PEOPLE FOR THE ETHICAL TREATMENT OF ANIMALS

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September 3, 2021

The Honorable Merrick Garland
Attorney General
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530-0001

Via e-mail: askdoj@usdoj.gov

Dear Attorney General Garland:

Thank you in advance for your time. I am writing to you on behalf of PETA and our more than 6.5 million members and supporters worldwide to follow-up on our February 8, 2021, letter (enclosed) to then-Acting Attorney General Monty Wilkinson, in which we urge the Department of Justice (DOJ) to end its use of animals in deadly live tissue training (LTT).[1]

Given the apparent serious noncompliance with regulations by LTT contractors used by the DOJ,[2] the U.S. Coast Guard's (USCG) ending of its use of animals in LTT in favor of animal-free training methods,[3] and the Department of Defense's requirement to now use human patient simulators "to the maximum extent practicable,"[4] can you please confirm if and when the DOJ will end its use of animals for LTT?

As detailed in our letter to then-Acting Attorney General Wilkinson, the Federal Bureau of Investigation (FBI) and the United States Marshals Service (USMS) previously issued disturbing taxpayer-funded awards for cruel trauma training drills on animals—who are typically shot, stabbed, dismembered and killed—despite not providing effective anatomically-relevant training to treat human injuries. We presented several studies that confirm the validity and superiority of advanced human patient simulators

[1]PETA. 2021, February 8. Letter to Acting Attorney General. https://www.peta.org/wp-content/uploads/2021/09/2021-02-08-Letter-to-Acting-Attorney-General-Wilkinson.pdf
[2] PETA. 2016, June 29. Member of Congress: Stop FBI's Trauma Training on Animals. https://www.peta.org/blog/member-congress-stop-fbis-trauma-training-animals/
[3] Seck. H.H. 2018, March, 20. Coast Guard Puts Permanent End to Wounding Animals for Training. Military News. https://www.military.com/daily-news/2018/03/20/coast-guard-puts-permanent-end-wounding-animals-training html
[4] Crist, C. 2018, October 11. Doctors move away from using live animals for trauma surgery training. Reuters. Retrieved from https://www reuters.com/article/us-health-trauma-training-animals/doctors-move-away-from-using-live-animals-for-trauma-surgery-training-idUSKCN1ML2LE

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and perfused human cadavers. More than 91,000 concerned individuals have now called on the DOJ to end its use of animals in LTT.[5]

We also wish to draw your attention to the fact that the U.S. Marshals Service's (USMS) "Statement of Work" from November 13, 2020, titled "Medical Oversight Services for Special Operations Group" (Federal Solicitation Number: 15M10421QA4700001), describes an Emergency Medical Technician (EMT) refresher course that includes, "Cadaver lab learning opportunities for anatomy and procedure training."[6] This document does not mention the use of animals for trauma training purposes, and we hope this means that the DOJ is now using only animal-free training methods.

You may contact me at ShalinG@peta.org. Thank you for your consideration of this important issue, and we look forward to your response.

Sincerely yours,

Shalin G. Gala
Vice President, International Laboratory Methods
Laboratory Investigations Department

cc: The Honorable Lisa Monaco, U.S. Deputy AG (lisa.monaco@usdoj.org)
The Honorable Donald Washington, Director, USMS (donald.washington@usdoj.gov)
Carole O'Brien, Procurement Executive, USMS (carole.o'brien@usdoj.gov)
The Honorable Christopher Wray, Director, FBI (cawray@fbi.gov)
Wendell "Drew" Watts, Procurement Section Chief, FBI (wwatts@fbi.gov)

Enclosure: February 8, 2021, letter to then-Acting AG Monty Wilkinson

[5]PETA. PETA to Department of Justice: End Gruesome Trauma Training on Animals. https://support.peta.org/page/14376/action/1?locale=en-US
[6]USMS. 2020, November 13. Medical Oversight Services for Special Operations Group. https://sam.gov/opp/ff6c4e1cfe4d45f4a881a4d87768fe00/view

AN INTERNATIONAL ORGANIZATION DEDICATED TO PROTECTING THE RIGHTS OF ALL ANIMALS

PETA

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February 8, 2021

The Honorable Monty Wilkinson
Acting Attorney General
c/o The Honorable John P. Carlin, U.S. Acting Deputy Attorney General
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530-0001

Via e-mail: john.p.carlin@usdoj.gov; askdoj@usdoj.gov

Dear Acting Attorney General Wilkinson:

Thank you in advance for your time. I am writing to you on behalf of PETA and our more than 6.5 million members and supporters worldwide to follow-up on our October 30, 2019, letter to then-Attorney General William Barr regarding disturbing taxpayer-funded awards issued by the Federal Bureau of Investigation (FBI) and the United States Marshals Service (USMS) for cruel and deadly trauma training drills on animals (otherwise known as live tissue training or LTT), in which live animals are typically shot, stabbed, dismembered and killed.

