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### Resources

**BMJ Best Practice**

BMJ Best Practice uses the latest evidence-based research, guidelines and expert opinion to offer step-by-step guidance on diagnosis, prognosis, treatment and prevention.

**DynaMed**

DynaMed study summaries provide brief and clinically oriented descriptions of clinical research studies, placed in context within the clinical framework. Key elements of a DynaMed study summary include the study conclusion, level of evidence rating, study type, reference, and study details.

**Trip**

Trip is a clinical search engine designed to allow users to quickly and easily find and use high-quality research evidence to support their practice and/or care. As well as research evidence we also allow clinicians to search across other content types including images, videos, patient information leaflets, educational courses and news.

### Systematic Reviews

*Cochrane Database of Systematic Reviews*

**Single-dose intravenous ketorolac for acute postoperative pain in adults** (2021)

Ewan D. McNicol, McKenzie C. Ferguson, Roman Schumann

[Available online at this link](#)

Postoperative pain is common and may be severe. Postoperative administration of non-steroidal anti-inflammatory drugs (NSAIDs) reduces patient opioid requirements and, in turn, may reduce the incidence and severity of opioid-induced adverse events (AEs).
A combination of serratus and transverse thoracic muscle plane blocks as the main anesthetic method for a high-risk patient with pericardial tamponade.

Available online at this link

A lumbar anterior lateral transverse-process (LALaT) block for a patient with multiple traumatic injuries.

Available online at this link

A novel indication for pericapsular nerve group (PENG) block: High volume PENG block combination with sciatic block for surgical anesthesia of lower limb.

Available online at this link

An investigation of the effects of dexmedetomidine and fentanyl as an adjuvant to ropivacaine on pain scores and hemodynamic changes following laparoscopic cholecystectomy.

Modir Hesameddin Medical gas research 2021;11(3):88-93.
Postoperative pain control is recognized as a challenging surgical issue receiving high priority in the healthcare system, and opioids are routinely prescribed for anesthesia and pain relief. This study aimed to investigate the effects of ropivacaine administered intraperitoneally alone or combined with dexmedetomidine or fentanyl on postoperative pain control following laparoscopic cholecystectomy. This randomized double-blind clinical trial recruited three equal-size block-randomized groups of patients (n = 138) scheduled for elective laparoscopic cholecystectomy at Valiasr Hospital, Arak, Iran, in 2019-2020 who received ropivacaine (40 mL/0.5%), ropivacaine (40 mL/0.5%) + dexmedetomidine (1 μg/kg), and ropivacaine (40 mL/0.5%) + fentanyl (1 μg/kg). No significant differences were observed among the three groups according to the vital signs (mean arterial pressure/heart-rate/oxygen saturation) in the study period and during surgery (P > 0.05). Lower pain was revealed in the ropivacaine + dexmedetomidine group (P = 0.001), with the lowest opioid dose in postoperative 24 hours (P = 0.001). Moreover, no clinically significant differences were observed in complications among the three groups (P = 0.483), and no patient developed ileus. Intraperitoneal ropivacaine administered with dexmedetomidine could relieve pain and reduce opioid use in postoperative 24 hours, without any complication and ileus. Therefore, intraperitoneal ropivacaine administered with dexmedetomidine is recommended for postoperative pain control in patients undergoing laparoscopic cholecystectomy. This study was approved by the Ethical Committee of Arak University of Medical Sciences (approval No. IR.ARAKMU.REC.1397.267) on December 30, 2018 and was registered in the Iranian Registry of Clinical Trials (No. IRCT 20141209020258N117) on July 13, 2019.
Available online at this link

Analysis of mRNA-IncRNA and mRNA-IncRNA-pathway co-expression networks based on WGCNA in developing pediatric sepsis.

Pediatric sepsis is a great threat to death worldwide. However, the pathogenesis has not been clearly understood until now in sepsis. This study identified differentially expressed mRNAs and IncRNAs based on Gene Expression Omnibus (GEO) database. And the weighted gene co-expression network analysis (WGCNA) was performed to explore co-expression modules associated with pediatric sepsis. Then, Gene Ontology (GO), KEGG (Kyoto Encyclopedia of Genes and Genomes) pathway, mRNA-IncRNA and mRNA-IncRNA-pathway co-expression network analysis was conducted in selected significant module. A total of 1941 mRNAs and 225 IncRNAs were used to conduct WGCNA. And turquoise module was selected as a significant module that was associated with particular traits. The mRNAs functions associated with many vital processes were also shown by GO and KEGG pathway analysis in the turquoise module. Finally, 15 mRNAs (MAPK14, ITGAM, HK3, ALOX5, CR1, HCK, NCF4, PYGL, FLOT1, CARD6, NLRC4, SH3GLB1, PGS1, RAB31, LTB4R) and 4 IncRNAs (GSECI, NONHSAT160878.1, XR_926068.1 and RARA-AS1) were selected as hub genes in mRNA-IncRNA-Pathway co-expression network. We identified 15 mRNAs and 4 IncRNAs as diagnostic markers, which have potential functions in pediatric sepsis. Our study provides more directions to study the molecular mechanism of pediatric sepsis. Abbreviations: mRNA: messenger RNA; IncRNA: long noncoding RNAs; GEO: Gene Expression Omnibus; WGCNA: weighted gene co-expression network analysis; GO: Gene Ontology; KEGG: Kyoto Encyclopedia of Genes and Genomes; SIRS: systemic inflammatory response syndrome; TOM: topological overlap measure; BP: biological process; MF: molecular function; CC: cellular component; ROC: receiver operating characteristic curve; AUC: area under curve; MAPK14: Mitogen-activated protein kinase 14; ALI: acute lung injury; ITGAM: Integrin subunit alpha M; HK3: Hexokinase 3; LPS: lipopolysaccharide; S-LO: S-lipoxygenase; LTs: leukotrienes; LTB4R: leukotriene B4 receptor.
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Inferior alveolar nerve block (IANB) is a frequently used anesthetic technique for restorative and surgical procedures in the mandible and its success rate usually ranges from 80 to 85%. Thus, this study aimed to compare the anesthetic efficacy of an alternative technique named superficial nerve block (SNB)—which consists of a modified approach using an extra-short needle inserted 10 mm deep and on a higher injection site to the conventional technique (CT) for IANB in healthy individuals.

METHODS About 20 participants received both SNB and CT with 1.8 mL of 2% lidocaine and 1:100,000 epinephrine. Thermal tests were performed 6 times, every 2 min, on the inferior canine and first molar to determine the success rate and anesthesia onset. Assessments were repeated at 20, 40, and 60 min to determine anesthesia duration. Sensitivity of lips and tongue was tested by clamp pressure. Pain perception during injection was assessed by a 100 mm visual analog scale (VAS).

