

Poster Presentations
Monday, 18 June 2018
16.45-18.30

Poster Area (2nd Floor)

Topic: Procedures

01

Methylene Blue as an Adjunct to Treat Vasoplegia in Patients Undergoing Cardiac Surgery Requiring Cardiopulmonary Bypass: A Literature Review

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Introduction with Hypothesis: The term vasoplegia is used to describe a combination of clinical findings associated with cardiopulmonary bypass (CPB), including normal to high cardiac output, decreased systemic vascular resistance (SVR), hypotension, and increased vasopressor requirements.¹ There is no consensus on specific hemodynamic values to rule-in vasoplegia, but, in general, mean arterial pressure (MAP) less than 65 mmHg, SVR less than 700 dynes · sec/cm⁵, and cardiac index greater than 2.5 L/min/m² in the presence of high-dose vasopressor infusions characterize vasoplegia.² Traditional treatment of vasoplegia includes administration of fluids and vasopressor agents such as phenylephrine and norepinephrine.^{3,6} These medications are usually enough to maintain hemodynamic stability⁴, but in some instances vascular tone can be refractory to conventional treatment. High doses of vasopressor therapy have serious adverse effects including ischemia of the extremities and intestinal hypoperfusion. Methylene blue (MB), a guanylyl cyclase inhibitor, is a novel agent that is gaining recognition as a useful adjunct in patients with vasoplegia.

Methods: Databases were systematically searched for literature on MB as an adjunct therapy to treat vasoplegia. The quality of the studies was evaluated using the US Preventative Services Task Force (USPSTF) grading tool. Each article was given a grade representing the strength of the recommendations found in that article. A grade A article is one in which the study methods and statistical analysis are strong which gives a high level of certainty that the net benefit described in the article is substantial. Grade B articles are missing variables such as effect size and confidence intervals that lend strength to articles, but are strong enough that there is a high certainty that the benefit described is moderate or there is moderate certainty that the net benefit is moderate to substantial.

Results: All 15 selected articles received either a grade A or B showing that the literature provides fair to good evidence recommending the intervention. Altogether, these studies demonstrate that MB is effective in treating vasoplegia related to CPB. Improvements in MAP and SVR are noted along with a decreased need for vasopressor therapy. Maintenance of hemodynamic parameters prevents the possible malperfusion associated with hypotension refractory to catecholamines.

Discussion: Current literature suggests that MB is a safe and effective adjunct in treating vasoplegia associated with cardiac surgery and cardiopulmonary bypass that is refractory to catecholamines. The recommendations are of moderate strength as larger studies are needed to provide sufficient statistical power to confirm the findings. MB can be administered pre-operatively, intra-operatively, or more commonly postoperatively. Since dosing regimens and protocols have not been defined, careful evaluation of each patient is warranted by the anesthetist to determine at which time frame MB would be most useful. Contraindications and possible side effects of this drug also need to be considered.

Conclusion: Methylene blue is an effective treatment of refractory hypotension related to cardiac surgery requiring cardiopulmonary bypass.

References: 1. Gomes WJ, Carvalho AC, Palma, JJ, et al. Vasoplegic syndrome after open heart surgery. *J Cardiovasc Surg.* October 1998; 39(5): 619-623. 2. Faber P, Ronald A, Millar BW. Methylthioninium chloride: pharmacology and clinical applications with special emphasis on nitric oxide mediated vasodilatory shock during cardiopulmonary bypass. *Anaesthesia.* May 2005; 60(6): 575-587. doi: 10.1111/j.1365-2044.2005.04185.x 3. Lenglet S, Mach F, Montecucco F. Methylene blue: potential use of an antique molecule in vasoplegic syndrome during cardiac surgery. *Expert Rev. Cardiovasc. Ther.* 2011; 9(12): 1519-1525. doi: 10.1586/erc.11.160 4. Fischer G, Levin M. Vasoplegia during cardiac surgery: Current concepts and management. *Semin Thoracic Surg.* 2010; 22(2): 140-144. doi: 10.1053/j.semtcvs.2010.09.007 6. Egi M, Bellomo R, Langenberg C, et al. Selecting a Vasopressor Drug for Vasoplegic Shock after Adult Cardiac Surgery: A systematic Literature Review. *Ann. Thorac. Surg.* 2007; 83(2): 715-723. doi:10.1016/j.athoracsur.2006.08.041

Keywords: *methylene blue, vasoplegia, refractory hypotension, cardiac surgery*

02

Influence of Preoperative Anesthesia Assessment on Postoperative Outcomes in Ophthalmologic Patients

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INTRODUCTION: Preoperative preparation of ophthalmologic patients includes a whole range of procedures and measures to eliminate all conditions that can endanger the patient during and after surgery. Inadequate preoperative assessment and inadequate perioperative strategy are the most common causes of complications during anesthesia.

For ophthalmologic patients, mostly one-day surgery, we have rarely emergency cases, and possibilities for good anesthesia preparation are high. Pre-operative preparation has three essential components:

- Inform the patient about day surgery imperatives;
- Get informed consent of patient oral and written;
- Identify anesthetic risk factors, and optimize the patient's condition.

OBJECTIVE: Retrospective analysis shows the effect of good preoperative assessment for diabetic patients, which is first cause of eyes diseases.

MATERIAL AND METHODS: Prospective, analytic and observational study, during the year 2017, for more than 3600 patients operated in Miloš Clinic Belgrade. Data compilation and statistics was used, with additional comparison with international publications and documentations. Patients' data include antecedents, chronic illnesses and proposed type of surgery.

RESULTS AND DISCUSSION: Everyday, from January to December 2017, we review our patient's medical files and record them, as well as surgical and anesthetic protocols, age, type of surgery, duration, and frequency and type of complications. Over 3600 patients have been operated, of which 1312 is included in the study. Patients are surgeries of the last eye segment. These types of surgeries are most commonly operated on patients whose vision problems are due to some illness or injury. In 474 patients, a combined operation of vitrectomy and cataracts was performed. Of this number, 64 patients were operated in general anesthesia, of which 2/3 were under 16 years of age.

CONCLUSION: Judicious and professional preoperative assessment shortens time, facilitates the operation as well as the postoperative period. It takes a shorter or longer time depending on the type and scope of the operation and the health status of the patient. But, it's the best guarantee for patient safety, and their surgical outcome.

Keywords: *anesthesia, preoperative assessment, ophthalmology, postoperative outcomes*

03

Islet of Langerhans Transplantation

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Introduction: Diabetes is a chronic, silent disease with multiple degenerative complications. Five million deaths from diabetes occurred in 2015. Treatment with insulin therapy reduces the incidence of these complications but carries the risk of severe glycemic imbalances. Islet transplantation is a technique aimed at restoring glucose metabolism in patients with type 1 diabetes (T1D) with severe and iterative episodes of hypoglycaemia.

Method: The islets are isolated from the pancreas of a deceased donor. A threshold dose of 9000 islets/kg of recipient is necessary to finalize a transplant, in 2 to 3 injections for a patient. Preoperatively, the patient receives immunosuppressive therapy and intravenous insulin protocol to obtain glycemic stability. Anesthetic consultation and associated complementary examinations will assess associated risks. Islet transplantation is feasible either surgically by a laparotomy for catheterization and injection of islets into portal vein, or radiologically through a transhepatic approach, via the catheterization and injection of the islets into the portal tranhepatic flow. Anesthetic management covers the specificities of the diabetic patient with tight monitoring of the blood glucose. This procedure also requires measurement of the portal pressure and effective anticoagulation to limit the risk of portal thrombosis during injection of the islets. Postoperative management is based on monitoring blood glucose-ketones and the prevention of risks associated with the technique. Effective anticoagulation should be initiated as early as the 6th postoperative hour with hepatic ultrasound and doppler control of the liver and the portal vein.

Results: Between 1999 and 2009, more than 600 T1D patients received 1,072 infusions in more than 35 centers worldwide. 6 months after the last infusion of islets, 65% of the patients were insulin independent and at 3 years this rate ranged from 50 to 70%. North America has the largest density of laboratories for islet preparation. Europe hosts just under 10 centers. In France, there are on average 40 transplant candidates per year. In 2012, 31 injections were performed and 12 transplants completed with an average of 2 infusions per patient.

Discussion: Islet transplantation allows better blood glucose control or insulin independence. It's a minimally invasive method with low mortality and with results similar to a total pancreas transplant, avoiding the risks and complications of the latter. Currently the researchers continue to study islets. Research routes are focused on reducing early loss of islets during isolation and transplantation phases, gradual loss over time of the function of transplanted islets and on improving immunosuppressive therapy. Similarly, the French Society of Anesthesia and Resuscitation published in 2017 a reference of "Perioperative management of the diabetic patient" to optimize our actions.

Conclusion: The goal of islet transplantation is to achieve normoglycaemia, reduce the risk of diabetes-related complications and improve the quality of life of diabetic patients. The success of the technique depends not only on surgical and radiological teams but also on anesthetic teams in view of the specificity of this type of patient. Islet transplantation certainly represents a credible solution for the treatment of T1D because of its minimally invasive character and the results reported so far. However accessibility of this treatment remains limited by the lack of organ donors, the small number of specialized centers and limited funding.

Keywords: *Pancreas-Diabetes-Insulin*

04

Kinetics of Hemostasis Reserve Capacity in Bloodless Liver Transplantation

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Introduction with Hypothesis: On international scale Massicotte had published 600 bloodless liver transplants (OLTx) based on acute normovolemic hemodilution and "cell saver" technique, but the special characteristics of hemostatic changes in these patients were not reported (1). The aim of the study was to evaluate the hemostatic changes defined as hemostasis reserve capacity (HRC) in the first perioperative 48 h of bloodless OLTx.

Patients and Methods: The HRC in bloodless OLTx pts (n=51) was designed by the implementation of the "Görlinger pyramid methodology" based on lower reserves of RBCs, factor levels and thrombocytes (FI: 1g/l, FII-V-VII-X: 30%, FXIII: 60%, Platelets: 30 G/l, AT III: 40%, Hematocrit: 27%). Laboratory measurements followed by the counting of HRC were done before OLTx (T1), at arrival on ICU (T2) and 12-24-48 h after OLTx (T3-5). Demographic data of the patients, the hemodynamic parameters, the vasopressor requirement, the ventilation support, the MELD, DRI, APACHE II, SOFA scores and LOS were also recorded. The data are given mean±SD and were analyzed with rAnova, Fisher exact by SPSS 20.0.

Results: The cohort MELD, DRI and APACHE score were: 10±4, 1.5±0.4 and 16±5. None of the pts needed RBC, FFP or platelets replacement at all, but 14 pts of 51 required FI (1-4 g) or PCC (500-2000 IU) substitution in absence of coagulopathy bleeding during surgery. The intraoperative weakening and postoperative improvement of HRC was noticed (T1=T5). A significant decrease of factors were observed due to the intraoperative vascular bleeding, factor consumption and dilution (T1-T2): FI: 0.9±0.6 g/l; FII 27±15%, FV 42±25%; FVII 28±18%; FX: 40±23%; FXIII: 26±23%; ATIII: 35±17%; p<0.001. Platelet count were found modified by 0.9±46% of the preoperative value. Only 10 pts of 51 required FI (2g), PCC (500IU), FXIII (1250 IU) substitution in lack of bleeding 48h after surgery. As an indicator of

the early graft synthesis the factor levels significantly increase in the first 24h (T2-T4) FI with 0.98 ± 0.65 g/l, and next 24h (T3-T5) FII-V-VII with $20 \pm 19\%$, $32 \pm 34\%$, $17 \pm 24\%$ $p > < 0.001$, except FXIII which remain decreased by $19 \pm 23\%$ of the preoperative value. No correlation between DRI and HRC improvement was found. The postoperative ventilation and vasopressor requirement time were: 8 ± 5.6 h and 13 ± 13 h.>

Conclusions: The individualized, multimodal approach of hemostasis based on repeated evaluation of HRC focuses on the weakest link within the system. In the absence of bleeding some patients need only factor replacement, so besides bloodless OLTx, the algorithm could be useful in Jehovah witness patient's hemostasis management as well.

References: 1. Massicotte et al.: Transplantation. 2014; 98(2): e13-5.

Keywords: *bloodless transplantation, hemostasis reserve capacity, individualized hemostasis management*

05

The Interscalene Catheter for Shoulder Rotator Cuff Repair in the Beach Chair Position – Possible Issues and Risks

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Introduction: Patients undergoing a shoulder arthroscopy in pure regional anesthesia using an interscalene catheter remains not only interesting but also demanding for the anesthesia team. Not just because of the frequently used beach chair position for this surgery but also due to the sedation needed to ease the tension and fear, and increase patient's comfort. The awareness of the patient could provoke fear caused by unexpected noises, actions or movements. Also, the patient could be in doubt if he remains pain free or not during the whole procedure. Therefore, the psychological aspect of individual nursing care shouldn't be underestimated. The interscalene catheter is placed for perioperative pain management and to avoid the risks of general anesthesia. However, the interscalene catheter has its own risks. The focus of the anesthesia team should always be on the patient but also on the workplace because of the limited access to the patient. The workplace organization has to be prepared to anticipate unexpected circumstances and therefore to minimize risks. Goal is to show the possible issues and potential risks that can occur during this surgery under regional anesthesia and conscious sedation management.

Method: Based on practical guidelines, clinical experience and literature research we collected the information for this presentation.

Results:

Monitoring & Anesthesia

- Basic Patient monitoring includes NIBP, SpO₂, ECG and respiration rate (Advanced monitoring for high risk patients could include: invasive blood pressure monitoring at the brain level; end tidal or transcutaneous CO₂ monitoring, NIRS or EEG monitoring)
- Anesthesia monitoring and -accesses are isolated on one side of the patient's body to ensure all time access by the anesthesia team
- Oxygen is delivered mostly via oxygen mask
- It is difficult to place laryngeal mask or intubate the patient due to the narrow room under the sterile draping and the beach chair position
- For sedation we use Propofol, Remifentanyl or Midazolam. Additionally, we use clonidine for decreasing high blood pressure (high blood pressure increases the risk of bleeding which reduces the surgeon's visibility during arthroscopy)

Positioning of the patient

- Sterile drapes that almost cover the face of the patient (Keep the patient's face visible)
- The head is fixed to the operating table to reduce head movements during surgery (Cave: strong neck distortion can lead to damages to the cervical spine or to rotation of the neck impeding venous back flow or even carotid artery blood flow)
- Consider hemodynamic instability due to the beach chair position (Controlled hypotension protocols are often used with different targets. To lower the systolic blood pressure more than 30% from baseline is however not recommended. Intraoperative hypotension is considered to be a factor for perioperative cardiac complications after non-cardiac surgery)

Ensure a secure position of the interscalene catheter. Special attention must be during placement and removal of the sterile drapes

Psychological aspect

- Understandable explanations of the interscalene block effect and the subsequent actions are necessary
- Offer headphones with music. Individually chosen music increases comfort and relaxation. It also minimizes the disturbing sounds.
- Build trust with the patient by individual communication.

Discussion & Conclusion: To prevent any unwanted circumstances, it is important to test the effect of the interscalene block after application of ropivacaine before positioning and surgery.

- Testing is done by checking temperature sensitivity with a cold metal rod, and test motor reaction.
- Specific block related incidents have to be kept in mind
- Don't forget the time required for achieving a complete sensory block (10 to 25 minutes)

We recommend additional research and case reports because of the issues and risks mentioned above.

Reference: 1. Aguirre J et al. Anesthesia International 2010, Autumn/Winter: 19-29 2. Borgeat A / Aguirre J. Anesthesiology 2010; 112:742-5; Peruto CM et al. Peruto CM et al. Arthroscopy 2009; 25:891-96 3. Aguirre J et al. Rev Esp Anestesiol Reanim. 61: 64-72; Aguirre J et al. J Clin Anesth. 35: 456-464; Baulig W / Aguirre J et al. Monit Comput. 29: 499-507; Gillespie R et al. J Bone Joint Surg Am 2012; 94:1284-90 4. Borgeat A / Aguirre J. Curr Opin Anaesthesiol 2009; 22:678-82 5. Papadonikolakis A et al. Arthroscopy 2008; 24:481-82 6. Devereaux PJ et al. N Engl J Med 2015; 373:2258-2269; Monk TG et al. Anesthesiology 2015; 123:307-319

Keywords: *Beach chair position, Interscalene catheter, sedation, issues*

06

Our Experience in the Anesthetic Management of Craniosynostosis and Perioperative Bleeding

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Introduction: Management of anesthesia during craniosynostosis surgery includes careful monitoring and follow-up of the patients during insidious bleeding throughout the surgery. In this retrospective analysis we report our experience during craniosynostosis surgery.

Materials and Methods: All the infants who had been undergone craniostylosis surgery during March 2017 and January 2018. Fourty three infants had been evaluated retrospectively according to their anesthesia reports. Twenty –three of them were operated for scaphocephaly, 2 were, late scaphocephaly, 11 of them were trigonocephaly, 5 of them were plagiocephaly, 2 of them were brachicephaly patients. Their mean age was 9.3 months (min 3, max 36 months) and mean body weight was 8.184kg (min 5 max 16.5 kg). Mean operation time was 234,666 min (min 60 , max 360 min). Their mean systolic blood pressure (BP) was 75.45 mmHg and diastolic BP was 43.97 mmHg, pulse oximetry was 99.74. Inhalation induction had been performed with sevoflurane/air/oxygen mixture and fentanyl intravenous (i.v.) 3 mic/kg used for analgesia and rocuronium i.v. 0.6 mg/kg for muscle relaxation. Maintenance of anesthesia had been achieved by sevoflurane, remifentanyl infusion (0.25 mic/kg/hour). Three 22 G or 20 G i.v. lines and an arterial line had been placed to all of the patients. Peroperative mean systolic BP was 61.39 and diastolic BP 38.03 mmHg. Their peroperative body temperature was 35.05oC. They had mean urinary output as 7,95 ml/kg/hour. The mean blood loss throughout the surgery was 9,675 ml/kg/hour and blood were replaced by a mean 39.96 ml/kg red blood cells and 15.279 ml/kg/hour crystalloid fluids. Only 6 patients needed fresh frozen plasma replacement. The complications related to management of anesthesia for craniostylosis surgery were reported as difficult entubation, hypothermia and blood loss and transfusion problems.

Conclusion: Safety of management of anesthesia during craniostylosis surgery can only be achieved if careful and meticulous monitoring of the patient could be performed and safe and secure intravenous lines are mandatory for careful blood loss replacement and hypovolemia prevention. Hypothermia and blood loss, transfusion problems are the main problems related to this surgery.

Keywords: *safety in management of anesthesia; craniostylosis, surgery; craniostylosis; anesthetic management*

07

Transoral Thyroidectomy: A Nurse Anesthetist's Perspective

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Transoral endoscopic thyroidectomy has been carefully investigated since 2008 with the use of natural orifice transluminal endoscopic surgery (NOTES), which represents the desire of seeking a scarless and non-visible incision.

Due to tissue bruise, organ damage, laryngeal nerve injuries, restrictive surgical view and safeness, Transoral Endoscopic Thyroidectomy Vestibular Approach (TOETVA) was chosen by more and more surgeons these days, instead of sublingual approach. The surgical instruments of TOETVA are all operated in oral cavity, that's the reason why this kind of surgery so challenging for perianesthesia nursing care.

According to Gianlorenzo Dionigi et al. (2017), the indication of TOETVA, i.e., (1) preoperative estimated gland size <10 cm; (2) thyroid volume ≤45 mL; (3) dominant nodule size ≤50 mm; (4) benign lesion, like thyroid cyst, single-nodular goiter, or multinodular goiter; (5) papillary microcarcinoma without any evidence of metastasis. The contraindication of TOETVA, i.e., (1) unfit for surgery or cannot tolerate general anesthesia; (2) had previous neck surgery or had antecedent radiation in the area of the head, neck, upper mediastinum; (3) recurrent or huge goiter; (4) evidence of lymph node or distant metastases; (5) tracheal/esophageal invasion; (6) preoperative recurrent laryngeal nerve palsy; (7) oral abscesses [1,2,3].

During the perianesthesia nursing care, we did encounter some difficulties, the first is "How to fix the endotracheal tube safely, firmly and try not to contaminate the surgical area", because the endotracheal tube has to be placed in transnasal way, leading this problem much harder to solve. We came up with using a well sterilized stainless-steel right-angle adapter to connect ventilation hose and endotracheal tube, then winding alongside the table to get our goal.

The second one is because of intraoperative neuromuscular monitoring, which made muscle relaxants are prohibited, special treatments were needed to prevent patient from "bulking". In our opinion, using a TCI infusion pump with setting Alfentanil 50-90 ng/ml is a good solution to this problem.

Last but not least, in order to maintain a proper surgical view, a CO2 insufflation system is needed and emphysema should be concerned, therefore when and how to remove the endotracheal tube safely is an important issue to this surgery.

With the rapid development of medical science and technology, new challenges present each day, how to keep up and offering the best perianesthesia nursing care is our lessons for life. We shall encourage ourselves together with it.

References: 1. Dionigi, G., Lavazza, M., Wu, C. W., Sun, H., Liu, X., Tufano, R. P., .Anuwong, A. (2017). Transoral thyroidectomy: why is it needed? *Gland Surg*, 6(3), 272-276. doi:10.21037/gs.2017.03.21 / 2. Udelsman R, Anuwong A, Oprea AD, et al. Trans-oral Vestibular Endocrine Surgery: A New Technique in the United States. *Ann Surg* 2016;264:e13-e16 / 3. Anuwong, A. (2016). Transoral Endoscopic Thyroidectomy Vestibular Approach: A Series of the First 60 Human Cases. *World J Surg*, 40(3), 491-497. doi:10.1007/s00268-015-3320-1
Keywords: *Natural orifice transluminal endoscopic surgery (NOTES), TOETVA, Perianesthesia nursing care*

08

The Clinical Reasoning: A Lethal Complication in Ophthalmic Surgeries

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In this article, we present a case received general anesthesia whose heart rate, blood pressure, SPO2 and end-tidal CO2 dropped significantly while undergoing vitrectomy for retinal detachment. After emergency treatments, cardiogenic shock and multiple organ failure was confirmed and the patient expired within 4 hours [1]. Analyzing the reason may provide anesthesia colleagues a better understanding to prevent lethal complications in ophthalmic surgeries.