More than 86,000 concerned individuals have called for an end to LTT.[1] In light of new studies confirming the validity and superiority of advanced human patient simulators and perfused cadavers – as well as the apparent serious noncompliance with regulations by LTT contractors used by the DOJ, the U.S. Coast Guard's (USCG) ending of its LTT in favor of non-animal training methods, and the Department of Defense's requirement to now use simulators "to the maximum extent practicable"[2] – we urge you to permanently end the DOJ's use of animals in all trauma training.

Please find enclosed our briefing on this topic that details the DOJ's use of animals for LTT and the scientific, ethical, and fiscal justifications for ending this practice, which the U.S. Defense Health Agency criticized as being "outdated and cost-prohibitive"[3] and "not anatomically accurate,"[4] and which the then-USCG Commandant in 2017 deemed to be "abhorrent."[5]

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[1] PETA. PETA to Department of Justice: End Gruesome Trauma Training on Animals. https://support.peta.org/page/14376/action/1?locale=en-US

[2] Crist, C. 2018, October 11. *Doctors move away from using live animals for trauma surgery training*. Reuters. Retrieved from https://www.reuters.com/article/us-health-trauma-training-animals/doctors-move-away-from-using-live-animals-for-trauma-surgery-training-idUSKCN1ML2LE

[3] Defense Health Agency. *2016 stakeholder report*. Retrieved from https://health.mil/Reference-Center/Reports/2017/06/08/Defense-Health-Agency-2016-Stakeholder-Report

[4] Defense Health Agency SBIR/STTR programs. 2017, May 16. *Seed Funding Health Technologies*. Retrieved from https://www.sbir.gov/sites/default/files/Master%20Health%20Technologies.National%20SBIR.pptx

[5] Seck, H. H. 2017, May 18. *Ending "abhorrent" live tissue training was right: Coast Guard*. Military.com. Retrieved from http://www.military.com/daily-news/2017/05/18/ending-abhorrent-live-tissue-training-was-right-coast-guard html

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Sincerely yours,

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cc: The Honorable Donald Washington, Director, USMS (donald.washington@usdoj.gov)
Carole O'Brien, Procurement Executive, USMS (carole.o'brien@usdoj.gov)
The Honorable Christopher Wray, Director, FBI (cawray@fbi.gov)
Johnny Cooper, Procurement Chief, FBI (jjcooper@fbi.gov)

Enclosure: Briefing Regarding Non-Animal Training Methods: Replacing Live Tissue Training (LTT) at the U.S. Department of Justice (DOJ)

Briefing Regarding Non-Animal Training Methods:
Replacing Live Tissue Training (LTT) at the U.S. Department of Justice (DOJ)

Prepared by: People for the Ethical Treatment of Animals (PETA)
February 8, 2021

2019 DOJ Awards for LTT, and Contractor Noncompliance

On February 11, 2020, PETA submitted a Freedom of Information Act (FOIA) request to the U.S. Department of Justice (DOJ) for pertinent records regarding the agency's cruel and deadly trauma training drills on animals (otherwise known as live tissue training or LTT) – in which live animals are typically shot, stabbed, dismembered and killed – and on February 13, 2020, MRUFOIA (within Logistics Management, Facilities and Administrative Services Staff, Justice Management Division) forwarded that FOIA request to the United States Marshals Service (USMS) and the Federal Bureau of Investigation (FBI) for response.

The DOJ's Douglas R. Hibbard (Chief, Initial Request Staff) replied to our February 11, 2020, FOIA request (reference number FOIA-2020-01645) on July 21, 2020, stating that they received 2 responsive pages of records from the USMS on July 20, 2020, but that DOJ is withholding them "in full pursuant to Exemption 5 of the FOIA, 5 U.S.C. § 552(b)(5), which pertains to certain inter- and intra-agency communications protected by the deliberative process privilege."[6] On information and belief, it appears that the USMS does hold responsive records that may not be included in the 2 responsive pages of records the USMS sent to the DOJ—given that, the USMS awarded $86,898.00 to The Tactical Development Group, LLC (dba Allegiance) for a contract from May 9, 2019, through September 30, 2019, for USMS Special Operations Group (SOG) Camp Beauregard to undergo "LTT for SOG New Operator Class (NOC) and SOG Mandatory recertification training (MRT)."[7] Per the U.S. Department of Agriculture's (USDA) website that lists registered research facilities that are permitted to conduct regulated activities (including LTT) on animals,[8] The Tactical Development Group, LLC and Allegiance do not appear to have any active USDA registrations and no indication is given that they are conducting LTT as part of another party's registration. If corroborated, this may violate the federal Animal Welfare Act.

