway Featuring Peripheral Nerve Block Improves Perioperative Outcomes After Major Orthopedic Surgery.*

Hebl JR, Dilger JA, et al:

Reg Anesth Pain Med 2008; 33 (November-December): 510-517

Pre-emptive multimodal analgesia techniques improve outcomes in orthopedic surgery.

**Background:** Major orthopedic surgery is associated with significant postoperative pain. Adequate analgesia is required for effective physiotherapy as well as for facilitating joint motion and early hospital discharge.

**Participants:** 100 patients undergoing total hip replacement (THR) or total knee replacement (TKR) at Mayo Clinic.

**Methods:** Patients were evaluated using the Total Joint Regional Anesthesia (TJRA) protocol. Criteria were matched to age, gender, surgeon, date of surgery, American Society of Anesthesiologists (ASA) status, and anesthetic management. Primary outcome was hospital length of stay. Secondary outcomes were time-to-ambulation, joint range, verbal analog pain (VAS) scores, opioid requirements, side effects, and perioperative complications. Exclusion criteria were opioid dependence, coagulation abnormalities, bacteremia or septicemia, neurologic deficits, and allergies. TKR received the lumbar plexus block with a catheter and either psoas or femoral with 20mL of bupivacaine 0.5% and 1:200,000 epinephrine. THR received the psoas block. All patients also received a single shot sciatic nerve block (30mL of 0.5% bupivacaine with 1:200,000 epinephrine). No intravenous analgesics were given in the postoperative period; breakthrough pain was controlled with oxycodone. Catheters were discontinued on the second postoperative day.

**Results:** All patient demographics (age, gender, surgical demographics, and perioperative joint motion range) were comparable. Surgical duration was less in TJRA patients than in controls. Opioid-related side effects (like nausea, vomiting, and urinary retention) were lower in TJRA patients. The ability to transfer from bed to chair was sooner ( $0.2 \pm 0.6$  days) in TJRA patients. Discharge was  $1.7 \pm 1.9$  days sooner in TJRA patients, and their length of stay was 3.8 days versus 5.0 days in controls. Controls had postoperative ileus as well as wound infections (2%) and wound erythema (5%).

**Conclusions:** Patients having TJRA had early ambulation, improved joint motion range, lower perioperative scores, decreased nausea and vomiting, and lower opioid requirements leading to significantly lower hospital stay, thereby improving perioperative outcomes in comparison to the age-old intravenous opioid analgesics.

**Reviewer's Comments:** Pre-emptive analgesia technique with peripheral nerve blocks reduces requirements of intravenous opioid drugs to a large extent. This concept is based on the pain along several pathways which need to be obtunded and the signal transmission from the surgical site. Surrounding tissues and nerves are severed thus reducing pain perception. This helps early ambulation and provides better perioperative outcomes for major surgeries, thus reducing costs for in-hospital stay and facilitating early discharges. (Reviewer-Sunita Goel, MD).

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Keywords: Pre-Emptive Analgesia

Print Tag: Refer to original journal article

## Intraarticular or Extraarticular Local Anesthetics After TKA

*Local Anesthetics After Total Knee Arthroplasty: Intraarticular or Extraarticular Administration? A Randomized, Double-Blind, Placebo-Controlled Study.*

Anderson LØ, Kristensen BB, et al:

Acta Orthop 2008; 79 (December): 800-805

According to the current study, patients receiving intraarticular versus extraarticular analgesics following total knee replacement showed no significant difference in pain relief.

**Background:** Pain is rather debilitating after any major orthopaedic surgery and prevents adequate rehabilitation and mobilization. A large number of studies have been conducted to ameliorate pain after total knee arthroplasties (TKA). Options like local infiltration and continuous catheter infusions as well as subcutaneous infiltrations have been studied.

**Objective:** To determine effectiveness of intraarticular or extraarticular local injections to ameliorate pain after TKA.

**Methods:** Between October 2006 to May 2007, 32 patients were recruited after informed consent and ethics committee approval to undergo TKA. Demographic data were comparable. All patients had an intraarticular catheter and received local anesthetics according to protocol for the first 24 hours. They were then randomly assigned to 2 groups: 1 receiving 30 mL of ropivacaine (0.2%) with epinephrine 10µg/ml and the other receiving 30 mL saline (0.9%) just prior to removal of the catheter. Patients who had a pathological problem, were on opioids or other analgesics, or had a drug allergy were excluded from the study. All patients were given spinal anesthesia along with sedation and the regular prosthesis used for TKA according to protocol. Intraoperative infiltration was done with 120 mL ropivacaine (0.2%) with epinephrine (10 µg/mL) and 50 mL ropivacaine without epinephrine resulting in total volume of 170 mL before closure of the wound. At 6, 12, and 24 hours all patients received 20mL of ropivacaine (0.2%) with epinephrine. At the time of catheter removal, patients were divided into 2 groups: 1 receiving 30 mL of ropivacaine and the other saline. Change in pain intensity was noted at the end of 4 hours and after 24 hours at an interval of every 30 minutes. Pain was assessed using a numeric rank scale (NRS) from 0 to 10, where 10 is the worst pain.

**Results:** In the first 1.5 hours, the 2 groups had similar NRS scores. Comparisons at different intervals of time were also not statistically significant. **Conclusions:** This is a well-conducted study with a well-defined group of patients showing that there wasn't any significant analgesic effect on patients receiving either intraarticular ropivacaine or extraarticular ropivacaine. This could also be due to the fact that intraarticular knee space was a relatively small space and it's not the volume but the concentration of the local anesthetic which was important. Therefore, it would be of significance for studies to be conducted for volume of drug versus concentration of local anesthetics for improved analgesic effects after TKA.

**Reviewer's Comments:** This is an interesting study evaluating pain relief measures after TKA showing that intraarticular or extraarticular wound infiltration does not have any relevant significance. This is in contradiction to studies done by Kehlet's group. (Reviewer-Sunita Goel, MD).

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Keywords: Intraarticular Local Anesthetics

Print Tag: Refer to original journal article

## Urinary Retention: Spinal Anesthesia Vs Other Factors

*Factors Associated With Delayed Postsurgical Voiding Interval in Ambulatory Spinal Anesthesia Patients: A Prospective Cohort Study in 3 Types of Surgery.*

Gil MJL, Gómez AE, et al:

Am J Surg 2009; 197 (February): 182-188

There are other factors besides spinal anesthesia that could increase the duration of postsurgical voiding intervals including male gender, increased lidocaine doses, and type of surgical procedure.

**Background:** Spinal anesthesia is one of the most common forms of regional anesthesia in day care surgeries. It is often associated with urinary retention; therefore, use has been controversial even though it is the simplest form of regional anesthesia in patients who are high risk for general anesthesia.

