GUIDELINES FOR THE EUTHANASIA OF MOUSE AND RAT FETUSES AND NEONATES

The Report of the AVMA Guidelines on Euthanasia provides limited recommendations for the euthanasia of prenatal or neonatal animals.[1] The following guidelines are suggested to assist individual Animal Care and Use Committees at the NIH in reviewing proposals which involve the use of rodent fetuses or neonates.

Fetuses:

a) 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 loss of blood supply and non-viability of fetuses at this stage of development.

b) 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 resistant to inhalant anesthetics including CO_2, euthanasia may be induced by the skillful injection of chemical anesthetics. Decapitation with surgical scissors, *or* cervical dislocation are acceptable physical methods of euthanasia. Rapid freezing, without prior anesthesia, as a sole means of euthanasia is not considered to be humane. Animals should be anesthetized prior to freezing. When chemical fixation 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[2] 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 institute 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.

Neonates:

a) Up to 14 days of age: Acceptable methods for the euthanasia of neonatal mice and rats include: injection of chemical anesthetics (e.g., pentobarbital) or decapitation. Additionally, these animals may be anesthetized with an inhalant anesthetic; e.g., isoflurane (used with appropriate safety considerations) or narcotized with CO_2 before decapitation. Neonate animals are more resistant to the effects of inhalant anesthesia and CO_2, therefore, it is recommended that the animals be exposed to these agents for a minimum of 10 minutes. Immersion in liquid nitrogen may be used only if preceded by anesthesia. Similarly, anesthesia should precede immersion or perfusion with chemical fixatives. Anesthesia may be induced by inhalant or injectable anesthetics; the institute veterinarian should be consulted for appropriate agents and dosages. Alternatively, when adequately justified, hypothermia[2] may be used to induce anesthesia in pups six days of age or less (see Rodent Neonatal Anesthesia Guidelines at - http://acs.ufl.edu/guidelines/Rodent_Neonatal_Anesthesia_Guidelines.shtml

b) Older than 14 days: Follow guidelines for adults.

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

[1] "When ovarian hysterectomies are performed, euthanasia of feti should be accomplished as soon as possible after removal from the dam. Neonatal animals are relatively resistant to hypoxia." 2007 The AVMA Guidelines on Euthanasia, JAVMA 218:688.

[2] Phifer CB, Terry LM. 1986. Use of hypothermia for general anesthesia in preweanling rodent. Physiol & Behav 38:887 890.

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