The FBI's David M. Hardy (Section Chief, Record/Information Dissemination Section, Information Management Division) replied to our February 11, 2020, FOIA request (reference number 1460527-000) on February 24, 2020, stating that the FBI was "unable to identify records responsive to [PETA's] request."[9] However, on evidence and belief, it appears that the FBI does hold responsive records that we are seeking—given that, the FBI awarded $22,594.00 to Assessment and Training Solutions Consulting Corp. (ATSCC) for a contract awarded on from June 27, 2019 for "Tactical First Responder Training" for the agency's Counterterrorism Division (CTD) Fly Team (FTMU) agents,[10] which involved "live patient models" (e.g., animals) being subjected to harmful "battlefield injury scenarios."[11] In the written "justification" for this

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[6] Letter from DOJ to PETA, July 21, 2020.
[7] Record from USASpending.gov. https://www.usaspending.gov/award/88015821
[8] USDA APHIS (2021, January 25) *Active License Report for Web*. Retrieved from https://www.aphis.usda.gov/animal_welfare/downloads/List-of-Active-Licensees-and-Registrants.xlsx
[9] Letter from FBI to PETA, February 24, 2020.
[10] Record from beta.sam.gov. https://beta.sam.gov/opp/6eed46ef86ab6b49088caa35a4e88145/view
[11] FBI. *Justification for Limited Competition/Simplified Acquisition*. Retrieved from https://beta.sam.gov/api/prod/opps/v3/opportunities/resources/files/d11bba8976fb61f688e2bff409e18f84/download?api_key=null&status=archived&token=

award, the FBI stated that, "ATSCC is a USDA Class R research facility and for the past 10 years received no adverse action from the USDA."[12] However, ATSCC has been cited by the USDA multiple times for apparent violations of the federal Animal Welfare Act, including on January 19, 2011 (an "Official Warning"), August 14, 2014, and September 21, 2015. In 2015 following a PETA complaint, Virginia officials issued a cease-and-desist notice to ATSCC's CEO John Janota, stating he could longer use his property to conduct LTT since it isn't zoned for such activities.[13]

On August 7, 2020, PETA submitted a new FOIA request to DOJ regarding pertinent records regarding the agency's LTT. The DOJ's Hibbard replied to our August 7, 2020, FOIA request (reference number FOIA-2021-02510) on November 2, 2020, stating that, "Based on the information you have provided concerning contracts awarded by the Federal Bureau of Investigation (FBI) to the Assessment and Training Solutions Consulting Corp. and by the United States Marshals Service (USMS) to The Tactical Development Group, LLC, I suggest that you direct your request to the FBI and USMS as the Department components most likely to maintain the records you are seeking."[14] On August 14, 2020, the FBI's Michael G. Seidel (Section Chief, Record/Information Dissemination Section, Information Management Division) replied to our August 7, 2020, FOIA request (reference number 1460527-001) stating, "[W]e were unable to identify records responsive to your request."[15]

There is clear evidence – as we have detailed above – confirming that the USMS and FBI have awarded contracts for LTT, however they been reluctant to provide the specific responsive records we have requested. Nonetheless, it is evident that the DOJ and its component agencies have explicit involvement in LTT, and we urge the DOJ to ban the use of animals in this archaic and cruel practice.

Non-Animal Training Methods Are Widely Available, Validated, and Cost-Effective

Medical literature confirms the efficacy of human-simulation technology that is currently commercially available for replacing the use of animals in LTT. For example, there are numerous human-patient simulators – such as Simulab Corporation's TraumaMan,[16] Strategic Operations' Cut Suit,[17] CAE Healthcare's Caesar,[18] TraumaFX's Multiple Amputation Trauma Trainer,[19] Laerdal Medical's range of lifelike manikins,[20] the Advanced Modular Manikin,[21] Operative Experience's array of simulators for surgical training,[22] SynDaver's virtual patient simulation systems (VPSS) and whole body patient simulators (WBPS)[23] and others– that faithfully replicate human anatomy and physiology, can mimic trauma and haemorrhage in realistic situations, and can replace LTT exercises in full.

