

were specifically designed to assess for neuroleptic side-effects. Four studies were at high risk of bias. In primary analysis, PAD had no effect on the incidence of extra-pyramidal symptoms (7 studies,  $n = 1393$  patients, RR 0.70 [0.40-1.22]), akathisia (5 studies,  $n = 1094$  patients, RR 0.81 [0.36-1.82]) and sedation (5 studies;  $n = 1079$ , RR 1.48 [0.90-2.42]). Higher dosage of diphenhydramine was not associated with a greater reduction of extra-pyramidal side-effects. In a sensitivity analysis excluding an outlier study ( $n = 120$ , RR 6.63 [1.55-28.35]), PAD was associated with a significant decrease in extra-pyramidal side-effects (6 studies,  $n = 1273$ , RR 0.56 [0.38-0.82]), but not with any of the secondary outcome measures. **Conclusion:** Conclusion: When excluding an outlier study, PAD was associated with a significant reduction of extra-pyramidal side-effects. However, PAD did not significantly influence the incidence of akathisia. Overall quality of evidence is low. Further studies are warranted. PAD represents an interesting treatment option against neuroleptic side-effects, but its widespread usage without strong evidence to support it raises concerns. **Keywords:** neuroleptic side-effects, diphenhydramine, systematic review

#### PL04

##### Effectiveness of hospital avoidance interventions among elderly patients: a systematic review

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**Introduction:** Overuse of acute care services, particularly emergency department (ED) use, is an important topic for healthcare providers and policy makers within Canada and abroad. Prior work has shown that frail elderly patients with complex medical needs and limited personal and social resources are heavy users of ED services and are often admitted when they present to the ED. Updated information on the most effective strategies to avert ED presentation and hospital admission focused specifically on elderly patients is needed. **Methods:** This systematic review addressed the question: what interventions have demonstrated effectiveness in decreasing ED use and hospital admissions in elderly patients? Comprehensive literature searches were conducted in databases including Ovid Medline, EMBASE, CINAHL, and the Cochrane Central Register of Controlled Trials with no language or date restrictions. Citations were limited to interventional studies. Grey literature and reference list searches, as well as communication with experts in the field were performed. Consensus or a third reviewer resolved any disagreements. Original research regarding interventions conducted in populations 65 years or older with acute illness, either living in community or facility-living were included. Primary outcomes were ED visits and hospital admissions. Secondary outcomes included: mortality, cost, and patient-reported outcomes such as health-related quality of life and functional status. **Results:** Forty-three relevant studies were identified including 22 randomized controlled trials (RCT), 2 cluster-RCT, 2 trials with non-random allocation, 4 before-after studies, 6 quasi-experimental studies, and 7 cohort studies. Intervention settings included: home visits (22), long-term care (7), outpatient or primary care clinics (8), and ED (3) or inpatient (3). Data characterization revealed that home-based, outpatient and/or primary care-based strategies reduced ED visits and hospitalizations, particularly those which included comprehensive geriatric assessments, home visits or regular face-to-face contact and interdisciplinary teams. Hospital-based models generally showed no difference in ED or inpatient service utilization. There was, however, considerable variability across individual studies with respect to reporting of outcomes, statistical analyses performed, and overall risk of bias. **Conclusion:** Various interventional strategies have been studied to avert ED presentation and hospital

admission for frail elderly patients. More rigorous methodology and standardization of outcome measures is needed to quantitatively assess the effects of these programs.

**Keywords:** elderly, emergency department avoidance, systematic review

## Oral Presentations

#### LO01

##### Analysis of bystander CPR quality during out-of-hospital cardiac arrest using data derived from automated external defibrillators

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**Introduction:** Out-of-hospital cardiac arrest (OHCA) is associated with high mortality, and CPR quality is one of the few modifiable factors associated with improved outcomes. Particularly, bystander CPR has been shown to improve survival and neurological outcomes in OHCA. However, the quality of CPR performed by bystanders in OHCA is unknown. We evaluated bystander CPR quality during OHCA, utilizing data stored within Automated External Defibrillators (AEDs), and matched with cases enrolled in the Resuscitation Outcomes Consortium (ROC) database. **Methods:** This cohort study included adult OHCA cases from the Ottawa ROC site between 2011-2016, which were of presumed cardiac etiology, not witnessed by EMS, and where an AED was utilized by a bystander with >1 minute of CPR process data available. AED data from Ottawa Paramedic Services was matched to each case identified by the ROC database. AED data was analyzed using manufacturer software to determine overall measures of bystander CPR quality, changes in bystander CPR quality over time, and bystander adherence to existing 2010 Resuscitation Guidelines. **Results:** 100 cases met all inclusion criteria. 75.0% of patients were male, with a mean age of 62.3 years. 58.0% of arrests occurred in the home setting, and 24.0% were witnessed arrests. Initial rhythm was ventricular fibrillation/ventricular tachycardia in 36.0% of cases. Overall survival rate was 42.0%, with a modified Rankin Score of 3.7 (95% CI: 2.9-4.5). Bystanders demonstrated high-quality CPR over the course of resuscitation, with a chest compression fraction (CCF) of 75.9% (73.6-78.1), a compression depth of 5.26 cm (5.03-5.49), and a compression rate of 111.2/min (107.7-114.7). Mean peri-shock pause was 26.8 seconds (24.6-29.1). Adherence rates to 2010 Resuscitation Guidelines for compression rate and depth were 66.0% (60.9-71.1) and 54.9% (48.6-61.3), respectively. CPR quality was lowest in the first minute of resuscitation, during which rhythm analysis took place (mean 40.5 sec). In cases involving a shockable rhythm, overall latency from initiation of AED to shock delivery was 59.2 sec (45.5-72.8). **Conclusion:** We found that bystanders perform high-quality CPR, with strong adherence rates to existing Resuscitation Guidelines. Our findings provide evidence of the quality of bystander CPR performed during OHCA.

**Keywords:** cardiac arrest, cardiopulmonary resuscitation, bystander cardiopulmonary resuscitation

#### LO02

##### Characteristics and predictors of pediatric emergency department use in Manitoba: a population based study

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**Introduction:** Within Manitoba, little is known about the current state of pediatric emergency department (ED) use or the state of provincial

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**

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**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**

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**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