median age 31 years, 56.7% female). Mean antibiotic prescription rate in the RADT and control arm was 38.2% (SD 15.6) and 55.9% (SD 16.3), respectively. The use of RADT was associated with lower antibiotic prescription rate in both adults (OR = 0.60 [95% CI 0.45-0.80], I^2 = 8%, N = 1407) and pediatrics (OR = 0.49 [95% CI 0.44-0.55], I^2 = 5%, N = 976). There was no overall difference (p < 0.3) in antibiotic prescription rate among disease severity (Centor scores 1-4). The use of RADT did not significantly impact the appropriateness of antibiotic management (OR = 1.15 95% CI 0.94-1.5). **Conclusion:** The use of RADT is associated with a reduction in antibiotic prescription for patients with GAS pharyngitis without an increase in appropriate antibiotic use. Despite low prevalence of the disease in the population, antibiotic prescription rates are still high. These findings suggest great potential for antibiotic stewardship and reevaluation of current guidelines for managing GAS pharyngitis.

Keywords: rapid antigen detection test, pharyngitis, antibiotics

LO47
Use of C-reactive protein can safely decrease the number of emergency department patients with sepsis who require blood cultures

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Introduction: Sepsis protocols call for the acquisition of blood cultures in septic emergency department (ED) patients.However, the criteria for blood cultures are vague, they are costly, only positive 8-12% of the time, with up to half of these being false positives. The objective of this study was to establish if positive blood cultures could be excluded in low-risk sepsis patients with levels of CRP below 20 ml/L. **Methods:** This was a multicenter prospective cohort study of 765 ED patients at St Paul's and Mount St Joseph's hospitals in Vancouver with sepsis (2 or more SIRS criteria and infection) and none of: immuncompromised, injection drug use, indwelling vascular device or septic shock (SBP < 90 mmhg). Consecutive patients with sepsis had CRP and blood cultures obtained at the same time.OUTCOMES. True positive blood cultures, false positive blood cultures, positive blood cultures that changed patient management. True and false positive blood cultures were based on Infectious Disease Society of America Guidelines, and change in management was defined as change in type or length of antibiotic therapy and was blindly adjudicated by a medical microbiologist. **Results:** 765 ED patients with sepsis met inclusion criteria. Mean age was 48.3 years and 57% were male. Blood cultures were positive in 99/765 (12.9%) subjects, of which 19 were false positive (19.2%). CRP was >20 mg/L in 595/765 (77.8%) of patients. Of 170 subjects with a CRP < 20 mg/L, 3 had a positive blood culture (1.8%; 95% CI 0.1%- 5%). Management was not changed in any patient with a positive blood culture and CRP level < 20 mg/L. Of 19 subjects with a false positive blood culture, CRP was <20 mg/L for 6 (31.6%). **Conclusion:** In this cohort of low-risk sepsis patients, based on a CRP of <20 mg/L, acquisition of blood cultures could be safely avoided in 22.2% of patients, at significant savings to the health care system.

Keywords: sepsis, blood culture, C-reactive protein

LO48
Evaluation of the effect of nightshifts on patient outcomes: a multi-center study

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Introduction: Nightshifts may represent a more challenging work environment due to staff fatigue. Our objective was to determine if an association exists between health outcomes for patients seen in Calgary Zone Emergency Department (ED) during nightshifts as compared to other time periods. **Methods:** Administrative data from a city-wide electronic health record was collected from four urban EDs on all discharged patients during a 2-year period: January 2015-December 2016. A total of 454,125 patient visits were included and patients with a scheduled return to the ED were excluded. Three primary outcomes were selected to assess the effects of night shifts on the quality of care received by patients in the ED at night; (i) unscheduled returns to the ED within 7 days resulting in admission, (ii) mortality within 48 hrs and, (iii) mortality within 7 days of being seen by a physician. Non-night shifts were defined as patients seen on day and evening or 700-2300. The data was analyzed using descriptive statistics and precision reported via 95% confidence intervals. **Results:** For the outcome of returns resulting in admission, a 2.6% rate was noted for patients seen at night compared to 2.3% during non-night; OR 1.15 (95% CI 1.09-1.21). Furthermore, patients seen at night had a 0.033% rate of death, while non-night patients had a 0.022% chance of death within 48 hrs of discharge; OR 1.53 (95% CI 0.98-2.38). For mortality within 7 days, the rate of death observed was 0.10% and 0.078% respectively; OR 1.24 (95% CI 0.97-1.60). **Conclusion:** Our study identified presenting to the ED at night as a potential risk factor for adverse patient outcomes using 3 primary quality of care indicators. An adjusted analysis is needed to account for potential confounding variables and effect modifiers and is underway.

