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AND PERIOPERATIVE MEDICINE (SSAPM)
SWISS ASSOCIATION FOR ANAESTHESIA CARE (SIGA/FSIA)**

ABSTRACTS OF THE JOINT ANNUAL CONGRESS 2025

LAUSANNE, NOVEMBER 6–8, 2025

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ORAL PRESENTATIONS

OP 1

Reducing Sevoflurane Emissions: The Role of EcoFlow in Enhancing Anesthetic SustainabilityGomez Pereda D¹, Schwitter C¹, Mauermann E², Blumenthal S³, Rumpff D⁴¹Department of Anaesthesia, Stadtspital Zurich, Switzerland

Background: Climate change is a pressing global health threat, with the Swiss healthcare sector contributing approximately 6.7% of national greenhouse gas (GHG) emissions. Volatile anesthetics such as sevoflurane significantly contribute to these emissions. One promising strategy to reduce their environmental impact involves minimizing fresh gas flow rates through automated control systems such as EcoFlow®.

Objective: This quality control study evaluated the impact of implementing EcoFlow® technology – combined with structured staff training – on sevoflurane consumption, associated costs, and CO₂-equivalent emissions in a large urban hospital setting. We hypothesized that EcoFlow® would reduce sevoflurane use by at least 33%.

Methods: A prospective before–during–after (B-D-A) analysis was conducted at Stadtspital Zürich from December 2024 to February 2025. Adult patients undergoing elective surgery under general anesthesia with sevoflurane were included. The intervention involved the use of EcoFlow®, a clinical decision support tool integrated into anesthesia machines. Primary outcomes were sevoflurane consumption (mL/min), financial expenditure (CHF), and estimated CO₂ emissions based on GWP100 values.

Results: A total of 92 patients were analyzed (B: n = 34; D: n = 35; A: n = 23). During the EcoFlow phase, sevoflurane consumption decreased by 37.04%, with corresponding reductions in CO₂ emissions (25.56%) and cost (26.09%). After discontinuation, agent use increased slightly but remained below baseline, indicating a sustained behavioral impact. High correlations (r = 0.99) were observed between agent use, emissions, and cost. National extrapolations suggest a potential reduction of 1,783 metric tons of CO₂ annually representing a 37% drop in sevoflurane-related emissions.

Conclusion: EcoFlow® technology significantly reduced sevoflurane use, environmental emissions, and cost without compromising clinical care. Behavioral changes persisted beyond the intervention phase, underscoring the potential for long-term impact. Integrating intelligent automation into anesthesia practice offers a scalable pathway to achieving climate targets within healthcare.

OP 2

Sex Differences in the Prediction of Inducible Myocardial Deoxygenation Triggered by Blood Gas ChangesReinmann I¹, Abegg J¹, Weiner J², Heinisch C², Schmid B¹, Kujawski T², Guensch DP¹, Fischer K¹¹Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland;²Cardiology, Hospital Centre of Biel, Biel, Switzerland

Background: A key cause of perioperative complications is inducible myocardial ischaemia. To identify patients at risk, anaesthesiologists are increasingly using cardiovascular magnetic resonance (CMR) reports, focusing on ventricular ejection fraction, myocardial scarring and perfusion. However, traditional diagnostic markers often fail to detect microvascular abnormalities, which are more prevalent in females. Subsequently, females are underdiagnosed with cardiovascular disease and

their risk is underestimated in perioperative assessments. CMR now has modern quantitative techniques designed to detect microvascular abnormalities. The aim of this study was to assess, in a diagnostic setting, whether routine modern quantitative CMR measurements could better predict myocardium prone to deoxygenation, especially in females.

Methods: Patients (n = 108, 66±11 years, 31% female) referred for a diagnostic CMR stress exam were recruited. A research imaging technique called oxygenation-sensitive CMR was applied to quantify changes in myocardial oxygenation after a hyperaemic breathing manoeuvre. Up to twelve myocardial segments per patient were measured. Logistic regression compared if modern quantitative measures for ventricular function (strain), hyperaemic quantitative myocardial blood flow and myocardial fibrosis (T1 mapping) better predicted regional myocardial deoxygenation in comparison to the traditional model of ejection fraction, first pass perfusion and focal scar.

Results: In males, 40% (271/680) of the myocardial segments exhibited deoxygenation after the breathing manoeuvre. The traditional model predicted deoxygenation (AUC = 0.57, p <0.01), but the quantitative model was superior (AUC = 0.64, p <0.01). In females, although 39% (138/352) of the segments showed myocardial deoxygenation, the traditional imaging parameters were ineffective at predicting these, as no females presented classical perfusion deficits or an ejection fraction below 40% (AUC = 0.50, p = 0.92). Deoxygenation in females could only be predicted by quantitative measures (AUC = 0.68, p <0.01)

Conclusion: Newer quantitative measures from CMR reports better predict which patients are at risk of inducible myocardial deoxygenation in a diagnostic setting, especially in females who were missed by traditional markers. It is now warranted to investigate if these CMR findings can be used by anaesthesiologists to more effectively identify female patients at risk for perioperative myocardial ischaemia.

OP 3

Despite an improvement in left ventricular function, elective electrical cardioversion is associated with acute and chronic myocardial injuryColatruglio D¹, Becker P¹, Grob L¹, Tanner H², Reichlin T², Guensch DP^{1,3}, Fischer K¹¹Department of Anaesthesiology and Pain Medicine, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland; ²Department of Cardiology, Inselspital, Bern University Hospital, University of Bern, Switzerland;³Department of Diagnostic, Interventional and Paediatric Radiology, Inselspital, Bern University Hospital, University of Bern, Switzerland

Introduction: Atrial fibrillation is the most common arrhythmia and can be solved using electric cardioversion (EC). While rhythm control is often necessary, the potential acute and long-term negative effects of EC on the heart remain unclear. Cardiovascular magnetic resonance (CMR) can noninvasively quantify both myocardial injury such as oedema and fibrosis, and ventricular function using ejection fraction and strain analysis techniques. This study applied CMR imaging to investigate if EC leads to the development of acute and chronic myocardial tissue injury and how the intervention impacts ventricular function in patients with atrial fibrillation.

Methods: Patients undergoing elective EC underwent a series of three CMR exams: 1) prior to EC; 2) 2-5h after EC; and 3) 6-12 weeks later. From each exam, myocardial oedema was quantified from T2 maps, and myocardial fibrosis from extracellular volume maps. Left ventricular function was measured using

ejection fraction and longitudinal strain analysis, while ventricular contractile synchronicity was defined by mechanical dispersion.