RESULTS The success rate in accordance with anatomical location was molars (SNB = 90%; CT = 85%), canines (SNB = 25%; CT = 70%), lips (SNB = 45%; CT = 95%), and tongue (SNB = 85%; CT = 95%). Significant differences were found for canines (P = .012) and lips (P < .002). Moreover, median anesthesia onset was: molars (SNB = 6 min; CT = 4 min), canines (SNB = 6 min; CT = 6 min), lips (SNB = 10 min; CT = 6 min), and tongue (SNB = 8 min; CT = 4 min), whereas median duration was molars (SNB = 60 min; CT = 60 min), canines (SNB = 20 min; CT = 60 min), lips (SNB = 60 min; CT = 60 min), and tongue (SNB = 60 min; CT = 60 min). A significant difference was found for anesthesia onset on molars (P = .024) and lips (P = .009). Pain scores on VAS were SNB (median = 8.5 mm) and CT (median = 10.0 mm) (P = .398). CONCLUSION In healthy individuals, the anesthetic effects of SNB were noninferior to CT in molars and tongue, although efficacy was considerably inferior in anterior teeth and lips.

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Anesthetic techniques for patients with pulmonary hypertension undergoing ophthalmologic procedures: A case series.


Available online at this link

Assessing the antinociceptive effect of nitrous oxide to tetanic stimulation in anaesthetised patients with new intra-operative nociception monitors: An observational study.


BACKGROUND Nitrous oxide (N2O) has been used since the 19th century for its analgesic, antinociceptive and anxiolytic effects during surgical procedures in awake and anaesthetised patients. However, quantification of noxious stimuli that occur under general anesthesia is a constant challenge for anaesthesiologists, and recently two new indices have been developed to assess intra-operative nociception.

OBJECTIVE The aim of this study was to quantify with new indices as well as with more classical clinical parameters the antinociceptive effect of N2O during general anaesthesia.

DESIGN Prospective, open label, patient-blinded, observational and descriptive trial.

SETTING Single-centre academic hospital.

PARTICIPANTS Forty American Society of Anesthesiologists’ physical status 1 to 3 patients undergoing general anaesthesia for elective abdominal surgery via laparotomy were recruited.

MAIN OUTCOMES MEASURES Intra-operative pain was assessed using a standardised electrical stimulation of the forearm (tetanic stimulation at 70 mA, 100 Hz for 30 s), at 0, 25 and 50% inhaled N2O/O2. Heart rate (HR), mean arterial blood pressure, bispectral index, the analgesia nociception index and the nociception level (NOL) index were used to evaluate intra-operative nociception before and after each standardised tetanic stimulation.

RESULTS There was a 16% reduction of the analgesia nociception index reaction, a 31% reduction of the NOL reaction and a 51% reduction of the HR reaction to a standardised electrical tetanic nociceptive stimulation during administration of 50% N2O. Administration of 50 or 25% inhaled N2O produced the same quality of antinociception based on HR and NOL index analyses. HR and the NOL index were the best parameters to identify the antinociceptive effect of intra-operatively administered N2O.

CONCLUSION In anaesthetised patients, our study demonstrated clinically significant antinociceptive properties of N2O. Our results showed that low concentrations of N2O (25%) are as effective as higher concentrations (50%) to achieve a significant antinociceptive effect during general anaesthesia.

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Can local anesthesia with ropivacaine provide postoperative analgesia in extraction of impacted mandibular third molars? A randomized clinical trial.


OBJECTIVE The aim of this study was to compare the local anesthesia efficacy of ropivacaine 0.75% compared to lidocaine 2% with 1:100,000 epinephrine for postoperative analgesia following extraction of impacted mandibular third molars. STUDY DESIGN In this randomized, double-blind crossover clinical trial, 30 participants underwent surgical removal of bilateral impacted mandibular third molars under local anesthesia using ropivacaine 0.75% or lidocaine 2% with 1:100,000 epinephrine. The pain was recorded on a visual analog scale at 4, 8, 12, 24, and 48 h postoperatively. The use of analgesics and the presence of adverse effects were recorded.

RESULTS The duration of soft tissue anesthesia in the ropivacaine group was significantly long compared to lidocaine. The use of analgesics and the presence of adverse effects were significantly more in the lidocaine group. Rescue medication was used by 2 patients in each group (6.7%).

CONCLUSION In healthy individuals, the anesthetic effects of SNB were noninferior to CT in molars and tongue, although efficacy was considerably inferior in anterior teeth and lips.

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Clavpectoral fascial plane block for implantable cardioverter defibrillator implantation.


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Combination thoracic paravertebral blockade with caudal blockade provides complete anesthesia and analgesia in the percutaneous nephroscopic lithotomy.

Bu Lina Journal of clinical anesthesia 2021;71:110250. Available online at this link

Comparison of the TetraGraph and TOFscan for monitoring recovery from neuromuscular blockade in the Post Anesthesia Care Unit. Renew J. Ross Journal of clinical anesthesia 2021;71:110234.

Study Objective: Comparison of the TetraGraph (TG) and TOFscan (TS) for monitoring recovery from neuromuscular blockade in the Post Anesthesia Care Unit (PACU); ; Design: Randomized, multcenter trial.; Setting: PACU in three tertiary care hospitals.; Patients: 120 patients (40 per site) receiving neuromuscular blockade during elective surgery.; Interventions: Patients were enrolled preoperatively and intraoperative neuromuscular blockade management was at the discretion of the anesthesiologist. Upon arrival to the PACU, patients were randomized to have either TG or TS placed on their dominant hand. The alternate device (TS or TG) was placed on the non-dominant hand. Following simultaneous ulnar nerve stimulation on each arm, the response of the adductor pollicis was measured.; Measurements: Train-of-four ratios (TOFRs) were obtained upon arrival to the PACU (t = 0), after 5 min (t = + 5) and after +10 min (t = + 10); Main Results: There was there was no significant difference in the mean TOFRs obtained with the TG and TS at t = 0 (0.97 ± 0.18 vs 0.94 ± 0.13, P = 0.06, respectively) and t = + 5 (0.96 ± 0.20 vs 0.95 ± 0.12, P = 0.29, respectively). At (t = + 10), there was a statistically significant difference in mean TOFRs obtained with the TG and TS, (0.99 ± 0.14 vs 0.94 ± 0.12, P < 0.001, respectively). The bias between devices at t = 0 was estimated to be 0.03 (95% CI, -0.29 to 0.35, P = 0.26); at t = + 5 min, it was estimated to be 0.02 (95% CI, -0.36 to 0.40, P = 0.54); and at t = +10 min, it was estimated to be 0.05 (95% CI, -0.25 to 0.36, P = 0.77); Conclusions: TS and TG provide interchangeable quantitative measurements once the TOF ratio has returned to a value of 0.90 or greater in the PACU. (Copyright © 2021 Elsevier Inc. All rights reserved.) Available online at this link


