(0.97; 95%IC: 0.95-0.99) in comparison to the ISS (0.78; 95%IC: 0.71-0.85). **Conclusion:** The BIG score is an excellent predictor of survival for children visiting the emergency department following a blunt trauma.
Keywords: children, blunt trauma, mortality

LO64

Emergency department directed multifaceted interventions to improve outcomes after asthma exacerbations: a 3-armed randomized controlled trial

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Introduction: Approximately 20% of Canadians who present to emergency departments (EDs) with acute asthma relapse within 4 weeks of discharge. The reasons are likely multi-factorial; however, the lack of timely primary care provider (PCP) follow-up and inadequate patient self-management are thought to be important variables. Therefore, we tested the effectiveness of ED-directed multifaceted interventions that targeted PCPs and enhanced patient self-management to reduce asthma relapse following ED discharge. **Methods:** Adults with acute asthma discharged from 6 Alberta EDs were randomly allocated, in a centralized and concealed manner, to receive usual care (UC), opinion leader [OL] guidance to their PCPs, or OL guidance + nurse case-management [OL+CM] for patients (NCT01079000). The main outcome was asthma relapse within 90-days of ED discharge. Secondary outcomes included PCP visits, time to relapse, hospitalizations and asthma-related quality of life (QoL). Outcomes were collected independently and assessors were masked to intervention assignment. **Results:** From 943 screened patients, 367 patients were allocated to the study arms (UC = 146; OL = 110; OL+CM = 111). Median age was 28 years, 64% were women, median peak flow at discharge was 350 L/min; 77% were discharged home on prednisone and 85% on either inhaled corticosteroids (ICS) or ICS/long-acting β_2-agonists. Compared with UC, both interventions significantly *increased* rates of relapse at 90-days: UC = 12%, OL = 28%, OL+CM = 19%; p = 0.006. Based on an absolute increased risk of 0.16 (95% CI: 0.05, 0.25), the number needed to treat for harm was 6 (95% CI: 3.9, 19.0) for the OL arm. Across study differences in PCP follow-up visits, time to relapse, hospitalizations or asthma-related QoL were not identified. **Conclusion:** Two different theory-informed and evidenced-based interventions intended to decrease asthma relapse robustly and significantly increased rates of relapse compared with UC. While the reasons for these unintended consequences require further study, we caution against the adoption of similar interventions by other EDs.
Keywords: asthma, education

LO65

Outpatient care gaps in subjects presenting to emergency departments with acute asthma

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Introduction: Many patients presenting to Emergency Departments (EDs) with acute asthma have limited or no access to health care providers, medications and preventive resources. This study explored outpatient care gaps among subjects presenting to the ED for acute asthma, before being discharged. **Methods:** Cross-sectional analysis of data obtained in a comparative effectiveness trial conducted in six EDs in Alberta (NCT01079000). Data were collected through patient interviews and chart reviews at ED presentation. Two clinician-investigators independently reviewed and adjudicated the following preventive actions: use of spacer devices, written asthma action plans (AAPs) and asthma medication; influenza immunization, cigarette smoking, and referral to asthma education. Agreement between adjudicators was calculated based on kappa (k) statistics. **Results:** The median age of the study population (n = 367) was 28 years and 64% were women. Overall, 26% of patients reported not having a regular family physician. Agreement between reviewers was excellent (k = 0.96). More than half (59%) reported not using spacer devices despite being indicated and 3% reported having a written AAP. Following the recommendations of the current asthma guidelines, 38% of the patients required the initiation of inhaled corticosteroids (ICS), 11% required the addition of ICS/long-acting β-agonists combination agents and 39% required reinforcement of adherence with preventer medications. Finally, 37% reported receiving influenza vaccination in the past year, 7% had been referred to asthma education in the last 10 years, and 31% were still smoking, suggesting that cessation counselling was indicated. **Conclusion:** The ED encounter for patients with acute asthma represents a unique opportunity to establish important partnerships across the continuum of asthma care (e.g., link them with a family doctor). This study provided a robust assessment of the outpatient care gaps in this patient population, which identified many areas for targeted interventions. The method of delivery and type of messaging needs further study.
Keywords: asthma, education