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[12] *Id*.
[13] Mather, M. 2015, November 25. *City leaders: Suffolk land cannot be used for military trauma training without proper permits*. Retrieved from https://wtkr.com/2015/11/25/city-leaders-suffolk-land-cannot-be-used-for-military-trauma-training-without-proper-permits/
[14] Letter from DOJ to PETA, November 2, 2020.
[15] Letter from FBI to PETA, August 14, 2020.
[16] Simulab Corporation. TraumaMan Surgical Simulator. http://www.simulab.com/product/surgery/open/traumaman-system
[17] Strategic Operations. Surgical Cut Suit. https://www.strategic-operations.com/Surgical-Cut-Suit-p/cs-surg.htm
[18] CAE Healthcare. CAE Caesar. https://caehealthcare.com/patient-simulation/caesar/
[19] Trauma F/X. Multiple Amputation Trauma Trainer (MATT). https://www.traumafx.net/multiple-amputation-trauma-trainer-matt/
[20] Laerdal Medical. Military Training Solutions. https://laerdal.com/us/support/ordering-shipping/military-customers/
[21] Advanced Modular Manikin. https://www.advancedmodularmanikin.com/
[22] Operative Experience. https://operativeexperience.com/
[23] SynDaver. https://syndaver.com/

Numerous studies have found that teaching emergency medical procedures and damage control surgery using human patient simulators or perfused cadavers is as good as or better than teaching them using animal-based laboratories.[24,25,26,27,28] A 2020 study published in *Trauma Surgery & Acute Care Open* examined the training of U.S. Navy and U.S. Army surgical teams using the human simulator Cut Suit.[29] The authors found that simulation training enhanced team performance, i.e. "improves surgical procedures and processes." The paper concludes, "High fidelity surgical simulation equipment such as the … 'Cut Suit' combined with highly realistic replicated settings will allow surgical trauma teams to improve their lifesaving skills and teamwork communication to maximize successful patient outcomes. High fidelity, highly realistic, immersive and stress-provoking surgical trauma training is now an option to improve the readiness and capabilities of trauma teams."[30] These tools offers trainees "advanced realism and detailed/functional anatomic/physiologically real training models,"[31] and empowers them to build confidence and effectively manage stress. Such approaches are also more relevant to the real life experiences of trauma care in the clinical setting.

Indeed, studies have found that these methods better equip trainees with the technical skills and psychological preparedness necessary to treat traumatic injuries.[32,33] They are also more cost-effective because they are reusable, shareable, and do not require the extensive resources associated with constantly purchasing animals. Importantly, there are no studies showing that animal use is superior to using human patient simulators or cadavers for teaching trauma management skills. A 2014 letter published in the journal *Military Medicine* by a surgeon in the U.S. Air Force states, "We have entered into an age where artificial simulator models are at least equivalent to, if not superior to, animal models."[34]

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[24] Ali, J., Sorvari, A., & Pandya, A. (2012). Teaching emergency surgical skills for trauma resuscitation-mechanical simulator versus animal model. *ISRN Emergency Medicine, 2012*.

[25] Sergeev, I., Lipsky, A. M., Ganor, O., Lending, G., Abebe-Campino, G., Morose, A., ... & Glassberg, E. (2012). Training modalities and self-confidence building in performance of life-saving procedures. *Military medicine*, *177*(8), 901-906.

[26] Bowyer, C. M. W., Liu, A. V., & Bonar, J. P. (2005). Validation of SimPL-a simulator for diagnostic peritoneal lavage training. *Studies in health technology and informatics*, *111*, 64-67.

[27] Sweet R. (2014). *Comparing Live Animal and Simulator Alternatives for Training and Assessing Hemorrhage and Airway Procedures in a Tactical Field Situation* [presentation]. Fort Lauderdale, Fla.: Military Health System Research Symposium.

[28] Savage E. (2014). *A Comparison of Two Medical Training Modalities for CAF Medical Technicians: Live Tissue Training and High Fidelity Patient Simulator* [presentation]. Fort Lauderdale, Fla.: Military Health System Research Symposium.

[29] Strategic Operations. Surgical Cut Suit. https://www.strategic-operations.com/Surgical-Cut-Suit-p/cs-surg.htm

[30] Hoang, T.N., LaPorta, A.J., & Malone, J.D., et al. (2020). Hyper-realistic and immersive surgical simulation training environment will improve team performance. *Trauma Surg Acute Care Open, 5*(1), e000393.

[31] Kirkpatrick, M. A. W., LaPorta, A., Brien, S., Leslie, T., Glassberg, C. E., McKee, J., ... & Tien, C. H. (2015). Technical innovations that may facilitate real-time telementoring of damage control surgery in austere environments: a proof of concept comparative evaluation of the importance of surgical experience, telepresence, gravity and mentoring in the conduct of damage control laparotomies. *Canadian Journal of Surgery*, *58*(3 Suppl 3), S88.