**Objective:** To study non-associated factors related to urinary retention other than spinal anesthesia.

**Design:** Prospective cohort study.

**Methods:** 406 patients were recruited. Exclusion criteria were: allergy to local anesthetics, voiding dysfunction, refusal to take regional anesthesia, and prostate syndrome. Routine monitoring was used along with standardized technique of spinal using 25-gauge Sprotte needle with 3% hyperbaric lidocaine in the L4-L5 space. Of patients, 187 had inguinal herniorrhaphy, 187 for lower limb surgeries, and 32 for anorectal surgeries. They were assessed for their height, weight, body mass index, duration of surgery, perioperative and intraoperative fluid administration, and interval from administration of spinal to first passage of urine (voiding interval).

**Results:** Majority of patients were men, >75% with American Society of Anesthesiologists (ASA) status II or III. All patients passed urine spontaneously; none needed catheterization. Patients with lower limb surgery had increased duration of voiding intervals when compared to other surgeries and those who had an increased surgical duration or high lidocaine doses. In all surgeries, the common factor for increased duration of voiding interval was gender of the patient, males more than females. No complications of regional anesthesia were noted in any patient.

**Conclusions:** This study was undertaken to determine factors other than anesthesia on post surgical voiding interval. Results obtained showed that male gender, increased lidocaine doses, and type of surgical procedure increased the duration of voiding interval. The limitation of this study was that the anorectal surgical group was small; therefore, there was no significant correlation. Also, pain in the patient was not assessed and documented which could result in increasing the voiding interval. Type of surgery was an independent factor which increased the duration of voiding interval; also, patient gender as well as high doses of lidocaine also accounted for an increased duration. It was seen that perioperative fluid management did not play a significant role. Lidocaine doses should be kept to the minimum for level of anesthesia desired.

**Reviewer's Comments:** Interesting article discussing the various factors, other than spinal anesthesia, which cause urinary retention. This article justifies the use of spinal anesthesia being the simplest and most commonly used regional anesthesia with no significant complications. (Reviewer-Sunita Goel, MD).

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Keywords: Regional Anesthesia

Print Tag: Refer to original journal article

## Effectiveness of Beta Blocker Therapy in Surgery

*Needs Analysis for the Development of a Preoperative Clinic Protocol for Perioperative Beta-Blockade Therapy.*

Hepner D, Correll D et al:

J Clin Anesth 2009; 20 (December): 580-588

Beta blocker therapy premedication may be of benefit in cardiac surgery patients undergoing non-cardiac surgery.

**Background:** More than 100 million non-cardiac surgeries take place worldwide a majority of which had perioperative cardiovascular complications resulting in increased costs and hospital stay. These cardiac events can be avoided by using beta blockade therapy preoperatively which can reduce cardiac events, morbidity and mortality.

**Objective:** To study the implementation of preoperative beta blockade to improve outcomes and thereby reduce costs.

**Methods:** This study was carried out at Brigham and Women's Hospital by reviewing 1000 patients in 3 months. They were analyzed regarding demographics, beta blockade therapy use, risk factors, type of surgery and postoperative complications. The beta blockade therapy indications and contraindications protocol was designed by a group of anaesthesiologists, cardiologists, nursing care providers, and surgeons who divided them in to high- or low-risk patients depending on surgical procedure with strong recommendations for high-risk groups.

**Results:** Of reviewed patients, 960 were analyzed. Patients on beta blockade therapy were older and 72% of the high-risk group needed therapy if the proposals had been already initiated. Of patients, 61% had complications postoperatively though on beta blockade therapy. Those patients who had a cardiovascular event postoperatively were in the intermediate group or low-risk group. There was no difference in groups with or without therapy as far as hypotension, bradycardia, or congestive heart failure were concerned.

**Conclusions:** Standardizing procedures and protocols preoperatively in anesthesia clinics not only reduce costs, but also the rate of complications. Developing and implementing a protocol has its own limitations. It was seen that a significant number of patients who came in to the preoperative clinic needed beta blocker therapy for their cardiovascular conditions but were not on any therapy so far. The POISE trial data also supports use of beta blocker therapy for non-cardiac surgery in patients having cardiovascular risk factors. Use in minor risk factors group has been controversial. Making algorithms and its implementations is a team effort and cannot be carried out individually as it requires education and training of personnel at various levels to improve the level of patients' care.

**Reviewer's Comments:** This interesting study does point out the usefulness in reducing costs as well as complications by the use of beta blockers preoperatively. (Reviewer-Sunita Goel, MD).

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Keywords: Beta Blocker Therapy

Print Tag: Refer to original journal article

## O<sub>2</sub> for Pts During C-Section Doesn't Appear to Harm Newborns

*Supplementary Oxygen for Emergency Caesarean Section Under Regional Anaesthesia.*

Shaw KS, Wang CC, et al:

Br J Anaesth 2009; 102 (January): 90-96

Supplemental administration of oxygen in emergency caesarean section may not increase risk of lipid peroxidation in mothers or neonates.

**Background:** Administration of supplemental oxygen to parturients during emergency caesarean section is a common practice. This can result in an increase in lipid peroxidation in both mother and fetus.

**Objective:** To compare effects of 60% oxygenation on fetal oxygenation and lipid-peroxidation in mother and baby.

**Design:** Prospective, randomized, double-blinded study.

**Participants:** >100 women having emergency caesarean section under regional anesthesia. Patients were excluded if they had intrauterine growth retardation, known fetal abnormality, or pre-eclampsia.

**Methods:** Patients were randomized to receive either 21% or 60% FIO<sub>2</sub> via a venturi mask attached to a shielded box from the anesthesia machine. Anesthesia was provided by a regional technique. Hypotension was treated with fluids and phenylephrine. Times from beginning of O<sub>2</sub> administration to delivery of the infant, skin incision to delivery, and uterine incision to delivery were recorded. If the patient developed an oxygen saturation (SaO<sub>2</sub>) <95%, they were removed from study and had O<sub>2</sub> administered to maintain adequate saturation. At delivery, umbilical artery and venous samples were taken prior to infant's first breath for parameters of oxygenation and for 8-iso-prostaglandin, a marker of lipid peroxidation. Maternal samples for 8-iso-prostaglandin were taken prior to O<sub>2</sub> and after administration of oxytocin. Results were compared in both presence and absence of suspected fetal compromise.

**Results:** The 2 groups were similar in demographics, gestational age, duration of labor, and various time parameters evaluated. In approximately one-third of patients, fetal compromise was considered to be present. Apgar scores were similar between groups and all scores were >7 at 5 minutes. None of the neonates admitted to the neonatal intensive care unit were due to concerns about hypoxia. Predictably, umbilical artery and vein measurements of O<sub>2</sub> were higher in the group that received O<sub>2</sub>. Hemoglobin SaO<sub>2</sub> was significantly higher only in the umbilical vein samples of the O<sub>2</sub> group. Levels of 8-iso-prostaglandin in umbilical blood were similar between groups, however, indicating no significant differences in lipid peroxidation. When comparing groups that had or did not have fetal compromise, again there were no significant differences in 8-iso-prostaglandin levels. Neonates with suspected fetal compromise had lower umbilical artery pH than those without compromise, even in the face of higher levels of O<sub>2</sub>.