Results: Nineteen patients (age 25–81 years; 21% female) underwent one to three biphasic shocks (120–600J) to restore sinus rhythm. T2 water content increased from baseline to the post-EC (T2 40.3±1.8 ms to 42.6±2.5 ms, $p < 0.01$), indicating increased myocardial water content, normalizing by the long-term exam (40.9±1.6 ms, $p = 0.13$). As a marker of fibrotic tissue, there was no acute change in global extracellular volume (28.5±2.3% to 29.3±2.0%, $p = 0.10$), but it significantly increased by the third exam (30.8±2.8%, $p < 0.01$). Ejection fraction improved shortly after EC (43±10% to 50±12, $p = 0.02$), as did peak strain (-11.5±3.9% to -14.6±2.8%, $p < 0.01$), with reduced mechanical dispersion (112±48 ms to 72±29 ms, $p < 0.01$) indicating better ventricular synchronicity. By the third exam, ejection fraction was 52±14% ($p = 0.06$ vs pre-EC), while peak strain (-15.1±3.9%, $p < 0.01$) and synchronicity (mechanical dispersion, 86±33 ms, $p = 0.02$) remained better than pre-EC values.

Conclusion: Although elective EC improves left ventricular function and synchronicity, it led to transient oedema in the myocardium, followed by the subsequent accumulation of fibrotic load. Using advanced imaging modalities, these findings provide insight into the impact of EC on the heart and demonstrate that, despite rhythm control, patients may develop new acute and chronic myocardial injuries resulting from the intervention.

OP 4

Understanding the ideal intraoperative FiO₂ targets for avoiding perioperative cardiovascular complications: Insights from cardiac troponins and echocardiography

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Background: Patients with cardiovascular disease are at risk of perioperative myocardial ischaemia during major non-cardiac surgery (MINS). Hyperoxia, a known vasoconstrictor, may be a trigger. However, international studies show that its effects are heterogeneous, being detrimental in many cardiac patients, yet some patients benefit from higher oxygen titrations. Now it is important to combine pre-, intra- and postoperative findings to understand who is at risk for developing myocardial ischaemia during anaesthesia and in which patients hyperoxia is indeed a trigger. While MINS is defined by postoperative high-sensitivity cardiac troponin (hsTnT), intraoperative echocardiography can immediately quantify cardiac dysfunction. Therefore, this study applied both techniques to investigate the relationship of hyperoxia on cardiac function and MINS in anesthetized patients.

Methods: Fifty patients with ≥2 cardiovascular risk factors who were scheduled for major vascular surgery were prospectively recruited. After induction of general anaesthesia, the fraction of inspired oxygen was titrated to both 0.3 and 0.8 and the left ventricle was imaged with echocardiography and quantified for circumferential strain. Blood samples were acquired preoperatively and 24h after surgery and measured for hsTnT. MINS was defined by a rise in ≥5ng/L to 20–64 ng/L, or by hs-TnT ≥65 ng/L.

Results: MINS occurred in 10 (20%) patients. Only preoperative hsTnT could predict which patients would develop MINS (AUC = 0.715, $p = 0.037$), with a threshold of hsTnT > 18 ng/l as the optimal cut-off (specificity 83%, sensitivity 54%). Intraoperative

imaging showed that 28 (56%) of patients had worsening of ventricular strain under hyperoxic conditions, which was predicted by preoperative hsTnT <12ng/l (AUC = 0.678, $p = 0.044$).

Conclusion: A combination of biomarker analysis and intraoperative imaging may help understand which patients are at risk for cardiovascular complications during general anaesthesia for major non-cardiac surgery. Preoperative hsTnT discriminated if patients' ventricular function would benefit from a high or low titrated oxygen, and which patients develop MINS. Ongoing recruitment aims to further elucidate the relationship between perioperative functional changes and long-term outcomes.

OP 5

Intraoperative Alterations in Insulin, C-Peptide, and Haemolysis During Cardiopulmonary Bypass: Insights from an Observational Study

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Introduction: Hyperglycaemia is a common and clinically significant issue during cardiovascular surgery on cardiopulmonary bypass (CPB), contributing to increased postoperative morbidity and mortality. The unusually high insulin requirements observed during CPB remain poorly understood. We recently demonstrated in an ex-vivo study, that substantial insulin degradation is associated with increased haemolysis during CPB. However, clinical data supporting this mechanism is lacking. This study aims to explore the alterations of haemolysis, endogenous insulin, and C-peptide levels in patients undergoing elective cardiac surgery with CPB.

Methods: In this prospective observational study, blood samples were obtained to measure endogenous insulin concentration, the haemolysis index and C-peptide at seven predefined timepoints, including measurements before the start of CPB (baseline), before and after aortic cross-clamping, during CPB, and after CPB. A highly specific human insulin immunoassay was used and recombinant insulin aspart boli were administered according to clinical protocols.

Results: This interim analysis includes 20 patients (age: 46–81 years, 50% type 2 diabetes, 50% no diabetes, 14 male). Endogenous insulin concentrations (median [interquartile range]) rose from 4.2 [2.2, 9.3] µU/ml at baseline to 11.1 [4.4, 15.9] µU/ml following aortic cross-clamping ($p = 0.02$). The nadir of 1.1 [0.0, 2.1] µU/ml was detected 60 minutes after decannulation from CPB ($p < 0.01$), what is below the laboratory's reference range for fasting insulin levels (2.6–24.9 µU/ml). The haemolysis index increased progressively during CPB, rising from 7.0 [5.0, 8.0] to 14.0 [10.5, 15.0] immediately after CPB initiation ($p < 0.01$). Peak levels were observed directly after decannulation (41.0 [22.0, 48.8]) and remained elevated at 60 minutes post-CPB (35.0 [24.5, 44.5], $p < 0.01$). C-peptide concentrations remained stable during CPB compared to baseline values (1.18 [0.9, 1.6] ng/ml), but showed a significant decrease to 0.81 [0.5, 1.3] ng/ml at 60 minutes post-decannulation ($p < 0.01$).

Conclusion: The decrease in insulin alongside rising haemolysis supports our ex-vivo findings of haemolysis-driven insulin degradation. C-peptide levels remained stable throughout CPB,

indicating sustained pancreatic function. Future steps will involve accounting for exogenously administered insulin, ultimately aiming to better understand the mechanisms behind perioperative hyperglycaemia and to improve patient outcomes.

OP 6

Comparing the Incidence and Extent of Post-Induction Hypotension between Titration and Conventional Induction with Propofol TCI in Adults Undergoing Non-Cardiac Surgery – a Retrospective Cohort Study

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Background: Hypotension is the most common side effect of propofol and is more pronounced at high plasma concentrations, particularly in elderly patients. The aim of this study was to investigate whether this side effect can be reduced through individualised drug titration.

Methods: This retrospective cohort study included patients undergoing planned, non-cardiac surgery at the University Hospital Basel from February 2022 to December 2024. Both groups used target-controlled infusion (TCI) for propofol (Schnider model) and for remifentanyl (Minto model). The titrated group received an anaesthesia induction with a stepwise increase of the propofol target effect site concentration (Cet) by 0.5-1(2) ug/ml until loss of consciousness, whereas the conventional group received a high starting Cet of 4-8 ug/ml. To create a balanced dataset, surgical disciplines were frequency-matched between the two groups. Using a two-sample t-test, the area under the individual pre-induction threshold of the mean arterial pressure (MAP) as well as the MAPs maximum decrease were compared between both groups as a primary and first secondary endpoint, respectively. The final multivariable regression analysis still needs to be performed.

