



Collegium of the Head Anesthesiologists and Intensivists of the Campania Region (CPARC): Proceeding of the 28th Conference 'Sicurezza in Anestesia' [Safety in Anesthesia], November 29-December 1, 2018; Naples, Italy

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Introduction

We are very proud to present the proceeding of the 28th Italian Conference 'Sicurezza in Anestesia' (Safety in Anesthesia), held from 29 November to 1 December in Naples, Italy. A total of 250 clinicians (anesthesiologists, general internists, intensivists) and nurses attended the meeting and discussed a variety of issues related to safety in anesthesia. The conference was only possible with the zealous and ardent efforts of Prof Arturo Cuomo and the members of the 'Collegio dei Primari di Anestesia e Rianimazione della Regione Campania' (CPARC) which is the collegium of the directors of the anesthesia divisions and intensive care units of Campania region, southern Italy.

Eight special comprehensive lectures, focused on the topic of clinical practice to be performed safely in anesthesia, were provided: 1) minimum standards for safety in anesthesia (Prof Flavia Petrini); 2) preoperative anesthesia evaluation (Prof Eugenio Agrò); 3) pediatric regional anesthesia guidelines (Prof Giorgio Ivani); 4) anesthesia awareness, postoperative delirium and postoperative cognitive dysfunction (Dr Marco Cascella); 5) intraoperative hemodynamic ultrasound monitoring (Dr Raffaele Di Minno); 6) roles of anesthesiologist in different clinical settings (Prof Alberto Zangrillo); 7) end-of-life management in intensive care unit (Prof Antonino Giarratano); 8)

intraoperative transesophageal echocardiography (Prof Luigi Tritapepe).

Several scholars presented the results of their recent research, touching upon many important aspects of anesthesia practice: a) intraoperative brain monitoring (Dr Giuseppe Lubrano); b) perioperative nutritional support (Dr Italia Odierna); c) postoperative pain management by sublingual approach (Dr Marco Rispoli); d) intraoperative non-invasive hemodynamic monitoring (Dr Clelia Esposito); e) management in emergency of patient with vascular diseases (Dr Rosanna De Rosa).

Other oral presentations on intraoperative fluid management, ultrasound-guided regional anesthesia, Italian Society of Anesthesia Analgesia Reanimation and Intensive Care (SIAARTI) airways management guidelines, protective ventilation strategies in obese patients and obstetric analgesia were respectively given by Prof Nicola Brienza, Prof Astrid Ursula Behr, Prof Massimiliano Sorbello, Prof Pasquale Sansone and Prof Eduardo De Robertis.

Prof Elvio De Blasio, who is an opinion leader in sepsis and septic shock introduced the lecture of Prof Luca Lorini. Prof Maria Beatrice Passavanti, Prof Gennaro Savoia and Prof Arturo Cuomo discussed on multimodal approaches for postoperative pain management with special regard to the cognitively

impaired patient and those on opioid addiction treatment.

In a dedicated session of the congress, Professors Anna Maria Cerbone, Lucio Bucci and Fabio Gori debated on coagulation abnormalities and new treatment strategies in anesthesia and intensive care unit. The last day of the Conference Dr Pasquale Aprea focused on the vascular access procedures and Dr Giovanni Petrillo discussed on safety procedures and roles of nurses in the theatre.

The guest editor Dr Marco Cascella, the President Prof Arturo Cuomo and the CPARC members would like to thank all speakers and participants for their contributions. First of all, we would like to express our sincere appreciation to Professors Caterina Aurilio, Maria Caterina Pace, Pasquale Sansone, and Maria Beatrice Passavanti of the University of Campania 'Luigi Vanvitelli' for their active collaboration.

Furthermore, we are sincerely grateful to Dr Dario Galante, Editor-in-Chief of the International Journal of Clinical Anesthesia for accepting the proceedings of the Conference and their precious cooperation in publishing this paper. Finally, we would like to express our sincere gratitude to Dr Francesca Cavaliere and the staff of CapriMed for organizing this event. It is our sincere belief that this significant collaboration and partnership will be further strengthened in the years to come. A selection of thirteen interesting abstracts have been included in this manuscript.

Sugammadex Dosage Adjustments in Morbidly Obese Patients: What Do We Know?

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Background: Since 2009, rapid efficacy and safety of sugammadex, also known as Org25969 a new molecular entity of the γ -cyclodextrin class, have been proved in reversing neuromuscular blockades induced by rocuronium bromide.

Few studies have evaluated adequate dosage in morbidly obese patients and no systematic reviews exists. Currently, sugammadex dosage is based on real body weight without taking fat content into account, increasing the likelihood of adverse drug reactions. The FDA recommends the dose of 4 mg/kg of sugammadex if spontaneous recovery of the twitch response has reached 1 to 2 post-tetanic counts (PTC) and there are no twitch responses to train-of-four (TOF) stimulation following rocuronium induced neuromuscular blockade. A dose of 2 mg/kg of sugammadex is recommended if spontaneous recovery has reached the reappearance of the second twitch (T2) in response to TOF stimulation following rocuronium induced neuromuscular blockade.