Vital capacity rapid inhalation induction (VCRII) results in faster achievement of desired minimum alveolar concentration while reducing the incidence of excitative phenomenon compared to conventional incremental technique. This study aimed to determine whether the VCRII can achieve faster induction of anesthesia in adults compared to the traditional tidal ventilation (TV) technique. Following the approval from the Institutional Ethics Committee, Amala Institute of Medical Sciences, with an approval No. AIMSEC/07/2017, on July 1, 2017, 51 adults belonging to American Society of Anesthesiologists physical status I-II, undergoing elective surgery at a tertiary care teaching hospital were prospectively assigned to two groups: 25 in VCRII (38.3 ± 13.3 years old, 20 (80%) females) and 26 in TV inhalation induction (35.2 ± 11.9 years old, 17 (65%) females) using 8% sevoflurane in 66% nitrous oxide. The induction time, such as time (in seconds) to the cessation of voluntary finger tapping, time to loss of eyelash reflex, time to return of regular breathing, the return of conjugate gaze, was measured. The primary outcome was time to induction as defined by time to loss of eyelash reflex. Hemodynamic effects of both methods were compared at baseline and 1, 3, 5, 10, 15-minute intervals from induction. Induction was significantly faster in the VCRII group compared with the TV group in all the measured parameters. Hemodynamic parameters were comparable in both the groups. VCRII resulted in a faster induction time compared to the TV technique in adults. Available online at this link


The development of local anesthetic (LA) system is the application of commercial drug for the pain management that indorses the reversible obstructive mechanism of neural transmission through preventing the innervation process in human peripheral nerves. Ropivacaine (RV) is one of the greatest frequently used LA s with the actions of long-lasting and low-toxicity for the post-operative pain management. In this work, we have approached novel design and development of glycosylated chitosan (GCS) encapsulated mesoporous silica nanoparticles (GCS-MONPs)-based nano-scaffold for sustainable distributions and controlled/supported arrival of stacked RV for targeting sites, which can be activated by either outer ultrasound activating to discharge the payload, foundation on-request and dependable analgesia. The structural and morphology analyses result established that prepared nano-formulations have successful molecular interactions and RV loaded spherical morphological structures. The drug release profile of developed nanostructure with ultrasound-activation has been achieved 50% of drug release in 2 h and 90% of drug release was achieved in 12 h, which displays more controlled release when compared to free RV solution. The in vitro cell compatibility analysis exhibited GCS-MONPs with RV has improved neuron cell survival rates when compared to other samples due to its porous surface and suitable biopolymer proportions. The analysis of ex vitro and in vivo pain relief analysis demonstrated treated animal models have high compatibility with GCS-MONPs@RV, which was confirmed by histomorphology. This developed MONPs based formulations with ultrasound-irradiation gives a prospective technique to clinical agony the board through on-request and dependable help with discomfort. Available online at this link


BACKGROUND Several randomized controlled trials (RCTs) have evaluated the use of dexmedetomidine versus fentanyl as adjuvants to
Effect of anesthesia on electrocorticography for localization of epileptic focus: Literature review and future directions.


Intraoperative electrocorticography (ECoG) is a useful technique to guide resections in epilepsy surgery and is mostly performed under general anesthesia. In this systematic literature review, we seek to investigate the effect of anesthetic agents on the quality and reliability of ECoG for localization of the epileptic focus. We conducted a systematic search using PubMed and EMBASE until January 2019, aiming to review the effects of anesthesia on ECoG yield. Fifty-eight studies were included from 1016 reviewed. There are favorable reports for dexmedetomidine and remifentanil during ECoG recording. There is inadequate, or sometimes conflicting, evidence to support using enflurane, isoflurane, sevoflurane, and propofol. There is evidence to avoid halothane, nitrous oxide, etomidate, ketamine, thiopental, methohexital, midazolam, fentanyl, and alfentanil due to undesired effects. Depth of anesthesia, intraoperative awareness, and surgical outcomes were not consistently evaluated. Available studies provide helpful information about the effect of anesthesia on ECoG to localize the epileptic focus. The proper use of anesthetic agents and careful dose titration, and effective communication between the neurophysiologist and anesthesiologist based on ECoG activity are essential in optimizing recordings. Anesthesia is a crucial variate to consider in the design of studies investigating ECoG and related biomarkers.

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Effect of inhaled anesthetic gases on immune status alterations in health care workers.


The objective of this research was to evaluate consequences to the immune system of long-term exposure to waste anesthetic gases (WAG) by medical theater personnel. Two groups were recruited: (i) 60 healthy male controls; (ii) 120 medical professionals exposed to WAG, subdivided according to theater role, i.e. surgeons, surgical assistants (SA), anesthetists, anesthetic assistants (AA), nurses, and workers. Serum levels of fluoride, hexafluoroisopropanol (HFIP), total lymphocyte counts, as well as of CD3, CD4, and CD8 cells, CD4/CD8 ratios, and immunoglobulins IgA, IgG, IgM, and IgE were assayed. The results showed that fluoride and HFIP titer were significantly increased in anesthetists and AA compared with the other exposed groups. All exposed groups demonstrated significant elevation in lymphocyte count, CD4 + cell levels, CD4/CD8 ratios, as well as levels of IgE, IgM and IgG compared with the controls. With regard to the latter outcomes, a significant increase in IgE was seen in the surgeon, nurse, and worker groups compared with the other professions. Surgeons, anesthetists and AA exhibited higher IgM titer compared with their colleagues. Significantly higher IgG levels were identified in the SA, anesthetists, AA, and workers than in their nurses and surgeon coworkers. Of the six sub-groups, only the anesthetists and their assistants (AA) displayed a significant increase in CD4 + cells and CD4/CD8 ratios and a decrease of CD8 + cells compared with the controls. This spectrum of results suggests that variation exists in immunomodulatory responses to WAG exposure amongst hospital personnel.

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Efficacy of systemic lidocaine on postoperative quality of recovery and analgesia after video-assisted thoracic surgery: A randomized controlled trial.


Study Objective: Intraoperative systemic lidocaine has become widely accepted as an adjunct to general anesthesia, associated with opioid-sparing and enhanced recovery. We hypothesized that perioperative systemic lidocaine improves postoperative pain and enhances the quality of recovery (QoR) in patients following video-assisted thoracic surgery (VATS).; Design: Prospective, single-center, double-blind, randomized placebo-controlled clinical trial.; Setting: Single institution, tertiary university hospital.; Patients: Adult patients aged 18 to 65 undergoing VATS were eligible for participation.; Interventions: Patients enrolled in this study were randomized to receive either system lidocaine (a bolus of 1.5 mg kg^-1, followed by an infusion of 2 mg kg^-1 h^-1 until the end of the surgical procedure) or identical volumes and rates of 0.9% saline.; Measurements: The primary outcome was a global QoR-15 score 24 h after surgery. Secondary outcomes included postoperative pain score, cumulative opioid consumption, emergence time, length of PACU stay, adverse events, and patient satisfaction.; Main Results: There was no difference in the global QoR-15 scores at 24 h postoperatively between the lidocaine and saline groups (median 117, IQR 113.5-124, vs. median 116, IQR 111-120, P = 0.067), with a median difference of 3 (95% CI 0 to 6, P = 0.507). Similarly, postoperative pain scores, postoperative cumulative opioid consumption, PACU length of stay, the occurrence of PONV, and patient satisfaction were comparable between the two groups (all P > 0.05).; Conclusions: Our current findings do not support using perioperative systemic lidocaine as a potential strategy to improve postoperative pain and enhance QoR in patients undergoing VATS.; Trial Registration: Chinese Clinical Trial Registry (identifier: ChiCTR1900027515). (Copyright © 2021 Elsevier Inc. All rights reserved.)

