

of the resuscitation effort, lesser post-resuscitation myocardial dysfunction, and improved survival. We investigated the effects of EPO on hemodynamic and myocardial function along with subsequent survival in a swine model of ventricular fibrillation (VF) and closed-chest resuscitation. **Methods:** VF was electrically induced in 16 male immature domestic pigs (35 to 41 kg) and left untreated for 8 minutes. Chest compression was delivered using a LUCAS device and defibrillation attempted 10 minutes later. Resuscitated pigs were observed for 120 minutes. Pigs were then recovered from anesthesia and observed for a maximum of 72 hours. Pigs were randomized 1:1 to receive 1,200 U/kg of EPO or vehicle control into the right atrium before starting chest compression. **Results:** LUCAS delivered CPR was highly effective hemodynamically yielding an aortic diastolic pressure of approximately 45 mmHg in both groups and a comparable resuscitation rate. Post-resuscitation there was comparable early hemodynamic and myocardial function as well as comparable organ blood flow but more control pigs died after resuscitation with only 2 of 8 control pigs and 6 of 8 EPO pigs surviving 72 hours ($p = 0.048$ by log-rank test). Demise – documented during the monitored period – was characterized by progressive hemodynamic deterioration. **Conclusions:** The present study is consistent with an emerging body of preclinical work and a single non-randomized, open-label, clinical study supporting a potential role of EPO for resuscitation for cardiac arrest. The present study failed to demonstrate effects during CPR or the early post-resuscitation phase but indicated an effect mitigating post-resuscitation myocardial and hemodynamic dysfunction that resulted in improved survival from cardiac arrest.

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VARIATION OF CENTRAL VENOUS CATHETER USAGE IN THREE ICUS MANAGED BY THE SAME INTENSIVIST GROUP

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Learning Objectives: The complications and costs associated with central venous catheters (CVC) have led to much interest in their incidence and epidemiology. A wide variability of use in ICUs has been identified with subsequent speculation that provider practice patterns as opposed to patient factors, including acuity, influence their use. A further understanding of CVC utilization by fellowship-trained intensivists in a group practice would assist in risk-benefit analysis and facilitate consensus opinion on appropriate usage. Hypothesis: There would not be a significant difference in CVC use in ICUs managed by Pittsburgh Critical Care Associates (PCCA). **Methods:** A retrospective observational study utilizing data derived from an APACHE II B database that included three community hospital ICUs managed by PCCA, from January 1, 2013 to December 31 2013. Multivariate regression models were used to estimate the association between the presence and duration of a CVC at anytime during the ICU stay and APACHE II score on admission to the ICU, ICU length of stay, presence of an endotracheal tube (ET), presence of an arterial catheter (AC), and hyperalimentation (HAL). **Results:** 2,736 patients were admitted to the three ICU's in 2013, of which 423 received a CVC. The incidence was similar at ICU1 (9.6%) and ICU2 (12.7%), but higher at ICU3 (32.3%). ICU3 had higher acuity (mean APACHE II score 23.4 ICU3 vs. 18.8 ICU1 vs. 19.3 ICU2), longer ICU stays, and higher incidence of ET, AC, and HAL compared with ICU1 or ICU2. In a logistic regression model adjusting for APACHE II, ET, AC, HAL, and ICU days, the odds of CVC were 46.4% lower at ICU1 compared with ICU3 (OR 0.54; 95%CI 0.40–0.71) and 26.7% lower at ICU2 compared with ICU3 (OR 0.73; 95%CI 0.54–1.0). In contrast, a linear regression employing the same variables among those with CVC found that CVC duration was 0.52 days longer at ICU1 (95%CI -0.06 – 1.1) and 0.64 days longer at ICU2 (95%CI 0.09–1.19). **Conclusions:** Significant variations in incidence and duration of CVCs in ICUs managed by the same intensivists group exist and are not fully explained by patient acuity.

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USING INDIRECT CALORIMETRY DATA TO ASSESS THE IMPACT OF SEDATIVES ON REE IN THE ICU

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Learning Objectives: Continuous intravenous sedation is used frequently in the ICU to promote comfort and reduce anxiety associated with therapeutic modalities, such as mechanical ventilation. Nutrition support is also important to minimize metabolic demands. The contribution of sedation/analgesia, often with multiple pharmacologic agents, to resting energy expenditure (REE) is not well-described in the literature. The aim of this project was to examine the impact of these agents on REE by comparing predicted with measured REE obtained by indirect calorimetry (IC). **Methods:** This retrospective, correlational design used a convenience sample of adult ICU patients. Data from ICU patients during the period from October 2009 to present are summarized. Variables of interest include actual body weight, BMI, age, gender, respiratory quotient (RQ), VO₂,

