

LO76**Effect of task interruptions training on the quality of simulated ALS**

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Introduction: Task interruptions are reportedly frequent disturbances for emergency physicians performing advanced life support (ALS). The aim of this study was to evaluate the benefit of adding task interruptions in ALS simulated training session. **Methods:** We conducted a multi centered randomized controlled trial in four emergency departments of a university hospital in Paris, France. Each emergency team included one resident, one nurse and one emergency physician. The teams were randomized for the nature of their training session: control (without interruption) or realistic (with interruptions). The interruption consisted of an interfering family member speaking a foreign language, and of repetitive phone calls during ALS. After the first training session, teams were evaluated on a second realistic session with task interruptions. The primary outcome was non-technical skills assessed with the TEAM score during this evaluation session. We also measured the no flow time, and the Cardiff score, which reflects the quality of ALS: including chest compression depth and rate, no flow time. **Results:** On a total of 23 included teams, 12 had a control training session and 11 with task interruptions. Baseline characteristics and TEAM score were similar between the two groups (Mean difference: 3,3 [-2,2; 8,9]; $p = 0,26$). During the evaluation session, the TEAM score was lower for “realistic” teams (mean difference -8 [95% confidence interval -13; -3]). We also report a higher no flow time and similar overall Cardiff score. **Conclusion:** In this simulated ALS study, the presence of disturbances during simulation seemed to worsen the quality of training. This study highlights the negative consequences of task interruptions in emergency medicine.

Keywords: advanced life support, simulation, task interruptions

LO77**Performance enhancing psychological skills in clinical simulation**

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Introduction: Clinical simulations in are designed to evoke feelings of stress and uncertainty in order to mimic challenges that learners will face in the real world. When not managed properly, these sources of extraneous cognitive load cause a burden on working memory, leading to a hindered ability to acquire new information. The “Beat the Stress Fool” (BTSF) protocol is a performance-enhancing tool designed to reduce cognitive overload during acute care scenarios. It involves breathing exercises, positive self-talk, visualization, and deliberate articulations. This study aims to validate the BTSF protocol as a method for reducing cognitive load using both psychometric and physiologic measures. **Methods:** Data collection took place during the Queen's University “Nightmares-FM” course. This clinical simulation program involves team-based scenarios designed to teach the fundamentals of acute care to first-year family medicine residents. Participants were divided equally into experimental and control groups based on pre-existing cohorts. Participants completed a baseline state-trait anxiety inventory and a demographics survey. The experimental group was guided through the BTSF protocol prior to

each of 16 simulations; in both groups, physiologic and psychometric cognitive load measurements were collected for the alternating team leader. Galvanic skin response (GSR) and heart rate (HR) were collected during a 15-second baseline and throughout each simulation using a Shimmer 3 GSR+ wearable sensor. Self-reported cognitive load was assessed after each scenario using the 9-point Paas scale.

Results: The mean Paas scores for the BTSF group were significantly lower than the control group (6.2 vs 6.9, $p < 0.05$), indicating lower subjective cognitive load. GSR signal magnitude ($p = 0.086$), spike amplitude ($p = 0.066$), and spike density ($p = 0.584$) were also lower in the BTSF group. There was no difference in HR between groups. There was not a significant correlation between self-reported cognitive load and the normalized physiologic measures. **Conclusion:** The results demonstrate the effectiveness of the BTSF protocol in lowering the amount of perceived mental effort required to perform clinical simulation tasks. These findings were mirrored in the galvanic skin response signal, though our study was likely underpowered for significance. This is the first study to validate a proof-of-concept for the BTSF protocol in learners during simulated training.

Keywords: cognitive load, physiologic measures, psychometric measures

LO78**Ready for launch? A survey of readiness factors among 2019 Competence By Design launch disciplines**

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Introduction: A critical component for successful implementation of any innovation is an organization's readiness for change. Competence by Design (CBD) is the Royal College's major change initiative to reform the training of medical specialists in Canada. The purpose of this study was to measure readiness to implement CBD among the 2019 launch disciplines. **Methods:** An online survey was distributed to program directors of the 2019 CBD launch disciplines one month prior to implementation. Questions were developed based on the R=MC2 framework for organizational readiness. They addressed program motivation to implement CBD, general capacity for change, and innovation-specific capacity. Questions related to motivation and general capacity were scored using a 5-point scale of agreement. Innovation-specific capacity was measured by asking participants whether they had completed 33 key pre-implementation tasks (yes/no) in preparation for CBD. Bivariate correlations were conducted to examine the relationship between motivation, general capacity and innovation specific capacity. **Results:** Survey response rate was 42% ($n = 79$). A positive correlation was found between all three domains of readiness (motivation and general capacity, $r = 0.73$, $p < 0.01$; motivation and innovation specific capacity, $r = 0.52$, $p < 0.01$; general capacity and innovation specific capacity, $r = 0.47$, $p < 0.01$). Most respondents agreed that successful launch of CBD was a priority (74%). Fewer felt that CBD was a move in the right direction (58%) and that implementation was a manageable change (53%). While most programs indicated that their leadership (94%) and faculty and residents (87%) were supportive of change, 42% did not have experience implementing large-scale innovation and 43% indicated concerns about adequate support staff. Programs had completed an average of 72% of pre-implementation tasks. No difference was found between disciplines ($p = 0.11$). Activities related to

curriculum mapping, competence committees and programmatic assessment had been completed by >90% of programs, while <50% of programs had engaged off-service rotations. **Conclusion:** Measuring readiness for change aids in the identification of factors that promote or inhibit successful implementation. These results highlight several areas where programs struggle in preparation for CBD launch. Emergency medicine training programs can use this data to target additional implementation support and ongoing faculty development initiatives.

