AN INTERNATIONAL ORGANIZATION DEDICATED TO PROTECTING THE RIGHTS OF ALL ANIMALS

PETA

PEOPLE FOR THE ETHICAL TREATMENT OF ANIMALS

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May 11, 2022

Randy Boyd
President
The University of Tennessee System
c/o Alison Ross, Executive Assistant

Board of Trustees
The University of Tennessee System
c/o Cynthia Moore, Secretary and Special Counsel

Via e-mail: utpresident@tennessee.edu; alison.ross@tennessee.edu; trustees@tennessee.edu; cynthia.moore@tennessee.edu

Dear President Boyd and Trustees:

Thank you in advance for your time. I'm writing on behalf of People for the Ethical Treatment of Animals—PETA entities have more than 9 million members and supporters globally—regarding the apparent disturbing mutilation of live pigs in emergency medical training conducted for staff, physicians, and/or residents affiliated with the University of Tennessee College of Medicine (UTCOM) in Chattanooga and its medevac partner, Life Force Air Medical, in apparent violation of UTCOM's prior public claim against this practice.

Given this information, we urge you and the University of Tennessee Board of Trustees to intervene and require that the University of Tennessee Health Science Center (UTHSC) and its affiliated programs—including Life Force Air Medical and UTCOM—adopt a public policy prohibiting the use of animals for all such training. We have enclosed a brief for your reference detailing the widespread availability of superior human simulation models that can be used instead of harming animals for these exercises.

In a set of public records that PETA received from UTHSC in response to our December 1, 2021 request,[1] we learned that emergency medicine (EM) residents participate in a "Skills Lab"[2] that uses live animals in invasive and deadly procedures.

[1]Trunnell, ER. Records request. People for the Ethical Treatment of Animals. December 1, 2021. Accessed May 11, 2022. https://www.peta.org/wp-content/uploads/2022/05/2021-12-01_uthsc_tpra-re-utcom-chattanooga.pdf
[2]Carr, MG. Skills lab. University of Tennessee College of Medicine. Accessed May 11, 2022. https://www.peta.org/wp-content/uploads/2022/05/utcom-animal-lab-em.pdf

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This appears to be a blatant contradiction of UTCOM's prior public claim that live animals are not used in EM resident training. Specifically, in 2018, ABC affiliate News Channel 9 interviewed Dr. R. Bruce Shack, dean of UTCOM-Chattanooga, and reported, "According to the Dean, the College does not use live animals in its Emergency Medicine Resident Training or it's [*sic*] Advanced Trauma Life Support and Pediatric Advanced Life Support courses."[3]

On January 18, we sent a letter to UTHSC Chancellor Dr. Peter F. Buckley regarding this troubling matter.[4] He sent us an interim reply on February 4, stating that he would have to "check into this going forward."[5] Despite repeated follow-ups, we have not yet heard back from him.

UTCOM leadership also acknowledges that using live animals in its graduate medical training is a serious detriment to the institution's reputation. In a 2016 internal e-mail, the former interim dean and current associate dean for academic affairs, Robert C. Fore, warned, "The issue of live animal models will not go away. While we have removed this from the medical school curriculum, it remains in GME [graduate medical education]. So far we have not had a reporter be perceptive enough to press the question about GME, but it is coming. And our response will be viewed as being less than forthcoming about the use of animals on the Chattanooga campus. Discovering that we are still using animals, even though in GME, will be very damaging to the College of Medicine and our credibility."[6]

You can contact me at ShriyaS@peta.org. I look forward to your reply regarding this important issue. Thank you.

Sincerely yours,

Shriya Swaminathan
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[3]Levine, A. New calls to end surgical training on live pigs at UT College of Medicine Chattanooga. NewsChannel9.com. May 7, 2018. Accessed May 11, 2022. https://newschannel9.com/news/local/new-calls-to-end-surgical-training-on-live-pigs-in-chattanooga

[4]Swaminathan, S. Letter to Chancellor Buckley. People for the Ethical Treatment of Animals. January 18, 2022. Accessed May 11, 2022. https://www.peta.org/wp-content/uploads/2022/02/2022-01-18-letter-to-uthsc-incoming-chancellor.pdf

[5]Buckley, PF. PETA re animal use in UTHSC Life Force training. UTHSC Office of the Chancellor. February 4, 2022. Accessed May 11, 2022. https://www.peta.org/wp-content/uploads/2022/05/PETA-re-animal-use-in-UTHSCLife-Force-training.pdf