Preliminary Results: In this preliminary analysis of 345 patients, 168 (49%) received a titrated and 177 (51%) a conventional anaesthesia induction. Most baseline characteristics such as age, with a median of 54 years (IQR: 41-68) in the titration group and 53 years (IQR: 38-64) in the conventional group as well as BMI, gender and cardiovascular comorbidities were comparable. However, there were fewer ASA II and more ASA III patients in the titration group (83 (49%) and 71 (42%)) than in the conventional group (110 (62%) and 54 (31%)). In the still unadjusted analysis, the area under the threshold of the MAP was found to have significantly decreased in the titration group with a mean difference (SD) of 68.0 (30.3) mmHg*min (95%-CI: 8.4 to 127.6 mmHg*min; $p = 0.025$). However, the maximum decrease of the MAP was found to be only insignificantly smaller in the titrated group with a mean difference (SD) of 1.5 (1.3) mmHg (95%-CI: -1.0 to 3.9 mmHg, $p = 0.241$). Additionally, fewer patients received vasoactive drugs in the titration group 69 (41%) than in the conventional group 79 (45%).

Conclusions: The titration approach resulted in a reduction of the area under the threshold of the MAP and thereby is a promising alternative to conventional induction techniques.

OP 7

Randomized controlled trials of goal-directed haemodynamic therapy for noncardiac surgery: A Bayesian reanalysis of available evidence

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Background: Haemodynamic management constitutes a cornerstone of perioperative care. Goal-directed haemodynamic therapy (GDHT) presents an effort to optimize plasma volume expansion intraoperatively. Recent meta-analyses assessing the relative benefit of GDHT versus a conventional fluid therapy were based on frequentist methods. Here, we employ a Bayesian framework to reanalyze the available data from published randomized controlled trials (RCTs) and focus on the probability of GDHT superiority.

Methods: Based on a previous published meta-analyses (PMID: 39687427), we performed a Bayesian meta-analysis for the outcomes mortality, sepsis, surgical site infection (SSI), pneumonia, urinary tract infection (UTI), acute kidney injury (AKI), paralytic ileus, the need for reoperation and the incidence of ≥ 1 complications. Results shown here are based on an uninformative, normally distributed prior on the log-odds ratio scale and a half-Cauchy distribution for the heterogeneity parameter tau. The probability of an overall GDHT benefit was calculated from the cumulative incidence function of the posterior distributions and are compared to a frequentist random effects meta-analysis. All calculations were performed with R.

Results: We found an overall GDHT superiority for all outcomes, however, to a varying degree. There is only weak evidence for superiority for sepsis and reoperation with probabilities for a GDHT benefit of 54% and 71%, respectively. For all other outcomes, the probability of a GDHT benefit ranges from 89% to more than 99%, in particular for the outcomes SSI, pneumonia and more than one complication. With respect to P values, the traditional threshold of 0.05 for the significance level creates an artificial distinction between outcomes that show similar GDHT benefits. For example, the probabilities of GDHT superiority for AKI and UTI are 96% and 98%, respectively. Their corresponding P values from conventional meta-analyses are 0.087 and 0.030, which would be considered statistically non-significant and significant, despite their similar GDHT benefits.

Discussion: A Bayesian perspective highlighted clinically relevant, complementary insights of the relative benefit of GDHT compared to a control treatment. The Bayesian re-analysis demonstrated the overall superiority of GDHT for all outcomes considered based on probabilities rather than on P values. Further analyses will quantify the probability of a GDHT benefit for various clinically relevant thresholds.

OP 8

Public Perceptions of Ambulatory Surgery in Geneva, Switzerland

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Background: Outpatient surgery is rapidly expanding worldwide, but its adoption in Switzerland remains relatively limited due to several factors, including a strong tradition of hospitalization rooted in a culture of safety, trust, and comfort. This study aims to explore the general population's perception of ambulatory surgery in the Canton of Geneva, Switzerland.

Methods: We analyzed data from a population-based study completed in March 2025. The questionnaire assessed general health and included specific questions about experiences and attitudes toward ambulatory surgery.

Results: Among 3,957 respondents (mean age 52.6 years; female (60%, n = 2,346)), 40% (n = 1,582) reported being fully comfortable with ambulatory surgery, while 60% (n = 2,257) expressed moderate to significant concerns and preferred conventional hospitalization. Among those reluctant to ambulatory surgery, the most common concerns were potential complications (54%, n = 1,246), insufficient medical monitoring at home (49%, n = 1,139), and logistical challenges (27%, n = 616). Additionally, 22% (n = 508) expressed concerns about pain management, while only 4.0% (n = 82) were worried about medication management errors. Women were significantly more reluctant to engage in ambulatory surgery, compared to men (adjusted OR = 2.18, 95% CI: 1.90–2.49). Patients with poor mental health (adjusted OR = 1.38, 95% CI: 1.11–1.72) and poor physical health (adjusted OR = 1.31, 95% CI: 1.09–1.58) were significantly more likely to express negative attitudes toward ambulatory surgery. Conversely, participants with good or very good financial situations were less likely to have concerns (adjusted OR = 0.80, 95% CI: 0.66–0.96) compared to those with average to poor finances. Prior experience with ambulatory surgery was associated with increased acceptance, rising from 40% among those without experience to 47% among those with previous exposure.

Conclusion: A significant proportion of the population in this cohort expressed hesitation toward ambulatory surgery. Targeted education may be necessary to improve public acceptance and support the ongoing development of ambulatory surgical care in Switzerland.

The study was approved by the Cantonal Research Ethics Commission of Geneva (CCER project ID 2020–00881).

OP 9

Risk factors for chronic neuropathic pain after surgery

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Background: Chronic pain after surgery, especially chronic neuropathic pain (NP), has a severe impact on patients' quality of life. Screening questionnaires can be used to detect possible neuropathic pain.

Aim of the study: Possible risk factors for NP 12 months after surgery.

Methods: Following ethics committee approval and written informed consent, patients were enrolled in PAIN OUT. Participants completed the Brief Pain Inventory and the interview version of the Douleur Neuropathique en 4 Questions (DN2) 6 and 12 months (M6/M12) after surgery. A positive screening for NP was defined as ≥ 3 of 7 possible symptoms.

Primary endpoint: DN2 results at M12. Comparison of patients with positive (DN2+) vs. negative DN2 (DN2-) for pain-related outcomes, patient characteristics, and surgical intervention.

Statistics: ANOVA, Kruskal-Wallis, χ^2 -test, multivariable logistic regression analysis.

