

LO95**A prospective evaluation of mild traumatic brain injuries in a working population in Edmonton, AB**

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Introduction: Patients with mild traumatic brain injury (mTBI) frequently present to the emergency department (ED); however, wide variation in diagnosis and management has been demonstrated in this setting. Sub-optimal mTBI management can contribute to post-concussion syndrome (PCS), affecting vocational outcomes like return to work. This study documented the work-related events, ED management, discharge advice, and outcomes for employed patients presenting to the ED with mTBI. **Methods:** Adult (>17 years) patients presenting to one of three urban EDs in Edmonton, Alberta with Glasgow coma scale score ≥ 13 within 72 hours of a concussive event were recruited by on-site research assistants. Follow-up calls ascertained outcomes, including symptoms and their severity, advice received in the ED, and adherence to discharge instructions, at 30 and 90 days after ED discharge. Dichotomous variables were analyzed using chi-square testing; continuous variables were compared using t-tests or Mann-Whitney tests, as appropriate. Work-related injury and return to work outcomes were modelled using logistic or linear regression, as appropriate. **Results:** Overall, 250 patients were enrolled; 172 (69%) were employed at the time of their injury and completed at least one follow-up. The median age was 37 years (interquartile range [IQR]: 24, 49.5), both sexes were equally represented (48% male), and work-related concussions were uncommon (16%). Work-related concussion was related to manual labor jobs and self-reported history of attention deficit disorder. Patients often received advice to avoid sports (81%) and/or work (71%); however, the duration of recommended time off varied. Most employed patients (80%) missed at least one day of work (median = 7 days; IQR: 3, 14); 91% of employees returned to work by 90 days, despite 41% reporting persistent symptoms. Increased days of missed work were linked to divorce, history of sleep disorder, and physician's advice to avoid work. **Conclusion:** While work-related concussions are uncommon, most employees who sustain a mTBI at any time miss some work. Many patients experience mTBI symptoms past 90 days, which has serious implications for workers' abilities to fulfill their work duties and risk of subsequent injury. Workers, employers, and the workers compensation system should take the necessary precautions to ensure that workers return to work safely and successfully following a concussion. **Keywords:** occupational injury, mild traumatic brain injury

LO96**Syncope prognosis based on emergency department diagnosis: a prospective cohort study**

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Introduction: Relatively little is known about outcomes after disposition among syncope patients assigned various diagnostic categories during emergency department (ED) evaluation. We sought to measure the 30-day serious outcomes among 4 diagnostic groups (vasovagal, orthostatic hypotension, cardiac, other/unknown) within 30 days of the index ED visit. **Methods:** We prospectively enrolled adult syncope patients at six EDs and excluded patients with pre-syncope, persistent mental status

changes, intoxication, seizure, and major trauma. Patient characteristics, ED management, diagnostic impression (vasovagal, orthostatic, cardiac, or other/unknown) at the end of the ED visit and physicians' confidence in assigning the etiology were collected. Serious outcomes at 30-days included: death, arrhythmia, myocardial infarction, structural heart disease, pulmonary embolism, and hemorrhage. **Results:** 5,010 patients (mean age 53.4 years; 54.8% females) were enrolled; 3.5% suffered serious outcomes: deaths (0.3%), arrhythmias (1.8%), non-arrhythmic cardiac (0.5%) and non-cardiac (0.9%). The cause of syncope was determined as vasovagal among 53.3% and cardiac in 5.4% of patients. The proportion of patients with ED investigations ($p < 0.001$) and short-term serious outcomes increased ($p < 0.01$) increased in each diagnostic category in the following order: vasovagal, orthostatic hypotension, other/unknown cause and cardiac. No deaths occurred in patients with vasovagal syncope. A higher proportion of all serious outcomes occurred among patients suspected of cardiac syncope in the ED ($p < 0.01$). Confidence was highest among physicians for a vasovagal syncope diagnosis and lowest when the cause was other/unknown. **Conclusion:** Short-term serious outcomes strongly correlated with the etiology assigned in the ED visit. The physician's clinical judgment should be incorporated in risk-stratification for prognostication and safe management of ED syncope patients.

