

and malrotation with strong performance (C-statistic 0.88) and was named the Calgary Kids' Hand Rule (CKHR). **Methods:** A prospective cohort study was conducted at the Alberta Children's Hospital from April 1 until December 31, 2019. Eligible patients included children 17 years and younger with a radiographically confirmed hand fracture. Both emergency physicians and plastic surgeons completed independent CKHR forms for each new hand fracture. The fracture was predicted as "complex" if any one of the six predictors were present on the form. If none of the six predictors were present, the predicted outcome was "simple". The observed outcome was "complex" if the fracture required surgery, closed reduction, or four or more appointments with a plastic surgeon at three months follow-up. All other fractures were observed outcome "simple". The classification performance of the CKHR was assessed via sensitivity, specificity, and C-statistic. The kappa coefficient for inter-rater reliability between emergency physicians and plastic surgeons was calculated for each predictor. **Results:** To date, 102 pediatric hand fractures have been included in this prospective cohort study. Of the 74 observed simple fractures, 49 were predicted as "simple" and 25 were predicted as "complex". Of the 28 observed "complex" fractures, 25 were predicted as "complex" and 3 were predicted as "simple". These findings correspond to a sensitivity of 89%, specificity of 66%, and a C-statistic of 0.78. Of the 3 observed "complex" fractures that were predicted as "simple", i.e. the 3 false negatives, one was a Seymour fracture of the fourth distal phalanx for which the emergency physician did not tick any boxes on the form. Upon further investigation, we learned that the physician had commented that the fracture was open, thus alluding to their acknowledgement of the predictor "open fracture" as being present). This fracture went on to require surgery. The second false-negative fracture was a non-displaced, intra-articular fracture of the fourth metacarpal head that required multiple appointments with the plastic surgeon. The third false-negative fracture was a non-displaced Salter-Harris II fracture of the thumb proximal phalanx without malrotation that received a closed reduction by the emergency physician. The kappa coefficient for inter-rater reliability between emergency physician and plastic surgeon evaluation of predictors varied by predictor from fair to almost perfect agreement. Condylar involvement had the highest kappa coefficient (kappa = 0.85) followed by malrotation (kappa = 0.65) and dislocation (kappa = 0.64). The predictors with the lowest kappa coefficients were displacement (kappa = 0.42), open fractures (kappa = 0.50), and angulation (kappa = 0.53). **Conclusion:** The Calgary Kids' Hand Rule had a sensitivity of 89% in a prospective cohort of pediatric hand fractures referred to the Alberta Children's Hospital. The sensitivity could likely be improved with knowledge translation and specific education regarding use of the prediction tool. Emergency physicians and plastic surgeons displayed the lowest inter-rater reliability when assessing displacement, open fractures, and angulation. These predictors may represent areas of future research and physician education to delineate and decrease the discordance between emergency physicians and plastic surgeons.

**Keywords:** hand, pediatrics, prediction model

#### P088

##### **Dextrose 50% versus dextrose 10% or dextrose titration for the treatment of out-of-hospital hypoglycemia; a systematic review and meta-analysis**

