Effect of thoracic epidural ropivacaine versus bupivacaine on lower urinary tract function: a randomized clinical trial

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Background: Thoracic epidural analgesia with bupivacaine resulted in clinically relevant postvoid residuals due to detrusor underactivity. This study aimed to compare the risk of bladder dysfunction with ropivacaine versus bupivacaine using postvoid residuals and maximum flow rates. Our hypothesis was that ropivacaine would result in lower postvoid residuals, because ropivacaine has been shown to have less effect on motor blockade.

Method: In this single-center, parallel-group, randomized, double-blind superiority trial, 42 patients undergoing open renal surgery were equally allocated to receive epidural bupivacaine 0.125% or ropivacaine 0.25% (n = 21 per group). Inclusion criterion was normal bladder function. Patients underwent urodynamic investigations preoperatively and during thoracic epidural analgesia. Primary outcome was the difference in postvoid residual preoperatively and during thoracic epidural analgesia postoperatively. Secondary outcomes were changes in maximum flow rate between and within the groups.

Results: Median difference in postvoid residual (ml) from baseline to postoperatively was 300 (range, 30 to 1125; P = 0.005) for bupivacaine and 125 (range, –30 to 350; P = 0.011) for ropivacaine, with a significant mean difference between groups (–175; 95% CI, –295 to –40; P = 0.012). Median difference in maximum flow rate (ml/s) was more pronounced with bupivacaine (–12; range, –28 to –2; P < 0.001) than with ropivacaine (–4; range, –16 to 7; P = 0.025) with a significant mean difference between groups (7; 95% CI, 0 to 12; P = 0.028). Pain scores were similar. No adverse events occurred.

Conclusions: Postvoid residuals were significantly lower using ropivacaine compared to bupivacaine for thoracic epidural analgesia reflecting less impairment of detrusor function with ropivacaine.

Can early oral prolonged-release oxycodone with or without naloxone reduce the duration of epidural analgesia after cystectomy? A 3-arm, randomized, double-blind, placebo-controlled trial

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Background: Thoracic epidural analgesia (TEA) enhances recovery after major bowel surgery. Early postoperative prolonged-release oral formulation of oxycodone or oxycodone/naloxone is potentially useful as a second analgesic step to reduce the duration of TEA. We hypothesized that oxycodone would decrease the duration of TEA and combined with naloxone preserve gastrointestinal function.

Methods: Ninety patients undergoing open cystectomy and urinary diversion were enrolled in this randomized double-blind, three-arm, parallel-group, place-controlled single-center trial between September 2015 and February 2017. Exclusion criteria were known allergy to oxycodone/naloxone, severe pulmonary diseases, hepatopathy, analgesics non-naive patients. From postoperative day 3, patients received batches with oxycodone, oxycodone/naloxone or placebo every 12 h (n = 30 in each arm). Reduction of the epidural drug infusion rate was attempted with the goal to maintain a pain intensity <3 at rest and <5 (numeric rating score) in 27% compared to 2287% (7%) in the oxycodone/naloxone group and to 2/3 (7%) in the placebo group; (P = 0.031).

Results: The median duration of TEA did not differ between patients treated with oxycodone/naloxone (6.7 [range 3.1–10.9] days), oxycodone (70 [3.0–9.1] days) or placebo (6.4 [3.1–8.4]); P = 0.95. Time to first defecation was prolonged in the oxycodone group compared to the placebo group (difference 22.48 hours ±8.95; P = 0.037). In the oxycodone group, we found 8/30 patients (27%) compared to 2287% (7%) in the oxycodone/naloxone group and to 2/3 (7%) in the placebo group; (P = 0.031).

Conclusions: Oxycodone, with or without naloxone, did not reduce the duration of TEA. Oxycodone alone led to a delayed return of bowel function, whereas the combination was not different from placebo.

Impact of intraperoperative fluid and noradrenaline administration on early postoperative renal function after cystectomy and urinary diversion: An observational cohort study

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Background: The use of noradrenaline to enable a restrictive intraperioperative hydration and avoid salt and water overload has gained increasing acceptance. However, concerns have been raised about the impact of this approach on renal function.

Objectives: To identify risk factors for acute kidney injury (AKI) in patients undergoing cystectomy with urinary diversion and to hypothesize whether administration of noradrenaline and intraperioperative hydration regimes affect early postoperative renal function.

Design: Retrospective observational cohort study.

Setting: University hospital from 2007 to 2016.

Patients: A total of 769 consecutive patients scheduled for cystectomy and urinary diversion. Patients with incomplete data and preoperative haemodialysis were excluded.

Main outcome measures: AKI was defined as serum creatinine increase >50% over 72 hours postoperatively. Multiple logistic regression analysis was performed to model the association between risk factors and AKI.

Results: Postoperative AKI was diagnosed in 86789 patients (11.1%), independent predictors for AKI were the amount of crystalloids administered (OR 0.79 [95% CI, 0.68 to 0.91], P = 0.002), antihypertensive medication (OR 2.07 [95% CI, 1.25 to 3.43], P = 0.005), preoperative haemoglobin value (OR 1.02 [95% CI, 1.01 to 1.03], P = 0.010), duration of surgery (OR 1.01 [95% CI, 1.00 to 1.01], P = 0.002), age (OR 1.32 [95% CI, 1.44 to 1.79], P = 0.002) but not the administration of noradrenaline (OR 1.09 [95% CI, 0.94 to 1.21], P = 0.097). Postoperative AKI was associated with longer hospitalisation (18 days [15–22] vs. 16 [15–19]; P = 0.035) and a higher 90 day major postoperative complication rate (41.9% vs. 27.5%; P = 0.002).

Conclusions: Noradrenaline administration did not increase the risk for AKI. An overly too restrictive administration of crystalloids was associated with an increased risk for AKI, particularly in patients treated with antihypertensive medication, older age and prolonged duration of surgery. As AKI was associated with longer hospitalisation and increased postoperative morbidity, these observations should be taken into account to improve outcome when addressing perioperative fluid management.