**Conclusions:** The authors conclude that supplemental O<sub>2</sub> increase fetal indices of oxygenation without increasing free radical activity.

**Reviewer's Comments:** This study, although small, appears to support the notion that O<sub>2</sub> administered to the mother does not appear to have any harmful effects but may not improve clinical outcome for the newborn. (Reviewer-Allen Miranda, MD).

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Keywords: Caesarean Section

Print Tag: Refer to original journal article

## Deep Anesthesia Possibly Dangerous for Patients

*Mortality Within 2 Years After Surgery in Relation to Low Intraoperative Bispectral Index Values and Preexisting Malignant Disease.*

Lindholm M-L, Träff S, et al:

Anesth Analg 2009; 108 (February): 508-512

Deeper levels of general anesthesia may be associated with adverse outcome in patients having surgery for malignancy.

**Background:** Some recent studies have suggested that deep anesthesia, as documented by the Bispectral Index (BIS) and other electroencephalogram (EEG) modalities, may be associated with worsened outcome postoperatively.

**Objective:** To determine if a relationship exists between deep anesthesia and death within 2 years of surgery in the setting of pre-existing malignant disease.

**Design:** Prospective outcome study.

**Participants:** Over 4000 adults undergoing non-cardiac surgery with inhalational or intravenous general anesthesia. The goal was to keep the BIS value between 40 and 60.

**Methods:** A 3-step analysis was performed. In the first step, survivors were compared to non-survivors in gender, American Society of Anesthesiologists (ASA) status, body mass index (BMI), smoking status, case duration, and intraoperative BIS values. Malignancy was not considered in this step of the analysis. In the second step, the relationship between the presence of malignant disease with BIS <45 and mortality in the 2-year postoperative period was examined. Malignancy was subdivided into those patients requiring more extensive surgery or cancer associated with shorter life span and a group that did not have these characteristics. The final step included repeating the initial analysis and adding malignancy as a co-variable.

**Results:** Inhaled anesthesia was the predominant type of anesthesia. Average BIS value for all patients was 37. The strongest risk factor associated with death within the first 2 years after surgery was ASA physical status. Female gender, surgery type, BMI, and age also predicted death within 2 years. Duration of surgery was not a significant predictor, however. Patients who died in the first postoperative year spent more time with a BIS <45 when compared to survivors. This relationship also occurred in the second postoperative year. When the malignancy variable was included, the relationship between mortality and low BIS values held only for those patients with the more severe forms of malignancy.

**Conclusions:** The authors conclude that there appears to be a statistical relationship between deep anesthesia and 2-year postoperative mortality in patients with malignancy. They state that the relationship is probably not as strong as ASA physical status or other variables but they recommend that a randomized study needs to be performed to try and demonstrate a causal relationship between deep anesthesia and mortality.

**Reviewer's Comments:** The mechanism for this association is not immediately apparent from this study. However, it appears to enforce the increasing body of evidence that general anesthesia, particularly with volatile inhaled agents, may be detrimental to some populations of patients. (Reviewer-Allen Miranda, MD).

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Keywords: Bispectral Index

Print Tag: Refer to original journal article

## Effect of Desmopressin on Bleeding, Blood Transfusion

*Desmopressin Reduces Transfusion Needs After Surgery: A Meta-Analysis of Randomized Clinical Trials.*

Crescenzi G, Landoni G, et al:

Anesthesiology 2008; 109 (December): 1063-1076

Desmopressin has a very small effect on transfusion requirements and surgical bleeding.

**Background:** Transfusion of allogenic blood products is associated with poor postoperative patient outcome. Strategies to reduce utilization of blood products include improvement in surgical techniques, intraoperative cell salvage, preoperative blood donation, and use of topical or systemic hemostatic agents. Desmopressin (DDAVP), a synthetic analog of the antidiuretic hormone, improves hemostasis by stimulating the release of von Willebrand factor from endothelial cells. Several studies have examined the effectiveness of DDAVP on surgical hemostasis with inconclusive or mixed results.

**Objective:** To determine the effect of DDAVP on transfusion needs and assess risk of thromboembolic events.

**Design:** Review and meta-analysis of data pooled from existing trials.

**Methods:** 4 investigators searched 3 databases (BioMed Central, CENTRAL, PubMed) and 2003-2008 Conference Proceeding, for relevant studies. Only human randomized experimental trials were included. Main end-point was transfusion of blood products. Secondary outcomes were death, reoperation for bleeding, postoperative bleeding, and number of patients received transfusion of blood products.

**Results:** From 348 citations, 42 eligible randomized trials were included in the analysis consisting of 2488 patients randomized in the DDAVP and placebo groups. DDAVP was given for prophylaxis, at a dose 0.3 µg/kg in the majority of the studies. DDAVP was beneficial in 12 of 42 studies. DDAVP reduced blood product transfusion by 0.29 units per patient and bleeding volume by 70 mL per patient mean difference. Although there was a trend toward less transfusion of platelets in the DDAVP group, statistical significance was not reached. DDAVP was associated with 4.84 times higher risk of hypotension compared to placebo, but it was transient and without consequences. There was no difference in the frequency of thromboembolism in the number of patients that required transfusion and in the overall mortality (5.7% in DDAVP vs 4.6% in placebo,  $P = 0.3$ ).

**Conclusions:** Although the clinical importance of the small effect of DDAVP on blood transfusion requirement is questionable, the authors suggest that DDAVP should be considered because of its low cost at \$5 to \$10 (United States currency) per treatment. While the thromboembolic risk was not higher in the DDAVP group, the authors suggested caution in making conclusions about the safety of DDAVP because incidence of these events were low and power was inadequate to detect a significant difference.

**Reviewer's Comments:** Meta-analysis is a method of combining small studies in order to increase statistical power to detect a specific effect size. In this meta-analysis, the authors acknowledge the small effect size of the DDAVP. This does not manifest a clinically significant effect and generalized use of DDAVP is not recommended. Although patients who are at risk for bleeding from platelet dysfunction may benefit from DDAVP. Etiology of excessive bleeding is multifactorial and requires a systematic approach rather than a single pharmacologic intervention. (Reviewer-Ioanna Apostolidou, MD).

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Keywords: Desmopressin

Print Tag: Refer to original journal article

## Role of Echocardiography in ICU Setting

*Impact of Echocardiography on Patient Management in the Intensive Care Unit: An Audit of District General Hospital Practice.*

Orme RML'E, Oram MP, McKinstry CE:

Br J Anaesth 2009; 102 (March): 340-344

Echocardiography may have a significant impact on the management of the critically ill patient.

**Background:** Echocardiography has been increasingly used as a diagnostic bedside modality for assessment of the hemodynamically unstable patient. Echocardiography, either transthoracic (TTE) or transesophageal (TEE) has been shown to change the management of up to 46% of critically ill patients. However, utilization of echocardiography in the Intensive Care Unit (ICU) setting has not reached its full capacity because of cost and shortage of trained physicians that can provide 24 hour service.

**Objective:** To assess impact of echocardiography on critically ill patients.

**Design:** Observational retrospective study conducted in a 425 bed general hospital with 5 ICU beds and 4 high dependency beds.

