MP13

Injuries presenting to the ED following jumps from bridges into water: a multi-agency retrospective case series

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Introduction: Suicidal jumps from bridges into water are a unique blunt trauma mechanism. Impact into water produces substantial variation in injuries as compared to falls onto hard surfaces. Outcomes can be further complicated by submersion injuries. We identified cases through a multi-agency review in order to analyze injury patterns seen in EDs. **Methods:** Cases in British Columbia's Lower Mainland of jumps from bridges >12m into water between 2006 and 2017 were identified by retrospective review of Coast Guard and Police records. Records pertaining to identified incidents were located in ambulance and then hospital records. This multi-agency approach was necessary to generate a comprehensive case series, as case identification was not possible at the hospital level. Patient hospital charts were abstracted and injury incidence rates were analyzed. **Results:** Records were available for 41 of 52 patients. The population was 63% (26/41) male, median age 37 (IQR 29-48). Thirty-two cases were admitted to hospital, seven were deceased in the ED, one was discharged, and disposition is unknown for one. Most patients (85%) presented to Level One trauma centers. Bridge heights ranged from 15m to 70m; the mean fall height was 40.1m. Pulmonary injuries were nearly universal, including pneumothorax (51%), haemothorax (22%), and pulmonary infiltrate (34%). The primary cardiovascular concern was cardiac arrhythmia (51%). A quarter of cases had intraabdominal lacerations or ruptures (27%). Vertebral fractures at all levels were frequent (59%), although there was only one case each of cord transection and contusion. Neurological injuries were rare; 59% of patients presented to the ED with GCS $\geq$14 and the incidence of intracranial bleeding was low (7%). Rib fractures were commonly reported (37%) along with other fractures (32%). Body temperature was reported in 24 cases with 3 reports of moderate and 6 reports of mild hypothermia. **Conclusion:** This case series is the first to characterize injury patterns of jumps from bridges into water in Canada. Patterns are similar to reports in the literature from other countries. However, we found lower injury severity, and higher incidences of spinal fractures and cardiac arrhythmias. The low injury severity reflects the survivorship bias inherent to the sample: data was only obtained from patients who survived to be assessed the ED. These results suggest that patients with this mechanism of injury should be treated for both suspected trauma and cold-water immersion injuries.

Keywords: bridge, multi-agency, trauma

MP14

Quantification of head-neck motion in trauma patients in the emergency department under spinal motion restriction: a prospective observational study

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Introduction: This was a prospective observational study involving a convenience sample of low-risk trauma patients presenting to a Level 1 Trauma Centre under spinal motion restriction (SMR). To our knowledge no prior studies have objectively measured head-neck (H-N) motion in trauma patients with suspected spine injuries during emergency department (ED) care. The goal was to establish the feasibility of deploying non-invasive motion sensors on trauma patients in the ED and to provide initial estimates for H-N kinematics under SMR during different phases of treatment. **Methods:** Low-risk adult patients treated by Winnipeg Fire Paramedic Service who sustained non-life threatening trauma with the potential for spine injury were eligible for inclusion. Participants received usual pre-hospital care; application of spine board and/or cervical collar, as determined by local practice protocol. Inertial measurement units (IMUs) were placed on participant's forehead, sternum and stretcher upon arrival to the ED. Data was collected during three phases of care: patient handling (log rolls, transfers, clothing removal); stretcher movement (to imaging, etc); stretcher stationary. IMUs were removed upon disposition decision by the attending physician. IMUs yielded data on H-N motion in terms of linear acceleration (resultant) and angular displacement (rotation + flexion-extension + side-flexion = total). Peak (M +/- SE) displacements and accelerations are reported, with comparisons across treatment phases using repeated measures ANOVA. **Results:** Eleven patients were enrolled in the study (age: 49 +/- 16 years; Injury Severity Score 13.4 +/- 9.9; female = 2). Substantial H-N motion was observed during ED care. Total H-N displacement (28.6 +/- 3.6 deg) and acceleration (7.8 +/- 1.0 m/s2) were higher during patient handling compared to stretcher moving (13.0 +/- 2.5 deg; 4.6 +/- 0.9 m/s2; p < .05) but not while the stretcher was stationary (18.9 +/- 3.4 deg; 5.4 +/- 1.2 m/s2; p > .06). Similar differences were detected for side-flexion and flexion-extension (p < .05), with peak displacements of 11.4+/-1.5 deg and 14.6 +/- 2.2 deg during patient handling, respectively. **Conclusion:** IMU use on trauma patients safely described H-N motion kinematics in a small sample of patients with different spectrums of illness during their care in the ED. Future studies utilizing IMUs could inform ED spine motion restriction protocols and compare movement of patients in specific subsets (intoxicated, spinal tenderness, injury severity etc.).

Keywords: emergency department, spinal motion restriction, trauma

MP15

Predictors of emergency department opioid use and variability of prescribing practices in a large multicenter Canadian cohort