Impact of packed red blood cells and fresh frozen plasma given during radical cystectomy and urinary diversion on cancer-related outcome and survival: An observational cohort study

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Background: The relationship between blood transfusion and cancer-related outcome and mortality is controversial.

Objective: To assess if perioperative administration of packed red blood cells (PRBC) and fresh frozen plasma (FFP) units affects disease progression and survival after radical cystectomy for bladder cancer.

Design, setting, and participants: We conducted an observational single-centre cohort study of a consecutive series of 885 bladder cancer patients, between 2000 and 2015. Perioperative blood transfusion was defined as need for PRBC and FFP transfusion within the first 24h after the beginning of surgery.

Outcome measurements and statistical analysis: Disease recurrence-free, cancer-specific, and overall survival were estimated using the Kaplan–Meier technique and log rank test.

Results and limitations: A total of 267/885 patients (23%) were transfused; 187/267 patients (70%) received only PRBC (median 2 units [IQR: 1–2]) and 80/267 patients (30%) received PRBC (2 [2–3])
plus FFP (2 [2–2]). Receipt of PRBC or PRBC+FFP was associated with a higher 90d mortality (70% vs. 75% vs. 2.9%; P = 0.016), an inferior 5yr recurrence-free survival (no transfusion 92%, PRBC 74%; P = 0.005, PRBC+FFP 49%; P = 0.002), 5yr cancer-specific survival (no transfusion 74%, PRBC 60%, PRBC+FFP 49%, all P < 0.001) and 5yr overall survival (no transfusion 90%, PRBC 70%, PRBC+FFP 34%, all P < 0.001). In multivariate analysis, blood transfusion was predictive for all-cause mortality [PRBC (HR 1.610; P < 0.001) and PRBC+FFP (HR 1.640; P = 0.003)] and cancer-specific mortality [PRBC (HR 1.467; P = 0.010) and PRBC+FFP (HR 1.901; P = 0.021)]. Limitations include selection bias and lack of standardized transfusion criteria.

Conclusions: The administration of PRBC and FFP was associated with significantly inferior cancer-specific and overall survival. Relevant preoperative factors for receiving blood transfusion were neoadjuvant chemotherapy, preoperative anemia, older age and ASA score ≥3 and emphasize the importance of preoperative optimization of patients undergoing cytoresection.

The analgesic efficacy of tap block versus epidural analgesia: a systematic review and meta-analysis
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Background and aim: TAP block has gained popularity in regional anaesthesia to provide postoperative analgesia but its advantage over epidural analgesia is disputed. The objective of this meta-analysis was to compare the analgesic efficacy of both techniques.

Methods: We followed the PRISMA statement guidelines. Only trials comparing TAP block with epidural analgesia were included meta-analyses were performed following mostly a random-effects model. The primary outcome was pain score at rest (analogue scale, 0–10) on postoperative day 1 analyzed in subgroups according to the population (children or adults, score ≤ 5 or > 5), outcome (hypotension, length of stay, and functional outcomes (time to first bowel sound, time to first flatus). Ten controlled trials, including 505 patients, were identified.

Results: Pain score at rest on postoperative day 1 was equivalent in TAP block and epidural analgesia groups in children (mean difference: 0.3; 95% CI: −0.1; 0.6; I2 = 0%; p = 0.15) and in adults (mean difference: 0.5; 95% CI: −0.1; 1.0; I2 = 81%; p = 0.10). The quality of evidence for our primary outcome was low according to the GRADE system, due to the risk of type II error. Rate of hypotension was higher in the epidural analgesia group (RR: 0.13; 95% CI: 0.04; 0.38; I2 = 0%; p = 0.0002), while hospital length of stay was reduced in TAP block group (mean difference: −0.6 days; 95% CI: −0.9; −0.3 days; I2 = 0%; p < 0.001), without impact on functional outcomes.

Conclusions: There is low evidence that TAP block and epidural analgesia are equally effective in treating postoperative pain. Additional trials with robust methodology are required to assess the analgesic effect and the functional impact of each technique before recommending TAP block that is associated with less episodes of hypotension and reduced length of stay.
Changes induced by the Airtraq Mobile app on handling and improving intubation ease with Airtraq in simulated difficult airways by novice users

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Background: The Airtraq Mobile app is a new intubation solution designed to combine any smartphone to a universal adaptor fitted on any Airtraq. High quality image resolution allows live image display and sharing, in addition to picture and movie recordings. This study was designed to assess the changes induced by adding the Airtraq Mobile to Airtraq SP intubations in simulated difficult airway scenario by novice users.

Methods: This prospective, single blinded, randomized study included 106 ASA I–III adults in which difficult airway was simulated using a rigid neck collar. All novice intubators were directly assisted by an experienced Airtraq user. Patients were randomly allocated for Airtraq SP (AS) vs Airtraq Mobile (AM) intubation. Success and number of attempts necessary were recorded, as well as times (expressed as median seconds [25th; 75th]) necessary for glottis identification, blocking of the cuff, ventilation and total procedure. Ventilation was defined as the observation of end-expiratory CO2 curve on capnography, procedure time as the time from touching the Airtraq to ventilation. Timing of assistance by the TOF-Cuff® on the site of the ulnar nerve was equally analyzed. Subjective ease of intubation was assessed on a scale from 1 to 5 and post-operative discomfort (sore throat, hoarseness, dysphagia) evaluated 24h after intubation.

Results: Demographic and anatomical characteristics were identical in both groups. The usage of the Airtraq Mobile solution increased the overall success rate of intubation by novice users (100% vs 94.3%) and shortened the total time necessary for tracheal intubation (63sec [50;84] vs 74sec [68;90]). The AM group generated more frequent supervisor assistance (77.4% versus 72%) and, in all those cases, was offered spontaneously by the supervisor. In the AS group, 58.3% of the novices had to ask for assistance. The timing of assistance was significantly later in the AS group. Post-operative airway comfort was less frequent in the AM group, as 37.8% of the patients in the AS group had at least one item related to post-operative discomfort versus 20.8% in the AM group. Those discomforts were less frequent in the AM group for each individual item.

