

**Brief Regarding
Non-Animal Alternatives for
Advanced Trauma Life Support
(ATLS) Animal Teaching Lab**

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March 8, 2006

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I. Institutions Can Replace ATLS Animal Lab With Non-Animal Simulator

Instead of using animals in Advanced Trauma Life Support (ATLS) courses, an increasing number of ATLS instructors are opting for practical, didactic sessions in which all skills are taught using state-of-the-art human simulators, such as Simulab's TraumaMan—a system approved by the American College of Surgeons.

A. Scientific Studies Validate TraumaMan System

There is overwhelming scientific evidence showing that TraumaMan is a valid, reliable, and effective teaching model, especially with regard to teaching cricothyroidotomy—a core ATLS skill.

According to a study published in the November 2002 edition of the *Journal of the American College of Surgeons*: “Surgical skills training is an integral component of the Advanced Trauma Life Support (ATLS) Course. ... In the canine models, 47 necks with 52 attempted cricothyroidotomies were inspected and mapped by the investigators. Four specimens had multiple tracheotomy sites: three had two and one had three. If these multiple attempts are excluded from analysis, 13 of the 43 cricothyroidotomies in the canine models were misplaced (30.2%). ... It is imperative that cricothyroidotomy, a high-risk procedure, be taught in an appropriate model to best prepare students to perform it in a life-saving situation. Placement accuracy in canine models is low. Alternative models for teaching this procedure should be considered.”¹

Instead of using animals in ATLS courses, a study published in the February 2003 edition of *Anesthesiology* concludes: “Practice on mannequins leads 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 [seconds] or less. ... [T]he authors recommend that providers of emergency airway management be trained on mannequins for at least five attempts or until their cricothyroidotomy time is 40 [seconds] or less.”²

B. Non-Animal Methods Are Relevant, Reliable, and Reproducible

At the December 2002 forum held by the U.S. Medicine Institute for Health Studies, Dr. Alan Liu, project scientist for surgical simulation at the National Capital Area Simulation Center, said: “In the past, until recently, the traditional method for teaching ATLS involved animals and cadavers. For various reasons, that’s not really a very good method. Animals obviously have the wrong anatomy. Cadavers are extremely unremarkable and don’t do very much. If you train with animals all day long, at the end of the day you become very good at saving goats and pigs. You haven’t saved your first human yet.”³ Using a human patient simulator such as TraumaMan would obviously confer anatomical benefits that are lacking in nonhuman species.

C. TraumaMan Can Effectively Assess Surgical Residents’ ATLS Skills

Additionally, TraumaMan enables instructors to effectively assess surgical residents’ ATLS skills. In a September 2000 study published in the *Journal of Surgical Research*, researchers divided 32 postgraduate first-year surgical residents into two groups that

consisted of 16 people each. The researchers noted: “By use of a trauma mannequin, the 32 residents’ performances were scored using four trauma scenarios before 16 residents (ATLS group) completed a standard ATLS course. Performances were also scored after the ATLS course on another four trauma scenarios. The scores were standardized to a maximum of 20 for each scenario. Organized Approach scores with a range of 1 to 5, Priority scores ranging from 1 to 7, and global ratings of Honors, Pass, Borderline, or Fail were assigned for each clinical scenario.”⁴ After conducting their analyses, the researchers concluded: “Using a trauma mannequin, for assessment, surgical residents completing the ATLS course demonstrated superior resuscitation skills compared with a non-ATLS group.”⁵

D. There Is Scientific Consensus on the Effectiveness of TraumaMan

In correspondence from Dr. David Burris (military region chief of the American College of Surgeons Committee on Trauma and professor and interim chair of the Norman M. Rich Department of Surgery) dated July 7, 2005, Burris praised the TraumaMan model:

All who teach ATLS are now able to use the Simulab model. In fact, now all military ATLS courses use the Trauma Man. Several hundred courses have now been successfully taught in the military using this model. Over 30 at USU [Uniformed Services University] alone. ...

In addition to animal use issues, we have found that ... the “difficult to define something” that students seem to gain by working with tissue is offset by not having to explain the difference between goat and human anatomy [which] shortens the time necessary to teach the lab. We are also able to teach the skills in the “ABC” order, whereas with the animal model, you could only do the airway last, after sacrifice, since [the animals] needed to be on the ventilator for the other procedures.⁶

In a summer 2005 issue of the Association for Surgical Education’s *Focus on Surgical Education*, Dr. Alan Marr of the Louisiana State University Health Science Center affirmed the importance and necessity of TraumaMan: “[TraumaMan] allows for training in medical situations that include patient safety. In a group setting it also provides a method for team building which is an important part of the ACGME core competencies with respect to communication skills and patient care. ... Surgical simulators teaching everything from basic skills to advanced laparoscopic operations should be used to teach necessary skills prior to first use on patients. No house officer should be performing an elective procedure ... which has not been perfected in the simulation lab. This plan would reduce errors and improve patient care.”⁷

Additionally, in the July 2002 issue of *Surgeons News*, Dr. Richard Fantus, chair of the Chicago Committee on Trauma, stated, “The Trauma Man simulator has been utilized in two recent courses and received high evaluation marks from participants.”⁸

Joining Fantus in his praise and adoption of TraumaMan are such prestigious organizations as Beth Israel Deaconess Medical Center (a major teaching affiliate of

Harvard Medical School), Virginia Commonwealth University's Center for Trauma and Critical Care Education, Emory Healthcare, George E. Moerkirk Emergency Medicine Institute, University of Missouri-Columbia's Department of Surgery, EMS & Trauma Systems Section for the state of Montana, Arkansas Trauma Education, Strong Regional Trauma Center, Ohio Valley Medical Center, and Christiana Care Health System.

