

despite a Choosing Wisely recommendation to restrict the use of CT scans in a target population and infrequent changes in management after obtaining a CT. These findings highlight the need for quality improvement strategies to decrease CT utilization in this patient population with suspected renal colic.

Keywords: renal colic, Choosing Wisely, computed tomography

LO87

Use of a clinical prediction rule would lead to more effective CTA utilization for urgent brain imaging of suspected TIA/mild stroke in the emergency department

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Introduction: Canadian stroke best practice guidelines recommend patients suspected of Acute Cerebrovascular Syndrome (ACVS) receive urgent brain imaging, preferably CTA. Yet, high requisition rates for non-ACVS patients overburdens limited radiological resources. We hypothesize that our clinical prediction rule (CPR) previously developed for diagnosis of ACVS in the emergency department (ED), and which incorporates Canadian guidelines, could improve CTA utilization.

Methods: Our data consists of records for 1978 ED-referred patients to our TIA clinic in Victoria, BC from 2015-2016. Clinic referral forms captured all data needed for the CPR. For patients who received CTA, orders were placed in the ED or at the TIA clinic upon arrival. We use McNemar's test to compare the sensitivity (sens) and specificity (spec) of our CPR vs. the baseline CTA orders for identifying ACVS. **Results:** Our sample (49.5% male, 60.6% ACVS) has a mean age of 70.9 ± 13.6 yrs. Clinicians ordered 1190 CTAs (baseline) for these patients (60%). Where CTA was ordered, 65% of patients ($n = 768$) were diagnosed as ACVS. To evaluate our CPR, predicted probabilities of ACVS were computed using the ED referral data. Those patients with probabilities greater than the decision threshold and presenting with at least one focal neurological deficit clinically symptomatic of ACVS were flagged as *would have received a CTA*. Our CPR would have ordered 1208 CTAs (vs. 1190 baseline). Where CTA would have been ordered, 74% of patients ($n = 893$) had an ACVS diagnosis. This is a significantly improved performance over baseline (sens 74.5% vs. 64.1%, $p < 0.001$; spec 59.6% vs. 45.9%, $p < 0.001$). Specifically, the CPR would have ordered an additional 18 CTAs over the 2-yr period, while simultaneously increasing the number of imaged-ACVS patients by 125 with imaging 107 fewer non-ACVS patients. **Conclusion:** Using ED physician referral data, our CPR demonstrates significantly higher sensitivity and specificity for CTA imaging of ACVS patients than baseline CTA utilization. Moreover, our CPR would assist ED physicians to apply and practice the Canadian stroke best practice guidelines. ED physician use of our CPR would increase the number of ACVS patients receiving CTA imaging before ED discharge (rather than later at TIA clinics), and ultimately reduce the burden of false-positives on radiological departments.

Keywords: transient ischemic attack, computed tomography angiography, decision support

LO88

Beside sonography performed by emergency physicians to detect acute appendicitis in the pediatric emergency department

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Introduction: Previous studies have suggested that emergency physicians (EP) highly experienced in point-of-care ultrasound (POCUS)

have similar performance to formal ultrasound to identify appendicitis in children. The aim of this study was to evaluate the ability of EP with various levels of POCUS experience to detect appendicitis with POCUS among children visiting a pediatric ED. **Methods:** A prospective cohort study was conducted in an urban, tertiary care pediatric ED. Children aged 2 to 18 years old who presented to the ED with acute abdominal pain suggesting appendicitis were included. Patients were excluded if they had a history of appendectomy, hemodynamic instability requiring resuscitation, or were transferred with proven diagnosis of appendicitis. Participating EP had various levels of POCUS experience. Four of the 22 physicians were experienced in bowel sonography (EDU 2 level and higher) while the others were inexperienced in bowel sonography (EDU 1). All the participants received a 1-hour didactical and practical training session on appendix ultrasound. The treating physician performed all POCUS following initial physical exam, before further radiological evaluation. Final outcomes were determined by pathology and/or operative reports for surgical cases, and telephone follow-up at 3 weeks for those who did not have surgery. The primary analysis was a simple proportion for sensitivity and specificity for POCUS. Expecting a sensitivity of 80% based on previous studies, we calculated that a sample size of 50 cases would provide a 95%CI ranging from 66 to 90%. **Results:** We approached 140 patients, of which 121 accepted to participate and were recruited. After excluding 4 patients for missing POCUS data, 117 patients were included in the primary analysis, of which 51 (44%) had appendicitis. Twenty-two EP performed between 1 and 20 POCUS. The POCUS identified 27 out of 51 appendicitis for a sensitivity of 0.53 (95%CI 0.40-0.66). A negative POCUS was reported for 54 out of 66 patients without appendicitis (specificity of 0.82; 95% CI 0.71-0.89). **Conclusion:** This study shows limited sensitivity and specificity of POCUS when performed by EP with various level of experience for appendicitis in children. While showing lower sensitivity and specificity than previous studies, the inclusion of a large number of physicians solidifies the external validity of our conclusion.

