

versus no concussion, the frequency of persistent symptoms was 62.5% vs. 38.8% ($p < 0.0001$) at one week, 46.3% vs. 25.8% ($p < 0.0001$) at two weeks and 33.0% vs. 23.0% ($p < 0.0001$) at four weeks. **Conclusion:** Most children meeting international criteria for concussion were provided this diagnosis by the ED physician. There were five variables which increased the odds of this diagnosis by at least 1.5-fold. Relative to international criteria, the more selective assignment of concussion by ED physicians was associated with a greater frequency of persistent concussion symptoms. Nevertheless, many patients with alternative diagnoses exhibited persistent concussive symptoms at all time points. Clinicians should therefore weigh the benefits and risks of strictly applying the Zurich/Berlin international criteria versus individual discretion.

Keywords: pediatrics, concussion, diagnosis

LO87

iPad distraction during intravenous cannulation in the pediatric emergency department: a randomized clinical trial

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Introduction: Intravenous (IV) cannulation is commonly performed in emergency departments (ED), often causing substantial pain and distress. Distraction has been shown to reduce child-reported pain, but there is currently little published about the effects of using iPad technology as a distraction tool. Our primary objective was to compare the reduction of pain and distress using iPad distraction (games, movies, books of the child's choice) in addition to standard care, versus standard care alone. **Methods:** This randomized clinical trial, conducted at the Stollery Children's Hospital ED, recruited children between ages 6 to 11 years requiring IV cannulation. Study arm assignment was performed using REDCap randomization feature. Due to the nature of the intervention, blinding was not possible for the children, parents or research and ED staff, but the data analyst was blinded to intervention assignment until completion of analysis. Pain, distress, and parental anxiety were measured using the Faces Pain Scale-Revised, the Observed Scale of Behavioural Distress-Revised, and the State Trait Anxiety Inventory, respectively. The pain scores and observed behavioural distress scores were compared using the Mann-Whitney U test. Other co-variables were analyzed using a linear regression analysis. **Results:** A total of 85 children were enrolled, with 42 receiving iPad distraction and 43 standard care, of which 40 (95%) and 35 (81%) children received topical anesthesia, respectively ($p = 0.09$). There were 40 girls (47.1%) with a mean age of 8.32 ± 1.61 years. The pain scores during IV cannulation ($p = 0.35$) and the change in pain score during the procedure compared to baseline ($p = 0.79$) were not significantly different between the groups, nor were the observed distress scores during IV cannulation ($p = 0.09$), or the change in observed distress during the procedure compared to baseline ($p = 0.44$). A regression analysis showed children in both groups had greater total behavioural stress if it was their first ED visit ($p = 0.01$), had prior hospitalization experience ($p = 0.04$) or were admitted to hospital during this visit ($p = 0.007$). A previous ED visit, however, was predictive of a greater increase in parental anxiety from baseline ($p = 0.02$). When parents were asked whether they would use the same methods to manage pain for their child, parents of the iPad group were more likely to say yes than were parents of the standard care group ($p = 0.03$). **Conclusion:** iPad distraction during IV cannulation in school-aged children was not found to decrease pain or distress more than standard care alone, but parents preferred its use. The effects of iPad distraction may have been over-shadowed by potent topical anesthetic effect. Future directions include exploring iPad distraction for other age

groups, and studying novel technology such as virtual reality and interactive humanoid robots.

Keywords: pain, digital technology, distress

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Bronchiolitis management in Calgary emergency departments

