trial of older adults (age > 70) discharged home from the ED with acute pain secondary to an upper extremity, lower extremity, rib, pelvic or vertebral compression fracture. Patients will be randomized to receive a 3-day supply of codeine, oxycodone or hydromorphone. Patients will also be given acetaminophen. Patients will be contacted by phone or email 3 days following their ED visit. The primary outcome will be differences in pain scores at 3 days assessed using the validated Brief Pain Inventory (Short Form). Secondary outcomes will include side effects (ie: confusion, constipation), adverse events (ie: falls, healthcare visits) and pain interference with daily activity. Patients, physicians and all research staff will be blinded to group allocation. **Data Analysis Plan:** The study design assumed three arms (codeine, oxycodone and hydromorphone), therefore the 2-tailed alpha will be set to 0.025 to adjust for the increased risk of type-I error with 3 pairwise comparisons. To test for pairwise equality between groups, a 1-way ANOVA will be employed. Proportional differences will be assessed using Pearson chi-square statistic**. Sample size calculation:** Assuming a mean (SD) change in pain scores between groups of 2.2 (3.0), a minimum clinically important difference on the Brief Pain Inventory of 2.0, a 2-tailed alpha of 0.025 to adjust for 3 pairwise comparisons and a beta of 0.20, we estimate that 47 patients per group (N = 141) will be required. To account for potential loss to follow-up, we will increase our sample size by 25% per group, resulting in a final sample size of 177 patients (59 per group). **Importance:** All analgesics (including opioids) prescribed to older adults are associated with risk of adverse events. This study seeks to inform ED providers of opioid efficacy, side effects and patient-important, functional outcomes in this growing patient population.

GD05

Careful Anticoagulation Review in Emergency Medicine (CARe-EM)

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Background: The number of patients prescribed anticoagulation for stroke prevention is increasing, along with the proportion of emergency department (ED) patients who are anticoagulant users. Bleeding is the most common side effect. Inappropriate dosing, co-prescription of anti-inflammatories or aspirin, and renal impairment all increase the bleeding risk. An ED visit is an opportunity to review anticoagulant bleeding risks and intervene to prevent bleeding in patients at high risk. **Objectives:** To establish the 12-month incidence of bleeding in anticoagulated patients visiting the ED, to develop an ED specific anticoagulant-associated bleeding prediction score, to evaluate the ED utility of existing prediction scores. **Methods:** Research ethics board approval has been granted. Patients will be identified in Hamilton General and Juravinski EDs. Each patient will be followed forward in time for 12 months to document bleeding events. **Population:** Inclusion criteria: ED patients prescribed warfarin, rivaroxaban, dabigatran, apixaban, edoxaban or low molecular weight heparin (prevalent users). Exclusion criteria: Patients under 16 years of age. Primary outcome: The incidence of major bleeding (defined by ISTH criteria) within 12 months from the index ED visit. Secondary outcomes: Derivation of an ED prediction score to identify patients at high risk of anticoagulant-associated bleeding within 12 months. Tertiary outcomes: Evaluation of ATRIA, modified HAS-BLED and HEMORR2HAGES scores utility in predicting bleeding within 12 months. **Data management:** The data will be stored anonymously and securely on RedCAP. A literature search / expert discussion has identified multiple potential risk factors for bleeding. This data is collected at the time of the index ED presentation. A committee of emergency, thrombosis, gastroenterology and cardiology physicians will review each major bleeding case. **Analysis:** Primary analysis: a multiple logistic regression analysis to identify variables associated with major bleeding diagnosed within 12 months of the index presentation. Using the model β coefficients we will derive a simple clinical decision rule. Secondary analysis: assessing the area under the curve and optimal cut points for pre-existing bleeding prediction scores for predicting major bleeding within 12 months. **Sample size calculation:** With 3000 patients we expect 2700 to be anticoagulated long term, and at least 135/2700 patients will have a major bleed. This is a sufficient number for multivariate analysis to establish a simple model. We estimate 20,000 anticoagulated ED patient attendances/year. **Importance:** This is the first study to consider the ED visit an opportunity to prevent bleeding. We will establish a method to identify ED patients at high risk of anticoagulant-associated bleeding.