[32] Sergeev, I., Lipsky, A.M., & Ganor, O., et al. (2012). Training modalities and self-confidence building in performance of lifesaving procedures. *Mil Med, 177*(8), 901-906.

[33] Bowyer, C.M., et al. (2011). Validation of SimPL – a simulator for diagnostic peritoneal lavage training. *Studies in Health Technology and Informatics, 111*, 64–7.

[34] Hall, A. (2014). Letter to the editor. *Military Medicine, 179* (7), vii.

In 2020, researchers published a study in the journal *Injury*, stating, "We have demonstrated an ability to recreate highly realistic injuries in an ultra-high-fidelity simulation of a multiply injured military casualty. There was a measurable increase in confidence for both technical skills in all major body areas, and non-technical skills."[35]

Below are some of the superior non-animal trauma training methods along with relevant efficacy studies.

Human Worn Partial Task Surgical Simulator (Cut Suit)

- A 2015 review article found that the Human Worn Partial Task Surgical Simulator (Cut Suit) "is a realistic surgical training tool that allows for the simulated performance of actual surgical procedures" and, "In addition to perfused extremities, the Cut Suit also has perfused internal organs that may be accessed through the abdominal wall and can be incised to bleed and repaired or excised to control hemorrhage. The Cut Suit is regularly being upgraded and in the near future will be equipped with specific in-line flow sensors that will permit an accurate calculation of simulated blood loss during different procedures and situations and with different surgeons."[36]
- A 2017 study stated, "Remote damage control resuscitation (RDCR) endeavours to rescue the most catastrophically injured, but has not focused on prehospital surgical torso hemorrhage control (HC). … A surgical simulator was customized with high-fidelity intraperitoneal anatomy, a 'blood' pump and flowmeter. A standardized HC task was to explore the simulator, identify 'bleeding' from a previously unknown liver injury perfused at 80 mm Hg, and pack to gain hemostasis. Ten surgeons performed RDCR laparotomies onboard a research aircraft, first in 1g followed by 0g. The standardized laparotomy was sectioned into 20-second segments to conduct and facilitate parabolic flight comparisons, with 'blood' pumped only during these time segments. A maximum of 12 segments permitted for each laparotomy. … Performing laparotomies with packing of a simulated torso hemorrhage in a high-fidelity surgical simulator was feasible onboard a research aircraft in both normal and weightless conditions."[37]

High-Fidelity Human Cadaver Models

- The "Major Incident Surgical and Trauma Teams" (MISTT) Trauma Course, held at Queen Elizabeth Hospital Birmingham (UK) and supported by the UK National Health Service, states that, "Delegates will benefit from a three day cadaveric course, focusing on damage control of all cavities and extremities in Trauma, together with two days of discussion, lively debate and case studies."[38] In private communication with the PETA Foundation, the MISTT Trauma Course confirmed that it "do[es] not use any cadaveric or anaesthetised models, tissue or other samples derived from animals" and that they are going to be "using silicone anatomical models such as

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[35] A. Beaven, D. Griffin and H. James, Highly realistic cadaveric trauma simulation of the multiply injured battlefield casualty: an international, multidisciplinary exercise in far-forward surgical management, Injury, https://doi.org/10.1016/j.injury.2020.09.023

[36] Kirkpatrick, M. A. W., et al, 2015.

[37] Kirkpatrick, A. W., McKee, J. L., Tien, H., LaPorta, A. J., Lavell, K., Leslie, T., ... & Franciose, R. (2017). Damage control surgery in weightlessness: A comparative study of simulated torso hemorrhage control comparing terrestrial and weightless conditions. *Journal of trauma and acute care surgery*, *82*(2), 392-399.

[38] The MISTT Trauma Course. Retrieved from https://www.mistt.co.uk

supplied by TraumaSimU Ltd," which is the Surgical Anatomical Model (SAM).[39] Regarding the SAM model, Surgeon Vice Admiral Alasdair Walker (former Surgeon General of the UK Defence Medical Services) and his colleagues in the Royal Army Medical Corps and the Royal Navy stated in a 2016 study: "During damage-control surgery using the SAM, the materials and anatomical details have simulated human blast injury with fidelity that may be superior to cadaveric and animal models … ."[40]