Results: 2'133 patients with complete data on M6 and M12 were analysed (age 50 $\pm$ 16 years; 64% female). Preoperative chronic pain was reported in 42% (women: 49%). 123 participants took opioids before surgery. At M6/M12, 12.8%/11.7% had a positive DN2 screening, most frequently after neurosurgical back surgery (M6: spine 25%, orthopaedics 21%, gynaecology 13%, general surgery 6%). The proportion of patients with DN2+ increased with increasing pain intensity; at M6 for patients with

no, mild (Pain Composite Score NRS <3), moderate (NRS 3–6) or severe pain (NRS >6): 2%/34%/54%/63% (p < 0.001). Similarly, DN2+ patients reported more pain-related impairment (p < 0.001). At M12, 12% had chronic postsurgical pain (CPSP, ICD-11 definition), 9% had pain unrelated to surgery, and 15% had pain at the surgical site not meeting the ICD-11 criteria. The groups did not differ in DN2 results (DN2+: 28%/21%/31%). Regression analysis showed an association between DN2+ results and the following variables: surgical department (e.g. gynaecology vs. general surgery (OR (95% CI): 3.0 (1.9–5.0), M12 mild pain (6.8 (4.5–10.4)), M12 moderate to severe pain (17.8 (11.1–29.0)), pain-related interference 24h after surgery (1.1 (1.0–1.2), and postoperative opioids (1.4 (1.0–2.0)).

Conclusion: The type of surgery and pain intensity at follow-up were the most important variables associated with a positive DN2. The diagnosis of NP should be confirmed by further investigations.

OP 10

GUT - Gastric Ultrasound in Trauma

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Background: Trauma patients are at an increased risk for pulmonary aspiration during emergency anesthesiologic care. Achieving a fasting state according to national or institutional guidelines by delaying surgery is often neither feasible nor desirable and might be further complicated in traumatic injuries by the presence of delayed gastric emptying. Data regarding the extent and time-course of delayed gastric emptying is still lacking. POCUS assessment of gastric content to determine the fasting state is a novel tool with promising reliability and applicability.

Methods: In this single-center, exploratory, observational, cross-sectional study, all non-pregnant patients from 18–80 years presenting to the local emergency department for non-life-threatening traumatic injury were eligible. Patients were included depending on workload feasibility. Included patients had to be in a non-fasted state at the time of injury (i.e. last meal <6h before injury). To assess for residual gastric content, patients underwent a standardized gastric ultrasound examination 6 to 8 hours after their last meal. Patients with concurrent medical conditions known to impair gastric emptying were excluded from this study. Residual gastric content corresponding to a non-fasting state was defined as either any solid content, or more than 1.5mL/kg bodyweight of clear liquid. The primary endpoint was to determine the fasting state of patients after exceeding the conventional fasting intervals.

Results: This study included 28 patients (9 women, 19 men) presenting with non-life-threatening traumatic injury. Patients were a median of 42 (IQR 27;57) years old. Most patients were healthy (64% ASA I, 28% ASA II). Traumatic injury to an extremity was the most common injury type (71%). In 23/28 patients (p = 0.82, 95%CI [0.64,0.92]) residual gastric content corresponding to a non-fasting state was found on gastric ultrasound examination. Median time between last meal and the ultrasound examination was 6.25 (IQR 6.1;6.8) hours. The median time between injury and ultrasound examination was 3.8 (IQR 2.6;4.5) hours. The mean gastric volume of patients with residual gastric content was 107 (SD $\pm$ 55) mL.

Conclusion: The rate of residual gastric content present after a fasting period of 6 to 8 hours is markedly increased in patients with non-life-threatening traumatic injury, suggesting delayed gastric emptying. This study emphasizes the need for caution regarding the fasting state of trauma patients.

POSTERS

P 1

Dexmedetomidine vs Remimazolam: Evaluating sedation characteristics and post-interventional reorientation in procedural sedation for transcatheter aortic valve implantationsAebi J¹, Toengi N¹, Fischer K¹, Filipovic MG¹, Guensch DP¹¹Department of Anaesthesiology and Pain Medicine, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland.

Background: Dexmedetomidine (dex), often the drug of choice for procedural sedation in transfemoral transcatheter aortic valve implantation (TAVI), has significant drawbacks, including a slow and unreliable onset of action and suboptimal controllability of sedation depth and duration. The advent of remimazolam (rem), a novel ultra-short-acting benzodiazepine, offers a solution to these problems due to its distinct mechanism of action. The aim of this study was to compare the key sedation characteristics of dex and rem in TAVI procedures.

Methods: In this observational study, we recruited elective transfemoral TAVI patients scheduled for procedural sedation with either dex or rem. Participants were monitored from arrival in the operating room until two hours after regaining consciousness. Sedation depth was recorded at predefined time points using the Richmond Agitation Sedation Scale (RASS) ranging from -5 (unarousable) to 4 (combative). Reorientation was measured with the Nursing Delirium Screening Scale (Nu-DESC) where scores range from 0 (unremarkable) to 10 (pathological), with scores ≥ 2 corresponding to delirium. Time to loss and regain of consciousness were also recorded.

Results: Overall, 53 patients were included in the dex group (81 $\pm$ 7y, 53% male) and 46 patients in the rem group (82 $\pm$ 5y, 67% male). Time to loss of consciousness was significantly faster with rem (dex: 20[13–38] min vs rem: 4[3–6] min, $p < 0.01$), while time to regain consciousness was longer (dex: 13[8–20] min vs rem: 21[15–30] min, $p < 0.01$). Rem resulted in deeper sedation at all timepoints measured. Nu-DESC scores were worse in the rem group at regain of consciousness (rem: 2.12 $\pm$ 2.10 vs dex: 0.96 $\pm$ 1.45, $p < 0.01$), while Nu-DESC scores for dex were poorer 1h and 2h later (rem: 0.33 $\pm$ 1.35 vs dex: 0.45 $\pm$ 1.03, $p = 0.03$ / rem: 0.15 $\pm$ 0.89 vs dex: 0.29 $\pm$ 0.64, $p = 0.02$).

Conclusion: Rem is a promising alternative for procedural sedation in TAVI, with a faster onset and deeper overall sedation compared to dex. In addition, reorientation was slightly better one and two hours after regaining consciousness, suggesting a potential mitigating or at least equivalent effect on delirium in this high-risk patient population. However, time to regain of consciousness was longer in the rem group, which may be related to the limited experience at the time with this agent. Further studies with a focus on postoperative reorientation and delirium, as well as after more user experience with rem, are warranted.

P 2

Correlation between ROTEM values compared to conventional laboratory and validation of a cardiac app in non-cardiac patientsFischer P¹, Mauermann E², Frei I³, Bolliger D³¹Kantonsspital Aarau, KSA, Aarau Switzerland; ²Department of Anesthesia, Zurich City Hospital; ³Clinic for Anesthesia, Intermediate Care, Prehospital Emergency Medicine and Pain Therapy, University Hospital Basel

Background: Rotational thromboelastometry (ROTEM) is increasingly used in coagulation management, but its validation outside of cardiac surgery remains limited. This study aimed to evaluate the correlation between ROTEM values and conventional laboratory measurements in non-cardiac patients and to assess the applicability of a ROTEM-based predictive app originally developed for cardiac surgery.

Methods: In this retrospective, single-center cohort study, 257 non-cardiac patients with simultaneous ROTEM and laboratory measurements were analyzed. Correlations between ROTEM parameters (FIBTEM A10/MCF, EXTEM A10, INTEM A10) and laboratory fibrinogen and platelet counts were assessed using Pearson's correlation and Bland-Altman analysis. A predictive model based on cardiac surgery data was applied to estimate fibrinogen and platelet values, which were then compared with observed laboratory results.

