

closed thoracic injuries are often discharged from Emergency Departments (ED) and treated on an outpatient basis. One potential complication is the development of a delayed hemothorax (DHx). Currently, there exists no consensus on the best method for classifying DHx. The goal of this study is to evaluate the level of interrater and intrarater agreement with respect to three classification schemes for DHx. **Methods:** This was a secondary analysis drawn from a prospective multicenter cohort study of consecutive patients presenting to one of four Canadian ED for minor closed thoracic trauma over a four-year period. Using intraclass correlation (ICC), chest radiographs of 50 patients previously diagnosed with new DHx within 2 weeks of discharge were randomly selected and subjected to analysis by emergency physicians, radiologists, surgeons and family physicians using three different methods of classification to study their reliability, both between raters and for the same rater on two separate evaluations, at determining hemothorax severity. **Results:** Analysis of ICC values demonstrates poor interrater agreement (Global ICC 0.44, 0.35-0.52) for the current classification method, based on professional experience and opinion. The second method, based on hemothorax / total thorax ratio calculation, showed good Global ICC (0.58, 0.49-0.67) on lateral films. The third method, based on presence / absence of overflow from the costo-phrenic angle, showed equally good Global ICC (0.56, 0.47-0.64) on postero-anterior films and was more homogenous across the four different groups of physicians. **Conclusion:** Our results demonstrate that the current method used to classify DHx, based on gestalt, shows poor interrater agreement. Two innovative classification methods achieved good interrater agreement. Future studies, analyzing possible correlation of this more reliable classification method to objective, clinical measures would be of value to management decisions.

Keywords: delayed hemothorax, minor chest trauma, classification

P041

Accuracy of medical student-performed point-of-care ultrasound in the diagnosis of distal radius fractures in adults

L. Farnell, MD, A.K. Hall, MD, C. McKaigney, MD; Queen's University, Kingston, ON

Introduction: Previous investigations of the diagnostic accuracy of point-of-care ultrasound (POCUS) in distal radius fractures (DRF) report a wide range of sensitivities (71%-98%) and specificities (73%-100%) when performed by medical professionals, which may reflect inconsistencies in POCUS training or sonographer experience. The purpose of this study was to determine the accuracy of POCUS performed by pre-clerkship medical students with minimal POCUS training compared to standard radiography in diagnosing DRF in adult patients with traumatic wrist injuries, in order to assess POCUS as an alternative to traditional radiographic imaging. **Methods:** This prospective observational study was conducted from June to September 2015. The study population consisted of adults presenting to the emergency department (ED) with distal forearm pain secondary to traumatic injury within the past seven days and for whom radiographic imaging was ordered. Patients were evaluated using POCUS performed by medical students with no prior experience who had received one hour of POCUS training taught by an emergency ultrasound fellowship-trained ED physician. A pre-test probability of fracture was stratified as low or high and documented independently by the treating physician. Students were blinded to pre-test probability and radiography results. **Results:** Of the 52 patients enrolled, 18 had DRF diagnosed by radiographic imaging. Compared to radiography, student-performed POCUS had 72% overall sensitivity (95% CI, 47%-90%) and 85% specificity (95% CI,

69%-95%), with 81% overall accuracy. In the high pre-test probability group (N = 20), POCUS had 80% sensitivity (95% CI, 52%-96%) and 60% specificity (95% CI, 15%-95%). In the low pre-test probability group (N = 32), POCUS had 33% sensitivity (95% CI, 1%-91%) and 90% specificity (95% CI, 73%-98%). **Conclusion:** POCUS performed by medical students demonstrated reasonable success in diagnosing DRF, with overall sensitivity and specificity in keeping with published data. Within the low pre-test probability group, the diagnostic accuracy of POCUS suggests that ultrasound was an unreliable alternative to radiographic imaging for DRF in this cohort. Future analysis of the factors leading to DRF missed by POCUS as being related to adequacy of POCUS training, image capture, or sonographer experience will further explore the utility of POCUS as a diagnostic alternative.