Aim: This systematic review will assess the efficacy in reverting decurarization using a sugammadex dosage calculated on the ideal weight compared to the dosage of sugammadex adjusted on the real weight; procedure time and type of surgery will also be assessed. In order to improve patient safety, adverse drug effects and costs will be taken into account.

Methods/Design: Literature search will be performed by the strings "sugammadex AND obesity" and "sugammadex AND body weight" on several databases: PubMed, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL) and JBI Database of Systematic Reviews. The search strategy is formulated

following the PICO (Population, Intervention, Comparator, Outcome) method. The selected population will include morbidly obese with BMI greater than or equal 30 Kg/m² undergoing surgical procedures in general anesthesia considering their ideal weight; intervention is intraoperative administration of sugammadex in morbidly obese with BMI greater than or equal 30 Kg/m² according to their real weight; comparison will include morbidly obese with BMI greater than or equal 30 Kg/m² undergoing surgical procedures treated with drug doses considering their ideal weight. The primary outcome taken into account will be decurarization and patient's extubation time, while as secondary outcomes we will evaluate presence of clinical signs of residual muscular weakness, bradycardia (HR<60 bpm) and postoperative collateral effects reported by FDA and EMEA labels.

The Cochrane Collaboration tool will be used to assess risk of bias in randomized controlled trials. Statistical elaboration will be performed by 2x2 table, with 95% confidence interval, using Q statistic and IC to assess studies heterogeneity.

Conclusions: Preliminary results are estimated to be published on October 2018.

The rationale of this review is to define the adequate dosage of sugammadex needed to reverse NMB in obese patients undergoing general anaesthesia. Adjusting sugammadex dosage on ideal weight without a reduction in efficacy, may reduce costs and produce less symptoms related to sugammadex adverse drug effects. This Protocol has been submitted to the International prospective register of systematic reviews (PROSPERO ID 99978).

Levobupivacaine vs. Ropivacaine For TAP Block in Colorectal Laparotomic Surgery: Quality of The Postoperative Analgesia and Analgesic Rescue Evaluations

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Background: The Transversus Abdominis Plane (TAP) Block is a technique of locoregional anesthesia that ensures analgesia of the anterolateral abdominal wall [1]. The ultrasound guide is considered the gold standard for the execution of this technique. It consists in the administration of an anesthetic solution in a plane placed between the internal oblique muscle and the transversus (Figure 1).

The nerve fibers arising from the T6 to L1 segment and provide sensory innervation of the anterolateral abdominal wall run within that plane. Although its

analgesic efficacy only covers somatic pain, the TAP Block plays a fundamental role in multimodal analgesia [2,3]. We performed the TAP Block with a lateral approach, placing the probe between the iliac crest and the last costal margin on the mid-axillary line. This technique of locoregional anesthesia reduces postoperative pain and therefore the use of analgesics, thus reducing the related side effects, such as nausea, vomiting and respiratory depression. The objective of our study was to evaluate the efficacy of ropivacaine vs levobupivacaine for post-operative analgesia in the execution of TAP Block for laparotomic colorectal surgery.

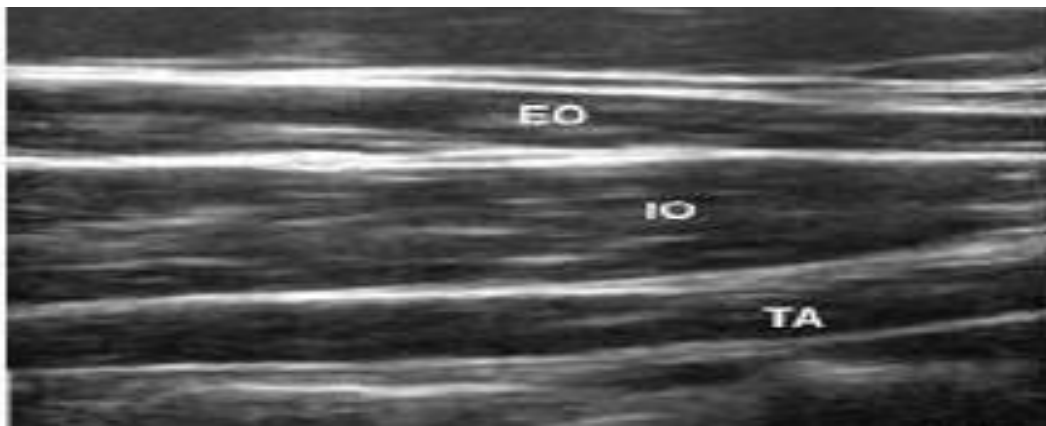


Figure 1: Ultrasound anatomy for performing the TAP Block. EO: External Oblique Muscle; IO: Internal Oblique Muscle; TA: Transversus Abdominis

