Methods: This was a descriptive, cross-sectional electronic survey that was disseminated to all current Canadian EM residents from both Royal College (RC) and Family Medicine - EM training streams. Residents were recruited either directly or through their program's administrative assistant. The survey consisted of multiple-choice, Likert and free-text entry questions. Themes included a) familiarity with QIPS; b) local opportunities for QIPS projects and mentorship; and c) desire for further QIPS education and involvement. The survey was open for a five-week period, with formal reminders after the first and third weeks. Descriptive statistics are reported. **Results**: 189 (35%) of 535 current EM residents completed the survey, representing all 17 medical schools. 77% of respondents were from the RC stream. 54.7% of respondents reported being "somewhat" or "very" familiar with QIPS. 47.2% of respondents reported "not knowing" or "not having readily available" QIPS projects to participate in their local environment, and 51.5% had equivalent responses with respect to QIPS mentorship opportunities. Only 17.5% of respondents reported that QIPS methodologies were already formally taught in their residency program, and 66.9% indicated a desire for increased QIPS teaching. The majority of respondents were "slightly" (35.9%), "moderately" (23.2%) or "very" (11.3%) interested in becoming involved with QIPS training and initiatives. **Conclusion**: Responding Canadian EM residents are interested in obtaining greater QIPS education as well as project and mentorship opportunities, but many perceive that they do not have adequate access to these at the current time. As the importance of QIPS increases in the EM community, supporting residents with more robust educational infrastructures may be necessary. Future efforts may include the standardizing of QIPS postgraduate curricula and improving access to QIPS opportunities across the country.

Keywords: medical education, patient safety, quality improvement

LO62

Intranasal dexmedetomidine for procedural distress in children: a systematic review and meta-analysis

J. Spohn, BSc, MSc, S. Hendrikx, MLIS, E. Doyon-Trottier, MDCM, V. Sabhaney, MD, S. Ali, MDCM, A. Shah, MD, N. Poonai, MD, London Health Sciences Centre, London, ON

Introduction: Intranasal dexmedetomidine (IND) is an emerging agent for procedural distress in children. However, studies to date have been limited by small samples and imprecise estimates of effect size. We sought to summarize the evidence on the effectiveness of IND for procedures associated with distress in children. **Methods**: We performed electronic searches of MEDLINE (1946-2018), EMBASE (1980-2018), Google Scholar (2018), CINAHL (1981-2018), Cochrane Central Register of Controlled Trials (2018), 6 clinical trials registries and conference proceedings (2010-2018). Title searches, data abstraction, and risk of bias assessments were performed in duplicate. We included all published and unpublished, randomized and quasi-randomized trials of IND for procedures in children younger than 19 years of age without language restriction. The methodological quality of studies was evaluated using the Cochrane Collaboration's Risk of Bias tool. The primary outcome was the proportion of participants that were deemed to be adequately sedated for the procedure. **Results**: Of 661 studies, 18 met inclusion criteria. Trials involved 2128 participants, age 1 month - 14 years (836, 39.3% females), who received IND 1 - 4 mcg/kg either by drops (n = 12), atomizer (n = 4), or both (n = 2). 12 trials were eligible for meta-analysis. 13 trials used validated instruments to assess sedation. All studies except one were associated with low or moderate risk of bias. For painful procedures (IV insertion; laceration repair; dental extraction), the pooled OR (95% CI) for adequate sedation and need for additional analgesia was non-significant [1.19 (0.53, 2.65)] and [2.16 (0.62, 7.49)], respectively (n = 5). For non-painful procedures (diagnostic imaging), the corresponding pooled OR (95% CI) favored IND [3.04 (1.58, 5.82)] and [4.44 (2.11, 9.35)], respectively (n = 7). Time to onset and duration of sedation ranged from 13-31 minutes and 41-91.5 minutes, respectively. For adverse effects, the pooled OR (95% CI) was not significantly different between IND and comparators [0.58 (0.22, 1.55] and there were no serious adverse events. **Conclusion**: IND at doses 1 to 4 mcg/kg are safe and adequately sedate children undergoing non-painful procedures, although the ease of administration must be weighed against the risk of prolonged sedation. Additional trials with larger sample sizes and greater methodologic rigor are needed for painful emergency department procedures such as laceration repair and IV insertion.

