

Alternatives in Veterinary Surgery Training

Cadavers

Abstract:

Cadavers of nonhuman animals are used to develop a variety of surgical skills. The source of the cadaver is important if one is proposing an alternative for moral or ethical reasons.

Published Material:

Carpenter LG, Piermattei DL, Salman MD, Orton EC, Nelson AW, Smeak DD, Jennings PB, Taylor RA: A comparison of surgical training with live anesthetized dogs and cadavers. *Veterinary Surgery* 20:373-378, 1991.

“No statistically significant difference could be detected between the two groups [of students, with respect to skill, outcome].”

Pavletic MM, Schwartz A, Berg J, Knapp D: An assessment of the outcome of the alternative medical and surgical laboratory program at Tufts University. *Journal of the American Veterinary Medical Association* 205(1):97-100, 1994 (1 July).

“Our results suggest that use of cadavers during the third-year laboratory program, when supplemented with additional clinical training during the fourth year, can provide training comparable to that provided in a conventional laboratory program.”

Surgical procedures assessed through the survey were: Ovariohysterectomy, Castration, Laceration Abscess, Laparotomy, Gastrotomy, Eyelid surgery, Cystotomy, Intestinal anastomosis, Splenectomy, Gastric torsion/Gastropexy, Simple fracture repair, Cast/Splint application, Thoracotomy, Other.

White KK, Wheaton LG, Greene SA: Curriculum change related to live animal use: A four-year surgical curriculum. *Journal of Veterinary Medical Education* 19(1):6-10, 1992.

“The small animal surgical faculty have noted that students from the alternative surgical laboratory program are more timid and hesitant the first time they incise living tissue. This hesitancy is only apparent on the first live tissue surgery. In all other segments of the fourth-year small animal surgery and anesthesia rotations, including patient care, the alternative students perform on par with the students from the standard laboratory experience.”

Models/Simulators

The items in this category are numerous. The following are some good examples.

DASIE™ (Dog Abdominal Surrogate for Instructional Exercises)

Abstract:

DASIE was created to facilitate the development of some of the psychomotor skills required to perform clinical surgery. This model is used as an alternative to live animals for teaching sterile technique, surgical draping, instrument handling, suture patterns, abdominal surgery in general,

and gastrointestinal and urogenital surgical procedures in particular. The outer and inner fabric layers, and laminated middle layers, are reinforced to resist cutting, respond to surgical instruments, and hold suture much like living cutaneous and fascial tissues. The internal tube of 'bowel' facilitates the practice of suture patterns that are used during gastrointestinal and urogenital surgical procedures.

Contact Information:

David L. Holmberg
DASIE International
292 South River Road
RR #2
Elora, Ontario NOB 1S0
Canada
Fax: 519-846-8960
E-mail: dholmberg@ovcnet.uoguelph.ca

Published Material:

Holmberg DL, Cockshutt JR, Basher AWP: Use of a Dog Abdominal Surrogate for Teaching Surgery. *Journal of Veterinary Medical Education* 20(3):107-111, Fall 1993.

"The results of the questionnaire confirm the impression of the faculty and staff who participated in the training sessions that the DASIE functioned well as an intermediate step between the single layer foam block and the animal. The multiple layers of laminated fabric and foam rubber respond to surgical instruments much like the tissues of the canine abdomen. The layered outer wall and internal tube of "bowel" permit students to practice the various suture patterns used clinically for abdominal, gastrointestinal and urogenital procedures. The "blood vessels" between the layers give the students practice at grasping and ligating specific points of tissue. Because the welfare and survival of the patient is not an issue, the use of the surrogate helps reduce the apprehension that most students feel when first attempting surgery on live animals.

"As a surrogate, the DASIE was well received by students. We consider them to be an effective, low stress method of preparing for live animal surgery. Its use has reduced the need for animals in teaching abdominal surgery. This follows the philosophical trend of today's society in its demands for non-living teaching models. We suggest the use of an abdominal surrogate as an aesthetically acceptable alternative to live animal or cadaver surgery for some introductory surgical laboratories."

Accent on an Alternative: DASIE™. *Alternatives in Veterinary Medical Education Newsletter* 2:2-3 1996.

