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Dear Dr. Kennedy, Dr. Cole, Dean Shapiro and Chancellor Wrighton,

Thank you for ending intubation training with cats in Pediatric Advanced Life Support (PALS) courses. "The use of manikins and simulators is recommended by the Neonatal Resuscitation Program, a joint venture of American Academy of Pediatrics and American Heart Association," Medscape Medical News states [1]. I urge you to update all pediatric residency programs with animal-free technology.

Drs. Kennedy and Cole of Washington University School of Medicine (WUSM) call "training with sedated animals...beneficial," asserting that "some pediatric intubation courses separate from PALS...will continue to involve animals until more effective teaching tools are developed." They believe animal use improves education, yet fail to cite scientific data to substantiate this claim [2, 3].

Qualified studies show that high-fidelity simulations exceed animal use as instructive tools and are the standard method at an overwhelming majority of medical training facilities.

- Endotracheal intubation is the most painful process human infants encounter when hospitalized [4]. The *Guide for the Care and Use of Laboratory Animals* indicates "procedures that cause pain in humans also cause pain in animals [5]." Repetitive insertion of tubes down a kitten's fragile windpipe can generate severe pain and cause an animal to bruise, bleed, swell or scar. Continually intubated animals are at risk for pneumothorax, subcutaneous emphysema, or even death from improperly routed tubes. Inadequately anesthetized animals may become alert during procedures [6, 13].
- There is no publicly available data to prove that animal-based instruction surpasses (or even equals) training with manikins and simulators. Studies do, however, show that simulator-based training improves dexterity and competence more so than training with animals or even human patients. Simulators — such as Laerdal's SimNewB (co-developed with American Academy of Pediatrics), Gaumard's Premie HAL and PREMIE Blue, and METI's SimBaby — accurately represent human anatomy. Their capacity for repeated use cuts cost and enhances the learning process with more opportunity for observable feedback and assessment [7, 8].
- In one study, Adams *et al* examined intubation skills of practitioners who'd undergone Neonatal Resuscitation Program (NRP) and PALS, plus further training with anatomical manikins or cat intubation labs. Manikin-educated practitioners were "significantly more successful on the first attempt at intubation," with a 92% overall success rate, compared to 77% efficacy for animal-use trainees [9]. "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 [10]."

- A different study ranked animal-trained pediatricians at just 65% for general proficiency [11]. Other medical literature recognizes trainee apprehension about animal use as a deterrent to learning [12].
- There are “drastic differences between the oropharyngeal anatomy of human infants and cats,” notes Cindy Tait, R.N., M.P.H., a co-developer of the PALS course [13]. An earlier study highlights disparities so significant that intubation methods used for humans differ from those specifically geared for animals [14]. The feline mouth/pharynx area has sharper-edged teeth and a proportionately larger tongue; more abundant salivation; a slighter anterior larynx; dome-shaped arytenoid cartilage; a larger epiglottis; and lengthened jaws and snouts.
- In contrast, patient simulators replicate human physiology and can reproduce reactions associated with breathing struggles. A report published in *Advances in Neonatal Care* described how SimBaby “breathes, cries, coughs, hiccoughs [and] can be programmed to exhibit cyanosis, stridor, retractions, wheezing, and even a pneumothorax [15].”

“The bottom line,” says PALS co-developer Tait, “is that there is no need to traumatize and harm animals to teach [intubation and airway management skills], especially when highly effective non-animal methods are the accepted standard of practice and readily available to instructors [13].”

The American Heart Association, American Academy of Pediatrics, and Emergency Nurses Association — agencies that design and sponsor most pediatric/neonatal life support courses — promote use of simulation technology, not animals. I urge Washington University to keep pace with evolving ethical and educational advances. Please end animal use in all pediatric residency training.

Thank you,

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