Materials and Methods: 50 patients were enrolled for laparotomic colorectal surgery, with an ASA I-II classification, to which, randomly divided in two groups of 25 patients, TAP Block was bilaterally performed at the end of the surgery procedure with 20 ml of ropivacaine 0.25% (Group R) or with 20 ml of levobupivacaine 0.25% (Group L). Dexamethasone 4 mg was added to both local anesthetic mixtures. About 30 minutes before awakening, acetaminophen 1 g and ondansetron 8 mg were also administered. All patients

were evaluated for NRS and the need for rescue analgesics upon awakening (T0), at 1 h (T1), 4 h (T2), 8 h (T3), 12 h (T4), 18 h (T5) and 24 h (T6).

Results: There were no significant differences between the two drugs regarding the onset time of the sensory block. No significant differences in the quality of the analgesia (NRS) were recorded, although the use of levobupivacaine induced a longer duration analgesia (1120 min vs. 840 min) and a lower use of analgesic drugs compared to ropivacaine. (Figure 2).

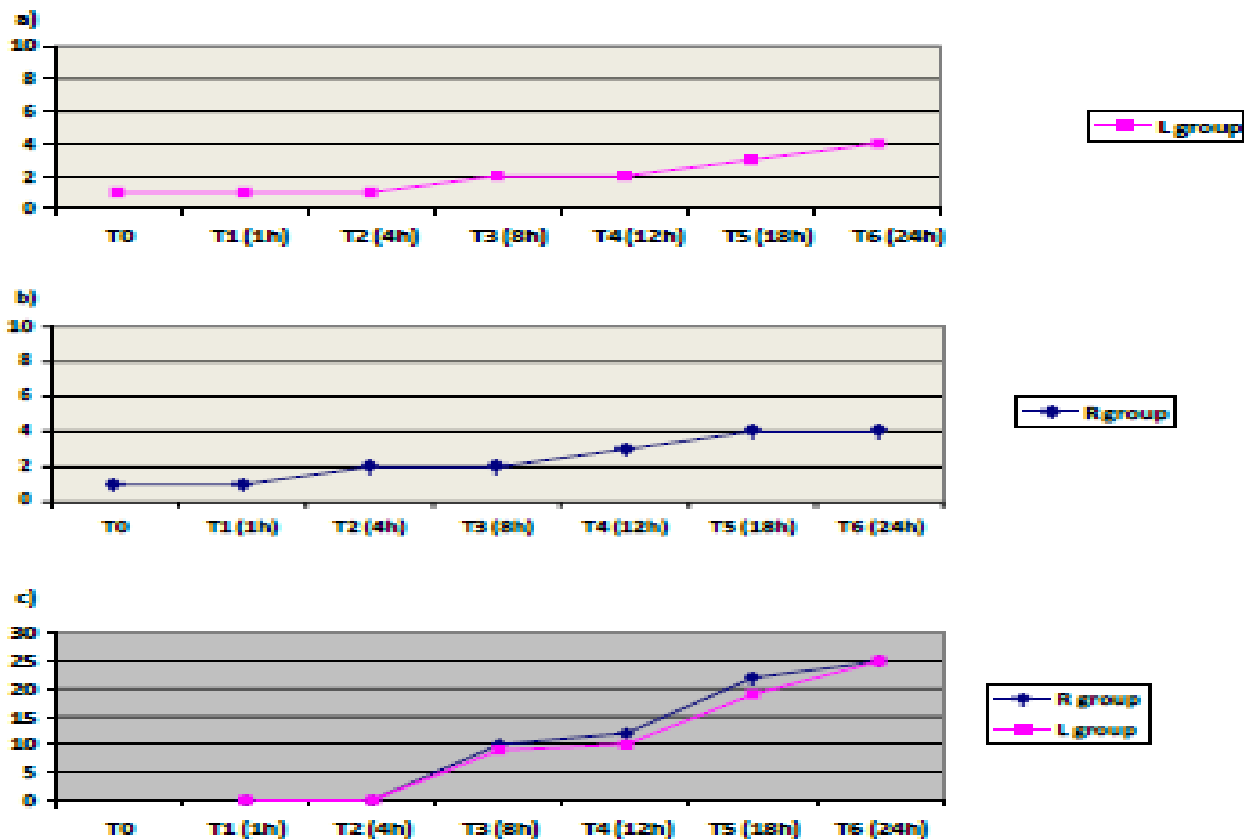


Figure 2: NRS evaluation results in levobupivacaine group (a); ropivacaine group (b); analgesic rescue doses (number of administrations) (c)

Conclusions: Our study shows that TAP Block induces effective and prolonged post-operative analgesia, but, in terms of pain assessment and analgesic administration, it has emerged that the use of levobupivacaine determines a prolonged analgesia compared to ropivacaine. However, further studies and a larger number of cases will be needed to confirm these results.

