Alternatives to Live Animal Laboratories

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The use of live animal laboratories to demonstrate basic physiology and pharmacology is an issue of great concern for many medical students. While approximately three-quarters of all medical schools in the United States have eliminated these exercises, they remain—usually as optional activities—at the remainder. In the typical first- or second-year live animal laboratory, students observe the effects of various drugs on an anesthetized dog and then kill the animal.

A recent study found that nearly a quarter of medical students object to "dog labs" and that the number of students who are uneasy about the use of animals "tends to be larger than the number who express these feelings to faculty."[1] Indeed, another study found that "only a small number of students unequivocally claimed that they had no uneasiness about experimenting on dogs."[2] Taking part in the procedure apparently does not alleviate that uneasiness. In one case, the percentage of students believing the laboratory "involved a morally wrong use of animals" was twice as high after completion of the exercise than it was in the pre-laboratory survey.[1]

The American Medical Student Association (AMSA) has twice passed resolutions urging schools to provide alternatives to animal laboratories for students with either "moral or pedagogical" objections and has condemned "faculty intimidation of medical students to force them to attend classes and labs using live animals."[3] A few isolated institutions do dissuade students from requesting a non-animal assignment or speaking out against this use of animals, but most schools that still have the laboratories readily offer alternatives.

Prompted by student concerns about an animal laboratory, Harvard Medical School developed a dynamic and popular practicum wherein students go directly into the operating room, right alongside the surgeons, perfusionist, and cardiac anesthesiologist, to observe an actual human cardiac bypass surgery. They see the chest opened and the effects of epinephrine and other agents on the heart, and witness the patient going on and coming off the cardiopulmonary bypass machine. During this practicum, the cardiac anesthesiologist walks students through the basics of physiology and pharmacology. Students report that the practicum is "an absolutely amazing experience." A short videotape documenting this method, *Advances in Medical Education with Henry Heimlich, M.D.*, is available through PCRM.

In addition to student pressure, financial concerns have led many institutions to eliminate animal laboratories,[4] which can cost roughly $100 per student. Sophisticated multimedia computer programs, on the other hand, cost just a few hundred dollars for an entire class, require no upkeep or care, and allow for multiple use by many students. Such programs simulate human physiology, letting students control hundreds of physiological parameters in a virtual reality clinical setting. Students can learn from mathematical models of the coupled heart, lungs, kidneys, and circulation; read real-time data viewers displaying waveforms, curves, and numerical data; and perform multiple, varied experiments on the computer model. The dynamic operating room experience pioneered by Harvard costs essentially nothing.

Whether fiscal, pedagogical, or ethical concerns are the primary factor, clearly the trend towards replacing live animal laboratories is continuing. Faculty and administration are increasingly open to student concerns and eager to implement more relevant and cost-effective educational methods.

References

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