Inferences for the dramatic change of vital signs: There are many reasons could cause changes of vital signs in general anesthesia, by comparing the patient's preoperative and the event-happened blood samples, hyperkalemia, low blood volume, low blood sugar or electrolyte imbalance can be ruled out.

Although oculocardiac reflex and anaphylactic shock could cause such sudden change, which cannot explain the presentation of ETCO2 plummeted with intravascular full of bubbles and transesophageal echocardiography findings, considering the ocular air/fluid exchange (OAFE) was needed to maintain surgical field, so at that time the intraoperative vascular gas embolism was highly suspected [2].

Inferences for intraoperative gas embolism:

According to the surgeon, in order to maintain a proper operating field, the OAFE pressure was maintained at about 80 mmHg, a lot more than usual. Two hours later, the surgeon increased the pressure up to 100 mmHg, a total gas insufflation time was more than 2 hours.

Before the event, patient was ventilated with proper ventilation settings, without any history of respiratory system disease. The patient's right arm was inserted with a 22-gauge intravenous infusion line with no obvious visible air bubbles.

Based on the above information and transesophageal echocardiography (TEE) findings, intraoperative vascular gas embolism was diagnosed unanimously.

It's worth noting that all these inferential thinking processes were NOT to be examined in orderly, all possibilities should be considered simultaneously instead. Ophthalmic surgery leading to lethal gas embolism is rare but critical, early detection, precise diagnosis and proper treatments are extremely important [3].

References: 1. Wu, C. C., Chen, K. Y., & Hsieh, Y. J. (2015). Fatal air embolism and ocular shrinkage during vitrectomy. *J Anesth*, 29(2), 318. doi:10.1007/s00540-014-1893-8 / 2. Morris RE, Sapp MR, Oltmanns MH, Kuhn F (2013) Presumed Air by Vitrectomy Embolisation (PAVE) a potentially fatal syndrome. *Br J Ophthalmol* (in press). Epub Jun 21 / 3. Marek A. Mirski, Abhijit Vijay Lele, Lunei Fitzsimmons and Thomas J. K. Toung (2007). Diagnosis and Treatment of Vascular Air Embolism. *Anesthesiology CME Program*, 106,164–77.

Keywords: *Ocular air/fluid exchange (OAFE)* , *Intraoperative vascular gas embolism* , *Vitrectomy*

09

The Influence of Perioperative Systemic Steroid Administration in Diabetic Patients Receiving Fast Track Primary Total Hip Or Knee Arthroplasty. Results of a Retrospective Study.

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Background and Goal of Study: As part of the fast track total Hip or Knee Arthroplasty (THA/TKA) in our hospital, patients receive dexamethasone 0,15 mg/kg/ivpreoperatively. Steroids or glucocorticoids provides effective pain relief by reducing inflammation, reduces PONV and LOS in hospital. The aim of this study is to evaluate the influence of 0,15 mg/kg/iv dexamethasone on serum glucose levels in patients with diabetes in the early postoperative phase in fast track THA/TKA surgery.

Materials and Methods:

In this retrospective cohort study, serum blood glucose levels in the first 24 hours after surgery were analyzed. All patients underwent THA or TKA in 2016 or 2017 and received 0,15 mg/kg dexamethasone intravenously. Data on demographics, surgery and outcomes were retrieved from their medical records. The hospital medical ethical board granted permission for the study.

Results:

A total of 214 patients were analyzed, mean age was 71.2 ± 8.21 years, 60,7% were female, mean ASA score was 2.38 ± 0.50 , 63.1% received TKA and 36.9% THA. Mean blood glucose before surgery was 8.08 ± 2.07 mmol/l. General Linear Models for repeated measures indicated a significant increase in blood glucose levels after surgery ($p < .001$) with a clear peak 4-8 hours post-surgery ($M = 17.33 \pm 4.65$). After 24 hours, blood glucose levels turned to baseline levels. The increase in blood glucose levels was significantly related to interventions for high blood glucose levels (e.g. additional measurements, change in insulin). Such interventions were needed in 51.6 % of the patients.

Conclusion:

Our study suggests that by providing lower incidence of postoperative nausea and vomiting and less postoperative acute pain, high-dose systemic steroid plays a critical role in rapid recovery to TKA and THA. The preliminary results also show the superior possibility of systemic steroid in functional rehabilitation and inflammation control. In diabetes patients the use of dexamethasone increases blood glucose levels temporarily, which needs interventions in diabetes regime in about half of the patients. However, in light of the advantages this seems acceptable and changes in our glucose and insulin policy are advised. Well powered randomized clinical trials are needed to investigate the safety and dose-response relationship.

This abstract has already been used for the ESA in Copenhagen, june 2018

Keywords: *dexamethasone*, *serum glucose levels*, *fast track*

10

Ultrasound-Guided Infraclavicular and Transversus Abdominis Plane Block for a High Risk Patient who had Surgery Simultaneously for Fracture of the Right Radius-Ulna and Left Inguinal Herni: Case Report

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Introduction: The use of ultrasound (US) reduces the amount of local anesthetic (LA) required for successful block (1,2). Reduced LA requirement reduces the risk of LA toxicity when multiple blocks are to be done for surgery of more than one region in the same patient. In this case report, high risk patient with multiple block for two different surgery had been discussed.

Case: Sixty-eight years old, male, 85 kg patient, who had planned elective right inguinal herni surgery 1 week later. Unfortunately the patient is admitted to the emergency service with fracture of left radius-ulna. The ejection fraction of the patient with coronary artery disease and cardiac pace-maker was measured as 15% after cardiology consultation. When the patient refused general anesthesia due to high risk we planned two different peripheral nerve block for two different surgery. After the written consent was obtained, 2mg IV midazolam and 50 µg fentanyl were administered for sedation. First of all, lateral sagittal infraclavicular block was successfully performed with US guided in-plane technique. Thirty mL (20 mL of 0.25% bupivacaine and 10 mL of 1% lidocaine) of local anesthetic mixture was administered around the lateral-medial-posterior cords using the in-plane approach. Secondly, lateral transversus abdominis plane block was successfully performed with US guided in-plane technique under complete aseptic technique. Twenty mL of 0.25% bupivacaine was administered in transversus abdominis plane. After 30 minutes, the left forearm and right inguinal area covered by the block was checked and it was found to be anaesthetized. Both surgeries performed to different regions have been successfully completed without any sign of local anesthetic toxicity.

Conclusion: Two different peripheral nerve blocks can be done safely in high-risk patients with ultrasonographic guidance.

References: 1) Koscielniak-Nielsen Z. J. "Ultrasound-guided peripheral nerve blocks: what are the benefits?" *Acta Anaesthesiologica Scandinavica*, vol. 52, no. 6, pp. 727–737, 2008; 2) Gurkan Y. Ultrasound-guided infraclavicular and sciatic block for a patient who had surgery simultaneously for sindactilia of the right hand and polydactilia of the right foot: Case report *AGRI* 2014;26(4):184-186

Keywords: *Peripheral nerve blocks*; *safety*, *peripheral nerve blocks*; *transversus abdominis block*

11

The French Agreement Committee of CRNA (IADE fr.) Schools: More than a Contribution to Education Quality

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Introduction: Our committee federates the 28 nurse anesthetist training schools of France. Several national surveys allowed the committee to have precise mapping of those schools. It takes two years (4 semesters) to obtain a master's degree in nursing anesthesia in France. Since 2012, CRNA studies have become a master's degree in France. This academic upgrade needs a follow up in research, education programs, structural changes and the qualifications of educators. The CEEIADÉ supervises this evolution at decisional level.

Methods: Twice a year during a general meeting in Paris, the committee presents the results of several national questionnaires on student satisfaction, simulation programs, financing conditions and educational conditions. The annual survey is sent by mail to each school which in turn is transferred to the graduate students in the trimester following the end of the school year.

Results and analysis: The response rate stays just beyond the 50 percent. So this return is considered as representative.

Since the beginning of the master's educational program, there is a progressive amount of student's satisfaction concerning courses and the practice. However we observe that first year lessons are more attractive than the second year ones. An explanation therefore could be that first year theory contains a majority of 'anaesthesia' study units.

Each semester is validated by credits granted to students. A jury awards theoretical credits in order to the results of tests. The practical skills are evaluated by anesthesia professionals accompanying the student during practice. Each student for each period needs a minimum score for each of their seven competencies :

1. Anticipate and organize the anesthetic environment according to patient's status, surgical intervention and anesthesia
2. Evaluate the case, anticipate anesthesia risks associated to patient's status, surgical intervention and perform an appropriate anesthesia care.
3. Perform and execute an anesthesia procedure according to patient and time of surgery
4. Assure and assess anesthesia quality and security.
5. Assess patient's behavior and implement his accompaniment and adjusted information according to anesthesia care.
6. Coordinate between members of the team and educate professionals in order of anesthesia care, intra and extra-hospital emergency and pain management.
7. Research, collect and produce professional and scientific evidence in anesthesia intensive or emergency care and analgesia.

The actual program integrates also a 4 week work placement in a research laboratory allowing nurses to explore a scientific methodology and to write their essay. We notice that this scientific initiation is progressively appreciated by more than 60 percent of the students. However the workload of their scientific paper doesn't seem to be satisfactory with a percentage of more than 80 percent in 2017.

Discussion: These surveys allow a benchmark between schools enabling to define a common proposal for a strategic program for education in order to professionalize CRNA. According to political governance it seems important to demonstrate the importance of a common viewpoint to identify the educational objectives together with professional development in the workplace. Through scientific methodology applied in the different schools the production of knowledge creates an academic culture leading to the upgrading of the nurse anesthetist education. Nevertheless a language barrier still exists limiting the publication in international journals. After completing 2 years in anesthesia nursing education, full-time nurse anesthetists obtain 120 ECTS and holds a Master degree. They become Certified Registered Nurse Anesthetist (in French IADE: Infirmiers Anesthésistes diplômés d'Etat). Those credits are transferable allowing Registered Nurse Anesthetists to work abroad. They also guarantee the knowledge and skills of French Registered graduate nurses.

Keywords: *CRNA, student satisfaction survey, France*

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Education Application of Taiwan Nurse Anesthesia Care in Mainland China

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Nowadays, with the improvement of modern medical technology and development of international communications, specialization of clinical nursing has become more and more important in mainland China. Many institutes offer training courses to cope with the shortage of labor and medical resources because the growing need of civilian health has led to the establishment of training courses in nurse anesthesia to improve medical quality of clinical anesthesia. However, no laws or regulations clearly define the role of nurse anesthetist nor the scope of practice for nurse anesthesia management. Our hospital is one of the few hospitals in mainland China to try to establish training courses for nurse anesthetist.

The aim of this report is to discuss the training course for nurse anesthetist at BenQ hospital. Considering the pros and cons of training course around the world, a well-coordinated training course has been developed involving many departments on supervising each other to ensure details.

The training courses have been carefully designed to teach candidates to develop high-quality anesthetic skills and clinical aptitude. Large time and effort has been invested by the teachers on the preparation of teaching materials for the best learning environment. During the training course, they need to be passionate and self-motivating to remain competence. This will ensure the improvement on the pre-operative nurse anesthesia and the quality, reducing the incidence of post-operative complications and enhance the safety of patients.

We have been making some progresses, yet there remains some difficulties. Since clinical work is heavy-loaded, being a medical-practitioner, the teachers cannot concentrate on teaching, while students are cost a lot of time for learning, reducing the efficiency of the training course. Because of these above, together with low salary but high mental stress, many students give up.

Therefore, many experts in China have also realized the urgency of building a professional nurse anesthesia team, which is not only the requirement of medical development, but also the need for the progress of nursing, we hope there will be more training experience and cooperation introduced from abroad. Years of systematic management produces us an outstanding nurse anesthesia team domestic, as far as concern, we are eager for foreign experts to generate a further promotion in enhancing our ability about training nurse anesthesia and make mutual contributions to healthcare service in China.

Keywords: *Education, Nurse Anesthesia, training course, China*

Evaluation of the Licensees in Anesthesia-Resuscitation's Knowledge in the Anesthetic Management of Drug Addicts

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Nowadays the rate of drug addicts is in continuous progression. Young people are more concerned with this multidimensional problem that affects physical, mental, economic and social public health. As a result, anesthetists have to take care of drug-dependent patients. Therefore, it is important that they are prepared to assume the anesthetic problems related to drug addiction. The objective of our current study is to evaluate licensees in anesthesia-resuscitation's knowledge concerning drug addicts' anesthetic management in the main university hospital centers in Tunis.

This prospective study took place in January 2017 in seven operating blocs distributed in four university hospital centers in Tunis. A questionnaire regarding drug addicts' anesthetic management and psychological support was addressed to the licensees in anesthesia-resuscitation exercising in these hospitals' operating theaters. Statistical analysis was performed using SPSS 13.0 and Microsoft Excel 2010. From the point of ethical considerations, collected answers were kept strictly confidential and anonymous.

Among 70 distributed questionnaires, a total of 50 were completed. The results showed that 56% of anesthesia-resuscitation licensees (ARLs) have not received sufficient training in drug addicts' management during their studies. After getting their licenses, only 12% got training essentially during seminars. Results showed that 62% ARLs were dealing with 1 to 10 drugs addicts per year that most of which (46%) got hospitals by emergency way. Furthermore, drugs-addicted patients consumed one or more types of drugs and results showed that 75% used Cannabis. Also, a total of 64% of ARLs claimed that drug addicts require specific care and 92% hadn't any specific anesthetic protocol to follow. In fact, 90% of ARLs refer to their colleagues in case of difficulties dealing with patients. Moreover, 42% of ARLs believe that it is necessary to substitute the drug before anesthesia while 46% consider unnecessary to provide specific premedication for addictive patients. The choice of an anesthetic technique is shared between ARLs: 52% chose general anesthesia technique while 48% prefer a loco-regional anesthesia. Also, 60% of ARLs chose general anesthesia with crush-induction (Full stomach).

These results are close to the literature which confirms that the reasons for access to the surgery of an addict are most often emergencies (injection site abscesses, fractures, stab wounds or firearms) [1].

According to the World Drug Report 2017, 29.5 million people in the world suffer from drug-related disorders, Cannabis being the most harmful in Africa which concurs with our results that showed cannabis as the most consumed drug in Tunisia [2]. Moreover, result of our work in the anesthetic management of an addict patient supported a previously published study conducted by Questel et al., 2011 confirming the importance of ensuring comfort and optimal patient safety. General anesthesia often proves to be a simpler and safer choice in the case of a surgical emergency or when the addict patient is in a state of agitation [3].

In conclusion, a significant lack of knowledge of drug addicts' anesthetic management is deplored among the interviewed anesthesia-resuscitation licensees which highlights the importance of updating health workers' knowledge through continuing education about this major health problem.

References: 1. Sofia.medicalistes.fr. (2018). Available at: https://sofia.medicalistes.fr/spip/IMG/pdf/Anesthesie_chez_le_toxicomane.pdf [Accessed 12 Jan. 2018]. 2. United Nations Office on Drugs and Crime. World Drug Report 2017. https://www.unodc.org/documents/research/wdr_volume1_fr.pdf [Accessed 12 Jan. 2018]. 3. Questel F., Kierzek G., Pham-Tourreau S. and Pourriat J.L. Anesthésie du patient toxicomane. (2011). Elsevier Masson SAS.

Keywords: *drug addiction; anesthetic management; evaluation*

Engaging Nurse Anesthesia Students with Medical Reader's Theatre

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Introduction: The Medical Readers' Theater (MRT) is an instructional strategy historically utilized by medical schools to present relevant social and ethical issues to students in a manner that sparks discussion and analysis[1]. Students are treated to a live theater reading by actors assuming roles but maintaining an off stage focus during the performance. At the conclusion of the performance the instructor moderates a discussion on the issues presented. Following the discussion, students have the opportunity to question the actors to learn more about their roles and viewpoints. The purpose of using this technique was to engage students in a shared discussion about an ethical case or social issue using a novel technique.

Method: The strategy was utilized in the Virginia Commonwealth University Department of Nurse Anesthesia Ethics and Health Care course. The unique challenge being that it is a hybrid course with only the first and last sessions being held on campus. In addition, students attended the live on campus sessions from four distant sites concurrently via video conferencing technology. To accommodate the structure of the course, the readers' theater performance was pre-recorded and delivered as a streaming video during class. The instructor then continued with the discussion facilitation in a live manner.

Results: Anecdotal results of this informal study were positive. We solicited student perception feedback via survey using a Likert scale of 1-4; 1 indicating strongly disagree, and 4 strongly agree. We received feedback from 43 students in the class. The first question: Did you enjoy the use of this technique to present a case of moral dilemma? resulted in a mean score of 3.76. How immersed with the case and characters did you feel during the viewing? a mean score 3.52. I felt the format presented the case clearly, a mean score of 3.64. "Did you feel the pace of the reading allowed adequate time for you to understand and process the content of the story? a mean score of 3.88. Lastly, Following the presentation did you find value in the discussion and sharing of thoughts? a mean score of 3.76.

Discussion: A recent nursing student data set has identified a lack of student engagement with traditional pedagogics as the most significant barrier to classroom learning[2]. Developing a digital version of the readers' theater performance not only maintained the integrity of the experience, but also opened up new avenues for student engagement and learning. These included the opportunity to present to students at distance sites as well as those who were unable to attend the live session, the option to post the video for review after the in-class session, and the ability to rewatch a portion of the video to cover items that may have not been clear during the initial presentation. Student engagement is dwindling with the traditional "sage on the stage" teaching methodology. The future of nurse anesthesia education may entail the development of an interactive social learning platform or a novel strategy not yet imagined.

References: Savitt, T. (Ed.). (2002). Medical readers' Theater: A Guide and Scripts. Iowa City, Iowa: University of Iowa Press. Toothaker R, Taliaferro D. A phenomenological study of millennial students and traditional pedagogics. Journal of Professional Nursing. 2017 Sep - Oct;33(5):345-349. doi:10.1016/j.profnurs.2017.01.004. Epub 2017 Jan 31. PubMed PMID: 28931481.

Keywords: *Medical Reader's Theater, Education, Innovation*

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The Simulation Centre at University Hospital Zurich

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Background: In 2010, the Institute of Anaesthesiology at University Hospital Zurich developed a program for simulation training concerned mainly with resuscitation and critical incidents during anaesthesia as part of their ongoing training program for residents and staff. In 2013, the Simulation Centre had grown in size and diversity, offering full-scale crisis resource management (CRM) team-trainings. In order to make the trainings accessible to all staff at University Hospital Zurich, it was converted into the separate department it is today.

The aim of simulation: Using simulation training, processes can be trained, and new methods and workflows tested and improved without any risk to patients whatsoever, before applying the skills and knowledge at the bedside. Simulation training aims to increase patient- and system safety, ultimately improving overall patient outcome.

The simulation centre: Whenever possible, trainings are designed to be completely inter-professional and inter-disciplinary, adhering to the principle of “training together those that work together”. Specific medical situations are recreated in the action rooms, which can be adapted to imitate the respective clinical surroundings – for added immersion, or exact testing and training of processes, trainings are performed on site (“in-situ”) wherever possible. Increasingly, real critical incidents based on our critical incident reporting system (CIRS) are used to objectively select and address high-risk topics. With all simulations, specially trained instructors facilitate briefing and debriefing of the teams involved in the cases using audio/video recordings, and principles of adult learning and guided self-correction.

Results: Medical simulation has been shown to improve patient safety and increase the performance in teams. Medical skills and knowledge are improved – particularly team coordination benefits from this form of training. Evaluation of simulation trainings shows high levels of acceptance and satisfaction amongst participants.

Conclusion and outlook: In the past years, simulation trainings in general, and specifically team-trainings in simulation, have been firmly established at University Hospital Zurich. As we have been able to show, learning at the simulation centre is experiential, practical and sustained – and contributes to patient safety and satisfaction of staff. As we further expand our simulation centre, we are increasingly incorporating more departments of our hospital to inter-disciplinary, inter-professional trainings, performing internationally respected research, and incorporating new methods of measurement concerning stress and biometric data into our analysis and debriefing of team performance.

Keywords: *simulation centre, team-trainings, cirs,*

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Nice to Have, Need to Have?

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Introduction: Use of ultrasound for applications of difficult iv acces has in recent years been the goldenstandard. Only few nurses in The Department of Anaesthesia, Center of Head and Orthopaedics, Rigshospitalet University of Copenhagen has the correct competences to do ultrasound guided iv acces. Therefore we offer competency development by structured training program and bedside practice with qualified instructors to any nurse with interest. We experienced great interest for this project and half of the clinics nurses (30) pre-registered to the teaching program. Four instructors were available. (Nurses in the clinic who in advance has completed competency development training.

The teaching program was developed July 2017. The interest was great and all registered was given a teaching program, with guidance and instructions to a e-learningprogram, and a outline on the course of bedside teaching. In addition, everyone was assigned a permanent instructor. There are 4 phantoms and 8 ultrasound devices in the clinic.

After 7 months, 2 out of 30 students had completed the competence development program. The remaining students have not completed their e-learning course and have not proceeded to the practical part of the course. Despite the great interest in competency lifting in ultrasound, the project failed to complete.

One possible explanation is that the clinic has not devoted a dedicated time to the individual employee to complete the e-learning course during working hours. It was up to the individual himself to find time during the working day to complete or do it in his spare time.

In addition, the experience of a busy weekday can make education and skills development down priority.

To address the problems, the solution can be to let the nurses have a dedicated time allocated to complete the course.

A major obstacle to the implementation of the e-learning program is that no dedicated time has been allocated to the nurse's e-learning in the working day. It has been suggested that one could individually agree to use any available time during the working day of colleagues. It is possible to make e-learning programs from your own home, but no one has taken advantage of this opportunity. Despite the great interest in ultrasound competence lift, the project failed to complete. This is mainly due to the fact that the nurses in the department have not prioritized the implementation of the e-learning program during working hours and have not wished to implement it in their free time without wage compensation.

