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State of the evidence for emergency medical services (EMS) provision of palliative care: an analysis of appraised research from the Canadian Prehospital Evidence-based Practice (PEP) Project

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Introduction: Patients who require end of life (EoL)/palliative care occasionally need assistance from paramedics. This review evaluated the evidence for paramedic-delivered EoL/palliative care interventions. **Methods:** The Canadian Prehospital Evidence-based Practice (PEP) Project methodology was used. A PubMed search was conducted, using Medical Subject headings and title/abstract key words. Titles and abstracts were reviewed for relevance. Studies were not required to be EMS based but must have focused on interventions available to EMS personnel. Included full text studies were scored by trained primary appraisers on a three-point Level of Evidence (LOE) scale (high = 1, moderate = 2 and low = 3) and three-point Direction of Evidence (DOE) scale (supportive, neutral, or opposing). Studies were categorized by clinical condition (n = 5) and by intervention (n = 25), and plotted on 3×3 (DOE × LOE) tables. The study primary outcome and setting were determined. **Results:** The search returned 3255 articles; 86 were selected for abstract review; with 30 full text articles ultimately included. Intervention recommendations were: LOE 1-supportive (n = 3, 12%), 2-supportive (n = 2, 8%), 3-supportive (n = 2, 8%), 1-neutral (n = 2, 8%), 2-neutral (n = 2, 8%), 3-neutral (n = 4, 16%). No primary studies were identified for 10 (40%) interventions. Conditions with 1-supportive studies were: 'breathlessness' and 'analgesia'. 'Secretions' condition had no relevant evidence. Interventions with 1-supportive evidence were: Haldol for agitation (n = 1), fentanyl and morphine for analgesia (n = 3 and n = 1), narcotics for breathlessness (n = 1). No intervention had opposing evidence. Primary outcomes were more commonly related to symptom relief (n = 26, 87%), safety (n = 3, 10%), or tolerability (n = 1, 3%). Only one included study was conducted in the EMS setting. **Conclusion:** Evidence for interventions used by paramedics in the treatment of patients requiring EoL/palliative care was identified, as were evidence gaps. Little research was conducted in the EMS setting, and most interventions had few studies. These PEP findings highlight topics requiring high quality EMS research specific to EoL/palliative care to inform this growing aspect of paramedic practice.

Keywords: palliative care, emergency medical services (EMS), end-of-life care

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The state of the evidence for emergency medical services (EMS) care of blunt spinal trauma: an analysis of appraised research from the Canadian Prehospital Evidence-based Practice (PEP) Project

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Introduction: The Canadian Prehospital Evidence-based Practice (PEP) project is an online, freely accessible, continuously updated EMS evidence repository. The summary of research evidence for EMS interventions used to care for blunt spinal trauma is described. **Methods:** PubMed was systematically searched. One author reviewed titles and abstracts for relevance. Included studies were scored by trained appraisers on a three-point Level of Evidence (LOE) scale (based on study design and quality) and three-point Direction of Evidence (DOE) scale (supportive, neutral, or opposing results). Second party appraisal was conducted for included studies. Interventions were plotted on a 3x3 table (DOE × LOE) for the spinal injury condition based on appraisal scores. The primary outcome was identified for each study and categorized. **Results:** Seventy-seven studies were included. Evidence for adult and paediatric blunt spinal trauma interventions was: supportive-high quality (n = 1, 7 %), supportive-moderate quality (n = 3, 21.4%), supportive-low quality (n = 1, 7%), neutral-high quality (n = 1, 7%), neutral-moderate quality (n = 5, 35.7%), neutral-low quality (n = 1, 7%), opposing-high quality (n = 0, 0%), opposing-moderate quality (n = 0, 0%), opposing-low quality (n = 1, 7%). One (7%) intervention had no evidence. Interventions with supportive evidence were: steroids, cervical-spine clearance, scoop stretcher, self-extrication and "leaving helmet in place". The evidence weakly opposed use of short extrication devices. Leading study primary outcomes were spinal motion, diagnostic accuracy, and pressure/discomfort. **Conclusion:** EMS blunt spinal trauma interventions are informed by moderate quality supportive and neutral evidence. Future research should focus on high quality studies filling identified evidence gaps using patient-oriented outcomes to best inform EMS care of blunt spinal injury.