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OBJECTIVES

The issue of needing additional lingual injection in extractions of mandibular premolar and incisors is still not clarified. The

Impact of aging on interactions between opioid and propofol concentrations during total intravenous anesthesia.


Identification of Sleep Medicine and Anesthesia Core Topics for Anesthesia Residency: A Modified Delphi Technique Survey.


BACKGROUND

Sleep disorders affect up to 25% of the general population and are associated with increased risk of adverse perioperative events. The key sleep medicine topics that are most important for the practice of anesthesiology have not been well-defined. The objective of this study was to determine the high-priority sleep medicine topics that should be included in the education of anesthesia residents based on the insight of experts in the fields of sleep medicine and sleep medicine.

METHODS

We conducted a prospective cross-sectional survey of experts in the fields of sleep medicine and anesthesia based on the Delphi technique to establish consensus on the sleep medicine topics that should be incorporated into anesthesia residency curricula. Consensus for inclusion of a topic was defined as >80% of all experts selecting "agree" or "strongly agree" on a 5-point Likert scale. Responses to the survey questions were analyzed with descriptive statistical methods and presented as percentages or weighted mean values with standard deviations (SD) for Likert scale data. Results of topics that were found to have 100% agreement among experts were the influence of opioids and anesthetics on control of breathing and upper airway obstruction; potential interactions of wake-promoting/hypnotic medications with anesthetic agents; effects of sleep and anesthesia on upper airway patency; and anesthetic management of sleep apnea. Less than 80% agreement was found for topics on the anesthetic implications of other sleep disorders and future pathways in sleep medicine and anesthesia.

CONCLUSIONS

We identify key topics of sleep medicine that can be included in the future design of anesthesia residency training curricula.

Evaluation of Drug Wastage in the Operating Rooms and Intensive Care Units of a Regional Health Service.


BACKGROUND

Pharmacological treatments for critical processes in patients need to be initiated as rapidly as possible; for this reason, it is a standard of care to prepare the main anesthesia and emergency drugs in advance. As a result, 20%-50% of the prepared drugs remain unused and are then discarded. Decreasing waste by optimizing drug use is an attractive strategy for meeting both cost containment and environmental sustainability. The primary end point of this study was to measure the actual amount of drug wastage in the operating rooms (ORs) and intensive care units (ICUs) of a Regional Health Service (RHS). The secondary end point was to analyze and estimate the economic implications of this waste for the Health Service and to suggest possible measures to reduce it.

METHODS

This prospective observational multicenter study was conducted across 12 hospitals, all of which belong to the same RHS in the north-east of Italy. Data collection took place in March 2018 and included patients admitted to ICUs, emergency areas, and ORs of the participating hospitals. Data concerning drug preparation and administration were collected for all consecutive patients, independent of case types and of whether operations were scheduled or unscheduled. Drug wastage was defined as follows: drugs prepared in ready-to-use syringes but not administered at all and discarded untouched. We then estimated the costs of wasted drugs for a 1-year period using the data from this study and the yearly regional pharmacy orders of drugs provided to the ORs and ICUs. We also performed a sensitivity analysis to validate the robustness of our assumptions and qualitative conclusions.

RESULTS

We collected data for a total of 13,078 prepared drug syringes. Drug wastage varied from 7.8% (Urapidil, an alpha-1 antagonist antihypertensive) to 85.7% (epinephrine) of prepared syringes, with an overall mean wastage rate of 38%. The estimated yearly waste was 139,531 syringes, for a total estimated financial cost of €78,060 ($92,569), and an additional quantity of medical waste amounting to 4968 kg per year. The total provider time dedicated to the preparation of unused drugs was predicted to be 1512 working hours per year.

CONCLUSIONS

The overall extent of drug wastage in ORs and ICUs is concerning. Interventions aimed at minimizing waste-related costs and improving the environmental sustainability of our practice are paramount. Effort should be put into designing a more efficient workflow that reduces this waste while providing for the emergency availability of these medications in the OR and ICU.

Functional status assessment for preoperative cardiac risk prediction.


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General anaesthesia with desflurane or propofol in lung volume reduction surgery: Results of an unpublished randomised clinical trial.


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Is the only buccal infiltration anesthesia enough for extraction of mandibular anterior incisors and premolar teeth? A split-mouth randomized clinical trial.


OBJECTIVES

The issue of needing additional lingual injection in extractions of mandibular premolar and incisors is still not clarified. The
aim of this study is to investigate whether it is necessary to perform lingual injection in addition to buccal infiltration anesthesia in mandibular incisors and premolar teeth extractions.

MATERIALS AND METHODS
Sixty-six patients who admitted to our clinic for the removal of bilateral mandibular anterior teeth were included in the present study. Patients were divided into two groups. The experimental group received only 1.5 ml of 2% lidocaine with 1:80,000 epinephrine by injection into the buccal vestibule of the tooth. The control group received 1.5 ml of 2% lidocaine with 1:80,000 epinephrine by buccal injection into the buccal side and 0.3 ml same lidocaine solution injected into the lingual side of the tooth. After 5 min, tooth was extracted and each patient was asked to record the intensity of injection and extraction pain by 0-100 mm and a 10-point Visual Analogue Scale (VAS) and six-pointed Face Pain Scale (FPS).

RESULTS
The injection pain scores were significantly higher in terms of the VAS 0-10 point and 0-100 mm and FPS in the control group to which additional lingual injections were applied than the experimental group (p < 0.05). No statistically significant differences were found in all three scales between the groups in terms of extraction pain (p > 0.05). The mean extraction pain scores were lower in the experimental group according to the three scales. No additional anesthetic injection and post-operative complications were observed in all patients.

CONCLUSIONS
The extraction of mandibular incisors and premolar teeth can only be done with only the buccal infiltration.

CLINICAL RELEVANCE
In the extraction of mandibular anterior teeth, it can be performed with less anesthetic amount without the need for an additional lingual injection.

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Local anesthetic lidocaine-encapsulated polymyxin-chitosan nanoparticles delivery for wound healing: in vitro and in vivo tissue regeneration.

In relieving local pains, lidocaine, one of ester-type local anesthetics, has been used. To develop the lidocaine membranes of enhanced local anesthetic effects, we have designed to establish the composition of wound dressings based on lidocaine chloride (LCH) (anesthetic drug)-loaded chitosan (CS)/polymyxin B sulfate (PMB). The LCH membranes (LCH-CS/PMB) was fabricated by the LCH oxide solutions within the CS/PMB matrix. The influences of different experimental limitations on CS/PMB membrane formations were examined. The double membrane particle sizes were evaluated by scanning electron microscopy (HR-SEM). Additionally, antibacterial efficacy was developed for gram-positive and negative microorganisms. Moreover, we examined in vivo healing of skin wounds formed in mouse models over 16 days. In contrast to the untreated wounds, rapid healing was perceived in the LCH-CS/PMB-treated wound with less damaging. These findings indicate that LCH-CS/PMB-based bandaging materials could be a potential innovative biomaterial for tissue repair and regeneration for wound healing applications in an animal model.

