roomed next to a psychiatric patient affects patient satisfaction and perception of care. **Methods:** A survey consisting of 15 patient satisfaction questions was distributed to patients over a period of three months in the ED at a tertiary care center with >125,000 visits a year. Patients included were English-speaking adults (18 years or older) with an Emergency Severity Index of 3-5. Responses were analyzed with a chi-square across 2 groups with p-value of 0.05 considered as significant. **Results:** A convenience sample of 78 surveys was obtained. 40 surveys were completed by those roomed next to a patient with a psychiatric complaint and 38 surveys were completed by patients not roomed next to a patient being seen for a psychiatric complaint. For every satisfaction question asked, the patients placed away from mental health encounters gave significantly higher ratings than the patients roomed near psychiatric patients. Patients roomed next to psychiatric patients had a statistically significant decrease in satisfaction in nursing attentiveness, nursing promptness in responding to the call bell, attentiveness of the physician team, and of the overall encounter itself. All values were significant with all but one p-value being < 0.01. There was no difference between the 2 groups with respect to gender, age range, reason for visit or wait time. **Conclusion:** This study suggests that patients being roomed next to a patient with a psychiatric complaint had significantly decreased patient satisfaction.

Keywords: patient satisfaction, psychiatric complaint

P015

Implementing the Canadian CT Head Rule in a community emergency department

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Introduction: The Canadian CT Head Rule ('the rule') is widely used across the country and its use is specifically recommended by Choosing Wisely Canada. Studies in Canadian hospitals have shown appropriate declines in CT scans when decision tools have been made readily available and useable at the point of care. Research into the implementation of the Canadian CT Head Rule in particular has shown that barriers to its use include an inability to accurately recall each criteria and forgetting to attempt to apply the rule altogether. In an attempt to provide our clinicians with effective access to the rule, we modified CT requisitions and order procedures to facilitate the use of the rule for every head CT in our emergency department (ED). **Methods:** A quality improvement (QI) approach was used to pilot, implement, and evaluate the modified CT requisition at our hospital. Several Plan-Do-Study-Act cycles involving stakeholders in the hospital resulted in iterative changes to the requisition leading to the implemented version. The new requisition required physicians to indicate which rules or exclusion criteria were met and this was made mandatory for all head CTs ordered. Demographic data was collected on all patients presenting to the ED on age, gender, CTAS level, disposition, and length of stay. Data on which exclusion criteria were appropriate, the rules met leading to CT scans, whether each requisition was used appropriately, and whether there was a significant injury found was collected for each patient receiving a head CT after implementation. **Results:** In our primary outcome (% of ED visits receiving a head CT), preliminary results have demonstrated a relative reduction in head CT ordering of 10.9%. Our study at completion is powered to detect a ~10% relative change in ordering behaviour, and a Chi square of the data to date yields a P-value of 0.0147. There are no significant differences in visit volume or any of the demographics collected to date. Final results including analysis are anticipated in March, 2016. **Conclusion:** Preliminary results on this simple, no-cost intervention are very promising. The reduction in head

CTs ordered suggests that with mandated access to an easy-to-use, well validated decision tool, ED physicians have been able to confidently defer scans that have a very low risk of having any significant injury present, reducing cost, radiation exposure, and perhaps time in department.

Keywords: decision tool, computed tomography, quality improvement

P016

Evaluating the impact of a novel mobile care team (MCT) on the prevalence of ambulatory care sensitive conditions presenting to emergency medical services in Nova Scotia

