

following each POCUS scan and the post-reduction radiograph. **Results:** There were 131 patients with 132 distal radius fractures. Twelve cases were excluded prior to analysis. There was no significant difference in the assessment scores for reduction success by PoCUS vs. clinical assessment (Median scores 4 vs.4; $p = 0.370$;) or in the odds ratio of successful reduction (0.89; 95% CI 0.46 to 1.72; $p = 0.87$). Significantly fewer cases fell in the uncertain category with POCUS than with clinical assessment (12 vs 2; $p = 0.008$). Repeat reduction was performed in 49 patients (41.2%). In this group, the odds ratio for adequate reduction assessment post-PoCUS to pre-PoCUS was 12.5 (95% CI 3.42 to 45.7; $p < 0.0001$). There was no significant difference in the assessment of reduction by PoCUS vs. radiograph. **Conclusion:** PoCUS guided fracture reduction leads to repeat reduction attempts in approximately 40% of cases, and enhances certainty regarding reduction adequacy when clinical assessment is unclear.

Keywords: point-of-care ultrasound (PoCUS), fracture, reduction

LO063

Adverse events in a pediatric emergency department: a prospective, cohort study

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Introduction: Data regarding adverse events (AEs) (unintended harm to a patient related to health care provided) among children treated in the emergency department (ED) have not been collected despite identification of the setting and population as high risk. The objective of our study was to estimate the risk and type of AEs, as well as their preventability and severity, for children seen in a pediatric ED. **Methods:** This prospective cohort study examined outcomes of patients presenting to a paediatric ED. Research assistants (RA) recruited patients < 18 yrs old during 28 randomized 8-hr shifts (over 1 yr). Exclusion criteria included unavailability for follow-up and insurmountable language barrier. RAs collected demographics, medical history, ED course, and systems level data. A RA administered a structured telephone interview to all patients at day 7, 14, and 21 to identify flagged outcomes (such as repeat ED visits, worsening/new symptoms, etc). Admitted patients' health records were screened with a validated trigger tool. A RA created narrative summaries for patients with flagged outcomes/triggers. Three ED physicians independently reviewed summaries to determine if an AE occurred. Primary outcome was the proportion of patients with an AE within 3 weeks of their ED visit. **Results:** We enrolled 1367 (70.3%) of 1945 eligible patients. Median age was 4.3 yrs (range 2 months-17.95 yrs); 676 (49.5%) were female. Most ($n = 1279$; 93.9%) were discharged. Top entrance complaints were fever ($n = 206$, 15.1%), cough ($n = 135$, 9.9%), and difficulty breathing ($n = 108$, 7.9%). Eight eighty (6.5%) patients were triaged as CTAS 1 or 2, 689 (50.6%) as CTAS 3, and 585 (42.9%) as CTAS 4 or 5. Only 44 (3.2%) were lost to follow-up. Flagged outcomes/triggers were identified for 498 (36.4%) patients. Thirty three (2.4%) patients suffered at least one AE within 3 weeks of ED visit; 30 (90.9%) AEs were related to ED care. Most AEs ($n = 28$; 84.8%) were preventable. Management ($n = 18$, 54.5%) and diagnostic issues ($n = 15$, 45.5%) were the most common AE types. The most frequent clinical consequences were need for medical intervention ($n = 15$; 45.5%) and another ED visit ($n = 13$, 39.4%). In univariate analysis, age ($p = 0.005$) and weekday presentation ($p = 0.02$) were associated with AEs. **Conclusion:** We found a lower risk of AEs than that reported among inpatient paediatric and adult ED studies utilizing similar methodology. A high proportion of AEs were preventable.