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Intrathecal Atropine vs. Ondansetron ev in Management of Postoperative Nausea and Vomiting after Administration of Intrathecal Morphine in Cesarean Section

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Background: Intrathecal morphine ensures optimal analgesia after caesarean section surgery, but side effects include postoperative nausea and vomiting (PONV). Literature studies prove that intrathecal administration of atropine may reduce the incidence of such side effects [1-3]. This study compares the effect of intrathecal atropine to ondansetron ev in prevention of PONV in cesarean section.

Materials and Methods: We prospectively recruited 68 ASA I–II patients undergoing cesarean section. Spinal anesthesia was administered in all cases except for 3 women who received general anesthesia (n=65). Enrolled patients were randomized to one of the two groups; Group A (n=30): spinal anesthesia by bupivacaine hydrochloride 0,5% 10 mg, plus intrathecal morphine 2 µg/kg (considering ideal weight) and intrathecal atropine 150 µg; Group O (n=35): bupivacaine hydrochloride 0,5% 10 mg, plus intrathecal morphine 2 µg/kg (considering ideal weight) and ondansetron 8 mg ev. Outcomes measured were PONV incidence, NRS pain scale, itch and analgesia rescue need.

Results: Spinal anesthesia was administered in 65 cases: unpredictable complications occurred in three

cases and general anesthesia was practiced, therefore these were not considered. PONV incidence was 8% in group A, 20% in group O. No differences were reported about NRS pain scale, itch and need of rescue drugs.

Conclusion: In cesarean section intrathecal atropine is more effective than ondansetron for prevention of PONV related with intrathecal morphine.

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Management of Chronic Pain after Hysterectomy: Ultrasound – Guided Single Shot Transversus Abdominis Plane Block: A Study Design

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Background: Chronic Post-Surgical Pain (CPSP) affects approximately 5–32% of women after hysterectomy [1] and persists for at least 2 months following surgery [2]. Pre-emptive analgesia is an antinociceptive treatment that prevents the altered processing of afferent inputs that amplifies postoperative pain [3]. Furthermore, local anesthetics block nerve interferes with the transmission of the stimuli to pain centers by inhibiting the function of the sodium channel in the cell membrane of nerve cells [4]. The ultrasound-guided Transversus Abdominal Plane (TAP) block is used to prevent firing from neural afferents of intercostal, subcostal, ilioinguinal and iliohypogastric nerves, in order to obtain an analgesic block of anterolateral abdominal wall. Although in literature TAP block is largely described to be used for post-surgical pain management, there are not enough similar studies that encourage its use to prevent the onset of CPSP in patients presenting risk factors [1,4].

Study Design: An ethical approval of this prospective, randomized, controlled trial (RCT) was obtained by the local Ethic Committee. Using a computerized random number generator, patients belonging to “Dipartimento della Donna, del Bambino e di Chirurgia Generale Specialistica” of the Luigi Vanvitelli University of Naples, undergoing hysterectomy, will be enlisted into two equal groups in the period from July 2018 to July 2019. The number of our sample will be determined during the study according to the statistical criteria present in the literature.

Inclusion criteria:

- BMI <30
- ASA I-II
- Age 30-65
- Two among the following risk factors:
 - Younger Age
 - Preoperative pelvic pain;
 - Preoperative pain in other organs (such as irritable bowel syndrome);

- Psychological factors (anxiety, depression);
- Type of hysterectomy (abdominal, vaginal and laparoscopic)
- Frequency and intensity of Previous post-surgical pain;

Before general anesthesia, Group A will receive ultrasound-guided single shot TAP block with ropivacaine 0.5% (40ml). Control Group B will receive morfina 30 mg with NaCl 0.9% 100 ml, according to previously published studies [1]. Pain will be measured every six hours during first postoperative day (T0) using a Numerical Rating Scale (NRS). Seven days (T1), one month (T2) and three months (T3) after hysterectomy, CPSP will be evaluated in both groups by using NRS and DN4 (Douleur Neuropathique 4). The primary endpoint of our ongoing study is to understand if in the group that has received TAP block there is a considerable reduction of the incidence of CPSP, especially in patients with important risk factors. Observing an effective lower consumption of opioid drugs for CPSP will be a secondary endpoint.

Conclusions: Literature shows that chronic pain problem after hysterectomy has been underestimated. Future results of our RCT will clarify if TAP block technique could be considered as a possible method enable to prevent CPSP in women with prediction of susceptibility. Furthermore, its use could reduce the consumption of analgesic drugs and their side effects, improving patients' comfort.

