## LO49

### Digital technology distraction for acute pain in children: a meta-analysis

M. Gates, PhD, L. Hartling, PhD, J. Shulhan-Kilroy, MSc, T. MacGregor, MA, S. Guitard, MSc, A. Wingert, MPH, R. Featherstone, MLIS, B. Vandermeer, MSc, N. Poonai, MD, MSc, J. Kircher, MD, S. Perry, MN, T. Graham, MD, MSc, S. Scott, PhD, S. Ali, MD CM, University of Alberta, Edmonton, AB

**Introduction:** Digital distraction is being integrated into pediatric pain care, but its efficacy is currently unknown. We conducted a systematic review to determine the effect of digital technology distraction on pain and distress for children experiencing acutely painful conditions or medical procedures. **Methods:** We searched eight online databases (MEDLINE, Embase, Cochrane Library, CINAHL, PsycINFO, IEEE Xplore, Ei Compendex, Web of Science), grey literature sources, scanned reference lists, and contacted experts for quantitative studies where digital technologies were used as distraction for acutely painful conditions or procedures in children. Study selection was performed by two independent reviewers with consensus. One reviewer extracted relevant study data and another verified it for accuracy. Appraisal of risk of bias within studies and the certainty of the body of evidence were performed independently in duplicate, with the final appraisal determined by consensus. The primary outcomes of interest were child pain and distress. **Results:** Of 3247 unique records identified by the search, we included 106 studies (n = 7820) that reported on digital technology distractors (e.g., virtual reality; videogames) used during common procedures (e.g., venipuncture, minor dental procedures, burn treatments). We located no studies reporting on painful conditions. For painful procedures, digital distraction resulted in a modest but clinically important reduction in self-reported pain (SMD -0.48, 95% CI -0.66 to -0.29, 46 RCTs, n = 3200), observer-reported pain (SMD -0.68, 95% CI -0.91 to -0.45, 17 RCTs, n = 1199), behavioural pain (SMD -0.57, 95% CI -0.94 to -0.19, 19 RCTs, n = 1173), self-reported distress (SMD -0.49, 95% CI -0.70 to -0.27, 19 RCTs, n = 1818), observer-reported distress (SMD -0.47, 95% CI -0.77 to -0.17, 10 RCTs, n = 826), and behavioural distress (SMD -0.35, 95% CI -0.59 to -0.12, 17 RCTs, n = 1264) compared to usual care. Few studies directly compared different distractors or provided subgroup data to inform applicability. **Conclusion:** Digital distraction provides modest pain and distress reduction for children undergoing painful procedures; its superiority over non-digital distractors is not established. Healthcare providers and parents should strongly consider using distractions as a pain-reduction strategy for children and teens during common painful procedures (e.g., needle pokes, dental fillings). Context, child preference, and availability should inform the choice of distractor.

**Keywords:** digital technology, distraction, pain

## LO50

### Pain free laceration repairs using intra-nasal ketamine: DosINK 2 clinical trial

S. Rached-Dastous, MD, E. D. Trottier, MD, Y. Finkelstein, BSc, MD, B. Bailey, BSc, MD, MSc, C. Marquis, MSc, BPharm, D. Lebel, MSc, M. Desjardins, MD, SickKids Hospital, Toronto, ON

**Introduction:** Lacerations are common in children presenting to the emergency department (ED). They are often uncooperative when sutures are needed and may require procedural sedation. Few studies have evaluated intranasal (IN) ketamine for procedural sedation in children, with doses from 3 to 9 mg/kg used mostly for dental procedures. In a previous dose escalation trial, DosINK-1, 6 mg/kg was found to be the optimal IN ketamine dose for procedural sedation for sutures in children. In this trial, we aim to further evaluate the efficacy of this dose. **Methods:** We conducted a multicentre single-arm clinical trial. A convenience sample of 30 uncooperative children between 1 and 12 years (10 to 30 kg) with no cardiac or kidney disease, active respiratory infection, prior administration of opioid or sedative agents received 6 mg/kg of IN ketamine using an atomizer for their laceration repair with sutures in the ED. The primary outcome was defined as the proportion (95% CI) of patients who achieved an adequate procedural sedation evaluated with the PERC/PECARN consensus criteria. **Results:** Thirty patients were recruited from April 2018 to November 2019 in 2 pediatric ED. The median age was 3.2 (interquartile range(IQR), 1.9 to 4.7) years-old with laceration of more than 2 cm in 20 (67%) patients and in the face in 21 (70%) cases. Sedation was effective in 18 out of 30 children 60% (95%CI, 45 to 80), was suboptimal in 6 patients (20%) with a procedure completed with minimal difficulties, and unsuccessful in the remaining 6 (20%), all without serious adverse event. Similarly, 21/30 (70%) physicians were willing to reuse IN ketamine at the same doses and 25 parents (83%) would agree to the same sedation in the future. Median time to return to baseline status was 58 min (IQR, 33 to 73). One patient desaturated during the procedure and required transitory oxygen and repositioning. After the procedure, 1 (3%) patient had headache, 1 (3%) patient had nausea, and 2 (7%) patients vomited. **Conclusion:** A single dose of 6 mg/kg of IN Ketamine for laceration repair with sutures in uncooperative children is safe and facilitated the procedure in 60% (95%CI, 45 to 80) of patients, was suboptimal in 20% and unsuccessful in 20% of patients. As seen with IV ketamine, an available additional dose of IN ketamine for some children if needed could potentially increase proportion of successful sedation. However, the safety and efficacy of repeated doses needs to be addressed.