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Lung protective ventilation strategy to reduce postoperative pulmonary complications (PPCs) in patients undergoing robot-assisted laparoscopic radical cystectomy for bladder cancer: A randomized double blinded clinical trial.

Study Objective: To evaluate the effects of ventilation with low tidal volume and positive end-expiratory pressure (PEEP) on postoperative pulmonary complications in patients undergoing robot-assisted laparoscopic radical cystectomy (RARC) for bladder cancer.

; Design: A prospective randomized double-blinded study.
; Setting: A single center trial in a comprehensive tertiary hospital from January 2017 to January 2019.
; Patients: A total of 258 patients undergoing RARC for bladder cancer.
; Interventions: Patients were randomly assigned to receive either lung-protective ventilation (LPV group) [tidal volume 6 ml/ kg predicated body weight (PBW) + PEEP 7 cmH 2 O] or nonprotective ventilation (control group) [tidal volume 9 ml/ kg PBW without PEEP] during anesthesia.
; Measurements: The primary outcome was the occurrence of postoperative pulmonary complications (PPCs) during the first 90 days after surgery. The secondary outcomes were extubation time, oxygenation index (OI) after extubation and at postoperative day 1 in blood gas.
; Main Results: The incidence of PPCs at postoperative day1, 2 and 3 were lower in LPV group [26.8% vs. 47.2%, odds ratio (OR) 0.41, 95% confidence interval (CI), 0.24-0.69, P = 0.0007, 21.3% vs. 43.3%, OR 0.36, 95% CI, 0.20-0.61, P = 0.0002, 14.2% vs. 27.5%, OR 0.43, 95%CI, 0.23-0.82, P = 0.0087, respectively], while no differences were observed at day 7 and 28 (3.9% vs. 9.4%, P = 0.0788, 0% vs. 1.6%, P = 0.4980, respectively). No PPCs were observed at postoperative day 90 in both groups. Furthermore, immediately after extubating and at postoperative day 1, OI was significantly higher in LPV group compared with control group [390(337-467) vs. 343(303-420), P = 0.0005, 406.7(73.0) vs. 425.5(74.7), P = 0.0440, respectively]. Patients in LPV group had a significant shorter extubation time after operation compared with control group [38(33-54) vs. 35(25-46), P = 0.0012].

; Conclusion: LPV combining low tidal volume and PEEP during anesthesia for RARC may decrease the incidence of postoperative pulmonary complications. (Copyright © 2020. Published by Elsevier Inc.)

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Medical malpractice cases involving anesthesia awareness.

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Offline comparison of processed electroencephalogram monitors for anaesthetic-induced electroencephalogram changes in older adults.
Eagleman Sarah L. British journal of anaesthesia 2021;126(5):975-984.

BACKGROUND
Several devices record and interpret patient brain activity via electroencephalogram (EEG) to aid physician assessment of anaesthetic effect. Few studies have compared EEG monitors on data from the same patient. Here, we describe a set-up to simultaneously compare the performance of three processed EEG monitors using pre-recorded EEG signals from older surgical patients.

METHODS
A playback system was designed to replay EEG signals into three different commercially available EEG monitors. We could then simultaneously calculate indices from the SedLine® Root (Masimo Inc., Irvine, CA, USA; patient state index [PSI]), bilateral
BIS VISTA™ (Medtronic Inc., Minneapolis, MN, USA; bispectral index [BIS]), and Datex Ohmeda S/5 monitor with the Entropy™ Module (GE Healthcare, Chicago, IL, USA; E-entropy index [Entropy]). We tested the ability of each system to distinguish activity before anaesthesia administration (pre-med) and before/after loss of responsiveness (LOR), and to detect suppression incidences in EEG recorded from older surgical patients receiving beta-adrenergic blockers. We show examples of processed EEG monitor output tested on 29 EEG recordings from older surgical patients. RESULTS All monitors showed significantly different indices and high effect sizes between comparisons pre-med to after LOR and before/after LOR. Both PSI and BIS showed the highest percentage of deeply anaesthetised indices during periods with suppression ratios (SRs) > 25%. We observed significant negative correlations between percentage of suppression and indices for all monitors (at SR >5%). CONCLUSIONS All monitors distinguished EEG changes occurring before anaesthesia administration and during LOR. The PSI and BIS best detected suppressed periods. Our results suggest that the PSI and BIS monitors might be preferable for older patients with risk factors for intraoperative awareness or increased sensitivity to anaesthesia.

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Optimal interval and duration of CAM-ICU assessments for delirium detection after cardiac surgery.

Study Objective: Our goal was to determine when postoperative delirium first occurs, and to assess evaluation strategies that reliably detect delirium with lowest frequency of testing.; Design: This was a retrospective study that used a database from a five-center randomized trial.; Setting: Postoperative cardiothoracic ICU and surgical wards.; Participant: Adults scheduled for elective coronary artery bypass and/or valve surgery.; Intervention and Measurements: Postoperative delirium was assessed using CAM-ICU questionnaires twice daily for 5 days or until hospital discharge. Data were analyzed using frequency tables and Kaplan-Meier time-to-event estimators, the latter being used to summarize time to first positive CAM-ICU over POD1-5 for all patients for various evaluation strategies, including all assessments, only morning assessment, and only afternoon assessments. Sensitivity for various strategies were compared using McNemar's test for paired proportions.; Main Results: A total of 95 of 788 patients (12% [95% CI, 10% to 15%]) had at least 1 episode of delirium within the first 5 postoperative days. Among all patients with delirium, 65% were identified by the end of the first postoperative day. Delirium was detected more often in the mornings (10% of patients) than evenings (7% of patients). Compared to delirium assessments twice daily for five days, we found that twice daily assessments for 4 days detected an estimated 97% (95% CI 91%, 99%) of delirium. Measurements twice daily for three days detected 90% (82%, 95%) of delirium.; Conclusions: Postoperative delirium is common, and CAM-ICU assessments twice daily for 4 days, versus 5 days, detects nearly all delirium with 20% fewer assessments. Four days of assessment may usually be sufficient for clinical and research purposes. (Copyright © 2021 Elsevier Inc. All rights reserved.)

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Oral delivery of carrier-free dual-drug nanocrystal self-assembled microspheres improved NAD + bioavailability and attenuated cardiac ischemia/reperfusion injury in mice.