[6]Fore, RC. Live animal models. UTCOM. August 9, 2016. Accessed May 11, 2022. https://www.peta.org/wp-content/uploads/2022/05/robert-fore-re-live-animals-email.pdf

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Briefing Regarding Non-Animal Methods for Life Force Air Medical Training

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People for the Ethical Treatment of Animals (PETA)

November 04, 2021

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I. Anatomical and Physiological Differences Between Species Render Animals Poor Surrogates for Human Medicine

There are numerous significant anatomical and physiological differences between pigs and human beings that render the former a poor surrogate for teaching human medical procedures. Compared to human beings:

1. Pigs have thicker skulls and necks, a different hindbrain orientation, a larger subarachnoid space, and a greater degree of blood clotting.[1]
2. Pigs' blood takes longer to start clotting after an injury, but the clots propagate faster, the enzyme breakdown of clots after 30 minutes is to a lesser degree, and fibrinogen contributes less to the clots, whereas platelets contribute more.[2]
3. Pigs' hind limb arterial anatomy is different from that of humans, and pigs also have smaller limbs.[3]
4. Instructors cannot assess medics' proficiency in ventilating pigs' lungs or producing changes in blood gas levels that would indicate a successful patient recovery after a trauma.[4]
5. Pigs have smaller torsos and thicker skin.[5]

Anatomical differences between human beings and other species can negatively compromise the quality of medical training provided, potentially leading to serious problems or medical errors when performing these techniques in a clinical setting. One study criticizes the use of animals for hemorrhage control training, stating, "[p]roblems with this type of training model are multiple and include differences in anatomy, differences in the force required on the tourniquet to arrest bleeding, ethical concerns for the animals, and lack of repeatable training as erroneous management frequently results in death of the animal."[6] Similar criticism apply to other medical skills, such as establishing an airway—using animals during training allows only one airway attempt before another animal is required, increasing costs and decreasing the number of repetitions permitted in order to develop proficiency; because of species differences in

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[1] Baxter D, Kwok H-T, DeFelice J, et al. Blast injury in pigs. Society of British Neurological Surgeons. 2017. Available at: http://www.sbns.org.uk/index.php/download_file/view/1130/229/; Accessed: October 28, 2021.

[2] Kessler U, Grau T, Gronchi F, et al. Comparison of porcine and human coagulation by thrombelastometry. Thromb Res. 2011;128(5):477-482. doi:10.1016/j.thromres.2011.03.013. https://www.ncbi.nlm.nih.gov/pubmed/21492909.

[3] Barnes SL. University of Missouri Combat Casualty Training Consortium (MU CCTC) for the study of militarily relevant trauma training seeking to validate and compare both live tissue and inanimate simulator training. Army award number W81XWH-11-2-0155. September 30, 2014.

[4] Vadodaria BS, Gandhi SD, McIndoe AK. Comparison of four different emergency airway access equipment sets on a human patient simulator. Anaesthesia. 2004;59(1):73-79. doi:10.1111/j.1365-2044.2004.03456.x. https://www.ncbi.nlm.nih.gov/pubmed/14687103

[5] McLellan R. Pigs and military: Medical training using animals does not save lives. The San Diego Union-Tribune. March 31, 2012. http://www.sandiegouniontribune.com/sdut-military-medical-training-using-animals-does-not-2012mar31-story.html; Accessed: October 28, 2021.

[6] Matt Ritter E, Bowyer MW. Simulation for trauma and combat casualty care. Minim Invasive Ther Allied Technol. 2005;14(4):224-234. doi:10.1080/13645700500243703. https://pubmed.ncbi.nlm.nih.gov/16754168/.

anatomy (e.g., airway size and critical landmark identification), being able to stabilize the airway of a pig doesn't necessarily mean being able to stabilize the airway of an injured human.

