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A phase IV real world study on the use of low dose methoxyflurane (PENTHROX™) for the treatment of moderate to severe trauma pain in the Canadian emergency department (ADVANCE-ED): an interim report on secondary outcomes

S. Campbell, MBChB, E. Simard, MD, A. Arcand, MD, HBSc, L. Blagrove, BScN, P. Piraino, PhD, S. Dhani, PhD, Dalhousie University, Halifax, NS

Introduction: Inhaled low dose methoxyflurane (MEOF) was recently approved in Canada for the short-term relief of moderate to severe acute pain associated with trauma or interventional medical procedures in conscious adult patients. ADVANCE-ED is an ongoing phase IV, prospective open label study undertaken to generate real-world evidence to complement the global clinical development program through evaluation of the effectiveness of low dose MEOF in Canadian emergency departments (EDs). **Methods:** This multicentre study is enrolling adult (≥18 yrs) patients with moderate to severe acute pain (NRS0-10 ≥ 4) associated with minor trauma. To address limitations from the pivotal study, this study allows patients who were excluded in the pivotal trials: namely, those with severe (≥7) pain, and those using OTC or stably dosed analgesics for other conditions, including chronic pain. Eligible patients receive a single treatment of up to 2 x 3 mL MEOF (2nd 3 mL to be provided only upon request), self-administered by the patient under medical supervision. Rescue medication is permitted at any time, if required. **Results:** Here we describe the patient demographics and treatment satisfaction (Global Medication Performance, GMP) at 50% enrolment (n = 49). Mean (SD) patient age is 48.0 (17.1) yrs and 55.1% are female. Mean pain (SD) reported at enrolment is 8.3 (1.5), with 73.4% of patients with NRS0-10 ≥ 8. Injuries are overwhelmingly limb trauma (87.8%). The most common type is sprain/strain (40.8%), followed by fracture (32.7%). At 5 minutes post-start of administration (STA) of MEOF, 80.4% of patients reported pain relief; this increased to 91.3% at 15 minutes, and 100% of patients reported pain relief by 30 minutes post-STA. GMP was assessed as "good", "very good" or "excellent" by ≥80% of patients both 20 minutes post-start of administration (STA) of MEOF (83.3%) and at discharge (85.8%). When asked to what extent their expectation of pain relief had been met, 32.7% responded good, 26.5% responded "very good" and 22.4% responded "excellent". Three quarters of enrolled patients (75.5%) did not require rescue medication. The most common (≥5%) treatment-related adverse events were dizziness (n = 14, 28.6%) and euphoric mood (n = 4, 8.2%). No serious adverse events have been reported. **Conclusion:** Based on 50% of the patients enrolled in this prospective, open label study, responses to inhaled low-dose MEOF are within expectation for both effectiveness and tolerability.

Keywords: low-dose methoxyflurane, real-world evidence, trauma

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Feasibility of self-assessing functional status in older emergency department patients

V. Boucher, MSc, V. Boucher, MSc, M. Lamontagne, PhD, J. Lee, MD, MSc, M. Émond, MD, MSc, CHU de Québec-Université Laval, Quebec, QC

Introduction: Geriatric Emergency Department (ED) guidelines recommend systematic screening of older patients for geriatric syndromes. However, compliance issues to this recommendation have already been observed. Self-assessment tools could be an interesting solution as self-assessed general, mental and physical health was shown to be predictive of functional decline and mortality. The Older Americans Resources and Services scale (OARS), is a simple geriatric functional assessment scale that is widely used by professionals to quantify patients' ability to perform activities of daily living (ADL) and instrumental activities of daily living (IADL). However, its use as a self-assessment tool has never been tested. Objective: to evaluate the feasibility of the self-assessed OARS compared to its standard administration by a research assistant (RA) in older ED patients. **Methods:** A planned sub-analysis of a single center randomized cross-over pilot study in 2018 was realized. Patients aged ≥65 who consulted to the ED for any medical reason were included. Patients were excluded if they: 1) required resuscitation (CTAS 1); 2) were unable to consent/to speak French; 3) had a physical condition preventing the use of an electronic tablet. Patients were randomized 1:1 to either 1) tablet-based functional status self-assessment or 2) the RAs questionnaire administration at first, after which they crossed-over to the other assessment method. Paired t-tests were used to assess the score differences. **Results:** 60 patients were included. Mean age was 74.4 ± 7.6 and 34 (56.7%) participants were women. Mean OARS score according to RA was 25.1 ± 3.3 and mean self-assessed OARS score was 26.4 ± 2.5 ($p < 0.0001$). There was also differences when looking at the AVQ and AIVQ separately. Mean AVQ scores were 12.5 ± 1.8 and 13.5 ± 0.9 ($p < 0.0001$) and mean AIVQ scores were 12.6 ± 1.8 and 12.9 ± 1.8 ($p = 0.04$) for RA assessment and self-assessment, respectively. **Conclusion:** Our results show a statistically significant difference between RA assessment and patient self-assessment of functional status, and this difference seems to be more pronounced regarding AVQ than AIVQ. The study confirms that self-assessment of functional status by older ED patients is feasible, but further testing is required in order to confirm the validity and psychometric values of this self-administered version of the OARS.

