

data collection. This study sought to gain a baseline understanding of pediatric ED use in Manitoba, including child demographics, visit characteristics, variation across the province, drivers of ED use, and data completeness. **Methods:** A retrospective cohort study was conducted using administrative data from the Manitoba Centre for Health Policy, and included all children aged 0-17 who presented to a Manitoba ED between 2011/12 and 2015/16, as identified from the Emergency Department Information System (EDIS), the National Ambulatory Care Reporting System (NACRS) and physician billing claims. Frequency of use was defined as single, intermediate (2-6 visits) and frequent (7+) and regional trends in child characteristics, ED use, acuity, presenting complaints, and discharge dispositions were observed. Ordinal logistic regression will be used to identify predictors of ED use. **Results:** Overall, we were able to capture 250,620 ED visits made by 172,306 children; data sources and completeness varied by year. Provincially, children under 5 years of age were the most frequent users of the ED, and use <1 year of age was highest in the North. We observed higher use among low-income children, particularly in rural mid and north, and few differences by sex. By year, the majority of children made single-use of the ED (64.48%), while fewer were classified as intermediate (34.40%) or frequent users (1.11%). Overall, the top presenting complaints were for fever (10.27%), limb complaint/trauma (7.48%), abdominal pain (5.75%), nausea and/or vomiting (4.53%) and shortness of breath (3.68%), with variation by triage level. In rural but not urban areas, mental health assessments were a top presenting complaint and primary reason for transfer to larger centres. Results of predictors of ED use are pending. **Conclusion:** Results from this study will provide important information about the predictors and variation of ED use by region and top causes for visit, enabling us to better tailor knowledge mobilization efforts and tool development to the local context. Identified gaps in data collection are important to address to advance our knowledge and delivery of pediatric emergency care at the provincial level.

Keywords: pediatric emergency care, regional variation, knowledge mobilization

LO03

Impact of the conversion to a shockable rhythm from a non-shockable rhythm for patients suffering from out-of-hospital cardiac arrest

A. Cournoyer, MD, E. Notebaert, MD, MSc, S. Cossette, PhD, J. Morris, MD, MSc, L. de Montigny, PhD, D. Ross, MD, L. Londei-Leduc, MD, M. Iseppon, MD, J. Chauny, MD, MSc, R. Daoust, MD, MSc, C. Sokoloff, MD, E. Piette, MD, MSc, J. Paquet, PhD, Y. Lamarche, MD, MSc, M. Albert, MD, A. Denault, MD, PhD, Université de Montréal, Hôpital du Sacré-Coeur de Montréal, Institut de Cardiologie de Montréal, Montréal, QC

Introduction: Patients suffering from out-of-hospital cardiac arrest (OHCA) with an initial shockable rhythm (ventricular tachycardia or ventricular fibrillation) have higher odds of survival than those suffering from non-shockable rhythm (asystole or pulseless electrical activity). Because of that prognostic significance, patients with an initial non-shockable rhythm are often not considered for advanced resuscitation therapies such as extracorporeal resuscitation. However, the prognostic significance of the conversion to a shockable rhythm from an initially non-shockable rhythm remains uncertain. This study aimed to determine the degree of association between the conversion (or not) of a non-shockable rhythm to a shockable rhythm and resuscitation outcomes in patients with OHCA. It was hypothesized that such a conversion would be associated with a higher survival to discharge. **Methods:** The present

study used a registry of adult OHCA between 2010 and 2015 in Montreal, Canada. Adult patients with non-traumatic OHCA and an initial non-shockable rhythm were included. The primary outcome measure was survival to hospital discharge, and the secondary outcome measure was prehospital return of spontaneous circulation (ROSC). The associations of interest were evaluated with univariate logistic regressions and multivariate models controlling for demographic and clinical variables (e.g. age, gender, type of initial non-shockable rhythm, witnessed arrest, bystander cardiopulmonary resuscitation). Assuming a survival rate of 3% and 25% of the variability explained by the control variables, including more than 4580 patients would allow to detect an absolute difference of 4% in survival between both groups with a power of more than 90%. **Results:** A total of 4893 patients (2869 men and 2024 women) with a mean age of 70 years (standard deviation 17) were included, of whom 450 (9.2%) experienced a conversion to a shockable rhythm during the course of their prehospital resuscitation. Among all patients, 146 patients (3.0%) survived to discharge and 633 (12.9%) experienced prehospital ROSC. In the univariate models, there was no association between the conversion to a shockable rhythm and survival (odds ratio [OR] 1.14 [95% confidence interval {CI} 0.66-1.95]), but a significant association was observed with ROSC (OR 2.00 [95% CI 1.57-2.55], $p < 0.001$). However, there was no independent association between the conversion to a shockable rhythm and survival (adjusted OR [AOR] 0.92 [95% CI 0.51-1.66], $p = 0.78$) and prehospital ROSC (AOR 1.30 [95% CI 0.98-1.72], $p = 0.073$). **Conclusion:** There is no clinically significant association between the conversion to a shockable rhythm and resuscitation outcomes in patients suffering from OHCA. The initial rhythm remains a much better outcome predictor than subsequent rhythms and should be preferred when evaluating the eligibility for advanced resuscitation procedures.