**Methods:** All TTE and TEE studies performed in the ICU between October 2005 and December 2007 were audited. ICU consultants, cardiac physiologists, and cardiologists performed the studies after they had completed a hands-on training course in echocardiography. The following baseline data were collected: patient characteristics, mechanical ventilation status, type of study (TTE or TEE), person who performed study, quality and indication for study. Indications included assessment of left ventricular (LV) function, right ventricular (RV) function, hypotension, endocarditis, pulmonary edema, and pericardial effusion. Main end-point was a change in patient management as a result of the study. A significant change in management was defined as therapeutic impact.

**Results:** From the 1,576 patients admitted to these units, 217 had 258 echo exams. Of these, 187 studies were transthoracic and 71 were transesophageal. The majority of the TEE exams were performed in mechanically ventilated patients. ICU doctors performed the majority of the exams. Main indications were assessment of LV function (46%) and hypotension (17%). Echocardiography changed patient management in 51% of the studies (49% in TTE and 54% in TEE). The echo study dictated an immediate change in therapy in 41% of studies while in the rest 10% helped to support clinical decision making. Change in management included altered drug therapy (inotropic, diuretics, or other drugs), fluid management, cardiac intervention (surgery or percutaneous), and other ICU procedures (pericardial drain, TEE, central line placement, and intercostal drain).

**Conclusions:** A little over half of ICU echo studies resulted in a significant therapeutic impact with change in patient management. Both modalities were helpful but TEE obtained better views than TTE in mechanically ventilated patients. Previous studies reported a similar therapeutic impact between 24% and 46% of total performed studies.

**Reviewer's Comments:** There is growing evidence in observational studies, such as the current study, that echocardiography may help significantly in the management of the critically ill patients. The authors stated that while further studies needed to look at the impact of echocardiography on patient outcomes, a randomized controlled study might be unethical because it will deprive patients from a potential life saving intervention. A prospective observational design is the next best approach to strengthen the existing evidence. (Reviewer-loanna Apostolidou, MD).

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Keywords: Echocardiography

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## Fluid Therapy in Tx of Severe Traumatic Brain Injury

*Fluid Therapy and the Use of Albumin in the Treatment of Severe Traumatic Brain Injury.*

Wahlstrom MR, Olivecrona M, et al:

Acta Anaesthesiol Scand 2009; 53 (January): 18-25

Fluid management after traumatic brain injury plays a key role in recovery of patients with such injuries.

**Background:** Fluid management to maintain intracranial pressure (ICP) targeted therapy is important in the management of patients with severe traumatic brain injury (TBI).

**Objective:** To determine the occurrence of organ failure and mortality in patients with severe traumatic brain injury with defined fluid therapy protocols that included the administration of albumin. The latter has been associated with high mortality rates.

**Participants:** 93 patients with severe traumatic brain injury and Glasgow Coma Score  $\leq 8$  admitted to the Umeå University Hospital from January 1998 to December 2001.

**Methods:** ICP was monitored in all patients with traumatic brain injury and ICP kept at  $< 20$  mmHg, cerebral perfusion pressure (CPP) at  $> 50$  mmHg, and mean arterial pressure (MAP) approximately 70mmHg. Fluid therapy which included crystalloid, 20% hyperoncotic albumin, 4% albumin, plasma and red cells were recorded, as were all medications. Patients received either or both types of albumin solutions. Outcomes measured were mortality, organ failure and lung injury.

**Results:** Mortality rate was 5% after 10 days, 11% after 28 days and 13% after 6 months. Most patients who died had severe injuries. Of patients, 29% had respiratory failure, including 14% with acute respiratory distress syndrome and 4% with acute lung injury. The most important finding was that use of albumin did not result in excessive mortality and lung injury as previously reported.

**Conclusions:** The maintenance of normal colloid osmotic pressure with the use of albumin for severe TBI does not increase mortality or morbidity.

**Reviewer's Comments:** This is a confusing paper but with important implications. Unfortunately, there is no information on the fluid regimens used. This is a challenging clinical problem with the goal of keeping a dry brain. How this is achieved is controversial. (Reviewer-Errol Lobo, MD).

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Keywords: Traumatic Brain Injury

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## Epidural Failure in Cesarean Delivery

*Failure of Augmentation of Labor Epidural Analgesia for Intrapartum Cesarean Delivery: A Retrospective Review.*

Lee S, Lew E et al:

Anesth Analg 2009; 108 (January): 252-254.

If an epidural requires frequent boluses to be effective, was placed as an epidural not a combined spinal epidural, and/or it has been in place a long time, it is more likely to fail as anesthesia for a Cesarean delivery.

**Background:** Failure rate for use of an epidural catheter for Cesarean delivery that has been used to provide labor analgesia varies from 0 to 30%, depending upon how failure is defined.

**Objective:** To determine what factors led to failure of the epidural technique to provide anesthesia for Cesarean delivery if it had previously been used for labor.

**Design:** Retrospective chart over an 18-month period of all women who requested neuraxial pain relief at the Women's and Children's Hospital in Singapore.

**Participants:** 5483 women requested neuraxial analgesia during the study period (658 epidural alone and 4825 combined spinal-epidural). Of these, the 1025 who went on to Cesarean section using epidural catheters were studied.

**Methods:** Charts were reviewed to determine the number of patients who required general anesthesia because of failure of augmentation of the epidural. Characteristics (such as the length of placement, frequency of boluses for breakthrough pain, and whether a combined spinal-epidural technique was used) of patients whose epidurals had failed was utilized.

**Results:** 17 of 1025 patients (1.7%) had to have general anesthesia because the epidural could not be augmented to provide adequate anesthesia for Cesarean section. Patients who had epidural analgesia alone were more likely to have failed augmentation than those who had a combined spinal/epidural technique (odds ratio [OR] 5.54;  $P=0.001$ ). Those patients with  $>2$  episodes of breakthrough pain during their labor were also more likely to have a failed epidural for Cesarean section (OR 6.65;  $P<0.001$ ). Finally, patients who had a longer duration of labor ( $12 \pm 6$  hours) were more likely to have a failure than those of shorter duration ( $8 \pm 6$  hours;  $P=0.02$ ).

**Conclusions:** Use of an epidural technique alone,  $\geq 2$  episodes of breakthrough pain and long duration of labor was associated with more epidural failures for Cesarean section.

**Reviewer's Comments:** This study confirms my belief that if an epidural is not working well for labor, one should not use it for Cesarean section. The greater success rate if combined spinal/epidural analgesia is used is interesting. Perhaps dural rent from the spinal enhances the effect of local anesthesia. Alternatively, the combined spinal/epidural technique may result in a more midline catheter placement because the free flow of cerebral spinal fluid from the spinal needle confirms the proper position of the Touhy needle. (Reviewer-David S. Beebe, MD).