Keywords: point-of-care ultrasound (PoCUS), diagnostic accuracy, distal radius

P042

Use of technology to create economically sustainable supplemented triage: a feasibility study at an urban tertiary care centre

C.H. Filipowska, MB, BCh, CAO, L. Mazurik, MD; Sunnybrook Health Sciences Centre, Toronto, ON

Introduction: Decreasing patient Length of Stay (LOS) in the Emergency Department (ED) improves patient safety. Numerous studies have taken differing approaches to supplementing care at triage in order to decrease LOS, however, have not proven to be financially sustainable. The goal of this study was to explore financially viable options to expedite care in a safe way and reduce patient LOS. **Methods:** The ED process chain was identified. Two reviewers observed triage for a 4-hour period following patients. Times from patient arrival to: completion of triage, completion of registration, test ordering, physician assessment and final disposition were measured. Results were presented at departmental rounds. Nursing staff, Physician Assistants, Residents and Physician staff were paired in interdisciplinary groups to brainstorm and trial approaches to expedited test ordering and use of technology to carry out orders. **Results:** Triage interruptions increased time to triage a patient up to 3 times baseline, and 33% of triage interactions were interrupted. A bottleneck occurred at registration, increasing time to be registered by up to 30 minutes. Also, registration is using antiquated technology, significantly increasing registration time. Average patient LOS was 249 min, but was only 120 min if there was no delay in test ordering for patients. Average time for MD disposition was 129 min, but was only 47 minutes if there was no delay in ordering tests. Brainstorming lead to the following ideas: 1) use of companion phones to access already-working ED MD for test ordering and ECG interpretation 2) the use of the computer system to flag new orders or ECG for triage patients 3) use of a dedicated iPad in zones 4) increased standing orders for RNs to order diagnostic imaging. **Conclusion:** Patient LOS was reduced by lack of delay in test ordering, in keeping with previous studies. Numerous points in the process chain were identified for creating an economically sustainable supplemented triage to improve patient flow. These were: interruptions to triage, registration bottleneck, technology at registration, test ordering at triage. Ways in which to effectively order tests at triage include: MD-companion phones, pre-existing computer program, dedicated iPad in zones. The next step in this study is to trial each of these low-cost technologies.

Keywords: supplemental triage, technology, economic feasibility

P043

Education innovation: a postgraduate emergency medicine musculoskeletal medicine curriculum

A.S. Foran, MD: The University of Alberta, Edmonton, AB

Introduction / Innovation Concept: Musculoskeletal medicine (MSKM) complaints account for a significant portion of emergency room visits. Furthermore, MSKM diagnostic and management skills are poorly taught in undergraduate medicine and emergency medicine (EM). Here, we successfully developed an MSKM curriculum resulting in objectively improved resident acumen. **Methods:** Curriculum development was achieved by surveying local EM residents on their perceived MSKM deficits, and effective MSK teaching strategies. A literature search was also completed identifying MSKM teaching shortcomings. Finally, orthopaedic surgeons were asked which clinical entities they thought should be emphasized in our curriculum. **Curriculum, Tool, or Material:** A case-based MSKM curriculum was created. Cases emphasized commonly occurring emergency department presentations, topics that EM practitioners self-identified as requiring further teaching, commonly missed problems at first presentation, and high-risk cases if mismanaged. Curriculum implementation consisted of three, half-day, workshops. Workshops included didactic lectures, MSKM physical exam practice, and MSKM cases. MSKM cases required resident history taking and physical exam practice, radiography interpretation, and management plan formulation. Objective assessments of resident MSKM knowledge and skill were given to the learners before and after the workshops. Survey questions were grouped into 3 categories: MSK assessment, investigation, and management. Questions were scored on a 5-point Likert scale, ranging from “not at all confident” to “very confident”. A Wilcoxon Signed Rank Test indicated statistically significant improvement in learner confidence within all three domains after the first workshop (n = 19 learners; assessment: p < 0.001, investigation: p < 0.001, management: p < 0.001), and after the second workshop (n = 24 learners; assessment: p < 0.001, investigation: p < 0.001, management: p < 0.001). **Conclusion:** We successfully incorporated MSKM teaching into our academic curriculum based on previously identified weaknesses, resulting in improved resident MSKM case management. Further MSKM teaching sessions and evaluations to facilitate knowledge and skill maintenance are currently under development. **Keywords:** innovations in EM education, curriculum, medical education

P044

HEADSTRONG: helmet education, advocacy, distribution & social media trial to reduce obstacles & nudge group behaviour
S.M. Friedman, MD, MPH, M. Kuipers, MSc, A. Ackery, MD, MSc; University Health Network, Toronto, Toronto, ON