To increase the success rate, another form of education must be considered or nurses must be economically compensated to spend their free time training

Keywords: *PUGVA implementation failed attemp development of competences*

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Innovative Project in Nurse Anesthesia Education: Our Serious game: «JOSiAne» Jeu sur l'Ouverture du Site d'Anesthésie Apprentices' Tool Co-designed by our Students

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Introduction: JOSiAne Jeu sur l'Ouverture du Site d'Anesthésie (Anesthesia Site Opening Game) is a pedagogical tool created by nurse anesthetist students from the 2015-17 year group and intended for other students on the theme of the anesthesia check-list. The game offers two levels of difficulty “beginner” and “advanced” The game will evolve in 2018 by adding specific situations including patient pathologies and targeted surgeries which will allow to develop clinical reasoning.

This serious game (SG) is a tool used for enhancing professional skills in the context of training quality improvement. It falls under the French National Authority for Health (HAS) guidelines concerning training simulations (1) and the improvement of operating room anesthetic safety. It was created in collaboration with a private company and funded by a grant delivered by our Region

Research Hypothesis: Given the fact that students face difficulties in the early stages of their training to acquire the nationally defined skill-set (“Anticipating and implementing the organization of the anesthesia work site according to the patient, the type of intervention and the type of anesthesia”)(2), this SG could be considered as an additional innovative tool for a greater acquisition of these skills.

Methods: The questionnaire is based on the following criteria: realism, learning, usability, challenge, motivation, training. The questions’ answers range from 1 to 7 corresponding to « do not agree at all» all the way to « very much agree »The assessment of the efficiency of this tool was done in different steps.

- Step 1: SG evaluation by instructors and our students
- Step 2: pending, Use tests with other schools’ students
- Step 3: projected, SG evaluation with prevailing situation

Results: Step1: 14 of our students participated. Conformity to real practice: 13/14 gave a score ≥ 5 ; Equipment realism: 12/14 scores ≥ 6 ; Efficient learning source: 14 score ≥ 5 ; Desire to play outside of class time: 10/14 score ≥ 6 ; Preferred use by 10/14 after classes; Game mechanism easy to understand: 12/14; Adequate level of difficulty: 13/14 score ≥ 5 ; Desire to play again once a week: 6/12 once a month 6/12; Desire to integrate the game in the curriculum: all the instructors.

Also includes the results from Namur school (Belgium). Rouen school + Namur = 31 students, 8 instructors: Realism 85%, Learning 90%, Usability 82%, Challenge 75%; Desire to play again: students & instructors: once a week/1 hour

Discussion: This study is Ongoing but early feedback indicates pedagogical interests. Format suitable and easily accessible everywhere. Learning by trial and error, facilitates memorization. Students are motivated with objective scores to reach. The simulation before and/or after full scale practice in the operating room is easy to integrate to the curriculum. Negative aspects: need for stable internet access and high broadband to download the game

Conclusion: The SG is faithful to observed practice. Because of the positive early feedback, the anesthesiologists have underlined the value of deploying this game to the largest number of learners possible in the field of anesthesia (nurse anesthetists and resident anesthesiologists)

References: 1 National Authority for Health (France) national et international report on simulation practices in the health domain for continuing professional development and prevention of delivery of care associated risks. PrJC Granry and Dr MC Moll, January 2012/ 2. July 23rd 2012 Decree concerning the training and state diploma of nurse anesthetists in France

Keywords: *Serious game, operating room, check-list, learning, skills*

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Improving Attitudes Toward Interprofessional Learning: Integration of High-Fidelity, Simulation-Based Team Training in the Nurse Anesthesia Curriculum

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Introduction: In today’s dynamic healthcare environment, effective inter-professional teamwork is essential for safe, quality care. Unfortunately, the clinical environment is often characterized by professional tribalism and a silo mentality. Increasing opportunities for Interprofessional Education (IPE) among the different health profession student populations through the use of simulation based team training has the potential of overcoming this silo mentality. There are many advantages of IPE including: improving both students’ attitudes toward team working skills and professional practice and patient care among practitioners in the clinical environment. In a report commissioned by the Agency for Healthcare Research and Quality (AHRQ), it was concluded that team training should be embedded as part of professional medical education [1]. In addition, the final report from the 2008 National League for Nursing (NLN) Think Tank on Transforming Clinical Education highlights the need for nursing educators to “Create opportunities for effective, positive interprofessional teamwork, particularly those that focus on system-wide concerns” [3,p.3]. We introduced a high-fidelity, simulation-based team training curriculum centered in the Nurse Anesthesia Program (NAP) and investigated its impact on participating students’ attitudes toward inter-professional learning and teamwork.

Methodology: From 2015 to 2017, a high-fidelity, simulation-based team training curriculum was introduced across a large academic health sciences center in the southeast United States. Teams of various combinations of nurse anesthesia students, senior medical students, and allied health students participated in a dual scenario-training format with immediate after-action debriefing on team-based competencies. Pre- and post-intervention, students completed the Readiness for Interprofessional Learning (RIPL) questionnaire (18 items, 5-point Likert type scale) and an Interprofessional Teamwork Training (IPTT) attitudes questionnaire (15 items, 6-point Likert type scale). Descriptive statistical analyses were performed for both the RIPL and the IPTT to determine whether there were significant changes from pre to post.

Results: Over the three-year period, matched scores were available for 646 to 649 individuals, depending on the item. Results were analyzed and trended by the project statistician. Statistically significant increases were found from pre- to post-intervention for all three years in 11 of the RIPL items, and in one of the years in the four other RIPL items. Statistically significant increases were found pre- to post-intervention for all three years for all 15 IPTT items (e.g. team based behaviors, shared mental model, with p values $<.00001$).

Discussion: Through collaboration with the Schools of Medicine and Allied Health, the School of Nursing NAP successfully integrated a sustainable IPE program into the respectable curricula that improved learners’ attitudes toward interprofessional learning and teamwork. This project contributed to the ability of nurse anesthesia, medical and allied health profession graduates to assume practice roles upon graduation and enter into the professional workforce.

Conclusion: Interprofessional team training using high fidelity simulation can be integrated into the everyday curricula of students in Schools of Nursing, Medicine and Allied Health to improve students’ inter-professional learning and teamwork attitudes.

References: 1. Baker, D. P., Gustafson, S., Beaubien, J., Salas, E., Barach, P. (2005). Medical teamwork and patient safety: The evidence-based relation literature review. AHRQ Publication No. 05-0053, April 2005. Agency for Healthcare Research and Quality, Rockville, MD. Retrieved February 2, 2009 from www.ahrq.gov/qual/medteam/. 2. NLN. (2008). Final report of the 2008 NLN think tank on transforming clinical nursing education. National League for Nursing. Retrieved February 6, 2009, from www.nln.org/facultydevelopment/pdf/think_tank.pdf.

Keywords: *Interprofessional education, nurse anesthesia, high-fidelity simulation, health professions education*

The Development of a Common Clinical Assessment Tool for Clinical Evaluation in Nurse Anesthesia Education in the United States

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Introduction: Due to an increased demand for accountability health care professions are establishing methods to demonstrate competency of their graduates. (1) There is currently a lack of standardization and consistency among clinical preceptor evaluation of student registered nurse anesthetists' (SRNAs) competencies during their clinical education in the United States. One reason for this deficit is that a common clinical assessment tool (CCAT) that is competency based and methodologically validated does not exist. The Council on Accreditation for Nurse Anesthesia Educational Programs (COA) standards require that formative and summative evaluations of each SRNA are conducted for counseling students and documenting student achievement. In 2015, a focus group consisting of nurse anesthesia educators was assembled. From their comments, it was determined that development of a CCAT would improve their ability to more accurately assess students' clinical competencies. In 2016, the COA appointed a CCAT Special Interest Group (SIG) to develop a standardized assessment instrument that is competency based and reflective of the Practice Doctorate Standards. (2)

Methods: The development of the COA's CCAT is ongoing. After a literature review, input from the communities of interest, results from the American Association of Nurse Anesthetist professional practice survey, and analysis of the National Board of Certified Registered Nurse Anesthetists certifying examination content outline, an initial draft CCAT was developed. To obtain input from the community of interest and clarification on content items, a Delphi study was initiated after IRB approval was granted. A survey was constructed to elicit the opinions of participants in relation to the CCATs domains, domain descriptors, competencies, competency descriptors and progression indicators. The participants enrolled met eligibility criteria and were divided into four groups; administrators, academic faculty, clinical faculty and learners. Participation was voluntarily and consent was achieved.

Results: Ninety-seven participants responded to the first stage of the Delphi study. Both quantitative and qualitative data was obtained. Comments were assessed for common themes. The CCAT SIG evaluated the results and has collectively revised each item. The revised draft CCAT will be deployed for the second stage of the Delphi study in February 2018.

Discussion and Conclusion: The CCAT will be revised after the second stage and re-deployed for a third stage. If the CCAT SIG then determines that the CCAT meets validation criteria, it will be presented to the COA for approval. It is anticipated that completion of the CCAT will occur by December 2018. The CCAT will be made available for all nurse anesthesia programs to use on an optional basis.

References: 1. Englander R., Cameron, T, Ballar, A.J., Dodge, J, Bull, J, Aschenbrener, C.A. (2013). Toward a Taxonomy of Competency Domains for Health Professions and Competencies for Physicians. *Academic Medicine* (88), 8, pp 1088-1094. 2. Council on Accreditation of Nurse Anesthesia Educational Programs. *Standards for Accreditation of Nurse Anesthesia Program: Practice Doctorate*. Park Ridge, IL; 2015.

Keywords: *clinical evaluation, common clinical assessment tool*

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The Outcome of Airway Management in Patient Undergoing Emergency Cesarean Section – Case Description

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Introduction: The incidence of failed intubation in the standard laryngoscopy of the patient during pregnancy ranges from 1 to 300 to 1 to 238 intubations and remains unchanged since the seventies, despite progress in the development of intubation devices [3]. Among physiological changes, the most important respiratory changes are those responsible for the faster development of hypoxia. Pregnant woman desaturates at higher partial oxygen pressures in arterial blood than a non-pregnant woman. Additional risks may be due to pregnancy conditions in pregnancy such as obesity, increased risk of preeclampsia and gestational diabetes, obstructive sleep apnea, and increased edema of the upper respiratory tract in preeclampsia [1, 2].

Case description: The obstetricians indicated an urgent c-section. The patient had an ASD surgery in childhood, in 1996 she underwent orthopedic surgery due to the scoliosis of the thoracolumbar spine, and also had a scoliosis of the neck spine. She had an atelectasis of the right lower lobe and a restrictive ventilatory disorder. She also had a vocal cord paresis. We decided to perform awake intubation and then induce general anaesthesia. We conducted a pre-operative conversation with the patient. Upon arrival in the operating theater, the patient became worried, anxious, restless and non-cooperative. After premedication we started with topical mucous membrane anaesthesia.

Nasopharyngeal airway was inserted into the nostril. We pre-oxygenated the patient with 100% oxygen. At the beginning of the introduction of a bronchoscope through the nostril, the patient began to cough, had extremely hyperactive pharyngeal reflex, the anxiety was intensifying. The patient resisted, despite the continuation of additional topical anaesthesia and was continuously guided through the course. After the introduction of a bronchoscope in the trachea, a tube was introduced and induction in general anaesthesia was performed. We found that the tube did not lie in the trachea, so we removed it. The patient started to bleed from the nasopharynx and the O₂ saturation began to fall. Ventilation through the face mask was not effective. We tried to intubate with a C-MAC, but we were unable to display the boundary of the epiglottis (Mallapati class 4). After muscle relaxation we introduced Airtraq and the orotracheal intubation was successful. During intubation attempts, SpO₂ fell below 50% (approximately 30 s), but was repaired after intubation and ventilation. To ensure control before and after extubation we agreed to observe a patient in the ITU. A few hours after the procedure, the patient was successfully extubated and was dismissed from the hospital the seventh day after the procedure.

Discussion: Providing safe respiratory care and developing intubation guidelines were first considered by anesthesiologists in obstetrics. They identified an increased risk of aspiration, statistically treated with severe complications with respiratory care, an optimal method for laryngoscopy, and a first algorithm for difficult airway management [1]. The latest difficult intubation guidelines have been published by the Difficult Airway Society (DAS) in association with the Obstetric anaesthesiologists Association (OAA) in 2015. For the optimization of awake intubation, a regional techniques for upper respiratory anaesthesia could be performed (nerve blocks). More patient cooperation and less agitation would be achieved with a longer pre-operative preparation. Studies have shown, that recently less anesthesiologists decide to wake up the patient after the unsuccessful attempt of intubation in case they succeed in providing an appropriate oxygenation with the aid of a supraglottic device [2].

Conclusion: Unsuccessful intubation is more frequent in pregnant women than in the general population due to anatomical and physiological changes that occur during pregnancy. Regional anaesthesia is the best method to avoid respiratory tract. In cases where general anaesthesia is required, it is sensible to work according to the designed algorithms for safer treatment.

References: 1. Asai T. Airway management in patients undergoing emergency Cesarean section. *J Anesth* 2015; 29:927-33. 2. Kinsella SM, Winton AL, Mushambi MC, et al. Failed tracheal intubation during obstetric general anaesthesia: a literature review. *Int J Obstet Anesth* 2015; 24: 356-74. 3. Myhre JM, Healy D. The unanticipated difficult intubation in obstetrics. *Anesth Analg* 2011; 112: 648-52.

Keywords: *awake intubation, failed intubation, obstetric anaesthesia*

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TransOral Robot Surgery (TORS) and Airway Management – A Guide to Nurse Anesthetists

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Introduction: The number of patients with cancer of the throat (or hypopharynx cancer) has increased in Denmark in the period between 2000-2010. This mainly due to an increased number of cases caused by the Human Papilloma Virus (HPV). More men below the age of 55 are affected by the disease than before 2000-2010.

At Copenhagen University Hospital, 320 surgical procedures are until now performed by using TORS, on patients with this type of cancer of the throat. Robot Surgery is used as an alternative form of treatment to chemotherapy and radiation, where the patients often experience side-effects in both short and long term.

The purpose of this study was to acquire the necessary knowledge and evidence to develop a method for management of the potential difficult airway, in connection to trans oral robotic surgery.

We started the project sending one anesthetist and one nurse anesthetist from the ear nose and throat surgical ward, attended an educational visit to the Saint Marys Hospital in London, and another to the Knødel's Hospital Hamburg. They watched robot surgeries, interviewed the staff, and gained an insight into the equipment that was used.

Method: The collected knowledge was then combined with existing knowledge of difficult airway management, as well as local and national guidelines in the field of airway management.

The two anesthetists gathered all accumulated knowledge during the first performed trans oral robotic surgeries, and this, combined with their other findings, became the basis for the preparation of a guideline to TORS and the handling of the potentially difficult airway.

In the department of anaesthesiology, the guideline was implemented in the beginning of the TORS operations.

The guideline, describe the special respiratory problems associated with the TORS operation and how we best prevent and handles airway complications subsequently due to surgery and extubation.

Airway management and planning of postoperative care is planned out in close collaboration with the (primary operating) surgeon.

Result: The result is the focus on prevention and treatment of post-operative respiratory complications. Furthermore, it provides a uniformity in the airway management of the patient group and data to statistics material. (We expect to have more data before the congress).

Today two hundred and thirty trans oral robotic surgeries have been performed, and sample pool of thirty patients shows that four patients had a difficult airway preoperatively, four patients had respiratory edema, and two patients needed postoperative respiratory treatment due to airway edema.

Discussion: TORS surgery has not previously been performed in a Denmark, and as such there is no experience or research about this type of surgery and airway management.

The number of patients who have undergone the trans oral robotic surgery is modest and there is a need for systematic data collection and cataloguing of trans oral robotic surgeries in order to do more efficient research in the future, and to optimize treatment to prevent pre, per and postoperative respiratory problems.

References: Chi JJ, Mandel JE, Weinstein GS, O'Malley BW, Anesthetic Considerations for Transoral Robot Surgery, *Anesthesiology Clinics* 2010, Vol 28, Iss 3 pp. 411-22.

Keywords: *difficult airway management, transoral robot surgery*

22

Simulation-based Education and Evaluation for Safe Airway Management; Procedure for Tracheal Intubation and the Tube Fixation.

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Background: In the past seven years, 54 incidents related to tracheal intubation have been reported in Japan. Thirteen of them are incidents under anesthesia management, occurring irrespective of time zone or occurrence place.

Objective: Therefore, we conducted simulation-based education and evaluation for safe tracheal intubation and tube fixation.

Desing: Time investigation on tracheal intubation and fixed procedure.

Participants: The subjects were 8 participants in specific advanced nursing training.

Methods: First, based on the tracheal intubation guide guidelines of the Japanese Society of Anesthesiologists, tracheal intubation procedure was prepared. Next, in classes related to tracheal intubation and tube fixation, lectures and practical training in accordance with the procedure were conducted, and procedures were confirmed. After practicing 5 or 6 times per person, practicing using a simulator was carried out. In the simulator-based practice, elapsed time was measured three times at a time. Based on the measurement results, the total time of the stroke, time taken for tracheal intubation and apnea time were aggregated, and the difference in time lapse of 3 times was examined.

Results: Every participant had obviously shortened the elapsed time as the number of times increased. In order to ascertain whether the difference between the first, second, and third average times is statistically significant, a two-tailed t-test was conducted with a significance level of 5%. As a result, $p=0.002$ to 0.01 , and clearly significant differences were observed in each procedure at the first and third times.

Conclusions: Simulation-based training according to the procedure was effective not only to enable the implementation of appropriate procedures but also to facilitate smooth communication with assistant. Moreover, objective evaluation is possible, and it can be expected to lead to securing uniform quality.

Keywords: *Intubation, Simulator-based training, safe airway management*

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Difficult Airway: Endotracheal Tube over Fiberoptic Bronchoscope with Videolaryngoscope Guidance (ET /FB with VL guidance)

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Introduction: Difficult intubation is no more 'difficult' when proper modalities like fiberoptic instruments and videolaryngoscopies had been used whenever possible with the help of experienced hands. In this case report four cases of 'difficult' intubations performed with videolaryngoscopy and fiberoptic laryngoscopy had been discussed.

Case I: Five years old, male, 18 kg body weight child with a limited mouth opening had been scheduled for an syndactyly operation. Forseeing that he could have difficult airway, laryngeal airways (LMA) no 2 and 2.5, endotracheal tubes (ET) 4.0, 4.5, guides, videolaryngoscopy and fiberoptic instruments had been prepared. Anesthesia induction had been done by administration of intravenous (i.v.) propofol 2.5 mg/kg, fentanyl 3 mic/kg, and muscle relaxation had been achieved by rocuronium 0.6 mg/kg i.v. After preoxygenation with mask, oxygen 6 L/min, fiberoptic bronchoscope (FB) had been advanced through the limited mouth opening, however larynx could not be identified. The FB had been taken out in order to re-oxygenate the patient. Videolaryngoscope with the pediatric blade had been inserted, larynx had been visualized, however the ET could not be advanced. ET had been placed over the FB, and with the help of videolaryngoscope, the larynx had been visualized and through the FB, the ET had been advanced through the vocal cords. Endotracheal intubation had been accomplished with ET no 4.5 and verified by auscultation and end tidal carbondioxide monitorization. At the conclusion of the surgery, as soon as efficient spontaneous respiration of the child (7 ml/kg) had been monitored, he had been extubated through exchange catheter.

Case II: Twenty-eight years old, female, 75kg body weight, had been examined as Mallampati IV preoperatively. After induction with propofol 3mg/kg and remifentanyl 1 mic/kg i.v., she had been preoxygenated and entubation had been attempted through videolaryngoscopy however, although proper guides had been inserted ET could not be advanced. She had been entubated through ET over FB though videolaryngoscopy guidance with ET no 7.0. She had been extubated at the conclusion of the surgery with an exchange catheter.

Case III: Thirty-five years old, 95 kg, male patient, had been evaluated as Mallampati III. Intubation had been attempted first by FB, however since very big epiglottis occluding the larynx, proper visualization could not be achieved. Videolaryngoscope with high angled blade the visualization had been achieved and ET over FB had been advanced and successful intubation had been performed.

Case IV: Six months old, 8 kg, infant with sever facial anomalies, no nose, and hydrocephalus had been scheduled for ventriculoperitoneal shunt operation and had been entubated with ET over FB with VL visualization by two experienced anesthetists.

Conclusion: Combination of known and experienced modalities like VL and FB can be used successfully when advantages of the methods had been unified.

Keywords: *Difficult intubation; videolaryngoscopy; fiberoptic intubation*

Difficult Airway Management in Patients with Huge Perioral Cavity Tumours

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Introduction: Huge perioral tumour surgery which is presumed to last long operating hours necessitates a safe airway management. Airway management is considered very difficult preoperatively and preparation likewise should be performed. In this case report, two patients with huge uncontrolled oral cavity tumours had been discussed.

Case I: Fifty-two years old, male, 75 kg patient, coming from an African country who had a perioral very fast growing tumour (11.5x8x6.5 cm) had been scheduled for resection and reconstruction surgery. After preoxygenation for 5 minutes, anesthesia had been induced by intravenous (i.v.) propofol 2.5 mg/kg and rocuronium 0.6 mg/kg and remifentanyl 1 mic/kg. Since mask ventilation was very difficult and oral cavity was full of the tumour, nasal fiberoptic intubation had been performed successfully as planned and prepared likewise with the help of a collaborative team of anesthesia. Maintenance of anesthesia had been accomplished by desflurane/air/oxygen beginning with 4 L/min 8/2/1 % and reduced to 1 L/min. Remifentanyl i.v. infusion 0.25mic/kg/h had been used as peroperative analgesia. In addition to standard monitorization, intraarterial blood pressure, pulse variation index, cerebral oxygenation, urinary output had been monitored throughout the surgery which had lasted 12 hours. After the perioral tumour had been dissected successfully, peroperative tracheostomy had been performed and the patients had been admitted to intensive care unit at the conclusion of the surgery.