- A 2018 study from the U.S. Navy Trauma Training Center stated: "[O]ur military trauma training site now utilizes a novel ventilated and pressurized cadaver model for training and evaluation of forward surgical teams (FST). FSTs attend a 4-day damage control course including didactics and cadaveric dissection focused on trauma exposures, damage control vascular and orthopedic procedures. A capstone half-day simulation pairs the perfused cadaver model with conventional simulation to involve the entire surgical team in four sequential surgical scenarios that involve the chest, abdomen, and extremities, as well as airway management and resuscitation. Initial evaluations support the use of this novel perfused cadaver model for the training and evaluation of military FSTs. Preliminary data highlights the utility for open vascular, thoracic and other high acuity/low volume procedures critical to combat casualty care."[41]

Advanced Human Patient Simulators

- A study published in 2014 by a U.S. Air Force team in the journal *Military Medicine* compared the self-efficacy reported by military trainees taught emergency procedures on human simulators versus live animals and found equivalent results in both groups, concluding that "if 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."[42] The author published a separate letter in the journal, stating, "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 arrive."[43]
- A 2015 study found that a human patient simulator is as effective as animal use during LTT in teaching trauma injury management to military medical technicians, and the researchers "found no difference in performance between medics trained on simulators versus live tissue models."[44]
- A 2015 study by one of the research teams that are part of the U.S. Combat Casualty Training Consortium stated that they "assembled a 'Frank N. Stein' model representing the best of

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[39] The MISTT Trauma Course. Private correspondence with PETA Foundation. 2019, October 16.

[40] Naumann, D. N., Bowley, D. M., Midwinter, M. J., Walker, A., & Pallister, I. (2016). High-fidelity simulation model of pelvic hemorrhagic Trauma: the future for military surgical skills training?. *Military medicine*, *181*(11-12), 1407-1409.

[41] Polk, T. M., Grabo, D. J., Minneti, M., Kearns, M. J., Inaba, K., Benjamin, E. R., & Demetriades, D. (2018). Initial Report on a Damage Control Surgery Course for Military Forward Surgical Teams Utilizing a Novel Perfused Cadaver Model for Training and Evaluation. *Journal of the American College of Surgeons*, *227*(4), e40.

[42]Hall, A. B., Riojas, R., & Sharon, D. (2014). Comparison of self-efficacy and its improvement after artificial simulator or live animal model emergency procedure training. *Military medicine*, *179*(3), 320-323.

[43]Hall A. (2014). Letter to the editor. Military Medicine; 179(7): vii.

[44] Savage, E. C., Tenn, C., Vartanian, O., Blackler, K., Sullivan-Kwantes, W., Garrett, M., ... & Tien, H. C. (2015). A comparison of live tissue training and high-fidelity patient simulator: a pilot study in battlefield trauma training. *Journal of Trauma and Acute Care Surgery*, *79*(4), S157-S163.

commercially available simulation. … For Airway, the SimMan 3G head/neck was selected as the nasopharyngeal airway and cricothyrotomy model. For chest tube and needle decompression, the Strategic Operations Cut Suit was selected. For hemorrhage, the KGS MATT was chosen as the only model that contained both junctional and amputation wounds with animatronics. An actor was trained and a platform was created to allow the head and arms of the actor to wear the cut-suit above the platform, with the actor's torso and legs below the MATT legs on the platform. Frank was dressed appropriately and moulage was applied to face, wounds, and amputated stump. … The actor could be switched out for the SimMan head/neck/torso for airway interventions. … 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."[45]

Anatomical Differences Between Species Restrict Transferability of Skills to Humans

There are significant differences in anatomical structures and vasculature between humans and animals. In trauma cases, where lifesaving decisions must often be made within seconds, familiarity with human anatomical structures is crucial. Animal models cannot accurately mimic human anatomy, and major anatomical variances exist between humans and animals due to the differences between the quadruped stance of animals and the bipedal stance of humans.

For example, humans' bipedal nature results in a thorax that is vertically oriented and appears quite different from other mammals. The pig heart, as it sits in the thorax, is rotated counterclockwise as compared to the human heart, resulting in different locations for key structures such as the left ventricle and atrium. The vasculature of the heart and lungs is also significantly different between pigs and humans, with pigs having a left azygous vein that drains into the coronary sinus and only two pulmonary veins in comparison with up to five in humans.[46]

Differences in other organs, such as the shape and arterial supply of the spleen,[47] orientation of the pelvis, and the shape of the liver[48] limit the realism and utility of animal models like the pig in surgical training. A 2016 study in the *Journal of the Royal Army Medical Corps* stated the following regarding the use of pigs: "Training courses based on animal models and cadavers have been used extensively to prepare surgeons for deployment in recent conflicts. However, they are expensive and provide a one-off opportunity to practice advanced techniques in models that are either anatomically incorrect (pigs) or have altered tissue characteristics with no vascular perfusion (cadavers). [Instead, a]bdominal multivisceral organ retrieval [in clinical settings] is the ultimate laparotomy and takes the surgeon to parts of the retroperitoneum and thorax otherwise not seen during standard surgical training."[49]

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[45] Reihsen, T., Speich, J., Ballas, C., Hart, D., & Sweet, R. (2015). Creation of a multi-trauma patient using current technology based simulators. *Academic Emergency Medicine, 22*.