Nicotinamide riboside (NR), as a dietary supplement, can be converted to nicotinamide adenine dinucleotide (NAD + ) in cells to support mitochondrial energy metabolism. However, the efficacy of oral administrated NR is limited due to its quick degradation in circulation and low bioavailability in targeted organs. In this study, we fabricated nanocrystal self-assembled microspheres by Nano Spray Dryer for oral delivery of NR. The structure of NR and resveratrol (RES) nanocrystal self-assembled microspheres (NR/RESms) is confirmed by the morphology, chemical structure, and crystallization. The NR/RESms displayed restricted NR release at the gastric acid-mimic condition (<15% in the first 8 hours), while achieved accelerated NR release in an enteric-mimic environment (>46% within 8 hours). Oral administration of NR/RESms for 8 hours significantly elevated NAD + levels in serum (169.88 nM versus 30.93 nM in the NR group, p < .01; and 66.89 nM in the NR + RES group, p < .05), and enhanced NAD + abundance in multiple organs in mice, exhibiting an improved oral NAD + bioavailability. In addition, without any serious adverse effects on major organs, oral delivery of NR/RESms attenuated myocardial infarction (15.82% versus 19.38% in the I/R + NR group and 20.76% in the I/R + NR + RES group) in a cardiac ischemia/reperfusion (I/R) injury mouse model. Therefore, our data supported that the NR/RESms is a promising candidate as NAD + booster for oral administration.

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Perioperative euglycemic diabetic ketoacidosis following use of SGLT-2 inhibitors after cardiac surgery.

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Perioperative troponin screening and detection of myocardial injury.
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Posttraumatic stress disorder and anesthesia: Respect for the military veteran’s mind.
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In 2017, the Food and Drug Administration published a safety recommendation to limit the exposure to general anesthesia as much as possible below the age of three. Indeed, several preclinical and clinical studies have questioned the possible toxicity of general anesthesia on the developing brain. Since then, recent clinical studies tried to mitigate this alarming issue. What is true, what is false? Contrary to some perceptions, the debate is not over yet. Only stronger translational research will allow scientists to provide concrete answers to this public health issue. In this review, we will provide and discuss the more recent data in this field, including the point of view of preclinical researchers, neuropsychologists and pediatric anesthesiologists. Through translational research, preclinical researchers have more than ever a role to play to better understand and identify long-term effects of general anesthesia for pediatric surgery on brain development in order to minimize it.
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Prolonged time to extubation after general anaesthesia is associated with early escalation of care: A retrospective observational study.
BACKGROUND Prolonged time to extubation after general anaesthesia has been defined as a time from the end of surgery to airway extubation of at least 15 min. This occurrence can result in ineffective utilisation of operating rooms and delays in patient care. It is unknown if anticipated delayed extubation is associated with escalation of care. OBJECTIVES To assess the frequency of ‘prolonged extubation’ after general anaesthesia and its association with ‘escalation of care before discharge from the postanaesthesia care unit’, defined as administration of reversal agents for opioids and benzodiazepines, airway re-intubation and need for ventilatory support. In addition, we tried to identify independent factors associated with ‘prolonged extubation’. DESIGN Single-centre retrospective study of cases performed from 1 January 2010 to 31 December 2014. SETTING A large US tertiary academic medical centre. PATIENTS Adult general anaesthesia cases excluding cardiothoracic, otolaryngology and neurosurgery procedures, classified as: Group 1 - regular extubation (≤15 min); Group 2 - prolonged extubation (≥16 and ≤60 min); Group 3 - very prolonged extubation (≥61 min). MAIN OUTCOME MEASURES First, cases with prolonged time to extubation; second, instances of escalation of care per extubation group; third, independent factors associated with prolonged time to extubation. RESULTS A total of 86,123 cases were analysed. Prolonged extubation occurred in 8,138 cases (9.5%) and very prolonged extubation in 357 cases (0.4%). In Groups 1, 2 and 3 respectively, naloxone was used in 0.4, 4.1 and 3.9% of cases, flumazenil in 0.3, 0.6 and 2% and respiratory support in 0.2, 0.7 and 2%, and immediate re-intubation occurred in 0.1, 0.3 and 2.8% of cases. Several patient-related, anaesthesia-related and procedure-related factors were independently associated with prolonged time to extubation. CONCLUSION Prolonged time to extubation occurred in nearly 10% of cases and was associated with an increased incidence of escalation of care. Many independent factors associated with ‘prolonged extubation’ were nonmodifiable by anaesthetic management.
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PROSPECT guideline for elective caesarean section: updated systematic review and procedure-specific postoperative pain management recommendations.
Caesarean section is associated with moderate-to-severe postoperative pain, which can influence postoperative recovery and patient satisfaction as well as breastfeeding success and mother-child bonding. The aim of this systematic review was to update the available literature and develop recommendations for optimal pain management after elective caesarean section under neuraxial anaesthesia. A systematic review utilising procedure-specific postoperative pain management (PROSPECT) methodology was undertaken. Randomised controlled trials published in the English language between 1 May 2014 and 22 October 2020 evaluating the effects of analgesic, anaesthetic and surgical interventions were retrieved from MEDLINE, Embase and Cochrane databases. Studies evaluating pain management for emergency or unplanned operative deliveries or caesarean section performed under general anaesthesia were excluded. A total of 145 studies met the inclusion criteria. For patients undergoing elective caesarean section performed under neuraxial anaesthesia, recommendations include intrathecal morphine 50-100 µg or diamorphine 300 µg administered pre-operatively; paracetamol; non-steroidal anti-inflammatory drugs; and intravenous dexamethasone administered after delivery. If intrathecal opioid was not administered, single-injection local anaesthetic wound infiltration; continuous wound local anaesthetic infusion; and/or fascial plane blocks such as transversus abdominis plane or quadratus lumborum blocks are recommended. The postoperative regimen should include regular paracetamol and non-steroidal anti-inflammatory drugs with opioids used for rescue. The surgical technique should include a Joel-Cohen incision; non-closure of the peritoneum; and abdominal binders. Transcutaneous electrical nerve stimulation could be used as analgesic adjunct. Some of the interventions, although effective, carry risks, and consequently were omitted from the recommendations. Some interventions were not recommended due to insufficient, inconsistent or lack of evidence. Of note, these recommendations may not be applicable to unplanned deliveries or caesarean section performed under general anaesthesia.
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Protective effect of sevoflurane on vascular endothelial glycocalyx in patients undergoing heart valve surgery: A randomised controlled trial.
BACKGROUND: The glycocalyx plays an important physiological role and may be damaged during cardiopulmonary bypass. Sevoflurane can protect the glycocalyx; however, its relevance in a clinical setting is unknown. OBJECTIVE: Glycocalyx degradation during cardiopulmonary bypass in patients was investigated. On the basis of the available experimental data, we hypothesised that sevoflurane-based anaesthesia would confer additional protection against cardiopulmonary bypass-induced glycocalyx damage. DESIGN: Randomised controlled study. SETTING: Clinical study at The First Affiliated Hospital of Wenzhou Medical University between June 2018 and March 2019. PATIENTS: Fifty-one patients. INTERVENTIONS: After intubation and mechanical ventilation, patients undergoing elective heart valve surgery were maintained under general anaesthesia with either propofol or sevoflurane during surgery. MAJOR OUTCOME MEASURES: Glycocalyx markers (such as syndecan-1, heparan sulphate and hyaluronan), sheddases responsible for the degradation of the endothelial glycocalyx (such as matrix metalloproteinase-9 and cathepsin-B), urine albumin-to-creatinine ratio and levels of lactic acid and myocardial enzymes were all measured. Postoperative mechanical ventilation time and length of stay in the cardiac care unit and hospital were also measured. Morbidity and mortality after 30 days and 1 year were evaluated. RESULTS: The vascular endothelial glycocalyx was damaged during cardiopulmonary bypass. The glycocalyx damage in the sevoflurane group was less extensive than that in the propofol group. The urine albumin-to-creatinine ratio increased in both groups but was lower in the sevoflurane group. Enzymes including matrix metalloproteinase-9 and cathepsin-B were positively correlated with glycocalyx marker concentrations. After operation, the sevoflurane group showed lower levels of lactic acid and myocardial enzyme, as well as shorter duration of postoperative mechanical ventilation than the propofol group. CONCLUSION: Sevoflurane can decrease glycocalyx degradation in patients undergoing heart valve surgery under cardiopulmonary bypass. TRIAL REGISTRATION: Chinese Clinical Trial Registry, chictr.org.cn, identifier: ChiCTR1800016367.
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Quality improvement: identifying and disseminating perioperative cardiac outcomes to providers.
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Spontaneous breathing for managing analgesia during balanced anesthesia with remifentanil and desflurane: a prospective, single center randomized controlled trial.
The main goal of anaesthesiology is to achieve the best level of analgesia and a fast recovery of consciousness following anesthesia. The preservation of spontaneous breathing during general anesthesia with anesthetic gases is practiced by many anesthetists. However, very few studies have dealt with these positive properties of volatile anesthetics such as sevoflurane or desflurane. Remifentanil is a very short half-life opiate that combines sufficient intra-operative analgesia with a fast post-operative recovery time. We tested the hypothesis that spontaneous breathing can reduce overdosing with remifentanil during desflurane anesthesia. In this prospective, single center, multiple anesthetist study, 30 patients were randomized into two groups (volume-controlled ventilation mode and spontaneous breathing). The spontaneous breathing group showed a significantly lower post-operative pain level than the volume-controlled ventilation mode group. Furthermore, less remifentanil as well as less piritramide was needed in the spontaneous breathing group compared with volume-controlled ventilation mode. It was possible to achieve spontaneous breathing in all patients with 0.6 minimum alveolar concentration desflurane, in order to control the remifentanil rate and prevent an overdose. All spontaneous breathing patients had low intra- and post-operative pain levels and the need for analgesics was equal to or lower than that in the volume-controlled ventilation mode group. By reducing the intra-operative amount of opiates, both the post-operative pain and the amount of post-operative analgesia required can be reduced. A balanced anesthesia with spontaneous intra-operative breathing is needed to determine the required amount of opiates. This study was approved by the Ethnic Committee of the Ruhr-University of Bochum (approval No. 2435) in September, 2004.
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The addition of clonidine to ropivacaine in rectus sheath nerve blocks for pediatric patients undergoing laparoscopic appendectomy: A double blinded randomized prospective study.
Study Objective: The primary goal of this study was to determine if the addition of clonidine to ropivacaine prolonged periumbilical numbness compared to ropivacaine alone in pediatric patients receiving ultrasound guided rectus sheath nerve blocks for laparoscopic appendectomy. The secondary goals were to evaluate differences in perioperative pain scores, analgesic consumption, sedation, anxiolysis, and hemodynamic effects from clonidine.; Design: This was a single center, randomized, double-blinded prospective study.; Setting: This study was conducted within the pediatric operating rooms at the Children's Hospital of Pittsburgh, a large university-based academic medical center.; Patients: Fifty pediatric patients (ages 10-17 years old) without pre-existing cognitive impairment, developmental delay or chronic pain undergoing laparoscopic appendectomy during weekday hours were enrolled and randomized to control versus intervention groups.; Intervention: Ultrasound guided rectus sheath nerve block injections were performed at the beginning of surgery with either ropivacaine 0.5% plus normal saline or ropivacaine 0.5% plus clonidine (2 mcg/kg, maximum of 100 mcg).; Measurements: The duration of periumbilical numbness, Numeric Pain Rating Scale scores, University of Michigan Sedation Scale, State-Trait Anxiety Inventory for Children, analgesic consumption, heart rate, blood pressure, and mean arterial pressures, were recorded for each patient at several time points in the perioperative setting.; Main Results: There were no significant differences in demographic characteristics between groups. The median duration of periumbilical numbness did not significantly differ between the
ropivacaine only and the ropivacaine plus clonidine groups 540.0 minutes [360.0 -1015.0] (median [interquartile range (IQR)]) versus 823.5 minutes [509.5- 1080.0], p = 0.451. There were no significant differences in perioperative analgesic consumption, pain and anxiety scores, PACU sedation, or hemodynamic instability.; Conclusions: The addition of clonidine did not significantly prolong rectus sheath nerve block duration and was well tolerated in pediatric patients. Perioperative analgesia, hemodynamics, anxiety, and PACU sedation did not differ between groups.; Trial Registration: Clinical Trials NCT02439281. (Copyright © 2021 Elsevier Inc. All rights reserved.)

