

an adult and 3.0 mmol/L in child < age 2 ) was found in 1 case when BS was checked-overall 1/501 (0.2%); adults 1/388 (0.3%), paediatric 0/113 (0.0%). Case 1-age 70 yr, GCS 12, BS 3.8 mmol/L. **Conclusion:** Hypoglycemia was rarely found in patients who had a pre-hospital seizure. It did not require treatment. When it was found, hypoglycemia was unlikely to be the cause of the seizure. The results are similar to the findings from other recent, retrospective, reviews. The routine determination of blood sugars in all patients who have had a seizure prior to paramedic arrival should be reconsidered.

**Keywords:** paramedic, seizure, hypoglycemia

### LO39

#### **Healthcare costs among homeless and/or substance using adults presenting to the emergency department: a single centre study**

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**Introduction:** Active substance use and unstable housing are both associated with increased emergency department (ED) utilization. This study examined ED health care costs among a cohort of substance using and/or homeless adults following an index ED visit, relative to a control ED population. **Methods:** Consecutive patients presenting to an inner-city ED between August 2010 and November 2011 who reported unstable housing and/or who had a chief presenting complaint related to acute or chronic substance use were evaluated. Controls were enrolled in a 1:4 ratio. Participants' health care utilization was tracked via electronic medical record for six months after the index ED visit. Costing data across all EDs in the region was obtained from Alberta Health Services and calculated to include physician billing and the cost of an ED visit excluding investigations. The cost impact of ED utilization was estimated by multiplying the derived ED cost per visit by the median number of visits with interquartile ranges (IQR) for each group during follow up. Proportions were compared using non-parametric tests.

**Results:** From 4679 patients screened, 209 patients were enrolled (41 controls, 46 substance using, 91 unstably housed, 31 both unstably housed and substance using (UHS)). Median costs (IQR) per group over the six-month period were \$0 (\$0-\$345.42) for control, \$345.42 (\$0-\$1139.89) for substance using, \$345.42 (\$0-\$1381.68) for unstably housed and \$1381.68 (\$690.84-\$4248.67) for unstably housed and substance using patients ( $p < 0.05$ ). **Conclusion:** The intensity of excess ED costs was greatest in patients who were both unstably housed and presenting with a chief complaint related to substance use. This group had a significantly larger impact on health care expenditure relative to ED users who were not unstably housed or who presented with a substance use related complaint. Further research into how care or connection to community resources in the ED can reduce these costs is warranted.

**Keywords:** unstable housing, substance use, emergency department cost

### LO40

#### **Designing for the future: machine learning software in the age of competency-based medical education**

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**Introduction/Innovation Concept: Background:** Competency based medical education (CBME) is a method of assessing resident performance through standardized tasks and milestones. The Royal College of

Physicians and Surgeons of Canada has started phasing in CBME as the preferred training method, but no tool support exists to process this data. Approximately 400 data points are collected per resident per year at McMaster's Division of Emergency Medicine. This is an unwieldy amount of data to analyze. **Objective:** Recognizing that collection and analysis of resident data is an important facet to postgraduate medical education, McMaster University began developing a program to provide predictive automated data analysis of resident performance. **Methods:** To achieve the stated objective, we adapted a design thinking methodology, which emphasizes the importance of human-centered design. By interviewing stakeholders, we collected user requirements and "pain points" that allowed us to build and evaluate multiple prototypes addressing their problems, such as the ability to process data into reports, real-time reporting, and predictive analytics. We solicited feedback from our stakeholders to iteratively refine the prototypes, ensuring that it was user intuitive and met user needs. **Curriculum, Tool, or Material:** We developed a software platform that collects, aggregates, reports, and has the possibility of analyzing resident data in real time. It also can present performance data via a real-time dashboard. Having automated the report generating process, administrative workload is reduced to a monitoring capacity. Quantitative data on resident performance has been analysed using artificial Neural Network to identify patterns in resident performance. It performs with a sensitivity of 81% and a specificity of 43%, and accurately predict which residents require remedial support 43% of the time. When built into a learning management system, this allows for the provision of additional support to residents-at-risk. **Conclusion:** Combining machine learning with resident assessment data has allowed us to build a promising predictive model to predict resident outcomes. This gives us the potential to decrease administrative workload and improve data quality by providing real-time performance dashboards and eliminating the redundancies of manual data processing. If scaled, this innovation might assist program directors in determining competency of residents and human resource planning for the healthcare systems at large.

**Keywords:** design thinking, predictive analytics, machine learning

### LO41

#### **Disrupting quality improvement: integrating design thinking in the emergency department**

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**Introduction/Innovation Concept:** Quality Improvement (QI) remains a challenge and has been identified as a key competency by the Royal College of Physicians and Surgeons. Hospitals can be dehumanized environments, both for patients and the staff working there. The distant understandings of each other's expectations during their health care encounter often create a sense of futility, frustration, and moral distress in therapeutic relationships. The transient nature of interactions and workplace culture in emergency departments (ED) enhances this distress. **Methods:** Working in a cross-disciplinary fashion, we explored how residents could develop quality improvement initiatives as a way to engage personal interests for QI measures. Key goals for developing these tools were 1) Learn cross-disciplinary tools for observation, inquiry, and improvement, 2) Develop reflective practice for residents, and 3) create ownership for the work and ongoing areas for improvement in local EDs for learners. **Curriculum, Tool, or Material:** We developed a process that would connect designers, residents, and content experts to an area of QI. Residents will be asked to identify an area in the ED that they field would benefit from a QI project (examples

include: trauma team activation, waiting room anxiety, and referral delays from the ED). Working with designers and stakeholders (including patient representatives), learners would map the experience of a particular project. Strengths and opportunities for improvements would be identified at each step of the project. The team would then prototype solutions which will be presented to site chiefs for implementation and evaluation. **Conclusion:** Working with designers offers a practical and powerful approach to undertaking QI projects in the ED. We hope that this process allows residents to undertake projects that they are personally invested in and helps build longitudinal relationships beyond direct clinical work with the local ED they are working in

