On the Differences Between a Child and a Kitten

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The American Heart Association (AHA) recently sent a memo to all affiliated training centers reminding them that the AHA "does not require or endorse the use of live animals" in their Pediatric Advanced Life Support (PALS) course and have thereby distanced themselves from training centers that opt to use animals for training purposes. It no doubt came as a surprise to many instructors to learn that animals were being used for such purposes, because most centers have neither the funds nor the desire to use animals.

As one of the developers of the PALS course, I was certainly mortified. I am not alone in my concerns. Most PALS instructors I speak with share the same response: "How does maiming animals help us teach pediatric resuscitation skills?"

The very first PALS course I attended at a University Medical Center used live animals. When they brought live kittens out on waxed metal trays I left the room and wept. After I composed myself I insisted that I be certified using manikins only, and they reluctantly complied. To date I have successfully intubated close to 1000 patients, many younger than 5 years old, with skills gained from practice and training that did not utilize live animals.

The most common—although still exceedingly rare—use of live animals for PALS training is in the intubation module of the course. Kittens, and sometimes infant ferrets, are used (erroneously) as animal models of human infant airway anatomy. Choosing to use kittens to teach people how to intubate human infants is a poor decision given the drastic differences between the oropharyngeal anatomy of human infants and cats (Figures 1 and 2).[1,2] Kittens have fully developed dentition that includes large, sharp incisors. Kittens and ferrets have proportionately longer tongues than human infants that are one and a half times the length of their mouth. Further differences include more profuse salivation, dome-shaped arytenoid cartilage, and comparatively large epiglottises and smaller anterior larynxes. Cats also have furry facial structures as well as elongated jaws and snouts, unlike human infants. Therefore, there is no anatomical specificity between the maxillofacial or oropharyngeal features of animals and humans. It has been said that health care professionals need to learn how to handle the delicate tissues of an infant. My response is that we are all well aware that tissue bleeds, bruises, swells, and even spasms when traumatized. This does not need to be confirmed by inflicting injuries on a helpless animal.

Parts of animal bodies also sometimes are used for the PALS course; chicken or turkey legs are provided for participants to practice intraosseous needle placement. Again, anatomical differences between these birds and human infants make this practice an ineffective training model. Chickens and turkeys have bones that are shaped quite differently from humans at the point of insertion. In addition to being more realistic, the available alternatives designed to teach this skill also provide a more sanitary work environment for course participants. The poultry industry is well aware of the zoonotic diseases that can be transferred to humans, including salmonella, colibacillosis (from *Escherichia coli*), and chlamydiosis.[3] Health care providers are exposed to enough diseases when caring for patients. It is necessary to make them vulnerable during training as well?

Superior non-animal methods, such as task trainers, humanlike manikins, and high-fidelity simulators, are widely available from various suppliers and should be utilized for all skills included in the PALS course. Laerdal's SimBaby, for example, provides realistic infant airway anatomy that allows for training in a wide range of airway management skills and patient care scenarios. SimBaby "breathes, cries, cough, hiccoughs [and] can be programmed to exhibit cyanosis, stridor, retractions, wheezing, and even a pneumothorax."[4] SimNewB, a full-term newborn female manikin that Laerdal developed with the American Academy of Pediatrics specifically to satisfy the learning objectives of the Neonatal Resuscitation Program, can be used to teach intubation, CPR skills, intraosseous needle placement, chest tube inser-

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FIGURE 1

Five-week-old infant, Nuvay B., with open mouth revealing small, short jaw, thick tongue, and no dentition. This figure is available in color and as a full-page document at www.jenonline.org.