Case II: Fifty-years old, 38 kg body weight female patient had a huge mass at her tongue which made feeding only with pipette possible. She had no other illnesses except for novocaine allergy. She had been evaluated as Mallampati IV, so awake fiberoptic intubation had been planned and prepared likewise. After standard monitorization of her vitals, invasive blood pressure, cerebral oxygenation, pulse variation index and urinary output had been monitored all operation long. After preoxygenation, anesthesia induction started with i.v. infusion of dexmedetomidine 1 mcg/kg/min and remifentanyl 1mic/kg, keeping spontaneous breathing of the patient. After induction, nasal fiberoptic intubation had been performed successfully and i.v. propofol 2 mg/kg, rocuronium 0.6 mg/kg were administered. Anesthesia maintained with oxygen/air/desflurane 0.5/1/7 in 4 L/min. After the operation which had lasted 14 hours, the patient had been admitted to the intensive care unit without any unwanted effects or complications.

Conclusion: Difficult airway management is not 'difficult' if the collaborative anesthesia team prepared, worked in high level harmony. Resection and reconstruction of uncontrolled huge perioral tumours necessitates a teamwork, patience, experience and careful, safe, meticulous anesthetic management, monitorization and follow-up.

Keywords: *Difficult airway; perioral tumours; fiberoptic intubation*

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Evaluation of Different Professions Managing VivaSight™ Double-lumen Tracheal Tube – A Prospective Observational Study

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Background: The VivaSight DL (ET-View Medical Ltd) is a single-use endobronchial double-lumen tube with light source and an integrated camera at the distal end of the tracheal lumen providing continuous placement of the DLT. The real-time video image is transmitted to a 7" monitor why malposition and dislocation are easily detected and corrected. When correctly positioned the video imaging device is focused on the carina, providing visual confirmation of the bronchial cuff in the left main bronchus. The double-lumen endotracheal tube (DLT) is more complicated to position correctly than traditional tubes and is more likely to cause airway injuries, so it is often performed by experienced anesthetists. The literature is predominantly focused on highly educated and experienced staff for managing a DLT, however, the influence of professional skills is inconclusive. For less experienced anesthetists and senior trainees a failure rate as high as 36% was reported. The VivaSight DL has been used by nurse anesthetists as the standard tube in the Department of Cardiothoracic Surgery at Copenhagen University Hospital for nearly four years but no evaluation has been done.

Aim: To assess the airway management in placing the VivaSight DL left-sided tracheal tube related to professional skills among nurses- or doctors anesthetist trainees (< 3 month of experience in placing a double-lumen endotracheal tube), nurse anesthetists and anesthesiologists. The primary outcome was time of successful attempt to intubation of the patient in supine position, defined as the time from when the participant inserted the laryngoscope until its correct location was confirmed viewed on the monitor and the cuff was inflated.

Method: Prospective observational single-centre study

Results: Data were collected from five hundred seventy nine consecutive patients, scheduled for thoracic surgery with a requirement for one-lung ventilation, from a period of 12 month ending December 2017. 35 anesthetist trainees (nurses or doctors) (287 cases), 27 nurse anesthetists (239 cases) and 8 anesthesiologists (53 cases) managed intubation with the VivaSight DL left-sided tracheal tube. All airways could be intubated and no serious airway injuries were found in this study. In 514 (89%) of 579 cases correct placement of the VivaSight DLT was archived on the first attempt. Second attempt was required in 45 (8%) and third attempt in 20 (3%) cases. The mean time required by the groups to complete the succeeded attempt was for anesthetist trainees (nurses or doctors) 53 sec [SD 33] with extreme values of 12 and 300 seconds and was considered easy in 82% of the cases. For nurse anesthetists 40 sec. [SD 28] with extreme values of 14 and 246 seconds and was considered easy in 80% of the cases. For anesthesiologists 63sec. [SD 58] with extreme values of 18 and 300 seconds and was considered easy in 51% of the cases versus 23% moderate and 26% as difficult. Primary outcome, time from insertion of the laryngoscope to visually verified carina and inflation of cuff, was relatively equal between groups with a mean time (sec.) of 53 (anesthetist trainees); 40 (nurse anesthetists) and 63 (anesthesiologists) The median time from laryngoscopy to intubation was shorter for nurse anesthetists (30 sec.) when compared with the anesthetist trainees and anesthesiologists (45 seconds) ($p < 0.001$). Characteristics of airway assessment were similar between groups with Mallampati classification ($p = 0.08$), Cormack Lehane grade ($p = 0.13$) and Dentures ($p = 0.06$). Regardless of skills 222 (38%) of the succeeded attempts were performed in ≤ 30 seconds and 423 (80%) in less than 60 seconds.

Discussion and conclusion: Significant different in time (sec.) to intubation with the use of VivaSight DL between nurse anesthetists, anesthetist trainees (nurses or doctors) and anesthesiologists were found. Despite the uniform characteristics of airway assessment between

groups it can probably be explained by the difference in number of cases for each group. Means of 40 – 63 sec. is below the defined onset time of apnoea, and seems to be of less clinical importance since patients ruinously are preoxygenated. The learning curves, defined as an improvement in performance over time, increased rapidly for anesthetist trainees (nurses or doctors). The VivaSight DL allowed fast and safe insertion and facilitated initial positioning.

References: 1) Koopman E, Barak M, Weber E, Valk M, Schepper R, Bouwman R, et al. Evaluation of a new double-lumen endobronchial tube with an integrated camera (VivaSight-DL™): a prospective multicentre observational study. *Anaesthesia* 2015;70(8):962-968. 2) Massot J, Dumand-Nizard V, Fischler M, Le Guen M. Evaluation of the Double-Lumen Tube Vivasight-DL (DLT-ETView): A Prospective Single-Center Study. *J Cardiothorac Vasc Anesth* 2015 12;29(6):1544-1549. 3) Rapchuk I, Kunju S, Smith I, Faulke D, Kunju S. A six-month evaluation of the VivaSight™ video double-lumen endotracheal tube after introduction into thoracic anaesthetic practice at a single institution. *Anaesthesia & Intensive Care* 2017;45(2).

Keywords: *One-lung ventilation; double-lumen endobronchial tube; VivaSight-DL; nurse anesthetists; professional skills*

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Evaluation of Endotracheal Cuff Pressure Reduces Incidence of a Too Large Pressure

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Introduction: An endotracheal tube cuff pressure above the tracheal perfusion pressure (27-40 cm H₂ O) may provoke tracheal mucosal ischemia and injury even within only 15 to 30 min [1, 2]. On the other hand, insufficient cuff pressure increases air leak and risk of aspiration. With no control of cuff pressure the considered upper limit (30 cm H₂ O) may be exceeded for as many as half of the patients [3]. We evaluated whether the incidence of excessive endotracheal cuff pressure (or a too low pressure) is reduced after providing possibility for routine evaluation of cuff pressure.

Methods: In a prospective observational study including 78 adults (40 men) undergoing abdominal, urological, or vascular surgery, endotracheal cuff pressure was measured (AMBU manometer, Copenhagen, Denmark) and air leak determined (Dräger Primus, Herlev, Denmark). Also size of the endotracheal tube (Unomedical endotracheal tube) was noted.

Data are presented as median (IQR) and comparison between men and women was by an unpaired *t*-testor Wilcoxon-Mann-Whitney test. The relation between cuff pressure and air leak was evaluated by Spearman's correlation. The proportion of men and women who presented excessive or too low cuff pressure was evaluated by Fisher's exact test and $P < 0.05$ was taken to represent statistical significance.

Results: Among the males the height was 177 cm (174-183), weight 84 kg (76-95), and tube size 8.0 mm (8.0-8.0) and higher than for women at 164 cm (160-168), 63 kg (54-76), and 7.0 mm (7.0-7.0; all $P < 0.0001$). Cuff pressure was 26 cm H₂O (20-30) for males and similar 28 (22-34) for females ($P = 0.2203$) and air leak was 0.12 l/min (0.00-0.37) for males and similar 0.07 l/min (0.00-0.16) for females ($P = 0.0922$).

Cuff pressure exceeded 30 cm H₂ O for 7 men (18%) and 11 women (29%; $P = 0.287$). For the men tube size was 7.0 mm (ID) to 8.5 with the majority being size 8.0 (n=30) and for women the tube size was 7.0 (n=32) or 7.5. Cuff pressure was lower than 20 cm H₂O for 5 men (13%) and 3 women (8%; $P = 0.7123$), but not correlated to air leak. Values are median (IQR).

Discussion: Our aim is to seal endotracheal tubecuff pressure below 30 cm H₂ O to avoid mucosal ischemia. Yet, despite providing ability to measure cuff pressure after intubation, for 22% of the patients cuff pressure exceeded that limit. Although that is an improvement compared to when cuff pressure was not determined (3), it illustrates that determination of cuff pressure is not (yet) sufficiently implemented. Also it may be considered that cuff pressure should not exceed the lower limit of tracheal perfusion pressure (27 cm H₂ O) and if so, still half of the patients were provided with a too high cuff pressure. Cuff pressures can also be too low and significant air leak was observed for 10% of the patients albeit not clearly related to cuff pressure.

The most frequently used tube size for women was 7.0 and 8.0 for men but it is likely that smaller tubes should be used and evaluation of peak inspiratory pressure securing maintained end-tidal carbon dioxide tension could direct the choice of tube size.

Conclusion: Since introduction of routine cuff pressure evaluation, the proportion of patients exposed to a too excessive cuff pressures is reduced. Yet, cuff pressure was above the upper limit for 23% of the patients indicating that attention to cuff pressure should be emphasized.

References: [1]. Seegobin RD, van Hasselt GJ. Endotracheal cuff pressure and tracheal mucosal blood flow: endoscopic study of effects of four large volume cuffs. *BMJ* 1984; 288: 965-8 [2]. Nordin U. The trachea and cuff-induced tracheal injury. An experimental study on causative factors and prevention. *Acta Otolaryngol Suppl* 1977; 345: 1-71 [3]. Rokamp KZ, Secher NH, Møller AM, Nielsen HB. Tracheal tube and laryngeal mask cuff pressure during anaesthesia - mandatory monitoring is in need. *BMC Anesthesiol*. 2010 - 3;10:20.

Keywords: *Endotracheal cuff pressure, tracheal perfusion pressure, cuff manometer, endotracheal tube size*

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The Effect on Postoperative Sore Throat (POST) of Lubricating the Flexible Laryngeal Mask Airway (FLMA) with Betamethasone Gel or NSAID Gel

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Introduction: The laryngeal mask airway (LMA) is an alternative to the traditional endotracheal tube and can effectively ensure a stable airway during anaesthesia.

The inflation of the LMA-cuff may, however, cause a reduction of blood flow to the mucosal pharyngeal mucosa and may induce direct tissue trauma and POST. Lidocaine, Betamethasone, NSAID or Dexamethasone applied on the LMA before insertion has been suggested to reduce the incidence and grade of POST, but data is inconclusive.

The purpose of this study was to investigate the effect of Betamethasone gel and NSAID gel lubricated on FLMA on the incidence and grade of POST 6 hours (T6) after FLMA removal (T0).

Our hypothesis was that Betamethasone gel would be the most effective of the two substances.

Methods: This pilot study used a non-blinded sequential design with a treatment block of 20:20:20. The included study participants were allocated to the interventions groups and the placebo-group according to the date of eye surgery. Anaesthesia was induced and maintained with Remifentanyl and Propofol. In the intervention group A the FLMA was lubricated with NSAID gel (Ipren 0.5%), in the intervention group B the FLMA was lubricated with Betamethasone gel (Diprolen 0.05%) and in the Placebo-group the FLMA was lubricated with Neutral gel (Exploration Gel). Ketorolac 15 mg was given as postoperative pain management. Paracetamol, Ibuprofen and Ondansetron were given for postoperative pain or moderate/pronounced nausea if needed. All the study participants were planned for the manual insertion of the FLMA in the supine position. A manual cuff pressure gauge was used to prevent air leak during anaesthesia.

The study participants assessment of POST, hoarseness and cough at 2, 4, 6, 8 and 24 hours (T2, T4, T6, T8, T24) after FLMA removal (T0) were recorded on a Likert scoring system ranging from 0 to 3, where 0 = no pain and 3 = worst-case pain. Demographic data, number of insertion attempts, cuff pressure, duration of anaesthesia, postoperative analgesics, blood on the FLMA, location of pain and pain administrated analgesics were registered. The data were analysed by t-test and Fisher's exact test. Bonferroni correction was applied.

Results: The incidence of POST at T6 (in all grades) were increased in the Ipren-group (80%) compared to the Diprolen-group (20%) and the Placebo-group (20%). Through out the study period, there was a significant difference in POST between the Ipren group and the Placebo group (all registered times (AT), $p < 0.02$) likewise between the Ipren-group and the Diprolen-group (AT, $p < 0.02$). When comparing the Diprolen-group and the Placebo-group there was no significant difference regarding POST (AT, $p > 0.69$).

No significant difference was observed between the groups with regard to hoarseness and cough. Demographic data, number of insertion attempts, cuff pressure, duration of anaesthesia, postoperative analgesics and blood on FLMA similar in all three groups.

Conclusion: The results of this pilot study did not confirm our hypothesis. There was no significant difference in POST when lubricating the FLMA with Diprolen gel compared with Placebo. In addition, it turned out that the pilot study showed a significant increase in the incidence and grade of POST when using Ipren gel compared to both the other groups. Based on these results, it seems that Ipren gel for lubrication of the FLMA should not be used.

Keywords: *Postoperative sore throat, flexible laryngeal mask airway, NSAID, Betamethasone.*

The Practice of the Australian Perianaesthesia Nurse Tested against IFNA Standards

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Background: In the Australian healthcare system, anaesthetist are assisted by anaesthetic nurses or technicians. Between 2005 and 2016 the anaesthetic nurses were represented by the Australian Society Perianaesthesia Nurses. To strengthen and boost the development of the perianaesthesia nurses, it was rebranded as Australian College of Anaesthetic Nurses, ACPAN, in 2016. The College is fast growing as a professional partner for the Australian and New Zealand College of Anaesthetists and the Australian College of Operating Room Nurses. Important for ACPAN was finding international connection and ACPAN became a member of the International Federation of Nurse Anesthetists (IFNA). Part of the growth process is to develop and implement Practice and Education Standards and education curricula for the formal training of the Australian Perianaesthesia nurses.

Aim of the study: Australia is a vast continent with specific anaesthesia challenges and needs in metropole, rural and remote areas. Eager to adopt the IFNA Standards and to finalise the ACPAN Standards, we intended to perform a gap analysis. The aim of this study was to compare the IFNA Standards with the current practice of Australian perianaesthesia nurses. The results of the study will be used to develop the three levels of education curricula for the perianaesthesia nurses and ACPAN Standards.

Methods:

Sample: All ACPAN members (n = 782) were invited by email to participate in an online survey about their perianaesthesia practice. They received a monthly reminder and after 3 months the survey was closed. In total 223 perianaesthesia nurses participated.

Instrument: The IFNA Standards were transferred into a multiple-choice questionnaire consisting of 10 main topics: educational background, patient advocacy, resource for others, preoperative assessment, preparation of the perianaesthesia work environment, postoperative care, interdisciplinary communication, participation in quality activities and organisational activities. The CANMED competency model was maintained as much as possible.

Analysis: Descriptive statistics were performed.

Results:

Topic	Percentage
Trained on the job.	54.8
Informing patient and/or its family	56.6
Present during the anaesthesia	81.2
Analysis parameters	62.7
Undertake corrective action	68.4
Interdisciplinary communication	68.9
Resource person	69.2
Preoperative assessment	72.3
Postoperative care	86.4
Preparing theatre	85.5
Handover to PACU	37.5
Quality improvement activities	51.7
Organisational activities	55.6

Conclusions

1. The present study provides evidence that IFNA Standards are applicable for most CANMED roles.
2. A formal education system is crucial in improving practice.
3. To work efficiently in the Australian perianaesthesia environment, the curriculum of the basic training of perianaesthesia nurses must focus on the expert role.
4. Developing the education Master level, the education curriculum should focus on:
 - organisational aspects and quality improvement (Manager).
 - communication in the interdisciplinary domain (Communicator).
 - self-evaluation processes to improve own practice (Scholar).
 - use their expertise and influence to advance the health and well-being of individual patients (Health advocate).

References: 1. IFNA Standards, 2016; 2. Frank JR, Ed. The CanMEDS 2005 Physician Competency Framework. Better standards. Better physicians. Better care. Ottawa, Ontario, Canada: The Royal College of Physicians and Surgeons of Canada; 2005.

Keywords: *Perianaesthesia Standards, Education*

Investigating the Construct Validity of IFNA's Standards of Practice and the CanMEDS Roles to Derive an Evidence-based Framework of Nurse Anesthetists' Core CompetenciesChristian Herion¹, Lars Egger², Tino Greif³, Claudio Violato⁴¹Kantonsspital Aarau, Department of Anesthesiology, Aarau, Switzerland²Medi | Centre for Medical Education, Bern, Switzerland³Bern University Hospital, Department of Anesthesiology and Pain Therapy, Bern, Switzerland⁴University Ambrosiana, Department of Medical Education, Milano, Italy

Background: The high content validity of 76 graduate competencies of IFNA's Standards of Practice (IFNA, 2016) according to Swiss Nurse Anesthetists' scope of practice was investigated in a previous study (Herion C et. al. 2016). The integration of the 76 graduate competencies within the 7 CanMEDS roles (Frank J, 2005) is a new approach, wherefore the construct validity should be tested. Further an optimized and evidence-based Framework of Swiss Nurse Anesthetists core competencies should be investigated.

Method: The results of the 76 graduate competencies from the content validity study (mean scores of relevance) (n=449) were divided into two randomized samples. With sample 1 (n = 225) we performed an exploratory factor analysis (EFA) employing varimax rotation with

Kaiser normalization to investigate the factors structures underlying the instrument. This allowed us to reduce the large number of 76 competencies into a small number of factors which influenced NAs' responses on the graduate competencies to identify the underlying relationships between measured variables. Factor loadings >0.4 indicated acceptable strength and direction and the influence of a factor on the graduate competencies. EFA was performed with a resulting seven-factor solution excluding fifteen items whose loadings were ambiguous or low (<0.4). We hypothesized that these 7 will correspond to the seven CanMEDS Roles, used to categorize the 76 graduate competencies. To determine the best-fitting model of NAs' medical professionalism that had been derived from sample 1 we subsequently performed a confirmatory factor analysis (CFA) with cohort 2 (n = 224). Factor correlation coefficients (r) were calculated and accepted to interpret loadings between the CanMEDS roles if >0.4.

Results:

Exploratory Factor Analysis: EFA, used to reduce the large number of 76 competencies into a small number of factors which influenced Nurse Anesthetists' responses on the graduate competencies, revealed 26 graduate competencies and seven theoretically meaningful and cohesive factors. The seven factors accounted for 72% of the variance and reflect the seven CanMEDS roles.

Confirmatory Factor Analysis: Based on the EFA of sample 1 and the CanMEDS framework, the developed seven-factor model was tested by CFA on sample 2 (n=224). Twenty-six variables (loadings>0.40) were selected to test the fit of the model with maximum likelihood estimation.

Indicated by large comparative fit index (CFI) of 0.952, small root mean square error approximation (RMSEA) of 0.037 and a 90% CI 0.024 to 0.046, the graduate competencies and the modified seven factor model (namely the CanMEDS roles) of EFA were well-fitting.

Overall, CFA results showed that a relationship of the graduate competencies as observed variables and the seven CanMEDSs roles as underlying latent construct of IFNA's Standards of Practice exists.

Discussion: Both, CFA and EFA, provided evidence for construct validity. The 76 graduate competencies together with the adopted CanMEDS role model are building a well-fitting conceptual framework for Swiss NA's scope of practice, represented in the model of medical professionalism for Nurse Anesthetists. Therefore the investigated evidence based core competencies should be implemented into the national curriculum, Continuing Professional Development and the assessment of Swiss Nurse Anesthetists.

References: 1. IFNA. The International Federation of Nurse Anesthetists: Code of Ethics, Standards of Practice, Monitoring, and Education. 2016:1-36. <http://ifna.site/wp/?wpdmdl=900>; 2. Herion, Ch. The CanMEDS Framework and the Competency-Based IFNA Standards of Practice for Swiss Non-Physician Anesthesia Providers: A Validity Study. PhD – Dissertation, University Ambrosiana, Milan 2016. Print; 3. Frank, J. (2005). The CanMEDS 2005 Physician Competency Framework. Better Physicians. Better Care. Ottawa, ON: Royal College of Physicians and Surgeons of Canada 2005

Keywords: *IFNA Standards of Practice, CanMEDS, Nurse Anesthetists, Validation*

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IFNA Foundation Research Grant

Jakob Ibsen Vedtofte

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Introduction: The IFNA established the IFNA Education and Research Foundation in 2002 in order to support education and research with an international interest for nurse anesthesia worldwide of IFNA country members. The finances are based on grants, donation and part of the benefits of each IFNA World congress.

Aim: To support research projects about nurse anesthesia with an international relevance.

Subject: Every project for basic and/or continuing education, workshops for nurse anesthetists and all type of research about nurse anesthesia with an international relevance can apply for financial support from the Scientific Committee behind the IFNA Foundation.

An application form should be completed preferably by the person responsible for the project and should include: Relevance to nurse anesthesia internationally, how the proposed education, practice, or research study will contribute to the increasing of nurse anesthesia research in the country where research will be conducted. Other main topics included in the application: Introduction and Purpose of the research project; Methods and materials; Research design and protocol; Data collection plan and procedures; Data analysis plan and procedures; Timelines of study; Budget justification and list of the costs of the direct cost of study.

Applications will be judged by the IFNA Foundation Scientific Committee. An application including a project that involves collaboration between two or more countries will receive priority over a project involving only one country.

Deadline: Application has to be submitted to the Foundation Scientific Committee before March 1st of each year.

The application form can be found on the IFNA webpage <http://ifna.site/ifna-education-research-foundation/>

Contact: ifna.rod@wanadoo.fr

Keywords: *study, projects, nurse anesthesia, international*

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IFNA Anesthesia Program Approval Process (APAP) Grant

Marianne Riesen

IFNA, APAP management, Schaffhausen, Switzerland

Introduction: The International Federation of Nurse Anesthetists (IFNA) believes that it is possible to improve the health and welfare of humanity by promoting international educational standards for non-physician anesthesia programs. In June 2010, during the 9th World Congress for Nurse Anesthetists in The Hague, The Netherlands, IFNA approved an Anesthesia Program Approval Process (APAP). During the years IFNA has awarded several grants for APAP projects.