LO66

Did the Choosing Wisely Canada campaign work? A retrospective analysis of its impact on emergency department imaging utilization for head injuries

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Introduction: Head injuries are a commonly encountered presentation in emergency departments (ED) and the Choosing Wisely Canada (CWC) campaign was released in June 2015 in an attempt to decrease imaging utilization for patients with minor head injuries. The impact of the CWC campaign on imaging utilization for head injuries has not been explored in the ED setting. In our study, we describe the characteristics of patients with head injuries presenting to a tertiary care academic ED and the impact of the CWC campaign on CT head utilization. **Methods:** This retrospective cohort study used linked databases from the province of Ontario, Canada to assess emergency department visits with a primary diagnosis of head injury made between June 1, 2014 and Aug 31, 2016 at the University Health Network in Toronto, Canada. We examined the number of visits during the study period, the proportion of patients that had a CT head performed before and after the release of the CWC campaign, as well as mode of arrival, and disposition. **Results:** There were 4,322 qualifying visits at our site during the study period. The median presenting age was 44.12 years (IQR 27.83,67.45), the median GCS was 15 (IQR 15,15) and the majority of patients presenting had intermediate acuity (CTAS 3). Overall, 43.17% of patients arrived via ambulance, 49.24 % of patients received a CT head and 10.46% of patients were admitted. Compared to patients presenting before the CWC campaign release, there was no significant difference in the rate of CT heads after the CWC (50.41% vs 47.68%, P = 0.07). There were also no significant differences between the two groups in mode of arrival (ambulance vs ambulatory) (42.94% vs 43.48%, P = 0.72) or admission rates (9.85% vs 11.26%, P = 0.15). However, more patients belonged to the high acuity groups (CTAS 1 or 2) in the post CWC campaign release group (12.98% vs 8.11% P < 0.001). **Conclusion:** Visits for head

injuries make up a significant proportion of total ED visits and approximately half of these patients receive CT imaging in the ED. The CWC campaign did not seem to impact imaging utilization for head injuries in the 14 months following its launch. Further efforts, including local quality improvement initiatives, are likely needed to increase adherence to its recommendation and reduce imaging utilization for head injuries.

Keywords: Choosing Wisely, head injury, emergency department

LO67

The impact of CPR quality during entire resuscitation episode on survival from cardiac arrest

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Introduction: High-quality cardiopulmonary resuscitation (CPR) is essential for patient survival. Typically, CPR quality is only measured during the first 10 minutes of resuscitation. There is limited research examining the quality of CPR over the entire duration of resuscitation. **Objective**: To examine the quality of CPR over the entire duration of resuscitation and correlate the quality of CPR to patient survival. **Methods:** This was a retrospective observational study using data from the Toronto RescuNET Epistry-Cardiac Arrest database. We included consecutive, adult (>18) OHCA treated by EMS between January 1, 2014 and September 30, 2015. High-quality CPR was defined, in accordance with 2015 AHA Guidelines, as a chest compression rate of 100-120/min, depth of 5.0-6.0 cm and chest compression fraction (ccf) of >0.80. We further categorized high-quality resuscitation as meeting benchmarks >80% of the time, moderate-quality between 50-80% and low-quality meeting benchmarks <50% of the resuscitation. We used multivariable logistic regression to determine association between variables of interest, including CPR quality metrics, and survival to hospital discharge. **Results:** A total of 5,208 OHCA met our inclusion criteria with a survival rate of 8%. The median (IQR) duration of resuscitation was 23.0 min (15.0,32.7). Overall CPR quality was considered high-quality for ccf in 81% of resuscitation episodes, 41% for rate, and 7% for depth. The percentage of resuscitations meeting the quality benchmarks differed between survivors and non-survivors for both depth (15% vs 6%) and ccf (61% vs 83%) (P value <0.001). After controlling for Utstein variables maintaining a chest compression depth within recommendations for >80% showed a trend towards improved survival (OR 1.68, 95% CI 0.96, 2.92). Other variables associated with survival were public location, initial CPR by EMS providers or bystanders, witnessed cardiac arrest (EMS or bystander), and initial shockable rhythm. Increasing age and longer duration of resuscitation were associated with decreased survival. **Conclusion:** Overall, EMS providers were not able to maintain rate or depth within guideline recommendations for the majority of the duration of resuscitation. Maintaining chest compression depth for greater than 80% of the resuscitation showed a trend towards increased survival from OHCA.