"The Dog Abdominal Surrogate for Instructional Exercises (DASIE)™ is a nonanimal surrogate for teaching the basic principles of abdominal surgery. Use of the model has reduced the need for live animals at several institutions and follows the trend of today's society in its demands for nonliving teaching models..."

Sawbones® Veterinary Bone Models

Abstract:

Sawbones® have been developed specifically for use in motor skills exercises where a realistic bone specimen is required, providing a working model for various orthopaedic operations. Veterinary students or veterinarians that wish to practice a new or difficult procedure can perform it first on a Sawbones®. Canine, equine, and bovine models are available and can be ordered to your specifications.

Contact Information:

Pacific Research Laboratories
P.O. Box 409
Vashon, WA 98070
206-463-5551
e-mail: info@sawbones.com
Web site: <http://www.sawbones.com>

Published Material:

DeYoung DJ, Richardson DC: Teaching the Principles of Internal Fixation of Fractures With Plastic Bone Models. *Journal of Veterinary Medical Education* 14(1):30-31, Spring 1987.

“...it is our opinion that the student’ self-confidence is greatly increased after working with the plastic models. Their motor skills and comprehension of the biomechanical principles of fracture fixation and implant application are superior to those resulting from the use of live animal laboratories only...”

Accent on an Alternative: Sawbones®. *Alternatives in Veterinary Medical Education Newsletter* 5:2 1997.

“The advantages of Sawbones are numerous. Live-animal laboratories do not provide enough hands-on exposure or time for students to develop the necessary motor skills and experience for orthopedic surgery...”

“Sawbones are cost efficient when compared with live-animal purchases...”

“Sawbones are easier to obtain than live nonhuman animals.”

“Most important, Sawbones reduce the number of live nonhuman animals needed for surgical instruction.”

Sharpoint® PracticeRat™

Abstract:

Sharpoint® PracticeRat™ is a realistic simulator used to teach basic microsurgical skills, keep surgeons ‘current,’ and monitor their skills on an ongoing basis. This simulator uses materials from the thermoset polyurethane family molded to exactly match the rat’s leg vessels. Dyes and particulate matter are used to further increase realism. The ‘artery’ and ‘vein’ have an outer covering (adventitia) and both are approximately one millimeter in diameter. Proprietary pumps and purpose-built controllers are programmed to deliver ‘blood’ in pulses and at pressures

equivalent to those in the rat femoral artery. The venous circulation is simulated by using alternative circuitry in the controller. A simulated muscle bed for the vessel simulations is provided by proprietary fiber products that retain artificial blood very well, resulting in a realistic environment. Teaching units consist of a vein and artery running parallel, assembled in Petri dishes. The lid prevents desiccation, allowing the device to be used on successive days, unlike a live rat. The configuration allows all the usual microvascular training. Nerve simulation is also possible.

Contact Information:

Surgical Specialties Corporation
100 Dennis Drive
Reading, PA 19606
Phone: 610-404-1000 800-523-3332
Fax: 610-404-4010
E-mail: info@surgicalspecialties.com
Web site: <http://www.surgspec.com>

Simulator/Media Based Teaching of Basic Surgical Skills (Hemostasis-Ligature Placement)

Abstract:

A simple model for teaching basic hemostasis technique. Uses a foam pad with a v-shaped trench cut in surface to simulate a surgical incision and red ribbon to simulate bleeding vessels.

Contact information:

Daniel D. Smeak, D.V.M.
Professor and Head, Small Animal Surgery
Department of Veterinary Clinical Sciences
College of Veterinary Medicine
The Ohio State University
1900 Coffey Road
Columbus, OH 43210
614-292-3551
E-mail: smeak.1@osu.edu

Published Material:

Smeak DD, Beck ML, Shaffer CA, Gregg CG: Evaluation of Video Tape and a Simulator for Instruction of Basic Surgical Skills. *Veterinary Surgery* 20(1):30-36, January-February 1991.

Skin and Suture Pattern Simulator

Abstract:

The Skin and Suture Pattern Simulator was developed to begin teaching eye-hand coordination, suture patterns, and early wound closure principles. It was specifically designed to simulate skin to help demonstrate how tissues respond to suture patterns, and for teaching basic suture and instrument handling skills.