Aim: The APAP process is meant to encourage programs/schools to comply with IFNA's Educational Standards for Preparing Nurse Anesthetists through an approval process that takes cultural, national or regional differences into consideration.

Subject: Three categories of approval are available; Level #1 Registration would require submission of a pledge by the anesthesia program to meet the IFNA Educational Standards to the best of its ability; Level #2 Recognition would require submission of a pledge by the anesthesia program to meet the IFNA Educational Standards to the best of its ability, and the program would also be required to submit its curriculum and related material for review by the IFNA Education Committee; and Level #3 Accreditation requiring submission of a pledge by the anesthesia program to meet the IFNA Educational Standards, and the program would also be required to submit its curriculum and related material in a written self-study for review by the IFNA Education Committee. The information would also be evaluated by an on-site team of visitors to determine if it met the IFNA Educational Standards.

Offering several categories of approval recognizes: (1) the diversity of nurse anesthesia programs throughout the world; (2) the capacity of a program given its national or regional context; (3) the resources available to individual programs; (4) a commitment of diverse programs to a

common standard of educational quality. Decisions are a joint activity of the Education Committee and IFNA authorities. Progress toward meeting all of the standards and changes in programs are to be reviewed at 5 year intervals.

Information contact: Marianne Riesen, APAP Manager at apap@ifna.site

<http://ifna.site/ifna-accreditation-program/approval-process-for-nurse-anesthesia-programs/>

Deadline for grant application: Each year February 28 send to ifna.rod@wanadoo.fr

Keywords: *Standards, Practice, Education, Program, Nurse, Anesthetist*

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IFNA Student, Faculty and Nurse Anesthesia Practitioner Exchange

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Introduction: International collaboration between health care institutions is becoming more and more important and many educational institutions see it as part of their mission to promote international collaboration. At the World Congress in Slovenia 2012 IFNA decided to develop Guidelines for student, faculty and anesthesia practitioner exchange worldwide.

Aims: To promote and intensify collaboration between educational partner institutions worldwide, to get an understanding of the nurse anesthesia programs worldwide as well as to promote collaboration and increase understanding of the cultural differences between the partners in the exchange activities.

Subject: The grant was established in order to support a new pilot project for student, faculty and nurse anesthesia practitioner exchange between country members of IFNA. The project is to include contributions from all these groups. The intentions behind the grants are

- To promote and intensify collaboration between educational partner institutions
- To promote collaboration and increase understanding of the cultural differences between the partners in the exchange activities
- To develop an understanding of the nurse anesthesia education in the host country and to identify the competencies and the daily practice of nurse anesthetists
- To identify the structure and organization of the anesthesia ward and to describe the management of the patients pre-, intra- and postoperatively
- To identify current anesthetic methods and medications in the host country

An application form should be completed preferably by the responsible for the exchange project and include: General information about the project's curriculum; Proposed exchange activities; Budget; Timetable and evaluation of the Project.

The application form and further information about the Exchange project can be found on the ifna webpage <http://ifna.site/ifna-education-research-foundation/>

Deadline: Due March 1/October 1 every year

Contact: ifna.rod@wanadoo.fr

Keywords: *International, Collaboration, Educational, Partner, Institutions*

33

Policy Analysis Process for Evidence Based Defensible Safe and Quality Nurse Anesthesia Practice

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Nurse anesthesia evidence based policies and procedures should guide the practice of nurse anesthesia. The development of policies and procedures that are evidence based provide a support structure to defend nurse anesthesia practice. The legal protective boundary of evidence based policies is dependent on a comprehensive issue and policy analysis process. The purpose of this presentation is to provide Porche's Policy Analysis Process as a strategy to conduct nurse anesthesia policy analysis [1]. Porche's policy analysis method identifies essential synergistic and iterative issue and policy analysis steps that provide a comprehensive political and policy analysis. This presentation will review the steps of policy analysis with specific nurse anesthesia exemplars. The policy analysis process consist of issue, political, and policy analysis. Policy analysis is a critical step to ensure that nurse anesthesia safety and quality policies and procedures are grounded within a context of evidence. Problem analysis framework will be presented to consist of boundary analysis, concept analysis, hierarch analysis, synectics, multiple perspective analysis, assumption analysis, and argumentation mapping. The policy analysis steps to be presented are: identification of the area of concern, background, stakeholder and constituent analysis, position analysis, political analysis, statement of concern, interaction analysis, outcome identification, policy recommendation, impact assessment, and determination. Within this framework (PESTEL) will be integrated. PESTEL consist of political, economic, social, technological, environmental, and legal elements. SWOT analysis framework integration will also be presented to consist of internal analysis - strengths and weaknesses and external analysis - opportunities and threats.

References: Porche, D. (2018). Health policy: Application for nurses and other healthcare professionals. Jones & Bartlett Learning.

Keywords: *Policy Analysis, Evidence based practice, policy and procedure*

34

Assessment of Quality in Patient Documentation in the Trauma Room – A Retrospective Audit.

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Introduction and objective: Patient safety and continuity of care are crucial factors for quality in health care. Documentation plays an important role in the interaction and continuity of patient treatment [1]. Inadequate documentation is associated with inconclusive hand-overs and may threaten patient safety [2]. The objective was to use audit as a method to assess the documentation in the trauma room, documented by the nurse anesthetist, and assess compliance with the recommendations from evidence-based guidelines and national standards for trauma care.

Method: An audit instrument was developed to explore to what degree specific criteria for documentation were met. The criteria were derived from evidence-based guidelines and national standards for trauma care and then operationalized into categories and items. Three experts assessed content and face validity. 10 % of the records were reviewed by two nurse anesthetists and the reliability coefficient was calculated. A retrospective audit of 146 trauma records from one month in 2015 was then performed using the audit instrument developed. Statistical analysis was performed using the Statistical Package for Social Sciences, SPSS version 22. Frequency analysis, cross tables and chi-squared test were performed to describe the results.

Results: The project resulted in an audit instrument with 29 items organized into three dimensions; "logistics", "patient data" and "patient status". Inter-rater reliability ranged from 0,36-1,0, average of 0,89. The results of the audit show that the category "logistic" had the highest compliance score: 88%. The category "patient data" had the lowest score: 67 %. However, the documentation was more complete when the patient was presumed critically injured. There was statistical difference in four groups of data: documented blood pressure, pupil size, temperature and the respiratory rate was more completely documented when the patient was presumed critically injured.

Discussion and conclusion: Several studies have reported poor recording of vital signs in emergency departments [3]. This correspond with the findings in this study where only 67% of the patients vital signs were documented, which is perhaps the most serious flaw in the audit. The audit shows discrepancy between practice and guidelines and standard for documentation and support the need for quality improvement strategies to be implemented to ensure continuity and patient safety. Such strategies should include feedback of results, evaluation of the present trauma sheet and education about the importance of documentation.

References: 1. Saranto K, Kinnunen UM. Evaluating nursing documentation - research designs and methods: systematic review. *J Adv Nurs.* 2009;65(3):464-76 2. Zakrisson TL, Rosenbloom B, McFarlan A, Jovicic A, Soklaridis S, Allen C, et al. Lost information during the handover of critically injured trauma patients: a mixed methods study. *BMJ Qual Saf.* 2016;25(12):929-36. 3. di Martino P, Leoli F, Cinotti F, Virga A, Gatta L, Kleefield S, et al. Improving vital sign documentation at triage: an emergency department quality improvement project. *Patient Saf.* 2011;7(1):26-9.

Keywords: *nurse anesthetist, audit, documentation, quality improvement, patient safety, trauma room.*

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We Take Waste Management to Heart

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Background: Promoting sustainable waste management in hospitals is a major issue. Without sustainable waste management we will continue polluting the environment with risks for human health, quality of life and charged economy. One part of waste management is implementing technology for waste disposal, but planning, budgeting, monitoring and training are important factors too.

Aims: To fulfill the regional regulation of waste management we aim to sort at least 30% of our waste as recyclables in all operating rooms (OR) in the Department of Cardiothoracic Anesthesiology at Copenhagen University Hospital by the year 2019. Additionally, through the hospital's own strategy for sustainability, we even aspire to surpass this goal and recycle 50% of our waste by 2020.

Our aim is to:

- Implement the regional waste management plans at a local level taking account of the different types of waste, including hard and soft plastic, organic and hazardous waste
- Facilitate a paradigm shift from non-awareness of waste management to an informed and focused approach
- Set up a platform to facilitate the exchange of expertise, best practice and techniques based on training programs, targeted awareness-raising campaigns and information-sharing

Method: Structured strategy for implementation of waste management involved:

- Suitable and labeled bins and bags placed strategically in the ORs
- Platform to facilitate the exchange of expertise, best practice and techniques:
 - Education of colleagues and collaborators in the meaning of waste sorting
 - Picture collages with illustrations of what to put where and monitoring the waste management regularly
- Boost the concept:
 - Providing staff with articles (knowledge and previous experience) concerning waste management
 - Publication of the concept in articles in homepages and relevant literature
 - Regular meetings with debates of this topic

Results: At present, waste management is done in most of the OR's in our department. We deliver more than 50 bags of soft and hard plastic for recycling on a daily basis in comparison to none before the project started. Staffs are aware that plastic can be re-used up to ten times and cardboard, metal, paper, glass, hazardous waste and residual waste are sorted systematically accordingly.

Discussion and conclusion: To change the waste management in the setting of OR is necessary, but it takes a great deal of patience and a lot of dialogue. We managed to bring colleges together to contribute with great enthusiasm. This effort was recognized by receiving the Region's Environmental Acknowledgement 2017. Some of the obstacles we faced was small OR's where it is difficult to place the bins for the different waste, and the time for managing the waste is limited especially when the surgery is acute. Hopefully routine will be a helping factor.

Future perspectives: Monitoring the amount of waste from the hospital is difficult but crucial. It will encourage the staff and the achievement of the goal of 30 %-50 % recyclables will be detectable. Despite the fact that waste management will never be a profitable business as long as the regulation by law is missing, it is necessary to prioritize and protect the environment against pollution and to reduce the carbon dioxide emission globally.

References:

The Price became a matter at heart, downloaded xx.xx-2018; <https://www.intranet.regionh.dk/rh/nyheder/intranetnyheder/sider/miljoprisen-2017> Waste sorting, downloaded xx.xx-2018; <https://www.regionh.dk/miljoe/grønnere-hospitaler/Affald-som-ressource.aspx> Affaldsressourceplan 2025, på vej mod en ressourceeffektiv koncern. Region Hovedstaden, Strategisk indsats, Grøn Drift og Udvikling 3. april 2016.

Keywords: *Waste management; environment; Recycle; Reduce waste; Soft plastic; Hard plastic; Environmental awareness;*

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Large Degree of Satisfaction with Ultrasoundplaced PowerGlide among Patients and Staff

Tina Kreilgaard, Anette Dewett

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Introduction with Hypothesis: Often an ordinary PVK isn't viable for more than a few days. Sometimes a new IV access needs to be reestablished several times. It is often difficult to establish an IV access in patients requiring long-term IV treatment. Repeated attempts increase the problem and treatment with drugs in small peripheral vessels can cause fibrosis in the tissues.

PowerGlide is a PVK of 10cm, which is placed peripherally, but in a large vein on the upper arm. The benefits of PowerGlide are that it can last up to 29 days before changing is needed, it reduces patient discomfort, reduces time consumed reestablishing IV access and insures that patients get their IV treatment on time. The hypothesis is that patients and staff will be satisfied with PowerGlides as fewer attempts to establish IV access is needed and administration in a larger vessel reduces the patient discomfort.

Methods: The project is made as a prospective quality development project. Data were collected at Vejle Hospital from June 2016 to September 2016. Four anesthetic nurses who already performed ultrasound guided IV access were trained to insert PowerGlides.

30 patients were included. The anesthetic nurse, patient and ward staff caring for the patient supplied written answers to questions regarding PowerGlide placement, use and removal. Both open and closed questions were used.

In addition, questionnaires were sent to 250 staff members from the wards.

Results: We received responses from 24 patients (80%) and 87 (35%) staff members. 79 % of the patients and 88 % of ward staff were more satisfied with PowerGlide compared to normal PVK.

The PowerGlide was used for an average of 14 days. 19 (76 %) were used for the entire treatment. 5 (28 %) were removed for other reasons before the end of treatment.

Discussion: The trend in this project points to the fact that PowerGlides is a good alternative to normal PVK.

The quality development project reflected a predominantly positive experience of PowerGlides from both patients and staff. Patients believed that PowerGlides worked better than the catheters they had previously, and the staff members thought it was a good and safe IV access.

The majority of patients had the PowerGlide until the end of treatment. This indicates that PowerGlide is better alternative than repeated insertions PVKs. Because of the placement on the upper arm, there is a risk of accidental subcutaneous infusion, not being observed by the staff. Therefore the patients who receive a PowerGlide must be able to express pain and discomfort at the catheter and only pH friendly and easily soluble preparations may be given in a PowerGlide.

Conclusion: Based on the results of this project Vejle Hospital is now offering PowerGlides to the following patients: habile patients, patients with difficult venous access and patients requiring IV treatment > 4 days. The solutions must have a pH of 5-9.

Keywords: *Quality development, IV access, PowerGlide, PVK*

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Construction and Validation of a Nursing Care Protocol in Anesthesia

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Introduction: Better communication and collaboration among professionals may reduce the risk of morbidity associated with the care of the surgical patient[1]. In this context, health care planning by physicians, nurses and anesthesiologists is essential to reduce the risks of morbidity and mortality during the anesthetic-surgical procedure, thus promoting patient safety. In order for nurses in a surgical center to perform their relevant role of care, it is necessary to master the scientific knowledge and specificities of the changes generated by anesthesia and surgery, for adequate care planning and evidence of the significant role in the healthcare team. Therefore, in this study the objective was to construct and validate a nursing care protocol in anesthesia.

Method: Methodological study of face and content validation, judging clarity, relevance, pertinence and comprehensiveness of a care protocol, elaborated from the integrative review of previous literature[2] and based on the conceptual model of assistance perioperative nursing of Castellanos and Jouclas[3]. The protocol was evaluated by five anesthesiologists and nurses from the surgical center. The results were analyzed through the content validity index.

Results: Among the 119 items assessed by experts, 11 (9.2%) instrument items presented content validity index of <80% and were changed. The items with disagreement were related to the selection and availability of materials and equipment, especially before anesthetic induction. The content validity index, obtained for the different items, proposed after the amendments mentioned, ranged from 80 to 100%, in the three periods of anesthesia, indicating the proper validity of the proposed content.

Discussion: The results indicated a good agreement among the items evaluated by the specialists, considering that only 9.2% generated some type of disagreement and the divergences were mainly related to the criteria of choice, availability and selection of materials for the anesthetic procedure in the pre-induction period. The definition of care standards, with the identification of potential risks and necessary measures for the safety of interventions, combined with inter-professional work and good communication, can improve health care processes and outcomes. The use of checklists for the organization of anesthetic induction care can assist in the detection of errors and negligence in relation to care, reducing failures during anesthesia and surgery, by means of appropriate equipment and material checks, in addition to promoting the exchange of information among professionals about the clinical conditions of the patient and critical aspects, thus improving the perception of professionals about teamwork and prevention of damages.

Conclusion: The nursing care protocol in anesthesia was validated with good agreement among specialists, and 90.8% of the items were considered adequate in the first round. The nurse's use of the care protocol should be linked to the existence of systematized technical and scientific knowledge about the actions to be performed during anesthesia, stating the importance of their presence in a surgical room for care activities.

References: 1. Davenport DL, Henderson WG, Mosca CL, Khuri SF, Mentzer RJ. Risk-adjusted morbidity in teaching hospitals correlates with reported levels of communication and collaboration on surgical teams but not with scale measures of teamwork climate, safety climate, or working conditions. *J Am Coll Surg.* [Internet]. 2007 [cited 2017 Jul 2]; 205(6):778-84. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/18035261/2>. Lemos CS, Peniche ACG. [Nursing care in the anesthetic procedure: an integrative review]. *Rev Esc Enferm USP.* [Internet]. 2016 [cited 2016 Mar 25]; 50(1):154-62. Portuguese. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27007433/3>. Castellanos BEP, Jouclas VMG. Assistência de enfermagem perioperatória: um modelo conceitual. *Rev Esc Enferm USP.* [Internet]. 1990 [cited 2017 Jun 30]; 24 (3):359-70. Available from: <http://www.scielo.br/pdf/reeusp/v24n3/0080-6234-reeusp-24-3-359.pdf>

Keywords: *Anesthesia; Nursing Care; Operating Room Nursing; Perioperative Nursing; Patient Safety; Checklist*

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The Performance of Nurse Anaesthetist in Digestive Endoscopy: Results in a Sedation Practice.

Adriana Carbó Garcia, Silvia Rodríguez Vall-llovera, Bibiana Ros Nebot, Lucia Cao López, Sonia Parcet Serra, Goreti Escuer Badia

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Introduction: The incorporation of a nurse anaesthetist in the Anaesthesiology Department as a multidisciplinary model isn't a new concept. In most developed countries (Europe, America and Canada), this nurse's role is implemented and its competencies well defined, among those, administration and sedation control in digestive endoscopy. In Spain, the Health Care Ordinance Law (LOPS) 44/2003 contemplates the delegation of functions as long as the condition and actions of teamwork acts are established. According to the Catalan Society of Anaesthesiology (SCARDT) and following quality criteria of the Joint Commission, the administration, monitoring and sedation control can be delegated to a qualified nurse professional dedicated solely to this function.

The Aim of this study is to evaluate the results when the nurse anaesthetist participates in the administration and sedation control during digestive endoscopy during the month of May 2017, at CM Teknon in Barcelona.

Methods: Patients between 18-85 years old, ASA I-II, who undergo a digestive endoscopy were selected, obtaining a total sample of 464 subjects during May of 2017 at CM Teknon in Barcelona. Described, observational and transversal study was performed. The main variables evaluated were those related to the performance of the anaesthesia nurse and the cases in which the nurse required the collaboration of the anaesthesiologist. To carry out the study, each nurse registered her own activity and complications filling a specific document, consisting of: patient data, ASA, type of examination, medication, incidents and actions.

Results: 31% of patients required some additional support maneuverer or presented a significant vital signs variation. Respiratory depression had the highest incidence, and in most of the cases it was solved with opening airway maneuverer. 6% of patients presented cough and/or secretions and 1% needed ventilation with Ambú. Only in two cases the anaesthesiologist had to assist for bronchospasm and excess secretions.

Discussion: The increasing demand of the sedations outside the Operating Rooms area (OR) for all kind of diagnostic procedures makes nowadays, relevant and necessary the figure of the nurse anaesthetist. The nurse anaesthetist plays a pivotal role in the multidisciplinary anaesthesia team. Hospitals have designed specific guidelines and training for nurse anaesthetist.

In terms of patient safety, our results are in concordance with previous published experiences. The most frequent complications were respiratory depression, which was solved through open airway manoeuvres. Rarely, the anaesthesiologist was required. Most of the reviewed studies concluded that the sedation performed by NA are compliant with high standards of quality and safety.

Conclusions: Anaesthetist nurse's role can achieve high quality results with great efficiency and safety. The evaluation of our activity shows that there were no serious complications. Moreover, a model of a teamwork that incorporates nurse anaesthetist specially trained and following a protocol established is the future model of Anaesthesia Department.

References: 1. Lichtensein DR, Jagannath S, Baron TH, Anderson MA, Banerjees, Domnitz JA, et al. Sedation and analgesia in GI endoscopy. *Gastrointest Endosc* 2008; 68:205-16 2. Martínez G, Ubré M, Rivas E, Blasi A, Borrat X, Pujol R et al. Consolidación de un modelo asistencial basado en un equipo de anestesia: experiencia en más de 12.000 casos en una Unidad de Endoscopia Digestiva. *Rev Esp Anestesiol Reanim.* 2011; 58:406-411. 3. Documento S.E.D.A.R. Sedaciones en procedimientos diagnósticos y/o terapéuticos:

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Perioperative Hypothermia; Where are We Now

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Objective: Perioperative hypothermia is a common problem in anesthetized patients and an important risk factor for mortality and morbidity. In a previous study, which was done in our clinic 5 years ago, perioperative hypothermia was found to be occur in 45,7% of our patients. Our aim was to identify the current incidence of hypothermia in our operating theatres after the taken precautions in the last 5 years.

Methods: After obtaining the ethics committee approval and informed patient consent, patients with operation times longer than 30 minutes were included into this cross-sectional study for one-month period. Demographical data, type and duration of surgeries, pre and postoperative temperatures and if used, external warming systems and temperature monitoring types were recorded.

Results: A total number of 793 patients were enrolled to the study (461 women and 332 men). Ages of patients varied from 1 month to 96 years (mean 42±22). Hypothermia incidence was calculated as 31,27% (248 patients). Sixty percent of our patients (475 patients) found to be treated with a forced air warming system during perioperative period yet only 71 patients (9%) had temperature monitoring.

Conclusion: Postoperative hypothermia is still standing as a problem to solve in our clinic. But our results were better from many of the studies in the literature. Also, it seems that we took a few steps forward for preventing it, regarding to our previous results. We suggest that temperature monitoring and patient warming should be a routine procedure during anesthesia management.

Keywords: *Thermoregulation, perioperative hypothermia, temperature monitoring*

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Blue Code Calls

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Aim: In our country, management of in-hospital emergency situations and responsible personnels (Blue Code Team) are under responsibility of our clinic. In the frame of this responsibility, we aimed to analyze this code method and its results

Method: Blue code calls since 2013 to 2018 are investigated by our team. Age and sex of patients, location, date, time of arrival of blue code team, interventions, if CPR needed or not, its time and result and drugs are recorded.

Findings: 814 blue code calls are found in these years. 167 of these calls were reported as wrong call. 35,32% (59) of false calls were result of use of wrong number or misuse of device without patient. 64,68% (108) of false calls were result of inappropriate evaluation of patient.