Conclusion: The use of the Airtraq Mobile solution to assist intubation by novice users in simulated difficult airways increases first pass success while reducing post-operative airway discomfort. Sharing the airway changes timing and type of assistance by an experienced user assisting to the procedure.

Comparison of the TOF-Cuff® with the TOF Watch SX® in patients undergoing surgery. An observational study

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Background and goal: The TOF-Cuff® is a non-invasive medical device that combines blood pressure cuff and neuromuscular monitoring. It has never been validated using accelerometerography. We compared recovery parameters of a neuromuscular block between the TOF-Cuff® and the TOF Watch SX® (reference).

Methods: Forty patients, ASA I to II, aged 18–65 years, undergoing elective surgery, were included into this single centre study. Each patient served as his own control. The TOF-Cuff® was installed on an upper arm and the electrodes of the TOF Watch SX® on the site of the ulnar nerve on the opposite wrist. After a standardised IV induction with propofol and sufentanil, the devices were calibrated, and simultaneous and continuous train-of-four (TOF) stimulations were commenced. Then, a single IV dose of rocuronium 0.6 mg kg−1 was administered for intubation. Anaesthesia was maintained with a combination of propofol infusion and sufentanil boluses as needed. Primary outcome were the total recovery times (time in minutes from injection of rocuronium to a normalised TOF ratio of 0.9%) with both devices. Bias and limits of agreement between the two monitors were calculated as proposed by Bland and Altman.

Results: The primary outcome could be analysed for both monitors with data of 27 patients. With the TOF Watch SX®, average recovery time was 67.5 minutes (95%CI). With the TOF-Cuff®, total recovery time was on average 16.4 min shorter compared with the TOF Watch SX® (limits of agreement according to Bland and Altman −6.1 to 39.1). The difference was increasing with increasing total recovery time, suggesting that the bias of the TOF-Cuff® was not systematic but relative.

Conclusion: Compared with the TOF Watch SX®, the TOF-Cuff® overestimated speed of recovery of a rocuronium-induced neuromuscular block. It is likely that patients who are extubated based on TOF-Cuff® values are at risk of residual neuromuscular blockade.
capita in Europe and 861 mg per capita in North America. Important disparities between European countries will be mapped out, with for example higher levels of consumption in the Northern than Eastern European countries. Some regional characteristics in the use of specific molecules will also be presented, such as the less frequent prescription of oxycodeone and hydromorphone in Europe compared to North America.

Conclusions: Surprisingly, the increase in consumption in Europe surpassed the one in Northern America over the course of the studied period, however it is in line with the North American trends. European consumption remained higher than the European one. Other hypotheses about this finding will be brought forward. The differences in European levels of current opioid consumption suggest differential regional issues: the high quantities of opioids used in Northern Europe could hint at possible over-prescription issues similarly to North America, while Eastern Europe's lower rates might indicate opioid under-access. This unified data on the use of opioids in Europe should help researchers, clinicians and policymakers to address the specific situation of each country.

Rapid sequence induction with a magnesium – rocuronium combination compared with succinylcholine: a randomized controlled trial
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Background: Succinylcholine has serious side-effects, but remains the neuromuscular agent of choice for rapid sequence induction (RSI). As magnesium increases the onset time of rocuronium, a magnesium-rocuronium combination may be an alternative to succinylcholine.

Objective: To determine whether pre-treatment with IV magnesium before a standard intubation dose of rocuronium (0.6 mg kg-1) provides superior intubation conditions compared with succinylcholine (1 mg kg-1) for RSI.

Methods: Randomized double-blind controlled trial conducted at Geneva and Lausanne University Hospitals. In the magnesium-rocuronium (MR) group, patients received a short IV infusion of magnesium sulphate 60 mg kg-1, RSi was then induced with propofol (2 mg kg-1), sufentanil (0.2 mcg kg-1) and rocuronium (0.6 mg kg-1). The control (PS) group received a matching placebo infusion and succinylcholine 1 mg kg-1 after anaesthesia induction. Intubation conditions were graded as excellent, good or poor 30 sec after administration of the neuromuscular agent using an internally-recognized score. Primary endpoint was the rate of excellent intubation conditions. Secondary endpoints were hemodynamic stability and adverse events.

Results: Among 280 randomized patients, intubation conditions were analyzed in 259 (133: MR; 126: PS). Intubation conditions were similar in both groups (excellent, 61 vs. 57; good, 51 vs. 46; poor, 21 vs. 23, respectively; p = 0.863). Hemodynamic stability and injection-related adverse events were also similar. However, significantly more PS patients complained of postoperative muscular pain (25 [29%] vs. 2 [2%], respectively; p <0.001).

Conclusions: A combination of magnesium pre-treatment with a standard rocuronium intubation dose provides no better intubation for RSI, but has less adverse events.

Patient and procedural features predicting early and mid-term outcome after radical surgery for non-small cell lung cancer
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Background: Postoperative cardiovascular and pulmonary complications (PCVCs and PPCs) are frequent and result in prolonged hospital stay. The aim of this study was to update the risk factors associated with major complications and survival after lung cancer surgery.

Methods: This is a post-hoc analysis of a randomized controlled trial that was designed to assess the benefits of preoperative physical training. After enrollment, clinical, biological and functional data as well as intraoperative details were collected. In-hospital PCVCs and PPCs were recorded and survival data were adjudicated up to 4 years after surgery.

Results: Data from 151 patients were analyzed. Thirty-day mortality rate was 2.6% and the incidence of PCVCs and PPCs was 15% and 33%, respectively. Stepwise logistic regression analysis showed that, PCVCs were mainly related to elevated plasma levels of brain natriuretic peptides (odds ratios (ORs) of 6.0 with 95% confidence interval (CI) of 1.3 to 27) and performance of a pneumonectomy (OR 6.5) and the need for blood transfusion (OR 5.2 with 95%CI 1.2 to 23).

