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### MP13

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

D. Stephanian, MSc, BSc, D. Shearer, BSc, N. Bandara, BSc, J. Brubacher, MD, MSc, University of British Columbia, Vancouver, BC

**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

M. Kulas, MD, L. Brueton-Campbell, BSc, E. Weldon, MD, N. McDonald, MPhil, R. Pryce, PhD, University of Manitoba, Winnipeg, MB

**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/s<sup>2</sup>) were higher during patient handling compared to stretcher moving (13.0 +/- 2.5 deg; 4.6 +/- 0.9 m/s<sup>2</sup>; p < .05) but not while the stretcher was stationary (18.9 +/- 3.4 deg; 5.4 +/- 1.2 m/s<sup>2</sup>; 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

T. Lau, MD, BSc(Pharm), J. Hayward, MD, G. Innes, MD, MHSc, University of Calgary, Calgary, AB

**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