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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