

the immediate impact of the intervention on the outcome levels, and whether there were changes in the trend between pre-intervention and post-intervention segments. **Results:** 251,899 patients attended the ED during the study period. Daily patient volumes increased 17.3% during the post-intervention period. Post-intervention, for CTAS 2-5 patients, there was a reduction in average LOS by 0.64 hours ($p < 0.001$), and 90th-percentile LOS by 0.81 hours ($p = 0.024$). When separated by acuity and disposition, there were reductions in LOS for non-admitted CTAS 2 (-0.58 hours, $p < 0.001$), 3 (-0.75 hours, $p < 0.001$), 4 (-0.32 hours, $p = 0.002$), and 5 (-0.28 hours, $p = 0.008$) patients. For secondary outcomes, there was a decrease in overall average PIA by 43.81 minutes ($p < 0.001$), and 90th-percentile PIA by 91.39 minutes ($p < 0.001$). LWBS and LAMA rates decreased by 35.2% ($p < 0.001$) and 61.9% ($p < 0.001$), respectively. **Conclusion:** A series of process improvements meant to optimize flow in the ED without the addition of resources was associated with clinically significant reductions in LOS, PIA, LWBS and LAMA rates for non-resuscitative patients.

Keywords: efficiency, patient flow, length of stay

PL004

A population-based analysis of outcomes in patients with a primary diagnosis of hypertension in the emergency department, using linked datasets

S. Masood, MD, C.L. Atzema, MD, MSc, P. Austin, PhD; Division of Emergency Medicine, Department of Medicine, University of Toronto, Toronto, ON

Introduction: Patients seen primarily for hypertension are common in the emergency department. The outcomes of these patients have not been described at a population level. In this study we describe the characteristics and outcomes of the patients making these visits, as well as changes over time. **Methods:** This retrospective cohort study used linked health databases from the province of Ontario, Canada, to assess emergency department visits made between April 1, 2002 and March 31, 2012 with a primary diagnosis of hypertension. We determined the annual number of visits as well as the age and sex standardized rates. We examined visit disposition and assessed mortality outcomes and potential hypertensive complications at 7, 30, 90, 365 days and 2 years subsequent to the ED visit. **Results:** There were 206,147 qualifying ED visits from 180 sites. Visits increased by 64% between 2002 and 2012, from 15793 to 25950 annual visits, respectively. The age- and sex-standardized rate increased from 170/100,000 persons to 228/100,000 persons over the same time period, a 34% increase. Eight percent of visits ended in hospitalization, but this proportion decreased from 9.9% to 7.1% over the study period. Mortality was very low, at less than 1% within 90 days, 2.5% within 1 year, and 4.1% within 2 years. Among subsequent hospitalizations for potential hypertensive complications, stroke was the most frequent admitting diagnosis, but the frequency was still <1% within 1 year. Together hospitalizations for stroke, heart failure, acute myocardial infarction, atrial fibrillation, renal failure, hypertensive encephalopathy and dissection were <1% at 30 days. **Conclusion:** The number of visits made primarily for hypertension has increased dramatically over the last decade. While some of the increase is due to aging of the population, other forces are contributing to the increase. Subsequent mortality and complication rates are low and have declined. With current practice patterns, the feared complications of hypertension are extremely infrequent.

Keywords: hypertension, stroke, emergency department

Oral Presentations

LO001

The prevalence of low back pain in the emergency department: a systematic review and primary study in the Charles V. Keating Emergency and Trauma Centre, Halifax, Nova Scotia, Canada

J. Edwards, MSc, J. Hayden, PhD, K. Magee, MD, M. Asbridge, PhD; Dalhousie University, Halifax, NS

Introduction: Low back pain (LBP) may be having a significant impact on emergency departments (ED) around the world. Two analyses conducted in the USA and Australia suggest that LBP is one of the leading causes of emergency department visits. However, in the peer-reviewed literature, there has been limited focus on the prevalence and management of back pain in the ED setting. Furthermore, the applicability of the available research to our local ED setting is unclear. **Methods:** This project includes two studies to investigate the prevalence of LBP in the ED: 1. a comprehensive **systematic review** of the published literature to gather a comprehensive and global perspective about the prevalence of LBP in the ED setting, and 2. a **retrospective cross sectional analysis** using six years of data from our local ED, the Charles V. Keating Emergency and Trauma Centre, Halifax, Nova Scotia. **Results:** Searches from multiple databases including PubMed (392 citations), resulted in 3024 citations, of which 20 studies were found to have prevalence data for LBP. Studies were reported between 2001–2015 and used mixed methods of data collection, including electronic databases, surveys and patient charts. Ranges for prevalence estimates were 1.9% to 17% of patient visits. Results indicated there are many gaps in the literature, for example research in rural EDs and in Canada. In our primary study, we have identified a sample of 10 000 patients presenting with LBP to our local ED. Analysis of this data will be completed prior to the CAEP conference. **Conclusion:** This project is the first systematic review; comprehensive search strategy to examine the prevalence of LBP in the ED. It is also the first project to assess the prevalence of LBP in a Canadian ED. Results from this study will inform healthcare providers, as well as administrative and policy decision-makers, of the global and local impact of LBP in the ED, and will identify opportunities for further research to enhance care pathways of patients suffering from LBP.