VO₂, measured REE (MREE), predicted REE (PREE), use of sedatives/analgesics and dose classified as high or low, hospital day, and ventilator day. **Results:** 269 IC reports with sedative/analgesic data were available for review. Sample demographics are: mean age 60.5 (17.5) yrs, 62% male, 80% Caucasian, BMI 30.2, 71% receiving sedation/analgesia, mean hospital and ventilator days were 11.5 and 6.3, respectively. Mean (m) MREE 1792 + 585 kcal/d, mPREE 1585 + 329 kcal/d, mVO₂ .260 (.08) L, mVCO₂ .204 (.07) L, and mRQ .79 (.09). Hypermetabolic patients (VO₂ > .250 L; n=119) were younger (60.5 y) with a significantly greater MREE 2291 + 510 kcal/d than other ICU patients (n=147) who were older (70 y) with MREE 1389 + 215 kcal/d; $p < .001$. Amount of sedation/analgesia was correlated with MREE; high dose agents compared with no agents had higher MREE; mean difference of +355.9, SE 104.2; $p=.002$; this contradicts the assumption that higher levels of sedation/analgesia lower the REE. **Conclusions:** Both SCCM and ASPEN guidelines recommend the use of IC for critically ill patients. Energy needs are often unpredictable and hypermetabolism may not be reduced by sedative agents, even at higher doses. Further research into choice of sedative/analgesic agents and impact on REE is needed.

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EPIDEMIOLOGY AND OUTCOMES OF NEW-ONSET ATRIAL FIBRILLATION IN THE ICU: A 6-YEAR RETROSPECTIVE STUDY

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Learning Objectives: Atrial fibrillation (AF) is the most common arrhythmia in the critically ill. However, data in the medical intensive care unit (MICU) is scarce. This study was conducted to determine epidemiology and outcomes of new-onset atrial fibrillation (NOAF) in non-cardiac and non-surgical ICU patients. **Methods:** Single center, retrospective cohort study of patients admitted to the MICU at Mayo Clinic, Rochester from 2008 to 2013. Patients were grouped into AF and no AF identified using ICD-9 diagnosis code 427.3x. AF cohort was further divided into NOAF and pre-existing AF. Demographics, comorbidities, CHADS₂, and APACHE III scores were abstracted from the medical record along with outcomes such as vasopressor use, renal replacement therapy (RRT), mechanical ventilation (MV), length of stay (LOS) and mortality. Logistic regression analysis was used to compare outcomes of patients with NOAF, pre-existing AF, and no AF. Effects of age, CHADS₂, and APACHE were adjusted for in regression models. **Results:** A total of 10,836 MICU patients were included in the study, of which 582 (5%) had NOAF, 2368 (22%) pre-existing AF, and 7886 (73%) no AF. Baseline characteristics were significantly different between groups ($p<0.001$) with AF patients being older (73.5 vs 78.6 vs 59.8). Hypertension was the most common comorbidity (68% vs 81% vs 53%). APACHE scores higher in the NOAF group (57 vs 54 vs 42). Outcomes significantly different ($p<0.001$) between cohorts with higher vasopressor use (33% vs 18% vs 12%); RRT (11% vs 9% vs 5%); MV (39% vs 22% vs 24%); MICU mortality (11% vs 8% vs 5%); and hospital mortality (20% vs 16% vs 8%) in the NOAF group. Logistic regression models comparing NOAF with no AF showed increased need for vasopressors (OR 2.45); RRT (OR 2.15); MV (OR 1.69); MICU and hospital mortality (OR 1.40; 1.63). **Conclusions:** NOAF was noted in 5% of MICU admissions. Our study suggests that even after adjusting for age, CHADS₂ and APACHE III, NOAF patients exhibited poorer outcomes and higher resource utilization with increased need for vasopressors, RRT and MV along with higher MICU and hospital LOS and mortality.

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VALIDATION OF THE SWIFT SCORE FOR INTENSIVE CARE UNIT (ICU) READMISSIONS IN AN ASIAN POPULATION

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Learning Objectives: Readmissions occur in nearly 10% ICU discharges. Since readmissions are costly and often associated with high mortality, many tools have been devised and validated to prevent this from occurring. One such clinical tool is the Stability and Workload Index for Transfer (SWIFT) score which has been validated in several ICU centers worldwide. No study has yet validated this tool in Asian population. **Methods:** We reviewed the records of all patients admitted/discharged from the medical ICU of a large university Hospital in Asia from January to June of 2008. The SWIFT score for each patient was calculated from their electronic medical records. The SWIFT score was then compared with the readmission rates to determine if it can be a valuable predictor for readmission in an Asian population. **Results:** 409 patients were admitted over the set time period. 59 patients were excluded from the study due to incomplete data [necessary for SWIFT score calculation]. 80 patients died before initial ICU discharge.