Keywords: out-of-hospital cardiac arrest, initial rhythm

LO04

Health effects of training laypeople to deliver emergency care in underserved populations: preliminary results of a systematic review

A. Orkin, MD, MSc, MPH, J. Curran, MSc, S. Ritchie, MBA, PhD, S. van de Velde, PT, MPH, PhD, D. Vanderburgh, MD, Schwartz/Reisman Emergency Medicine Institute, Toronto, ON

Introduction: The World Health Organization recommends emergency care training for laypeople in low-resource settings, but the effects of these programs on patient outcomes and community health have not been systematically reviewed. Our objective was to identify the individual and community health effects of educating laypeople to deliver emergency care in low-resource settings. **Methods:** We conducted a systematic review to address this question: in low-resource populations (P), does emergency care education for laypeople (I) confer any measurable effect on patient morbidity and mortality, or community capacity and resilience for emergency health conditions (O), in comparison with no training or other education (C)? We searched 12 electronic databases and grey literature for quantitative studies. We conducted duplicate and independent title and abstract screening, methodological and outcomes extraction, and study quality assessment using the Effective Public Health Practice Tool. We developed a narrative summary of findings. (PROSPERO: CRD42014009685) **Results:** We reviewed 16,017 abstracts and 372 full-text papers. 38 met inclusion criteria. Most topically relevant papers were excluded because they assessed educational outcomes. Cardiopulmonary resuscitation training (6 papers) improved cardiac arrest survival and enhanced capacity to respond to cardiac arrest in rural Norway, Denmark and

commercial aircraft operations. A public education campaign in remote Denmark improved absolute cardiac arrest survival by 5.4% (95% CI 2-12). Lay trauma training (12 papers) reduced absolute injury mortality and improved community capacity in Iraq, Cambodia, Iran and Indigenous New Zealand communities. A trauma care program in Iraq and Cambodia reduced absolute mortality by 25% (95% CI 17.2-33). Education for mothers on paediatric fevers in Ethiopia was associated with 40% relative reductions in under-5 mortality (95% CI 29.2-50.6). Similar training improved access to care for paediatric malnutrition, malaria, pneumonia, and gastrointestinal disease in Nigeria, Kenya, Senegal, Burkina Faso, Mali, and India (13 papers). Overdose education and naloxone distribution was associated with reductions in opioid overdose deaths (3 papers), including in Massachusetts where high-uptake communities for overdose education had significantly lower overdose fatality rates than no-uptake communities (rate ratio 0.54, 95% CI 0.39-0.76). Community education improved measures of access to emergency care for remote Indigenous populations in Canada, Alaska and Nepal (3 papers) and adolescent mental health capacity in Australia (1 paper). Studies were of low or medium quality. **Conclusion:** In addition to established interventions for injury and cardiac arrest, emergency care training can improve community capacity in underserved populations, and save lives in opioid overdose, paediatric infectious disease and malnutrition.

Keywords: task shifting, first aid, low-resource settings

LO05

A statistical analysis to estimate the spatial dynamics of opioid-related emergency medical services responses in the city of Calgary 2017

M. Zhang, M. Mahsin, L. Huang, K. Fournier, Z. Li, R. Ngom, S. Trithart, A. MacDonald, S. Edwards, Alberta Health Services, Calgary, AB