Contact information:

Daniel D. Smeak, D.V.M.
Professor and Head, Small Animal Surgery
Department of Veterinary Clinical Sciences
College of Veterinary Medicine
The Ohio State University
1900 Coffey Road
Columbus, OH 43210
614-292-3551
E-mail: smeak.1@osu.edu

Published Material:

Smeak, DD: Accent on an Alternative: Skin and Suture Pattern Simulator. *Alternatives in Veterinary Medical Education Newsletter* 10:2-3, January 1999.

“Use of simulators have distinct advantages over traditional laboratories that use cadavers or live animals. Ethical, cost-effective, and portable simulators are provided along with autotutorial lessons for each student to use when and where they choose. Thus, practice time can be tailored to the individual student. Some students without prior surgical experience or tuned psychomotor skills may require more time or repetitions to become adept at a skill. In most traditional surgery laboratories, only one animal is provided for three or more students, and the exercise is conducted only during specific supervised laboratory settings. Time restrictions and the laboratory environment may not be as conducive for learning for some students. Simulators allow repetitive practice and this helps strengthen motor skills and increase confidence and efficiency.”

Spay/Neuter Programs

Abstract:

Spay/Neuter Programs are those that obtain primarily dogs and cats from an animal shelter or humane society, have veterinary students perform an ovariohysterectomy or castration, recover the animal from surgery, and then return them to the animal shelter or humane society for adoption. This not only provides the veterinary student with an excellent opportunity to apply their surgical skills, it is also a tremendous contribution to the community in curbing the pet overpopulation problem.

Published Material:

Fingland, R: After Alternatives: Comparison of Skills Oriented and Procedure Oriented Junior Surgery Laboratory Curriculum. *Alternatives in Veterinary Medical Education Newsletter* 10:1,6, January 1999.

“Dr. Fingland: Students in the “new” curriculum were superior in the performance of the ovariohysterectomy and in some aspects the lateral ear canal resection. Most importantly, the “new” curriculum did not compromise the education of veterinary students but provided a better way to teach surgical skills. The feed back that we have received from clinicians is that the students in the “new” curriculum are better prepared to perform surgery in their senior year.”

Maki, B: Physicians Committee for Responsible Medicine.

"It has been documented (Janis and Mann 1977) that psychological distress, such as that experienced by many veterinary students in 'animal labs', can result in decreased observational and cognitive functions; the use of non-patient animals in veterinary education may therefore result in decreased learning.

"Finally, use of non-patient animals in veterinary medicine may decrease students' abilities to be compassionate and empathic. It has been documented in a variety of situations that exposure to violence or other aversive stimuli leads to desensitization; 'animal labs' may desensitize students to animal suffering."

Videodisc

Use of Three-Dimensional Imaging and Interactive Videodisc as an Alternative Method of Teaching Surgery

Abstract:

This is a research project to develop this surgical training alternative, funded by the Demeter Fund, which is administered by the American Anti-Vivisection Society.

Contact Information:

Karl H. Kraus, D.V.M.
Associate Professor
Department of Clinical Sciences
School of Veterinary Medicine
Tufts University
200 Westboro Road
North Grafton, MA 01536-1895
Phone: (508) 839-5395 Ext. 84659
Fax: (508) 839-7922
E-mail: karl.kraus@tufts.edu

Published Material:

Kraus, KH: Use of Three-Dimensional Imaging and Interactive Videodisc as an Alternative Method of Teaching Surgery. *The AV* 101 (8):17-18, 1993 (September).

"In 1990 the Demeter Fund funded Dr. Kraus's initial efforts to produce three-dimensional computer graphic programs suitable for training veterinary students. That work was successful, and the developed programs are now used in several veterinary schools. Learning surgical techniques requires the ability to visualize three-dimensional concepts (i.e., anatomy is not two-dimensional). Dr. Kraus's current proposal will prepare a complete computer/videodisc presentation on the hind limb of the dog that can be used in all veterinary schools and replace the currently used live animal demonstrations. This technology can also be used to produce similar programs for other species of animals (including humans) and a variety of diagnostic and surgical procedures.

"Tufts University School of Veterinary Medicine was one of the first to make a firm commitment to provide an 'alternatives' educational curriculum for students who requested it. Recent post-graduate evaluations have shown that students trained using such alternatives

had no significant differences in regard to their skills, abilities, attitudes or confidence, from students who chose the more traditional vivisection experiences.”