[46] Lelovas, P.P., Kostomitsopoulos, N.G., & Xanthos, T.T. (2014). A comparative anatomic and physiologic overview of the porcine heart. *Journal of the American Association for Laboratory Animal Science, 53*(5), 432–438.

[47] Pereira-Sampaio, M.A., Marques-Sampaio, B.P. (2006). Anatomical study and proportional analysis of the pig spleen arterial segments. *Cells Tissues Organs, 182*(1),32-34.

[48] Nykonenko A, Vávra P, Zonča P. Anatomic peculiarities of pig and human liver. (2017). *Exp Clin Transplant, 15*(1), 21-26.

[49] O'Reilly, D., Lordan, J., Streets, C., Midwinter, M., & Mirza, D. (2016). Maintaining surgical skills for military general surgery: The potential role for multivisceral organ retrieval in military general surgery training and practice. *J R Army Med Corps, 162*(4), 236-238.

Other trauma training courses forgo the use of animals and successfully provide realistic human simulations, including the Definitive Surgical Trauma Skills (DSTS) course. The Royal College of Surgeons of England describes this non-animal course wherein trainees "will learn how to make life-saving surgical decisions and perform damage control under pressure in a trauma and emergency environment." They further state- "Through practical workshops on unembalmed cadavers, you will learn surgical procedures to manage a broad range of trauma situations, as well as covering decision-making, epidemiology and emerging technologies."[50] Similarly, the Advanced Surgical Skills for Exposure in Trauma (ASSET) course – overseen by the American College of Surgeons – "uses human cadavers to teach surgical exposure of anatomic structures that, when injured, may pose a threat to life or limb. Key areas of exposure are neck, chest, abdomen and pelvis, and upper and lower extremities."[51] A study by the U.S. military examined data from 25 ASSET courses that included self-reported comfort levels with 25 specific skills, both before and after the course, and found that "[t]he ASSET course was well received and significantly improved self-reported confidence in the exposures needed to care for trauma in both surgical trainees and [practicing surgeons]."[52]

Researchers Call for Ending Unethical and Unrealistic Live Tissue Training

It is ethically wrong to subject live animals to traumatic injuries, especially when sufficient non-animal training methods exist and are already in use by other military medical programs.

A 2018 peer-reviewed study stated, "A close examination of the evidence base for the presumed advantages of LTT showed that it is not superior to simulation-based methods in terms of educational benefit. Since credible alternatives that do not cause harm to animals are available, we conclude that LTT on animal models is ethically unjustified."[53] A 2016 study regarding the use of animals in military LTT found "[t]here is a need to replace LTT with other educational methods such as simulation,"[54] and the authors cite growing concern for animal welfare, the problems with expensive purpose-built laboratories, and the fact that militaries from many countries do not use animals for medical training.

This use of animals is also highly unrealistic for teaching battlefield or severe trauma management, as the use of anesthesia invalidates live animals as realistic "models" for medical training. Animals under anesthesia do not experience stress or present symptoms of stress, e.g. elevated heart rate and blood pressure, hyperventilation, and more. These are important medical factors that could alter the course and procedures needed for managing trauma such as the speed of blood loss, medications needed, and other countermeasures that trainees need to learn. Intubated pigs attached to assisted breathing machines simply do not mimic actual war, terror, or emergency victims.

Simulating the stressful scenario is equally important from the trainees' perspective, and this can be provided by advanced human patient simulators. A 2018 study states: "High-fidelity simulation offers many advantages, including broad exposure to procedures, their complications, and the opportunity for

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[50] Royal College of Surgeons. (2014). Definitive Surgical Trauma Skills (DSTS). https://www rcseng.ac.uk/education-and-exams/courses/search/definitive-surgical-trauma-skills-dsts/.

[51] Center for Advanced Medical Learning and Simulation. Advanced Surgical Skills in Exposure in Trauma (ASSET). https://camls-us.org/courses-offered-at-camls/.