Keywords: low back pain, prevalence

LO002

Improving safety of patients in respiratory distress: identifying preventable adverse events related to care provided in the emergency department

S. Pretty, BHSc, S. Scaffidi Argentina, BSc, C. Vaillancourt, MD, MSc, CSPQ, J.J. Perry, MD, MSc, I.G. Stiell, MD, MSc, A. Forster, MD, R. De Gorter, BSc, L.A. Calder, MD, MSc; University of Ottawa, Ottawa, ON

Introduction: Patients with acute exacerbations of heart failure (HF) or chronic obstructive pulmonary disease (COPD) may be at high risk for preventable adverse events (AEs). Preventable AEs are ED care-associated complications due to medical error. Our objective was to identify and characterize preventable AEs among ED patients over 50 presenting with dyspnea from an acute exacerbation of HF or COPD; who were subsequently admitted or discharged. **Methods:** We conducted a multicentre health records review from six academic centers in Ontario and Alberta. We analysed health records for all prospectively enrolled patients who experienced flagged outcomes: relapse to ED within 14 days requiring admission; admission to a monitored unit (AMU), cardiac care unit (CCU), or intensive care unit (ICU); intubation

(ETI); non-invasive ventilation(NIV); diagnosis of acute myocardial infarction(AMI); or death within 30 days. Using a validated approach, an ED physician analyzed case summaries for flagged outcomes that were associated with ED care, designated as AEs. Preventable AEs had contributing errors in diagnosis, management, procedure, medications or unsafe disposition decisions. We analyzed these data using thematic coding and descriptive statistics. **Results:** Of 2,515 patients enrolled (1,100 HF and 1,415 COPD), 210 patients experienced flagged outcomes, 47.1% of which were female, 64.3% had HF and the remaining COPD. The majority (86.2%) of flagged outcomes were related to underlying disease, but 13.8% of cases met criteria for AE and all were deemed preventable. Of the identified AEs, 72.4% returned to the ED and required admission to hospital; 17.2% were admitted to ICU, CCU, or AMU; 6.9% of patients died; 3.4% were intubated; 3.4% had a diagnosis of AMI and 0% required NIV. We found 75.8% of preventable AEs resulted from a management error (eg. not prescribing steroids on discharge for moderate COPD exacerbation); 31.0% from an unsafe disposition decision and 10.3% of AEs resulted from diagnostic error. **Conclusion:** Patients with acute exacerbations of HF and COPD are at high risk of preventable AEs directly related to care provided in the ED. Management and disposition decisions were a concerning source of error and should compel and focus future quality improvement efforts.