Results: Fibrinogen correlated with FIBTEM A10 and FIBTEM MCF (both $r = 0.82$). Platelet count correlated with EXTEM A10 ($r = 0.58$), INTEM A10 ($r = 0.61$), and EXTEM-FIBTEM A10 ($r = 0.57$). AUROC for hypofibrinogenemia was 0.92 (95% CI: 0.87–0.96) for FIBTEM A10, 0.89 (95% CI: 0.84–0.95) for FIBTEM MCF, and 0.89 (95% CI: 0.80–0.98) for EXTEM alpha. AUROC for thrombocytopenia was 0.95 (95% CI: 0.90–1.00) for EXTEM A10, 0.96 (95% CI: 0.94–0.99) for INTEM A10, and 0.97 (95% CI: 0.95–0.99) for EXTEM-FIBTEM A10. Predicted and observed fibrinogen values correlated at $r = 0.82$. Predicted and observed platelet counts correlated at $r = 0.58$ for EXTEM A10, $r = 0.61$ for INTEM A10, and $r = 0.57$ for EXTEM-FIBTEM A10. Bland-Altman analysis showed a mean bias of +0.8 g/dL for fibrinogen and +62, +50, and +50 $\times 10^9/L$ for platelet counts.

Conclusion: ROTEM parameters, especially FIBTEM A10 for fibrinogen and EXTEM/INTEM A10 for platelet count, showed strong correlation with conventional laboratory values in non-cardiac patients. These results support the utility of ROTEM as a reliable point-of-care tool for coagulation assessment beyond cardiac surgery. The ROTEM-based predictive app demonstrated good external applicability but consistently underestimated actual fibrinogen and platelet values in this broader patient cohort.

P 3

Intraoperative blood irradiation during living donor liver transplantation. A pioneering experience in Ukraine with a technique adopted in Switzerland

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Introduction: Liver transplantation from a living (LDLT) and from a deceased donor has seen significant development in Ukraine over the past few years. One of the anaesthetic challenges is considerable intraoperative blood loss. The use of allogeneic red blood cells is a significant predictor of early postoperative mortality. It can lead to or enhance graft dysfunction and increase the risk of developing transfusion-related acute lung injury. The use of intraoperative red blood cell-salvage significantly reduces the need for allogeneic transfusion and helps avoid the aforementioned complications. However, it is not always possible to use it in oncological patients because of the risk of metastasis.

Objectives: We adopted the experience of intraoperative blood irradiation following a 2-month training program undertaken by an anaesthesiologist from our clinic at the University Hospital Zürich. The objective of our study was to investigate the results of intraoperative irradiation of washed red blood cells with cell-salvage during LDLT in a patient with hepatocarcinoma.

Materials and Methods of the Study: Gamma radiation damages DNA structures, leading to a loss of the cells' ability to replicate. It has been proven that the optimal irradiation dose is 50 Gy, representing a compromise between the need to ensure complete inactivation of tumor cells and the preservation of the functional properties of red blood cells. A TrueBeam 2.7 linear accelerator was used for irradiation.

Using an autotransfusion system (cell-salvage), four doses of red blood cells were obtained and washed, with a total volume of 1750 mL and a hematocrit of 78–79%. Each dose of red blood cell mass was irradiated for 15 minutes with a dose of 50 Gy in the radiation therapy department.

Results: In the postoperative period, no signs of acute respiratory failure, need for oxygen therapy, or CPAP therapy were observed. In the early postoperative period, there were no indications for transfusion of allogeneic red blood cells. The patient remained in the ICU for 7 days.

Conclusions: The use of intraoperative irradiation of washed red blood cells allowed for the avoidance of postoperative complications associated with massive allogeneic blood transfusion. Our positive experience in a recipient with hepatocellular carcinoma demonstrates the need to expand the use of this method in major surgical interventions in patients with an oncological diagnosis.

P 4

Imaging the interaction of caffeine and oxygen on the myocardium with cardiovascular magnetic resonance

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Introduction: Caffeine is one of the most consumed pharmacologically active substances. Little is known about how caffeine impacts cardiovascular function and if it interacts with other substances present in the operating room, specifically supplemental oxygen which has known vasoconstricting properties. Using cardiovascular magnetic resonance (CMR), the effects of these substances on myocardial oxygenation and ventricular function can be assessed. By imaging the heart in a controlled setting, these effects can be isolated without confounders present in a complex perioperative setting. Therefore, this study investigated the cardiovascular effects of caffeine and oxygen in healthy awake participants using CMR.

Methods: In a clinical trial, 28 healthy volunteers <45y were recruited to undergo two CMR exams. Firstly, systolic and diastolic function of the left (LV) ventricle were measured using circumferential peak strain and early diastolic strain rate. An oxygenation-sensitive sequence quantified LV myocardial oxygenation changes. Participants then breathed oxygen (10l/min) with a non-rebreathing mask and images were reobtained. After the exam, participants consumed three espresso shots (150mg caffeine). Two hours later, the exam was repeated and all measurements were compared to baseline.

Results: As primary outcome, the myocardial oxygenation response demonstrated a non-significant trend for deoxygenation -1.2% (95%-CI: -2.5 to 0.0, p = 0.055) in comparison to baseline. When oxygen was administered after caffeine, no negative effects were observed on the tissue (-0.2%, 95%-CI: -1.5 to 1.0, p = 0.72). As secondary outcomes, LV systolic (baseline: -18.7±1.8%, O₂: -18.0±1.6%, p <0.01) and diastolic function (baseline: 1.2±0.2s-1, O₂: 1.1±0.2s-1, p = 0.02) worsened after O₂ administration. When oxygen was administered after caffeine, there was an improvement in LV systolic function from baseline to -19.2±1.5% (p = 0.01) but not in LV diastolic function (1.1±0.2s-1, p = 0.25) with O₂.

Conclusion: Using CMR, the effect of supplemental oxygen and caffeine on myocardial tissue and function was comprehensively investigated in a controlled setting. Supplemental oxygen had a negative impact across the heart, while in combination, caffeine appeared to eliminate these detriments. It is now warranted to assess if these findings translate to a perioperative environment. These data could transform the view of anaesthesiologists on preoperative caffeine leading to uniformed protocols.

P 5

Perioperative imaging detects fluctuations in myocardial oxygenation during the induction of general anaesthesia

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Background: The induction of general anaesthesia (GA) is a complex and dynamic process, yet little is known what happens to the myocardial tissue during this time. Administered medications and changes in blood gases and blood pressure affect cardiovascular oxygen supply. Consequently, the myocardium is particularly vulnerable to an oxygen supply-demand imbalance. Recognising when these physiological changes occur and what are potential triggers for myocardial ischaemia is crucial for improving patient outcomes. Development of real-time oxygenation-sensitive cardiovascular magnetic resonance (CMR) now offers a non-invasive method to analyse and quantify myocardial oxygenation for every single heartbeat. This study investigated the effect of GA induction on myocardial oxygenation using this novel CMR technique in a perioperative setting.