The most blue code call were from oncology department 10,81% (88) than respectively general surgery 8,47% (69), gastro-endoscopy unit 8,23%, chest diseases – chest surgery department 7,66% (64), hematology 6,87% (56), orthopedics department 6,51% (53), Hemodialysis unit 6,51% (53).

Results: We think that detection of cardiopulmonary arrest and emergency call system should be introduced to all healthcare workers.

Keywords: *Cardiac arrest; blue code; resuscitation*

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Adverse Events in Anesthesia: An Integrative Review

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Introduction: Adverse event related to health care involves injury to the patient or increases length of hospital stays, being associated with human errors, lack of teamwork and organizational failures [1,2]. In this context, failure to care in anesthetic procedures may increase the risk of exposure to critical events and contribute to compromising patient safety, during the perioperative period. In this way, the aim of this study was to perform an integrative literature review, looking for scientific evidence available on the incidence of adverse events related to anesthesia during perioperative period. **Method:** Integrative review of scientific literature about adverse events related to anesthesia, indexed VHL portal and Medline/PubMed, CINAHL, Web of Science databases. Inclusion criteria comprised articles published in full, which analyzed adverse events in the perioperative period of adult in-hospital patients, exclusively associated with anesthesia care. Exclusion criteria were studies with pediatric patients or experimental animals, case studies, experience reports or reviews. **Results:** A total of 696 articles were found in the databases, of which 29 met the inclusion and exclusion criteria. Most of the studies (24; 82.7%) were retrospective, based on claims databases. The country with the higher number of studies was United States (16;55%). Among the articles, 11 studies (38%) evaluated, in general, adverse events in regional and general anesthesia, listing analysis of varied occurrences; four (13.8%) reported failures in obstetric care, three (10,3%) identified respiratory events, three (10,3%) failures in planning and professional attitude in anesthesia care during the perioperative period, three (10,3%) errors of medication, three (10,3%) were about equipment failures, intraoperative awareness and monitoring, and two (7%) regarding adverse events due to ocular injury. Adverse events in anesthesia caused harm to the patient, from minor to moderate injuries, such as intraoperative awareness, pain, increased length of hospital stays, to severe and permanent injuries, such as death, brain damage and nerve injury. **Discussion:** Anesthesia events involved different types of procedures and failures in the execution of care, related to inadequate planning of care by the professional, considering the prediction of necessary equipment and materials, evaluation of the clinical conditions of the patient and limitation for the early recognition of changes hemodynamics. Furthermore, the articles identified ineffective communication, equipment failures and inappropriate monitoring. **Conclusion:** The studies indicated that adverse events in anesthesia compromise the quality of care and patient safety. The analysis of the damages generated may contribute to improvements in daily practice and adequate training of professionals.

References: 1. Vicent, C. Patient safety. Ed Yendis, 2009./2. Haller G, Laroche T, Clergue F. Morbidity in anaesthesia: today and tomorrow. *Best Pract Res Clin Anaesthesiol.* 2011;25(2):123-32.

Keywords: *Keywords: anesthesia; adverse effects; malpractice; medical errors*

42

CRNA Survey on the Quality of Proximal versus Distal Radial Artery Cannulation

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Arterial cannulation is utilized for hemodynamic information and blood sampling in critical care and surgical patients. Utilizing an integrative review method, a literature review revealed many studies on safety, access, anatomy, complications, and pathologies. The literature did not disclose a study evaluating an optimal insertion site. This study sought to determine the optimal placement of the radial artery arterial line in patients undergoing radical neck dissection with free flap reconstruction. After IRB approval was obtained, a survey was distributed to Certified Registered Nurse Anesthetists (CRNA) administering anesthesia to this patient population. After candidate acceptance in the study, the CRNA documented a focused patient history. The CRNA placed the arterial line according to their standard insertion technique and preferred site. CRNAs documented insertion location on the survey according to three different regions on the forearm. Throughout the procedure, the CRNA documented adequacy of monitoring conditions and blood sampling. Monitoring acceptability was documented in two hour intervals and blood sampling adequacy was documented as the sampling occurred. The study sample size was 41 patients. Product-limit survival estimates review of the collected data did not disclose statistical differences between sampling or survivability of the arterial line. However, this study did reveal a clinical difference based on insertion site. Of the 24 distal arterial cannulations, 33% failed in monitoring or sampling conditions. There were 12 proximally placed cannulations experiencing 8% failure. Although this study had a small sample size, it did demonstrate a proximal placement provided for improved duration of function as measured by waveform quality and blood sampling conditions. Further research should be conducted to confirm this study, engage another patient population, or develop a random control trial.

Keywords: *radial, cannulation, proximal, distal*

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Intraoperative Administration of Dexmedetomidine to Minimize Emergence Delirium in the Pediatric Population

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Introduction: Pediatric emergence delirium (ED) is a behavior disorder that causes agitation and inconsolability that can put a child at risk for physical harm and effects up to 80% of children receiving anesthesia, especially those under 10 years old.[1,2] Dexmedetomidine (DXM), has been shown to be effective in preventing emergence delirium but optimal timing of administration has not been studied.[1,3] It was hypothesized that administration within 15 minutes of the end of anesthesia time will be more effective in prevention of ED than administration within 15 minutes of anesthesia start.

Methods: Following IRB approval, this observational study was conducted. Inclusion criteria: age between 18 months and 17 years, physical status 1 or 2, receiving general anesthesia with an anesthesia time greater than 14 minutes, and intraoperative administration of DXM. Exclusion criteria: patients with developmental or agitation disorders. Following parental consent, the potential participant's electronic health record was reviewed and data were collected. Participants were divided into groups based on time of administration of DXM. In the PACU, two investigators observed the patient to ensure inter-rater reliability. Observers utilized the validated Pediatric Anesthesia Emergence Delirium (PAED) scale to rate participants' ED.[4] PAED scoring continued every 5 minutes for 30 minutes after awakening. The highest score collected in the 30 minutes was used for data analysis.

Results: A sample size of 21 participants was obtained (10 females and 11 male) with an age range of 20 months to 17 years. Differences in age, gender, and DXM dose were not statistically significant.

The early and late administration groups were evenly divided. The mean PAED score for early dosing was 9.05 and for late dosing was 4.23. A t-test was used to demonstrate that late dosing had a significant decrease in PAED scores (P=0.03).

Discussion: The results of the study demonstrated a statistically significant reduction in the maximum PAED scores observed with the end of the case administration compared to early administration. In addition to the small sample size, limitations of the study include issues with PAED tool: subjectivity; inability to differentiate a patient who is sedated from a patient who is delirious; and lack of a specific score that diagnoses ED. A RCT should be controlling timing and dose of DXM as well as obtaining a larger sample size. This study did show a statistically significant decrease in PAED score; however, it did not examine other clinical significant issues including a decrease in required nursing interventions or PACU length of stay.

Conclusion: Reducing the incidence of ED should remain a high priority for all pediatric anesthesia providers. Although this study had limitations, a statistically significant (P=0.03) difference in PAED scores was found between the early and late administration groups. It is our conclusion that late administration of DXM was more effective in reducing PAED scores, and therefore pediatric emergence delirium. Providers should consider administering DXM late in the surgical procedure.

References: 1.Dahmani S, Stany I, Brasher C, et al. Pharmacological prevention of sevoflurane- and desflurane-related emergence agitation in children: a meta-analysis of published studies. *Br J Anaesth.* 2010;104(2):216-23. 2. Van hoff SL, O'neill ES, Cohen LC, Collins BA. Does a prophylactic dose of propofol reduce emergence agitation in children receiving anesthesia? A systematic review and meta-analysis. *Paediatr Anaesth.* 2015;25(7):668-76. 3. Hauber JA, Davis PJ, Bendel LP, et al. Dexmedetomidine as a Rapid Bolus for Treatment and Prophylactic Prevention of Emergence Agitation in Anesthetized Children. *Anesth Analg.* 2015;121(5):1308-15. 4. Sikich, N. Development and psychometric evaluation of the pediatric anesthesia emergence delirium scale. *Anesthesiology.* 2004; 100(5):1138-1145

Keywords: *Emergence agitation, emergence delirium, pediatric, Dexmedetomidine, Precedex*

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Neurotoxic Potential of General Anesthetic and Sedation Drugs in Pediatrics

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Introduction: The purpose of the review was to analyze, interpret, and synthesize the [12-14-2016] United States Food and Drug Administration's (FDA) Safety Announcement[1] with relevant literature from 2017. The authors considered that in light of new evidence modifications to the announcement recommendations for anesthetists may be merited.

Methods: Analysis and interpretation of the FDA's Safety Announcement[1] and of relevant literature published in 2017 was completed. Recommendations from the announcement were compared to studies published following the announcement. Clinical recommendations based on current best evidence were identified and summarized.

Results: Recommendations guide practice in regards to: patient and caregiver education, patient age, single versus repeated anesthetics, and anesthetic duration. Recommendations are based largely on nonclinical (animal) data. Evidence in humans supporting or refuting the neurotoxic potential of anesthetic medications is limited and inconsistent. No recommendation regarding a specific drug or anesthetic regimen is identified as being superior.

Discussion: The FDA warns that commonly administered anesthetic medications may have adverse effects on brain development in children less than three years of age when administered repeatedly or for longer than three hours[1]. The FDA recently required that warning labels be added to gamma-aminobutyric acid (GABA) agonists and N-methyl-D-aspartate (NMDA) antagonists used in anesthesia practice[1]. The FDA has not required a warning label be added to α 2-agonists (e.g. dexmedetomidine)[1]. At least one nonclinical (animal) study published since the safety announcement has reported an 84% reduction in neuroapoptosis when dexmedetomidine is co-administered with sevoflurane[2]. At least one nonclinical (animal) study published since the safety announcement has demonstrated that isoflurane anesthesia causes a fourfold increase in neuroapoptosis when anesthesia is administered for only three hours[3].

Conclusion: Nonclinical and clinical data support cause for concern about the use of general anesthetic drugs in young children and pregnant women. Current clinical recommendations are largely based on nonclinical (animal) data. Limited and inconclusive evidence published since the Safety Announcement[1] does not support modifying current clinical recommendations.

References: 1. FDA Drug Safety Communication: FDA review results in new warnings about using general anesthetics and sedation drugs in young children and pregnant women. FDA.gov. <https://www.fda.gov/Drugs/DrugSafety/ucm532356.htm>. Published December 14, 2016. Accessed October 16, 2017. 2. Perez-Zoghbi JF, Zhu W, Grafe MR, Brambrink AM. Dexmedetomidine-mediated neuroprotection against sevoflurane-induced neurotoxicity extends to several brain regions in neonatal rats. *British Journal of Anaesthesia*. 2017;119(3):506-516. doi:10.1093/bja/aex222. PubMed PMID: 28969317. 3. Noguchi KK, Johnson SA, Dissen GA, Martin LD, Manzella FM, Schenning KJ, Olney JW, Brambrink AM. Isoflurane exposure for three hours triggers apoptotic cell death in neonatal macaque brain. *British Journal of Anaesthesia*. 2017;119(3):524-531. doi:10.1093/bja/aex123. PubMed PMID: 28969320.

Keywords: *Neurotoxicity, Pediatrics*

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Effect of General Anesthesia on Regional Blood Flow of the Brachial Artery to the Cubital Fossa: A Proof of Concept Study

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Introduction: Perioperative nerve injury is a significant source of morbidity and liability; ranking second in the American Society of Anesthesiologists and American Association of Nurse Anesthetists (AANA) closed claims analyses. These injuries occur despite proper positioning and padding[1]. Studies show ulnar nerve function decreases to a greater degree with brachial artery occlusion than the radial or median nerve[2]. A gap in the literature exists regarding general anesthesia and blood flow dynamic changes. The purpose of this proof of concept study was to examine the effect, if any, of anesthesia on brachial artery flow.

Methods: Following institutional review board approval, blood flow analysis of the brachial artery was assessed using duplex ultrasonography in a convenience sample of 30 subjects. Baseline values were obtained in the brachial artery at the mid-upper arm prior to induction of anesthesia, within 15 minutes after the induction of anesthesia, and at 45 minutes, during the maintenance phase of anesthesia. Brachial artery diameter, and peak and minimum blood flow velocities were measured to calculate blood volume, pulsatility index and resistance index. Parametric testing was applied with a pre-study alpha of $p < 0.05$.

Results: There was a significant decrease in the pulsatility index from the preoperative baseline assessment to the 15-minute post-induction value ($p = 0.000006$). Additionally, there was a statistically significant decrease from the preoperative baseline assessment to the 45 minute maintenance phase value ($p = 0.02$). There was not a significant difference between the post-induction and maintenance phase values ($p = 0.14$). Taken together, this suggests the induction of anesthesia significantly changes blood flow dynamics in the brachial artery and it remains altered during the maintenance phase of anesthesia.

Discussion: The ulnar nerve is most affected, often attributed to ischemia from pressure on the cubital fossa. These injuries occur despite proper positioning and padding. Studies show ulnar nerve function decreases to a greater degree with brachial artery occlusion than the radial or median nerve. This proof of concept study examined the effect of anesthesia on brachial artery flow. The authors consider the possibility that an alteration in brachial artery blood flow under general anesthesia could be a potential contributory mechanism in the development of perioperative ulnar neuropathy.

Conclusion: The induction and maintenance of general anesthesia significantly changes blood flow dynamics in the brachial artery. The statistically significant decrease in the pulsatility index warrants further research to correlate clinical significance, if any. Additionally, different patient populations, comorbidities, various anesthetic techniques and surgical procedures require investigation to identify those at potentially increased risk.

Source of Funding: American Association of Nurse Anesthetists Foundation Grant

References: 1. Sawyer RJ, Richmond MN, Hickey JD, Jarratt JA. Peripheral nerve injuries associated with anaesthesia. *Anaesthesia*. 2000 Oct;55(10):980-91. Review. PubMed PMID: 11012494. 2. Swenson JD, Hutchinson DT, Bromberg M, Pace NL. Rapid onset of ulnar nerve dysfunction during transient occlusion of the brachial artery. *Anesthesia and Analgesia*. 1998Sep;87(3):677-80. PubMed PMID: 9728852.

Keywords: *Ulnar Neuropathy, Nerve Injury, Closed Claims, Ultrasound, Ultrasonography, Brachial Artery, Blood Flow*

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High Risk Affecting Factors on the Hypothermia after Surgery in a General Hospital

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The purpose of this study was to examine the high risk affecting factors that cause hypothermia after surgery and provide the basic data for the development of the hypothermia prevention program by investigating the actual condition of hypothermia in PACU.

The data were collected from April 1 to May 31, 2012 from 3258 who had operated under general anesthesia and spinal anesthesia and undergone hypothermia (body temp. <35°C) in Seoul national University Hospital. The data were collected from medical records and the questionnaire was designed to obtain information on 5 demographic factors, and 6 anesthetic factors, 6 factors related to operation, such as surgical site, operation time, anesthesia induction time, usage of warmer, underlying disease, CNS impairment, anesthesia, warm blood transfusion, BMI, body temperature at PACU admitting time after surgery ect.

To analyze the data, descriptive statistics and multiple regression were used with the SPSS statistical program (Version 19.0).

The Results are that among 3258 patients, 382 patients had a body temperature of less than 35 °C (11.7%). The demographic and disease characteristics were 46.2% for men and 53.8% for women. The mean age was 53.3 years and the subjects' underlying diseases are diabetes, hypothyroidism, cardiovascular, central nervous system dysfunction, hypothyroidism ect. Hypertension accounted for 27% of the total, diabetes was 11%, and cardiac arrhythmia was 14%. Woman influenced more than men ($p=0.001$) and those over 60 years old were significantly influenced more ($p=0.000$). Subjects with an operation time of more than 70 minutes had lower body temperature at admitting PACU ($p=0.000$) and the rate of hypothermia was significantly higher in patients with arm, leg, and back surgery ($p=0.000$).

It was found that subjects whose underlying diseases are diabetes ($p=0.012$) and hypertension ($p=0.000$) were significantly affected by hypothermia.

Orthopedics, neurosurgery, thoracic surgery, urologic surgery subjects were significantly more hypothermic ($p=0.000$).

In conclusion, there were 4 major affecting factors: gender ($p=0.001$), age ($p=0.000$), operation time ($p=0.000$), underlying disease (diabetes: $p=0.012$, hypertension: $p=0.000$) on the hypothermia after surgery in PACU

So we could classify the subjects with the 4 major factors affecting the hypothermia as hypothermic high risk subjects after surgery. Based on this study, more systematic hypothermia prevention programs are required. The patients scheduled for surgery will be classified into high-risk patients with hypothermia before surgery, and hypothermia prevention programs developed more systematically and structurally. The results of this study can be used as basic data to effectively prevent the adverse effects of patient's well-being and hypothermia by using few warming machines and manpower efficiently.

References: Berry D., Magons P. (2008). A Clinical evaluation of cost and time effectiveness of ASPAN hypothermia guideline, J. of Perianesthesia Nursing, Vol23, No 1 (February), 24-35 Burns S, Piotrowski K, Caraffa G, Wojnakowski M (2010). Incidence of postoperative hypothermia and relationship to clinical variables, J Perianesth Nurs. Oct;25(5):286-9. Burns S, Wojnakowski M., Pitrowski K., Garaffa G. (2009). Unintentional hypothermia: Implications for perianesthesia nurses, J. of Perianesthesia Nursing, Vol. 24, No 3 (June), 167-176 Cooper S. (2006). The effect of preoperative warming on patients' postoperative temperatures, AORN Journal, May Vol 83, No 5

Keywords: *Affecting factors, high risk hypothermia, PACU, anesthesia*

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Implementation and monitoring of the evidence-based ESA guideline on postoperative delirium

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Introduction with hypothesis: Postoperative delirium (POD) is an adverse complication and has an incidence rate of 10-70% (1). POD is associated with several deleterious clinical consequences such as short and long-term cognitive morbidity, increased short and long-term mortality and reduced quality of life (1). The 2017 published European Society of Anaesthesiology Evidence-based and Consensus-based Guidelines purpose a comprehensive set of tools to decrease incidents of postoperative delirium. The aim of this investigation is to investigate the preventive influence of the ESA guideline on patient's early postoperative delirium incidence.

Method: In this quantitative quality development study, the implementation of novel guidelines recommendations as well as the impact on the incidence of delirium were determined. For the methodology of implementation, we used the strategy suggested by the Danish Health Board. Furthermore, for continuous improvement we used the PDSA-model for documenting the test change. The study was performed at Naestved Hospital in Denmark starting in October 2016 to April 2017. For this analysis we include (n=1979) patients who underwent surgical procedures at our department and divided them into two groups. A baseline group (n=1311) mean age 59 years, all patients (n=1311) were screened for POD using Nursing Delirium screening scale (Nu-DESC DK) (2). The intervention group (n=665) mean age 61 years were screened for POD using Nu-DESC DK, furthermore we screened for pain, nausea and vomiting, Remifentanyl, aids, EEG-monitoring, sound, thirst and fluid fasting. ASA PS distribution in both groups was as follows: ASA PS I=27% (n=179), ASA PS II=56% (n=432), ASA PS III=16% (n=106) and ASA PS IV=1% (n=6). A paper case report form (p-CRF) was designed and used for data collection and an online web based Clinical Trial Management System (EasyTrial) was used for data storage. The Local Ethics Committee applied a waiver approval, and the Danish Data Protection Agency approved the project.

Main results: POD was determined in 15% (n=100) in the intervention group by arrival recovery room and there is a reduction of delirium occurrences over time in our recovery room, hereby 30% $p<0.001$ (CI: 6.3-19.5%). According to fluid fasting 52% (n=345) of patients had a fluid fasting time >4 hours and 19.6% (n=130) had a fluid fasting time >10 hours. 46% (n=305) of the patients had a numeric rating scale (NRS) >3 for feeling thirsty. Occurrence of pain defined as NRS >3 arriving the recovery room is 13% (n=86) in rest. Postoperative nausea and vomiting in the recovery room occurred 11.6% (n=77).

Discussion: Our most interesting result was a reduction of postoperative delirium occurrences after the ESA guideline implementation in our recovery room. It is difficult to comment on individual interventions when introducing a large guideline with several sub-elements, even though it is a monitoring measure, this may affect the behavior of the staff working with guidelines. To support the findings in this study Siddiqi et al (3) made a systematic review 2016 and the purpose is to evaluate the effectiveness of interventions for the prevention of delirium non-intensive patients and concludes that there is moderate-quality of evidence that multi component intervention prevents delirium in hospitalized patients. Findings according population is affected by comorbidity, the patient has multiple diseases and hence the risk of polypharmacy which increases risk of generating POD. Further studies are needed to determine the influence and weight of the guideline items on the early postoperative delirium incidence.

Conclusion: Based on results, the ESA guideline must be considered an integral part of the workflow at Naestved Hospital during period of implementation. The team at Naestved Hospital is able to identify, prevent and treat POD based on ESA's evidence and concessional recommendations. Although there is no 100% finish, it should be considered that with multi intervention it is possible with a team-based approach over time to reduce the occurrence of POD.

References: 1(Aldecoa C, Bettelli G, Bilotta F, Sanders RD, Audisio R, Borozdina A, et al. European Society of Anaesthesiology evidence-based and consensus-based guideline on postoperative delirium. Eur J Anaesthesiol 2017 Apr;34(4):192-214) 2(Hägi-Pedersen D1, Thybo KH1, Holgersen TH2, Jensen JJ3, Gaudreau JD4, Radtke FM1,5 Nu-DESC DK: the Danish version of the nursing delirium screening scale

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Seizure due to Propofol!! May It Happen?

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Introduction: Seizure due to propofol is an exceptional incident. Propofol has been the most often and controversially discussed drug in this context during the past few years and even early. We present a patient who developed seizure at the time of propofol withdrawal.