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The anesthetizing sites supervised to anesthesiologist ratio is an invalid surrogate for group productivity in academic anesthesia departments when used without consideration of the corresponding managerial decisions.

When the anesthetist does not individually perform the anesthesia care, then to make valid comparisons among US anesthesia departments, one must consider the staffing ratio (i.e., how many cases each anesthesiologist supervises when working with Certified Registered Nurse Anesthetists [CRNAs] or Certified Anesthesiologist Assistants [CAA]). The staffing ratio also must be considered when accurately measuring group productivity. In this narrative review, we consider anesthesia departments with non-physician anesthesia providers and anesthesia residents. We investigate the validity of such departments assessing the overall ratio of anesthetizing sites supervised per anesthesiologist as a surrogate for group clinical productivity. The sites/anesthesiologist ratio can be estimated accurately using the arithmetic mean calculated by anesthesiologist, the harmonic mean calculated by case, or the harmonic mean calculated by CRNA or CAA, but not by the arithmetic mean ratio by case. However, there is lack of validity to benchmarking the percentage time that anesthesiologists are supervising the maximum possible number of CRNAs or CAs when some of the anesthesiologists also are supervising resident physicians. Assignments can differ in the total number anesthesiologists needed while every anesthesiologist is supervising as many sites as possible. Similarly, there is lack of validity to limiting assessment to the anesthesiologists supervising only CRNAs or CAs. There also is lack of validity to limiting assessment only to cases performed by supervised CRNAs or CAs. When cases can be assigned to anesthesia residents or CRNAs or CAs, increasing sites/anesthesiologist while limiting consideration to the CRNAs or CAs creates incentive for the CRNAs or CAs to be assigned cases, even when lesser productivity is the outcome. Decisions also can increase sites/anesthesiologist without increasing productivity (e.g., when one anesthesiologist relieves another before the end of the regular workday). A suitable alternative approach to fallaciously treating the sites/anesthesiologist ratio as a surrogate for productivity is that, when a teaching hospital supplies financial support, a responsibility of the anesthesia department is to explain annually the principal factors affecting productivity at each facility it manages and to show annually that decisions were made that maximized productivity, subject to the facilities’ constraints. (Copyright © 2021 Elsevier Inc. All rights reserved.)