Keywords: syncope, prognosis

LO97**Validation of the HEART score in Canadian emergency department chest pain patients using a high-sensitivity troponin T assay**

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Introduction: The HEART score is a validated tool created to risk stratify emergency department (ED) chest pain patients using 5 simple criteria (History, ECG findings, Age, Risk factors, and Troponin). Several studies have demonstrated the superiority of HEART over other well known risk stratification tools in identifying low risk chest pain patients suitable for early discharge. All but one of these studies used conventional troponin assays, and most were conducted in European populations. This study aims to validate the HEART score using a high-sensitivity troponin T assay in a Canadian population. **Methods:** This prospective cohort study was conducted at a single urban tertiary centre and regional percutaneous coronary intervention site in Calgary, Alberta. Patients were eligible for enrolment if they presented to the ED with chest pain, were age 25-years or older and required biomarker testing to rule out AMI at the discretion of the attending emergency physician. Patients were excluded if they had clear acute ischemic ECG changes, new arrhythmia or renal failure requiring hemodialysis. Clinical data were recorded by the emergency physician at the time of enrolment and outcomes were obtained from administrative data. High-sensitivity troponin-T (Roche Elecsys hs-cTnT) results were obtained in all patients at presentation. The primary outcome was AMI within 30-days of ED visit, the secondary outcome was 30-day major adverse cardiac events (MACE). **Results:** A total of 984 ED patients with complete HEART scores were enrolled from August 2014 to September 2016. The 30-day incidence of AMI and MACE in the overall population was 3.3% and 20.6%, respectively. HEART scores were predictive of 30-day AMI incidence: low risk (0-3): 0.77% (95%CI 0.0-1.5%), moderate risk (4-6): 4.3% (95%CI 2.3-6.2%) and high risk (7-10): 12.2% (95%CI 5.5-19.0%). HEART scores also predicted 30-day MACE: low risk (0-3): 5.0% (95% CI 3.1-6.9%), moderate risk (4-6): 31.8% (95%CI 27.2-36.4%) and high-risk (7-10): 61.4% (95%CI 51.2-71.5%). More than half of patients, 522 (53.0%) could be identified as low risk based on the HEART score

using a single troponin result. **Conclusion:** Using a single high-sensitivity troponin result collected at ED presentation, the HEART score can rapidly and effectively identify more than half of ED chest pain patients as low risk for 30-day AMI, but is less sensitive for 30-day MACE.

Keywords: troponin, chest pain, myocardial infarction

LO98

Optimal length of observation for emergency department patients with syncope: a time to event analysis

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Introduction: Concern for occult serious conditions leads to variations in ED syncope management [hospitalization, duration of ED/inpatient monitoring including Syncope Observation Units (SOU) for prolonged monitoring]. We sought to develop evidence-based recommendations for duration of ED/post-ED ECG monitoring using the Canadian Syncope Risk Score (CSRS) by assessing the time to serious adverse event (SAE) occurrence. **Methods:** We enrolled adults with syncope at 6 EDs and collected demographics, time of syncope and ED arrival, CSRS predictors and time of SAE. We stratified patients as per the CSRS (low, medium and high risk as ≤ 0 , 1-3 and ≥ 4 respectively). 30-day adjudicated SAEs included death, myocardial infarction, arrhythmia, structural heart disease, pulmonary embolism or serious hemorrhage. We categorized arrhythmias, interventions for arrhythmias and death from unknown cause as arrhythmic SAE and the rest as non-arrhythmic SAE. We performed Kaplan-Meier analysis using time of ED registration for primary and time of syncope for secondary analyses. **Results:** 5,372 patients (mean age 54.3 years, 54% females, and 13.7% hospitalized) were enrolled with 538 (10%) patients suffering SAE (0.3% died due to an unknown cause and 0.5% suffered ventricular arrhythmia). 64.8% of SAEs occurred within 6 hours of ED arrival. The probability for any SAE or arrhythmia was highest within 2-hours of ED arrival for low-risk patients (0.65% and 0.31%; dropped to 0.54% and 0.06% after 2-hours) and within 6-hours for the medium and high-risk patients (any SAE 6.9% and 17.4%; arrhythmia 6.5% and 18.9% respectively) which also dropped after 6-hours (any SAE 0.99% and 2.92%; arrhythmia 0.78% and 3.07% respectively). For any CSRS threshold, the risk of arrhythmia was highest within the first 15-days (for CSRS ≥ 2 patients 15.6% vs. 0.006%). ED monitoring for 2-hours (low-risk) and 6-hours (medium and high-risk) and using a CSRS ≥ 2 cut-off for outpatient 15-day ECG monitoring will lead to 52% increase in arrhythmia detection. The majority (82.2%) arrived to the ED within 2-hours (median time 1.1 hours) and secondary analysis yielded similar results. **Conclusion:** Our study found 2 and 6 hours of ED monitoring for low-risk and medium/high-risk CSRS patients respectively, with 15-day outpatient ECG monitoring for CSRS ≥ 2 patients will improve arrhythmia detection without the need for hospitalization or observation units.

