

LO017**Review of prehospital naloxone use in Ontario: Is a mandatory patch point necessary?**

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Introduction: Recent years have brought an epidemic of opioid abuse to Canada. At present, in Ontario, Naloxone may not be administered by any paramedic without the direct online medical approval of a Base Hospital Physician (BHP). The objective of this study was to review the use of Naloxone by Emergency Medical Service (EMS) personnel, under the existing Advanced Life Support Patient Care Standards (ALS-PCS) medical directive for opioid toxicity, for safety and potential complications that may occur with removal of the mandatory patch point. **Methods:** This study was a retrospective ambulance call report review of consecutive Naloxone requests placed to a BHP of the Regional Paramedic Program of Eastern Ontario (RPPEO) between Oct 1st, 2013 and Oct 31st, 2015. The RPPEO consists of 10 prehospital services, both urban and rural jurisdictions, and has a mix of advance care and primary care paramedics. All ambulance call reports are electronically stored at the secured RPPEO data warehouse. Data was extracted using a standardized data collection tool. All ambulance call reports were reviewed by 2 independent authors (VC, NC). Compliance with the existing medical directive for opioid toxicity was determined. We calculated the frequency of denied Naloxone requests and the rationale for each patch refusal was recorded. We also categorized all adverse events associated with Naloxone administration. **Results:** From 244 patches, 215 patients were administered Naloxone. Only 7.8% (19/215) of requests for Naloxone were refused; 78.9% (15/19) did not meet existing inclusion criteria for Naloxone administration in the ALS-PCS medical directive for opioid toxicity because the patient's respiration rate was above 12/min. Of the 215 patients who were administered Naloxone, adverse events were extremely uncommon: 5 (2.3%) became violent or verbally abusive, 1 (0.5%) was transiently hypertensive and 4 (1.9%) vomited. **Conclusion:** Requests for Naloxone to a BHP are common and yet are seldom declined. The use of prehospital Naloxone is associated with few adverse events. These results demonstrate that it would be safe to remove online medical direction for Naloxone from the ALS-PCS medical directive for opioid toxicity if combined with updated paramedic education.

Keywords: emergency medical services (EMS), naloxone, opioid

LO018**The utility of ECG characteristics as prognostic markers in pulseless electrical activity arrests: a retrospective observational cohort study**

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Introduction: Compared to pseudo-pulseless electrical activity (PEA) with myocardial contractions present, true PEA is hypothesized to carry a poorer prognosis and to show bradycardia and a wide QRS complex on ECG. Our objective was to study the predictive potential of ECG characteristics on survival to hospital discharge (SHD) for out-of-hospital cardiac arrest (OHCA) patients with PEA initial rhythm. **Methods:** We studied a cohort of OHCA patients prospectively enrolled between Sept. 2007 and Oct. 2009 at the Ottawa/OPALS site (13 cities, 7 EMS, and 6 Fire services) of the ROC PRIMED study. We included adult (≥ 18) non-traumatic OHCA with PEA initial rhythm where

resuscitation was attempted, and for which ECG characteristics were available. We measured mean heart rate (HR), mean QRS interval, and presence of P waves (each with kappa agreement) using the first six QRS complex available. We report patient and system characteristics using descriptive statistics and determined the impact of ECG characteristics (HR, QRS width, P waves) on return of spontaneous circulation (ROSC) and SHD using multivariate regression analysis.

Results: Demographics of 332 included cases were: mean age 71.7; male 58.4%; home residence 76.5%; bystander witnessed 56.3%; bystander CPR 28.5%; interval from dispatch to paramedic arrival 6min:24sec; ROSC at ED arrival 26.5%; SHD 5.4%. Survivors had higher mean HR (66.1 vs. 52.0 bpm, $p = 0.83$; kappa = 0.69) and shorter mean QRS intervals (108.3 vs. 129.6 ms, $p = 0.01$; kappa = 0.74) compared to non-survivors. Presence of p waves could not reliably be ascertained (kappa = 0.35). Predictors of ROSC were: ALS paramedic on scene (AdjOR = 8.90, 95%CI 1.11-71.41; $p = 0.04$), successful intubation (AdjOR = 3.35, 1.75-6.39; $p = 0.0002$), and use of atropine (AdjOR = 0.27, 0.14 - 0.50; $p < 0.0001$). Predictors of survival were: location of arrest (AdjOR = 1.49, 1.11 - 1.99; $p = 0.007$), and use of atropine (AdjOR = 0.06, 0.02-0.22; $p < 0.0001$). Despite various cutoff explorations, ECG characteristics were not predictive of ROSC or survival in multivariate analyses. Survivors had HR as low as 6 bpm and QRS as wide as 357 ms. **Conclusion:** Early ECG characteristics could not predict ROSC or SHD in a population of OHCA PEA victims, and should not be used to terminate resuscitation efforts. Atropine administration was consistently associated with decreased likelihood of ROSC and survival.

