

identify the pulse using US compared to 9 (10%) by MP ($P=0.81$). Prior to training, participants had a higher comfort level using MP than US pulse checks (67 vs. 26 mm, $P<0.001$). Following the study, participants reported higher comfort levels using US than MP (88 vs. 78 mm, $P<0.001$). **Conclusion:** Carotid pulse detection in live subjects was not slower using US as compared to MP in this study. A brief teaching session was sufficient to improve confidence of carotid pulse identification even in those with little to no previous US training. The preliminary results from this study provide the groundwork for larger studies to evaluate this pulse check method for patients in actual cardiac arrest.

Keywords: ultrasound, pulse, palpation

LO79

Climbing the learning curve teaching the pediatric emergency physician how to interpret point-of-care ultrasound images

C. Kwan, MD, K. Weerdenburg, MD, M. Pecarcic, PhD, M. Pusic, MD, PhD, M. Tessaro, MD, H. Salehmohamed, MD, K. Boutis, MD, MSc, Hospital for Sick Children, Toronto, ON

Introduction: Point-of-Care Ultrasound (POCUS) is rapidly being integrated into Pediatric Emergency Medicine (PEM), and image interpretation is an important component of this skill. Currently, PEM physicians often rely on case-by-case exposure and feedback by a POCUS expert physician to learn this skill; however, this may not be efficient, reliable or feasible. Thus, there is a pressing need to develop effective POCUS image interpretation learning and assessment tools. We developed an on-line learning platform that allowed for the deliberate practice of images in four POCUS applications [soft tissue, lung, cardiac and Focused Assessment Sonography for Trauma (FAST)], and determined the quantity of participant skill acquisition by deriving performance metrics and learning curves. **Methods:** This was a prospective cross-sectional study administered via an on-line learning and measurement platform. Images were acquired from a pediatric emergency department and each POCUS application contained 100 still/video images. Final diagnosis of each image was determined via the consensus of three PEM POCUS experts. PEM fellow and attending study participants were recruited from the USA and Canada and were required to complete the cases of at least one application. We aimed to enroll 200 participants who had to complete a minimum of 100 cases which, based on prior work, would provide sufficient raters for item analyses and comparisons between PEM attendings and fellows. To derive reference standard performance metrics and to validate image interpretations, a unique set of five PEM POCUS experts completed each application. **Results:** We enrolled 225 PEM physicians, 74 fellows and 151 attendings. For all applications, the Cohens d effect size was large at 0.87, and there was no difference between PEM attendings and fellows with respect to summary performance metrics (accuracy, $p = 0.29$; sensitivity, $p = 0.13$; specificity, $p = 0.92$). Final accuracy soft tissue, lung, cardiac, and FAST for all participants was 86.4%, 89.6%, 81.6%, 88.0%, respectively, and the corresponding accuracy of PEM POCUS experts for each application was 96.0%, 96.0%, 90.0%, and 93.0%. Learning curves show maximal learning gains (inflection point) up until 65 cases for soft tissue, 70 for FAST, 75 for lung, and 85 for cardiac. **Conclusion:** Deliberate practice of POCUS image interpretation was effective for ensuring broad domain coverage and predictable skill improvement. Specifically, there was a large learning effect after 100 case interpretations, and 65-85 case interpretations were needed to reach an accuracy threshold of approximately 85%.

Keywords: medical education, diagnosis, learning

LO80

Ondansetron administration to non-dehydrated children with acute gastroenteritis-associated vomiting, in emergency departments in Pakistan: a randomized, blinded, phase 3, superiority trial

S. Freedman, MD, CM MSc, S. Soofi, MBBS, A. Willan, PhD, S. Williamson-Urquhart, BScKIN, N. Ali, MPH, J. Xie, MD, MPH, F. Dawoud, MD, Z. Bhutta, PhD, University of Calgary, Calgary, AB

