

ACS 2023 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Challenges in Surgical Education

Task Trainer Development for Realistic Simulated Penetrating Neck Trauma in Team Trauma Training

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Background: Penetrating neck trauma injuries are seen by Emergency Department teams in 10-15% of all trauma cases. Due to the location of important anatomical structures, neck trauma has a high rate of morbidity and mortality. Teamwork, excellent communication, and time management skills for airway management and hemostasis are essential for successful patient outcomes. These complex life-saving procedures require teams to operate effectively under crucial time constraints. This necessitates assembly of a reproducible task trainer so that trauma teams can practice proper management of this unusual but critical condition.

Current Challenges: Currently, no known simulator for penetrating neck trauma is available for retail purchase. While there are task trainers and team training exercises for neck trauma, these trainers either focus on airway management or hemostasis protocols. Additionally, there are no task trainers that allow teams to assess and manage both airways and hemostasis simultaneously.

In a recent regional multi-disciplinary healthcare team simulation competition, one scenario involved a patient presenting with a gunshot wound to the neck and difficulty breathing. A modified surgical Cut Suit™ was utilized to simulate a penetrating neck injury and allowed trauma teams to assess and manage the patient's high volume blood loss and difficult airway access.

Need of Innovation: This unique penetrating neck injury task trainer has a variety of applications for trauma and other perioperative specialties. It provides a well-received, highly realistic experience with a live actor wearing a surgical Cut Suit™. Interprofessional education training can utilize this simulator to measure and improve team communication, leadership and roles, technique, response time, and outcome in scenarios involving airway management and mass transfusion protocols. Further application of this innovative simulator includes developing a step-by-step guide to create a penetrating neck trauma model. This task trainer provides a critical life-saving educational opportunity for healthcare professionals in managing penetrating neck trauma.