GD06

Derivation and internal validation of a clinical prognostic tool for recurrent emergency visits for hyperglycemia in patients with diabetes mellitus: a multicentre prospective cohort study

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Background: Patients with poorly controlled diabetes mellitus (DM) often visit the emergency department (ED) for management of hyperglycemic episodes, including diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS). It has been previously reported that risk factors for readmission to the intensive care unit (ICU) in DKA include older age, female sex and the presence of significant comorbidity including sepsis. However, there are no ED-based studies on this topic, particularly in a Canadian setting, and data on outcomes such as recurrent ED visits, hospital or ICU admission after discharge in these patients is lacking. **Objectives**: The primary objective of this study is to derive and internally validate a clinical risk tool for prognosis of patients presenting with hyperglycemic emergencies to identify those at higher risk of adverse outcomes within 30 days of initial ED presentation. **Methods**: This will be a multicentre prospective cohort study of eligible consecutive adult patients with an ED diagnosis of hyperglycemia, DKA or HHS. We will include all visits of adult (≥18 years) ED patients with either a known or unknown history of DM and a diagnosis of hyperglycemia (blood glucose >11.0 mmol/L), DKA or HHS. We will include patients with co-morbid diagnoses in addition to hyperglycemia. We will exclude patients: a) with advanced care directives for resuscitation involving refusal of treatment, and b) who are initially assessed at a peripheral hospital and transferred to our sites for ongoing management. Research assistants will then contact the enrolled participants via telephone for follow-up regarding clinical outcomes, including repeat visits to see a health care provider, changes in diabetic medications, and time taken off of work or school. Participants will be followed to determine if they have further ED visits, admissions or ICU admissions after their ED visit for hyperglycemia. Data on missed patients or those who refused consent will be collected to assess for selection/enrolment bias. **Statistical considerations:** The primary outcome will be an unplanned return ED visit for hyperglycemia within 30 days of initial presentation. Secondary outcomes will include unplanned admission to hospital or ICU for hyperglycemia, or death within 30 days of the index ED visit. Additionally, we hope to characterize patient-important and health-care system outcomes such as time taken off work or school and follow-up visits to see a healthcare provider. We will conduct descriptive statistics on investigations, treatments, disposition and patient-important outcomes. We will

https://doi.org/10.1017/cem.2017.166 Published online by Cambridge University Press

perform an initial univariate logistic regression, followed by a multivariate analysis to identify predictor variables associated with adverse events such as recurrent ED visits, and admission to hospital or ICU for hyperglycemia within 30 days. We will include individual patients who have multiple recurrent visits to the ED during the study period and statistically weight for these using generalized estimating equations (GEE), which are used to develop regression models for correlated data that arise from repeated measures of the same individuals over time. Finally, a clinical risk tool will be derived by rounding the beta coefficients. Internal validation will be conducted using bootstrapping techniques. **Importance**: ED visits for hyperglycemia significantly affect both the healthcare system overall and the individual patient. The results of this project will assist clinicians to better identify these patients and enable them to intervene either medically or educationally to prevent subsequent visits to the ED. As a result, patients will have improved care, better blood glucose control, and be identified for closer follow-up with a family physician or diabetes specialist. Furthermore, by aiming to reduce the number of recurrent visits, this project may reduce ED utilization and the associated healthcare costs with frequent visits and admissions for hyperglycemia.

Moderated Poster Presentations

MP01

The canary in the coal mine: Does palliative care consultation influence emergency department utilization?