**Keywords:** intranasal ketamine, pediatrics, procedural sedation

## LO51

### Emergency department use by pregnant women: a population-based study within a universal healthcare system

C. Varner, MD, MSc, A. Park, MSc, D. Little, BSc, J. Ray, MD, MSc, Mount Sinai Hospital - University of Toronto, Toronto, ON

**Introduction:** Emergency Department (ED) utilization during pregnancy may be common, but data specific to universal healthcare systems like Canada are lacking, where pregnancy care is supposed to be standardized. The objective of this study was to quantify and characterize ED utilization among all Ontarian women who had a recognized pregnancy, including by trimester and within 42 days after pregnancy, and further stratified by pregnancy outcome. **Methods:** Utilizing provincial administrative health databases, this retrospective population-based cohort study included all recognized pregnancies in Ontario conceived between April 1, 2002 and March 31, 2017. Peri-pregnancy ED utilization was defined as any ED visit from 0-42 weeks' gestation, or within 42 days after the end of pregnancy. Modified Poisson regression was used to generate relative risks (RR) and 95% confidence intervals (CI) for the outcome of any peri-pregnancy ED utilization in association with maternal characteristics. **Results:** Peri-pregnancy ED utilization occurred among 1,075,991 of 2,728,236 recognized pregnancies (39.4%), including among 35.8% of livebirths, 47.3% of stillbirths, 73.7% of miscarriages, and 84.8% of threatened abortions. There were 22,802 (0.84%) ectopic



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pregnancies among all pregnancies in the cohort. ED utilization peaked in the first trimester and in the first week postpartum. A dose-response effect was seen in the number of peri-pregnancy ED visits in relation to certain maternal characteristics. Women residing in rural areas had an odds ratio (OR) of 3.44 (95% CI 3.39 to 3.49) for ≥ 3 ED visits, compared to those in urban areas. Women with 3-5 (OR 1.99 95% CI 1.97-2.01), 5-6 (OR 3.55, 95% CI 3.49 to 3.61), or ≥ 7 (OR 7.59, 95% CI 7.39 to 7.78) pre-pregnancy comorbidities were more likely to have ≥ 3 peri-pregnancy ED visits than those with 0-2 comorbidities. Of all recognized pregnancies in the cohort, only 106,989 (3.9%) had an injury-related ED visit. **Conclusion:** Peri-pregnancy ED utilization occurs in nearly 40% of pregnancies, notably in the first trimester and immediately postpartum. Efforts are needed to streamline rapid access to ambulatory obstetrical care during these peak periods, when women are vulnerable to either a miscarriage, or a complication after a livebirth.
**Keywords:** early pregnancy complications, obstetrics, pregnancy

**LO52**

**Distraction in the ED using Virtual reality for Intravenous Needs in Children to Improve comfort- DEVINCI - a pilot RCT**

E. D. Trottier, MD, E. Osmanlliu, MD, B. Bailey, MD, M. Lagacé, M. Certain, C. Khadra, M. Sanchez, MD, C. Thériault, D. Paquin, C. Cotes-Turpin, S. Le May, PhD, CHU Sainte Justine, Université de Montréal, Montreal, QC

