

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

infarction, subarachnoid hemorrhage, and pediatric sepsis). Submitted audits and their AEs/quality issues were analyzed by a team of emergency physicians with quality improvement (QI) expertise, and qualitative metrics were derived. Using the general inductive method, we conducted a qualitative analysis with Health Quality Ontario (HQP), and HQP completed an independent analysis of the submitted narrative reports. Our objective is to report on the qualitative and quantitative metrics of the program, and to explore emerging themes from the AEs/quality issues identified. **Results:** There were 36,304 72-hour RVs flagged, which represent 0.99% of all 3,672,708 ED visits in the province of Ontario for the 86 EDs participating in the first year of the program. Overall, 2,584 audits were conducted. For the audits involving all-cause 72-hour RVs, 571 (24%) of cases had AEs/quality issues identified. Of the 219 audits involving sentinel diagnoses, 107 (49%) audits identified AEs/quality issues. The qualitative analysis revealed 11 themes, which were classified into three groups: issues related to patient characteristics or actions (elder care, patient risk profile, left without being seen); issues related to actions or processes of the ED team (physician cognitive lapses, handover/communication, high risk medications, documentation, radiology, vital signs); and healthcare system issues (imaging/test availability, discharge planning). Over one hundred local QI projects were completed or planned as a result of the audits performed. **Conclusion:** The RVQP promotes a culture of quality by highlighting potential AEs and quality themes that can then be targeted to increase patient safety and quality of care in Ontario EDs. Numerous QI projects were undertaken in the first year of the program, and future efforts will monitor the completion and success of these. The program can be easily adapted in other jurisdictions.

Keywords: return visits, healthcare quality

LO08

PROM-ED: the development and testing of a patient-reported outcome measure for use with emergency department patients who are discharged home

S. Vaillancourt, MD, MPH, J. Cullen, MSc, D. Linton, MSc, A. Copti Fahmy, K. Dainty, PhD, C. Hofstetter, T. Inrig, BScN, MDiv, A. Laupacis, MD, MSc, A. Maybee, M. McGowan, MHK, M. J. Schull, MD, MSc, B. Seaton, D. Beaton, PhD, MSc, BScOT, St. Michael's Hospital, Division of Emergency Medicine, Department of Medicine, University of Toronto, Toronto, ON

Introduction: Patient-reported outcome measures (PROM) are questionnaires that can be used to elicit care outcome information from patients. We sought to develop and validate the first PROM for adult patients without a primary mental health or addictions presentation receiving emergency department (ED) care and who were not hospitalized. **Methods:** PROM development used a multi-phase process based on national and international guidance (FDA, NQF, ISPOR). Phase 1: ED outcome conceptual framework qualitative interviews with ED patients post-discharge informed four core domains (previously published). Phase 2: Item generation scoping review of the literature and existing instruments identified candidate questions relevant for each domain for inclusion in tool. Phase 3: Cognitive debriefing existing and newly written questions were tested with ED patients post-discharge for comprehension and wording preference. Phase 4: Field and validity testing revised tool pilot tested on a national online survey panel and then again at 2 weeks (test-retest). Phase 5: Final item reduction using a Delphi process involving ED clinicians, researchers, patients and system administrators. Phase 6: Validation - psychometric testing of PROM-ED 1.0. **Results:** Four core outcome domains were defined in Phase 1: (1) understanding; (2) symptom relief; (3) reassurance and (4) having

a plan. The domains informed a review of existing relevant questionnaires and instruments and the writing of additional questions creating an initial long-form questionnaire. Eight patients participated in cognitive debriefing of the long-form questionnaire. Expert clinicians, researchers and patient partners provided input on item refinement and reduction. Four hundred forty-four patients completed a second version of the long-form questionnaire (add in retest numbers) which informed the final item reduction process by a modified Delphi method involving 21 diverse contributors. The questionnaire was validated and underwent final revisions to create the 21 questions that constitute PROM-ED 1.0. **Conclusion:** Using accepted PROM instrument development methodology, we developed the first outcome questionnaire for use with adult ED patients who are not hospitalized. This questionnaire can be used to systematically gather patient-reported outcome information that could support and inform improvement work in ED care.

Keywords: health outcomes, patient-centred care, quality measurement

LO09

Population-based analysis of the effect of a comprehensive, systematic change in an emergency medical services resource allocation plan on 24 hour mortality

J. Tallon, MD, MSc, L. Zheng, O. Djurdjev, J. Wei, MSc, G. Papadopoulos, W. Dick, MD, MSc, British Columbia Emergency Health Services, Vancouver, BC

Introduction: Resource allocation planning (RAP) for emergency medical services (EMS) systems determines optimal resources for patient needs in order to minimize morbidity and mortality. The British Columbia Emergency Health Services developed a new RAP using an evidenced informed methodology, statistical analysis of outcomes and with further clinical input from EMS physicians, paramedics and allied EMS providers. The revised RAP was implemented on a pan provincial basis in fall of 2013. It is unknown how the modifications will affect outcomes of EMS cases. Population-based analysis was used to determine the effect of a comprehensive RAP changes by comparing 24-hour mortality before and after province-wide implementation of the revised RAP. **Methods:** The primary outcome, 24-hour mortality, was obtained through linked provincial health administrative data. All adult cases with evaluable outcome data were included in the analysis. A pre and post methodology was used to evaluate the effect of post-RAP revision (post-RAP-revision) on 24-hour mortality compared to pre-RAP revision (pre-RAP-revision). Multivariable logistic regression was used to adjust for variations in other significant factors associated with 24-hour mortality. The interrupted time series (ITS) estimated any immediate changes in the level or trend of outcome after the start of the revised RAP implementation (fall of 2013), while simultaneously controlling for pre-existing trends. **Results:** The cohort is comprised of 562,546 cases (April 2012 March 2015). In the multivariate model, adjusted for age, sex, urban/metro region, season, day hour, and MPDS determinant, the probability of dying within 24 hours of EMS call was 7% lower in the post-RAP-revision cohort (OR = 0.936; 95% CI: 0.886-0.989; P = 0.018). A sub-group analysis of immediately life-threatening cases demonstrated similar effect (OR = 0.890; 95% CI: 0.808-0.981; P = 0.019). **Conclusion:** Our results demonstrate that a comprehensive, evidence informed reconstruction of a provincial EMS RAP is feasible. Despite considerable change in crew level response and resource allocation, there was significant decrease in 24 hour mortality in a large pan-provincial population based patient cohort.

Keywords: emergency medical services, resource allocation, mortality