

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

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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

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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

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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