Keywords: dexmedetomidine, intranasal, sedation

LO63

Humanoid robot-based distraction to reduce pain and distress during venipuncture in the pediatric emergency department: A randomized controlled trial

S. Ali, MDCM, R. Manaloor, K. Ma, M. Sivakumar, BN, B. Vandermeer, MSc, T. Beran, PhD, S. Scott, BN, PhD, T. Graham, MD, MSc, S. Curtis, MD, MSc, H. Jou, MD, N. Beirnes, L. Hartling, PhD, University of Alberta, Edmonton, AB

Introduction: Intravenous insertion (IVI) is identified by children as extremely painful and the resultant distress can have lasting negative consequences. There is an urgent need to effectively manage such procedures. Our primary objective was to compare the pain and distress of IVI with the addition of humanoid robot-based distraction to standard care, versus standard care alone. **Methods**: This two-armed randomized controlled trial (RCT) was conducted from April 2017 to May 2018 at the Stollery Children's Hospital emergency department (ED). Children aged 6 to 11 years who required IVI were included. Exclusion criteria included hearing or visual impairments, neurocognitive delays, sensory impairment to pain, previous enrolment, and discretion of the ED clinical staff. Primary outcomes were measured using the Observational Scale of Behavioural Distress-Revised (OSBD-R) (distress) and the Faces Pain Scale-Revised (FPS-R) (pain). A total of 426 pediatric patients were screened and 340 were excluded. **Results**: We recruited 86 children, of which 55% (47/86) were male; 9% (7/82) were premature at birth; 82% (67/82) had a previous ED visit; 30% (25/82) required previous hospitalization; 78% (64/82) had previous IV placement and 96% (78/81) received topical anesthesia. The mean total OSBD-R score was 1.49 ± 2.36 (standard care) compared to 0.78 ± 1.32 (robot group) ($p = 0.047$). The median FPS-R during the IV procedure was 4 (IQR 2,6) in the standard care group alone, compared to 2 (IQR 0,4) with the addition of humanoid robot-based distraction ($p = 0.10$). Change in parental state anxiety pre-procedure versus post-procedure was not significantly different between groups ($p = 0.49$). Parental satisfaction with the IV start was 93% (39/42) in the robot arm compared to 74% (29/39) in the standard care arm ($p = 0.03$). Parents were also more satisfied with management of their child's pain in the robot group (95% very satisfied) compared with standard care (72% very satisfied) ($p = 0.002$). **Conclusion**: A statistically significant reduction in distress was observed with the

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addition of robot-based distraction to standard care. Humanoid robot-based distraction therapy reduces distress and to a lesser extent, pain, in children undergoing IVI in the ED. Further trials are required to confirm utility in other age groups and settings.
Keywords: distraction, intravenous, pain

LO64
The HEART score in predicting major adverse cardiac events in patients presenting to the emergency department with possible acute coronary syndrome: a systematic review and meta-analysis
C. Byrne, MD, C. Toarta, MD, B. Backus, MD, PhD, T. Holt, PhD, University of Toronto, Toronto, ON

Introduction: Acute coronary syndrome (ACS) is a common, sometimes difficult to diagnose spectrum of diseases. Given the diagnostic challenge, it is sensible for emergency physicians to have an approach to prognosticate patients with possible ACS. The objective of this review was to investigate the ability of the HEART score to predict major adverse cardiac events (MACE) in patients presenting to the ED with possible ACS. **Methods**: Eleven databases and other sources identified 468 potentially relevant studies. Sixty-seven studies underwent full text review with 25 studies meeting eligibility criteria. Main outcome measures were pooled prevalence, risk ratio (RR), and absolute risk reduction (ARR) for MACE within six weeks of ED evaluation, comparing HEART score 0–3 versus 4–10. Model discrimination (sensitivity, specificity, concordance statistic) and calibration (observed to expected events ratio) were also evaluated. **Results**: Data from 25 studies including 41,397 patients were combined in the meta-analysis. In total, 4815 patients (11.6%) developed MACE. Among 18,866 patients with HEART score 0–3, 396 (2.1%) developed MACE (RR 0.08; ARR 0.20). Outcome measures were consistent across planned subgroup and sensitivity analyses. Among studies with secondary outcome data for patients with HEART score 0–3, 5 of 6461 (0.1%) died and 75 of 7556 (1.0%) had a myocardial infarction. **Conclusion**: The HEART score provides a reliable quantitative risk assessment of MACE in ED patients with possible ACS. Emergency clinicians should consider using the HEART score to facilitate risk communication and shared decision making with patients and other care providers.
Keywords: acute coronary syndrome, chest pain, prognosis