Introduction: Head injury is a major cause of bicycling-related disability and death, and more likely to occur in unhelmeted riders. Legislation regarding helmet use varies by province. In Ontario, helmet use is not mandatory for cyclists \geq age 18, and approximately 50 % of adult cyclists do not routinely wear helmets. Non-legislative approaches to increase helmet use have included education, public health campaigns, and helmet giveaways, but sustained effect is typically limited. The goal of the HEADSTRONG Behaviour Study is to identify injured adult cyclists who do not regularly wear helmets, and effect *sustained* helmet use. The strategy incorporates evidence-based elements of health behaviour change, including: reducing barriers, education and modelling, providing necessary materials, and social support. **Methods:** Prospective cohort study in downtown Toronto teaching hospital, launched Nov 2015. ED clinician (EP or NP) will recruit injured cyclists (consecutive, convenience sample) who report not regularly wearing a helmet nor owning a suitable one. Study endpoint: 100 enrolled (to estimate prevalence of usage of +/- 10%, alpha 0.05, power > 90%, assuming 80% study completion and 50 %

helmet wearing at 12 months). Exclusion criteria: unable to consent, admitted to hospital, age < 18. Each element of the HEADSTRONG Behaviour Strategy is intended to facilitate patient adoption and maintenance of the desired behaviour, including: 1) enrolment/education by research associate while still in the ED; 2) provision and fitting of a free bicycle helmet; 3) social contract commitment and tailored reminders to document ongoing helmet use: participant agrees to respond to brief electronic survey follow-ups at two weeks, two months, six months, and twelve months; 4) social media engagement with participation in the HEADSTRONG Twitter group, which engages other enrollees and cycling advocacy groups; 5) peer nomination: the participant who is complying with the social contract is encouraged to nominate an uninjured non helmet-wearing colleague to enrol in the study. **Results:** Primary outcomes include: recruitment rate, enrolment, and sustained participation through follow-up period. Secondary outcomes include age, gender and social demographics of helmet recipients, and participation of peers. **Conclusion:** Discussion of strategy and interim results at six month interval will be presented at CAEP.

Keywords: injury prevention, bicycling, helmets

P045

What do we know about pediatric palliative care patients who consult the emergency department?

N. Gaucher, MD, N. Humbert, PhD, F. Gauvin, MD; CHU Sainte-Justine, Montréal, QC

Introduction: There is very little data about pediatric palliative care (PPC) patients' visits to the emergency department (ED). This study's goal was to determine the characteristics of PPC patients who consult the ED. **Methods:** A five-year retrospective chart review, conducted at a tertiary care pediatric university-affiliated hospital. Eligible patients initially consulted with the PPC team between April 1st 2007 and March 31st 2012. For each eligible patient, ED visits between these dates were included, using the ED's electronic data system. Data about each visit was drawn from the electronic data system and the patient's medical chart. This study was IRB approved. **Results:** During the study period, 290 new patients were followed by the PPC team; of these, 94 (32.4%) consulted the ED at least once (total of 219 visits). The median number of visits per patient was 2 (range: 1-8). Patient median age was 7 years 5 months (range: 1 month-22 years) and most common baseline diagnoses were: oncological diagnosis (39.4%), encephalopathy (27.7%) or genetic/chromosomal anomaly (13.8%). No patients died in the ED, but 36 (38.3%) died during the episode of care following one of their ED visits and 18 (19.1%) of them died within 72h of admission. PPC patients presented to the ED 219 times acutely ill: 11.4% of visits were triaged CTAS (Canadian Triage and Acuity Scale) level 1, 39.3% CTAS 2, 39.3% CTAS 3 and 10% CTAS 4 or 5. Many patients (37.9%) arrived by ambulance, 24.2% were admitted to the resuscitation room. Most patients consulted during day (45.2%) or evening (41.1%) shifts. Median length of stay was 3h50min (range: 13min - 15h10min). Reasons for consultation were respiratory distress/dyspnea (30.6%), pain (12.8%), seizure (11.4%), fever (9.1%), gastrointestinal symptoms (8.2%), fatigue (7.3%) and technical issues with catheters (5.9%). Most (79%) patients had investigations in the ED; 61.2% were admitted to wards, 7.3% to the PICU, and 20.5% were discharged. Two-thirds of patients (65.7%) had previously signed an advanced care directive at the time of their ED visit; discussions about goals of care were present in 37.4% of medical charts. **Conclusion:** Most PPC patients presented to the ED acutely ill, requiring work-up and admission. One-third presented in their end of life. Understanding the characteristics of PPC patients who consult the ED is the first step in offering better care for these complex patients.