Introduction: In high-income countries, vomiting often impedes oral rehydration therapy, leading to intravenous rehydration fluid administration to children with acute gastroenteritis. Ondansetron administration reduces vomiting and intravenous fluid administration in this population. We evaluated whether ondansetron is similarly effective when employed in Pakistan. **Methods:** In this 2-hospital, double-blind, placebo-controlled, emergency department-based, randomized trial, we recruited children aged 0-5 to 5-0 years, without dehydration, who had diarrhea and 1 episode of vomiting within 4 hours of arrival. Patients were randomly assigned (1:1), via an internet-based randomization service, using a stratified, variable block randomization scheme, to receive a single dose of oral ondansetron or placebo. The primary endpoint was intravenous rehydration (administration of 20 ml/kg over 4 hours of an isotonic fluid) within 72 hours of randomization. All randomized children were analysed. **Results:** From July 3, 2014, to January 12, 2017, 626 children were randomized. Intravenous rehydration was provided to 10.8% (34/314) and 10.3% (27/312) of children administered placebo and ondansetron, respectively (OR: 0.946; 95% CI: 0.564, 1.587; $P=0.834$). A regression model fitted with treatment group and adjusted for antiemetic administration and vomiting frequency in the preceding 24 hours, yielded similar results; OR = 0.952; 95% CI: 0.570, 1.589; $P=0.850$. There was no evidence of interaction between treatment group and age ($P=0.974$), 3 diarrheal stools in the preceding 24 hours ($P=0.983$) or 3 vomits in the preceding 24 hours ($P=0.554$). During the 4-hour study observation period, 24.0% (75/314) and 19.6% (61/312) of children in the placebo and ondansetron groups vomited, respectively; OR: 0.774; 95% CI: 0.528, 1.133; $P=0.187$. **Conclusion:** Ondansetron administration did not significantly reduce intravenous rehydration use, suggesting that in children without dehydration, ondansetron administration does not significantly alter the disease course and should not be administered to this group of children.

Keywords: ondansetron, vomiting, gastroenteritis

LO81

Bridging the GAP: A deliberate practice method for learning genital abnormalities in prepubescent girls

K. Boutis, MD, MSc, A. Davis, MD, MSc, M. Pecarcic, PhD, M. Pusic, MD, PhD, M. Shouldice, MD, T. Smith, J. Brown, MD, Hospital for Sick Children and University of Toronto, Toronto, ON

Introduction: Correctly identifying pathology in pre-pubertal females is a high-stakes physical examination skill. Currently, learning this skill relies heavily on case-by-case exposure, which is variable, limited and often results in suboptimal skill. Thus, there is a need to develop and evaluate learning platforms that simulate the presentation and diagnosis of this important clinical task. We developed an on-line learning and assessment platform that allowed the deliberate practice of 158 pre-pubertal female genital image interpretations. We examined the quantity of skill acquisition by deriving performance metrics and learning curves. **Methods:** This was a prospective cross-sectional study administered via an on-line learning and assessment platform. Colposcopic images were acquired from a child abuse clinic. Two child abuse experts

interpreted images to determine case solutions and 40% of cases had medical or traumatic pathology. Further, to validate image interpretations, a unique set of five child abuse and pediatric gynaecology experts reviewed the cases. Study participants were recruited from the USA and Canada and were required to complete all 158 cases. For each image, learners designated cases as normal or abnormal and if abnormal indicated the abnormal area on the image. The primary outcome was the change in accuracy, sensitivity and specificity. **Results:** We enrolled 107 participants, 26 medical students, 31 pediatric residents, 24 pediatric emergency fellows, and 26 pediatric emergency attendings. For all participants, the change in accuracy was +9.6% for accuracy ($p < 0.001$), +1.4% for sensitivity ($p = 0.6$) and +15.7% ($p < 0.001$) for specificity. The final score for accuracy, sensitivity and specificity was 79.5%, 66.1%, and 87.8%, respectively. There was no difference between learner types with respect to summary performance metrics (accuracy, $p = 0.15$; sensitivity, $p = 0.44$; specificity, $p = 0.54$). Learning curves show maximal learning gains (inflection point) up until 100 cases. **Conclusion:** Deliberate practice of pre-pubertal female image interpretation was effective for ensuring predictable skill improvement for normal cases but was less effective for abnormal cases. Future research could examine how to refine the education tool to better serve diagnostic skill of abnormal cases.