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ECG-Guidance for Optimal Central Venous Catheter Tip Positioning: A Case Report

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Case Report: Female patient, age 78 years, BMI 34, affected by end stage chronic renal disease was scheduled for positioning of cuffed tunneled central venous hemodialysis catheter. By blinded approach, nephrology team pricked unsuccessfully right internal jugular vein before and, then, left internal jugular vein. Because of the double failure, the qualified anesthesiology central venous catheter (CVC) team was asked for help.

First of all, the so-called Rapid Assessment for Central Venous Access (RaCeVA) protocol was performed [1] for excluding venous abnormalities (e.g., thrombosis, stenosis, external compression, anatomical variations of size, and shapes) and for obtaining a full anatomic evaluation for optimum site selection and the best insertion approach for the patient [2]. The protocol demonstrated the occurrence of a compressive perivascular hematoma around the right internal jugular vein; the right axillary vein was open; the left veins were compressible and there were no signs of thrombosis. Anesthesiologists selected the left internal jugular vein and performed ultrasound guided via posterior approach technique. A single venous puncture was practiced; Seldinger's wire was inserted into the right anonymous vein; real time ultrasound guidance was used during all procedure. Then, a member of the nephrology team inserted intravenous bilumen dialysis catheter. However, was detected catheter malfunction because although injection was not impaired, aspiration ability was particularly difficult. A chest radiograph was performed in the operating room and showed incorrect placement of CVC in the hemiazygos vein, as documented in figure 1. In turn, the device was replaced and a new procedure was successfully performed through ECG-guidance.

Conclusion: Real time ultrasound guidance is safer than static ultrasonography for CVC insertion [3]. However, the ECG guidance is appropriate to confirm correct placement of catheter tip, especially in difficult cases and in long standing catheter placement.

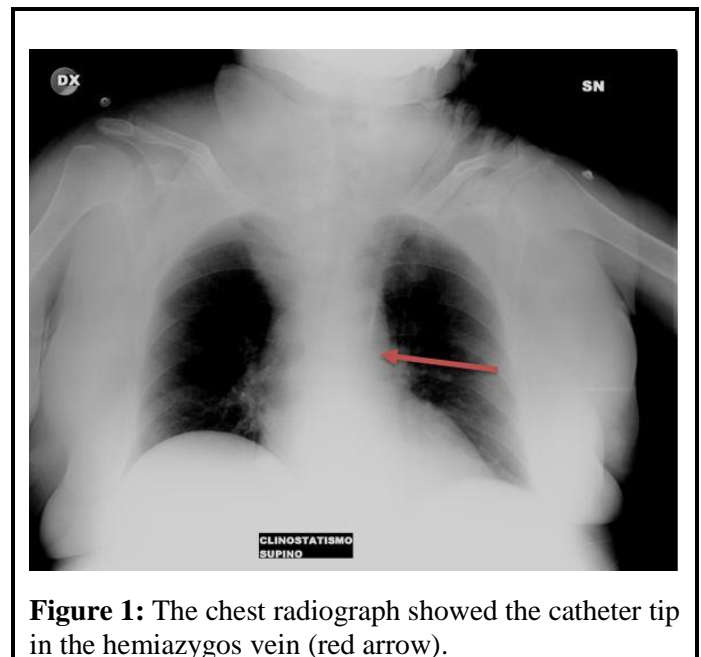


Figure 1: The chest radiograph showed the catheter tip in the hemiazygos vein (red arrow).

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Use of Dexmedetomidine in Combination with Retrobulbar Block in Ophthalmic Surgery of Cornea Transplant: Case Report

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Background: Corneal transplant is a microsurgery operation performed through an operating microscope. It has a duration ranging from thirty minutes to an hour and a half and can be performed under general anesthesia or local anesthesia with a hospital stay from one to three days. The intraoperative risks are generally high. Among these, the most dangerous is expulsive hemorrhage. Because of this, the ophthalmologist requires a maximum patient's compliance and immobilization, obtained mostly under general anesthesia. In ophthalmic surgery, patients with multiple comorbidities and high perioperative risk (ASA III) may benefit from a combination of retrobulbar block (RBB) with analog-sedation. This latter can be obtained through dexmedetomidine infusion which has consolidated analgosedative effects and is indicated for sedation of non-intubated adult patients prior to and/or during diagnostic or surgical procedures requiring sedation, i.e. procedural/awake sedation [1-4]. Dexmedetomidine, allows to get and maintain during surgical procedure a state of calm, anxiolysis, sedation, cooperation and ability to communicate by binding the cerebral alpha₂ adrenergic receptors and by causing a reduction in the activity of the sympathetic nervous system (sympatholytic effect) [5].