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Introduction: Bronchiolitis is a viral respiratory infection and the most common reason for hospitalization of infants. Despite evidence that few interventions are beneficial in patients with bronchiolitis, other studies would have shown that a significant proportion of patients undergo various forms of low value care. This objective of this project was to 1. establish baseline management of bronchiolitis in the Calgary Zone, and 2. deliver audit and feedback (A&F) reports to pediatric emergency physicians (PEP) to identify opportunities and strategies for practice improvement. **Methods:** This retrospective cohort study included all patients 12 months old that presented to a Calgary emergency department or urgent care center with a diagnosis of bronchiolitis from April 1, 2013 to March 31, 2017. Using data from various electronic health data sources, we captured age, vital signs, CTAS, common therapeutic interventions (bronchodilators, steroids, antibiotics) and investigations (chest x-ray (CXR), viral studies, antibiotics). Results were stratified by site and by admission status. Descriptive statistics were used to report baseline characteristics and interventions. Interhospital ranges (IHR) were provided to compare different hospitals in the zone. For the A&F component of the project, consenting PEP received a report of both their individual and peer comparator data and an in-person multi-disciplinary facilitated feedback session. **Results:** We included 4023 patients from all 6 sites (range from 28 to 3316 patients). Admission rates were 21.7% (IHR 0-29%). Mean age was 5.4 months old. Bronchodilator use was 27.0% (IHR 21-41%). 22.0% of patients received a CXR (IHR 0-57%) and 30.3% had viral studies done (IHR range 0.8-33%). PEP had higher usage of viral studies (30% vs. 5.7%), whereas non-PEP had higher CXR usage (46.2% vs. 23.4%). 41 of 66 PEP consented to receive their individual A&F reports (62%). In the facilitated feedback session PEP 1. identified two areas (bronchodilators and viral studies) where improvements could be made and 2. discussed specific strategies to decrease practice variation and minimize low value care including development of a multi-disciplinary care pathway, alignment with in-patient management, education and repeated A&F reports. **Conclusion:** Significant variability exists in management of patients with bronchiolitis across different hospitals in our zone. A facilitated feedback session identified areas for improvement and multi-disciplinary strategies to reduce low value care for patients with bronchiolitis. Future phases of this project include repeated data in 6 months and implementation of a provincial care pathway for the management of bronchiolitis.

Keywords: bronchiolitis, low value care, audit and feedback

LO89

The effectiveness of video discharge instructions for acute otitis media in children: a randomized controlled trial

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Introduction: In children, acute otitis media (AOM) pain is undertreated. We sought to determine if video discharge instructions were

associated with improved symptomatology, functional outcomes, and knowledge compared to a paper handout. **Methods:** We conducted a randomized controlled superiority trial comparing video discharge instructions (Easy Sketch Pro3™) on management of pain to a paper handout detailing the same. We included caregivers of children 6 months to 5 years presenting to the emergency department (ED) with a clinical diagnosis of AOM. The primary outcome was symptomatology using the Acute Otitis Media Severity of Symptom (AOM-SOS) score between 48 and 72 hours. The 7-item self-report AOM-SOS is scored from 0 to 13 with a higher score indicating more symptomatology. Secondary outcomes included knowledge gain using a 10-item survey, days of daycare/school/work missed, and recidivism. Assuming a minimal clinically important AOM-SOS difference of 2, 90% power, and 5% alpha, 60 individuals/group was needed. **Results:** 219 caregivers were randomized and 149 completed the 72-hour follow-up (72 paper and 77 video). The median (IQR) AOM-SOS score in the video group (adjusted for pre-intervention AOM-SOS, analgesic and antibiotic use) was significantly lower than paper [8 (7,11) versus 10 (7,13), respectively, $p=0.004$]. There were no significant differences between video and paper in the mean (SD) knowledge score [9.2 (1.3) versus 8.8 (1.8) correct answers, respectively, $p=0.07$], mean (SD) number that returned to a health provider [8/77 versus 10/72, respectively, $p=0.49$], mean (SD) number of daycare/schooldays missed [1.2 (1.5) versus 1.1 (2.1), respectively, $p=0.62$], and mean (SD) number of workdays missed by caregiver [0.5 (1) versus 0.8 (2), respectively, $p=0.05$]. **Conclusion:** Video discharge instructions are associated with less symptomatology compared to a paper handout, are effective for caregiver education in the ED, and should be used routinely.