II. Non-Animal Methods Can Effectively Teach the Procedures Covered in the Life Force Air Medical Training Program

In 2021, researchers in Europe and Australia conducted a systemic review of 50 studies that compared the use of "humane" teaching methods and live animals for education and training purposes, finding improved learning outcomes over time when trainees used animal-free methods due in part to the higher fidelity and efficacy of modern simulators available.[7] The authors concluded that in "90% of studies humane teaching methods were as or more effective than harmful animal use in achieving desired learning outcomes," and that, "The use of humane teaching methods instead is based not only on legal, ethical, and economic factors, but also on evidence that these training techniques are just as efficient or even better in improving knowledge, understanding, and clinical or surgical skills proficiency among students."[8]

Several studies have demonstrated the superiority of manikins as a teaching tool for cricothyrotomy. Dr. N.V. Kulkarni, an anesthesiologist at Mount Vernon Hospital, concurs that a crucial criteria for procedural competency is the assurance that the patient will survive after the procedure and that using live pigs is a poor training model in obtaining these valuable life-saving skills.[9] Dr. Kulkarni also emphasizes that "[a]ppropriate training methods assess the student's ability to oxygenate and ventilate patients appropriately."[10] This was demonstrated in a study that used a computerized human patient simulator (HPS) developed by Medical Education Technologies, Inc. (METI)—students in the study who trained on METI's 'Quiktrach' and 'Melker' sets tool had a 100% success rate in cricothyroid cannulae placement for treating emergency hypoxaemia.[11]

One study demonstrated that the use of animals yields poor cricothyrotomy placement accuracy by students; whereas, training on non-animal models such as human cadavers resulted in a reduction in the number of cricothyrotomy attempts and improved successful airway placement rates.[12] Another study concluded that "[p]ractice on mannequins leads

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[7] Zemanova MA, Knight A. The Educational Efficacy of Humane Teaching Methods: A Systematic Review of the Evidence. Animals (Basel). 2021;11(1):114. Published 2021 Jan 7. doi:10.3390/ani11010114. https://pubmed.ncbi.nlm.nih.gov/33430457/.

[8] Ibid.

[9] Kulkarni NV. Cricothyrotomy pig model flawed. Emerg Med J. 2009;26(8):623. doi:10.1136/emj.2008.071183. https://pubmed.ncbi.nlm.nih.gov/19625575/.

[10] Ibid.

[11] Vadodaria BS, Gandhi SD, McIndoe AK. Comparison of four different emergency airway access equipment sets on a human patient simulator. Anaesthesia. 2004;59(1):73-79. doi:10.1111/j.1365-2044.2004.03456.x. https://pubmed.ncbi.nlm.nih.gov/14687103/.

[12] McCarthy MC, Ranzinger MR, Nolan DJ, Lambert CS, Castillo MH. Accuracy of cricothyroidotomy performed in canine and human cadaver models during surgical skills training. J Am Coll Surg. 2002;195(5):627-629. doi:10.1016/s1072-7515(02)01337-6. https://pubmed.ncbi.nlm.nih.gov/12437248/.

to reductions in cricothyroidotomy times and improvement in success rates. By the fifth attempt, 96% of participants were able to successfully perform the cricothyroidotomy in 40 s or less."[13]

A study evaluating Simulab Corporation's TraumaMan model found the simulator to be ''superior'' to using animals for surgical airway placement instruction.[14] According to the study, "Students found the HPS to be superior to the animal model in teaching surgical airways [mean 3.64; standard deviation (SD) 0.93] and for management of pneumothorax (mean 3.86; SD 0.77). The students felt the [human patient simulator] would be useful in [Advanced Trauma Life Support] and should be included … ." Key conclusions from this study include that-

1. Simulab is a valuable tool for teaching ATLS Surgical airway skills.
2. Simulab is superior to standard techniques in teaching surgical airway skills.
3. Simulab is a valuable tool in teaching diagnosis and management of pneumothorax.
4. Simulab is superior to the animal model in teaching diagnosis and management of pneumothorax.
5. Simulab is a valuable tool in teaching diagnosis and management of pericardial tamponade.
6. Simulab is superior to the animal model in teaching diagnosis and management of pericardial tamponade.
7. Simulab is a realistic simulator for teaching patient assessment.
8. Simulab is a realistic simulator for teaching treatment options.
9. Simulab is a realistic simulator for demonstrating response to treatment.
10. Human patient simulators should be included in future version of the ATLS course.
11. There is a steep learning curve for the student using the human patient simulator.
12. Simulab improved [trainee] confidence in the clinical scenarios ("moulage").
13. Simulab improved [trainee] confidence for dealing with future trauma patient encounters.[15]

Another study recruited 27 third-year anesthesiology residents from Amiens, Caen, and Rouen University Medical Centers in France. Participants had some prior training in difficult airway management through lectures and clinical practice during internships. However, none of them had former experience on task trainers, high-fidelity simulators or, cricothyrotomy in a real-life 'cannot intubate, cannot ventilate' situation. After a 2-day seminar training that included practicing airway management techniques on human

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[13] Wong DT, Prabhu AJ, Coloma M, Imasogie N, Chung FF. What is the minimum training required for successful cricothyroidotomy?: a study in mannequins. Anesthesiology. 2003;98(2):349-353. doi:10.1097/00000542-200302000-00013. https://pubmed.ncbi.nlm.nih.gov/12552192/.