Keywords: spinal trauma, emergency medical services (EMS), immobilization

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Performance of a national simulation-based resuscitation OSCE for emergency medicine trainees

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Introduction: The use of high-fidelity simulation is emerging as an effective method for competency-based assessment in postgraduate medical education. We have previously reported the development of the Queen's Simulation Assessment Tool (QSAT), for use in simulation-based Objective Structured Clinical Examinations (OSCEs) for Emergency Medicine (EM) trainees. We aimed to demonstrate the feasibility and present an argument for the validity of a simulation-based OSCE utilizing the QSAT with EM residents from multiple Canadian training sites. **Methods:** EM post-graduate trainees (PGY 2-5) from 9 Canadian EM training programs participated in an 8-station simulation-based resuscitation OSCE at Queen's University in Kingston, ON. Each station was scored by a single trained rater from a group of 9 expert Canadian EM physicians. Raters utilized a station-specific QSAT and provided an Entrustment Score. A post-examination questionnaire was administered to the trainees to quantify perceived realism, comfort and educational impact. Statistical analyses included analysis of variance to measure the discriminatory capabilities and a generalizability study to examine the sources of variability in the scores. **Results:** EM postgraduate trainees (N = 36) participated in the study. Discriminatory validity was strong, with senior trainees (PGY4-5) outperforming junior trainees (PGY2-3) in 6 of 8 scenarios and in aggregated QSAT and Entrustment Scores across all 8 stations ($p < 0.01$). Generalizability studies found the largest sources of random variability was due to the trainee by station interaction and the error term, with a G coefficient of 0.84. Resident trainees reported reasonable comfort being assessed in the simulation environment (3.6/5), indicated significant perceived realism (4.1/5), and found the OSCE valuable to their learning (4.8/5). **Conclusion:** Overall, this study demonstrates that a large-scale simulation-based EM resuscitation OSCE is feasible, and an argument has been presented for the validity of such an examination. The incorporation of simulation or a simulation-based OSCE in the national certification process in EM may help to satisfy the increased demand for

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competency-based assessment required by the Royal College of Physicians & Surgeons of Canada's Competency by Design transition.
Keywords: simulation, objective structured clinical examination (OSCE), competency

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Improving patient safety and streamlining care at a community hospital through spread and scale of a trauma care bundle: a quality improvement pilot project

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Introduction: Non-trauma centers (NTC) and community hospitals commonly deliver medical care during the "golden hour" of trauma, which has significant implications on the health outcomes of patients. The Niagara Health System (NHS) and its 3 community NTC hospitals provide trauma care to over 100 patients annually during this critical period. NTCs lack standardized resources commonly found in trauma centers. Checklists and bundles have been effective in streamlining process to ensure health care providers provide the right care, at the right time and address critical points during patient care. A trauma care bundle was designed and implemented in the NHS as a means to improve trauma care and patient outcomes. **Methods:** A quality improvement (QI) approach was used to design, implement and evaluate a trauma care bundle at one of the NHS's community hospitals. These interventions were adapted and modified for community trauma care purposes. We piloted the trauma care bundle using rapid cycle improvements, known as Plan-Do-Study-Act (PDSA) cycles. We assessed outcome and process measures through a chart audit of all trauma care patients in the NHS from July 2015-December 2015. A safety attitudes questionnaire (SAQ) was administered to health system staff who were involved in the pilot to assess balancing measures. **Results:** Improvements to the bundle and its implementation from 4 PDSA cycles resulted in increased utilization. This continuous monitoring of the bundle and ongoing, conscious efforts to improve the intervention were used to spread and scale across all 3 sites of the NHS. 30% of patients received the trauma care bundle during phase 1 of the pilot from July 1- October 31, 2015. We are presently analyzing preliminary data to understand how the trauma care bundle impacts health outcomes and process and will present a comparative analysis between patient groups. **Conclusion:** Trauma care bundles may foster safer and more efficient patient care in community hospitals where the golden hour of trauma often occurs. This community trauma care bundle shows promising results for streamlining the care process to ensure patients receive appropriate care during the golden hour. Spread and scale of this bundle across other community hospitals will likely yield similar improvements in patient care.
Keywords: quality improvement, patient safety, trauma