Conclusions: Besides smoking and the extent of lung resection, preoperative physical training was a protective factor regarding PPCs (OR 0.13 with 95%CI 0.05 to 0.34). Cox proportional hazards regression analysis showed that ventilatory inefficiency during exercise (expressed by a ratio >40 of ventilation to carbon dioxide elimination), coronary artery disease, elevated plasma levels of brain natriuretic peptides and the occurrence of PPCs were all predictive of poor survival after surgery.

Satellite Gial cells activation in a mouse model of alcohol-induced neuropathic pain
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Neuropathic pain affects millions of people worldwide while Alcohol Use Disorder (AUD) affects about 4% of the world population. Clinical observations emphasized the strong comorbidity between these pathologies. The estimated prevalence of alcohol-related neuropathy is about 25–66% among, with an estimated 1/3 of painful neuropathy. The neurobiological mechanisms responsible such comorbidity remain to be further elucidated. Recent studies suggested that a deleterious pro-inflammatory environment occurs after chronic alcohol exposure. Interestingly, the activation of satellites glial cells (SGC), major actors of inflammation regulation into the dorsal root ganglion (DRG), plays a significant role in the development of chronic pain. We hypothesized that the SGC activation would play an essential role to the development and maintenance of an alcohol-induced neuropathic pain condition. The fractalkine receptor CX3CR1 has been described as a specific marker of microglial cells. In this study, a total of 75 males and females adult Cx3cr1-eGFP reporter mice were used to specifically visualize the microglia-like SGCs. 38 mice undergo intermittent alcohol exposure model, a diet of ethanol 6.5% for 5 days a week, while 37 mice were exposed to a control water diet for the whole week. The mechanical and thermal sensitivity was assessed once a week (Von Frey and Hargreaves tests). After 10 weeks, the number of Cx3cr1-eGFP positive cells from hypersensitive animals were counted into the DRG and the spinal cord (SC). We observed a significant decrease of the pain threshold within 4 weeks of intermittent alcohol exposure suggesting the development of neuropathic pain, in the group exposed to alcohol in comparison with the control water group. Our data suggest that the high alcohol intake decreases the sensitivity at early stages but then is associated with an hypersensitive phenotype after a long-lasting exposure. A statistical increase of microglia- and astrocyte-like cells in the DRG, in comparison with water diet controls, was observed in the DRG. In the SC, no significant change in glial cells activation was measured between both diet groups. Although future experiment will be required to precisely define the role of SGC in the development and maintenance of alcohol-induced neuropathic pain, SGC represent potentially major actors of the neurobiological process involved in this comorbidity.
The anti-diabetic drug metformin regulates voltage-gated sodium channel NaV1.7 via the ubiquitin-ligase NEDD4-2

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Aim: Voltage-gated sodium channels (NaVs) expression/function in dorsal root ganglia (DRG) neurons is often found to be dysregulated in neuropathic pain. The ubiquitin-ligase NEDD4-2 is a potent post-translational regulator of NaVs and is downregulated in the spared nerve injury model (SNI) of neuropathic pain, leading to an increased sodium current (INa) in DRG neurons. The anti-diabetic drug metformin, an AMPK-activator, was shown to decrease sensory neurons excitability, as well as allodynia developed by mice after SNI. Since AMPK can inhibit various ion channels activity by NEDD4-2, we investigated whether the effect of metformin can occur through post-translational modification of NaVs, via NEDD4-2.

Methods: INa was recorded in voltage-clamp, from HEK293 cells co-transfected with NEDD4-2 and NaV1.7 (a NaV isoform highly expressed in nociceptive neurons and regulated by NEDD4-2), and from isolated mouse DRG neurons, after 12-hours of incubation with metformin 20 mM. Cell-surface expression was studied using immunoblotting and western blotting.

Results: Metformin treatment significantly increased AMPK phosphorylation and significantly reduced INa in HEK293 cells co-transfected with NEDD4-2 and NaV1.7 (-58%, p <0.05). When NEDD4-2 was not co-transfected, metformin had no effect on INa. Cell-surface immunoblotting showed a decreased NaV1.7 expression after metformin treatment (~60%, p <0.01), only when NEDD4-2 was co-transfected. Incubation of isolated DRG neurons with metformin significantly reduced total INa as well as NaV1.7-mediated INa control neurons (Nedd4-2-/-/ft) by 35% and 52%, respectively (p <0.05), but not in neurons lacking NEDD4-2 (SNS-Nedd4-2-/-). NaV1.7 expression was decreased in whole-cultured DRG neurons at the surface of cultured DRG neurons from Nedd4-2-/-/ft control mice (~34%, p <0.05), but not in cultured DRG neurons from SNS-Nedd4-2-/- mice. The effects of metformin were mediated by changes either in NEDD4-2 expression or in NaV1.7 phosphorylation. Preclinical results obtained using current-clamp or multi-electrode array recordings showed that metformin decreases DRG neurons excitability, partially in a NEDD4-2 dependent way.

Conclusion: Our results suggest that metformin effect on DRG neurons excitability is related to post-translational modulation of NaVs by their regulator NEDD4-2. Comprehension of mechanisms of action of metformin opens new alternatives for the diminution of neuropathic pain.

Impact of natural sleep, sedation and hypercapnia on physiological ventilation variability: an experimental study

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Background and aims: The respiratory system exhibits intrinsic variability in breathing pattern. This physiological breath-to-breath variability in tidal volume (VT) and respiratory rate (RR) is expected to reduce tissue stress and improve regional ventilation and gas exchange. We aimed at investigating the effect of natural sleep, sedation and hypercapnia on the intrinsic variability of spontaneous breathing in juvenile rabbits.