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Introduction: Emergency department (ED) opioid prescribing has been linked to long-term use and dependence. Anecdotally, significant opioid practice variability exists between physicians and institutions, but this is poorly defined. Our objective was to collate and analyze multicenter data looking at predictors of ED opioid use and to identify potential areas for opioid stewardship. **Methods:** We linked administrative and computerized physician order entry (CPOE) data from all four ED's within our municipality over a one-year period. Eligible patients included those with a Canadian Triage and Acuity Scale (CTAS) pain complaint or an arrival numeric rating scale (NRS) pain score of greater than 3/10. Patients with missing demographic or chief complaint data were excluded. Multiple imputation was used for missing NRS pain scores. We performed descriptive analyses of opioid-treated and non-treated patients, followed by a multivariable logistic regression to identify predictors of ED opioid administration. **Results:** A total of 129,547 patients were studied. The mean age was 47.4 years and 55.4% were female. The median

pain score was 6.6 in the no-opioid group and 8 in the opioid group. The most common pain categories were abdominal pain (23%), trauma (18.2%) and chest pain (15.3%). Overall, opioids were prescribed to 34% of patients. The most common CTAS score was CTAS 3 (44%), CTAS 1-2 42%) and CTAS 4-5 (13.9%). Multivariable predictors of opioid-use included the need for admission (adjusted OR 6.57; CI = 6.34-6.79), NRS pain score (aOR 1.24 per unit increase, CI 1.23-1.25), higher numerical CTAS score (aOR 0.89 per unit increase, CI 0.87-0.91), and chief complaints of back (aOR 7.69, CI 7.1-8.1), abdominal (aOR 5.9, CI 5.6-6.2), and flank pain (OR 3.8, CI 3.5-4). Oral opioids were prescribed in 39.8% of back pain presentations and 18.5% received IV opioids. Increasing age was a predictor but sex was not. There were significant institutional differences in opioid prescribing rates, with Hospital B being the least likely to prescribe opioids (aOR 0.82, CI 0.80-0.85) followed by Hospital C (aOR 0.83, CI 0.79-0.86) compared to the reference standard of Hospital A. Hospital D was most likely to prescribe opioids (aOR 1.32, CI 1.27-1.37). **Conclusion:** Predictors of ED opioid use were characterized using multicenter administrative data. Future research should seek to describe the physician- and site-level factors driving regional variation in opioid-based pain treatment.
Keywords: acute pain, emergency department, opioid

MP16

Oral case presentation: evaluation of a novel curriculum and development of a competency-based assessment tool in Emergency Medicine

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Introduction: The oral case presentation is recognized as a core educational and patient care activity but has not been well studied in the emergency setting. The objectives of this study are: 1) to develop a competency-based assessment tool to formally evaluate the emergency medicine oral case presentation (EM-OCP) competency of medical students and 'transition to discipline' residents, and 2) to develop, implement and evaluate a curriculum to enhance oral case presentation (OCP) communication skills in the emergency medicine (EM) setting. **Methods:** Using data from a literature review, a Canadian Association of Emergency Physicians national survey, and local focus groups, the authors designed an OCP framework, blended learning curriculum, and EM-OCP assessment tool. Ninety-six clerkship students were randomly assigned to receive either the control, the standard clerkship curriculum, or intervention, the blended learning curriculum. At the beginning of their emergency medicine rotation, learners completed a pre-test using a standardized patient (SP) case to assess their baseline OCP skills. The intervention group then completed the EM-OCP curriculum. All students completed post-tests with a different SP at the end of the six-week EM rotation. Audio-recordings of pre and post-tests were evaluated using the assessment tool by two blinded evaluators. **Results:** Using the Kruskal-Wallis test, all students demonstrated improvement in EM-OCP skills between their pre-test and post-test, however, those who received the blended learning curriculum showed significantly greater improvement in synthesis of information (p = 0.044), management (p = 0.006) and overall entrustment decision score (p = 0.000). **Conclusion:** Implementation of a novel EM-OCP curriculum resulted in more effective communication and higher entrustment scores. This curriculum could improve OCP performance not only in

emergency medicine settings but also across specialties where medical students and residents must manage critical patients.
Keywords: communication, competency based medical education, curriculum design

MP17

Evaluation of a national competency-based assessment system in emergency medicine: A CanDREAM study

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Introduction: In 2018, Canadian postgraduate specialist Emergency Medicine (EM) programs began implementing a competency-based medical education (CBME) assessment system. To support improvement of this assessment program, we sought to evaluate its short-term educational outcomes nationally and within individual programs. **Methods:** Program-level data from the 2018 resident cohort were amalgamated and analyzed. The number of Entrustable Professional Activity (EPA) assessments (overall and for each EPA) and the timing of resident promotion through program stages was compared between programs and to the guidelines provided by the national EM specialty committee. Total EPA observations from each program were correlated with the number of EM and pediatric EM rotations. **Results:** Data from 15 of 17 (88.2%) EM programs containing 9,842 EPA observations from 68 of the 77 (88.3%) Canadian EM specialist residents in the 2018 cohort were analyzed. The average number of EPAs observed per resident in each program varied from 92.5 to 229.6 and correlated strongly with the number of blocks spent on EM and pediatric EM (r = 0.83, p < 0.001). Relative to the guidelines outlined by the specialty committee, residents were promoted later than expected and with fewer EPA observations than suggested. **Conclusion:** We present a new approach to the amalgamation of national and program-level assessment data. There was demonstrable variation in both EPA-based assessment numbers and promotion timelines between programs and with national guidelines. This evaluation data will inform the revision of local programs and national guidelines and serve as a starting point for further reaching outcome evaluation. This process could be replicated by other national assessment programs.
Keywords: competency based medical education, learning analytics

MP18

Pre-departure and post-elective requirements for global health electives: a survey of Canadian Royal College emergency medicine programs

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Introduction: Participation in Global Health (GH) electives can improve resourcefulness, cultural and ethical insight, and personal development. Risks to trainees, hosts and institutions may be minimized through pre-departure and post-elective training. In 2016 such training was mandatory in only 3 Canadian residency programs, however there is no published data specific to Canadian Emergency Medicine (EM) programs. This study sought to identify current GH elective requirements and related perceived gaps among Royal College EM programs. **Methods:** We conducted two cross-sectional