direct observation, coupled with the social expectation that residents should be responsible for ensuring observations occur, was identified as a key barrier. Additionally, competing demands identified across multiple TDF domains emerged as an important and pervasive theme. **Conclusion:** This study identified key barriers and enablers to direct observation. The influencing factors identified in this study provide a basis for the development of potential strategies aimed at embedding direct observation as a routine pedagogical practice in residency training.
Keywords: direct observation, residency education, assessment

LO38

Does spaced instructional design result in improved retention of pediatric resuscitation skills? A randomized education study

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Introduction: Survival from cardiac arrest has been linked to the quality of resuscitation care. Unfortunately, healthcare providers frequently underperform in these critical scenarios, with a well-documented deterioration in skills weeks to months following advanced life support courses. Improving initial training and preventing decay in knowledge and skills are a priority in resuscitation education. The spacing effect has repeatedly been shown to have an impact on learning and retention. Despite its potential advantages, the spacing effect has seldom been applied to organized education training or complex motor skill learning where it has the potential to make a significant impact. The purpose of this study was to determine if a resuscitation course taught in a spaced format compared to the usual massed instruction results in improved retention of procedural skills. **Methods:** EMS providers (Paramedics and Emergency Medical Technicians (EMT)) were block randomized to receive a Pediatric Advanced Life Support (PALS) course in either a spaced format (four 210-minute weekly sessions) or a massed format (two sequential 7-hour days). Blinded observers used expert-developed 4-point global rating scales to assess video recordings of each learner performing various resuscitation skills before, after and 3-months following course completion. Primary outcomes were performance on infant bag-valve-mask ventilation (BVMV), intraosseous (IO) insertion, infant intubation, infant and adult chest compressions. **Results:** Forty-eight of 50 participants completed the study protocol (26 spaced and 22 massed). There was no significant difference between the two groups on testing before and immediately after the course. 3-months following course completion participants in the spaced cohort scored higher overall for BVMV (2.2 ± 0.13 versus 1.8 ± 0.14, $p = 0.012$) without statistically significant difference in scores for IO insertion (3.0 ± 0.13 versus 2.7 ± 0.13, $p = 0.052$), intubation (2.7 ± 0.13 versus 2.5 ± 0.14, $p = 0.249$), infant compressions (2.5 ± 0.28 versus 2.5 ± 0.31, $p = 0.831$) and adult compressions (2.3 ± 0.24 versus 2.2 ± 0.26, $p = 0.728$) **Conclusion:** Procedural skills taught in a spaced format result in at least as good learning as the traditional massed format; more complex skills taught in a spaced format may result in better long term retention when compared to traditional massed training as there was a clear difference in BVMV and trend toward a difference in IO insertion.
Keywords: education, resuscitation

LO39

Stress inoculation training: a critical review for emergency medicine

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Introduction: In high stakes, performance-oriented professions, the ability to execute in stressful situations is both a prerequisite and an intense focus of training. Stress Inoculation Training (SIT) is a three-step cognitive-behavioural intervention aimed at reducing stress that may play a role in helping EM teams prepare for high acuity events. We conducted a systematic review of literature in medicine and performance-oriented professions to inform the development of an EM-focused SIT curriculum. **Methods:** An electronic search of Ovid MEDLINE, Web of Science Core Collection, PsychINFO, ProQuest and Scopus was conducted. Inclusion criteria were studies investigating the impact of stress inoculation training on performance and anxiety reduction. Data extraction included recording of performance and anxiety domains measured in each study and the details of how the stress inoculation training was delivered. Screening of articles, data extraction, and summarization were conducted by two independent reviewers using a standardized data extraction tool. **Results:** Our search yielded 431 studies; 40 were screened for full-text review and 10 met inclusion criteria. A total of 930 trainees throughout the 10 studies were enrolled. Four studies consisted of students in varying disciplines, including law, technology, education, and general undergraduate students, and 4 studies were composed of military personnel. No papers directly examined the effect of stress inoculation training on performance in healthcare. A change in performance and a reduction in anxiety and/or stress was noted in 90% of studies. Training length, experience of trainer, or group size did not appear to impact outcomes. Notably, heart rate variability (HRV) did not appear to be affected throughout the studies included, while cortisol and subjective stress were consistently reduced. **Conclusion:** SIT is an effective tool for enhancing performance and reducing stress and anxiety in high intensity environments. Studies examining the effect of EM-focused SIT on individual, team and patient-orient outcomes are needed.
Keywords: human factors, patient safety, stress

LO40

Describing CCFP(EM) programs in Canada: a national survey of program directors

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Introduction: Enhanced skills training in emergency medicine (EM) for family physicians (CCFP(EM)) has existed since the 1970s. Accreditation standards define what every program must and should have, yet little is known on what is currently done across Canada. Our objectives were to: 1) describe major components of CCFP(EM) programs; and 2) determine how programs incorporate these components into their curriculum. **Methods:** A rigorous development process included expert content development and in-person pilot testing using Royal College Emergency Medicine Program Directors. An electronic survey questionnaire comprised of 63 questions was administered to all 17 CCFP (EM) program directors using a modified Dillman technique. Non-responders were sent a reminder email every 2 weeks over a 6-week period and an in-person reminder was given to non-responders at a face to face meeting 4 weeks after the initial survey was sent in June 2016. **Results:** All 17/17 (100%) program directors responded. There was considerable variation in administrative structure and financial support for each program. All programs provided ultrasound courses for basic skills (trauma, abdominal aortic aneurysm, intrauterine pregnancy). Variation exists for offering independent ultrasound certification (77%), advanced scanning (18%) and protected academic time for scanning (53%). All programs utilize high fidelity simulation. Some programs

https://doi.org/10.1017/cem.2018.101 Published online by Cambridge University Press