Case report: A 17 year-old man with a history of a colon's wound caused by a domestic trauma and with no history of convulsion underwent a first surgery leading to a Hartmann stomy the 22nd-07-2011. Etomidate was used for the induction of anesthesia. The patient was scheduled for a surgery of restoring intestinal continuity the 01 st-03-2012. He developed a generalized tonic clonic seizure with rolling up of the four members after few seconds of propofol administration at anesthesia induction (300 mg). The seizure resolved spontaneously after 1 minute, however the patient's vital signs were stable, therefore Pentothal was infused, tracheal intubation was performed. Anesthesia was maintained with sevoflurane and 50% nitrous oxide in oxygen. There were no further episodes of seizure activity during anesthesia or recovery. In the recovery room, the neurologic examination was normal, blood gases were in the range of normality. Muscles enzymes were twice the average. Either natremia or kalemia and calcemia were normal.

Discussion: Propofol is a rapid onset and short-acting intravenous anesthetic agent. Neuroexcitation is a well-recognized side effect of propofol anesthesia which appears as myoclonus. Propofol is known as an anticonvulsant drug. Nevertheless 30 references in literature describe the occurrence of seizure due to propofol from 1988 to 2011. To our knowledge this is the first reported case of propofol-induced seizure in Tunisia. Even though propofol was the only drug injected, the causal relationship between propofol anesthesia and the seizure of our patient remains difficult to ascertain but we believe that we should be aware of this possible adverse relation that has been described before in literature.

Conclusion: No drug in anesthesia is safe to be administered despite recommendations and scientific data. Be vigilant.

References: 1. Bernhard walder, Martin R. Tramèr and Margitta Seeck. Seizure-like phenomena and propofol: A systematic review. *Neurology* 2002; 58; 1327-1332

2. Sascha Meyer, MD. Ulrich Grundmann, MD. Britta Kegel. Ludwig Gorth Shamdeen, MD. Propofol: pro-or Anti convulsant Drug? 200 International Anesthesia Research Society-1993

3. Khalil Mounir, MD. Mustapha Bensghir, MD. Nourine Drissi Kamel, MD, PhD. Five cases of during intravenous propofol anesthesia for neurosurgery. *J Canadian Anesthesiologists* (2009) 56;

Keywords: *propofol, anesthesia, seizure*

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Comparison of the Effects of Humeral versus Intravenous Epinephrine in an Adult Swine Model of Hypovolemic Shock

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Introduction: Vascular collapse following cardiac arrest (CA) may delay vascular access procedures. The humeral intraosseous (HIO) route is an alternative when intravenous (IV) access cannot be obtained. We compared the maximum concentration (Cmax), time to maximum concentration (Tmax), rate of return of spontaneous circulation (ROSC), time to ROSC, and odds of ROSC when epinephrine was administered by HIO compared to IV in a model of hypovolemic and normovolemic CA.

Methods: Twenty-eight Yorkshire-cross swine were randomly and equally assigned to four groups: HIO Normovolemia; HIO Hypovolemia; IV Normovolemia, and IV Hypovolemia. The hypovolemic groups were exsanguinated 31% of their blood volume. Subjects were placed into CA and cardiopulmonary resuscitation (CPR) began 2 minutes later. At 4 minutes post-arrest, 1 mg epinephrine was given, and blood samples collected over 4 minutes. Hypovolemic groups received 5% albumin (500 mL) following blood sampling. Resuscitation continued until ROSC or 30 minutes elapsed.

Results: The Tmax of the HIO normovolemic group was significantly faster than the HIO and IV hypovolemic groups (P= 0.021 and 0.01, respectively). The Tmax of the IV normovolemic group was significantly faster than the IV hypovolemic group (P= 0.01). There were no significant differences in Cmax, ROSC, time to ROSC, or odds of ROSC between the groups (P> 0.05).

Conclusions: Hypovolemia significantly delayed the absorption and distribution of HIO and IV administered epinephrine. However, this delay did not significantly affect Cmax or survival measurements. The performance of the HIO and IV routes were comparable supporting the use of the HIO route when IV access cannot be obtained quickly.

Funding: This study was funded by a grant from the Triservice Nursing Research Program.

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Comparison of the Effects of Endotracheal, Intraosseous, and Intravenous Epinephrine in an Adult Swine Model of Hypovolemic Cardiac Arrest

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Introduction: Hemorrhage is a leading cause of traumatic death. Hypovolemic shock and cardiac arrest (CA) may delay placement of vascular access. Vascular access facilitates administration of resuscitative drugs and fluids that may lead to return of spontaneous circulation (ROSC). We compared the maximum concentration (Cmax), time to maximum concentration (Tmax), plasma concentration over time, ROSC, and time to ROSC when epinephrine was administered by the endotracheal (ETT), intraosseous (IO), and intravenous (IV) routes in an adult swine model of hypovolemic CA.

Methods: Forty-nine Yorkshire-cross swine were randomly and equally assigned to seven groups: ETT, humerus intraosseous (HIO), tibial intraosseous (TIO), sternal intraosseous (SIO), IV, CPR with defibrillation, and CPR only. All swine were exsanguinated 31% of their blood volume and placed into CA. Chest compressions began 2 minutes post-arrest. At 4 minutes post-arrest 1 mg epinephrine was given, by group assignment, and blood samples collected over 4 minutes. All swine received 5% albumin (500 mL) following blood sampling. Resuscitation continued until ROSC or 30 minutes elapsed.

Results: There were no significant differences between the groups receiving epinephrine relative to Cmax, Tmax, ROSC, and time to ROSC ($P > 0.05$). Mean plasma concentration of IV epinephrine was significantly higher than the TIO and ETT groups at 90 and 120 seconds. Measurable epinephrine levels were undetectable in five ETT swine. No significant difference in ROSC was found between the groups receiving epinephrine and CPR with defibrillation group ($P > 0.05$). Significant differences in ROSC existed between all groups and the CPR only group ($P < 0.05$).

Conclusions: The pharmacokinetic and resuscitative performance of the IV, HIO, TIO, and SIO routes was comparable. The endotracheal route was less effective and an unreliable route for epinephrine administration than the IV and IO routes.

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A Descriptive Study Exploring the Perceptions of Certified Registered Nurse Anesthetists about Collaboration with Physician Anesthesiologists

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Introduction: There have been over one hundred years of interprofessional tension between nurse anesthetists and physician anesthesiologists. This tension has been demonstrated by many restrictions on the practice of nurse anesthesia and has contributed to an inequitable relationship between the two provider groups, thus limiting the potential contributions of competently trained professionals and ultimately affecting access to anesthesia care. In this qualitative study, the perceptions of nurse anesthetists about collaboration with physician anesthesiologists were explored.

Method(s): Four focus groups using semi-structured interviews were conducted with 24 participants about the perceptions of nurse anesthetists about collaboration with anesthesiologists. The interviews were tape recorded and transcribed; the resulting qualitative data were analyzed by using the Elo and Kyngas method of inductive content analysis. Three major themes were identified: The CRNA-Physician Anesthesiologist Relationship, Components of a Collegial Relationship and Barriers to Collaboration. The participants were later queried about how they define collaboration.

Results: The results from this study revealed that: 1) mutual trust and team work are integral to the CRNA-physician anesthesiologist relationship; 2) the components of a collaborative relationship include being confident and knowledgeable and that previous exposure may improve CRNAs' perception of collaboration, and 3) that several barriers to collaborative relationships exist. Additionally, CRNAs perceive collaboration with physician anesthesiologists as dependent on the individual anesthesiologist with whom they are working as some of the physician anesthesiologists may or may not collaborate equally with the CRNAs.

Discussion & Conclusions: The two implications of this study are that knowledge and confidence may enhance the CRNAs' relationship with physician anesthesiologists and that SRNA and anesthesia resident co-education may improve and enhance this relationship. The primary research recommendation is to explore possible strategies to improve the relationship between CRNAs and physician anesthesiologists.

Keywords: *Nurse Anesthesia, collaboration, physician anesthesiologists.*

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Potential Pitfalls of Short-Term Medical Missions

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Introduction: Participation in short-term medical mission (STMM) trips has grown dramatically in recent years in response to increased global communication, travel, and awareness of inadequate healthcare services in low income countries. More than half of the world's population lacks access to safe, timely and affordable surgical and anesthesia care [1]. The limited availability of surgical services in low income countries compared to high income countries, reveals a significant inequity. According to the World Health Organization [2], the world's poorest countries are recipients of just 4% of surgical services. The lack of life saving essential surgical services contributes to the troubling disparity in key health indicators. A striking 40-year gap exists between the average life expectancy in low-income versus high-income countries [3]. Over 73% of the worldwide burden of preventable deaths in children is limited to just two regions of the world [4].

Methods: A discussion of potential pitfalls and best practices of STMMs.

Results/Discussion: Short-term medical volunteers provide scarce health resources and services to low income countries. In addition to surgical services that impact morbidity and mortality, medical mission teams provide healthcare goods, services, and education to help fill the gap where access to care is extremely limited. Some argue STMMs have the potential to do more harm than good. Common criticisms include unsafe practices, lack of consideration for cultural differences, and lack of coordination with the host country. Limited accountability and liability as well as inadequate knowledge, preparation, or resources to meet the needs of the community can lead to the injudicious inclination of providers to practice beyond their scope of training. Improving the outcomes of STMMs requires increased awareness of potential pitfalls. With awareness and planning, the positive impact of STMMs in providing needed services to resource-limited countries can exceed the potential negative impact. The purpose of this presentation is to increase awareness of some of the potential pitfalls of STMMs and promote best practices of medical missions.

Conclusion: Increasing awareness of potential pitfalls is the first step in minimizing negative outcomes that may occur as a result of common practices of short-term mission teams. Following best practice guidelines of medical missions will improve safety and minimize risks [5].

References: 1. Alkire, B. C., Raykar, N. P., Shrimo, M. G., Weiser, T. G., Bickler, S. W., Rose, J. A., Nutt, C.T., Greenberg, S.L.M., Kotagal, M., Riesel, J. N., Esquivel, M., Uribe-Leitz, T., Molina, G., Roy, N., Meara, J.G., & Farmer, P.E. (2015). Global access to surgical care: a modelling study, *The Lancet Global Health*, 3(6), 316-323. / 2. World Health Organization. (2018a). Emergency and essential surgical care. Retrieved from <http://www.who.int/surgery/en/> 3. Central Intelligence Agency. (2012). The world factbook. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.h> / 4. World Health Organization. (2018b). Global Health Observatory (GHO). Retrieved from http://www.who.int/gho/child_health/en/ 5. Hawkins, J. E. (2013). Potential Pitfalls of Short-Term Medical Missions. *Journal of Christian Nursing*, 30(4), E1-E6.

Keywords: *short-term medical volunteers, safety and quality, global surgical access, health services disparities*

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Examining Patient Transfer from Operation Team to Postoperative Care Unit – A Pilot Study

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Background: Safe handover of patients is critical to patient safety and poor patient safety is a global problem (1-4). Transfers between the operating theatre and the postoperative care unit (PACU) are characterized by incorrect communication and the report's content varies (5, 6). Operation team (OT) and PACU nurse have different expectations to what the report should contain (7). Disruptions during report may seem stressful and distracting, thus endangering patient safety (7, 8).

Purpose: Investigate whether selected methods and instruments can be used to examine patient handoff, PACU nurse satisfaction and record interruptions during oral report. The aim is to carry out a pilot study to test feasibility before a larger study will be conducted to answer the topic question.

Topic question: Does the patient transfer after anesthesia and/or PACU nurse satisfaction get affected by interruptions?

Method: A total of 30 observations and questionnaires has been collected at two different PACUs at Oslo University Hospital. The sample population consisted of patients undergoing orthopedic, gastrointestinal and neurological surgery. An observation study using The Postoperative Handoff Assessment Tool compiled by Nagpal et al. (2011) (2) has been conducted to examine patient handoff between the OT and PACU nurse. The tool consists of 29 items related to tasks, patient specific information, surgical information and anesthetic information. A section was added to the form to register number of interruptions and cause. Within 30 minutes after the patient handoff, a survey was conducted in order to investigate the PACU nurse satisfaction with the report. The survey consists of nine questions regarding the oral report, tasks and potential follow-ups compiled by Petrovic et al. (2015) (9). The respondents are asked to rate each item on a five-point scale. The questionnaire also contained an open question where the respondents were asked to elaborate any concerns about the report or handover process with each particular handoff. Descriptive data analysis has been done in SPSS.

Conclusion: Observation study, survey with selected questionnaire and mapping of interruptions worked appropriately for data collection. The observation form needs adjustments before a larger scale study is conducted to answer the topic question.

For full abstract and references see attached file.

Keywords: *Patient safety, Oral report, Handoff, Interruptions, PACU satisfaction, anesthesia.*

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The Nurse Anesthetist in Catalonia: Role of Advanced Practice

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In Catalonia, nurse anesthetist isn't a specialty recognized from the government. In spite of this, the number of nurses who have studied a master degree to work as an anesthetists are increasing.

During the last ten years, nurse anesthetist in Catalonia have experienced an advance in the competences of their clinical practice, going from exercising a collaboration with anesthesiologists in the operating room to offer some care that corresponds to an autonomy role. Nurses go out to the surgical area, and care the patient in all the perioperative nursing process and the pain management in a holistic way.

.Aim: To determinate the competences of nurses anesthetists in Catalonia we propose the deliberation of whether nurses anesthetists in Catalonia could be considered as an advanced practice, taking into account the definition of nurse anesthetist specified by IFNA.

Methodology: We used a qualitative phenomenological method. We interviewed six experts' nurses at different areas of the profession, until we reach data saturation. During the study we have guaranteed data confidentiality also the Lincoln and Guba criteria of rigor and quality. The analysis of the data was carried out with the software Atlas.ti.

Results: After the analysis, three domains were identified: Professional Expert, that explains the actually situation of the profession; Professional Competences, and their categories that allowed to explain the knowledge, attitudes and skills of the nurses anesthesia practice, based on the definition of International Federation of Nurses Anesthetists; and Nurse Practice, that included the results of autonomy role and collaborative, in which the prescription nurse was presented as one of the important problems.

Conclusions: Nowadays, and despite the lack of legalization in Spain, we could argue that nurse's anesthetists in Catalonia are getting closer that the definition of advanced practice nurse just like have observed at this research. It would be necessary to regulate the accreditation education by the I.F.N.A., by the universities, and to get better in aspects such as nurse prescription, participation in education and interaction with the family, and also the research participation.

Implications to the practice: The difficulties that the prescription and the professional's reticence, included the own nurses, they have to be improved with the alliances, tenacity and collaboration between the different institutions, societies and the professionals themselves.

References: 1.Mantzoukas S, Watkinson S. Review of advanced nursing practice: The international literature and developing the generic features. *J Clin Nurs.* 2007;16(1):28–37. 2.International of Federation of Nurse Anesthetists. Code of Ethics, Standards of Practice, Monitoring, and Education [Internet]. Europe 2016. Available from: <http://dev.ipsasb.org/system/files/meetings/files/4502.pdf>. 3.. Sandin Esteban MP. Criterios De Validez En La Investigación Cualitativa: De la objetividad a la solidaridad. *Rev Investig Educ.* 2000;18(1):223–42. 4.Comellas Oliva M. La construcción de la práctica avanzada en enfermería en el contexto sanitario catalán. *Avanzando en la disciplina enfermera* [Internet]. Universitat de Barcelona; 2016. Available from: <http://www.tdx.cat/handle/10803/380905>.

Keywords: *nurse anesthetist, competences, Catalonia, advanced practice nurse*

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The Importance of Communication Between Nurses in an Anesthesiology Service at a High Complexity Hospital from the City of Buenos Aires.

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Objective: To analyze which risk factors related to the safety and quality of attention can be unchained during the postoperative period when the communication between the nursing team from an anesthesiology service is in deficit.

Methodology: A descriptive, transversal, and observational study was carried out that included nurses from an anesthesiology service during the last trimester of the year 2017 at a high complexity hospital from the autonomous city of Buenos Aires.

Results: The aforementioned anesthesiology service has been growing within time and because of this, the need for a bigger number of nurses, a greater number of procedures, a greater number of technological resources, and with this a larger capacitation and demand of human talent. In this studied service, the nursing professionals were distributed in two levels: Professional/University nurses (57,9% n=11)

with intermediate degrees, and Licensed nurses (42,1% n=8) with the final degree. From this nursing team a greater number of nurses work in the service for more than five years (52,6% n=10). After carrying out the observation in situ for analyzing the communication skills and the different environmental interferences, such as the application of a survey adapted for nurses it was possible to observe that the greater the risk factors for patient care and security was related to the moment of the transfer of care between nurses, that is, because of environmental alterations at the moment of the transference of care between nurses, during the observation it was possible to validate that at least six nurses (31,5%) had interruptions during their transfer of care because of the lack of retention capacity and information records during the transfer of care is also an alarming factor, at least 4 nurses (21,5%) had not enough patient information after receiving the transference from the companion who was leaving the work service, being these nurses with less than five years of experience on the area.

Conclusion: It was possible to establish that the nursing team has sufficient material and technological resources to carry out their work in a safe and effective way and that when the longer the experience time in such area, the fewer errors they commit. It is suggested that the greater the capacitation and internal control for the improvement of the nursing registers at the electronic clinical history and a bigger concentration at the moment of receiving the information transmitted by their colleague, that the nursing assessment is accompanied by the evolution of the registers as with the review of the information by the nurse who is receiving such transfer, and with a structured capacitation to the personnel of recent entry for a correct adaptation to the new work environment and guaranteed the acceptance of the institutional culture and the fomentation of a culture about safety and quality care to the users of the health service, to have places like athenaeums for the whole team to revise and learn from errors or faults committed in different situations, being these related to the patient care, nursing registers, the importance of the teamwork y the promotion of a safe working environment.

References: 1. Garrett, J. H. (2016), Effective Perioperative Communication to Enhance Patient Care. *AORN Journal*, 104: 111–120. / 2. Chard, R. and Makary, M. A. (2015), Transfer-of-Care Communication: Nursing Best Practices. *AORN Journal*, 102: 329–342. / 3. Steelman VM, Graling P, Perkhounkova Y.(2013). Priority patient safety issues identified by perioperative nurses. *AORN Journal*, 97:402-418.

Keywords: *Transference, Care, Registers, Safety, Quality, Perioperative.*

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Restraining the Anxious, Distressed Child – A Qualitative Study Highlighting the Parents' Perspective

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Introduction with Hypothesis: Although medical staff (i.e., nurses) usually advocate against restraining children due to known severe consequences, several studies indicate that anxious children often are restrained during clinical procedures (1). However, the role and significance of the parent's participation in this context is sparsely highlighted. The aim of the study was to investigate how parents take part in the decision-making process when the anxious and distressed child undergoes a clinical procedure where restraining may be a part of the practice.

Methods: The study is based on a hermeneutic understanding framework. Data is collected through semi-structured interviews with parents whose children have been restraint during medical procedures. For data processing, qualitative inductive content analysis was used (2). Data were collected in the period March 3rd to March 27rd 2017. The interviews took place in the parents' private residence in Copenhagen, Denmark.

Results: Based on the analysis, the parents' "expert knowledge" about their children was found not to be taken into account by the medical staff and their value went unused in the clinical decision-making process when defining the appropriate strategy for the procedure. The parents are subservient to the health professionals in terms of their professional knowledge and authority and do not have enough information and knowledge to relate critically to the academic priorities in difficult clinical situations. The analysis provides a glance of health professionals who reserve the right to establish the care and treatment of the anxious, distressed child while often excluding the parents from the decision-making process. In case of restraining, the parents' often have a dual role as the child's guardian as well as being the staff's assistant. A dual role in which they are often faced with difficult choices due to conflicts of interest between the parties involved. The latter imposes an ethical dilemma for the parents where they are often left to decide between traumatizing the child or a conflict with the staff which often exceeds their norms and ethical principles.

Discussion: The findings of this study are in line with previously published Danish studies. Health professionals have been found to favor and protect their professional domains at the expense of the patients' autonomy and parents' knowledge and resources (3). The patient and relatives are reduced to have an inferior and passive role without the possibility of influencing the treatment. When put in a difficult situation with an anxious and distressed child, the parents risk losing their self-esteem in order to please the staff. The parents may adopt the staff's moral standpoint at the expense of their own norms and ethical values, thus abandoning their role as the child's guardian.

Conclusion: The parents are subservient to the staff and are often not consulted when a clinical procedure is required for their anxious and distressed child. They are deprived of their decision-making competence and are faced with an ethical dilemma, when participating in restraining. There is an urgent need for further studies examining the long-term consequences and the impact of interventions in order to address this issue and raise awareness about the implications for children and their parents.

References: (1) Crellin Dea. Procedural Restraint Use in Preverbal and Early-Verbal Children. *Pediatric Emergency Care* 2011 Juli;27(Nr. 7):622-627. (2) Graneheim UHea. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today* 2004;24:105–112. (3) Jönsson ABRea. Sundhedsprofessionelles forståelse af patientinddragelse En kvalitativ undersøgelse. 2013 August:1.

Keywords: *Pediatric, restraining, clinical procedures, anxiety, parents, decision-making*

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Nurse Anesthetists in Norway - Practice and Working Conditions during the last 40 Years – A Longitudinal Study

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Introduction: A nationwide survey of the Norwegian nurse anesthetists and their practice and working conditions - was conducted in 1979, 1989 and 1999, through initiative of the Norwegian Association of Nurse Anesthesia (ALNSF). The health service has undergone major changes especially in relation to increased use of day surgery, changing anesthesia methods and drugs during this period. In addition, the administrative responsibility for the education has moved from hospital to university. The Norwegian nurse anesthesia programs are now mainly on master's level at the university colleges and universities.

As a following up of the earlier studies, ALNSF has planned several times to conduct a new survey with the same focus and questionnaires. In 2014 they received a grant from the Norwegian Nursing Organization (NSF), and this made it possible to start the “planning and doing” for the fourth survey. Delegates from the original project group, organized a new project group and the works could start again. The new survey are based on the same questionnaires and same method of analysis, in order to compare data over time. In addition to these, there is added some new questions, in the purpose of recognize the changes that has come.

During the analyzing and when summarize findings there will be formulated some key topics, and then following up with focus group interviews with participants from some of the largest university hospitals, and some of the smaller region hospitals to discuss findings in more details, and see if there are any differences between working at large or smaller hospitals. There are about 1700 members of ALNSF, and the survey will be send to all members on e-mail. We plan to send out the questionnaire during February this year, and finish our survey during April.

