The goal of this research is to advance the understanding of capabilities and limitations of advanced interactive modeling and simulation techniques through case study of two different simulators used to perform Cricothyroidotomy emergency medical training. This research explores performance, technology acceptance, and task load questions with respect to two different modeling and simulation techniques—haptic supplemented virtual reality and mannequins. The U.S. Army expressed interest in training of combat medics in the cricothyroidotomy airway management technique and offered to support experimentation with both facilities and trained combat medics as the sample population. The results of the participants’ assessment of each virtual simulator take the form of both analyses to standard as well as a comparison study between simulation approaches. To improve the advancement of interactive simulation and medical simulation in particular, a summary of findings, generalized conclusions, lessons learned and recommendations for future research are provided.

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Approved for distribution by Dr. Michael Proctor, Committee Chair, on June 24, 2013.

The public is welcome to attend.