Keywords: cardiac arrest, cardiopulmonary resuscitation, emergency medical services

LO68

Extracorporeal membrane oxygenation in the emergency department for resuscitation of out-of-hospital cardiac arrest patients: a systematic review

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Introduction: With one person in Canada suffering an out-of-hospital cardiac arrest (OHCA) every 12 minutes and an estimated survival to hospital discharge with good neurologic function ranging from 3 to 16%, OHCA represents a major source of morbidity and mortality. An evolving adjunct for resuscitation of OHCA patients is the use of extracorporeal membrane oxygenation-assisted CPR (ECPR). The purpose of this systematic review is to investigate the survival to hospital discharge with good neurologic recovery in patients suffering from OHCA treated with ECPR compared to those who received standard advanced cardiac life support with conventional CPR (CCPR) alone. **Methods:** A systematic database search of both MEDLINE & EMBASE was performed up until September 2016 to identify studies with ≥5 patients reporting ECPR use in adults (age ≥16 years) with OHCA. Only studies reporting survival to hospital discharge were included. All identified studies were assessed independently using pre-determined inclusion criteria by two reviewers. Study quality and risk of bias were evaluated using the Newcastle Ottawa regulations assessment scale. **Results:** Of the 1065 records identified, 54 studies met all inclusion criteria. Inter-rater reliability was high with a kappa statistic of 0.85. The majority of studies were comprised of case series (n = 45) of ECPR with 5 to 83 patients/study. Out of the 45 case series, 37 presented neurologic data at hospital discharge and demonstrated a broad range of patients surviving with good neurologic outcome (0 to 71.4%). Only 9 cohort studies with relevant control group (CCPR) were identified (38 to 21750 patients/study). Preliminary analysis demonstrated that 6 cohort studies were sufficient quality to compare ECPR to CCPR. All 6 studies showed significantly increased survival to hospital discharge with good neurologic recovery (ECPR 10.6 to 41.6% vs CCPR 1.5 to 7.7%, respectively). **Conclusion:** Given the paucity of studies using appropriate comparators to evaluate the impact of ECMO, our confidence in a clinically relevant difference in outcomes compared to current standards of care for OHCA remains weak. Interestingly, a limited number of studies with suitable controls demonstrated a potential benefit associated with ECPR in the management of OHCA in selected patients. In this state of equipoise, high quality RCT data is urgently needed.

Keywords: cardiac arrest, extracorporeal cardiopulmonary resuscitation, survival with good neurologic outcome

LO69

Evaluating the impact of night shifts on emergency medicine resident competence in simulated resuscitations

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Introduction: Sleep deprivation negatively affects cognitive and behavioural performance. Emergency Medicine (EM) residents commonly work night shifts and are then expected to perform with competence. This study examines the impact of night shifts on EM resident performance in simulated resuscitation scenarios. **Methods:** A retrospective cohort study was completed at a single Canadian academic centre where residents participate in twice-annual simulation-based resuscitation objective structured clinical examinations (OSCEs). OSCE scores for all EM residents between 2010-2016 were collected, as well as post-graduate year (PGY1-5), gender, and shift schedules. OSCEs were scored using the Queen's Simulation Assessment Tool (QSAT) evaluating four domains: primary assessment, diagnostic actions, therapeutic actions and communication, and an overall global assessment score (GAS). A night shift was defined as a late evening (beyond 23:00) or overnight shift within the three days before an OSCE. A mixed effects linear regression model was used to model the