Methods: In a prospective observational study, patients scheduled for elective surgery were recruited to undergo induction of GA inside an MRI. Real-time oxygenation-sensitive CMR was used to continuously measure myocardial oxygenation throughout the induction process and for the first 10 minutes of anaesthesia maintenance. Images were analysed for relative changes in myocardial oxygenation compared to the awake baseline breathing room air.

Results: Blinded interim analysis of the first three patients was performed (ASA-II, n = 1, ASA-III, n = 1, ASA-IV, n = 1). During 180s of deep breathing during preoxygenation and resulting hypocapnia, the myocardium deoxygenated ($-2.8 \pm 2.0\%$). Following the administration of sufentanil breathing significantly slowed leading to hypercapnia and a luxury myocardial oxygenation ($7.4 \pm 3.7\%$). Induction with propofol/rocuronium and subsequent manual bag ventilation resulted once again in hypocapnia and a drop in myocardial oxygenation ($-9.1 \pm 2.3\%$). After intubation, anaesthesia was maintained with sevoflurane, and myocardial oxygenation stabilized slightly below baseline (immediately post-intubation: $-1.0 \pm 1.1\%$, $-4.9 \pm 0.6\%$ at 5 minutes, and $-3.8 \pm 0.8\%$ at 10 minutes post-intubation).

Conclusion: Perioperative CMR imaging reveals that myocardial oxygenation fluctuates between states of deoxygenation and luxury oxygenation during the induction of GA. These findings provide valuable insights into the myocardial response to GA induction and highlight potential vulnerabilities to perioperative myocardial ischaemia.

P 6

Preoperative Ventricular Strain Predicts the Need and Effectiveness of Inotropes and Vasopressors for Managing Intraoperative Hypotension

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Background: Intraoperative hypotension (IOH) is a problem influenced by the type of surgery, but also by preexisting cardiovascular disease. Identifying patients at risk of IOH and those who need more intensive haemodynamic treatment is essential for improving perioperative management. Cardiovascular magnetic resonance (CMR) imaging offers a potential tool for risk stratification through analysis of ventricular function by strain. Yet, its clinical value in anaesthesia is unknown. We investigated whether CMR-derived strain predicts intraoperative haemodynamic management.

Methods: A retrospective analysis assessed 211 patients who had a clinical CMR exam <6 months prior to an elective surgery with anaesthesia. These CMR images were analyzed for global longitudinal strain (GLS) and compared to intraoperative use of inotropes and vasopressors. We then investigated if the effect of treatment by these medications to avoid IOH was dependent on the preoperative GLS. IOH was defined as the time-weighted average of MAP <65 mmHg, normalized to anaesthesia duration from induction to emergence.

Results: Of the cohort, 69 patients underwent cardiac and 142 non-cardiac surgery. GLS did not differ between groups ($-12.1 \pm 4.2\%$ vs $-13.2 \pm 4.4\%$, $p = 0.11$), neither did age (65 ± 9 vs 65 ± 9 y, $p = 0.54$). Cardiac surgery patients had a higher mean ASA score (3.9 ± 0.4 vs 3.2 ± 0.6 , $p < 0.01$), and a duration of anaesthesia of $155 [130-186]$ min vs $173 [116-284]$ min ($p = 0.06$). IOH was more severe in patients undergoing cardiac surgery (time-weighted average $1.5 [0.6-2.3]$ mmHg vs $0.3 [0.0-1.0]$ mmHg, $p < 0.01$). Patients undergoing cardiac surgery were more likely to receive milrinone, levosimendan, norepinephrine, epinephrine and vasopressin ($p < 0.05$). In cardiac surgery, a poor GLS predicted levosimendan (AUC = 0.93, $p < 0.01$) and vasopressin use (AUC = 0.86, $p < 0.01$). Interaction effects were observed between GLS and treatment with levosimendan ($p = 0.04$) and vasopressin ($p < 0.01$), concerning the severity of IOH, indicating patients with a poorer GLS were less responsive to treatment. For non-cardiac surgery, a poor GLS predicted the need for norepinephrine (AUC = 0.61, $p = 0.04$), and interacted with its treatment effect ($p = 0.04$).

Conclusion: Preoperative CMR-derived ventricular strain may improve risk prediction for IOH and responsiveness to cardio-circulatory treatment in both cardiac and non-cardiac surgery, potentially guiding safer anaesthetic management.

P 7

A Comparison of Left Ventricular Function in the Apical 4 Chamber and Subcostal 4 Chamber TTE Views in the Perioperative Setting: A Prospective, Clinical Trial

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Background: The perioperative period may be a haemodynamically challenging situation for patients. For this reason, in certain situations a preoperative transthoracic echocardiography (TTE) is performed. However, this is done mostly in non-comparable conditions to the perioperative TTE, e.g. positioning on the back only or difficulty to obtain all necessary windows (especially the parasternal or apical 4-chamber views). The subcostal 4-chamber (SC4C) view is generally obtainable, but visualized structures are neither identical or properly aligned for certain technologies (e.g. M-Mode). Newer technologies – such as speckle-tracking (STE) – may partially overcome these misalignments. We hypothesize that right ventricular measurements conducted in the SC4C, with the STE, are sufficient close to the endorsed measurements in the apical four chamber (AP4C) view in the left decubitus position.

Methods: We included 73 patients in this prove-of-concept analysis in a single-center, prospective, randomized study between 06/2022 to 12/2023. TTE was performed before and after induction of general anaesthesia. For the analysis, all endpoints were plotted to their respective references. The primary endpoints were the plotting of the angle corrected (= AM-Mode) TAPSE in the SC4C in the supine position to its corresponding references. For the secondary endpoints, the not angle-corrected (= M-Mode) TAPSE in the SC4C, and solely for the awake patient the TAPSE in the AP4C in the supine position, were plotted against their corresponding references.

Results: In the preinduction phase the reference TAPSE in AP4C left lateral decubitus view showed a mean of 26.9 mm ± 5.2 mm. Comparing to this, TAPSE were lower in the AP4C supine (24.2 mm ± 4.5 mm, p = 0.001) and SC4C Supine M-mode (21.2 mm ± 5.6 mm, p < 0.001), and higher in the SC4C Supine AM-mode (27.8 mm ± 4.5 mm, p = 0.046). In the postinduction phase the reference TAPSE in the AP4C Supine position showed a mean of 21.3 mm ± 4.2 mm. Comparing to this reference, the TAPSE were decreased in SC4C M-mode (17.8 mm ± 5.9 mm (p < 0.001) and slightly elevated in the SC4C AM-mode (23.6 mm ± 4.4 mm, p = 0.001).

Conclusion: This study underscores significant variability and limited interchangeability in TAPSE measurements obtained from AP4C and SC4C echocardiographic views in perioperative context. Clinicians must interpret SC4C-derived TAPSE values cautiously, acknowledging inherent variability.

