



Cornell University College of Veterinary Medicine

[Home](#) > [News](#) >

New simulation-based veterinary learning paradigm expands at Cornell

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What started with the world's first robotic rescue dog for medical training is evolving into a new teaching paradigm in veterinary medicine.

When bioengineer-turned-emergency-specialist Dr. Daniel Fletcher invented a sophisticated programmable dog simulator in 2010, it planted the seed of a teaching revolution at Cornell's College of Veterinary Medicine. Now as the College opens its first simulation center and develops new advanced pet simulators, it is expanding the simulation learning model throughout its curriculum and preparing tools for other institutions to follow suit.

Multi-room simulation center opens

Cornell's new simulation center grants space dedicated exclusively to simulation-based learning. It occupies a four-room suite in the College's former pathology wing, including two fully equipped exam rooms, two rooms for live video-feed observation and debriefing, and space for storage and developing new models, like a newly released robotic cat and a second more-advanced dog.



"Simulations like this have been used to teach human doctors for decades," said Fletcher, assistant professor of emergency and critical care (ECC). "The idea is to bridge preclinical lecture learning and actual clinical experience, letting students practice applying what they've learned in a safe setting before the stakes get high. The new center gives us much more room to work with."

In the ten-minute simulations, a small student team enters the exam room, collects basic patient info from the robotic dog or cat, assesses, plans, and treats. They can use a full crash cart, medical supplies, defibrillator, and other tools to take the robo-pet's pulse, listen to heart and lung sounds, insert catheters, and hook up monitoring devices to get feedback orchestrated through Fletcher's software. Others watch in the observation room, then all meet in the debriefing theater with a big projector screen split four ways (three exam room camera angles and the patient monitor data) to watch recordings and debrief.

The center is part of a greater plan to form a clinical skills complex: a self-paced multi-station lab open 24/7. Students will have access to direct hands-on practice with basic skills like suturing on skin models or putting catheters into fake limbs before labs or clinics.

Simulations in Cornell's veterinary teaching



Simulations are quickly weaving into Cornell's curriculum: First-year students now practice listening to heart and lung sounds on the robo-dog and cat. Second and third-year students started performing scenarios in required core classes this year. Students role-playing with actors in the required client communications class now get a mock patient thrown in the mix. They take cases from start to finish and juggle assessing a patient while communicating with technicians, clients, and other clinicians in the same room.

Preparing to expand the learning model further, ECC specialist Dr. Gretchen Schoeffler and an ECC resident will attend formal trainings on running simulations before offering a new ECC course in Spring 2013 in which they will conduct a formal study evaluating the effectiveness of simulation-based veterinary teaching. Meanwhile Fletcher is developing new simulation-based tools for the clinical competency assessments students must complete before earning a DVM.

New tools empower learners beyond Cornell

Other institutions are eager to explore the new paradigm. Fletcher has brought his robo-dog to curious schools across the country and world. To meet the demand at Cornell and beyond, he is building a second, more advanced model code-named "Butch." Butch is being designed to use inexpensive, off-the-shelf electronic components and sports a more realistic airway, a soft abdomen compartment, articulating joints, more areas for catheters, more space inside the body, and a more realistic overall feel.

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“No other schools are using this kind of simulation yet,” said Fletcher. “Our model can enhance CPR scenarios and can simulate a slew of other conditions, and we’ve seen interest in it growing. We’re gathering evidence and tools to help bring the simulation capability and teaching model outside Cornell.”

Fletcher and information-technology collaborators are working on a new simulation toolkit for veterinary education. The framework will include an open-source software platform with affordable hardware that can be shared with other institutions interested in introducing simulation teaching. It is slated for release in Spring 2013.