[14] Simulab. (n.d.). The TraumaMan System. https://simulab.com/collections/traumaman-system

[15] Block EF, Lottenberg L, Flint L, Jakobsen J, Liebnitzky D. Use of a human patient simulator for the advanced trauma life support course. Am Surg. 2002;68(7):648-651. https://pubmed.ncbi.nlm.nih.gov/12132752/.

patient simulators, residents significantly improved compliance with airway management guidelines and their performance of the cricothyrotomy procedure.[16]

Another study implemented simple tools and materials to develop what the team called a Chest Tube High-Feedback Educational Simulation Trainer (CHEST). This tool was simple to construct from affordable materials and was well reviewed by study participants, which included students and proctors. The overall consensus was that CHEST offers a "realistic demonstration of skin cutting, muscle puncture, and blunt dissection." Based on the results, most participants agreed or strongly agreed that "the model provided a realistic cut for skin and fat layers, hemostat puncture and spread through the muscle layer, and finger sweep. The majority also agreed that the model allowed for proper training of tube placement, skin suturing, and tube securing."[17]

A Canadian research team compared the delivery of emergency skills between study participants who trained using pigs versus participants who trained using the TraumaMan model. The authors reported the inability to repeatedly practice cricothyroidotomy on the same animal, and the requirement for an animal care facility, as drawbacks to the feasibility of using pigs for teaching this procedure. Further, they acknowledge that the airway anatomy in pigs differs from that of human beings. The study concluded, "TraumaMan is a suitable alternative to the porcine model and considering all factors it may be the preferred method for teaching ATLS emergency trauma surgical skills."[18]

The availability of realistic simulators that faithfully recapitulate human anatomy and physiology- such as Simulab Corporation's TraumaMan system, Strategic Operations' Cut Suit, CAE Healthcare's Caesar, Kforce Government Solutions' Multiple Amputation Trauma Trainer and Laerdal Medical's life-like military manikins, among others, can replace the use of live animal trauma exercises completely.[19] Further, 22 of 28 North Atlantic Treaty Organization (NATO) countries have reported that they use human patient simulators and other non-animal training methods instead of animal models in their training.[20] Similarly, a study conducted by the Canadian Forces Health Services

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[16] Hubert V, Duwat A, Deransy R, Mahjoub Y, Dupont H. Effect of simulation training on compliance with difficult airway management algorithms, technical ability, and skills retention for emergency cricothyrotomy. Anesthesiology. 2014;120(4):999-1008. doi:10.1097/ALN.0000000000000138. https://pubmed.ncbi.nlm.nih.gov/24434303/.

[17] Crawford SB, Huque YI, Austin DE, Monks SM. Development and Review of the Chest Tube High-Feedback Educational Simulation Trainer (CHEST). Simul Healthc. 2019;14(4):276-279. doi:10.1097/SIH.0000000000000361. https://pubmed.ncbi.nlm.nih.gov/30969266/.

[18] Ali J, Sorvari A, Pandya A. Teaching emergency surgical skills for trauma resuscitation-mechanical simulator versus animal model. ISRN Emergency Medicine. 2012;2012:1-6. doi:10.5402/2012/259864. https://www.hindawi.com/journals/isrn/2012/259864/.

[19] Pawlowski JB, Feinstein DM, Gala SG. Developments in the Transition From Animal Use to Simulation-Based Biomedical Education. Simul Healthc. 2018;13(6):420-426. doi:10.1097/SIH.0000000000000310. https://pubmed.ncbi.nlm.nih.gov/29672470/.