P 8

The Association of Preoperative Copeptin and Mortality in Noncardiac Surgery – An individual patient data meta-analysis

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Purpose: Biomarkers can aid in perioperative risk stratification. Different biomarkers have been assessed in the perioperative setting, one of them being copeptin. Copeptin has been associated with adverse events such as adverse cardiac and cerebrovascular events (MACCE) as well as with perioperative myocardial injury (PMI), but data for mortality – particularly short-

term mortality – remains inconclusive, due to the low number of events.

Methods: We conducted a medline literature searched (Copeptin [title/abstract] and Surgery [title abstract]). Noncardiac, adult studies measuring preoperative copeptin and reporting the primary outcome were eligible. Our main outcome was 12 month all cause mortality. The secondary outcomes was 30-day all-cause mortality and/or MACCE. We also corrected for troponin and pro-BNP/BNP when available.

Results: A total of 6 studies were found of which 5 studies with 2281 patients were willing to share data. The primary outcome event of a composite of all-cause mortality at 12 months occurred in 208/2281 (9.1%) patients; the secondary outcome 30-day all-cause mortality and/or MACE occurred in 193/2281 (8.5%) patients. The HRs were 1.003 (1.001-1.005) and 1.008 (95%CI 1.003 – 1.013) per pmol/L of copeptin, when correcting for troponin and BNP.

Conclusion: This individual patient data meta analysis showed an association between copeptin and mortality at 12 months as well as 30-day all-cause mortality and/or MACE when adjusting for troponin and BNP.

P 9

Central Venous Catheter Positioning with Ultrasound: A Prospective Observational Quality Control Initiative

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Background: Ultrasound use in central venous catheter (CVC) placement is the standard of care, but ultrasound may offer more benefits regarding tip positioning and the rule-out of pneumothorax. Routine chest x-rays are time-consuming, cost-intensive, and expose patients to radiation; point-of-care-ultrasound (POCUS) echocardiography protocols exist, but are also time and resource intensive. In this quality-control analysis, we examined 1) the rate of misplaced catheter tips and 2) the incidence of pneumothorax using our new institutional ultrasound-guided standard operating procedure (SOP) for internal jugular CVC placement and position control.

Methods: All patients requiring internal jugular CVC placement over the course of 6 months were included. Our “bare bones” SOP recommends A) following the guidewire caudally towards the heart (wire positive) and 2) visualizing the ipsilateral subclavian veins (wire negative) to indicate a presumably correct position. Postoperative chest x-rays were also routinely performed.

Results: A total of 524 CVCs were placed, with 499 correctly placed, 7 incorrectly placed (1 running cranially, 6 in the subclavian), and 18 without postoperative x-rays. Ultrasound was used in 433 (83%) patients. However, only 253 patients had saved images of both jugular and subclavian views, 61 had saved internal jugular views only, with the rest having no acquired images. None of the 7 incorrect placements occurred when both the jugular and subclavian views were visualized (p = 0.015). Of the 7 incorrect placements, 5 did not have any images, and 2 only the jugular image. Only one pneumothorax was found in the postoperative x-ray (excluding intrathoracic surgery). However, it was on the contralateral, non-punctured side possibly indicative of another etiology.

Discussion: Several strategies to determine CVC position and to rule out pneumothorax have been described, including routine chest x-rays or even a POCUS approach. However, our data suggests that neither routine chest x-ray nor POCUS is needed for (uncomplicated) jugular vein CVC placement when

visualizing the caudal part of the internal jugular as well as the ipsilateral subclavian vein.

P 10

Coagulation Management in Cardiac Surgery: Does the Experience of the Cardiac Anesthesiologist Affect the Administration of Coagulation Factors? [A preliminary analysis]

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Cardiac surgery often requires extensive correction of coagulation as bleeding and revisions are associated with adverse outcomes. While point of care testing offers distinct advantages and a number of point of care algorithms exist, there is still a substantial amount of clinician discretion in coagulation management. We wondered whether more experienced cardiac anesthesiologists would be less likely to correct coagulation than less experience cardiac anesthesiologists. Furthermore, we sought to determine whether or not being on call influenced led to more liberal correction of a coagulation.

This is a retrospective analysis from 02/2021 to 03/2022. The administration of coagulation products (beriplex, fibrinogen, FXIII, minirin, novoseven, platelets, FFP) was noted, as were the years of experience of the cardiac anesthesiologist as well as who was on call that evening. The years of experience were examined as the more experienced half vs. the less experienced half and also as a linear regression of years vs. the percent of patients receiving coagulation.

A total of 587 patients were examined of whom 167 (28%) received some sort of coagulation products. A total of 7 cardiac anesthesiologists ranging from 4 to 32 years of experience were routinely in the cardiac suite. The more experienced half of cardiac anesthesiologists did not exhibit a different rates of substitution than the less-experienced half (Chisq $p = 0.23$). A linear regression of years vs. the percent of substitution also did not show a significant slope ($p = 0.67$). Additionally, there was a trend toward more liberal substitution if one was also on call that evening ($p = 0.083$).

This retrospective study did not find an association with years of experience and coagulation management. However, there are important potential sources of bias. First, more experienced anesthesiologist tended to treat patients with a higher EuroSCOREII. Second, the total number of anesthesiologists involved was limited to 7, with only 5 permanently employed by the hospital and only these 5 performing on call services. It is possible that – when in doubt – being on call may lead to more liberal coagulation correction.

P 11

A comparison of conventional 2D measures and novel myocardial deformation imaging by transesophageal echocardiography in patients undergoing coronary artery bypass grafting with and without cardiopulmonary bypass.

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Coronary artery bypass grafting (CABG) is the most common cardiac surgery operation performed. Although generally performed with the use of cardiopulmonary bypass (CPB), it can also be performed without as off-pump CABG (OPCAB). Both the use of cardioplegia (CABG) and luxation/compression of the

heart while it is still performing work (OPCAB) may cause damage/stunning of the myocardium and influence postoperative cardiac function. In this analysis we examined 2D and 3D novel markers of myocardial deformation in both populations.

This is a retrospective study examining consenting adult patients undergoing CABG or OPCAB surgery, which was performed at the surgeon's discretion. Emergency surgery, beating-heart procedures, and patients with support devices pre-operatively were excluded. We examined the routine TEE exams performed before and after surgery while still in theater. Conventional (TAPSE, RV FAC, LVEF) and 2D strain of the left and right ventricle, as well as 3D strain, twist and torsion were examined.

A total of 28 patients were examined in this preliminary analysis; 14 undergoing CABG and 14 undergoing OPCAB surgery. The change from preop to postop for all patients in TAPSE, RVFAC, LVEF, LV GLS, RV GLS, LV Twist and LV Torsion were – 4.5mm [-11.5, 0.2], 0.6% [-11, 15], 1% [-12, 11], 5.5% [2.5, 8.5], 2.8% [-1.9, 13.5], –3deg [-9, 3], and –0.2 [-1, 0.6], with no significant differences between patients undergoing CABG vs OPCAB (all $p > 0.05$).

Although differences in techniques and differences in etiology for possible myocardial damage, this small sample could find no differences in conventional measures vs. novel myocardial deformation measures. This preliminary study may be limited by sample size in addition to possible sources of bias.