Case Report: A seventy-year-old male patient, suffering from multiple comorbidities including COPD stage III, severe arterial hypertension, ischemic heart disease, pre-existing episode of atrial fibrillation treated with bicameral pacemaker implantation, heart failure (EF 30-40%), chronic kidney disease not in dialysis treatment, grade I obesity (BMI 28) was scheduled for corneal transplant surgery (left eye). Considering the ASA III risk, it was decided to avoid general anesthesia, and to perform the procedure under analog-sedation approach combined with RBB.

Methods: The entire surgical procedure lasted approximately 75 minutes. The patient was monitored for: SpO₂, HR, NIBP, ECG, sedation level [Richmond Agitation Sedation Scale (RASS), under bispectral index (BIS) guidance] and he was spontaneously

breathing in ambient air with 3 L/min enrichment of O₂ using nasal goggles. The patient received a loading infusion of dexmedetomidine 1 µg/kg e.v. in 10 minutes, followed by a continuous intravenous infusion of 0.6-0.7 µg/kg/h, titrated to achieve the desired clinical effect with doses ranging from 0.2 and 1 µg/kg/hour. After the loading infusion, retrobulbar anesthesia was performed. The patient was monitored for up to one hour after the end of the operation.

Results: Continuous intravenous infusion of dexmedetomidine in combination with RBB allowed to maintain a hemodynamic and respiratory stability for the duration of the surgical procedure, with NIBP values: 140/80 mmHg, HR 60 rpm, SpO₂ 98%, with BIS values around 70. The patient was calm and collaborative for the whole duration of the operation. Furthermore, the RASS score was 0 after ten minutes from the drug switch off, at the end of the intervention.

Conclusions: In high risk patients, the proposed multimodal approach may allow to perform ophthalmic corneal transplant surgery obtaining, in turn, excellent compliance of the patient and the operator, and avoiding potential risks associated with general anesthesia.

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Antalgic Femoral Nerve Block in Emergency Room in Elderly Patients with Hip Fracture

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Background: The hip fracture in the elderly patients is one of the most frequent causes of hospitalization in orthopedic wards with a tendency to increase due to the aging of the population. International guidelines agree that surgery is the best treatment and that long waits increase mortality, recommending surgery within 24-28 hours of admission to hospital and therefore from diagnosis [1]. The Emergency Room (ER) has a fundamental role in organizing the course of care, for the diagnosis, the pathological anamnesis and the request for outpatient examinations and specialist advice and also for the treatment of the pain that in the hip fracture is severe and that increases with the movements as the periosteum is richly innervated by femoral nerve branches.

Aim: Was to assess in the ER the pain of patients with hip fracture treated with the femoral nerve block compared to those receiving acetaminophen and minor opioid. We also evaluated the ease of execution and the absence of side effects thanks to the use of ultrasound guidance [2].

Materials and Methods: We enrolled, by random method, 30 patients (20 F e 10 M), 65 to 90 years old, with hip fracture ASA II/III status and divided into two groups: N (femoral nerve block) and F (acetaminophen or minor opioids). Thus, we treated 15 patients with a femoral nerve block and 15 with paracetamol and minor

opioids. For the evaluation of pain intensity, we used the Visual Analogic Scale (VAS) 0-100. The N group was treated in the ER with an ECO / ENS assisted femoral nerve block with ropivacaine 2 mg/ml (15 ml). Group F was treated with acetaminophen 1000 mg i.v. every 8 hours and tramadol 100 mg every 12h.

Results: Before treatment the main pain intensity was 77. Patients of the N group showed a mean VAS score of 37 after 20 minutes from the femoral nerve block with easier mobilization. In group F, 4 patients (26.7%) had nausea/vomiting; 1 patient (6.7%) hypotension and VAS score for 5 patients (33.3%) remained above 50.

Conclusions: Due to its easy and safe execution the femoral nerve block is an effective alternative to conventional approaches for pain management in ER-patients with hip fracture awaiting surgery.

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Safety in Operating Rooms: Implementation of Communication Skills in a Nurse Team

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Introduction: Operating rooms (ORs) represent statistically one of the healthcare environments with the highest level of clinic risk and they are in general very relevant regarding the topic of safety in work environments. Among the risks linked to this context, we can identify some of them that are linked to communication gaps. Because of this relevance, we investigated on the main communication skills of a nurse team in an OR [1,2].

Resources and Methodology: We reviewed the publications on the topic from the last 12 months through PubMed e CINAHL Nursing Journal Databases databases, by using the following string search: ("communication"[MeSH Terms] OR "communication"[All Fields]) AND skills[All Fields] AND ("nurseries"[MeSH Terms] OR "nurseries"[All Fields] OR "nursery"[All Fields]). We identified 62 related scientific articles (38 in PubMed e 17 in CINAHL). After a screening of the references we could identify 15 additional articles. We excluded duplicates, abstracts, articles in other languages than English. We selected in total 36 articles.