Keywords: emergency department, functional status, self-assessment

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Practice patterns of emergency department physicians administering naloxone for patients with suspected opioid overdose

M. Blaszak, BSc, MD, S. Chilton, BSc, MD, K. Van Aarsen, MSc, J. Yan, MD, MSc, S. Detombe, PhD, S. Knezevic, BSc, M. Riggan, BSc, MD, Schulich School of Medicine and Dentistry, Western University, London, ON

Introduction: Naloxone is recommended for reversing opioid-associated respiratory depression. There is wide variability in emergency department (ED) practice patterns regarding naloxone use, dosing, and observation time post-administration. This study describes the naloxone practice patterns of ED physicians managing suspected opioid overdose patients. **Methods:** A retrospective chart review was conducted of adult patients (≥ 18 years) presenting to an academic tertiary care centre (consisting of two EDs with an annual census 150,000 visits) in 2017 with suspected opioid overdose who were administered naloxone in the ED. Patients were identified electronically and the following information was abstracted from patient charts: demographics, naloxone dosage and infusion initiation, disposition data, indications for naloxone administration, response to therapy, and adverse effects. Variability in initial and total dose was examined. Initial dose was also compared in those with cardiorespiratory compromise (CPR given, respiratory rate < 8, or desaturation below 89%) using independent samples median tests. Data was

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analyzed using standard descriptive statistics. **Results:** 113 patients met inclusion criteria. Indications for naloxone administration were: level of consciousness (50.5%), respiratory depression (4.0%), miosis (1.0%), a combination of factors (19.8%), or undocumented (24.8%). Median initial dose was 0.40 mg (IQR: 0.20-0.40 mg). Median total naloxone administered in the ED was 0.48 mg (IQR: 0.35-1.2 mg). The initial dose resulted in a response in 43.1% of patients, with 36.0% of responding patients later experiencing subsequent respiratory depression. 31% of patients received a naloxone infusion. Initial dose in patients with cardiopulmonary compromise was significantly different only comparing patients who received CPR versus those who did not (median 0.40 mg; IQR: 0.20-0.80 mg; P = 0.019). Four patients experienced emesis following naloxone. Median length of ED stay was 7.0 hours (IQR: 4.0-9.5 hours), and median hospital length of stay was 3.0 days (IQR: 1.0-5.0 days). Median ED observation time prior to discharge was 4.0 hours (IQR: 2.0-8.0 hours). Ultimate disposition home, to the ward, or to the intensive care unit was 47.1%, 42.2%, and 9.8% respectively (1.0% deceased). **Conclusion:** The dose and usage of naloxone by ED physicians in this study is variable. Further prospective studies are needed to determine the effective naloxone dosing strategy.
Keywords: naloxone, opioid, overdose

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Optimizing a physician surge protocol to address emergency department wait times during times of increased patient demand