**Keywords:** quality improvement, operations, curriculum

#### LO42

##### **Ice Cream Rounds: the adaptation and implementation of a peer-support wellness rounds in an emergency medicine residency training program**

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**Introduction/Innovation Concept:** Emergency Medicine (EM) is a specialty that requires physicians to deal with acutely ill patients in a fast-paced environment, which can create stress, mental exhaustion and burnout. Continually changing working teams in the Emergency Department does not always allow appropriate debriefing for difficult patient encounters and outcomes on shift. To address these challenges, we sought to adapt and implement a peer-support rounds called 'Ice Cream Rounds' used in some Pediatric training programs for an EM training program. **Methods:** CCFP and Royal College EM residents were surveyed to determine interest and need for Ice Cream Rounds. Of the 31/50 respondents, 87% (26/31) identified their co-residents as their main source of support after difficult patient encounters and 71% (22/31) felt that current opportunities to debrief after difficult experiences were only "sometimes" or "rarely" adequate. Overall, 84% (26/31) were interested in attending Ice Cream Rounds. Residents expressed that they did not want staff present for Ice Cream Rounds so two residents (SCS and TK) obtained training to lead peer-support sessions from The Faculty of Medicine Wellness Program. Attendance at rounds was voluntary and the EM program provided funding for refreshments. Two Ice Cream Rounds were piloted. Attendance and feedback was recorded from pilot sessions. **Curriculum, Tool, or Material:** Resident-only, peer-run confidential debriefing sessions. Sessions were voluntary and lasted one hour. Approximately 20-30/50 residents attended each Ice Cream Rounds. Discussions were confidential but include topics such as difficult patient encounters, poor patient outcomes, challenges in residency, and ethical issues. In response to positive attendance and feedback, the EM program provided 3-4 one-hour protected time slots with a stipend for refreshments for future academic years. Comments from residents consistently reaffirmed that Ice Cream Rounds was a helpful forum to discuss important issues with colleagues and provided a safe and confidential resource to help cope with residency challenges. **Conclusion:** We adapted, implemented, and evaluated a novel Peer-Support Wellness Rounds for debriefing resident issues and difficult patient encounters in a EM training program. To our knowledge this is the first Canadian initiative to implement such rounds in an EM training program. We believe that this template can be easily adopted by any EM training program and will effectively address wellness challenges faced by residents during their training.

**Keywords:** innovations in emergency medicine education, wellness, burn out

#### LO43

##### **Does point of care ultrasound improve resuscitation markers in emergency department patients with undifferentiated hypotension? The first Sonography in Hypotension and Cardiac Arrest in the Emergency Department (SHOC-ED 1) Study; an international randomized controlled trial**

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**Introduction:** Point of Care Ultrasound (PoCUS) protocols are commonly used to guide resuscitation for emergency department (ED) patients with undifferentiated non-traumatic hypotension. While PoCUS has been shown to improve early diagnosis, there is a minimal evidence for any outcome benefit. We completed an international multicenter randomized controlled trial (RCT) to assess the impact of a PoCUS protocol on key resuscitation markers in this group. We report diagnostic impact and mortality elsewhere. **Methods:** The SHoC-ED1 study compared the addition of PoCUS to standard care within the first hour in the treatment of adult patients presenting with undifferentiated hypotension (SBP < 100 mmHg or a Shock Index > 1.0) with a control group that did not receive PoCUS. Scans were performed by PoCUS-trained physicians. 4 North American, and 3 South African sites participated in the study. Resuscitation outcomes analyzed included volume of fluid administered in the ED, changes in shock index (SI), modified early warning score (MEWS), venous acid-base balance, and lactate, at one and four hours. Comparisons utilized a T-test as well as stratified binomial log-regression to assess for any significant improvement in resuscitation amount the outcomes. Our sample size was powered at 0.80 ( $\alpha$ :0.05) for a moderate effect size. **Results:** 258 patients were enrolled with follow-up fully completed. Baseline comparisons confirmed effective randomization. There was no significant difference in mean total volume of fluid received between the control (1658 ml; 95% CI 1365-1950) and PoCUS groups (1609 ml; 1385-1832;  $p = 0.79$ ). Significant improvements were seen in SI, MEWS, lactate and bicarbonate with resuscitation in both the PoCUS and control groups, however there was no difference between groups. **Conclusion:** SHOC-ED1 is the first RCT to compare PoCUS to standard of care in hypotensive ED patients. No significant difference in fluid used, or markers of resuscitation was found when comparing the use of a PoCUS protocol to that of standard of care in the resuscitation of patients with undifferentiated hypotension.

**Keywords:** point of care ultrasound (PoCUS), hypotension, emergency medicine

#### LO44

##### **Initial validation of the core components in the SHoC-Hypotension Protocol. What rates of ultrasound findings are reported in emergency department patients with undifferentiated hypotension? Results from the first Sonography in Hypotension and Cardiac Arrest in the Emergency Department (SHOC-ED1) Study; an international randomized controlled trial**

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