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The direct comparison of inhaled versus intravenous levosimendan in children with pulmonary hypertension undergoing on-cardiopulmonary bypass cardiac surgery: A randomized, controlled, non-inferiority study.

Study Objective: Pulmonary arterial hypertension is commonly seen in children with left to right intracardiac shunts and affects the outcomes of cardiac surgery. Our study aimed to compare the efficacy of inhaled levosimendan (LS) versus intravenous LS in reducing elevated pulmonary artery pressure (PAP) in children scheduled for cardiac surgery.; Design: Non-inferiority, prospective, randomized, blinded, controlled study.; Setting: Operative room and intensive care unit (ICU), institutional children's hospital of Mansoura Faculty of Medicine, Egypt.; Patients: 50 patients of either sex, aged 1 to 5 years undergoing surgical repair of intracardiac left to right shunt complicating by pulmonary hypertension were recruited for the study.; Interventions: In the intravenous LS group, patients received intravenous infusion of LS a rate of 0.1 μg/kg/min and in the inhaled LS group, LS (36 μg/kg/6 h) was delivered by nebulization.; Measurements: The primary endpoint was systolic PAP, while the secondary endpoints were the heart rate, mean arterial blood pressure, dose of norepinephrine, time to extubation and ICU length of stay.; Main Results: Both intravenous and inhaled routes of LS similarly reduced the high systolic PAP over all time points of measurement and intravenous LS was associated with higher heart rate, lower arterial pressure and the need for a higher dose of norepinephrine than the inhaled LS.; Conclusion: Inhalation of LS is non-inferior to intravenous LS in reducing high PAP in children who underwent on-pump cardiac surgery and it is associated with less tachycardia and hypotension with reduced need for vasoactive drugs. (Copyright © 2021 Elsevier Inc. All rights reserved.)

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The Neural Circuits Underlying General Anesthesia and Sleep.

General anesthesia is characterized by loss of consciousness, amnesia, analgesia, and immobility. Important molecular targets of general anesthetics have been identified, but the neural circuits underlying the discrete end points of general anesthesia remain incompletely understood. General anesthesia and natural sleep share the common feature of reversible unconsciousness, and recent developments in neuroscience have enabled elegant studies that investigate the brain nuclei and neural circuits underlying this important end point. A common approach to measure cortical activity across the brain is electroencephalogram (EEG), which can reflect local neuronal activity as well as connectivity among brain regions. The EEG oscillations observed during general anesthesia depend greatly on the anesthetic agent as well as dosing, and only some resemble those observed during sleep. For example, the EEG oscillations during dexmedetomidine sedation are similar to those of stage 2 nonrapid eye movement (NREM) sleep, but high doses of propofol and ether anesthetics produce burst suppression, a pattern that is never observed during natural sleep. Sleep is primarily driven by withdrawal of subcortical excitation to the cortex, but anesthetics can directly act at both subcortical and cortical targets. While some anesthetics appear to activate specific sleep-active regions to induce unconsciousness, not all sleep-active regions play a significant role in anesthesia. Anesthetics also inhibit cortical neurons, and it is likely that each class of anesthetic drugs produces a
Topical anesthetic and pain relief using penetration enhancer and transcriptional transactivator peptide multi-decorated nanostructured lipid carriers.


Many strategies have been developed to overcome the stratum corneum (SC) barrier, including functionalized nanostructures. Chemical penetration enhancers (CPEs) and cell-penetrating peptides (CPP) were applied to decorate nanostructured lipid carriers (NLC) for topical anesthetic and pain relief. A novel pyrenebutyrate (PB-PEG-DSPPE) compound was synthesized by the amide action of the carboxylic acid group of PB with the amido groups of DSPE-PEG. PB-PEG-DSPPE has a hydrophobic group, hydrophilic group, and lipid group. The lipid group can be inserted into NLC to form PB functional NLC. In order to improve the penetrability, TAT and PB multi-decorated NLC were designed for the delivery of lidocaine hydrochloride (LID) (TAT/PB LID NLC). The therapeutic effects of NLC in terms of in vitro skin penetration and in vivo in animal models were further studied. The size of TAT/PB LID NLC tested by DLS was 153.6 ± 4.3 nm. However, the size of undecorated LID NLC was 115.3 ± 3.6 nm. The PDI values of NLC vary from 0.13 ± 0.01 to 0.16 ± 0.03. Zeta potentials of NLC were negative, between -20.7 and -29.3 mV. TAT/PB LID NLC (851.2 ± 25.3 µg/cm2) showed remarkably better percutaneous penetration ability than PB LID NLC (610.7 ± 22.1 µg/cm2), TAT LID NLC (551.9 ± 21.8 µg/cm2) {p < .05} and non-modified LID NLC (428.2 ± 21.4 µg/cm2). TAT/PB LID NLC exhibited the most prominent anesthetic effect than single ligand decorated or undecorated LID NLC in vivo. The resulting TAT/PB LID NLC exhibited good skin penetration and anesthetic efficiency, which could be applied as a promising anesthesia system.

Topical lignocaine anaesthesia for oropharyngeal sampling for COVID-19.


OBJECTIVETo ascertain if topical lignocaine application in oropharynx prior to swab sampling to test for COVID-19 improves a patient's comfort and to assess its effect on the swab sample taken to conduct the RT-PCR. METHODSAdult patients testing positive on the RT-PCR COVID-19 test were sampled again within 48 h after administering topical oropharyngeal anaesthesia. Patients were asked to rate their discomfort on a visual analog scale (VAS) for both sample A and B. A qualitative real-time RT-PCR for detection of SARS-CoV-2 RNA, was performed, and the cycle threshold value (Ct), used as a surrogate marker for the viral load, was measured for the sample taken without lignocaine (sample A) and the sample taken post-lignocaine application (sample B). The difference in Ct values of both the groups was checked for any statistical significance using paired t-test. Wilcoxon signed rank test was used on VAS scores to determine any significant decrease in discomfort. RESULTS Forty patients (72.5%) reported the procedure to be more comfortable post-lignocaine application. Median (IQR) discomfort on VAS decreased from 7 (1) to 5 (2) after lignocaine use, which was statistically significant (p < 0.05). Mean Ct value for sample A was 17.21 ± 5.25 and for sample B was 18.44 ± 4.8 (p > 0.05), indicating a non-significant effect of lignocaine on SARS-CoV-2 concentration in the sample. CONCLUSION Topical lignocaine, while improving the comfort of the procedure of oropharyngeal sampling for patient did not alter the SARS-CoV-2 viral load that was detected in nasal and oropharyngeal samples taken together.

Transversus thoracic muscle visibility while performing transversus thoracic muscle plane block for breast surgery: A case series.


Ultrasound-guided deep supraspinatus muscle plane block for rescue analgesia after shoulder surgery.


Videoaryngoscopy versus direct laryngoscopy for tracheal intubation in obese adults: A meta-analysis.

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