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Keywords: Cesarean Section

Print Tag: Refer to original journal article

## Post-Surgical Pts May Benefit from Continuous Blood Glucose Monitoring

*Accuracy and Reliability of Continuous Blood Glucose Monitor in Post-Surgical Patients.*

Yamashita K, Okabayashi T, et al:

Acta Anaesthesiol Scand 2009; 53 (January): 66-71

In the future anesthesiologists will be able to monitor blood glucose continuously like the oxygen saturation.

**Background:** Tight glucose control in the operating room and intensive care unit (ICU) may benefit diabetic patients by reducing wound infections and aiding wound healing that may be impaired by hyperglycemia. However there is a significant risk of hypoglycemia if tight glucose control is utilized. A convenient, accurate, and rapid means to measure blood glucose is needed to help with diabetic management.

**Objective:** To evaluate how a new, continuous intravenous blood glucose monitor performs in comparison with arterial blood glucose measurements.

**Design:** Unblinded comparison study where each patient served as his own control.

**Participants:** 50 adult patients who underwent a variety of major surgical procedures that required admission to the ICU.

**Methods:** After admission to the ICU, a 20 gauge intravenous catheter was placed in the forearm vein of each patient. The blood sampling portion of the STG-22™ continuous glucose measuring device was placed through this needle. Radial arterial blood samples were obtained at 0, 4, 8 and 16 hours from the same forearm post admission and blood glucose determinations made using using an ABL™800FLEX blood gas analyzer. This is a device that uses the glucose-oxidase technology that is recommended by the National Committee for Clinical Laboratory Standards for blood glucose determinations. Results from the STG-22 were compared and correlated with the arterial blood glucose levels.

**Results:** Correlation coefficient (R2) was 0.96 for the STG-22 device and glucose levels obtained via arterial blood sampling. The percent errors of the new device were 7, 15, and 10% in hypoglycemia, normoglycemia and hyperglycemia, respectively. These were within the 15% margin of error suggested as acceptable for point-of-care glucose monitoring. However, they were not superior to those expected of other point-of-care devices.

**Conclusions:** The STG-22 device can provide continuous blood glucose measurements consistent with intermittent measurements.

**Reviewer's Comments:** This device is as accurate as other point-of-care glucose measuring devices that are used to measure blood glucose intermittently following blood sampling, although no better. However this device consumes 2mL of blood per hour. This could result in significant blood loss if used over several days. (Reviewer-David S. Beebe, MD).

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Keywords: Blood Glucose

Print Tag: Refer to original journal article

## Effect of Preoperative Hydration on Gastric Emptying Time

*Effect of the Preliminary Hydration on Gastric Emptying Time for Water in Healthy Volunteers.*

Umenai T, Arai N, Chihara E:

Acta Anaesthesiol Scand 2009; 53 (February): 223-226

Gastric emptying of water was not influenced by hydration, which indicates that water intake in the preoperative period is safe.

**Background:** International guidelines allow healthy patients to drink clear liquids up to 2 hours before general anesthesia.

**Objective:** To demonstrate a precise method for tracking gastric volume in humans.

**Design:** Experimental volunteer study.

**Participants:** 15 healthy volunteers aged 21 to 47 years.

**Methods:** Volunteers were enrolled to the hydration protocol (group H) and the water restriction protocol (group R). There was a 1 week interval between the 2 study groups. Group H were asked to drink 4mL/kg of clear water 2 hours and 1 hour before the experiment. Then 4mL/kg water via a straw were taken in and magnetic resonance imaging was performed every 10 minutes for 60 minutes. Liquid content of the stomach was outlined as area of interest and the area of each slice was summated to calculate the volume of gastric contents. Images were performed with a fast spin echo, T2-weighted imaging, TR 3113 ms, TE 70 ms, and slice width 6 to 8 mm. Gastric volume transition of the experiment was compared with analysis of variance (ANOVA) and  $P < 0.05$  was statistically significant.

**Results:** Gastric emptying time was evaluated as the 50% and 75% reduction time. R group showed  $18 \pm 9$  and  $24 \pm 3$  minutes. Residual gastric volume before ingestion was  $81 \pm 58$  mL. H group showed  $16 \pm 8$  and  $23 \pm 3$  minutes. Residual gastric volume before ingestion was  $89 \pm 77$  mL. Residual gastric volume and water emptying time was not significantly different between the 2 groups.

**Conclusions:** Gastric emptying of water was not influenced by hydration.

**Reviewer's Comments:** This is a nice method to demonstrate the gastric emptying rate of water and underlies the safety of repeated oral hydrations in the preoperative period. (Reviewer-Olga Plattner, MD).

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Keywords: Gastric Emptying Time

Print Tag: Refer to original journal article

## Simulation Based Skills Assessment of Anesthesia Providers

*Performance of Certified Registered Nurse Anesthetists and Anesthesiologists in a Simulation-Based Skills Assessment.*

Henrichs BM, Avidan MS, et al:

Anesth Analg 2009; 108 (January): 255-262

Anesthesiologists and certified registered nurse anesthetists were variably skilled in the initial diagnosis and management of simulated intraoperative emergencies.

**Objective:** To find out whether experienced anesthesiologists and certified registered nurse anesthetists (CRNAs) have comparable skill levels in dealing with acute conditions.

**Design/Participants:** Prospective, randomized, single-blinded simulation-based skill assessment involving 26 CRNAs and 35 board certified anesthesiologists.

**Methods:** 12 randomly selected and scripted intraoperative simulated events were developed including: acute hemorrhage, anaphylaxis, blocked endotracheal tube, bronchospasm, hyperkalemia, loss of pipeline oxygen, malignant hyperthermia (MH), myocardial ischemia, pneumothorax, right main stem intubation, total spinal, and ventricular tachycardia. Each scenario required individual practitioners to diagnose and manage the scripted emergency in a 5 minute time period. Each participant received standard orientation and was allowed to manage a set of 8 of the 12 possible scenarios. Anesthesia induction was achieved using Ohmeda® machine, MedSim Eagle® simulator, intravenous drugs, and airway equipment arranged in a manner familiar to each participant. Perioperative assessment was given before each case along with brief details and 10 minutes for case review. On average, anesthesiologists and CRNAs received scenarios of equivalent scope and difficulty. Each participant was expected to state diagnosis and treatments he/she was instituting. A total score of each participant was computed by two blinded raters.

**Results:** Averaged over 8 encounters, anesthesiologists received higher overall scores than the CRNAs. There was a significant effect attributable to scenario and performance did not improve as individuals progressed through the study. The majority of participants achieved >80% of key action items for bronchospasm, right mainstem intubation, pneumothorax, and loss of pipeline oxygen. However, <50% of participants were able to accomplish any key action in the MH and hyperkalemia scenarios. **Conclusions:** Anesthesiologists achieved modestly higher scores than CRNAs; however the similar broad range in both groups indicated that certification and clinical practice alone were not sufficient guarantees of universal adequate performance.

**Reviewer's Comments:** The study proves that practice certification does not by itself lead to common practice standards. It is not unusual for professionals to be more familiar and proficient in scenarios which are encountered often in the clinical practice and vice versa. I see the importance of simulation based skill assessment in identifying weak spots in health care provider's knowledge, which can be further addressed with various educational activities. (Reviewer-Krasimir George Bojanov, MD).

