

Dr. Joe Heck Statement on Live Tissue Training

As a former chairman of the House Armed Services Committee's Subcommittee on Military Personnel with jurisdiction over Department of Defense (DoD) medical training, a former medical director of the Casualty Care Research Center at Uniformed Services University, and a physician in the U.S. Army Reserve who commanded the emergency room of a Combat Support Hospital in Iraq, **I support the elimination of Live Tissue Training (LTT).**



Having taught courses that included LTT, I have no doubt that making the transition from ineffective, expensive, and unrealistic LTT to more advanced, more realistic, and less-costly human simulators will improve lifesaving training for combat medics.

During LTT, live goats and pigs are shot and stabbed so combat medics can try to learn human trauma treatment skills. Yet the anatomy of goats and pigs does not realistically replicate that of a human, gives combat medics a false confidence in their skills, and causes them to develop inaccurate muscle memory in the performance of critical, life-saving skills.

Unlike animals, life-like simulators, including “cut suits” worn by simulated live victims, have accurate anatomy and allow trainees to repeat trauma skills to mastery in a cost-effective manner. An Army study found simulators “cost substantially less per trainee than live tissue training.”¹

There is simply no reason to delay this modernization of military medical training:

- **Assistant Secretary of Defense for Health Affairs (ASD(HA)):** In 2014, ASD(HA) Dr. Jonathan Woodson issued a directive limiting LTT and directing the transition to simulators.² Since that time, simulator fidelity has increased exponentially, making simulators more powerful and useful than ever.
- **Coast Guard (USCG):** After reviewing the capabilities of the latest high-tech simulators, the USCG announced an end to LTT on June 28, 2017.³
- **Defense Health Agency (DHA):** The DHA, responsible for oversight of the DoD military health system, stated in 2017 that LTT is “outdated and cost-prohibitive”⁴ and “not anatomically correct.”⁵
- **Studies:** The DoD’s own studies show that simulators are just as, if not more, effective than LTT in training combat medics.^{6,7,8,9,10,11}
- **Uniformed Services University:** The DoD’s own medical school ended LTT for Tactical Combat Casualty Care training.

I urge Congress to support National Defense Authorization Act language that allows for a definitive, orderly, and predictable transition to these superior simulation-training models for combat medics throughout the DoD while finally ending LTT, helping save troops’ lives, and cutting wasteful spending.



Dr. Joe Heck
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(References on reverse)

The views expressed above are the opinion of the author and do not represent the position or views of the Department of Defense or the Department of the Army.

¹Evans L. Evaluation of the effectiveness of LTR training versus simulation training and stress inoculation. U.S. Army Medical Research and Materiel Command award number W81XWH-14-C-1392. October 2015. Available at: <http://www.dtic.mil/dtic/tr/fulltext/u2/1025216.pdf>.

²Woodson J. U.S. Department of Defense. Memorandum. Determination for the use of animals in medical education and training, May 15, 2014. Available at: <https://www.jsomonline.org/TCCCEsp/06%20TCCC%20Documentos%20de%20Referencia/ASDHA%20Memo%20140515%20LTT%20Policy.pdf>

³Seck HH. Coast Guard puts permanent end to wounding animals for training. Military.com. March 20, 2018. Available at: <https://www.military.com/daily-news/2018/03/20/coast-guard-puts-permanent-end-wounding-animals-training.html>.

⁴Defense Health Agency. 2016 stakeholder report. June 8, 2017. Available at: <https://health.mil/Reference-Center/Reports/2017/06/08/Defense-Health-Agency-2016-Stakeholder-Report>.

⁵NIH Small Business Innovation Research. Seed funding health technologies: National SBIR conference. May 16, 2017. Available at: <https://www.sbir.gov/sites/default/files/Master%20Health%20Technologies.National%20SBIR.pptx>.

⁶Hall AB, Riojas R, Sharon D. Comparison of self-efficacy and its improvement after artificial simulator or live animal model emergency procedure training. *Mil Med.* 2014 Mar;179(3):320-3. Available at: <https://academic.oup.com/milmed/article/179/3/320/4160692>. Maj. Andrew Hall, U.S. Air Force researcher in Department of Surgery at Keesler Medical Center, stated: “[I]f the goal for trainers is to produce individuals with high self-efficacy, artificial simulation is an adequate modality compared with the historical standard of live animal models.”

⁷Green PP. Current use of live tissue training in trauma: a descriptive systematic review. *Can J Surg.* 2015 Dec; 58(6): E6. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4651678/>. Maj. Andrew Hall also wrote: “We have entered into an age where artificial simulator models are at least equivalent to, if not superior to, animal models. ... [T]he military should make the move away from all animal simulation when effective equivalent artificial simulators exist for a specific task. For emergency procedures, this day has arrived.”

⁸Sergeev I, Lipsky AM, Ganor O, Lending G, Abebe-Campino G, Morose A, Katzenell U, Ash N, Glassberg E. Training modalities and self-confidence building in performance of life-saving procedures. *Mil Med.* 2012 Aug;177(8):901-6. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22934367>. Captain Ilia Sergeev, Medical Corps Israel Defense Forces, stated: “Among military advanced life support providers, self-confidence levels in procedure performance are positively associated with experience gained from manikins and supervised and unsupervised patient application. We were not able to demonstrate a clear benefit of an animal model in increasing self-confidence.”

⁹Booth-Kewley S, McWhorter SK, Dell'Acqua RG, Altarejos IV, Schmied EA. Perceived strengths and weaknesses of highly realistic training and live tissue training for Navy corpsmen: Report No. 15-12. Naval Health Research Center. 2015. Available at: www.dtic.mil/get-tr-doc/pdf?AD=AD1000732. Dr. Stephanie Booth-Kewley, research physiologist at the Naval Health Research Center, wrote: “Highly realistic training [incorporating simulators, pyrotechnics, battlefield special effects, and combat wound effects] was rated [by study participants] as more beneficial than live tissue training for the development of advanced corpsman skills.”

¹⁰Sweet R, Rule GT. MEDSIM Combat Casualty Training Consortium. U.S. Army Medical Research and Materiel Command award number W81XWH-11-2-0185. March 31, 2015. The U.S. Army funded a major study comparing LTT to human simulation-based training, concluding that “for most skills training medics and assessing performance on simulators is not less effective than live animal training” and additionally that “simulator training would be more cost effective ...”

¹¹Reihnsen T, Speich J, Ballas C, Hart D, Sweet R. Creation of a multi-trauma patient using current technology based simulators. *Acad Emerg Med.* May 2015;22.S1:S442-S443. Available at: <http://www.onlinelibrary.wiley.com/doi/10.1111/acem.12645/pdf>. A research team from the University of Minnesota published a study regarding the “Frank-N-Stein” polytrauma model (which combines the best of commercially available simulation models into one unified model) and found: “The emulation of a complex airway and hemorrhage patient was successful, providing a realistic full body simulation requiring placement of nasopharyngeal airway, chest seal, needle and tube thoracostomy, cricothyrotomy, tourniquet, amputation stump dressing, and junctional wound packing. ... Over 1000 trainees have been trained or assessed with this model. ... The hybrid Frank N. Stein model with a live actor was successfully designed, assembled, and utilized for training and assessment of life-saving hemorrhage and airway skills.”