[20] Gala SG, Goodman JR, Murphy MP, Balsam MJ. Use of animals by NATO countries in military medical training exercises: an international survey. Mil Med. 2012;177(8):907-910. doi:10.7205/milmed-d-12-00056. https://pubmed.ncbi.nlm.nih.gov/22934368/.

found that a human simulator is equally effective as LTT for teaching trauma management skills to military medical personnel.[21]

Another study evaluating virtual reality medical training technology comes from researchers who developed a "realistic and dynamic model" to teach routine intubations, showing that it is "possible to model, in real-time, the dynamics of the endotracheal intubation procedure even in a fairly large virtual model." The authors note: "The three-dimensional viewing and interaction available through virtual reality make it possible for physicians, pre-hospital personnel and students to practice many endotracheal intubations without ever touching a patient. The ability for a medical professional to practice a procedure multiple times prior to performing it on a patient will both enhance the skill of the individual while reducing the risk to the patient."[22]

Immersive virtual reality (IVR) technologies can offer a realistic environment akin to real-world trauma management situations. This can enable medical providers to respond appropriately during real-life, high-stress situations. A team of researchers and military medical personnel developed four IVR scenarios based on the highest mortality battlefield injuries: hemorrhage, tension pneumothorax, and airway obstruction. The participants of this working group "unanimously indicated a high level of realism and potential training usefulness."[23]

III. Replacing Animal Use in Medical Training is More Effective, Ethical, and Economical

There are federal ethical provisions in place regarding minimizing the use of animals in experiments and training:

- The eighth edition of the Guide for the Care and Use of Laboratory Animals states, "The Guide … endorses the following principles: consideration of alternatives (in vitro systems, computer simulations, and/or mathematical models) to reduce or replace the use of animals."[24]
- The U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training (1985) states, "The animals selected for a

[21] da Luz LT, Nascimento B, Tien H, et al. Current use of live tissue training in trauma: a descriptive systematic review. Can J Surg. 2015;58(3 Suppl 3):S125-S134. doi:10.1503/cjs.014114. https://pubmed.ncbi.nlm.nih.gov/26100772/.

[22] Mayrose J, Kesavadas T, Chugh K, Joshi D, Ellis DG. Utilization of virtual reality for endotracheal intubation training. Resuscitation. 2003;59(1):133-138. doi:10.1016/s0300-9572(03)00179-5. https://pubmed.ncbi.nlm.nih.gov/14580744/.

[23] Couperus K, Young S, Walsh R, et al. Immersive Virtual Reality Medical Simulation: Autonomous Trauma Training Simulator. Cureus. 2020;12(5):e8062. Published 2020 May 11. doi:10.7759/cureus.8062. https://pubmed.ncbi.nlm.nih.gov/32542120/.

[24] National Research Council (US) Committee for the Update of the Guide for the Care and Use of Laboratory Animals. (2011). Guide for the Care and Use of Laboratory Animals. https://grants.nih.gov/grants/olaw/guide-for-the-care-and-use-of-laboratory-animals.pdf.

procedure should be of an appropriate species and quality and the minimum number required to obtain valid results."[25]

- The U.S. Animal Welfare Act (AWA) was enacted to ensure minimal protection of animals in laboratories and to prevent redundant experimental studies, which waste precious resources and harm animals. Section 2143(e)(3) of the act calls for "improved methods of animal experimentation, including methods which could reduce or replace animal use" and section 2143(d)(2) states the need for scientific training using "methods that minimize or eliminate the use of animals or limit animal pain or distress."[26]
- According to Policy #12 in the federal Animal Care Policy Manual, "A fundamental goal of the AWA [Animal Welfare Act] and the accompanying regulations is the minimization of animal pain and distress via the consideration of alternatives and alternative methods."[27]

In compliance with these ethical standards, the aforementioned animal-free, human-relevant simulation models have proven to be effective, reliable and validated. As such, we urge Life Force Air Medical to adopt a public policy prohibiting the use of animals for all medical training and instead exclusively use animal-free human patient simulators.

[25] National Research Council (US) Committee for the Update of the Guide for the Care and Use of Laboratory Animals. (2011). Appendix B to the Guide for the Care and Use of Laboratory Animals: U.S. government principles for the utilization and care of vertebrate animals used in testing, research, and training. https://www.ncbi.nlm.nih.gov/books/NBK54048/.

[26] United States Department of Agriculture Animal and Plant Health Inspection Service. (2017). USDA Animal Care : Animal Welfare Act and Animal Welfare Regulations. United States Department of Agriculture Animal and Plant Health Inspection Service.

[27] Animal and Plant Health Inspection Service. (2000). Alternatives to Painful Procedures. http://www.aphis.usda.gov/ac/policy/policy12.pdf