

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

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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 REDCaps 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

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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