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Introduction: Hospitalization due to ambulatory care sensitive conditions (ACSC) is a proxy measure for access to primary care. Emergency medical services (EMS) are increasingly called when primary care cannot be accessed. A novel paramedic-nurse EMS Mobile Care Team (MCT) was implemented in an under-serviced community. The MCT responds in a non-transport unit to bookings from EMS, emergency and primary care and to low-acuity 911 calls in a defined geographic region. Our objective was to compare the prevalence of ACSC in ground ambulance (GA) responses before and after the introduction of the MCT. **Methods:** A cross-sectional analysis of GA and MCT patients with ACSC (determined by chief complaint, clinical impression, treatment protocol and medical history) one year pre- and one year post-MCT implementation was conducted for the period Oct. 1, 2012 to Sept. 30, 2014. Demographics were described. Predictors of ACSC were identified via logistic regression. Prevalence was compared with chi-squared analysis. **Results:** There were 975 calls pre- and 1208 GA/95 MCT calls post-MCT. ACSC in GA patients pre- and post-MCT was similar: n = 122, 12.5% vs. n = 185, 15.3%; p = 0.06. ACSC in patients seen by EMS (GA plus MCT) increased in the post-period: 122 (12.5%) vs. 204 (15.7%) p = 0.04. Pre vs post, GA calls differed by sex (p = 0.007) but not age (65.38 $\pm$ 15.12 vs. 62.51 $\pm$ 20.48; p = 0.16). Post-MCT, prevalence of specific ACSC increased for GA: hypertension (p < 0.001) and congestive heart failure (p = 0.04). MCT patients with ACSC were less likely to have a primary care provider compared to GA (90.2% and 87.6% vs. 63.2%; p = 0.003, p = 0.004). **Conclusion:** The prevalence of ACSC did not decrease for GA with the introduction of the MCT, but ACSC in the overall patient population served by EMS increased. It is possible more patients with ACSC call or are referred to EMS for the new MCT service. Given that MCT patients were less likely to have a primary care provider this may represent an increase in access to care, or a shift away from other emergency/episodic care. These associations must be further studied to inform the ideal utility of adding such services to EMS and healthcare systems.

Keywords: emergency medical services (EMS), ambulatory care sensitive conditions, community paramedicine

P017

Does a busy day predict another busy day? A time-series analysis of multi-centre emergency department volumes

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Introduction: Variations of patient volumes in the ED according to days of the week and month of the year are well-established. Anecdotally, ED volumes follow 'waves' that correlate with previous

days. Time-series models have traditionally been used in econometrics to develop financial models, but have been adapted in other fields, such as health informatics. This study uses a time-series approach to assess whether these impressions are valid. **Methods:** The daily volume of patients presenting to four emergency departments (ED) at the Nova Scotia Health Authority from Jan 2010 to May 2015 were analyzed to assess for the effect of previous volumes on future volumes. Parameters were selected using the auto-correlation (ACF) and partial auto-correlation functions (PACF) for a Seasonal Auto-regressive Integrated Moving Average (SARIMA) model. The Box-Jenkins statistic was assessed for model suitability. To assess for accuracy, a forecast of the model was evaluated with a year of volumes set aside for testing. **Results:** The EDs saw an average of 365.1 patients per day, with a minimum of 188 patients and a maximum of 479. The increasing trend in volumes consistent with the increasing number of ED presentations nation-wide was detrended using linear regression. There was a significant correlation in ACF with the previous day ($\rho_1 = 0.297$). A seasonal, periodic trend was seen weekly. Significant correlations occurred annually ($\rho_{365} = 0.279$) and at 29 days ($\rho_{29} = 0.339$), consistent with the lunar cycle. A seasonal model was postulated incorporating an auto-regressive (AR) coefficient, and a moving average (MA) coefficient for the previous day's volume. An AR and MA seasonal coefficient were each incorporated using the weekly period. When using the model on the test data, the model predicted 4 more patient presentations on average than the true value, with 90% of the values within 37 presentations of the true volume. The Box-Jenkins statistic was non-significant, indicating no problems with model specification. **Conclusion:** The volume of patients presenting to an ED system is correlated with that of the previous day. A weekly seasonal variation was confirmed. Auto-correlations also occur annually and possibly associated with the lunar cycle. Previous ED volumes may be useful in forecasting patient volumes. The time-series approach may discover further ways to predict ED volumes.