Keywords: point-of-care ultrasound (POCUS), appendicitis, pediatrics

LO89

Factors associated with delay in trauma team activation and impact on patient outcomes

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Introduction: Trauma code activation is initiated by emergency physicians using physiologic and anatomic criteria, mechanism of injury and patient demographic factors in conjunction with data obtained from emergency medical service personnel. This enables rapid definitive treatment of trauma patients. Our objective was to identify factors associated with delayed trauma team activation. **Methods:** We conducted a health records review to supplement data from a regional trauma center database. We assessed consecutive cases from the trauma database from January 2008 to March 2014 including all cases in which a trauma code was activated by an emergency physician. We defined a delay in trauma code activation as a time greater than 30 minutes from time to arrival to trauma team activation. Data were collected in Microsoft Excel and analyzed in Statistical Analysis System (SAS). We conducted univariate analysis for factors potentially influencing trauma team activation and we subsequently used multiple logistic regression analysis models for delayed activation in relation to mortality, length of stay and time to operative management. **Results:** 1020 patients were screened from which 174 patients were excluded, as they were seen directly by the trauma team. 846 patients were included for

our analysis. 4.1% (35/846) of trauma codes were activated after 30 minutes. Mean age was 40.8 years in the early group versus 49.2 in the delayed group $p = 0.01$. There was no significant difference in type of injury, injury severity or time from injury between the two groups. Patients were over 70 years in 7.6% in the early activation group vs 17.1% in the delayed group ($p = 0.04$). 77.7% of the early group were male vs 71.4% in the delayed group ($p = 0.39$). There was no significant difference in mortality (15.2% vs 11.4% $p = 0.10$), median length of stay (10 days in both groups $p = 0.94$) or median time to operative management (331 minutes vs 277 minutes $p = 0.52$). **Conclusion:** Delayed activation is linked with increasing age with no clear link with increased mortality. Given the severe injuries in the delayed cohort which required activation of the trauma team further emphasis on the older trauma patient and interventions to recognize this vulnerable population should be made. When assessing elderly trauma patients emergency physicians should have a low threshold to activate trauma teams.

Keywords: trauma team activation, triage

LO90

Trauma triage accuracy at a Canadian trauma centre

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Introduction: Trauma teams have been shown to improve outcomes in severely injured patients. The criteria used to mobilize trauma teams is highly variable and debated. This study was undertaken to define the triage accuracy at our level 1 trauma centre and identify the criteria predictive of appropriate activations. **Methods:** A 3-month prospective observational study was performed and all patients presenting to the ER who received a trauma flag were identified. Patient demographics, vital signs, trauma team activation and criteria for activation were documented. Trauma activations were deemed appropriate if the patient met any of the following; airway intervention, needle/tube thoracostomy, resuscitative thoracotomy, ED blood product transfusion, invasive hemodynamic monitoring, central line insertion, emergent OR (<8 hours), admission to ICU, and death within 72 hours. Over and undertriage rates were calculated and a multivariate logistic regression was performed to identify activation criteria predictive of appropriate activations. The activation criteria were then modified and the prospective study was repeated to assess the impact on triage accuracy.