Keywords: pediatrics, adverse events, patient safety

LO064

Simulation in Canadian postgraduate emergency medicine training — a national survey

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Introduction: Simulation-based medical education (SBME) is an important training strategy in emergency medicine (EM) postgraduate programs yet the extent of its use is variable. This study sought to characterize the use of simulation in FRCP-EM residency programs across Canada. **Methods:** A national survey was administered to residents (PGY2-5) and program representatives (PR), either a program director or simulation lead at all Canadian FRCP-EM programs. Residents completed either paper or electronic versions of the survey, and PR surveys were conducted by telephone. **Results:** The resident and PR response rates were 60% (187/310) and 100% (16/16), respectively. All residency programs offer both manikin-based high fidelity and task trainer simulation modalities. Residents reported a median of 20 (range 0-150) hours participating in simulation training annually, spending a mean of 16% of time in situ, 55% in hospital-based simulation laboratories, and 29% in off-site locations. Only 52% of residents indicated that the time dedicated to simulation training met their training needs. All PRs reported having a formal simulation curriculum with a frequency of simulation sessions ranging from weekly to every 6 months. Only 3/16 (19%) of programs linked their simulation curriculum to their core teaching. Only 2/16 programs (13%) used simulation for resident assessment, though 15/16 (93%) PRs indicated they would be comfortable with simulation-based assessment. The most common PR identified barriers to administering simulation by were a lack of protected faculty time (75%) and a lack of faculty experience with simulation (56%). Both PRs and residents identified a desire for more simulation training in neonatal resuscitation, pediatric resuscitation, and obstetrical emergencies. Multidisciplinary involvement in simulations was strongly valued by both residents and PRs, with 76% of residents indicating that they would like greater multidisciplinary involvement. **Conclusion:** Among Canadian FRCP-EM residency programs, SBME is a frequently used training modality, however, there exists considerable variability in the structure, frequency and timing of simulation exposure for residents. Several common barriers were identified that impact SBME implementation. The transition to competency-based medical education will require a national, standardized approach to SBME that includes a unified strategy for training and assessment.

Keywords: simulation, education, emergency medicine

LO065

Reduced length of stay and adverse events using Bier block for forearm fracture reduction in the pediatric emergency department

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Introduction: Distal forearm fractures are one of the most common injuries presenting to the pediatric emergency department. Procedural sedation (PS) is commonly used to provide analgesia during fracture reduction, but requires a prolonged recovery period and can be associated with adverse respiratory events. Bier block (BB) regional anesthesia is a safe alternative to PS for fracture reduction analgesia. We sought to assess the impact of BB on length of stay (LOS) and adverse events following forearm fracture reduction compared to PS. **Methods:** We performed a retrospective study of patients aged 6 to 18 years, presenting with forearm fractures requiring closed reduction from June

2012 to March 2014. The primary outcome measure was emergency department LOS; secondary outcomes included reduction success rates, adverse events and unscheduled return visits. **Results:** Two-hundred and seventy-four patients were included for analysis; 109 treated with BB, 165 underwent PS. Overall, mean LOS was 82 min shorter for patients treated in the BB group (279 min vs. 361 min, $p < 0.05$). Sub-analysis revealed a reduced LOS among patients treated with BB for fractures involving a single bone (286 min vs. 388 min, $p < 0.001$) and both-bones of the forearm (259 min vs. 321 min, $p < 0.05$). Both BB and PS resulted in comparable rates of successful reduction (98.2% vs. 97.6%, $p = 0.74$). There were no major adverse events in either group. Patients who received BB experienced significantly fewer minor adverse events (2.7% vs. 14.5%, $p < 0.05$). Return visit rates were similar in the BB and PS groups (17.6% vs. 17.1%, $p < 0.05$). **Conclusion:** Compared to PS, forearm fracture reduction performed with BB was associated with a reduced emergency department LOS and fewer adverse events, with no difference in reduction success or return visits.

Keywords: ketamine, lidocaine, sedation

LO066

H1-antihistamine administration is associated with a lower likelihood of progression to anaphylaxis among emergency department patients with allergic reactions