Keywords: pediatrics, diagnosis, education

LO82

Normal bedside ultrasound of growth plates in healthy children

E. Beatty, BA, BSc MD, L. Audette, MD, A. Paré, D. Simonyan, MSc, V. Dion, MD, S. Berthelot, MD, MSc, M. Parent, MD, Université Laval, Quebec, QC

Introduction: The diagnosis of Salter-Harris Type 1 fractures in the Emergency Department (ED) is primarily clinical, as radiographs are usually unrevealing. We hypothesize that bilateral asymmetry of the growth plate, detected using bedside ultrasound (US), could improve the accuracy of this diagnosis in the ED. This study seeks to determine growth plate size according to age, and to establish normal variation in bilateral symmetry of growth plate cartilage, for the ulna, radius, tibia, and fibula, using bedside US in normal healthy children. **Methods:** This prospective observational study was conducted in a convenience sample of children ages 0-17 during planned visits to an elementary school, high school, and an outpatient pediatric clinic. A sample size of 177 was determined with a linear regression model using previously published data on the subject. The study was approved by the hospital and university ethics board. After a medical questionnaire with a research nurse, the participants underwent ultrasound evaluation of bilateral ulnae, radii, fibulae, and tibiae, to obtain still images of the physes from two orthogonal views. The evaluations were performed by 3 medical residents, 1 medical student, and by the supervising emergency physician. All ultrasonographers were EDE1 certified and specifically trained for growth plate imagery. The still images were evaluated ulteriorly and measurements taken of the physal cartilage. Ten percent of the patients had their images re-evaluated by the supervising physician to determine inter-rater reliability. **Results:** A total of 227 patients were recruited. The median age was 8 years old with an interquartile range of (3;14). Mean growth plate size by age was determined, confirming decreasing growth plate size with advancing age for all articulations. The percentage of absolute difference between right and left, for all growth plates together, was a mean of 17% with a 95% CI of 16-19%. The overall inter-rater reliability was excellent at 0.84. **Conclusion:** This study establishes a reproducible technique of measuring growth plates with ultrasound. We suspect that increased asymmetry at the growth plate,

beyond this established normal variation, may signify a physis widening or hematoma consistent with a Salter-Harris Type 1 fracture; this will be evaluated in a second study.

Keywords: ultrasound, growth plate, Salter-Harris Type 1

LO83

Relevance of international opioid prescribing guidelines for emergency department practice

S. Upadhye, MD, MSc, A. Worster, MD, MSc, R. Valani, MD, MBA, McMaster University, Hamilton, ON

Introduction: The opioid crisis in North America has led to more rigorous prescribing guidelines in various practice settings. Recent studies suggest that the Emergency Department is an environment with increased opioid prescribing, leading to increased rates of long-term use and dependence in opioid naive patients. Prior reviews of international opioid prescribing guidelines have demonstrated overall congruence of practice recommendations, although these are focused on primary care prescribers. The goal of this study was to review international opioid prescribing guidelines for recommendations relevant to emergency department practitioners. **Methods:** The search strategies of prior congruence studies were reproduced, updated and supplemented by electronic database and specialty organization searches. Only the most recent iteration of a published guideline was included, unless it was a limited update of a prior more comprehensive guideline, in which case both were assessed. Prescribing guidelines were included if they represented national practice statements, national or international specialty organizations generating guidelines. Sub-national or regional guidelines were excluded due to local practice bias tendency. Included guidelines were independently reviewed for evidence evaluation and recommendation formulation frameworks, relevance of recommendations for emergency medicine (EM) practice (and supporting levels of evidence), inclusion of EM authors (and corresponding conflict of interest statements), and involvement of EM-relevant stakeholders in reviewing guideline publications. **Results:** Sixteen international and specialty organization guidelines were included in the review. Evidence evaluation and recommendation formulation frameworks were incompletely reported (12/16), and used a multitude of evaluation processes when reported. Two guidelines included EM-relevant recommendations based on weak evidence. Three guidelines included EM authors, one of which reported a conflict of interest. None of the included guidelines were reviewed by EM-relevant stakeholder organizations prior to publication. **Conclusion:** International and specialty organization opioid prescribing guidelines virtually ignore relevant recommendations for EM practice, and any supporting evidence is weak. Emergency practitioners are nearly absent from authorship groups, and are excluded from external review of draft documents prior to final publication. This study reinforces the urgent need for EM organizations to create guidance documents around opioid prescribing for their own practitioners, and involving appropriate EM stakeholders.

Keywords: guidelines, opioids

LO84

Experiences of youth and family presenting to the emergency department for addiction and mental health

H. Hair, MBA, M. Bercov, MSW, S. Hastings, PhD, Alberta Health Services, Calgary, AB

Introduction: The Canadian Institute for Health Information reports the rate of child and youth emergency department (ED) visits for mental