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[53] Rubeis, G., & Steger, F. (2018). Is live-tissue training ethically justified? An evidence-based ethical analysis. *Alternatives to Laboratory Animals*, *46*(2), 65-71.

[54] Silverplats, K., Jonsson, A., & Lundberg, L. (2016). A hybrid simulator model for the control of catastrophic external junctional haemorrhage in the military environment. *Advances in Simulation*, *1*(1), 5.

repetitious learning in a non-clinical setting. The stress of learners undergoing simulation events is a growing field of interest. Proponents of training with live-anesthetized animals argue the associated stress response cannot be equated with inanimate models, and therefore leads to an inferior learning experience with negative implications for future performance. … A randomized controlled study of 277 army combat medics was performed comparing procedural training and assessment on a live tissue (LT) goat model versus the best-in-class synthetic training models (STM). … No significant differences were seen for peak stress response of salivary cortisol or amylase, regardless of LT or STM method for training or assessment. In addition, the stress response did not correlate significantly with total performance score. … Synthetic models can produce a stress response equivalent to that of live tissue during simulation training. This is the largest study to date indicating synthetic models produce a sufficient immersive and realistic experience for trainees. … Stress inoculation while learning critical medical procedures can be achieved with synthetic models. Training programs may be able to reduce the use of live animals for training without sacrificing educational quality."[55]

It is more realistic to train on models that have correct human anatomy and are not intubated or anesthetized, and this can be achieved effectively and ethically using human patient simulation.

U.S. Coast Guard Ends LTT, DOD Mandates Non-Animal Training Methods

In 2017, the U.S. Defense Health Agency criticized the use of animals in military trauma drills as being "outdated and cost-prohibitive"[56] and "not anatomically accurate".[57] In 2017, U.S. Coast Guard Commandant Admiral Paul Zukunft told the U.S. Congress that the use of animals for military trauma training is "abhorrent" and that the Coast Guard "will move to a simulation [training model] . . . For us it will be the right thing to do to prepare our Coast Guard members who may be deployed to theaters where they may encounter traumatic injuries."[58] As such, the Coast Guard became the first branch of the U.S. military to end the use of animals for trauma training altogether. [59]

In 2018, the bipartisan John S. McCain National Defense Authorization Act (H.R. 5515) included a game-changing, first-of-its-kind restriction that requires the Department of Defense (DOD) to use medical-simulation technology in trauma-skills training "to the maximum extent practicable" before resorting to harming animals in the deadly drills.[60] This new provision now requires the DOD to focus on more effective, ethical, and economical human-simulation technology as the new gold standard of trauma training, rather than the decades-old practice of shooting, stabbing, dismembering, and killing thousands of pigs and goats each year, which will now be a secondary or non-essential element.

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[55] Keller, J., Hart, D., Rule, G., Bonnett, T., & Sweet, R. (2018). The physiologic stress response of learners during critical care procedures: live tissue vs synthetic models. *Chest*, *154*(4).

[56] Defense Health Agency. *2016 stakeholder report*. Retrieved from https://health mil/Reference-Center/Reports/2017/06/08/Defense-Health-Agency-2016-Stakeholder-Report

[57] Defense Health Agency SBIR/STTR programs. 2017, May 16. *Seed Funding Health Technologies*. Retrieved from https://www.sbir.gov/sites/default/files/Master%20Health%20Technologies.National%20SBIR.pptx

[58] Seck, H. H. 2017, May 18. *Ending "abhorrent" live tissue training was right: Coast Guard*. Military.com. Retrieved from http://www.military.com/daily-news/2017/05/18/ending-abhorrent-live-tissue-training-was-right-coast-guard.html

[59] Seck, H. H. 2018, March 20. *Coast guard puts permanent end to wounding animals for training*. Military.com. Retrieved from https://www.military.com/daily-news/2018/03/20/coast-guard-puts-permanent-end-wounding-animals-training html

[60] Crist, C. 2018, October 11. *Doctors move away from using live animals for trauma surgery training*. Reuters. Retrieved from https://www reuters.com/article/us-health-trauma-training-animals/doctors-move-away-from-using-live-animals-for-trauma-surgery-training-idUSKCN1ML2LE

Request to Prohibit LTT at DOJ

The DOJ should replace its use animals in LTT with superior and more cost-effective human simulation models. Such a move would bring the DOJ in line with growing medical consensus and the best practices of the nearly three-quarters of fellow NATO nations that do not use animals for military medical training.[61]

[61] Gala, S. G., Goodman, J. R., Murphy, M. P., & Balsam, M. J. (2012). Use of animals by NATO countries in military medical training exercises: an international survey. *Military medicine, 177*(8), 907-910.