Methods: Variability in VT and RR was measured by unconstrained barometric whole-body plethysmography in 3 juvenile rabbits (450–540 g) during 60 minutes twice a day, for 3 consecutive days. Breath-to-breath VT and RR variability, assessed as the coefficient of variation (CV, SD/mean) during the awake state, natural sleep, breath-to-breath VT and RR variability, assessed as the coefficient of variation (CV, SD/mean) during the awake state, natural sleep, hypercapnia (inhaling 5% CO2 for 30 minutes) and under light and deep sedation (7 ± 2 S), CO2 5% (11.1 ± 2.8 S), Sevo 2% (7.6 ± 3.0 S) and Sevo 4% (6.6 ± 1.8 S) CV RR (%): Awake (25.0 ± 10.2 S), CO2 5% (24.8 ± 9.3 S), Sevo 1.9 ± 2.2, Sevo 2% (6.1 ± 3.35) and Sevo 4% (4.7 ± 0.4%)

Results: A significant decrease in the CV of RR under light (p <0.01) and deep sedation (p <0.01) (table), CV of VT decreased under hypercapnia (p <0.01), light (p <0.01) and deep sedation (p <0.01). Conversely, natural sleep did not significantly change breathing variability. CV VT (%): Awake (15.5 ± 2.2 S), CO2 5% (11.1 ± 2.8 S), Sevo 2% (7.6 ± 3.0 S) and Sevo 4% (6.6 ± 1.8 S) CV RR (%): Awake (25.0 ± 10.2 S), CO2 5% (24.8 ± 9.3 S), Sevo 1.9 ± 2.2, Sevo 2% (6.1 ± 3.35) and Sevo 4% (4.7 ± 0.4%)

Conclusions: Our data show that sedation and hypercapnia, but not natural sleep decrease the physiological variability of breathing. Further study will assess the effects of breathing variability suppression under sedation and its causative role in adverse respiratory outcomes.

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Alerte Douleur+, an automatic alert system for patients at risk for chronic postsurgical pain

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Chronic postsurgical pain (CPSP) is a problem affecting more than 10% of surgical patients, and in certain types of surgery 30–50%.

Detecting patients at risk is an important first step for the implementation of prevention strategies. Multiple studies have revealed risk factors, but in clinical routine the screening of CPSP risk is rarely performed. However, most risk factors are documented in the routine documentation, and an automated alert system retrieving these risk factors from the multiple sub-systems of a hospital information system may help to direct the attention of caregivers to these patients at risk of CPSP. In this study we want to test the sensitivity and specificity of such an automated alert for the prediction of CPSP at 6 months postoperatively, and compare this with more exact prediction scores including specific preoperative questionnaires.

Methods: Included will be 450 adult patients scheduled for surgeries with known risk of CPSP: total knee arthroplasty, total shoulder arthroplasty, spine surgery, thoracic surgery, laparotomy, inguinal hernia repair, breast surgery. Excluded are patients undergoing emergency surgery and those undergoing repeat surgery. Following written informed consent, patients complete preoperatively the questionnaires HADS and PCS, and 24h postoperatively the international pain outcomes questionnaire. At 6 and 12 months, patients receive per email the BPI and DN4 questionnaires. The automatic alert is activated (i.e. an automated email is sent) if one of the following conditions is fulfilled: 1) in the preanesthetic consultation preoperative chronic pain, depression, anxiety disorder, substance dependence or chronic opioid or benzodiazepine use noted; OR 2) use of more than 20 mg of morphine iv in the recovery room OR 3) more than 3 pain scores of >5/10 noted in the electronic patient record in the 48h postoperatively.

Results: Until now 145 patients were included, 56 questionnaires at 6 months are already completed. 13/56 patients reported pain at the surgical site, and for 11 of these patients an alert was activated. However, in 28 of 43 patients reporting no CPSP there was also an alert activated, indicating a low specificity of the current alert system.

Conclusion: The automated alert in its raw form is much too unspecific: 39/56 of the patients included had at least one risk factor for CPSP A combination of risk factors will be necessary to augment the specificity of the automated alert system.
of paraesthesia and vascular puncture; pain scores during block procedure and at 24 postoperative hours; and patient satisfaction.

**Results:** Patient characteristics were similar between groups. In both groups, 98% of patients had a successful block (p = 0.96). Needling and procedure times were statistically longer with RCB (p = 0.004), but without having any clinical impact. All other block- and pain-related outcomes were similar between groups. Patient satisfaction was high after both blocks.

**Conclusion:** RCB and SCB provide equivalent anaesthesia and analgesia for distal upper limb surgery.


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**Postoperative analgesia in children recovering from tonsillectomy and adenoidectomy**

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**Background:** Insufficiently treated postoperative pain after tonsillectomy (TE) is frequent in adults [1]. Respective data of children recovering from TE are scarce. To improve clinical care, results of a standardized questionnaire on patient reported outcome on the first postoperative day were analyzed. Within the scope of a project of quality control of postoperative pain management, the intention was to detect possible deficits and, subsequently, to implement respective changes in clinical practice.

**Methods:** The analysis is based on the international registry PAIN OUT infant, in which children >4 years are prospectively enrolled for quality control of postoperative pain management [2]. Written informed consent was obtained from the parents. Patient characteristics as well as anaesthesia, analgesia and surgery related data were collected and documented in the internet-based case report form. On the first postoperative day, children (or children with the help of parents) answered the age adapted patient reported outcome questionnaire asking for pain related impairment and side effects of therapy. Benchmarking was used for comparison of participating hospitals.

**Results:** Complete data of 385 children undergoing tonsillectomy and/or adenoidectomy (females 52%: 8.3 ± 4.0 years, 35 ± 21 kg) could be analyzed. The benchmarking procedure allowed the comparison of nine hospitals. Our hospital showed good results for pain at rest (NRS median (IQR): 0(0/2)) and worst pain (4(2/8)), however, nausea (34.1% of the patients), vomiting (38.6%) and fatigue (65.9%) were relatively frequent. 93% of the children received a nonopioid analgesic (34.1% of the patients), vomiting (38.6%) and fatigue (65.9%) were relatively frequent. 93% of the children received a nonopioid analgesic

**Conclusion:** Twenty-four-hour doses per kg body weight were beneath recommended daily doses. Of note, children undergoing TE. Some aspects, like opioid-related side effects and not sufficiently high doses of nonopioid analgesics were identified, which should be improved in the future.

