



Duke University
Animal Care & Use Program
Policy



FETAL AND NEONATAL EUTHANASIA (Mouse / Rat)

PERFORMANCE STANDARD: All fetuses and neonatal animals will be euthanized in a humane manner, consistent with NIH Guidelines for euthanasia.

BACKGROUND: The 2007 AVMA Guidelines for Euthanasia does not provide specific recommendations for the euthanasia of prenatal or neonatal animals. The following guidelines are suggested to assist individuals in the use of rodent fetuses or neonates, and are based on NIH recommendations. This policy applies to mice and rat. For guidance for less common species, please contact DLAR or OAWA.

ROLES: All participants will adhere to this policy, unless an exception is granted by the IACUC.

POLICY:

➤ Mouse or Rat Fetuses:

- **Fetuses up to 14 days in gestation:** Neural development at this stage is minimal and pain perception is considered unlikely. Euthanasia of the mother or removal of the fetus should ensure rapid death of the fetus due to non-viability of fetuses at this stage of development.
- **Fetuses 15 days in gestation to birth:** The literature on the development of pain pathways suggests the possibility of pain perception at this time. Whereas fetuses at this age are less sensitive to inhalant anesthetics, euthanasia may be induced by the skillful injection of chemical anesthetics. Decapitation with surgical scissors, or cervical dislocation are acceptable physical methods of euthanasia. When chemical fixation or rapid freezing (immersion in liquid nitrogen) of the whole fetus is required, fetuses should be anesthetized prior to immersion in or perfusion with fixative solutions. Anesthesia may be induced by hypothermia of the fetus, by injection of the fetus with a chemical anesthetic, or by deep anesthesia of the mother with a chemical agent that crosses the placenta, e.g., pentobarbital. The university veterinarian should be consulted for considerations of fetal sensitivity to specific anesthetic agents. When fetuses are not required for study, the method chosen for euthanasia of a pregnant mother must ensure rapid death of the fetus.

➤ **Mouse or Rat Neonates:**

- **Up to 14 days of age:** Acceptable methods for the euthanasia of neonatal mice and rats include: injection of chemical anesthetics (e.g., pentobarbital), decapitation, or cervical dislocation. Additionally, inhalant anesthetics (e.g., isoflurane used with appropriate safety considerations), may be used. However, neonates have a high tolerance for hypoxia, so exposure must be prolonged (>20 minutes) and death confirmed by a secondary means. Pups should be anesthetized prior to freezing with liquid nitrogen. Similarly, anesthesia should precede immersion or perfusion with chemical fixatives. Anesthesia may be induced by inhalant or injectable anesthetics; the university veterinarian should be consulted for appropriate agents and dosages. Alternatively, when adequately justified, hypothermia for anesthesia may be used to induce anesthesia in pups younger than six days.
- **Older than 14 days:** Follow guidelines for adults.

➤ In all cases, the person performing the euthanasia must be fully trained in the appropriate procedures.

➤ Exceptions to these guidelines will be considered by the IACUC on a case-by-case basis.

References:

Phifer CB, Terry LM. 1986. Use of hypothermia for general anesthesia in pre-weanling rodents. *Physiology & Behavior* 38:887-890.