**Introduction:** Venipuncture is a frequent cause of pain and distress in the pediatric emergency department (ED). Distraction, which can improve patient experience, remains the most studied psychological intervention. Virtual reality (VR) is a method of immersive distraction that can contribute to the multi-modal management of procedural pain and distress. **Methods:** The main objectives of this study were to determine the feasibility and acceptability of Virtual Reality (VR) distraction for pain management associated with venipunctures and to examine its preliminary effects on pain and distress in the pediatric ED. Children 7-17 years requiring a venipuncture in the pediatric ED were recruited. Participants were randomized to either a control group (standard care) or intervention group (standard of care + VR). Principal clinical outcome was the mean level of procedural pain, measured by the verbal numerical rating scale (VNRS). Distress was also measured using the Child Fear Scale (CFS) and the Procedure Behavior Check List (PBCL) and memory of pain using the VNRS. Side effects were documented. **Results:** A total of 63 patients were recruited. Results showed feasibility and acceptability of VR in the PED and overall high satisfaction levels (79% recruitment rate of eligible families, 90% rate of VR game completion, and overall high mean satisfaction levels). There was a significantly higher level of satisfaction among healthcare providers in the intervention group, and 93% of those were willing to use this technology again for the same procedure. Regarding clinical outcomes, no significant difference was observed between groups on procedural pain. Distress evaluated by proxy (10/40 vs 13.2/40, $p = 0.007$) and memory of pain at 24 hours (2.4 vs 4.2, $p = 0.027$) were significantly lower in the VR group. Venipuncture was successful on first attempt in 23/31 patients (74%) in the VR group and 15/30 (50%) patients in the control group ($p = 0.039$). Five of the 31 patients (16%) in the VR group reported side effects **Conclusion:** The addition of VR to standard care is feasible and acceptable for pain and distress management during venipunctures in the pediatric ED. There was no difference in self-reported procedural pain between groups. Levels of procedural distress and memory of pain at 24 hours were lower in the VR group.
**Keywords:** pain management, pediatric, virtual reality

**LO53**

**Emergency department visits for hyperglycemia: through the eyes of the patient**

J. Yan, MD, MSc, D. Azzam, BSc, S. Liu, MD, MSc, T. Spaic, MD, MSc, M. Columbus, PhD, K. Van Aarsen, MSc, L. Shepherd, MD, MHPE, Western University, London Health Sciences Centre, London, ON

**Introduction:** Patients with poorly-controlled diabetes often visit the emergency department (ED) for treatment of hyperglycemia. While previous qualitative studies have examined the patient experience of diabetes as a chronic illness, there are no studies describing patients' perceptions of ED care for hyperglycemia. The objective of this study was to explore the patient experience regarding ED hyperglycemia visits, and to characterize perceived barriers to adequate glycemic control post-discharge. **Methods:** This study was conducted at a tertiary care academic centre in London, Ontario. A qualitative constructivist grounded theory methodology was used to understand the experience of adult patient partners who have had an ED hyperglycemia visit. Patient partners, purposively sampled to capture a breadth of age, sex, disease and presentation frequency were invited to participate in a semi-structured individual interview to probe their experiences. Sampling continued until a theoretical framework representing key experiences and expectations reached sufficiency. Data were collected and analyzed iteratively using a constant comparative approach. **Results:** 22 patients with type 1 or 2 diabetes were interviewed. Participants sought care in the ED over other options because of their concern of having a potentially life-threatening condition, advice from a healthcare provider or family member, or a perceived lack of convenient alternatives to the ED based on time and location. Participants' care expectations centred around symptom relief, glycemic control, reassurance and education, and seeking referral to specialist diabetes care post-discharge. Finally, perceived system barriers that challenged participants' glycemic control included affordability of medical supplies and medications, access to follow-up and, in some cases, the transition from pediatric to adult diabetes care. **Conclusion:** Patients with diabetes utilize the ED for a variety of urgent and emergent hyperglycemic concerns. In addition to providing excellent medical treatment, ED healthcare providers should consider patients' expectations when caring for those presenting with hyperglycemia. Future studies will focus on developing strategies to help patients navigate some of the barriers that exist within our current limited healthcare system, enhance follow-up care, and improve short- and long-term health outcomes.
**Keywords:** diabetes, hyperglycemia, patient experience

**LO54**

**Emergency department prevalence of intracranial aneurysm on computed tomography angiography (EPIC-ACT)**

B. Sheppard, MD, BSc, G. Beller, MD, BA, C. O'Rielly, BS, Charles Wong, MD, BHSc, University of Calgary, Calgary, AB

**Introduction:** Evidence is accumulating that a CT plus a CT angiogram (CTA) of the head and neck may be adequate to rule out subarachnoid haemorrhage (SAH) in patients with a thunderclap



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