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Keywords: Skills Performance

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## Laryngeal Mask Airway in Office-Based Adenotonsillectomy

*Safety of Laryngeal Mask Airway and Short-Stay Practice in Office-Based Adenotonsillectomy.*

Gravningsbraten R, Nicklasson B, Raeder J:

Acta Anaesthesiol Scand. 2009; 53 (February): 218-222

Airway management with a laryngeal mask airway showed a safe and short postoperative stay in children having adenoidectomy and/or tonsillectomy in an office-based setting.

**Background:** It is still disputed whether the laryngeal mask airway (LMA) is a safe airway management device for adenotonsillectomy operations.

**Objective:** To evaluate safety of the LMA use in adenotonsillectomies over a period of 5 years.

**Design:** Prospective study.

**Participants:** 1126 children aged <16 years having an adenoidectomy and/or tonsillectomy in an office-based ENT surgical practice between August 2002 and March 2007.

**Methods:** Patients were anesthetized with remifentanyl and propofol and received fentanyl for the postoperative pain therapy. If a problem occurred while establishing the intravenous (IV) line, induction was performed with sevoflurane and nitrous oxide and after an IV line was inserted propofol and remifentanyl was commenced. LMA was inserted at a sufficient depth of anaesthesia. Pain management was paracetamol, diclofenac, and/or (for children weighing >30 kg) ketorolac. The surgeons' technique is standardized and local anaesthesia was injected peritonsillarly. At surgery end, the LMA was removed and children who had a tonsillectomy stayed in the recovery room for  $\geq 1.5$  hours while the others stayed for about 15 to 20 minutes. Pain control medication and a 24 hour telephone number were given to the parents; the last 200 patients received a questionnaire containing questions on any problems.

**Results:** In 7 cases an endotracheal tube had to be inserted, in 10 cases laryngeal spasm occurred, and in 6 cases surgery had to be postponed due to airway problems. Of patients, 1 was transferred to hospital due to atelectasis. In the postoperative questionnaire, 25% had postoperative nausea and vomiting, 1.7% had bleeding, 5.7% had pain, and 1.6% needed a re-operation.

**Conclusions:** Airway management with an LMA showed acceptable safety and short postoperative stay in children having an adenoidectomy and/or tonsillectomy in an office-based setting. However, there were cases related to airway problems needing life saving intervention.

**Reviewer's Comments:** The good outcome depends on a very experienced team operating and anesthetizing these children. Nevertheless, I would not recommend that management because there are risks of dislocating the LMA and in that case the bleeding and hypoxia might lead to severe problems. In a big hospital this situation will be under control easier than in a small office based setting where the infrastructure is different and more basic. (Reviewer-Olga Plattner, MD).

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Keywords: Airway Management

Print Tag: Refer to original journal article

## Aprotinin and Renal Dysfunction in Neonates After Cardiac Surgery

*The Impact of Aprotinin on Postoperative Renal Dysfunction in Neonates Undergoing Cardiopulmonary Bypass: A Retrospective Analysis.*

Guzzetta NA, Evans FM, et al:

Anesth Analg 2009; 108 (February): 448-455

Cardiopulmonary bypass time of >100 minutes was associated significantly with development of postoperative renal dysfunction.

**Objective:** To determine safety profile of aprotinin in neonates.

**Design/Participants:** Retrospective chart review of 200 neonates undergoing 200 congenital cardiac surgical procedures.

**Methods:** Neonates were divided into 2 groups: those who received aprotinin (n=156) and those who did not (n=44). Chart reviews included: demographics, diagnosis, surgical procedure, creatinine levels, use of aprotinin, cardiopulmonary bypass (CPB) time, aortic cross-clamp time, regional perfusion time, deep hypothermic circulatory arrest time, lowest temperature during CPB, highest temperature during the first 24 hours postoperatively, time to extubation, duration of intensive care unit (ICU) stay, dialysis, thrombosis, and mortality. Aprotinin dose was consistent and as follows: 240 mg/m<sup>2</sup> patient load and pump prime, followed by an infusion of 56 mg/m<sup>2</sup>/h. Primary outcome was postoperative renal dysfunction, thrombosis, and in-hospital mortality.

**Results:** Aprotinin group infants had higher risk adjustment for congenital heart surgery score, significant longer CPB and aortic cross clamp times, lower temperatures on CPB, more frequent use of deep hypothermic circulatory arrest, and modified ultrafiltration. Mean perioperative creatinine levels were similar between study groups as well as duration of mechanical ventilation, thrombosis, mortality, and other documented adverse events. Multivariate logistic regression identified CPB time of >100 minutes as the most significant predictor of postoperative renal dysfunction, independent of aprotinin use.

**Conclusions:** Aprotinin use was not associated with increased incidence of postoperative renal dysfunction, increase in postoperative thrombosis, and intra-hospital mortality.

**Reviewer's Comments:** There are 2 major study limitations: retrospective design and small sample size. Apparently we have to wait for more scientific proof, in order to establish the usefulness and applicability of aprotinin in the particular patient population. (Reviewer-Krasimir George Bojanov, MD).

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Keywords: Postoperative Renal Dysfunction

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# Awareness During Anesthesia in Surgical Patients

*A Retrospective Study of Intraoperative Awareness With Methodological Implications.*

Mashour GA, Wang LY-J, et al:

Anesth Analg 2009; 108 (February): 521-526

Incidence of intraoperative awareness among patients under general anesthesia was 0.023% and not significantly different than that of non-general anesthesia patients.

**Objective:** To compare incidence of intraoperative awareness at the study institution with published intraoperative awareness rates for those with general anesthesia versus sedation only.

**Design/Participants:** Retrospective electronic chart review of 116,478 adult patients for various surgeries with general and non general anesthesia.

**Methods:** Information concerning awareness was obtained from patient interviews on postoperative day 1. All electronic intraoperative records were analyzed for anesthetic technique, anesthetic drugs, and use of benzodiazepines, opioids, and neuromuscular blocking drugs. No patients were monitored with an electroencephalographic device for detection of intraoperative awareness.

**Results:** 65,061 patients received general anesthesia and 51,417 other forms of anesthesia. Of general anesthesia patients, 0.023% experienced some degree of intraoperative awareness. Of general anesthesia cases, 90% were performed using inhaled anesthetics, while 10% used total intravenous anesthesia. There were no consistent findings regarding anesthetic choices among those patients. One "awareness" patient was undergoing an emergent cesarean delivery and another heart transplant. Several cases documented insufficient anesthesia on the electronic record correlating with complaints of awareness. Of non general anesthesia cases, 7 patients or 0.03% had undesired intraoperative awareness; this was not significantly different than general anesthesia patients. Relative risk of intraoperative awareness during a general anesthesia compared to non general was 0.74.

**Conclusions:** Reported incidence of undesirable intraoperative awareness was not statistically different in patients receiving general anesthesia and those who did not.