Keywords: Competence by Design, implementation, residency education

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The variable landscape of resident selection: A study of Canadian Royal College emergency medicine training programs

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Introduction: Little is known about how Royal College emergency medicine (RCEM) residency programs are selecting their residents. This creates uncertainty regarding alignment between our current selection processes and known best practices and results in a process that is difficult to navigate for prospective candidates. We seek to describe the current selection processes of Canadian RCEM programs. **Methods:** An online survey was distributed to all RCEM program directors and assistant directors. The survey instrument included 22 questions consisting of both open-ended (free text) and closed-ended (Likert scale) elements. Questions sought qualitative and quantitative data from the following 6 domains; paper application, letters of reference, elective selection, interview, rank order, and selection process evaluation. Descriptive statistics were used. **Results:** We received responses from 13/14 programs for an aggregate response rate of 92.9%. A candidate's letter of reference was identified as the single most important item from the paper application (38.5%). Having a high level of familiarity with the applicant was considered to be the most important characteristic of a reference letter author (46.2%). Respondents found that providing a percentile rank of the applicant was useful when reviewing candidate reference letters. Once the interview stage is reached, 76.9% of programs stated that the interview was weighted at least as heavily as the paper application; 53.8% weighted the interview more heavily. Once final candidate scores are established for both the paper application and the interview, 100% of programs indicated that further adjustment is made to the rank order list. Only 1/13 programs reported ever having completed a formal evaluation of their selection process. **Conclusion:** The information gained from this study helps to characterize the landscape of the RCEM residency selection process. We identified significant heterogeneity between programs with respect to which application elements were most valued. Canadian emergency medicine residency programs should re-evaluate their selection processes to achieve improved consistency and better alignment with selection best practices.

Keywords: emergency medicine, residency, selection

LO80

Perfecting practice for rare procedures: a simulation-based, multi-centre randomized trial

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Introduction: Mastery learning, which deconstructs a complex task into sequential sub-steps combined with deliberate practice to achieve each step in sequence, represents an important method to enhance simulation-based procedural skills training. However, the evidence to support the effectiveness of this theory to improve learning is lacking. This study compared mastery learning using deliberate practice with self-guided practice on skill performance of a rarely performed, life-saving procedure, a bougie-assisted cricothyroidotomy (BAC). **Methods:** In this multi-centre, randomized study at five North American emergency medicine (EM) residency training programs, we assigned 166 EM postgraduate trainees to either mastery learning and deliberate practice (ML + DP) or self-guided practice for BAC. Three blinded airway experts independently evaluated BAC skill performance by video review before (pre-test) and after (post-test) each training session. The primary outcome was post-test skill performance using a 5-point global rating score (GRS). A secondary outcome, defined a priori, was performance time to complete the BAC skill (chronometry). **Results:** There was no significant difference in post-test BAC performance after ML + DP or self-guided practice. Performance scores improved for both groups by 13% from the pre-test to post-test ($F(1,138) = 43, p < 0.001$). Overall, time to complete the BAC improved significantly from pre-test (87.6 seconds) to post-test (54.1 seconds), ($F(1,149) = 122, p < 0.001$). At post-test, the ML + DP group performed the skill 7.4 seconds faster than the self-guided practice group ($F(1,150) = 6.77, p < 0.01$). **Conclusion:** Mastery learning coupled with deliberate practice provides systematic and focused feedback during skill acquisition. However, it is resource intensive and its efficacy is not fully defined. In this study, ML + DP did not result in improved global performance; it did result in faster performance times, a relevant finding for time-sensitive procedures. These results are important for educators who seek to optimize technical skills training in a competency-based model of medical education. Our findings suggest that time-sensitive procedures might benefit from ML + DP teaching strategies to enhance time to procedural performance.

Keywords: deliberate practice, procedural skills, simulation

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The use of in situ simulation to improve emergency department staff comfort with the management of high acuity, low occurrence cases

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Introduction: In the emergency department (ED), high-acuity presentations encountered at low frequencies are associated with reduced staff comfort. Previous studies have shown that simulation can improve provider confidence with practical skills and management of presentations in various fields of medicine. The present study examined the effect of in situ simulation on interprofessional provider comfort with the identification and management of high-acuity low-frequency events in the ED. It further assessed the feasibility of implementing weekly simulation as an interprofessional education initiative in a high-volume ED. **Methods:** This was a retrospective pre-test post-test quasi-experimental design. Weekly in situ simulation events were facilitated by an interdisciplinary team in a high-volume ED in Hamilton, Ontario that sees an average of 185 patients per day. To date, 34 simulation events were held between January 18, 2019 and November 22, 2019, and included neonatal, paediatric and