P059

"Rate and See" – a pilot evaluation of a short duration atrial fibrillation pathway linking the emergency department to specialty care

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Introduction: Rapid atrial fibrillation (AF) and flutter remains a common cause of emergency department (ED) visits. Canadian guidelines recommend a rhythm control strategy for patients presenting to ED within 48 hours of arrhythmia onset or who are anticoagulated. However, up to 70% of patients spontaneously convert within 24 hours, mitigating the need for urgent cardioversion. Moreover, education, risk stratification, appropriate anticoagulation, and follow-up may be challenging in the ED setting. Therefore, direct and rapid linkage to an AF clinic was proposed to address these gaps in care. **Methods:** A pilot evaluation of a "Short Duration AF Pathway" was performed at Kelowna General Hospital, B.C., from June 2014 to Feb 2015. This care pathway–consisting of a treatment algorithm, ED order set, and referral process–was applied to patients with AF $\leq$ 48 hours or those who were anticoagulated. Patients received initial rate control medication in the ED and were referred for reassessment in a collaborative cardiologist/nurse practitioner AF clinic and seen within 24 hours. Data was collected prospectively; descriptive statistics are presented. **Results:** Twenty patients were enrolled during the pilot period. Mean age was 69 (SD = 10) years, 6/20 (30%) female, mean CHADS65 score 1.35 (SD = 1.1), with 15/20 (75%) CHADS65 $\geq$ 1. On presentation, 4/20 (20%) were taking anticoagulants and 12/20 (60%) had an AF history. All 20 patients were assessed in the AF clinic within 24 hours of referral. Upon assessment in the AF clinic, 10/20 (50%) had spontaneously converted to sinus rhythm and 5/20 (25%) were electrically cardioverted at the first AF clinic visit. The remaining 5/20 (25%) of patients were reclassified as AF of uncertain duration; one was admitted to hospital, the other four had delayed electrical cardioversion. All patients received education related to AF. No adverse events or readmissions to the ED were reported and 100% of patients with CHADS 65 $\geq$ 1 had received appropriate anticoagulation. **Conclusion:** A "Short Duration AF Pathway" is a viable alternate approach to immediate cardioversion within the ED. Potential advantages include avoiding unnecessary cardioversion, providing patient education, accessing timely specialty care, and initiating anticoagulation where appropriate.
Keywords: atrial fibrillation, atrial flutter, quality improvement

P060

Cannabinoid hyperemesis syndrome presentation to the emergency department: a two-year multi-centre retrospective study

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Introduction: Cannabinoid hyperemesis syndrome (CHS) is a paradoxical side effect of cannabis use. Patients with CHS often present multiple times to the Emergency Department (ED) with cyclical nausea, vomiting and abdominal pain, and are discharged with various misdiagnoses. CHS studies to date are limited to case series. We examined the epidemiology of CHS cases presenting to two major urban Tertiary Care Centre EDs. **Methods:** Using explicit variables, trained abstractors, and standardized abstraction forms, we abstracted data for all adults (18-55 years) with a presenting complaint of vomiting, and/or a discharge diagnosis of vomiting and/or cyclical vomiting, during a 2-year period. Inter-rater agreement was measured using a kappa statistic. **Results:** We identified 494 cases: mean age 31 years; 36% male; only 19.4% of charts specifically reported cannabis use. Among the regular cannabis users (>3 times per week), 43% had repeat ED visits for similar complaints. Interestingly, of these patients, 92% had bloodwork done in the ED, 92% received IV fluids, 89% received anti-emetics, 27% received opiates, 19% underwent imaging, 8% were admitted to hospital, and 8% were referred to the Gastroentorology service. Inter-rater reliability for data abstraction was kappa = 1. **Conclusion:** This study suggests CHS may be an overlooked diagnosis for nausea and vomiting, a factor which can possibly contribute to unnecessary investigations and treatment in the ED. Additionally, this indicates a lack of screening for CHS on ED history, especially in quantifying cannabis use and eliciting associated symptoms of CHS.