**Reviewer's Comments:** In my opinion, the finding of the study was surprising and indicated that patients having non general anesthesia cases did either have or were given wrong expectations regarding their anesthetic management. The other possibility is that those with non general anesthesia were quite well sedated. (Reviewer-Krasimir George Bojanov, MD).

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Keywords: Intraoperative Awareness

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## Topical Anesthesia for Fiber-optic Intubations in Difficult Airway Patients

*Spray-As-You-Go Airway Topical Anesthesia in Patients With a Difficult Airway: A Randomized, Double-Blind Comparison of 2% and 4% Lidocaine.*

Xue FS, Liu HP, et al:

Anesth Analg 2009; 108 (February): 536-543

Both 2% and 4% lidocaine administered to the airway mucosa in a spray-as-you-go technique can provide clinically adequate intubating conditions for awake fiberoptic intubations.

**Objective:** To find out significant differences in safety and efficacy of airway topical anesthesia using 2% and 4% lidocaine used in a spray-as-you-go technique in difficult airway patients.

**Design/Participants:** Prospective, randomized, double-blind, clinical study involving 52 adult American Society of Anesthesiologists (ASA) I to III patients with expected difficult airway, scheduled for surgery with general anesthesia.

**Methods:** In all patients the posterior pharynx was anesthetized with 5 intraoral sprays of 10% lidocaine. After achievement of desired sedation using fentanyl and midazolam, patients were randomly assigned to 1 of 2 study groups. Group 1 (n=26) received 2% and Group 2 (n=26) 4% lidocaine by spray-as-you-go technique with a fiberoptic bronchoscope (FOB) in a double blind manner. Lidocaine was sprayed through a 1.1 mm single-orifice epidural catheter, threaded through the suction channel of a FOB with an outer diameter of 3.1 mm. Data collected included: time for each airway spray, time for completion of airway topicalization, intubation time, numbers of attempts, difficulties, total lidocaine dose, side effects, patient's comfort, gagging, cough, and tracheal intubating conditions. Lidocaine levels were measured from blood samples collected at 10-minute intervals for 60 minutes.

**Results:** Study groups were similar to demographics and sedation drugs doses. There were no significant differences in times for each airway spray and total times for airway sprays between groups. Lidocaine total doses were significantly smaller in Group 1 than in Group 2. Patient's tolerance scores and gagging were similar between groups. Slight and moderate coughing was observed in 54% and 15% of the patients in Group 1, respectively, and 50% and 12% in Group2, respectively. Intubation times and patients' reaction to intubation were similar between groups. Peak plasma lidocaine concentrations were <5 µg/mL in all patients. Peak plasma lidocaine concentrations at all study times were larger in Group 2 than in Group 1.

**Conclusions:** Both 2% and 4% lidocaine, administered by a spray-as-you-go technique with the FOB, can provide clinically acceptable intubating conditions for awake fiber-optic intubations in sedated difficult airway patients.

**Reviewer's Comments:** Given the results of the study 2% lidocaine will provide greater margin of safety, compared to 4% lidocaine, knowing that plasma levels of topically sprayed lidocaine are highly variable and often unpredictably high, even when safe dosage is used. (Reviewer-Krasimir George Bojanov, MD).

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Keywords: Airway Topical Anesthesia

Print Tag: Refer to original journal article

## Adequate Lactated Ringer Resuscitation for Open and Laparoscopic Surgery

*The Volume of Lactated Ringer's Solution Required to Maintain Preload and Cardiac Index During Open and Laparoscopic Surgery.*

Concha MR, Mertz VF, et al:

Anesth Analg 2009; 108 (February): 616-622

Fluid required to maintain left ventricular end diastolic volume index and cardiac index was remarkably modest, based on trans-esophageal echocardiography guided replacement.

**Objective:** To investigate whether transesophageal echocardiography (TEE) guidance may reduce the amount of crystalloid administered during open and laparoscopic colorectal surgery.

**Design/Participants:** Prospective, clinical study involving 30 adult American Society of Anesthesiologists (ASA) I and II patients, scheduled for laparoscopic or open colorectal surgery.

**Methods:** 15 patients were scheduled for open (Group O) and 15 for laparoscopic (Group L) surgery. All patients received identical bowel preparation. TEE was used to determine left ventricular end diastolic volume index (LVEDVI) and cardiac index. Baseline TEE measurements were made before surgical stimulation, 5 minutes after establishing pneumoperitoneum and every 30 minutes or each time mean arterial pressure (MAP) decreased >20% of baseline. A maintenance infusion of lactated Ringer's (LR) solution was administered at 3 mL/kg/h with additional fluid boluses for decrease of MAP of >20% from baseline according to algorithm. Intra-abdominal pressure was maintained at 15 mmHg in the laparoscopic patient group.

**Results:** Study groups were similar to demographics. Duration of surgery in Group L was significantly longer than that in group O. LR was used for fluid replacement for all patients. Rate of LR administration during surgery was  $5.9 \pm 2.0$  mL/kg/h in Group O and  $3.4 \pm 0.8$  mL/kg/h in group L, which is significantly different. This difference in average rate of administration was exactly offset by the difference in average surgery duration. Baseline cardiac index and LVEDVI values were similar between groups and were kept within normal limits during surgery.

**Conclusions:** The rate of crystalloid administration required to maintain baseline LVEDVI and cardiac index was lower for laparoscopic surgery, but offset by the longer surgical duration. The rate of crystalloid solution to maintain baseline LVEDVI and cardiac index was lower than commonly recommended for colorectal surgery.

**Reviewer's Comments:** I do agree with the study approach that volume replacement therapy must be adapted to specific requirements of each individual patient. A limitation in the study was overlooking urinary output as an indicator for intravascular volume. All patients in the study had marginal urinary outputs based on textbook recommendations. It would have been nice to know if this ultrasound guided fluid volume was enough to meet a good cardiac output - a measurement that was not done! (Reviewer-Krasimir George Bojanov, MD).

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Keywords: Lactated Ringer

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## Method Comparison for Maintaining Cardiac Output After Spinal Anesthesia

*The Effect of Trendelenburg Position, Lactated Ringer's Solution and 6% Hydroxyethyl Starch Solution On Cardiac Output After Spinal Anesthesia.*

Zorko N, Kamenik M, Starc V:

Anesth Analg 2009; 108 (February): 655-659

A decrease of cardiac output after spinal anesthesia can be achieved by placing the patient in Trendelenburg position, giving 1L lactated Ringer's, or 500mL of hydroxyethyl starch.

**Objective:** To compare effects of 3 different strategies for preload increase on cardiac output (CO) after spinal anesthesia.

**Design/Participants:** Prospective, randomized, clinical study, including 70 American Society of Anesthesiologists (ASA) I and II patients aged >50 years and scheduled for orthopedic hip or knee replacement under spinal anesthesia.