Kir2.1 regulates spinal microglial membrane potential in the SNI model of neuropathic pain
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Background: Increasing evidence indicates that hyperpolarization of secondary neurones located in the dorsal horn of the spinal cord here microglia gets activated and enhance the sensitization process by releasing cytokines and chemokines. Overall, this results in an amplification of nociceptive stimuli, generating hypersensibility and allodynia – hallmarks of neuropathic pain. Several studies have shown that Microglial cells change their potassium currents once activated. We hypothesized that potassium channels may be necessary for microglial activation and proliferation. We investigated this in the context of neuropathic pain using the spared nerve injury (SNI) model.

Methods: Adult male C57/129-GFP transgenic mice (20–24 g) were sacrificed and L3–L5 dorsal horn part of the spinal cord was taken. For immunohistochemistry, it was fixed, sliced and stained with the proliferation marker Ki-67. For Electrophysiology, we incubated it in papain for 30 min at 30 °C and dissociated cells. Microglial cells were kept in culture until experiment. After Glu-seal formation, whole-cell configuration was established and microglial channels were recorded.

Results: By immunofluorescence we assessed the microglial proliferation, we show with the Ki-67 staining that it starts already 2 days after SNI and is reduced at day 4. The number of microglia increase already a bit at day 2 but then increase much more at day 4. At day 7 it increases again, but in a smaller amount. Inward potassium currents showed a 2 to 3 fold increase two days after SNI, and the resting membrane potential (RMP) of microglial cells got more hyperpolarized going from –21.5 ± 5.83 to –39.91 ± 5.83 mV when compared to naive animals. To determine the provenance of this current we used the SK channel blocker Apamin and the Kir2.x channel blocker ML133. Apamin did not significant change to both the current and RMP of SNI D2 cells. However ML133 abolished the potassium current and depolarized the RMP of microglial cells from –36.91 ± 5.83 to –9.00 ± 1.96 mV, reversing the membrane potential state beyond the naive condition. ML133 reduced the inward potassium current in a dose dependent way.

Conclusion: Interestingly, the peak of potassium current appears at D2, which corresponds to the proliferation peak of microglia after SNI. Thus potassium channels in microglia may play an important role in the activation and proliferation of Microglia.

Reporting of conflicts of interest of panel members and chairpersons of guidelines in anaesthesiology. A cross-sectional study
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Background: Conflicts of interest (COI) of panel members (panellists) may bias guideline recommendations. Their potential impact, and management, should be transparently reported.

Methods: We analysed 65 guidelines published in five anaesthesiology journals (2007–2016). We report on the number (%) that 1) published COIs, 2) in a distinct paragraph, 3) described COIs of panellists and 4) of the Chairperson, 5) described the impact of the sponsor on recommendations, 6) reported procedures taken to minimise the risk of biases due to panelists’ COI or the consultant were recorded.

Results: COIs were published in 31/65 (48%) guidelines; in a distinct paragraph of 14/31 (45%). Panellists reported no COI in 7/31 (23%) guidelines, disclosed COIs without describing their impact in 23/31 (74%), and disclosed such information in 1/31 (3%), 12/31 (40%) chairpersons were identified; 7/31 (23%) reported no COIs, 8/31 (26%) disclosed COIs without describing their impact, and 1/31 (3%) made no statement regarding COI. Statements regarding sponsors were reported in 17/35 (26%) guidelines; 5/17 (29%) declared none, 1/17 (6%) described its potential influence on the development of the guideline, 34 guidelines had COI and/or sponsorship disclosure. In

Anesthesia in toxic environment: PIPAC pressurized intraperitoneal aerosol chemotherapy
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Background: Pressurized Intraperitoneal Vaporized Chemotherapy (PIPAC) is a new technique of chemotherapy application for peritoneal carcinosis. Specificity of this technique is the transient chemo-toxic environment created in the theatre, requesting anticipation from the anaesthesiologist who will not be able to enter the operating room for 30 minutes. The procedure could be compared to a laparoscopic cholecystectomy and last 90 minutes.

Methods: From January 2015 until February 2018, all patients undergoing PIPAC procedure were included in the study. Due to the chemo-toxic environment created in the theatre, requesting anticipation from the anaesthesiologist who will not be able to enter the operating room for 30 minutes. The procedure could be compared to a laparoscopic cholecystectomy and lasts 90 minutes.

Conclusion: There are differences in paediatric trauma amongst European centers? Epidemiology in a Swiss trauma center Svantner J.1, Dolci M.1, Heim C.1, Schoettker P.1
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Background and Goal of Study: Major paediatric trauma in Switzerland is rare and published data are scarce. The University Hospital of Lausanne (CHUV) serves as a tertiary center for trauma and burn injuries. Its first trauma registry dates from 2011. The purpose of this study was to provide an internationally comparable overview of paediatric trauma and to compare the results with other European trauma centers, in order to improve their care.

Materials and Methods: We analysed all injured children below 16 years admitted to the resuscitation room (RR) after prehospital triage. Data included: age, gender, injury severity (ISS), mechanism of injury, lactate level, emergency interventions, location of transfer, length of stay and in-hospital mortality. The analysis covered the period of 2011–2016. p-values were calculated with the likelihood-ratio test from the chi-square distribution.