P 12

The impact of microRNAs on the regulation of the nociceptin system in human blood leukocytes

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Background: The nociceptin system, comprising nociceptin and its receptor (NOP), plays a role in pain processing and inflammation. 1–3 MicroRNAs (miRNAs) are non-coding RNAs which regulate gene expression through translational repression. Modulating effects of miRNAs on the expression of nociceptin and NOP are still not well revealed. This study aimed at the potential contribution of miRNAs on the regulation of nociceptin and its receptor in human blood leukocytes.

Methods: After obtaining approval from the local ethics committee and participants' informed consent, 20 healthy blood donors were enrolled in this study. Dose-response experiments were performed to evaluate the knockdown effect of small interfering RNA targeting prepronociceptin (siPNOC) on nociceptin protein levels. Whole blood was transfected with miR-26b-5p, miR-34a-5p, miR-31-5p, siPNOC, siRNA targeting NOP (siNOP), or a negative control miRNA (cel-miR-239b) for 48h, followed by the treatment of phorbol myristate acetate (PMA) or without PMA for 24h. Intracellular nociceptin and cellular NOP proteins were measured using flow cytometry. PNOC and NOP mRNA expression was quantified by RT-PCR.

Results: Nociceptin and NOP proteins were constitutively expressed in blood leukocyte subsets. PMA significantly increased nociceptin expression in blood cells both at the mRNA and protein levels (both $p < 0.01$). siPNOC suppressed PMA-induced intracellular nociceptin expression in a concentration dependent manner. 48h after transfection, transfection efficiency was $>95\%$ in monocytes and $>65\%$ in granulocytes. All the candidate miRNAs, siPNOC and siNOP attenuated PMA's upregulating effect on nociceptin in monocytes as well as in lymphocytes (CD4+ T cells, CD8+ T cells and B cells) compared to a cel-miR-239b group, respectively (all $p < 0.05$). In addition,

a decrease of cellular NOP proteins was detected in the blood samples transfected with miR-31-5p, siPNOC, or siNOP.

Conclusions: miR-26b-5p, miR-34a-5p and miR-31-5p impaired nociceptin protein expression in human peripheral blood leukocytes. Intracellular nociceptin protein expression correlated with the NOP protein levels. Mechanisms contributing to the modulation of the nociceptin system by miRNAs need to be further elucidated, thereby providing new insights into the treatment of pain and inflammatory diseases.

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P 13

Modelling Thiel cadaver fascial plane block fluid dynamics: a story without hyaluronic acid?

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Background and aims: Thiel-embalmed cadavers are commonly used for teaching/studying ultrasound-guided fascial plane (FB) blocks due to their improved sonoanatomy. Post-mortem degradation or removal of hyaluronic acid (HA), a key interstitial matrix viscosity component, may alter local anesthetic (LA) spread in Thiel tissues, challenging this model's fidelity to replicate in vivo fluid dynamics. Using a Hele-Shaw cell model, we aimed to simulate and compare LA distribution in environments mimicking different viscoelastic properties.

Methods: We constructed 8x9 cm Hele-Shaw cells using a glass plate covered by cling film simulating FP, containing four different Thiel media: A: Thiel with 1% high-molecular-weight (MW 1.5-1.8 Mio Dalton) HA; B: Thiel with 1% low-MW HA (MW 5000-8000 Dalton); C: Thiel; D: Thiel incubated on a gelatin-pad. 5 mL Mepivacaine 1% was injected over 90s via a pump. Endpoints included viscous fingering (VF), propagation speed (cm²/s), spread area at 45s and qualitative flow behavior (bulk-flow vs VF).

Results: High-MW HA demonstrated VF patterns, fastest propagation (mean 1.1 cm²/sec (0.88-1.43)) and largest spread (mean area 47.1 cm² (34.6-65.7)) after 45 sec of infusion with significant difference (p < 0.05) compared to pure Thiel solution under same experimental conditions (mean speed 0.84 cm²/sec and mean area 37.6 cm²). Low-MW HA presented intermediate spread behavior with less pattern stability. Thiel solution exhibited rapid, turbulent bulk flow without structured propagation, reduced speed and spread compared to high-MW HA. Gelatin conditioning demonstrated fluid behavior consistent with partial viscosity restitution.

Conclusions: FP composition and rheological properties substantially influence LA spread. In Thiel cadavers, likely depleted of native HA, fluid dynamics may shift toward disorganized bulk flow contrary to viscous fingering flow patterns dominant in compartments rich in high molecular weight HA-solution. The

latter situation (VF flow) is more comparable to living FSB conditions, with viscous fingering filling the modelled fascial sheath more swiftly and consistently than compartments predominantly filled with Thiel solution. Reconstituting viscoelasticity with HA or collagen analogues restores near-physiologic viscosity conditions. Therefore, injectate distribution in Thiel models should be interpreted and compared to in vivo conditions with caution.

P 14

Association Between Anaesthetic Technique and Dreaming Under Multimodal (MMGA) General Anaesthesia combined with locoregional Anaesthesia: A Retrospective Analysis

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Background and aims: Dreaming under general anaesthesia has incidence rates ranging from 17.5% to 57% depending on timing of assessment and anaesthetic agents used. Previous studies suggest that dreams are typically pleasant and occur during lighter stages of anaesthesia, particularly near emergence. However, the relationship between the type of anaesthesia and dream incidence remains underexplored. Hypothesis: Patients receiving combined general anaesthesia (multimodal GA + regional/local anaesthesia) are more likely to experience and recall pleasant dreams compared to those MMGA without RA.

Methods: In this retrospective analysis, 44 (33 male/11 female, median age 57y; IQR 38-69 years) patients undergoing surgery general anaesthesia with or without locoregional anaesthesia were assessed postoperatively for the occurrence of dreams. Dream presence, age, opioid use, and anaesthetic technique were recorded. Patients were stratified based on dream recall (dream vs. no dream), and group differences were evaluated using descriptive statistics and chi-squared tests. Perioperative EEGs were mounted fronto-centrally. The analysis of clinical data and EEGs was waived for further use by Bern Ethic committee.

Results: Dreams were reported by 23/44 patients (52%). The median age of dreamers was 54 years (IQR 40-68), compared to 62 years (IQR 39-69.5) in non-dreamers. Most patients (31/44, 70%) received combined anaesthesia (multimodal GA+regional/local anaesthesia). A statistically significant association was found between regional anaesthesia use and dreaming (p = 0.025), suggesting that EEG-guided, opioid-sparing multimodal GA with RA facilitates dreaming. No significant association was observed between opioid use and dreaming (p = 1.0). Dream reporting patients were younger (median 54y (IQR 40-68)) than non-dream reporting (median 62y (IQR 39-69.5)).

Conclusions: Dreaming under anaesthesia was common and associated with regional anaesthesia but not opioid administration in MMGA. These findings support the hypothesis that MMGA plus RA increases dream incidence and recall. Drawing on physiological sleep-dream analogies, perioperative EEGs need to be analyzed for sigma-dominance (12-16 Hz) in dream-reporting patients.

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