Results: Through the selected resources we can deduce that an optimal communication within the team during

the whole operating process strongly reduced the amount of nursing errors which can occur during the process itself. Regarding the considered communication skills, we can deduce that lacking or low quality of communication among team members increases the probability of clinical and post-clinical risks.

Conclusions: The research shows up the importance and the consequences that communication skills of the team members in the operating room have on the provided service. More efficient efforts will be needed in standardizing team communication. The research remarks the importance of all aspects connected to the internal communications, the correct sharing of information and ethical behaviours, the importance of communication channels and tools, the improvement of quality in provided services and the team confidence in all professional roles.

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The Role of the Nursing Coordinator

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Introduction: It is the working space occupied by a professional figure within a health organization, encompassing all the activities and actions that the figure of the coordinating nurse performs within a hospital structure. Due to the organizational aspects and management of human resources, the role of nursing management is incisive on the progress of the processes and care pathways. The manager, in fact, 'directly' coordinates the professionals entrusted to him, to ensure, with efficient efficiency, the achievement of the mission of the company, through methods of appropriateness, safety, quality and satisfaction of the user. To achieve these objectives, it is necessary to share the processes with all the professionals according to their personality and attitudes. The aim is to positively affect the health and well-being of the patients. The main clinical-assistance, management, relational or leadership skills in a nursing team were assessed.

Materials and Methods: A review of the literature published on the subject in the last 12 months has been carried out, using databases such as PubMed and CINAHL Nursing Journal Databases. The following search string ("nurse administrators" [MeSH Terms] OR ("nurse" [All Fields] AND "administrators" [All Fields]) OR "nurse administrators" [All Fields] OR ("nurse" [All Fields] AND "manager" [All Fields]) OR "nurse manager" [All Fields]) was adopted. We have identified 16761 relevant scientific articles (16729 in PubMed and 32 in CINAHL). After the screening of the references, we have excluded duplicate articles, abstracts, articles, not in English. Finally, we have selected 50 totals.

Results: The literature review shows that managing a team is of fundamental importance, from the clear identification of roles to individual technical skills. It is of note that the communicative and empathetic quality of a leader. This figure should be involved in the organization of frequent meetings for professional updating of the professionals as well as periodic meetings (briefing, debriefing) in order to identify and share objectives responding to the mission and vision of business strategies. The target is to guarantee and facilitate both the growth of the organization and the satisfaction of the users. The nursing coordinator, therefore, must have developed attitudes in the communication processes, one of the focal points for those who manage; there cannot be a directive function without the global consideration of a given problem, which goes from the latter's awareness to the implementation criteria to be able to solve it.

Conclusions: The study highlights the importance that the nursing manager has among many obligations to establish clear and serene relationships between institutions and colleagues (collaboration, integration and teamwork), accompanying all available resources and present towards achievement of the objectives set.

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Digital Technology-Based Interventions for Reducing Distress and Anxiety in Children Undergoing Anaesthesia

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The preoperative period can be a stressful time for children and parents. Moreover, parental stress can be easily transmitted to a child, enhancing distress and anxiety [1]. Preoperative distress may extend beyond the end of surgery because it has been associated with the occurrence of emergence delirium (ED). This latter term describes a complex of perceptual disturbances and psychomotor agitation with disturbance of awareness of, or attention to, the child's environment, disorientation, and hyperactive behavior, that occurs in up to 50% of preschool-aged children in the early post-anesthetic period. In turn, ED increases the risk of self-injury and often involves delayed discharge. Again, the occurrence of ED has been found to be associated with a high rating of postoperative maladaptive behaviors [2]. As a consequence, it is mandatory to evaluate successful methods for improving co-operation and reducing preoperative distress and anxiety.

Non-pharmacological approaches to this issue encompass a wide range of interventions including environmental interventions (e.g., use of induction room, the patient retains own clothing); equipment modification; social interventions (e.g., parental or support person presence); and improvement of communication strategies from anesthesiologists and nurses. However, a recent meta-analysis on the topic concluded that for the majority of these interventions (e.g., focused on parental presence) there was a low, or very low, evidence in effective reduction of children's anxiety [3]. Other interventions, such as parental acupuncture, seems to be not easily applicable in the routine clinical practice. Music therapy, hypnotherapy, and the presence of clowns/clown doctors in the operative room did not reduce children's anxiety. Probably, targeted psychological interventions may be necessary. For this aim, digital technology could offer positive perspectives. Findings from research studies and results

of evidence-based analysis, indeed, underline that this approach is beneficial for children's social relationships and can be useful for treating their anxiety. Digital technology can be used for passive and interactive interventions in children. The former approaches concern, for instance, programs focused on video viewing (e.g., a fairy-tale) in the induction room whereas interactive interventions in children are mostly based on cartoons and interactive computer-based programs, or video games. In addition, digital technology can be also applied to reduce parental distress.