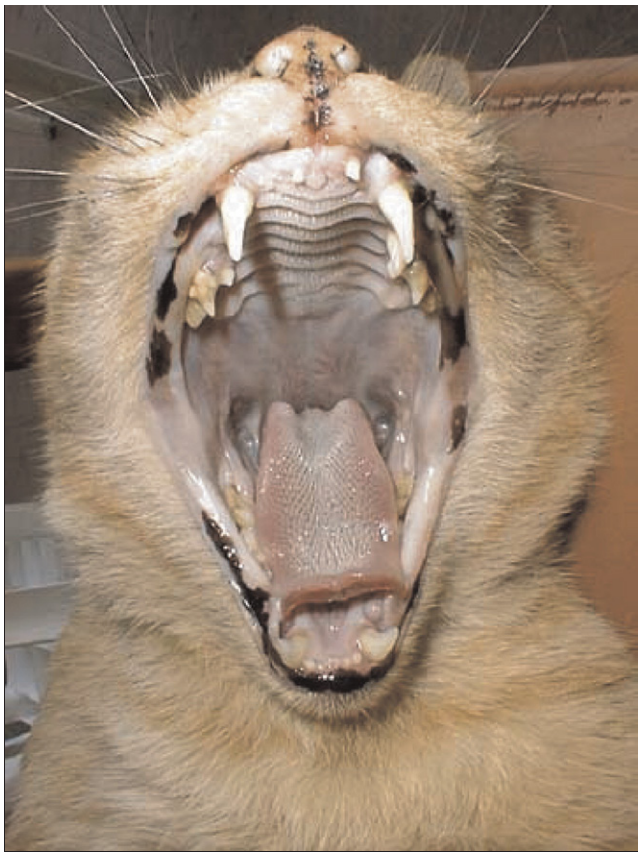

FIGURE 2

Adult cat, DK, yawning to reveal long, thin tongue, full dentition with sharp incisors, and elongated jaw. This figure is available in color and as a full-page document at www.jenonline.org.

tion, and evacuation of a tension pneumothorax, amongst many other skills. Unlike kittens and ferrets, these models provide the correct anatomy and proper landmarks for course participants. The educational efficacy and clinical transferability of manikin and high-fidelity simulators for difficult airway management training in both children and humans is well established.[5-8] Intubation success rates of those training on manikins and simulators are consistently equivalent or superior to those who learned the skill on human patients.[9] Compared with those who have trained on animals, practitioners who have been trained on manikins also are more proficient at pediatric intubation.[10] One comparative study concluded that "training on mannequins allows for greater concentration by the trainee on technique. Without the urgency to place the tube, which is felt when practicing on animals or humans, the trainee is much more open to suggestions and corrections."[11] Simulation methods also are well received by trainees.[12] This finding may explain why those who learned intubation skills in animal laboratories instead exhibit significantly lower success rates. One study found that pediatric residents trained in a cat laboratory had a 65% intubation success rate.[13] Where I went to school, a 65% rate was a D+. Our pediatric patients deserve better than this.

As far as I am aware, no scientific evidence exists that the use of animals for intubation training is as effective, much less superior to the use of manikins and simulators. The most frequently cited papers describing the use of animals do not include intubation success rates and are several decades old.[14,15] Even before the advent of modern simulation technology, animal use for neonatal and pediatric intubation training was criticized for not imparting skills that were transferable to the clinical setting, in part because of the anatomical differences between species.[16]

In addition to these anatomical differences, working with live animals can make course participants uncomfortable,[17] and the obvious trauma that the animals suffer often serves to create a significant degree of emotional stress for course participants. This situation can make it difficult for them to focus on the task at hand, thereby hampering the learning process.[18] This observation has been noted in the literature, and I have found it to be the case in my own personal experience and that of my colleagues.

Training programs that use animals require a constant stream of new animals to meet their misconceived training

goals. The costs incurred include purchasing animals from commercial breeders or shelters (defeating the purpose of animal rescue and shelter), veterinary oversight as required by law, and in some cases, fees for destroying the animals that have suffered from non-recoverable injuries to their airways, thoracic structures, and musculoskeletal anatomy.

Repeated intubation often can result in swelling and bleeding in an animal's throat, severe pain, possible scarring, collapsed lungs, exsanguination, and even death. These risks are exacerbated by the fact that course participants are not yet proficient in the intubation procedure but are still learning how to perform this skill.

A 2003 study on procedural pain in human neonates concluded that endotracheal intubation is the single most painful procedure that infants routinely undergo during hospital stays.[19] It is reasonable—and the accepted rule of thumb in laboratory animal medicine—to assume that animals experience levels of pain similar to those that human suffer. I believe that animals may suffer even greater pain than human infants because their nervous systems are even more developed, allowing them to see clearly, walk, and respond to danger literally within days of their birth. Such a painful procedure can be justified only when it is medically necessary for the health of the individual it is being performed on. Training sessions do not meet this criterion. The bottom line is that there is no need to traumatize and harm animals to teach these skills, especially when highly effective non-animal methods are the accepted standard of practice and readily available to instructors.

Given that the AHA, ENA, and the American Academy of Pediatrics do not endorse animal use and exclusively recommend human simulation manikins and task trainers for their pediatric life support courses, there is a near consensus among health care professionals regarding the unacceptability of using animals for such purposes. For educational and ethical reasons we must insist that our colleagues discontinue using live animals for these purposes and embrace the humane, modern, and validated science of simulation technology.

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