T. Bhate, BSc, MD, MHSc, S. Dowling, BA, MD, N. Collins, MD, University of Calgary, Calgary, AB

Background: Emergency Department overcrowding remains a significant problem. Interventions have often focused on areas external to the ED, with patient flow in the ED receiving less attention. Efforts to address ED flow are complicated by daily fluctuations in patient volume and acuity. Our local protocol brings in additional physicians when internal metrics indicate patient demand can't be met by current physician resources (a 'surge' period). However, anecdotal evidence suggests a lack of satisfaction and efficacy. We therefore undertook a project to improve our local management of these surge periods. **Aim Statement:** To improve the effectiveness of an ED Physician Surge Protocol to allow for a physician scheduling strategy that is reflective of the needs of the ED. **Measures & Design:** This project consists of 3 phases. Phase 1 was an analysis of current surge metrics (including frequency, temporal patterns and physician response), with concurrent literature search to identify any best practices or easily addressable protocol changes, with first planned PDSA cycle. Phase 2 is a mixed methods survey of local staff to identify barriers and enablers of our current protocol, concurrent with a national survey of current practices. Phase 3 will be the implementation of a revised protocol, followed by a second mixed methods survey and analysis of metrics of interest. **Evaluation/Results:** Analysis of surge data (Oct 2018-Oct 2019) demonstrated a high volume of surges per month (78.7 +/- 10.9), highest at Foothills Medical Centre (94.3). Across all sites, afternoon periods had highest frequency of surges (absolute peak 1400 - 1500) with a secondary peak 2200–2300, both peaks occurring most frequently on weekends (Fri-Sun) However, physician response to surge calls was < 10% (5.8-9.1%), with no discernable temporal pattern, even accounting for the significant number of automatic surge calls cancelled by clinicians. Analysis of data, in addition to literature review and engagement with senior administration suggested no immediate protocol changes, therefore project moved to 2nd phase. This phase is currently in progress, with planned analysis using Pareto Chart methodology. **Discussion/Impact:** Our initial data clearly demonstrates that current procedures are inadequate to address this ongoing issue, with no readily apparent solutions. Analysis of local barriers and enablers is currently underway, in addition to a national survey, with the results expected to inform an extensive redesign of current procedures.
Keywords: emergency department flow, emergency department staffing, quality improvement and patient safety

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A novel addictions curriculum for emergency medicine residents

B. Bérczi, BMBS, BComm, K. Chan, MD, BEng, McMaster University, Hamilton, ON

Innovation Concept: In the era of the current opioid crisis, addiction medicine is becoming a core competency of patient care. Despite the prevalence of addiction-related presentations, there is a paucity of formal education on the topic in emergency medicine; with time and lack of qualified staff cited as barriers to implementation. We aimed to correct this gap in education through the curriculum design of an addictions elective that can be easily implemented by Emergency Medicine Program Directors across Canada. **Methods:** Learning objectives were developed based on expert consensus and the list of entrustable professional activities (EPAs) mandated by the Royal College. A local needs assessment was conducted to identify existing addictions curriculum and identify opportunities for improvement. **Curriculum, Tool, or Material:** A one-month block addictions selective was developed specifically for emergency medicine residents. Elements of this curriculum included a suggested schedule, a list of supplemental resources, and an evaluation tool to track EPAs. A pre and post survey was created for distribution to all participants to track knowledge acquisition and to collect feedback on the education intervention. In the 2019-2020 academic year, 4 residents participated in this selective and multiple have expressed interest for the future. **Conclusion:** In Ontario alone, the rate of opioid-related deaths has quadrupled and has escalated to a rate of 2 deaths every day. Alcohol and other substance use is commonly a chief concern, catalyst, or comorbidity for patient presentations in the emergency department. Our selective curriculum seeks to address a gap for emergency medicine residents. Ongoing program evaluation will take place to continue to optimize this learning experience.
Keywords: addictions, innovations in education, opioids

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Orthopedic procedural videos as teaching tools in emergency medicine

N. Bazaracai, MD, BASc, J. Dong, BSc, MD, McMaster University, Hamilton, ON

Innovation Concept: Video has been proven to be an effective educational tool that is valued by learners and objectively improves knowledge and testing scores. It can simplify complex concepts and is more efficient and effective than audio or reading in tests of 3-day material recall. Our objective in this project was to develop a series of instructional videos geared towards emergency and family physicians on proper application of casts and splints in the emergency department. **Methods:** We created two procedural videos, each 5-6 minutes long. They each reviewed the process, indications, and precise steps for application for each of two splints: the ulnar gutter and the thumb spica. After finalizing the videos, we created a survey

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