Results: Between September to December 2015, 188 patients received a trauma flag. 137 patients met the activation criteria, however only 78 received a trauma team activation. 57% of patients who had TTA met the definition of appropriate activation, while 45% who met criteria for activation met the definition of appropriate. The rates of under and overtriage were 30.4% and 30.3%, respectively. Logistic regression revealed the following criteria to be predictive of appropriate activation; hypotension (OR 10.2 95% CI 2.3,45.5), arrival by HEMS (OR 3.2, 95% CI 1.4,7.6), pedestrian struck (OR 3.5, 95% CI 1.4,8.5) and fall (OR 5.1, 95% CI 1.7, 15.1). Tachycardia (OR 1.1, 95% 0.3,4.6) and high energy MVC (OR 1.4, 95% CI 0.7,3.1) were not found to be predictive. The post-modification study occurred between September to December 2016. Data analysis to assess the impact of criteria alteration are currently underway and will be presented at CAEP 2017. **Conclusion:** Triage accuracy for the mobilization of a multi-disciplinary trauma team is important, both to ensure optimal patient care as well as to reduce unnecessary resource strain. Our previous criteria lead to high rates of undertriage and subsequent modifications have been made. The impact of these changes will be ascertained and presented at CAEP 2017.

Keywords: trauma team, triage, activation criteria

LO91

Repeat exposures to culprit drugs contribute to adverse drug events in emergency department patients

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Introduction: Adverse drug events (ADEs), unintended and harmful events associated with medications, cause or contribute to 2 million annual emergency department (ED) visits in Canada. Australian data indicate that 27% of ADEs requiring admission are events caused by re-exposure to drugs that previously caused harm. Our **objective** was to estimate the frequency of repeat ADEs. **Methods:** We reviewed the charts of ADE patients who had been enrolled in 1 of 3 prospective studies conducted in 2 tertiary care and 1 urban community ED. In the parent studies, researchers enrolled patients by applying a systematic selection algorithm to minimize selection bias, and physicians and pharmacists evaluated patients prospectively to evaluate the causal association between the drug regimens and patient presentations. After completion of the parent studies, a research pharmacist and a physician independently reviewed the charts of ADE patients, abstracted data using electronic forms, and searched that hospital's records for previously recorded ADEs. The main outcome was a repeat ADE, defined as a same or same-class drug re-exposure, or repeat inappropriate drug withdrawal, causing a same or similar presentation as a prior ADE. Sample size was based on enrolment into the parent studies. **Results:** We reviewed the charts of 614 ED patients diagnosed with 655 ADEs. Of these, 20% (133/665, 95%CI 17.0-23.0%) were repeat events. Most repeat ADEs were moderate (61%) or severe (32%) in nature, and 33% (95%CI 25.1-41.1%) required hospital admission. The most commonly implicated drugs were warfarin (10%), hydrochlorothiazide (4%) and insulin (4%), and the most commonly implicated drug classes were antithrombotics (17%), psychotropics (12%) and analgesics (9%). Repeat ADEs commonly required clinical monitoring (59%), additional medications to treat the ADE (50%) and follow-up lab testing (35%). Overall, 61% (95%CI 51.3-70.7%) of culprit drug re-exposures were deemed potentially or definitely inappropriate. **Conclusion:** Inappropriate re-exposures to previously harmful medications cause a substantial number of recurrent ADEs, and may represent an ideal target for prevention. We were unable to search for repeat ADEs in the records of other hospitals that our patients may have visited, and could not detect ADEs that were not documented in the medical record. As a result, we likely underestimated the frequency of repeat ADEs.

Keywords: adverse drug events, patient safety, health services

LO92

Factors contributing to the development of adverse drug events treated in emergency departments

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Introduction: Adverse drug events (ADEs), unintended and harmful events associated with medications, commonly cause or contribute to emergency department (ED) presentations. Understanding provider, patient and system factors that contribute to their development may assist in developing effective preventative strategies. Our **objective** was to identify factors that contributed to the development of ADEs that caused ED presentations. **Methods:** We reviewed the charts of ADE patients enrolled in 1 of 3 prospective studies conducted in 3 tertiary care and 1 urban community ED. In the parent studies, researchers