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**Introduction:** Paramedics commonly administer intravenous dextrose to severely hypoglycemic patients. Typically, the treatment provided is a 25g ampule of 50% dextrose (D50). This dose of D50 is meant to ensure a return to consciousness. However, this dose may be unnecessary and lead to harm or difficulties regulating blood glucose post treatment. We hypothesize that a lower dose such as dextrose 10% (D10) or titrating the D50 to desired level of consciousness may be optimal and avoid adverse events. **Methods:** We systematically searched Medline, Embase, CINAHL and Cochrane Central on June 5th 2019. PRISMA guidelines were followed. The GRADE methods and risk of bias assessments were applied to determine the certainty of the evidence. We included primary literature investigating the use of intravenous dextrose in hypoglycemic diabetic patients presenting to paramedics or the emergency department. Outcomes of interest were related to the safe and effective reversal of symptoms and blood glucose levels (BGL). **Results:** 660 abstracts were screened, 40 full text articles, with eight studies included. Data from three randomized controlled trials and five observational studies were analyzed. A single RCT comparing D10 to D50 was identified. The primary significant finding of the study was an increased post-treatment glycemic profile by 3.2 mmol/L in the D50 group; no other outcomes had significant differences between groups. When comparing pooled data from all the included studies we find higher symptom resolution in the D10 group compared to the D50 group; at 99.8% and 94.9% respectively. However, the mean time to resolution was approximately 4 minutes longer in the D10 group (4.1 minutes (D50) and 8 minutes (D10)). There was more need for subsequent doses in the D10 group at 23.0% versus 16.5% in the D50 group. The post treatment glycemic profile was lower in the D10 group at 5.9 mmol/L versus 8.5 mmol/L in the D50 group. Both treatments had nearly complete resolution of hypoglycemia; 98.7% (D50) and 99.2% (D10). No adverse events were observed in the D10 group (0/871) compared to 12/133 adverse events in the D50 group. **Conclusion:** D10 may be as effective as D50 at resolving symptoms and correcting hypoglycemia. Although the desired effect can take several minutes longer there appear to be fewer adverse events. The post treatment glycemic profile may facilitate less challenging ongoing glucose management by the patients.

**Keywords:** emergency medical services, hypoglycemia, prehospital

#### P089

##### **Reducing preventable patient transfers from long-term care facilities to emergency departments: a scoping review**

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**Introduction:** Emergency Department (ED) crowding is an international health system issue that is worsening. Further, ED crowding and "hallway medicine" has been identified as one of the most significant healthcare challenges currently facing Canadians. One contributor is preventable transfers from long-term care facilities (LTCFs) to Emergency Departments (EDs). In Canada, there were 63,752 LTCF patient transfers to the ED in 2014, with 24% (15,202) of them due to potentially preventable conditions. Each preventable transfer exposes patients to transport and hospital-related complications, and costs the healthcare system thousands of dollars. There have been many proposed and studied interventions aimed at alleviating the issue, but few attempts to assess and evaluate different interventions across institutions in a systematic manner. **Methods:** A scoping review of the literature using three electronic databases was conducted. A scoping

review methodology was used due to the range of interventions and the heterogeneity in study design and outcome. Inclusion criteria included: studies on interventions designed to reduce transfers from LTCFs, studies that reported key outcomes such as number of ED transfers, and studies with a control or comparison group. Articles were screened by two independent reviewers (Cohen's  $k = 0.68$ ), and study quality was assessed using the National Heart, Lung, Blood Institute quality assessment tools. **Results:** Findings were organized into five intervention types (telemedicine, outreach teams, interdisciplinary teams, integrated approaches, and other), and both a tabular and narrative synthesis was completed. Eleven studies had a good quality assessment rating, 13 studies had a fair rating, and two studies had a poor rating. Twenty out of the 26 studies reported statistically significant reductions in ED transfer rate, ranging from 10-70%. Interdisciplinary healthcare teams staffed within LTCFs were the most effective interventions. **Conclusion:** There are several promising interventions that have successfully reduced the number of preventable transfers from LTCFs to EDs, in a variety of health system settings. Further analysis of the relative resource requirements of each intervention, and practices that can enable successful implementation are needed to inform healthcare policy and administrative decision making. Widespread implementation of these interventions has the potential to considerably reduce ED crowding.