Keywords: syncope, risk stratification, electrocardiographic monitoring

Grizzly Den Presentations

GD01

Age-adjusted D-dimer and two-site compression point-of-care ultrasonography to rule out acute deep vein thrombosis

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Introduction: Undiagnosed deep vein thrombosis (DVT) can lead to significant morbidity and mortality, including death from DVT-associated massive pulmonary embolism (PE). While several validated clinical prediction rules, blood test and imaging modalities exist to investigate a potential DVT, there is currently a lack of rapid, accessible and reliable methods to exclude the possibility of DVT without resorting to formal venous duplex scanning. Currently, the use in the ED of a validated clinical prediction rule combined to either a high-sensitivity D-dimer test or ultrasonography of the lower extremities has a poor predictive value, as 75-90% of patients suspected of DVT have a negative formal venous duplex scan. Compression bedside ultrasound has however recently been shown to be a safe, rapid and accurate method for the diagnosis of proximal DVT in the emergency department with a high sensitivity and specificity (combined sensitivity and specificity of 96.1% and 96.8%, respectively¹). **Research question:** In the present study, we will primarily assess whether two-site compression POCUS combined with a negative age-adjusted D-dimer test can accurately rule out DVT in ED patients regardless of the Wells criteria. **Methods:** This is a single-center, prospective, observational study carried out over one year in the Emergency Department of the Jewish General Hospital in Montreal, Quebec. We aim to enroll a convenience sample of 475 patients aged 18 years and older presenting to the ED with symptoms suggestive of a DVT. All enrolled patients will receive the standard of care required for a lower leg DVT presentation. After calculating Patients DVT risk using modified wells criteria, all patients will undergo POCUS for DVT followed by a D-dimer test. Based on their results, patients will either undergo formal duplex scanning, or will be discharged without further testing and receive a three-month phone follow-up. A true negative lower leg DVT will be defined as follows: (1) Negative follow-up phone questionnaire for patients who were sent home with no formal duplex venous scanning. (2) Negative formal duplex venous scanning for patients who were deemed likely to have lower leg DVT using the Wells score, with a negative D-dimer and POCUS. Age adjusted DVT was added to account for below knee DVT and avoid the need for patients to return for follow up duplex study in 1 week. To estimate our technique's sensitivity with a 4% margin of error with 95% confidence intervals, 92 confirmed DVT patients are needed. We expect to recruit a total 475 patients within one-year period at the JGH (95 DVT-positive patients and 380 DVT-negative patients). **Impact:** The use of compression bedside ultrasound with a negative age-adjusted D-dimer test to rule out DVT in the ED may accelerate the decision regarding patient disposition and significantly decrease the length of patient stay in the ED. In addition, it may help avoid unnecessary medical interventions and diagnostic tests, thus representing potential quality of care and cost-saving improvements as well.

¹Pomero F, Dentali F, Borretta V, et al. Accuracy of emergency physician-performed ultrasonography in the diagnosis of deep-vein thrombosis: a systematic review and meta-analysis. *Thromb Haemost* 2013;109:137-45.

GD02

An international consensus study to identify quality indicators for ambulatory emergency care

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Introduction: Redirecting low acuity patients from emergency departments to primary care walk-in clinics has been identified as a priority by many health authorities. Promoting family physicians for the