Keywords: otitis media, education, pain

LO90

Epidemiologic trends in substance and opioid misuse in Alberta: a cross-sectional, time-series analysis

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Introduction: Substance and opioid misuse are growing public health concerns in Canada. Substance use disorders affect 21.6% of Canadians and accounted for \$267 million in healthcare costs in 2011. Opioid misuse is a current public health crisis. The extent of the rise in substance and opioid misuse-related Emergency Department (ED) visits in Canada and the demographic groups in which the rise is concentrated have not been elaborated. Alberta has one of the most complete provincial ED visit records and provides an important understanding of national trends. The objective of this study was to evaluate trends in substance and opioid misuse-related ED visits in Alberta from 2010/11 to 2014/5 within demographic cross-sections of the population using administrative ED visit data from the National Ambulatory Care Reporting System (NACRS). **Methods:** All visits made by adult patients (18 years old) to any of more than 100 Albertan EDs for a substance misuse-related presentation between 2010/11 and 2014/15 were analyzed. Visits were classified as being related to substance or opioid misuse if the primary and/or secondary visit diagnoses were among an a priori determined group of ICD-10 codes. Annual substance misuse-related visits were compared as visits per 100,000 adult population in Alberta to standardize for population growth. Linear regression was used to assess whether ED visits increased significantly over time. A cross-sectional time-series analysis was employed to

examine trends within subgroups defined by sex and age categories (18-29, 30-39, 40-49, 50-59, and 60 years) over a 60-month period. **Results:** 149,719 substance misuse-related visits were made by 65,089 patients and 8768 opioid misuse-related visits were made by 5763 patients. From 2010/11 to 2014/15, substance misuse-related ED visits in Alberta increased by 38% from 811 to 1,119 visits per 100,000 population. Opioid misuse-related ED visits increased significantly (64%) from 44 to 72 per 100,000 population. Conversely, total ED visits per 100,000 population did not increase significantly. Substance and opioid misuse-related visits rose more in non-rural than rural areas. Cross-sectional time-series analysis showed that the greatest increase in substance and opioid misuse-related ED visits occurred in males and in the 18-29 year age category, in which visit increases for opioid misuse appeared exponential. **Conclusion:** Substance and opioid misuse-related ED visits increased significantly from 2010/11 to 2014/15 in Alberta, with the most dramatic increases occurring in young patients and males. These findings have important implications for targeting urgent preventative public health interventions to stem the rise of this epidemic.

Keywords: substance-related disorders, opioid-related disorders, public health

LO91

Relationship between pain, opioid treatment, and delirium in emergency department elderly patients

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Introduction: Emergency department (ED) stay and its associated conditions (immobility, inadequate hydration and nutrition, lack of stimulation) favor the development of delirium in vulnerable elderly patients. Poorly controlled pain, and paradoxically opioid pain treatment, has also been identified as a trigger for delirium. The aim of this study was to assess the relationship between pain, opioid treatment, and delirium in elderly ED patients. **Methods:** A multicenter prospective cohort study was conducted in four hospitals across the province of Québec (Canada). Patients aged 65 years old, waiting for care unit admission between February and May 2016, who were non-delirious upon ED arrival, independent or semi-independent for their activities of daily living, and had an ED stay of at least 8 hours were included. Delirium assessments were made twice a day for their entire ED stay and for the first 24 hours in the hospital ward using the Confusion Assessment Method (CAM). Pain intensity was evaluated using a visual analog scale (0-100) during the initial interview, and all opioid treatments were documented. **Results:** A total of 338 patients were included; 51% were female, mean age was 77 years (SD: 8). Forty-one patients (12%) experienced delirium during their hospital stay occurring within a mean delay of 47 hours (SD: 19) after ED admission. Among patients with pain intensity 60, 22% experienced delirium compared to 10.7% for patients with pain <60 ($p<0.05$). No significant association was found between opioid consumption and delirium ($p=0.22$). Logistic regression controlling for age, sex, ED stay duration, and opioids intake showed that patients with pain intensity 60 are 2.6 (95% CI: 1.2-5.9) more likely to develop delirium than patients who had pain <60. **Conclusion:** Severe pain, not opioids, is associated with the development of delirium during ED stay. Adequate pain control during the hospital stay may contribute to the decrease of delirium episodes.

Keywords: delirium, opioids, pain