Keywords: nightshifts, staff fatigue, quality of care

LO49
Characterizing highly frequent users of a large Canadian urban emergency department

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Introduction: Highly frequent users (HFU) of the emergency department (ED) remain a poorly defined and complex population. This study describes patient and visit characteristics for HFU of the ED, and analyzes subgroups of patients with mental illness, substance abuse, and/or ≥30 yearly ED visits. **Methods:** We performed a health records review of 250 randomly selected adults with >99th percentile of ED visit frequency (≥ 7 visits) at a tertiary care academic hospital with two EDs in 2014. Two reviewers collected demographic variables (age, sex, and comorbidities) and visit data (ED diagnosis, ED length of stay (LOS), ED presentation time (daytime 0800-1559 h, evening 1600-2359 h, overnight 2400-0759 h), consultation services, and final disposition). Data were analyzed using descriptive and univariate analyses, student t and Mann Whitney U tests. **Results:** Of 897 eligible patients who experienced 9,376 ED visits we included 250 patients (2,670 visits) in our main analyses, and an additional 11 patients (494 visits) outside of the random selection with ≥30 ED visits. Mean age was 53.4 ± 1.3 (SEM), and 55.6% were female. Most patients had a fixed address (88.9%), and a family physician (87.2%). Top comorbidities included gastrointestinal (61.6%), cardiovascular (52%), and chronic pain issues (47.2%). Top ED diagnoses included musculoskeletal pain (9.6%), abdominal pain (8.4%) and alcohol-related presentations (8.5%). Hospital admission was required for 15.6% of visits. From all possible visits (3164 visits), consultations for social workers, geriatric emergency medicine nurses, or Community Care Access Centres were made for 5.9% of visits, with 47.3% of these patients presenting during daytime hours. Among visits requiring these consultations, median ED LOS was greatest in the evening (12.7 hours, range 1.4-45.2 hours), compared to daytime (5.4, 1.2-33.6; p = 0.0002) or overnight (7.9, 1.0-38.3, p = 0.02).

Inter-rater review of 4.5% of abstracted health records revealed a kappa score of 0.8. **Conclusion:** This study highlights that a remarkably low proportion of HFUs received allied health consultations at the study sites, likely corresponding to a lack of available consultants outside of daytime work hours. Our findings suggest the need to address significant gaps in order to balance the clinical needs of patients who frequent the ED with currently available resources.

Keywords: frequent users, administration, emergency department crowding

LO50

Headache presentations to emergency departments in Alberta: understanding investigative approaches

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Introduction: Headaches are a common emergency department (ED) presentation. The objective of this study was to characterize headache presentations in Alberta over a five-year period and explore the proportion of patients with potentially severe pathology. **Methods:** Administrative health data for Alberta (years 2011-2015) were obtained from the National Ambulatory Care Reporting System (NACRS) for all adult (>17 years) headache presentations (ICD-10-CA: G43, G44, R51). Patients with a primary or secondary diagnosis code of headache were eligible for inclusion in the study. Exclusions were made using the following criteria: 1) sites without computed tomography (CT) scanners; 2) presentations with a Canadian Triage and Acuity Scale (CTAS) score of 1; 3) patients with trauma or external mechanism of injury (e.g., ICD-10-CA codes S,T, V,W,X,Y); and 4) presentations receiving an enhanced/contrast CT (head). NACRS data were linked with a provincial diagnostic imaging data. Data are reported as means and standard deviation (SD), medians and inter-quartile range (IQR) or proportions, as appropriate. **Results:** From 2011-2015, 98,333 presentations were made by 66,970 patients (~0.3 presentations per patient per year; equivalent to one presentation every 3.4 years). Headache presentations increased from 15,643 in 2011 to 21,636 in 2015. The median age was 38 years (IQR: 29, 51 years); more patients were female (69.3%), had a CTAS score of 3 (55%) and arrived at the ED without ambulance (90.3%). The majority of patients had a primary ED diagnosis of headache (88%) and the most common co-diagnosis was benign hypertension (2.8%). Additional diagnoses indicating severe or pathological headaches, included: stroke (0.63%), subarachnoid hemorrhage (0.43%), infection (i.e., meningitis) (0.11%), and other brain hemorrhages (0.08%). Overall, the ED management of approximately 25% of presentations involved a head CT. Most patients were discharged from the ED (89.4%) after a median length of stay of 3.5 hours (IQR: 2.1, 5.2 hours). **Conclusion:** Headache-related ED presentations are increasing in Alberta, yet few severe/pathological diagnoses are being identified. Efforts to ensure appropriateness of head CT ordering could reduce exposure to ionizing radiation, improve patient flow and reduce health care costs; this imaging represents a target for future interventions.