Keywords: heart failure, chronic obstructive pulmonary disease patient safety

LO003

Outpatient referrals from the emergency department - a retrospective review

N. Prudhomme, MSc, MD, S. White, BA, E.S. Kwok, MD; University of Ottawa, Ottawa, ON

Introduction: While a majority of patients presenting to the emergency department (ED) are discharged home without need for inpatient hospitalization, many require outpatient follow-up. Currently, outpatient referrals from our ED are made via a complex and error-prone series of manual steps which have the potential to be unreliable and negatively impact quality of care. We sought to perform a current state analysis of our outpatient referral processes across the hospital's specialties. **Methods:** We conducted a retrospective health records review at a tertiary academic centre (>160,000 ED visits/year) from January 1 to January 7, 2015. All consecutive outpatient consultation requests triggered by an ED physician were identified and included for chart review. All cases were subsequently followed up to 11 months. A single reviewer extracted data on demographics, actual referral attendance rates, incomplete referrals, return ED visits, and time intervals. The top 3 and bottom 3 performing services were identified for further analysis of their outpatient referral mechanisms and processes. We present descriptive statistics. **Results:** A total of 251 outpatient referrals to a broad range of specialty services were identified during the study period. 216 (86.1%) of patients attended the intended appointment, while 35 (13.9%) of referrals were incomplete at 11 months post index ED visit. The overall median time to successful outpatient follow-up appointments was 8.5 days [IQR = 3.8-24.2]. 8 (3.2%) patients had a return ED visit for a related complaint prior to being seen at their outpatient appointment. The top 3 performers were Ophthalmology [Median = 1.0 day, IQR = 0.0-1.0, Incomplete = 2.8%], Plastic Surgery [Median = 5.0 days, IQR = 2.8-6.0, Incomplete = 7.7%], and Orthopedics [Median = 8.0 days, IQR = 7.0-10.0, Incomplete = 0.0%]. The bottom 3 performers were Dermatology [Median = 52days, IQR = 41.5-92.5, Incomplete = 25.0%], Neurology [Median = 40.0 days, IQR = 2.5-43.5, Incomplete = 56.3%], and Urology [Median = 14.0 days, IQR = 10.5-48.0, Incomplete = 33.3%]. **Conclusion:** We found a

tremendous range of variability in both the waiting times and actual reliability of outpatient referral processes from the ED. Future phases of this project will focus on examining specific processes of the top and bottom performing specialties in order to improve and standardize all outpatient referrals.

Keywords: outpatient referrals, follow-up, quality improvement

LO004

Short-term risk of arrhythmias among syncope patients presenting with atrial fibrillation/flutter to Canadian emergency departments

C. Toarta, BSc, K. Kwong, BSc, I.G. Stiell, MD, MSc, M.A. Mukarram, MBBS, MPH, M. Taljaard, PhD, R. Sheldon, MD, PhD, G.A. Wells, PhD, V. Thiruganasambandamoorthy, MD, MSc; University of Ottawa, Ottawa, ON

Introduction: Short-term risk of arrhythmia or death among emergency department (ED) syncope patients with atrial fibrillation/flutter (AFF) has not been reported in the literature. Our objectives were to assess the incidence and the independent risk of 30-day arrhythmia or death for syncope patients with AFF after ED disposition. **Methods:** We conducted a prospective study at 6 Canadian academic EDs to include adults with syncope. We collected demographic, clinical and ECG characteristics while our outcome assessments were completed by medical records review and by telephone follow-up of patients after 30 days. Primary outcome was arrhythmia or death within 30-days after ED disposition and secondary outcomes included non-arrhythmic cardiac and non-cardiac outcomes. We performed descriptive and logistic regression analyses. **Results:** We enrolled 4,266 patients: mean age 53.4 years, 55.4% females, and 8.5% with AFF. After excluding those with outcomes in the ED, lost to follow-up and those with other non-sinus rhythms, 3,417 patients in the sinus and 280 patients in the AFF groups were analyzed. The incidence of arrhythmia or death was significantly higher in the AFF group (Relative Risk 5.1; 95% CI 3.1-8.4; $p < 0.0001$) but there were no significant differences in secondary outcomes between the groups. The unadjusted odds ratio for 30-days arrhythmia or deaths among ED syncope patients with AFF was 5.4 (95% CI 3.2- 9.2). After adjusting for important baseline risk factors by multivariable analysis, the odds ratio for arrhythmia or death in patients with AFF was 1.5 (95% CI 0.8-2.7). **Conclusion:** The risk of AFF for 30-day arrhythmia or death among syncope patients after ED disposition is higher but is attenuated when adjusted for important patient characteristics. Future research should assess long-term outcomes among syncope patients with AFF to guide follow-up after ED discharge.

Keywords: arrhythmia, atrial fibrillation/flutter, syncope

LO005

Association between emergency department chest pain volume and outcomes among patients presenting with chest pain

N.D. Dattani, MD, M. Koh, MSc, A. Chong, BSc, A. Czarnecki, MD, D.T. Ko, MD, MSc; University of Toronto, Toronto, ON

Introduction: Chest pain is one of the most common reasons for emergency department (ED) visits in developed countries. Patients discharged after ED assessment remain at risk for adverse cardiac events. Although a volume-outcome relationship has been shown for myocardial infarction, it is uncertain whether a similar relationship exists with ED chest pain volume. Accordingly, we aimed to determine whether ED chest pain volume influences outcomes of patients presenting to the ED with chest pain who were discharged home. **Methods:** This was a retrospective cohort study using population-based