Introduction: Understanding the spatial distribution of opioid abuse at the local level may facilitate community intervention strategies. The purpose of this analysis was to apply spatial analytical methods to determine clustering of opioid-related emergency medical services (EMS) responses in the City of Calgary. **Methods:** Using opioid-related EMS responses in the City of Calgary between January 1st through October 31st, 2017, we estimated the dissemination area (DA) specific spatial randomness effects by incorporating the spatial autocorrelation using intrinsic Gaussian conditional autoregressive model and generalized linear mixed models (GLMM). Global spatial autocorrelation was evaluated by Morans I index. Both Getis-Ord G_i^* and the LISA function in Geoda were used to estimate the local spatial autocorrelation. Two models were applied: 1) Poisson regression with DA-specific non-spatial random effects; 2) Poisson regression with DA-specific G-side spatial random effects. A pseudolikelihood approach was used for model comparison. Two types of cluster analysis were used to identify the spatial clustering. **Results:** There were 1488 opioid-related EMS responses available for analysis. Of the responses, 74% of the individuals were males. The median age was 33 years (IQR: 26-42 years) with 65% of individuals between 20 and 39 years, and 27% between 40 and 64 years. In 62% of EMS responses, poisoning/overdose was the chief complaint. The global Morans Index implied the presence of global spatial autocorrelation. Comparing the two models applied suggested that the spatial model provided a better fit for the adjusted opioid-related EMS response rate. Calgary Center and East were identified as hot spots by both types of cluster analysis. **Conclusion:** Spatial modeling has a better predictability to assess potential high risk areas and identify locations for community intervention strategies. The clusters identified in Calgary's Center and East may have implications for future response strategies.

Keywords: spatial analysis, autocorrelation, opioid crisis

LO06

Effects of emergency department system transformation (EDST) on patient experience of emergency department visits

S. Danby, K. Van Aarsen, MSc, M. Columbus, PhD, A. Dukelow, MD, MHSC, Schulich School of Medicine and Dentistry, Western University, London, ON

Introduction: Emergency Department Systems Transformation (EDST) is a bundle of Toyota Production System based interventions partially implemented in two Canadian tertiary care Emergency Departments (ED) between June 2014- July 2016 with the goal to improve patient care by increasing value and reducing waste. Some of the 17 primary interventions included computerized physician order entry optimization, staff schedule realignment, physician scorecards and a novel initial assessment process. Some interventions have only been partially implemented due to persistent access block. This project was designed to examine the effect of partial EDST implementation on patient experience of emergency department visits. Patient satisfaction has been linked to improved patient outcomes, improved adherence to physician instruction, and improved provider satisfaction. **Methods:** Semi structured interviews were conducted over three distinct time periods (summer 2015, 2016 and 2017) to encompass progressive levels of EDST implementation. The interviews focused on the patients perceptions in each of 4 stages of their ED visit - Check-in, assessment, reassessment, and disposition. Patients were asked a list of positive (respected, listened to, supported, safe) and negative (in pain, worried, confused, frustrated) emotions frequently experienced and asked if they felt any of these emotions during their ED stay. Open ended questions were also asked about their overall visit. Descriptive statistics were calculated as differences in the proportion of patients feeling each emotion across timeframes. The open-ended question was coded by two reviewers as positive, negative or mixed. A kappa score was calculated to determine reviewer agreement. **Results:** 987 interviews were completed. In general, the proportion of patients feeling negative emotions remained consistent while positive emotions increased as EDST implementation progressed. For open-ended responses, the percentage of overtly positive experiences increased significantly from 2015 to 2017 ($p=0.006$), while overtly negative experiences did not significantly change. Reviewers agreed in the coding of the open-ended responses in 97.6% of surveys. The kappa score for reviewer agreement was 0.96 (95% CI 0.94-0.98) indicating almost perfect agreement. **Conclusion:** Partial implementation of EDST positively impacted patients experience of emergency department visits.

Keywords: emergency department, patient satisfaction

LO07

Developing a culture of quality across Ontario's emergency departments: the return visit quality program

L. Chartier, MD, CM, MPH, O. Ostrow, MD, I. Yuen, MSc, B. Davis, MBA, E. Hayes, MSc, S. Kutty, LLB, MBA, L. Fairclough, MHSc, MRT(T), H. Ovens, MD, The Hospital for Sick Children, Toronto, ON

Introduction: In 2016, the Emergency Department (ED) Return Visit Quality Program (RVQP) was developed to promote a culture of quality in Ontario EDs, by mandating large-volume EDs to audit charts of patients who had a return visit leading to hospital admission (RV). This program provides an opportunity to identify possible adverse events (AEs) and quality issues, which can then be addressed to improve patient care. **Methods:** The RVQP requires EDs to audit a set number of 72-hour RVs for potential AEs/quality issues, as well as all 7-day RVs for one of three key paired sentinel diagnoses (acute myocardial