E. Leading Organizations Have Publicized Their Approval of TraumaMan

Four prominent organizations—the University of Washington, the Charles R. Drew University of Medicine and Science, Iowa Health-Des Moines, and Scott & White Memorial Hospital—are worth mentioning because they have publicized their approval of TraumaMan as an acceptable alternative to the use of animals, and as such, they have ended their use of animals in ATLS courses.

On August 8, 2005, John Coulter (associate vice president for medical affairs at the University of Washington) wrote the following to us:

I want to assure you that the University's Institutional Animal Care and Use Committee (IACUC) requires, per federal policy and law, that potential alternatives to the use of live vertebrate animals be used whenever they are available and will serve the necessary purpose.

I have consulted with the Director of the University's Office of Animal Welfare, Dr. Nona Phillips, and she has informed me that the University ATLS course has not used animals since September 2002. In fact, the University of Washington was a trial site for the use of the TraumaMan system in this course. The TraumaMan system was utilized in the course taught in November 2002 and the IACUC protocol was subsequently archived since the system was deemed an acceptable alternative to the use of animals.⁹

In the Charles R. Drew University of Medicine and Science's "Vivarium Manual," Dr. Adeleh Esfandiari (chair of the university's institutional animal care and use committee) discussed the university's adherence to federal law regarding the use of animals in its ATLS course:

[T]he Vivarium Director provided training for 'Advanced Trauma Life Support' (ATLS), a course for interns and residents of Emergency Medicine at the King Drew Medical Center. This course involved different surgical procedures performed on a variety of species of animals such as dogs and pigs. The use of these animals for ATLS course was terminated in 2003 because of [Public Health Service] regulations for availability of non-animal modules as an alternative replacing the usage of live animals for this course.¹⁰

In correspondence from Esfandiari dated July 12, 2005, she noted: “The American College of Surgeons which oversees the ATLS course for trauma medicine training approved using a simulation model as a non-animal alternative. This was introduced to us by USDA [United States Department of Agriculture]. We use these mannequins.”¹¹

Also, on August 3, 2005, Sid Ramsey, vice president of business development and marketing at Iowa Health-Des Moines, wrote to us:

I am pleased to tell you that TraumaMan® will be used in our next ATLS classes which are scheduled for October 13 and 14, 2005. Animals will no longer be used for teaching ATLS at Iowa Health-Des Moines. Thank you again for taking the time to write us and share this important information. At Iowa Health-Des Moines, we are always looking for ways to improve our approach to teaching and TraumaMan is just such an example.¹²

Finally, on January 16, 2006, Dr. Lee Ogburn-Russell, associate executive director at Scott & White Memorial Hospital, wrote to us:

[T]he Trauma Man System has been evaluated ... and will be incorporated into our existing program as soon as possible. We are arranging the funding and curriculum revisions necessary to incorporate this technology to replace our ... use of pigs in ATLS training.¹³

II. The Bottom Line

According to Policy #12 in the United States *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.”¹⁴ The TraumaMan simulator has proven to be an effective, reliable, and validated model, and it should be used in place of animals for all ATLS courses.

¹Mary McCarthy *et al.*, “Accuracy of Cricothyroidotomy Performed in Canine and Human Cadaver Models During Surgical Skills Training,” *Journal of the American College of Surgeons* 195.5 (2002): 627-9.

²David Wong *et al.*, “What Is the Minimum Training Required for Successful Cricothyroidotomy?: A Study in Mannequins,” *Anesthesiology* 98.2 (2003): 349-53.

³U.S. Medicine Institute for Health Studies, “Computers, Robots and Cyberspace: Maximizing the Cutting Edge,” 3 Dec. 2002, 30 Oct. 2005 <<http://www.usminstitute.org/1002forumtranscript.pdf>>.

⁴Jameel Ali *et al.*, “Trauma Mannequin Assessment of Management Skills of Surgical Residents After Advanced Trauma Life Support Training,” *The Journal of Surgical Research* 93.1(2000): 197-200.

⁵Ali *et al.*

⁶David Burris, “RE: Question About USU’s ATLS Course,” e-mail to member of the public, 7 Jul. 2005.

⁷Alan Marr, “The Future of Surgical Education,” *Focus on Surgical Education* 22.3 (2005): 17-8.

⁸Richard Fantus, “Chicago Committee on Trauma,” *Surgeons News* Jul. 2002, 30 Oct. 2005 <<http://www.facs.org/chapters/mccacs/news/download/newsletter02July.pdf>>.

⁹John A. Coulter, letter to the author, 8 Aug. 2005.

¹⁰Adeleh Esfandiari, "Vivarium Manual," Apr. 2004. 30 Oct. 2005.

¹¹Esfandiari, "RE: Question About ATLS Course," e-mail to member of the public, 12 Jul. 2005.

¹²Sid Ramsey, letter to the author, 3 Aug. 2005.

¹³Lee Ogburn-Russell, letter to the author, 16 Jan. 2006.

¹⁴Animal and Plant Health Inspection Service, "Alternatives to Painful Procedures," 21 Jun. 2000, 1 Nov. 2005 <<http://www.aphis.usda.gov/ac/policy/policy12.pdf>>.