Methods: As a preparation of the survey, the questionnaire is reviewed and edited by a group of nurse anesthetists, are either experienced clinicians, teachers or has been involved in the same project earlier. Some new questions were included in relation to today's conditions. Thereafter the questionnaires has been tested for comprehensibility and applicability in a pilot survey, among 107 ALNSF members during the period 12 December 2017 -12 January 2018.

Results: The questionnaires were considered as comprehensible and applicable. Results from the pilot study gave an indication that the working conditions and function of the nurse anesthetists might have changed during these years.

After April 2018, we will be able to present the main findings of the 2018 survey, and give the main conclusion of the similarities and differences, from 1979 and until today. Through these studies, our findings will map and describe the function and working conditions of the nurse anesthetists of Norway, during almost the last 40 years.

Discussion: Nurse Anesthesia Programs have changed and new challenges in the clinical field - such as less time for each patient, more day-surgical patients and more elderly patients with multiple diagnoses. This might change the need of competencies during this period. The number of anesthesiologists has increased, and this might influence on our results.

Conclusion: Knowledge of changes in the practice and working conditions of the nurse anesthetists are important both for ensuring the interests of the members and for facilitating education for today's work function. This longitudinal study is therefore extra important to show the development in our subject

References: Ringvold et al. (2018) Norwegian standard for the safe practice of anaesthesia. *Anaesthesiol Scand.* 2018 Jan 24. doi: 10.1111/aas.13066., se Anestesisykepleiernes landsgruppe av Norsk Sykepleierforbund –ALNSF -på www.alnsf.no

Keywords: *Nurse anesthetists, Practice, Working conditions, Survey, Longitudinal study*

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An Intraoperative Cardiac Arrest during a Myomectomy

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Introduction: The preoperative Cardiac arrest is a serious accident, of fatal evolution but the prognosis depends mainly on the etiology and the reactivity of the anesthesia team. We report the case of a cardiopulmonary arrest intra operative which will discuss the management and the most probable causes.

Case report: A 30 years-old woman without pathological history was programmed for polymyomectomy (01 myome prior corporeal 6cm and 03 subserosal fibroids). Propofol was used for the induction of anesthesia. The patient was scheduled for a surgery of myomectomy. Anesthesia was maintained with sevoflurane, Fentanyl, cisatracurium and oxygen. After 10 minutes, at the time of resection of the body myoma, the patient presented a cardiocirculatory arrest however the patient's vital signs became

-heart rate at 20b \ min

-capnometry = ETCO₂ at 10mmHG

-Imperceptible carotid pulse

-Several hypotensions

The cardiac arrest is recovered after 3 minutes of heart massage and 2mg of adrenaline. The time of the surgical operation was reduced. The patient was transferred intubated to the Resuscitation room.

Discussion: This patient presented cardiac arrest after 20 min of induction and 10 min of incision. The anaphylactic reaction seemed unlikely from the outset given the lack of introduction of the new molecules. A defect of anesthesia was also excluded from the outset since we have in our block the gas analyzer and the inhaled and expired concentrations of sevoflurane were adapted. We therefore suspected this causes that are not related to anesthesia and especially as the patient presented a Sinus tachycardia in favor of pulmonary embolism and had quickly recovered from this cardiac arrest with hemodynamic stability.

Conclusion: Cardiac arrest is often not associated with anesthesia. Our observation shows that we must not lose sight of the patient's etiology and current surgery in order to determine the etiology of this Cardiac arrest and improve the prognosis.

References:

1. Arrêt cardiaque pendant l'anesthésie et en phase de réveil J.C.OTTENI,A.STEIB,Th.PoTTECHER Département d'anesthésie réanimation chirurgicale, hôpital de Haute pierre

2. Arret circulatoire peropératoire P.Y.Carry,M.Benoist,Petit,service d'anesthésie réanimation Lyon sud, Samu de Lyon

Keywords: *cardiac arrest, anesthesia, myomectomy*

60**Interventional Program for Curtailing Chronic Opioid Use in Non-Cancer Patients**Shuching Chang¹, Chuan-Wei Cheng²¹E-Da Hospital, Anesthesia, Intensive Care and Pain Medicine, Kaohsiung, Taiwan, R.O.C.²National Yang Ming University, School of Nursing, Taipei, Taiwan, R.O.C

Objectives: This retrospective study was conducted to explore the epidemiology and medical utilization of chronic non-cancer pain (CNCP) patients who required chronic opioid therapy (COT) in the adult Taiwanese population. Chronic non-cancer pain (CNCP) imposes tremendous psychological stress on the affected individuals and substantially impairs their physical function and quality of life. The present study aimed at investigating the outcomes of an interventional program for this patient population in reducing opioid use.

Methods: Utilizing Taiwan E-Da hospital Research Database during 2015-2016, COT-requiring CNCP patients were identified by the criteria of both chronic analgesic requirement for over 3 months and long-term use of opioids for more than 28 therapeutic days during any period of 3 months as well as frequency of pain clinic, outpatient clinic, and emergency department visits after implementation of an interventional program comprising assignment of a designated nursing coordinator for following up and transferring patients to appropriate departments for consultation and treatment, establishment of one-stop window (i.e., pain clinic) for opioid users, organization of multidisciplinary teams for combined professional care.

Results: The equivalent total annual morphine dosage was significantly reduced from 63916.21 ± 44680.93 mg to 49114.59 ± 36703.23 mg ($p < 0.0001$) after implementation of the program. The frequency of pain clinic, outpatient clinic, and emergency department visits decreased from 24.92 ± 17.01 to 20.90 ± 11.94 ($p < 0.007$), 34.34 ± 3.088 to 29.40 ± 22.13 ($p < 0.016$), and 1.58 ± 4.04 to 1.28 ± 2.66 without reaching statistical significance. Compliance of chronic opioid users during pain clinic visit increased from 42.7% to 95.8%.

Conclusion: COT-requiring CNCP patients were associated with worse comorbidities and socioeconomic liabilities, and consumed more medical utilization, necessitating advanced approach to ease their physiological and fiscal burden. The results of this study demonstrated that a program integrating team effort and continuous monitoring could effectively reduce opioid use and addiction in patients with CNCP. Our results have great value as administrative references while formulating medical policy.

Keywords: *chronic opioid therapy, Chronic non-cancer pain*

61**Sedation and/or Analgesia in Intensive Care Units**

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Given the continued increase in the complexity of invasive and noninvasive procedures, healthcare practitioners are faced with a larger number of patients requiring sedation. Sedation is an integral part of the means implemented in intensive care for the acute management of patients. It enables patient's management with most physical and psychic comfort in order to reduce organs failures of patient in resuscitation and interventions such as mechanical ventilation. The objective of our study is to evaluate this current practice in resuscitation in order to adapt to each clinical situation and optimize the benefit-risk balance of sedation and/or analgesia.

This is a prospective study conducted in four university hospital centers in Tunisia. Data collection was based on 50 anonymous questionnaires from 15 anesthesia-resuscitation doctors (ARD), 10 anesthesia-resuscitation licensees (ARLs) and 25 resuscitation nurses whom 34% practice at Charles-Nicolle Hospital. Statistical analysis was performed using SPSS 13.0 and Microsoft Excel 2010. From the point of ethical considerations, collected answers were kept strictly confidential and anonymous.

The main results of our study showed that the majority of health personnel, 86%, know the main indications of sedation-analgesia. Regarding the best hypnotics for the sedation of adult ventilated patients in intensive care units, Propofol appeared to be the most used hypnotic for sedation/analgesia (40%) and half of the respondents confirm that the main effect of Midazolam is the delay of awakening. Almost all respondents used Fentanyl in intensive care (72%) and 66% confirmed the risk of its accumulation in case of prolonged use. Moreover, the majority of respondents (82%) rely on the clinic to monitor a sedated patient in intensive care and 62% monitor the patient's adaptation to the machine to check the effectiveness of sedation and 36% use analog and verbal descriptor scales to evaluate pain in a cooperating vigilant patient. More than half of the respondents (56%) don't use a dose modification algorithm depending on the patient's condition and 9 out of 15 indicate that the interest of the algorithm is to avoid overdose. 50% of respondents stops sedation gradually and 66% of them affirm that the major risk factor for withdrawal syndrome (a discontinuation syndrome) is the excessive use of sedatives.

Previously published studies supported our results indicating that infusions of both midazolam and propofol appear to provide similar quality sedation, that extubation time and recovery time is shorter in patients sedated with propofol and that haemodynamic complications related to either drug regime are not usually clinically significant [1]. Furthermore, Varndellet al., 2015 confirmed that monitoring is a crucial part of the care of the critically ill patient. Indeed, patient vital signs are commonly used as a means of providing objective information about a patient's response to sedation [2].

In conclusion, limited literature was found that directly addressed Tunisian practices in managing sedation and analgesia for patients. The degree of education and training required is above that obtained during training. No state or national models of education or training were identified to support practices in managing sedation and analgesia.

References: 1. Magarey, J.M. Propofol or midazolam: which is best for the sedation of adult ventilated patients in intensive care units? (2001). A systematic review. *Aust Crit Care.* 14(4): 147-54. 2. Varndell, W., Elliott, D. and Fry, M. (2015). Assessing, monitoring and managing continuous intravenous sedation for critically ill adult patients and implications for emergency nursing practice: A systematic literature review. *Australasian Emergency Nursing Journal*, 18(2), 59-67.

Keywords: *hypnotics; sedatives; analgesics; algorithm*

New Opportunities in the Pain Management in Prosthetic Knee Surgery

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Knee osteoarthritis, the main cause of the implantation of a knee prosthesis, affects 30% of the Spanish population older than 60 years, and along with the aging population, has been an increase of 30% of these surgeries between 2002 -2012. The implementation of the fast-track guides to these surgeries has become a common clinical practice. The objectives of these guides are the early reintroduction of the patient in their daily activities and, consequently, a decrease in hospital stays. From the Acute Pain Unit of the Fundació Hospital Sant Joan de Déu de Martorell, the concern for the correct management of the pain of these patients has been a purpose since its inception. Treatments and pain approaches, have been changing in recent years, looking for the "ideal".

Objective: Describe the different treatments performed in the perioperative of knee prosthesis surgery during the second half of 2017 at the Fundació Hospital Sant Joan de Déu de Martorell.

Methodology: A descriptive cross-sectional study. Data from 50 patients were retrospectively collected from the clinical history, keeping confidentiality at all times. 4 were rejected to present postoperative complications other than anesthesia. The analysis of the data was carried out with the SPSS program.

Results: The final sample of 46 patients had an average age of 71.57 +/- 7.40, 73.91% were women, 86.96% had primary studies, 93.48% were retired and 66.09% corresponded to an ASA II anesthetic risk. Two different treatment groups were identified that were defined by the study: Group 1, n = 24, where anesthesia was combined intradural-peridural, maintaining a continuous analgesia + Pacient Controlled Analgesia as a post-operative peridural analgesia with local anesthetic and fentanyl for 48 hours, and a Group 2, n = 22, where anesthesia was intradural without morphs combined with an intraarticular infiltration of local anesthetics (LIA) and post-operative analgesia with sublingual sufentanil with his own disposable Zalviso®.

The average values of EVA remains <3 the first 4 days of admission in both groups, and in particular the 3rd group 2 gets 0.97 +/- 1.54 against 2.32 +/- 1.84 group 1 (p = 0.006).

The average start time of the wandering in group 2 is 23.5 hours +/- 13.72 in front 48.38 hours +/- 13.18 in group 1 (p ≤ 0.001). The average total hospital stay time is 120.48 hours +/- 22.10 in group 1 to 105.17 hours +/- 19.65 in group 2.

Conclusions: Having different treatments for postoperative pain allows the population to be covered according to the characteristics and / or needs. However, it seems and waiting to obtain results with a wider sample, that both treatments achieve an effective postoperative analgesia and specifically in the case of sublingual sufentanil maintains a fairly homogeneous line throughout the hospital stays. The time in the postanesthetic care unit, at the start of wandering and hospital stays is shorter in the case of sublingual sufentanil, could in the future be a treatment of choice in patients of Fast-Track guides.

References: Comas M., Sala M., Román R. Hoffmeister L., Castells X. Impact of the distinct diagnostic criteria used in population-based studies on estimation of the prevalence of knee osteoarthritis. Gaceta Sanitaria 2010 24(1) 28-32; Henrik Husted. Fast-track hip and knee arthroplasty: clinical and organizational aspects, Acta Orthopaedica 2012 83:sup346, 1-39 ;Molko S et Combalia A. Rapid recovery programmes for hip and knee arthroplasty. An update. Rev Esp Cir Ortop Traumatol. 2017 Mar - Apr;61(2):130-138 ;Minkowitz HS. A review of sufentanil and the sufentanil sublingual tablet system for acute moderate to severe pain. Pain manag 2015 5 (4), 237-250

Keywords: *Pain management, patient controlled analgesia, sublingual sufentanil*

Effect of Gender, Age and Education on Postoperative Pain Perception

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Introduction: Various factors that are known to affect onperception of pain include the educational status,gender and age of PT. The aim of this study was to determine the impact of sex,age and gender on postop. pain perception.

Methods: The study was conducted in UHC "Sestre milosrdnice" Zagreb in Clinic for surgery and gynecology.It was conducted by nurse anest. in APS and included 134 PT in period of 2 months.In the study was used structured questionnaire about pain perception.Pain lvl.was measured by VAS score scale.Demographic and clinical data are presented as median and 25th and 75th interquartile range,or number(%).Continuous variables were compered using Students t-test for independent samples,while categorical variables were compared using x²- test.P values <0.05 were considered statistically significant.

Results: The sample consisted of 59(44%)M and 75(56%)F.There were no differences between groups according to gender in a presence of pain at the end of surgery-22(37%)M vs 28(37%)F, p = 0.861.Postop.,the most PT asked for analgetics at pain lvl VAS 4-7,as confirmed by 31(53%)M PT and 32(43%)F pat(p = 0.669).There were 70(52%)participants with university education and 64(48%)with high school education or lower.There were no differences between groups according to education in a presence of pain at the end of surgery-24(34%)participants with university education vs 26(40%)participants with high school education or lower, p = 0.715.Postop.,the most patients asked for analgetics at pain level VAS 4-7,as confirmed by 31(44%)participants with university education and 32(50%)participants with high school education or lower (0.798).There were 81(60%)participants up to 55y and 53(40%)participants 55y and older.The patients older then 54y had less frequently pain at the end of surgery than those younger than 55y(12,23% vs 38,47%, p = 0.002).Postop.,the most PT asked for analgetics at pain level VAS 4-7,as confirmed by 40(49%)respondents up to 54y and 23(43%)participants older then 54y(0.782).According to gender,education and age,PT groups did not significantly differ in pain level at "zero" postop.day,which was 4 in rest and 5 in activity according VAS score scale.

Discussion: Many studies indicate that gender, age and education influence on pain perception1,2.No difference in perception of pain as regards gender was found in this studys. According many studie F patients exhibited greater intensity of pain and required higher doses of analgesics compared to M in the postoperative period3. But,in a study by Chia et al M had increased postoperative pain and morphine requirements4.These differences could be due to heterogeneity in type of surgery,analgesic drugs and different methods of pain relief.Lantis et al. found that patients of lower education experience more pain than patients of higher education.The educational status may be associated with higher pain due to various reasons,including the poor understanding of the preop.information,the level of anxiety and depression caused by that and the suboptimal request and use of analgesia2.According our study there was no difference in pain perception with regard to education.One of possible reasons is good education about the possibilities of postop.analgesia through The APS.The age was suggested to

have removed the peripheral nociceptive function, reducing pain in some contexts and reducing morphic requirements. The meta analysis by Lautenbacher et al. showed that aging reduces pain sensitivity. Our study shows that people younger than 55 y have more frequent pain after waking from anesthesia, but there is no difference in age-related intensity of pain during "zero" postoperative day.

Conclusion: Although many studies have shown that gender, education and age are associated with the different perception of pain, our study results do not support that claim. Our data suggest that there was no difference in the perception of pain depending on gender, education and age. What is relevant and statistically significant in this research is that people younger than 55 y have more frequent pain after waking from anesthesia.

References: 1. Wandner LD, Scipio CD, Hirsh AT, Torres CA, Robinson ME. The perception of pain in others: how gender, race, and age influence pain expectations. *J Pain*. 2012 Mar;13(3):220-7. 2. Lanitis S., Mimigianni C, Raptis D, Sourtse G, Sgourakis G, Karaliotas C. The Impact of Educational Status on the Postoperative Perception of Pain. *Korean J Pain*. 2015 Oct; 28(4): 265-74. 3. Hussain AM, Khan FA, Ahmed A, Chawla T, Azam SI. Effect of gender on pain perception and analgesic consumption in laparoscopic cholecystectomy: An observational study. *J Anaesthesiol Clin Pharmacol*. 2013 Jul-Sep; 29(3): 337-41. doi: 10.4103/0970-9185.117095. 4. Chia YY, Chow LH, Hung CC, Liu K, Ger LP, Wang PN. Gender and pain upon movement are associated with the requirements for postoperative patient-controlled iv analgesia: A prospective survey of 2,298 Chinese patients. *Can J Anaesth*. 2002;49:249-55. 5. Lautenbacher S, Peters JH, Heesen M, Scheel J, Kunz M. Age changes in pain perception: A systematic-review and meta-analysis of age effects on pain and tolerance thresholds. *Neurosci Biobehav Rev*. 2017 Apr;75:104-113. doi: 10.1016/j.neubiorev.2017.01.039.

Keywords: *Pain; postoperative; gender; age; education*

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Effects of a Structured PCA Education on Knowledge and Attitude Regarding PCA usage, pain, and consumption of analgesics in colorectal surgery patients

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Purpose: The purpose of this study was to investigate the effects of a structured preoperative PCA (patient-controlled analgesia) education for colorectal surgery patients on the knowledge and attitude regarding PCA (patient-controlled analgesia) usage, level of pain, and the consumption of analgesics after operation.

Method: This study was conducted from 18 Feb. to 2 May, 2008. Participants were 80 colorectal cancer patients who would use the IV-PCA (Intravenous-patient controlled analgesia) after colorectal surgery in a cancer hospital in Gyeonggi-do, Republic of Korea. Two groups, experimental and control were consisted of 40 patients each. The 20-minute structured education regarding PCA (patient-controlled analgesia) usage was applied to each patient individually in the experimental group but only the routine anesthetic consultation was given to each patient in the control group a day before the surgery. The SPSS/PC 10.0 program was introduced to analyze the collected data on frequency, percentage, mean, standard deviation, χ^2 -test, t-test and paired t-test.

Result: The experimental group with the structured preoperative PCA (patient controlled- analgesia) education showed higher knowledge and more positive attitudes regarding the PCA (patient controlled analgesia) usage than the control group. Also the experimental group showed better pain control and lower consumption of analgesics at 4, 8 and 24 hours after than the control group.

Conclusion: The structured preoperative PCA (patient controlled analgesia) education is an effective nursing intervention for improving the knowledge and attitude of the colorectal surgery patients on the PCA (patient controlled analgesia) usage, and enabling the patient to take the analgesic more effectively with lower consumption, while reducing the patients' pain after operation.

Keywords: *Structured preoperative PCA education, knowledge, attitude, pain, analgesics.*

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General Anesthesia without Opioids or Vapors

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Problem Statement: Although effective for pain-management, opioid analgesic drugs are associated with adverse side effects including respiratory depression, nausea with and without vomiting, increased lethargy and post-operative ileus. Additionally, negative side effects of pain include shallow breathing, retention of secretions and atelectasis. These side-effects prevent the initiation of oral intake and may also contribute to prolonged ambulation times.

Notwithstanding these facts, in the United States, 99% of surgical patients receive opioids for postsurgical pain and many receive opioids as part of the anesthetic regime. Heroin is an illegal drug in the U.S., yet 80% of new heroin users stated out by misusing prescribed opioid pain treatment, while 99% of surgical patients who are prescribed opioids progress to long term opioid use or abuse.

Proposed Solution: It has long been known that non-opioid agents can provide effective analgesia through the administration of multi-modal therapy. Benzodiazepines, non-steroidal anti-inflammatory drugs (NSAIDs), centrally acting non-opioid non-NSAIDs such as acetaminophen, gabapentinoids, magnesium, lidocaine, and NMDA antagonists such as ketamine just in combination with inhalation anesthetic supplementation with nitrous oxide and supplemental nerve block as indicated, have been shown to provide an anesthetic that provides for physiological stability, excellent operating conditions, and patient comfort in the postoperative period.

Implementation Strategy: Prior to the induction of general anesthesia the patient should receive 1 gm IV acetaminophen, midazolam 0.03 mg/kg, ketamine 0.5 mg/kg, and lidocaine 1.0 mg/kg. Induction should be accomplished with propofol at a reduced dose consistent with the patient's state of wakefulness. Three infusions should then be started: Lidocaine 1 mg/kg/hr, Ketamine 0.1 mg/kg/hr and propofol 75-100 mcg/kg/min. After endotracheal intubation nitrous 50-70%. Magnesium 2 gm may be given either preoperatively or during the first 45 minutes of the operation. All infusions should be continued until the operation, including dressing application, is fully completed. At that point the nitrous oxide should be discontinued and the muscle relaxant reversed.

References: Ahmed, A., Latif, N., & Khan, R. (2013). Post-operative analgesia for major abdominal surgery and its effectiveness in a tertiary care hospital. *Journal of Anaesthesiology Clinical Pharmacology*, 29(4), 472-477. doi: 10.4103/0970-9185.119137. Grady, P., Clark, N., Lenahan, J., Oudekerk, C., Hawkins, R., Nezat, G., & Pellegrini, J. E. (2012). Effect of intraoperative lidocaine on postoperative pain and return of bowel function after laparoscopic gynecologic procedures. *AANA Journal*, 80(4), 282-288. Retrieved from www.aana.com/aanajournalonline. Kranke, P., Jokinen, J., Pace, N. L., Schnabel, A., Hollman, M. W., Hahenkamp, K., Eberhart, L. H., Poepping, D. M., Weibel, S. (2015). Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery. *Cochrane Database of Systematic Reviews*, 7. doi: 10.1002/14651858.CD009642.pub2

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