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Introduction: H1-antihistamines are often used to treat allergic reactions, however, the influence of H1-antihistamines on progression to anaphylaxis remains unclear. Among patients initially presenting with allergic reactions, we investigated whether H1-antihistamines were associated with a lower proportion of patients progressing to anaphylaxis during observation. **Methods:** This was a retrospective cohort study conducted at two urban EDs from 2007 to 2012. We included adult patients with allergy and excluded those who met criteria of anaphylaxis at first evaluation by medical professionals and/or received antihistamines before the evaluation. Primary outcomes of interest were the number of patients who developed anaphylaxis during observation at ED and/or transportation by EMS. Secondary outcomes were the number of biphasic reactions and severe anaphylaxis (defined as sBP < 90 ; SpO₂ $< 92\%$; and/or confusion, collapse, loss of conscious, or incontinence). Logistic regression was performed comparing primary and secondary outcomes between H1-antihistamine treated and non-treated groups with propensity score adjustment of the baseline covariates. Number needed to treat (NNT) was calculated by adjusted absolute risk reduction of H1-antihistamine compared to non H1-antihistamine use on primary outcome. **Results:** This study included 1717 patients with allergic reactions, of whom 1228 were treated with H1-antihistamines. In the H1-antihistamine group 1.0% and 0.2% developed anaphylaxis and severe anaphylaxis, respectively; in the non-H1-antihistamine group 2.6% and 0.6% developed anaphylaxis and severe anaphylaxis, respectively. There were no biphasic reactions (0%, 95% confidence interval [CI] 0 to 0.17%). Administration of H1-antihistamines was associated with a lower incidence of subsequent anaphylaxis (adjusted odds ratio [OR] 0.23, 95% CI 0.10 to 0.53; NNT to benefit 49.1, 95% CI 41.6 to 83.3). There were no significant associations between H1-histamines administration and secondary outcomes. **Conclusion:** Among ED patient with allergic reactions, H1-antihistamine administration was associated with a lower likelihood of progression to anaphylaxis. These findings suggest that H1-antihistamines should be administered early in the care of patients with allergic reactions.

Keywords: anaphylaxis

LO067

Emergency department management of diabetic ketoacidosis and hyperosmolar hyperglycemic state: national survey of attitudes and practice

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Introduction: The 2011 Canadian Diabetes Association (CDA) Clinical Practice Guidelines were developed in order to help physicians manage hyperglycemic emergencies in the emergency department (ED), including diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS). The goal of this study was to determine physician attitudes towards these guidelines and to identify potential barriers to their implementation in the ED. **Methods:** We distributed an online, cross sectional survey to 500 randomly selected members of the Canadian Association of Emergency Physicians (CAEP) who were currently practicing physicians. A total of 3 email notifications were distributed on days 1, 7 and 14. The survey consisted of 23 questions relating to physician management of DKA and HHS in the ED. The primary outcome was overall physician familiarity and usage of the guidelines using a 7-point Likert scale. Secondary outcomes included physician attitudes towards the guidelines as well as any perceived barriers to their implementation in the ED. Simple descriptive statistics were used to illustrate the survey results. **Results:** The survey response rate was 62.2% (311/500) with the following participant characteristics: male (62.6%), CCFP(EM) training (46.1%) and working in major academic centers (50.5%). The overall awareness rate of the CDA guidelines was 22.9% (95% CI = 18.3%, 27.5%). 58.9% (95% CI = 53.3%, 64.3%) reported the CDA guidelines being useful. The most frequently reported barriers to CDA guideline implementation were concerns about education issues (56.0%), lack of time and disruption of flow (23.9%), staffing and human resource issues (26.7%) and poor policy adherence (25.5%). Physician's ideal changes to optimize the management of these patients included improved coordination for follow-up with family physicians (79.9%), increased diabetes education for patients (73.9%) and increased availability to diabetes specialists (47.5%). **Conclusion:** In this study, although Canadian ED physicians were generally supportive of the CDA guidelines, many were unaware that these guidelines existed and barriers to their implementation were reported. Future research should focus on strategies to standardize DKA and HHS management by ensuring physician awareness and education to ensure the highest quality of patient care.

Keywords: clinical guidelines, diabetic ketoacidosis, hyperosmolar hyperglycemic state

LO068

Physician adherence to Antimicrobial Guidelines for Community Acquired Pneumonia in the St. Michael's Hospital Emergency Department

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Introduction: The Toronto Central Local Health Integration Network released new antimicrobial guidelines for the treatment of community acquired pneumonia (CAP) in August 2013. These deemphasized antimicrobial coverage for atypical organisms and use amoxicillin-clavulanic acid (AMC) as first-line for low risk CAP. The purpose of this study was to assess physician adherence to these guidelines in St. Michael's Hospital (SMH) Emergency Department (ED). **Methods:** A retrospective chart review was conducted from April 1 to May 31 in