Keywords: emergency department, headache, epidemiology

LO51

Incidence of clinically relevant medication errors after implementation of an electronic medication reconciliation process

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Introduction: Medication discrepancies are unintended differences between a patient's outpatient and inpatient medication regimens, and occur in up to 60% of hospital admissions. Canadian emergency departments (EDs) have implemented medication reconciliation forms that are pre-populated with outpatient medication dispensing data in order to reduce medication discrepancies and resultant adverse drug events. However, these forms may introduce errors of commission by prompting prescribers to reorder discontinued or potentially harmful medications. Our objective was to evaluate the incidence of medication discrepancies and errors of commission after the implementation of pre-populated medication reconciliation forms. **Methods:** This chart review included admitted patients who were enrolled in a parent study in which a research pharmacist prospectively collected best-possible medication histories (BPMHs) in the ED using all available information sources. Following discharge, research assistants uninvolved with the parent study compared medication orders documented within 48 h of admission with the BPMH to identify medication discrepancies and errors of commission. Errors of commission were defined as inappropriate continuations of medications and reordering discontinued medications. An independent panel adjudicated the clinical significance of the errors. We used regression methods to identify factors associated with errors. The sample size was limited by enrolment into the parent study. **Results:** Of 151 patients, 71 (47%; 95%CI 39.2-54.9) were exposed to 112 medication errors. Of these errors, 75.9% (85/112; 95% CI 67.1-82.9) were discrepancies, of which 18.8% (16/85; 95%CI 12.0-28.4) were clinically significant. Errors of commission made up 24.1% (27/112; 95%CI 17.3-32.8) of all errors, of which 37.0% (10/27; 95%CI 18.8-55.2) were clinically significant. Taking 8 or more medications was associated with a 5-fold greater odds of experiencing a medication error after controlling for confounders (OR 5.00; 95%CI 2.45-10.17; $p < 0.001$). **Conclusion:** Clinically significant medication discrepancies and errors of commission remain common despite the implementation of electronically pre-populated medication reconciliation forms. Prospective studies are needed to evaluate whether using pre-populated medication reconciliation forms increases the risk of introducing errors of commission.

Keywords: medication reconciliation, patient safety, adverse drug events

LO52

Combination of easily measurable real time variables to predict ED crowding

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Introduction: Almost every domain of quality is reduced in crowded emergency departments (ED), with significant challenges around the definition, measurement and interventions for ED crowding. We wished to determine if a combination of 3 easily measurable variables could perform as well as standard tools (NEDOCS score and a NEDOCS-derived LOCAL tool) in predicting ED crowding at a tertiary hospital with 57,000 visits per year. **Methods:** Over a 2-week period, we recorded ED crowding predictor variables and calculated NEDOCS and LOCAL scores. These were compared every 2 hours to a reference standard Physician Visual Analog Scale (range 0 to 10) impression of crowding to determine if any combination of variables outperformed NEDOCS and LOCAL (crowded = 5 or greater). Five numeric variables performed well under univariate analysis: i) Total ED Patients; ii) Patients in ED beds + Waiting Room; iii) Boarded Patients; iv) Waiting Room Patients; v) Patients in beds To Be Seen. These underwent multivariate, log regression with stratification and