Virtual ACS 2021 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Research In-Progress

Evaluation of Two Performance Assessment Modalities for a Novel Pediatric Cleft Lip Repair Simulator

Saumya Gupta, BSE; Tatum Y. Zurawski, BS; Chelsea L. Reighard, MD, MSEd; Lauren A. Bohm, MD; David A. Zopf, MD, MS; and Deborah M. Rooney, PhD, MAMS.

University of Michigan, Ann Arbor, MI

Introduction: With limited availability of pediatric surgical training models, trainees' exposure to pediatric procedures in otolaryngology and oral-maxillofacial surgery (OMFS) is limited to experiences in the operating room on patients. Traditional surgical teaching methods are not sufficient learning modalities for advanced procedures such as cleft lip repair (CLR). Using computer aided design and three-dimensional printing technology, pediatric CLR surgical simulators were designed and created along with web-based curriculum and assessment tools. Our earlier research demonstrated that the simulator improved trainees' performance. Continuing this work, we evaluated 2 procedural skills assessment modalities: a procedural video, and final photos of the completed CLR on the simulator for 5 trainees.

Methods: The course materials consist of a pre-module self-efficacy question (rated on 4-point scale) and 10-item multiple choice quiz, journal readings, video demonstration of the procedure, a post-module efficacy question and an online quiz. Five trainees submitted their performance video, and post-procedural photos of 3 different angles of the completed CLR. Performances and photos were rated by 2 otolaryngology and 2 OMFS faculty. Assessment tools consisted of 6 items on a 3-point scale and 1 global item, 'overall closure quality" (5-point scale). Mean ratings, inter-rater reliability, and practical aspects across modalities will be compared

Preliminary Results: Learner self-efficacy ($p < 0.02$) and knowledge ($p > .05$) improved following training. Review of procedural videos and post-procedural photographs suggested training succeeds in increasing performance. Statistical comparison of rating differences and inter-rater agreement across assessment modalities will be reported in detail at the conference, and rater time commitment discussed.

Next Steps: The next steps are to further research the quality, cost, and benefits of both video and photo assessment methods. Future work will also expand this research to larger and more varied cohort of trainees and raters to evaluate the generalizability of these preliminary findings.