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Heart Rate and Variability as Indicators of Stress in Emergency Medicine Faculty and Residents During Simulation

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Lateral Canthotomy and Inferior Cantholysis (LCIC), if performed within two hours of injury, leads to the highest chance of visual preservation. OCS has an incidence of 0.4%-0.65% in patients with orbital fractures. Due to the rare incidence, up to 90% of emergency physicians do not feel confident managing OCS. Simulated training is often the only way that providers gain procedural competency on rare procedures such as LCIC. Although some providers have access to cadaveric models, they are frequently not feasible or cost-effective. Previous low-cost trainers do not have feedback indicating successful cantholysis or have prolonged assembly time.

Objective: We propose a reusable, low-cost 3D printed device to train providers performing LCIC. We hypothesize that performing simulated LCIC will improve provider comfort in performing LCIC.

Methods: An observational prospective pre and post survey using a six point Likert scale from strongly agree to strongly disagree was conducted from March to September 2022 in the medical office building of a level II trauma center. A convenience sample of 32 medical students, residents, and physician assistant fellows viewed an instructional simulator set-up video, assembled the model themselves, and performed the simulated LCIC in addition to the surveys.

Results: 53% strongly agreed and 40% agreed the model was easy to set up and use while none disagreed. 78% agreed or strongly agreed they were comfortable performing LCIC following simulation compared to 43% prior to the simulation. 88% of those who had previously performed the procedure agreed or strongly agreed it was an adequate simulation of a true LCIC.

Conclusions: This model enhances provider comfort and skill at a low cost with rapid set up compared to high fidelity or cadaveric simulations.

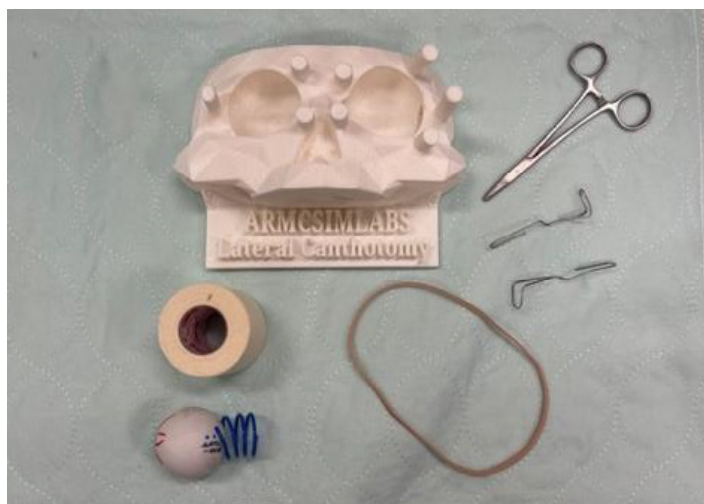


Figure.

27 Heart Rate and Variability as Indicators of Stress in Emergency Medicine Faculty and Residents During Simulation

Angela Cornelius, Jaime Jordan, Brad Goldman, Eric Clifford, Urska Cvek, Marjan Trutschl, Phillip CSR Kilgore, Shane Jenks

Background: The emergency department (ED) is a stressful clinical environment. Stress activates the sympathetic nervous system, which leads to physiologic responses such as increase in heart rate and heart rate variability. Studies have shown a relationship between heart rate variability (HRV) and cognitive performance. As a training tool, simulation attempts to mimic real world conditions including the reproduction of physiologic stress reactions in learners.

Objectives: We sought to assess physiologic indicators of resident stress and measure cognitive performance during a simulated clinical scenario.

Methods: A wearable device was used to measure heart rate, heart rate variability (HRV) and electrodermal activity (EDA) at two ACGME accredited emergency medicine (EM) residency programs during a simulation scenario. All residents at participating sites were eligible to participate. A standardized simulation protocol was utilized. Before and during the scenario, participants completed a cognitive test (Trail Making Test) and time for completion was noted. We calculated and reported descriptive statistics.

Results: Twenty-six residents participated including 7 PGY1s, 8 PGY2s, and 11 PGY3s. 11 (42.3%) participants were females, 15 (57.7%) male, and mean age was 30.7 years. The mean heart rate range was 59.11-117.46. Average percentage of time the heart rate was above 120, 130, and >160 were 2.475%, 0.88%, and 0.041%. HRV showed the mean standard deviation of the interbeat interval was 87 milliseconds(ms). EDA showed a trend of increasing throughout the scenario. Mean time for completion of cognitive test was 54.07 seconds before and 46.90 seconds during the simulation.

Conclusions: Simulation induced physiologic stress as evidenced by increased heart rates, HRV, and EDA. The cognitive test was completed in less time showing cognitive arousal during the simulation.

28 Impact of a Grading Committee for a Fourth-year Emergency Medicine Clerkship

Meredith Thompson, Megan Rivera, Jeffrey Katz, Caroline Srihari, Nicholas Maldonado, Michael Marchick, Rosemarie Fernandez

Background: As Step 1 has moved to pass/fail it has