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%), paedatric 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

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