Keywords: cardiac arrest, electrocardiogram (ECG), emergency medical services (EMS)

LO019**The prevalence and characteristics of non-transported EMS patients in Nova Scotia**

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Introduction: An undefined yet potentially significant risk for Emergency Medical Services (EMS) systems are patients who access 911 with an ambulance response who are not transported to hospital (non-transport). Our objective was to determine the prevalence and associated characteristics of non-transport and potentially clinically adverse non-transport in Nova Scotia. **Methods:** We conducted a secondary analysis of pooled cross-sectional, population-based administrative data in a provincial EMS system that provides care to 920,000 residents. Electronic patient care record (ePCR) data was retrospectively analyzed for one calendar year (2014). The dependent variables were non-transport status and potentially adverse non-transport status. Potentially adverse non-transport were defined as a repeat call within 48 hours for a related complaint with the outcome of transport or death. Independent variables include patient characteristics, (age, sex, vitals and paramedic clinical impression), operational (crew type and response code) and environmental (time, date, and location). For both objectives we determined the prevalence of the outcome of interest, and associated characteristics. **Results:** There were 74,471 EMS responses between January to December 2014, 18.9% ($n = 14, 094/74,471$) resulted in a non-transport. The characteristics most associated with non-transport are: age, paramedic clinical impressions, number of co-morbidities, response mode, and incident location type. As age decreased, the likelihood of non-transport increased. Younger non-transported patients (0-15 years old) (OR 2.2, 99.9% CI 1.9-2.5) are more likely to have non-transport. Relative to other paramedic

clinical impressions, glycemic issues (OR 4.8; 99.9% CI 3.9-5.7) and wellness checks (OR 6.5; 99.9% CI 5.7-7.3) are more likely to have a non-transport. Non-transporters are more likely at a detention facility (OR 4.1; 99.9% CI 3.2-5.1) or a roadway (OR 2.4; 99.9% CI 2.1-2.8). 5.6% ($n = 798/14094$) of non-transport patients were classified as a potentially adverse non-transport. **Conclusion:** This study demonstrated that a significant portion of patients (18.9%) had a non-transport outcome, but only a small percentage (5.6%) were considered potentially adverse. The results of this study provide timely information to policy makers and healthcare practitioners on the scope of this issue, and suggest potential directions for future study and clinical decision making.

Keywords: non-transport, emergency medical services (EMS), transport

LO020

Obstacle course runs: review of acquired injuries and illnesses at a series of Canadian events (RACE)

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Introduction: The growing popularity of obstacle course runs (OCRs) has led to significant concerns regarding their safety. The influx of injuries and illnesses in rural areas where OCRs are often held can impose a large burden on first responders, Emergency Medical Services (EMS) and local Emergency Departments. Literature concerning these events is minimal and mostly consists of media reports. Recognizing the lack of epidemiologic data, we sought to accurately determine the patterns and frequency of injuries and illnesses that occur at OCRs, the treatments required, and what proportion require further medical care or transfer to hospital. **Methods:** Data were extracted from medical charts completed for all patients presenting to the on-site medical team at OCR events across Canada from May to August, 2015. Frequency and patterns of injuries and illnesses were determined as well as treatments and disposition. There were 45 285 OCR participants in 8 events. There were 572 total patient contacts and 557 patients were included in the study. 15 patients were excluded because they were not race participants. **Results:** Less than 2% of participants at any event required on-site medical care. 11 patients (1.97%) required transfer to hospital by EMS. The majority of injuries were musculoskeletal in nature (74.71%). 495 patients (88.87%) returned to the event with no need for further medical care. The majority of treatments could be provided with first aid training and basic medical equipment. **Conclusion:** Injury and illness rates at this series of OCRs was similar to other mass gathering events. Injuries were mostly musculoskeletal in nature and required minor treatment. Having a medical team on site likely reduced local hospital and EMS volume from these events. This study raises the question of whether having a physician on site at OCRs could significantly reduce the number of patients advised to seek further medical care or the number of ambulance transfers. Prospective research is needed in order to develop plans for more appropriate resources, safety protocols, and medical staffing, thereby improving patient care and reducing the burden on local EMS and rural hospitals.

