SOP: Large Animal Euthanasia

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Scope
Euthanasia is the act of inducing humane death in an animal in a manner that minimizes pain and distress using methods that cause rapid unconsciousness and death. According to the Guide for the Care and Use of Laboratory Animals, 8th edition, 2011, methods employed for the euthanasia of animals used in research, teaching or testing must be consistent with methods described in the AVMA Guidelines for the Euthanasia of Animals, 2013 Edition (or most current edition), unless a deviation is scientifically or medically justified. The AVMA Guidelines can be accessed at the following website:


The purpose of this SOP is to describe the techniques approved by the University of Pittsburgh’s IACUC for euthanizing large animal species, to include the following species: dogs, cats, rabbits, sheep, goats, calves, pigs, and non-human primates.

Responsibilities
It is the responsibility of investigators to ensure the euthanasia methods that are used are specified in the approved IACUC protocol to which the animal is assigned. No alterations in the euthanasia procedures described in the protocol are permissible without permission from the IACUC.

Use of commercial euthanasia solutions (i.e. Euthasol, Beuthanasia-D) require DEA registration by the Principal Investigator. Information regarding obtaining these agents is available on the web (see: http://www.deadiversion.usdoj.gov/drugreg/reg_apps/) and from DLAR veterinary services.

It is the responsibility of investigators to ensure that personnel performing euthanasia have experience and training with handling the species involved, as well as the methods of euthanasia employed.

All personnel performing euthanasia are responsible for minimizing pain and distress using careful handling and/or gentle restraint in a safe and appropriate manner. Consideration should be given to minimizing distress in remaining animals by performing procedures away from housing areas. An attempt should be made to minimize sights, smells and sounds that could increase stressors to the animal. Personnel should have all equipment readily available before starting the procedure.

Euthanasia methods involving anesthesia followed by the euthanasia procedures must be carried out by personnel who are adequately trained in anesthesia and can recognize when a
surgical plane of anesthesia has been reached. Death must be confirmed by a combination of criteria, including loss of: heartbeat via stethoscope, ECG or direct visualization, breathing, corneal reflex, pupillary response to light and response to firm toe pinch.

For questions about this policy, contact the office for Institutional Animal Care and Use Committee at 412-383-2008 or iACUC@pitt.edu.

Procedure
The following is a list of accepted techniques for euthanizing large animals:

Preferred:

- Barbituric acid derivatives. Intravenous (IV) injection is the preferred method of administration. When the restraint necessary for giving an animal an IV injection is likely to impart added distress, sedation or anesthesia should be used before IV injection.
- Barbituric acid derivative injection is the only acceptable pharmacologic method for euthanizing non-human primates.

Acceptable with conditions:

- Intraperitoneal (IP) injection of non-irritating barbiturates (sodium pentobarbital, not combination products) may be used in restrained large animals of smaller size (i.e. small dogs, cats) in situations where IV injection would be considered distressful or dangerous. For IP administration, animals should be placed in a small enclosure in a quite area to minimize excitement and trauma, as this method takes longer than IV injection.
- Intracardiac (IC) injection of a barbiturate is acceptable in unconscious or anesthetized animals.
- Exsanguination is acceptable after a surgical plane of anesthesia is reached.
- Potassium chloride (KCL) injection IV or IC after a surgical plane of anesthesia is reached. KCL must be pharmaceutical grade, using 1-2 mmol/kg body weight or 1-2mEq K+/kg body weight.
- Inhaled anesthetics (i.e. isoflurane, sevoflurane) via overdose in a chamber are acceptable for euthanasia of small mammals < 7 kg in which venipuncture is difficult. Sufficient air or O2 must be provided to prevent hypoxemia.

The AVMA Guidelines for the Euthanasia of Animals, 2013 Edition lists other conditionally acceptable methods that have a high potential for operator error, inconsistent ability to produce humane death, or hazard to personnel. The use of conditionally accepted euthanasia methods must be justified scientifically. Consultation with a veterinarian regarding the use of these methods is strongly recommended. For further information on methods of euthanasia, anesthesia, or confirming death, contact the DLAR Veterinary Services at 412-648-8950.