**Keywords:** crowding, long-term care facility, preventable transfer

#### P090

##### Validation of a palliative or end of life care case-finding measure in emergency medical services

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**Introduction:** The novel Paramedics Providing Palliative Care at Home program has been developed to address the mismatch between traditional paramedic practice and patient's goals of care. Case-finding is key to estimate potential impact for systems looking to establish such programs, continuous quality improvement once operational, and for prospective identification of patients who might benefit from referral to palliative care. Typical paramedic charting templates do not provide direct identification of these cases. Our objective was to test the validity of a previously derived Palliative Support Composite Measure (PSCM) and two modifications. **Methods:** A priori Gold Standard criteria for determining whether a response was appropriate for a paramedic palliative care approach were identified by expert consensus. Excluding chief complaints and clinical conditions that were universally identified as not appropriate for paramedic palliative support, these criteria were applied by two trained chart abstractors to 500 consecutive charts to classify calls as appropriate for paramedic palliative support, or not. The PSCM and modifications (added criteria call location type and registration in a palliative care program, text mining terms) were applied to the same cohort, and sensitivity, specificity, positive and negative predicative (PPV/NPV) values calculated. **Results:** Of the 500 cases, 21 (4.2%) were classified as appropriate for paramedic palliative support by the Gold Standard ( $\kappa = 0.734$ ). 9 cases with initial disagreement were reviewed with 8 ultimately being deemed to fit the palliative support criteria. The PSCM performed poorly (using the "potential palliative" cut point): sensitivity 71.4% (95%CI: 47.8-88.7), specificity 71.4% (95%CI: 67.1-75.4) and PPV of 9.9% (95%CI: 7.5-12.9) and NPV of 98.3% (95%CI: 96.7-99). The modified PSCM: sensitivity 61.9% (95% CI:

38.4-81.9), specificity 99% (95%CI: 97.6-99.7), PPV 72.2% (95% CI: 50.5-86.9) and NPV 98.3% (95%CI: 97.2-99). A Modified PSCM plus pall\* text term performed similarly: sensitivity 100% (83.9-100), specificity 97.3% (95% CI: 95.4-98.5), PPV 61.8% (95%CI: 48.6-73.4) and NPV 100%. **Conclusion:** A modified PSCM provides moderate sensitivity, specificity and PPV, improved by the text term Pall\* if feasible. This query will be helpful to systems considering a paramedic palliative care program or when one is already operational.

**Keywords:** emergency medical services, palliative, paramedic

#### P091

##### Essential elements to implementing the paramedics providing palliative care at home program: an application of the Consolidated Framework for Implementation Research (CFIR)

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**Introduction:** Providing comfort care support at home without transport to hospital has not traditionally been part of paramedic practice. The innovative Paramedics Providing Palliative Care at Home Program includes a new clinical practice guideline, medications, a database to share goals of care, and palliative care training. This study aimed to determine essential elements for scale and spread of this model of care through the application of an implementation science model, the Consolidated Framework for Implementation Research (CFIR). **Methods:** Deliberative dialogue sessions were held with paramedic, palliative care, primary care, and administrative experts in a province that had the Program (Nova Scotia, March 2018) and one that had not (British Columbia, July 2018). Sessions were audio recorded and transcribed. The CFIR was used as the foundation for a framework analysis, which was conducted by four team members independently. Themes were derived by consensus with the broader research team. **Results:** Inter-sectoral communication between paramedics and other health care providers was key, and challenging due to privacy concerns. Relationships with health care providers are critical to promoting the new model of care to patients, managing expectations, and providing follow up/ongoing care. Training was an essential characteristic of the intervention that can be adapted to suit local needs, although cost is a factor. There were challenges due to the culture and implementation climate as a shift in the mindset of paramedics away from traditional roles is required to implement the model. Paramedic champions can play an important role in shifting the mindset of paramedics towards a new way of practice. **Conclusion:** The CFIR construct of cosmopolitanism, emphasizing the importance of breaking down silos and engaging diverse stakeholders, emerged as one of the most important. This will be helpful for successful scale and spread of the program.

**Keywords:** end of life, palliative, paramedic

#### P092

##### Caregiver perspectives on children's functional outcomes following fracture: a qualitative study

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**Introduction:** Fractures are a common childhood presentation to the emergency department (ED). While ED providers are aware of treating pain, we are less aware of the functional impact of these fractures.