

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

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**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

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**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

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

health complaints increased by 50% between 2007 and 2015. Improving care for these patients is a major priority of Alberta Health Services (AHS). As part of a multi-phased approach to improving care, the Emergency and the Addiction and Mental Health Strategic Clinical Networks (SCNs) surveyed youth who had presented to an ED for mental health or substance use concerns and their families/caregivers. **Methods:** The online survey contained closed- and open-ended questions on reasons for ED visits, expectations about and experiences during their visits, and areas for improvement. An ethics approved survey was conducted for 4 weeks. Participants were recruited across the province using an extensive array of social media platforms. For each survey, we randomly selected a sample of open-ended responses to thematically analyze to the point of informational redundancy. **Results:** The Youth survey received 992 responses and the Family survey received 553. A small number of overarching themes emerged. For both surveys, the major themes were 1) Wait times and access: participants were disappointed with lengthy wait times and services in the community. Youth said this made them question their decision to seek help and left them feeling hopeless. 2) Care provider training: participants were unhappy with the quality of care provided (e.g., lack of compassion, minimizing symptoms). They felt better training would improve care and attitudes towards mental health patients. 3) Environment: participants were uncomfortable with the lack of privacy for discussing sensitive topics; youth also requested items such as pens/paper and phone chargers to make the stay more comfortable and provide distractions. An additional theme emerged in the Youth survey regarding family involvement; participants wanted to decide how much/what information is shared with their families. Youth noted they were less likely to be honest with family present. Communication and navigation were mentioned frequently in the Family survey; participants noted the complexity of the mental health care system and felt frustrated by the lack of information to help them access additional resources. **Conclusion:** There are a number of areas in need of improvement to provide high-quality, patient-centred care to youth with mental health or substance use concerns that present to the Emergency Department. Phase II of this project will involve a review of the themes and determine priorities and strategies to address the themes that could be implemented into the workflow. **Keywords:** child, youth, addiction and mental health

#### LO85

##### **Knowledge, attitudes, and practices regarding opioid use in the pediatric emergency department**

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**Introduction:** Inadequate pain management in children is ubiquitous in the emergency department (ED). As the current national opioid crisis has highlighted, physicians are caught between balancing pain management and the risk of long term opioid dependence. This study aimed to describe pediatric emergency physicians (PEPs) willingness to prescribe opioids to children in the ED and at discharge. **Methods:** A unique survey tool was created using published methodology guidelines. Information regarding practices, knowledge, attitudes, perceived barriers, facilitators and demographics were collected. The survey was distributed to all physician members of Pediatric Emergency Research Canada (PERC), using a modified Dillmans Tailored Design method, from October to December 2017. **Results:** The response rate was 49.7% (124/242); 53% (57/107) were female, mean age was 43.6 years

(+/-8.7), and 58% (72/124) had pediatric emergency subspecialty training. The most common first line ED pain medication was ibuprofen for mild, moderate and severe musculoskeletal injury (MSK-I)-related pain (94.4% (117/124), 89.5% (111/124), and 62.9% (78/124), respectively). For moderate and severe MSK-I, intranasal fentanyl was the most common opioid for first (35.5% (44/124) and 61.3% (76/124), respectively) and second line pain management (41.1% (51/124) and 20.2% (25/124), respectively). 74.8% (89/119) of PEPs reported that an opioid protocol would be helpful, specifically for morphine, fentanyl, and hydromorphone. Using a 0-100 scale, physicians minimally worried about physical dependence (13.3+/-19.3), addiction (16.6 +/-19.8), and diversion of opioids (32.8 +/-26.4) when prescribing short-term opioids to children. They reported that the current opioid crisis minimally influenced their willingness to prescribe opioids (30.0 +/-26.2). Physicians reported rarely (36%; 45/125) or never (28%; 35/125) completing a screening risk assessment prior to prescribing opioids. **Conclusion:** Ibuprofen remains the most common medication recommended for MSK-I pain in the ED and at discharge. Intranasal fentanyl was the top opioid for all pain intensities. PEPs are minimally concerned regarding dependence, addiction, and the current opioid crisis when prescribing short-term opioids to children. There is an urgent need for robust evidence regarding the dependence and addiction risk for children receiving short term opioids in order to create knowledge translation tools for ED physicians. Opioid specific protocols for both in the ED and at discharge would likely improve physician comfort in responsible and adequate pain management for children.

**Keywords:** opioids, addiction, pain

#### LO86

##### **The diagnosis of concussion in pediatric emergency departments: a prospective multicenter study**

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**Introduction:** Accurate identification of children with a concussion by emergency department (ED) physicians is important to initiate appropriate anticipatory guidance and management. In children meeting international criteria for concussion, we aimed to determine the proportion who were provided this diagnosis by the ED physician and which variables were associated with a physician-diagnosed concussion. We also compared persistent symptoms in concussion cases versus those with alternative diagnoses. **Methods:** This was a planned secondary analysis of a prospective, multicenter cohort study. Participants were children aged 5 through 17 years and met Zurich/Berlin International Consensus Statement criteria for concussion. The primary outcome was the proportion of study participants who were assigned a diagnosis of concussion by the treating ED physician. Based on available evidence, between 50% and 90% of children meeting international concussion criteria are also diagnosed by an ED physician as having a concussion. Assuming a worst case scenario that 50% of physicians would diagnose concussion, our anticipated study sample size of 2946 would be accompanied by a +2% margin of error at the 95% confidence level for the primary outcome. **Results:** Among the 2946 eligible children, 2340 [79.4% (95% CI 78.0, 80.8)] were diagnosed with a concussion by an ED physician. Twelve variables were associated with this ED diagnosis, five of which had an odds ratio (OR) > 1.5: older age (13-17 vs. 5-7 years, OR = 2.9), longer time to presentation (>16 vs. < 16 hours, OR = 2.1), nausea (OR = 1.7), sport mechanism (OR = 1.7), and amnesia (OR = 1.6). In those with physician-diagnosed concussion