In conclusion, preoperative children/parent's anxiety and distress must be addressed for improving their well-being and for avoiding early and late postoperative cognitive/behavioural complications. However, in the lack of effective strategies, specific programs based on digital technology, and drawn under the assistance of psychologist's expert in the field should be better encouraged due to their ease, low cost, and potential effectiveness.

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Embolism of the Limbs: Case Report on a Rare Complication of the Intra-Aortic Balloon Pump

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Introduction: While the complication rates when using an intra-aortic balloon pump (IABP) are high and may account for up to 50% [1], thromboembolism with distal leg ischaemia limbs is a very rare complication of the procedure.

Case Report: Male 55 years old, cardiac arrest and prehospital resuscitation, Glasgow Coma Score (GCS) 3, intubated in mechanical ventilation. Although he underwent to percutaneous coronary angioplasty (PTCA) of the common trunk, an IABP was inserted on the left femoral artery due to ventricular dysfunction with an ejection fraction less than 30% [2]. The support was initiated using 1:1 electrocardiographic triggering (R wave triggered). Intravenous unfractionated heparin (500 UI/h). Levosimendan (bolus 12-24 mcg/kg and then c.i. 0.1 mcg/kg/min) and norepinephrine (0.10 mcg/kg/min) infusions were started.

- 1th day: haemodynamic stability; pale and cold feet, bilaterally.
- 2th day: IABP removing; inotropic and vasoconstrictor infusion switched off after de-escalation. After 4 hours: cold limbs. The doppler ultrasound showed thromboembolism of both lower limbs with absence of flow. The patient underwent to successful embolectomy procedure followed by respiratory weaning and sedative therapy de-escalation.
- 3th day: haemodynamic stability; GCS 15
- 5th day: compartment syndrome. The bilateral fasciotomy was necessary (figure 1).
- 7th day: start of physiotherapy.
- 10th day: tracheostomy followed by unsuccessful attempts of weaning from mechanical ventilation. Enteral nutrition (full capacity) normoproteic and normocaloric changed into hyperprotein and hypercaloric, with integration through nasogastric feeding tube (WCare®). VAC Therapy and targeted antibiotic therapy against multidrug-resistant *Pseudomonas aeruginosa* and *Acinetobacter baumannii*.
- 15th day: Large side necrosectomy
- 21th day: GCS 15: Rehabilitation program in

ICU.



Figure 1: Fasciotomy (5th day).

Conclusion: In this complex clinical case, a multimodal approach based on nutritional support, early physiotherapy, early cardiology rehabilitation and VAC therapy, all of them in addition to the basic drug therapy, have contributed to the complete resolution of the severe scenario (Figure 2) initiated by this rare complication of the IABP counter pulsation.



Figure 2: Clinical picture of the left after 30 days.

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Healthcare-Associated Infections in Coronary Intensive Care Unit

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Healthcare-associated infections (HAI) are a frequent cause of morbidity and mortality in Coronary Intensive Care Unit (CICU) patients. The most common infections are catheter-related urinary tract infections, hospital-acquired pneumonia and bloodstream infections, the latter mainly associated to invasive procedures including central line catheters [1]. These infections can be caused by a wide variety of microorganisms, including antimicrobial-resistant microorganisms. Initial inappropriate antibiotic treatment is an important and independent mortality risk factor for patients with severe bacterial infections. Many efforts have been made in the recent years to improve the prognosis of severe infections by reducing the risk of treating the patients inadequately [2]. Failure of the antimicrobial treatment may occur because inadequate antimicrobial tissue concentrations due to

underlying pathophysiological conditions. Drug-drug interactions between anti-infective and cardiologic agents is another major issue in critically ill cardiac patients. Here, we will briefly discuss the most common HAI in CICU, the clinical relevance of antimicrobial resistance and their therapeutic options.

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Sepsis in Critically Ill HIV-Infected Patients

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The widespread use of combination antiretroviral therapy (cART) has substantially improved the prognosis of patients infected with HIV. However, despite cART, HIV-infected patients are at greater risk of death compared to general uninfected population [1]. HIV infection is associated with an increased risk of severe bacterial infections, including sepsis [2]. Overall, sepsis is associated with high morbidity and mortality in critically ill HIV-uninfected and HIV-infected patients. The etiology of sepsis in HIV-infected patients depends on many factors including age, CD4+ cell count, clinical setting and geographic area. Septic HIV-infected patients admitted to the Intensive Care Unit (ICU) have a worse prognosis than patients without HIV infection. Moreover, sepsis independently affected the

short- and long-term mortality of HIV population. Finally, cART appears to be a major determinant of outcome in HIV-infected patients admitted to the ICU. In conclusion, despite the decrease in HIV-associated morbidity and mortality with the advent of cART, sepsis is yet a concern in HIV population [2].

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