LO65
Frailty and associated outcomes among emergency department patients requiring endotracheal intubation
S. Fernando, MD, D. McIsaac, MD, MPH, B. Rochwerg, MD, MSc, S. Bagshaw, MD, MSc, A. Seely, MD, PhD, J. Perry, MD, MSc, C. Dave, MD, P. Tanuseputro, MD, MHSc, K. Kyeremanteng, MD, MHA, University of Ottawa, Department of Emergency Medicine, Ottawa, ON

Introduction: Risk-stratification of patients requiring endotracheal intubation and mechanical ventilation in the Emergency Department (ED) is necessary for informed discussions with patients regarding goals-of-care. Frailty is a clinical state characterized by reduced physiologic reserve, and resulting from accumulation of physiological stresses and comorbid disease. Frailty is increasingly being identified as an important independent predictor of outcome among critically ill patients. Our objective was to identify the impact of clinical frailty (defined by the Clinical Frailty Scale [CFS]) on in-hospital mortality and resource utilization of ED patients requiring endotracheal intubation and mechanical ventilation. **Methods**: We analyzed a prospectively collected registry (2011-2016) of patients requiring endotracheal intubation in the ED at two academic hospitals and six community hospitals. We included all patients ≥18 years of age, who survived to the point of ICU admission. All patient information, outcomes, and resource utilization were stored in the registry. CFS scores were obtained through chart abstraction by two blinded reviewers. The primary outcome, in-hospital mortality, was analyzed using a multivariable logistic regression model, controlling for confounding variables (including patient sex, comorbidities, and illness severity). We defined "frailty" as a CFS ≥ 5. **Results**: 4,622 patients were included. Mean age was 61.2 years (SD: 17.5), and 2,614 (56.6%) were male. Frailty was associated with increased risk of in-hospital mortality, as compared to those who were not frail (adjusted odds ratio [OR] 2.21 [1.98-2.51]). Frailty was also associated with higher likelihood of discharge to long-term care (adjusted OR 1.78 [1.56-2.01]) among patients initially from a home setting. Frail patients were more likely to fail extubation during their hospitalization (adjusted OR 1.81 [1.67-1.95]) and were more likely to require tracheostomy (adjusted OR 1.41 [1.34-1.49]). **Conclusion**: Presence of frailty among ED patients requiring endotracheal intubation and mechanical ventilation was associated with increased in-hospital mortality, discharge to long-term care, extubation failure, and tracheostomy. ED physicians should consider the impact of frailty on patient outcomes, and discuss associated prognosis with patients prior to intubation.
Keywords: critical care, intubation, mechanical ventilation

LO66
Solid organ donation from the emergency department: A death review
J. McCallum, MD, R. Yip, BSc, S. Dhanani, MD, I. Stiell, MD, MSc, University of Ottawa, Department of Emergency Medicine, Ottawa, ON

Introduction: A significant gap exists between the number of people waiting for an organ and donors. There are currently 1,628 people awaiting organ donation in Ontario alone. In 2018 to date, 310 donors have donated 858 organs. The purpose of this study was to determine whether there were missed donors in the Emergency Department (ED) and by what percent those missed donors would increase organ donation overall. **Methods**: This was a health records and organ donation database review of all patients who died in the ED at a large academic tertiary care center with 2 campuses and 160,000 visits per year. Patients were included from November 1, 2014 – October 31, 2017. We collected data on demographics, cause of death, and suitability for organ donation. Data was cross-referenced between hospital records and the provincial organ procurement organization called Trillium Gift of Life Network (TGLN) to determine whether patients were appropriately referred for consideration of donation in a timely manner. Potential missed donors were manually screened for suitability according to TGLN criteria. We calculated simple descriptive statistics for demographic data and the primary outcome. The primary outcome was percentage of potential organ donors missed in the Emergency Department (ED). **Results**: There were 606 deaths in the ED from November 1, 2014 – October 31, 2017. Patients were an average of 71 years old, 353 (58%) were male, and 75 (12%) died of a traumatic cause. TGLN was not contacted in 12 (2%) of cases. During this period there were two donors from the ED and 92 from the ICU. There were ten missed potential donors. They were an average of 67 years,