Keywords: prehospital, sports medicine

LO021

Use of health services among non-institutionalized frail elderly with fracture: preliminary results

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Introduction: Frail older adults experience an increased risk of a number of adverse health outcomes such as comorbidity, disability,

dependency, institutionalization, falls, fractures, hospitalization, and mortality. Identification of frail adults is important. The objective of this study is to examine the association between frailty and use of health services (emergency, general practitioner, hospitalization) prior to and following a visit for a fracture in non-institutionalized seniors. **Methods:** This study is a population-based cohort build from the Quebec Integrated Chronic Disease Surveillance System, an innovative chronic disease surveillance system linking five health care administrative databases. Algorithms using data from this system are accurate and reliable for identifying fractures. The sample includes 179,734 seniors ≥ 65 years old, non-institutionalized in the year before the fracture. Their frailty status was measured using the elderly risk assessment index. Poisson regression models were used to compare use of health services (emergency, general practitioner, hospitalization) 1 year before and 1 year after a visit for a fracture (adjusting for age, sex, comorbidities, social deprivation, material deprivation and site of fracture). **Results:** Overall, preliminary results show that the use of health services increased significantly in the year following the fracture in frail non-institutionalized elderly vs the non-frail one ($p < 0.05$). **Conclusion:** This study suggests that frail seniors with a fracture require more health services after their incident fracture. Furthermore, using a frailty assessment index in health administrative databases can help identify seniors that are at high risk of needing more health services and, therefore, improve their care.

Keywords: frailty, fracture, health administrative databases

LO022

Incidence and impact measurement of delirium induced by ED stay - INDEED

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Introduction: Delirium is a dreadful complication in seniors' acute care. Many studies are available on the incidence of delirium, however ED-induced delirium is far less studied. We aim to evaluate the incidence and impact of ED-induced delirium among older non-delirious admitted ED patients who have prolonged ED stays (≥ 8 hours). **Methods:** This prospective INDEED study phase 1 included patients recruited from 4 Canadian EDs. **Inclusion criteria:** 1) Patients aged 65 and over; 2) ED stay ≥ 8 hours; 3) Patient is admitted to the hospital; 4) Patient is non-delirious upon arrival and at the end of the first 8 hours; 5) Independent or semi-independent patient. Eligible patients were assessed by a research assistant after an 8 hour exposition to the ED and evaluated twice a day up to 24h after ward admission. Patients' functional and cognitive status were assessed using validated OARS and TICS-m tools. The Confusion Assessment Method was used to detect incident delirium. Hospital length of stays (LOS) were obtained. Univariate and multivariate analyses were conducted to evaluate outcomes. **Results:** Of the 380 patients prospectively followed, mean age was 76.5 (± 8.9), male represent 50% and 16.5% very old seniors (> 85 y.o.). The overall incidence of ED-induced delirium was 8.4%. Distribution by the 4 sites was: 10%, 13.8%, 5.5% & 13.4%. The mean ED LOS varied from 29 to 48 hours. The mean hospital LOS was increase by 6.1 days in the delirious patients compared to non-delirious patient ($p < 0.05$). Increase mean hospital LOS distribution by site was by: 6.9, 8.5, 4.3 and 5.2 days for the ED-induced delirium patients. **Conclusion:** ED-induced delirium was recorded in nearly one senior out of ten after a minimal 8 hour exposure in the ED environment.