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Introduction: For cancer patients undergoing active treatment, emergency department (ED) visits may be an indicator of a breakdown in continuity and quality of care. Palliative care (PC) may be an important resource for patients in need of symptom management even during treatment with curative intent. This study aims to describe ED utilization by cancer patients and determine if PC consults impact ED use. **Methods:** Patient data from the Tom Baker Cancer Center (TBCC) was linked to PC and ED data as a retrospective cohort study. ED data was obtained from two administrative databases and PC data was obtained from four administrative databases and restricted to the first four hundred days following diagnosis. Univariate and Multivariate analyses were used. **Results:** Three actively treated cancer patient cohorts were identified based on first presentation following intake at the TBCC: 1) Used ED first ($n = 1637$), 2) Used PC first ($n = 539$), and 3) Only used services at the TBCC ($n = 2153$). Using Multivariate analysis, patients living alone or who had a diagnosis of prostate or breast cancer were more likely to access the ED first or to only use services at the TBCC rather than access PC first. Patients who were divorced, on income support, or diagnosed with a lung or GI cancer, were more likely to access PC first rather than access the ED or only use services at the TBCC. A subgroup analysis was performed on those who accessed the ED at some point during their care, consisting of three groups: 1) ED Only Users ($n = 1091$), 2) ED First Users, who also accessed PC ($n = 546$), and 3) PC First Users, who also accessed the ED. There was a significant difference in rates of ED visits between the three groups: ED Only Users went to the ED at a rate of 3.8 per 1000 patient days; ED First Users, who also accessed PC, went to the ED at a rate of 7.7 per 1000 patient days; and PC First Users, who also accessed the ED, went to the ED at a rate of 9.2 per 1000 patient days ($p < 0.001$). **Conclusion:** In a tertiary cancer centre, patients who were divorced, on income support, or diagnosed with lung or GI cancer were more likely to access PC. Amongst those patients who presented to the ED, those who accessed PC first had higher rates of ED use. Further explorations of presenting complaints, utilization patterns, and symptom burdens will be analyzed to determine if early PC consults can influence or decrease ED utilization.

Keywords: palliative care, cancer patients, utilization

MP02

Paramedic safety culture across Eastern Ontario

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Introduction: Safety culture is defined as the shared beliefs that an organization's employees hold relative to workplace safety. Perceptions of workplace safety culture within paramedic services have been shown to be associated with patient and provider safety outcomes as well as safe work practices. We sought to characterize paramedics' perceptions of the organizational safety culture across Eastern Ontario, Canada to provide important benchmarking data to evaluate future quality initiatives. **Methods:** This was a cross-sectional survey study conducted September 2015-January 2016 in 7 paramedic services across Eastern Ontario. We distributed an abridged version of Patterson's previously published EMS-SAQ survey, measuring six domains of workplace safety culture, to 1,066 paramedics during continuing medical education sessions. The questions were presented for rating on a 5 point Likert scale (1 = strongly agree, 5 = strongly disagree) and a response of 1 or 2 was considered a 'positive perception' response. We present descriptive statistics and chi-square tests where appropriate. **Results:** We received responses from 1,041 paramedics (97.6%), with a response rate varying between 88.0% and 100% across the 8 paramedic services. One third (33.6%) were Advanced Care Paramedics (ACPs) and 39.4% of paramedics had more than 10 years' experience. The percentage of positive responses for each domain were: Safety Climate 31.2% (95% CI 28.4-34.1), Teamwork Climate 29.3% (95% CI 26.6-32.1), Stress Recognition 56.8% (95% CI 53.8-59.8), Perceptions of Management 67.0% (95% CI 64.0-69.8), Working Conditions 42.6% (95% CI 39.6-45.7), Job Satisfaction 41.6% (95% CI 38.6-44.6). Primary care paramedics had more positive perception responses for Job Satisfaction (45% vs 35%, $p = 0.002$), whereas ACPs had more positive perception responses for Stress Recognition (61.5% vs 54.1%, $p = 0.022$). No association was found between gender or years of experience and a positive perception of any safety domain. **Conclusion:** The results provide valuable workplace safety culture data that will be used to target and evaluate needed quality improvement initiatives while also raising some awareness to paramedics of important factors related to patient and provider safety.

Keywords: paramedic, safety culture, patient safety

MP03

Predicting survival after pediatric out-of-hospital cardiac arrest

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Introduction: Pediatric out-of-hospital cardiac arrest (OHCA) is unique in terms of epidemiology, treatment, and outcomes. There is a paucity of literature examining predictors of survival to help guide resuscitation in this population. **Objective:** The primary objective was to examine predictors of survival to hospital discharge. The secondary objective was to determine the probability of return of spontaneous circulation

https://doi.org/10.1017/cem.2017.166 Published online by Cambridge University Press