Results and Discussion: We included 328 children. 63% were male, the median age was 8, Severe trauma (ISS >15) occurred in 97 patients. Main mechanisms of injury were falls (45%), road traffic (29%) and burns (14%). Number of home and sporting activities as causes was similar (32%; 28%). Affected areas were: head & neck (66%) and external body region (38%). Due to over triage, 43% of children were redirected from RR to the emergency department. Intensive care admission amounted to 20%; 2% underwent immediate surgical interventions (wound care, neurosurgery, and orthopaedic surgery). Overall mortality was 5.5% (18/328) with a median ISS of 9 (Denmark: 24/331, median ISS 9 [Do HQ 2012]). In the severe trauma subgroup, mortality was 17.5% with a median ISS of 22 (Germany: 13.4%; median ISS 25 [Schoeneberg 2014]; United-Kingdom: 8.6%; median ISS 16 [TARN 2014]). Half of children died within 6 hours. The main causes of death were falls from above 5m and traffic accidents as pedestrian. Mechanism, ISS, GCS, intubation and lactate level influence mortality (p <0.0001).

Conclusion: Compared to European trauma centers our mortality is slightly higher. Children died early after the admission, this suggests that improving pre-hospital care early resuscitation and injury prevention are likely to decrease mortality. Prevention should focus on pedestrian safety and protection from head injuries. Our results are similar to Danish paediatric trauma population. For the safety of children, a deliberate over triage strategy was adopted.
Anaesthetic risk factors on early cancer-related outcomes in bladder cancer patients undergoing radical cystectomy and urinary diversion: a case-series analysis

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Background: The impact of anaesthetic techniques on disease recurrence is controversial. In addition, concerns have been voiced that noradrenaline may be implicated in angiogenesis and metastasis via oxidative stress. To determine the potential association between noradrenaline on disease recurrence.

Methods: We conducted a retrospective analysis of a consecutive series of 952 urothelial carcinoma patients undergoing radical cystectomy and urinary diversion, between 2000 and 2016. A total of 582/952 patients (62%) received noradrenaline intraoperatively. Subgroup analysis was performed according to patients who received neoadjuvant chemotherapy or not. Additional sensitivity analysis evaluated risk factors for early disease recurrence (i.e. within 12 months). Regression models were used to analyze clinicopathologic variables associated with disease recurrence.

Results: The use of noradrenaline was not a predictor for disease recurrence in any models (P = 0.48). Duration of surgery (HR 0.996, 95% CI 0.992–1.000, P = 0.035), administered fentanyl (HR 1.002, 95% CI 1.000–1.004, P = 0.044), preoperative eGFR (HR 0.993, 95% CI 0.988–0.998, P = 0.011), neoadjuvant chemotherapy (HR 1.678, 95% CI 1.265–2.205, P < 0.001), tumor size (HR 1.654–2.776, P < 0.001), positive surgical margin (HR 2.304, 95% CI 1.803–2.939, P = 0.001) and nodal stage (HR 2.523, 95% CI 1.803–2.939, P < 0.001) were associated with higher risk of disease recurrence. In patients treated with neoadjuvant chemotherapy (n = 146), administered fentanyl (HR 1.001, 95% CI 1.000–1.002, P = 0.004), sex (HR 2.945, 95% CI 1.691–130, P < 0.001), tumor size (HR 2.385, 95% CI 1.135–4.213, P = 0.003), and surgical margin (HR 3.478, 95% CI 1.475–8.199, P = 0.000) were associated with higher risk of disease recurrence. Amount of fentanyl (OR 1.003, 95% CI 1.000–1.007, P = 0.04), pT stage (OR 0.368, 95% CI 0.259–0.522, P < 0.001), surgical margin (OR 0.324, 95% CI 0.135–0.776, P = 0.012), nodal stage (OR 0.107–0.480, 95% CI 0.00, P = 0.008) were risk factors for early recurrence in patients who did not receive neoadjuvant chemotherapy.

Conclusions: Noradrenaline does not seem to have an impact on disease recurrence after radical cystectomy for muscle invasive urothelial carcinoma. The amount of fentanyl seemed to influence disease recurrence in patients treated with neoadjuvant chemotherapy and consequently should be used with caution.
Anaesthesia-related mortality in Sub-Saharan African countries. A systematic review of the indexed and non-indexed literature

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Aim: We set out to estimate anaesthesia-related mortality in Sub-Saharan African countries based on the indexed and non-indexed (grey) literature.

Methods: Reports on dichotomous anaesthesia-related mortality in Sub-Saharan African countries (except South Africa) were systematically searched until April 2017. Searches were done in medical databases (PubMed, Cochrane, Web of Science, Embase – indexed literature), African National Congresses on obstetrics and surgery, medial theses and Google (non-indexed literature). Definitions of anaesthesia-related mortality were taken as reported in the individual reports. No restriction was applied concerning date or language of publication, or type of surgery. The Human Development Index, a summary measure of average achievement in key dimensions of human development, was regarded as a surrogate of the quality of a country’s national health care system.

Results: We included 170 reports (1,054,364 patients); 103 (882,734 patients) were from the indexed and 67 (171,630) from the non-indexed literature. Weighted mean of overall anaesthesia-related mortality was 8.03/10,000; it was 5.45/10,000 in the indexed literature and was 21.27/10,000 in the non-indexed literature. There was a trend toward lower mortality rates in countries with higher Human Development Indexes.

Conclusion: Anaesthesia-related mortality in Sub-Saharan African countries is higher than previously reported. It remains unclear whether mortality is underestimated in the indexed literature or overestimated in the non-indexed literature. Countries with lower Human Development Indexes have higher mortality rates.

Interscalene brachial plexus block for surgical repair of clavicle fracture: a matched case-control study

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Background: Innervation of the clavicle is complex and debated, with scarce data on the analgesic impact of regional anaesthesia after surgical repair of clavicle fracture. We report a matched case-control cohort study of patients undergoing clavicle fracture fixation performed under general anaesthesia with or without an interscalene brachial plexus block (ISB).