Videotapes

The items in this category are numerous. The following are some good examples.

Exploratory Celiotomy Video

Abstract:

This program presents a step-by-step demonstration for incision and exploration of the canine abdomen. The surgery is supported by a review of the corresponding anatomy.

Catalog No.: 9863-1

Contact Information:

University of California, Davis
School of Veterinary Medicine
Dean's Office – Academic Programs
One Shields Avenue
Davis, CA 95616
Phone: (530) 752-1324
E-mail: svmacadprog@ucdavis.edu
Web site: <http://www.calf.vetmed.ucdavis.edu/html/calf.html>

Ovariohysterectomy of the Dog Video

Abstract:

This video is a basic demonstration of technique, stressing anatomical structures. Comparative illustrations of anatomy highlight similarities and differences between the bitch and the queen.

Catalog No.: 9864-2

Contact Information:

University of California, Davis
School of Veterinary Medicine
Dean's Office – Academic Programs
One Shields Avenue
Davis, CA 95616
Phone: (530) 752-1324
E-mail: svmacadprog@ucdavis.edu
Web site: <http://www.calf.vetmed.ucdavis.edu/html/calf.html>

Suture and Suturing Video

Abstract:

Suture materials are examined in detail, as are the needles to be used in various applications. Suture patterns are illustrated both in computer graphic sequences and in-vivo on the dog.

Catalog No.: 9862-3

Contact Information:

University of California, Davis
School of Veterinary Medicine
Dean's Office – Academic Programs
One Shields Avenue
Davis, CA 95616
Phone: (530) 752-1324
E-mail: svmacadprog@ucdavis.edu
Web site: <http://www.calf.vetmed.ucdavis.edu/html/calf.html>

Washington State University, Basic Surgical Techniques: Alternative Laboratory

Abstract:

Effective instruction and experience in basic surgical techniques is the goal of this course without resulting in the injury or death of healthy animals. The course takes place over a three-week time period. A special emphasis is placed on psychomotor skills throughout the course, including basic motor skills practice, hand ties, and instrument handling. Each morning the students attend the Psychomotor Skills Laboratory. The first week concentrates on surgical incision and dissection, hemostatic techniques, suture patterns and material, surgical preparation of equipment, patient and surgeon, gowning and gloving, patient assessment and restraint, and anesthesia. The second week involves performing surgeries on cadavers of animals who were euthanized on humane grounds due to injury or disease and then frozen until needed for the laboratory. The cadavers are obtained from the humane society or local practitioners. The week concludes with instruction on anesthesia in dogs and cats and pre- and post-patient assessment. The last week of the course involves ovariohysterectomies/castrations on dogs and cats obtained from the humane society. After appropriate post-operative care, these patients are returned to the humane society for adoption. In addition, plastic models are used to teach bandaging and casting techniques.

Contact information:

Christina Rockett
Washington State University
College of Veterinary Medicine
Pullman, WA 99164-7010
509-335-7070
E-mail: crockett@vetmed.wsu.edu

Published Material:

Accent on an Alternative: Alternative Surgery Laboratory at WSU Gets Rave Reviews.
Alternatives in Veterinary Medical Education Newsletter 16:1,5, January 2001.

“...I have found that I am vastly better trained after participation in your program than any of my peers are after having been trained here at CSU. There are a few factors that contribute to this difference. First, it was wonderful to be able to spend three weeks in an intense program, with the same students and instructors. Your program emphasized one correct way, and had the guts to stick by its principles, ensuring the students had a template upon which variations could be placed, but without which no foundation would be present.

“Another factor that, not surprisingly, contributed to the program being a success was allowing the students to take care of the animals, be responsible for their health and well-

being, pre- and post-surgery. All too often in a teaching institution the animal, sadly, becomes a byproduct instead of the end it should be. Students get so busy conducting themselves and the surgery in the proper fashion they forget the most important factor, the animal. You and the staff did an excellent job of keeping the focus on what was important, the animal. In the big picture, the best learning occurs when the student is held responsible not just for his skills, but for the health and well being of the animal upon which the treatment is being applied. It was an honor and a privilege to be able to learn principles on animals that were returned to society instead of being needlessly sacrificed.”