**Methods:** After start of spinal anesthesia using L2-3 interspace with 3mL of 0.5% plain bupivacaine, patients were randomized to 1 of 3 treatment groups. Trendelenburg group consisted of 23 patients, which were placed in 15° Trendelenburg position for 10 minutes and then back in horizontal position for immediate infusion of lactated Ringer's (LR) 1L over 20 minutes. Hydroxyethyl starch group consisted of 22 patients, which received 500mL of 6% hydroxyethyl starch solution over 20 minutes. LR group patients (n=25) received 1L LR over 20 minutes. All groups received chosen treatment immediately after start of spinal anesthesia. Hemodynamic data was collected for 45 minutes and included CO, using impedance cardiography.

**Results:** Study groups were similar to demographic data, baseline hemodynamics, duration of surgery and level of sensory blocks. In the Trendelenburg group, CO did not change while patients were in Trendelenburg position but increased significantly 20 and 30 minutes after the block, compared to baseline. In the hydroxyethyl starch group, CO increased at 10 minutes after the block and remained increased until the end of the measurements. LR group patients had CO increase at 10, 20, and 30 minutes after the block, compared to baseline, with significant down trending from 20 to 30 minutes when LR infusion stopped.

**Conclusions:** Trendelenburg position, infusion of 6% hydroxyethyl starch or infusion of LR solution, all prevented a decrease of CO from baseline after spinal anesthesia.

**Reviewer's Comments:** Interesting is that moving patients from Trendelenburg back into supine position was hazardous. All adverse events in the Trendelenburg group happened just after placing the patients back into supine position and included bradycardia and hypotension requiring drug treatment. (Reviewer-Krasimir George Bojanov, MD).

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Keywords: Spinal Anesthesia

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## Postoperative Pain Control After Abdominal Hysterectomy

*Pregabalin and Dexamethasone in Combination With Paracetamol for Postoperative Pain Control After Abdominal Hysterectomy. A Randomized Clinical Trial.*

Mathiesen O, Rasmussen ML, et al:

Acta Anaesthesiol Scand 2009; 53 (February): 227-235

The combination of paracetamol, pregabalin, and dexamethasone did not reduce the postoperative morphine consumption; dexamethasone reduced nausea and vomiting.

**Background:** Multimodal analgesia might reduce opioid consumption and improve postoperative recovery.

**Objective:** To evaluate efficacy of pregabalin, dexamethasone, and paracetamol for postoperative pain control.

**Design:** Randomized, double-blinded placebo controlled study.

**Participants:** 128 patients scheduled for abdominal hysterectomy.

**Methods:** Anesthesia management was standardized according to protocol. Patients were randomly assigned to one of the following three groups: group A was paracetamol+placebo+placebo; group B was paracetamol+pregabalin+placebo; group C was paracetamol+pregabalin+dexamethasone. One hour before induction patients received orally (according to their randomization) 1000mg paracetamol and 300 mg pregabalin or placebo and 8mg dexamethasone intravenously or placebo. Postoperative pain management was paracetamol 1000mg every 6 hours starting 2 hours postoperatively. Patient-controlled analgesia was adjusted with 2.5mg bolus of morphine and a 10 minute lock-out time. In the first postoperative hour the nurse administered 2.5mg morphine on patients' request. All medication given including ondansetron was recorded. Morphine consumption from 0 to 4 hours and 0 to 24 hours after the operation was primary study outcome. Pain was evaluated 2, 4, and 24 hours post operatively with the visual analogue scale (VAS) pain score at rest and during mobilization. Nausea, vomiting, sedation, and dizziness were recorded 0 to 2, 2 to 4, and 4 to 24 hours postoperatively.  $P < 0.05$  was considered significant.

**Results:** 116 patients were analyzed. Morphometric data were comparable. There were no significant differences in the total 24-hour morphine consumption between the groups or in the VAS score at rest and during mobilization. Nausea score was significantly lower in group C compared to A and B. As a result ondansetron consumption was reduced in group C versus A and B,  $P < 0.001$ .

**Conclusions:** The combination of paracetamol, pregabalin, and dexamethasone did not reduce postoperative morphine consumption. Dexamethasone reduced nausea and vomiting.

**Reviewer's Comments:** **Reviewer's Comments:** There are various studies showing contradictory results with pregabalin and postoperative pain therapy. Most likely the dosage was inadequate in this study. Laparoscopic hysterectomies could show less morphine consumption after 600mg pregabalin was given and therefore abdominal hysterectomy with 300mg pregabalin is a small dose for showing any effect in reduction of the postoperative morphine consumption. (Reviewer-Olga Plattner, MD).

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Keywords: Postoperative

Print Tag: Refer to original journal article

## Articaine Vs Prilocaine for Spinal Anaesthesia in Ambulatory Surgical Patients

*Plain Articaine or Prilocaine for Spinal Anaesthesia in Day-Case Knee Arthroscopy: A Double-Blind Randomized Trial.*

Hendriks MP, de Weert CJM, et al:

Br J Anaesth 2009; 102 (February): 259-263

In day-case arthroscopy of the knee, 50mg plain articaine is preferable to 50mg prilocaine because full motor recovery occurs sooner, as does voiding.

**Background:** Spinal anaesthesia is often used for knee arthroscopy.

**Objective:** To compare articaine and prilocaine in day-case surgery.

**Design:** Prospective, double-blinded clinical study.

**Participants:** 72 patients having knee arthroscopy.

**Methods:** Patients received oral analgesics and oxazepam 10mg. Fluid intake was allowed up to 2 hours pre-operation. After vital signs were monitored, prepared local anaesthetic solutions were applied according to the randomization. Spinal anaesthesia was performed at the L3-L4 or L2-L3 interspace using a 27 gauge pencil point needle and 2.5mL solution of either 50 mg prilocaine or 50 mg articaine was slowly administered. Sensory block was assessed by loss to cold sensation with a frozen ampoule at 2, 5, 8, 10, 15, and 20 minutes after intrathecal injection and at 10 minutes thereafter. Motor block was tested with the modified Bromage scale at the same time intervals. Sufficient anesthesia was defined as a sensory block up to L1 and a grade 2 motor block (unable to bend the knee). Bladder volume was measured with an ultrasound and a volume >500 mL needed a single catheterization. Outcome was duration of motor block, time to onset, time to spontaneous voiding, and adverse effects. Statistical analysis was performed with SPSS version 14.0 for Windows.  $P < 0.05$  was considered significant.

**Results:** 36 patients were in each group. Time to full motor recovery was shorter (140 minutes) in the articaine group compared to 184 minutes in the prilocaine group. Voiding occurred also faster in the articaine group. There were no serious side effects in either group.

**Conclusions:** 50 mg plain articaine is preferable to 50 mg prilocaine in day-case arthroscopy of the knee.

**Reviewer's Comments:** Similar studies could show that spinal anaesthesia with articaine is superior to prilocaine in terms of duration time and ability of voidance. Nevertheless, in this study, 5 patients out of 34 had insufficient analgesia which might be a problem, but can be solved with supplementation of systemic analgesic therapy when required. (Reviewer-Olga Plattner, MD).

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Keywords: Day-Case Surgery

Print Tag: Refer to original journal article