Methods: Fifty consecutive patients scheduled for surgical fixation of middle/distal clavicle fracture underwent general anaesthesia with ISB were prospectively enrolled. This cohort was compared to a historical control of 76 retrospective patients without regional block. The primary outcome was total intravenous morphine equivalent consumption at 24 postoperative hours. Secondary outcomes included perioperative sufentanil administration, intravenous morphine equivalent consumption at 24 postoperative hours, and resting pain scores at 2 and 24 postoperative hours. To assess the ISB impact, we performed both an overall cohort analysis and a case-matched analysis with each ISB-treated patient matched to a Non-ISB-treated patient. Matching employed a 1-to-1, nearest-neighbour approach using the Mahalanobis metric.

Results: In the overall cohort, patients with ISB had significantly lower i.v. morphine equivalent consumption at 2 postoperative hours (0.7 mg [95%CI: 0.1–1.2]) versus controls (8.8 mg [95%CI: 7.1–10.4]; p < 0.0001). Secondary outcomes were also significantly reduced, except resting pain scores at 24 postoperative hours. These results persisted after case-matching the cohorts (mean difference for the primary outcome: 8.3 mg [95%CI: 6.5–10.0]; p < 0.001).

Conclusions: ISB provides effective analgesia after surgical fixation of middle/distal clavicle fracture suggesting clinically relevant clavicle innervation mainly from branches of the brachial plexus. These results should help physicians establishing an analgesic strategy for this type of surgery.

Keywords: Peripheral nerve block, regional anaesthesia, postoperative analgesia, trauma, clavicle fracture

Will I ever debrief?

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In this poster/workshop we aim to show/apply simulation-based debriefings methods to clinical practice. Particularly in intense, high-risk medical domains such as anaesthesia improving patient safety is a major concern. The science of teams provides a promising lens for examining work in these high-risk domains. Applying this lens reveals that work is performed by ad-hoc teams which are fluid and dynamic rather than definite and stable [1]. Despite the growing presence of these so-called acute care teams (ACT) in today’s organizations, not much is known of what drives their effectiveness and enables their learning [2]. Current team learning theories do not apply to ACTs because they do not factor in their lack of temporal stability [2]. Due to this temporal instability, learning has to be transitional, that is enable team members to use the team experience from participating in one ACT to improve participating in another ACT [2]. However, there is only limited knowledge on what ACTs do and need to learn. Our objective is to present how structured debriefings can provide a suitable learning infrastructure. Although widely used in simulation-based trainings (SBT) and studied in the context of simulation [3–6], debriefings are underutilized and understudied in clinical practice. The learner will be able to: (1) Discuss the core elements of SBT; (2) Describe how debriefings offer multiple learning possibilities; (3) Assess how learning and performance of ACTs will be effective; (4) Discuss how ACT debriefings have to be embedded in organizational learning; and (5) Identify what health care providers need in order to learn and apply debriefings.


Digital Emergency Checklists (DEC) – the cockpit in the operating room

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Emergency situations regularly occur in the perioperative setting. Doctors and nurses must coordinate the correct diagnostic or therapeutic actions within a very short time in order to ensure optimal patient care. As with aviation, the treatment teams in the operating room of the Cantonal Hospital Baden have checklists at their disposal since 2014 when the hospital joined the project “Progress – Safe Surgery”. The DEC are based on the Stanford Cognitive Aid Group. A few simulation studies described in literature have shown that the patient’s outcome after an emergency situation is better when working according to checklists. In addition, the medical team also achieved better results in terms of communication, leadership, decision-making and problem solving. The checklists at the Hospital in Baden have been designed to assist the team of anaesthesiologists in unpredictable and rare acute situations in order to ensure prompt and adequate treatment. Such situations pose a challenge to the entire team. Priorities and treatment procedures need to be set and established within an appropriate time. The goal, inspired by aviation, is to design clear and easily structured
checklists for doctors and nurses of anaesthesia, regardless of their experience and hierarchy level. In analogy to the internationally known ABCDE-scheme for the treatment of trauma patients, the DEC are structured similarly. The main idea is the fast, reliable and priority-oriented recording as well as the targeted initiation of treatment measures of the most threatening disturbances of the vital functions (“treat first what kills first”). A precondition for the successful implementation of DEC in emergency situations used in the Cantonal Hospital Baden is regular staff training. Thanks to the central storage in the hospital’s intranet and as well as to the smartphone version, every employee of anaesthesia is able and required to familiarize themselves with the DEC anywhere and anytime and to deepen their knowledge. A continuous update of the DEC that reflects the latest level of knowledge is ensured and simplified by our digital version. Errors that occur in stressful situations have decreased significantly because the involved health professionals follow a rule based action algorithm. The general sense of preparedness of the whole anaesthesia team at the Cantonal Hospital in Baden reflects the success and the generally positive response to the DEC respectively.

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Background: The radial nerve may be painfully irritated or damaged by osteosynthesis of humeral fractures. Secondary radial nerve lesions after osteosynthesis of humeral shaft fractures are described in up to 16%. Not only peripheral nerves but also orthopaedic instruments and osteosynthesis material are well visible in ultrasound. We evaluated the accuracy of ultrasound in assessing the relation between screw-tips and the radial nerve after osteosynthesis of humeral fractures.

Methods: Ultrasound guided drilling was used to place screws as close as possible to the radial nerve in 8 humeri of four cadavers. The relation between the radial nerve and the screw tips were assessed by high-resolution ultrasound. The overlap of the screw tip over the bone were measured by ultrasound and fluoroscopy and verified by anatomical dissection.

Results: We could correctly identify all screw-tips and their relation to the radial nerve in 8 humeri in 8 cases. The overlap of the screw tip over the bone was measured by ultrasound in all cases, in contrast fluoroscopy underestimated this length in 50% of cases.

Conclusions: With this study we show that ultrasound could be an adequate tool to guide drilling in humeral fracture osteosynthesis and to reliable visualize the screw-tips and its relation to the radial nerve. Furthermore, ultrasound is a promising diagnostic tool to evaluate patients with radial nerve irritations or lesions after humeral fracture osteosynthesis.

Ultrasound evaluation of radial nerve injuries by cortex overlapping screw-tips in the spiral groove in osteosynthesis of humeral fractures: a cadaveric study

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