Keywords: crowding, time-series, forecasting

P018

A prospective diagnostic support tool for the differentiation of abdominal pain in the adult emergency department population

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Introduction: The chaotic environment of the emergency department has a deleterious effect on clinical judgement. The diagnosis of abdominal pathology is difficult to differentiate. There are also many diagnoses that could be considered abdominal in nature, exacerbating the task of diagnosing these patients. We propose a novel machine-learning method, Hierarchical Structured Models (HSMs), to provide an adjunct to clinician judgement, that provides a ranking of the probabilities of a patient having each of 39 abdominal pathologies, using only variables at the triage stage of emergency department care, and compare its performance to several machine-learning methods. **Methods:** This was a retrospective analysis of 25,861 patients that presented with one of 39 ICD-9 abdominal pathologies. 90% of the data was used to build and fine-tune the model, and 10% was used for testing. Predictors included age, gender, triage vitals and presenting complaint. All variables were solely collected from the Emergency Department Information System (EDIS). A decision tree structure was built using hierarchical clustering algorithms, and then a support vector machine (SVM) was fit at each node. To optimize the parameters for each node, a grid-search method was used to maximize ten-fold classification accuracy. The output of the decision tree was the probability of a particular presentation having each of the 39 diagnoses. This output was translated to a ranking of the relative likelihood of each of the diagnoses as a suggestion system for the treating physician. The accuracy of the system on the test set was compared to conventional machine-learning methods: pair-wise SVMs, gradient boosted models (GBM), neural networks (NN) and k-nearest neighbours (KNN). **Results:** The HSM ranked the correct diagnosis first 51.0% of the time, and ranked the correct diagnosis within the top three ranks 67.6% of the time. The most accurate model was GBMs (52.3%), and the least was neural networks (50.4%). **Conclusion:** The HSM approach using only variables available electronically at triage successfully ranked the correct diagnosis 51.0% of the time, and within the top three 67.6% of the time. Future research will focus on the inclusion of clinically lab results and radiology reports that are available electronically to improve HSM accuracy, and supplement physician diagnosis.

Keywords: machine-learning, artificial intelligence

P019

Understanding patient perceptions of emergency department wait time publication: a mixed-methods needs assessment

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Introduction: Many emergency departments (EDs) have begun publishing wait times. This study seeks to develop an understanding of patients' needs with respect to publishing ED wait times, which, to our knowledge, has not been described in the literature. **Methods:** We conducted a two-stage mixed methods study at a dual campus tertiary care academic center. First, we held focus group discussions comprising of 7 patient advocacy hospital committee members. Themes generated from focus group discussions were then utilized to create a patient survey. Focus groups were analyzed using content theme analysis. Hospital sites for survey administration were randomized and pre-assigned shifts were established to ensure a balance of weekdays, weekends, days, evenings, and overnights. All adult patients (age > 18) in the waiting room were eligible, but excluded if they were directly referred to a specialty service or did not speak French or English. Survey data was analyzed using descriptive statistics. **Results:** We found 9 dominant focus group themes: definition of wait time, wait time posting, lack of communication, education in waiting room, patient expectations, utilization of the ED, patient behavior, physical comfort, and patient empowerment. Of the 240 patient questionnaires administered, 81.3% (195) wanted to know ED wait times before arrival to hospital and 90.8% (217) wanted ED wait times posted in the ED waiting room. The most popular choice for publishing wait times outside the ED was a website (46.7%) whereas, within the ED, patients were not particular about the specific display modality as long as times were displayed (39.6%). Overall, 76.7% (184) stated their satisfaction with the ED would be improved if wait times were posted. **Conclusion:** ED patients we surveyed strongly supported both the idea of having access to wait time information prior to arrival, as well as physical display of wait times in the waiting room.

Keywords: wait-times, patient-centered, waiting room

P020

Paramedic comfort with providing palliative support: pre-implementation survey