

UBC ANIMAL CARE COMMITTEE

POLICY 018

Policy on Rodent Euthanasia

Date Approved: September 6, 2011

PURPOSE

This Policy describes acceptable and conditionally acceptable methods for rodent euthanasia. As described by the Canadian Council on Animal Care (CCAC), euthanasia refers to "good death" and describes a cause of death with minimal stress and pain to an animal.

RESPONSIBILITY

Facility animal care staff, principal investigator (PI) and their students or research staff.

The method of euthanasia used must be appropriate for the species, age and health status of the animal. Death must always be verified prior to final disposal of the animal.

Definitions:

Acceptable methods: If performed properly, these methods meet the standards for a humane death and do not need additional justification.

Conditionally acceptable methods: Even if performed properly, these methods can cause distress or pain to the animal prior to death and must be additionally justified to the Animal Care Committee.

MATERIALS

CO2 euthanasia equipment (see CO2 SOP 009E4) including flow meter

Anaesthesia or commercial euthanasia solutions

Properly maintained small animal guillotine or appropriately sized scissors or small metal forceps

REFERENCES

CCAC Guidelines on Euthanasia <http://www.ccac.ca/documents/standards/guidelines/euthanasia.pdf>

American Veterinary Medical Association (AVMA) Guidelines on Euthanasia 2007

http://www.avma.org/issues/animal_welfare/euthanasia.pdf

UBC Animal Care Committee SOP 009E4

EUTHANASIA METHODS DESCRIBED FOR ADULT RODENTS

1. **Acceptable:** Overdose of inhalation anaesthetic (i.e. isoflurane or halothane)
2. **Acceptable:** Barbiturate or injectable anaesthetic overdose given IP/IV, diluted and buffered as required
3. **Acceptable:** Anaesthesia as above, followed by CO2 asphyxiation
4. **Conditionally acceptable:** CO2 asphyxiation of conscious animals
5. **Conditionally acceptable:** Physical methods (cervical dislocation in mice or decapitation in rats)

***For all methods, at no time should euthanasia occur in the presence of other conscious animals. Euthanasia should take place in a dedicated room away from animal holding rooms.**

Other methods may be approved but will require justification to the Animal Care Committee.

1. Overdose of inhalant anaesthetic (Halothane or Isoflurane):

- a. Anaesthetic chambers should not be overloaded and need to be kept clean to minimize odors that might distress animals subsequently euthanized. Animals from different cages should not be mixed together.
- b. The animal can be placed in a closed receptacle (home cage covered with Plexiglas lid) containing cotton or gauze soaked with an appropriate amount of the anaesthetic. Because the liquid state of most inhalant anaesthetics is irritating, animals should be exposed only to vapours (gauze or cotton must not be contacted by the animal).
- c. Procedures should be conducted in a chemical fume hood to prevent inhalation of the anaesthetic by personnel.
- d. The anaesthetic can also be introduced at a high concentration from a vapourizer of an anaesthetic machine connected to an adequate scavenging system or air filter.
- e. Sufficient air or O₂ must be provided during the induction period to prevent hypoxemia. In the case of small rodents placed in a large container, there will be sufficient O₂ in the chamber to prevent hypoxemia.
- f. To confirm death, monitor animal for the following signs: no rising and falling of chest, no palpable heart beat, poor mucous membrane color (blue/pale), no response to toe pinch or touching of the cornea.
- g. A physical method of euthanasia, such as cervical dislocation or opening the chest cavity, is required before disposal to ensure that they have been correctly euthanized.

2. Barbituate or injectable anaesthetic overdose:

- a. Inject three times the anaesthetic dose intra-venously or intra-peritoneally.
- b. Animals should be placed in their home cages or a clean cage in a quiet area to minimize excitement until euthanasia is complete. Do not mix animals from different cages
- c. To confirm death, monitor animal for the following signs: no rising and falling of chest, no palpable heart beat, poor mucous membrane color, no response to toe pinch.
- d. A physical method of euthanasia, such as cervical dislocation or opening the chest cavity, is required before disposal to ensure that they have been correctly euthanized.

3. CO₂ asphyxiation: a. See approved SOP on CO₂ euthanasia of rodents (<http://www.ors.ubc.ca/contents/animal-care>). Euthanasia must be carried out according to this SOP. ****Note that CO₂ is considered a conditionally acceptable method of euthanasia by the CCAC (see CCAC Guidelines on Euthanasia of Animals Used in Science). This means that its use must be justified to the Animal Care Committee.**

4. Physical methods:

- a. Personnel performing physical methods of euthanasia must be well trained and monitored for each type of physical technique performed. ****All persons must be approved by a UBC Veterinarian prior to performing these procedures within an approved Animal Care protocol.**
- b. Anaesthesia or sedation is necessary prior to physical methods of euthanasia, unless otherwise described in the Animal Care Protocol and approved by the Animal Care Committee (ACC).

Cervical dislocation:

a. For mice, the thumb and index finger are placed on either side of the neck at the base of the skull or, preferably, a metal rod or forcep is pressed at the base of the skull. Pressure on the neck should not be enough to suffocate the animal prior to euthanasia. With the other hand, the base of the tail or the hind limbs are quickly pulled while a quick movement is made forward with the forceps or fingers, causing separation of the cervical vertebrae from the skull. The animal should immediately stop breathing, there should be no movement other than twitching and there should be a separation felt between the back of the skull and the vertebrae.

Decapitation Using a Guillotine:

- a. Guillotines that are designed to accomplish decapitation in adult rodents in a uniformly instantaneous manner are commercially available and must be used.
- b. The use of plastic cones (Decapicone) to restrain animals is recommended as it minimizes the chance of injury to personnel, and improves positioning of the animal in the guillotine.
- c. The equipment used to perform decapitation should be maintained in good working order and serviced on a regular basis to ensure sharpness of blades.
- d. Animals must be decapitated one at a time in a room that does not house any conscious animals. All equipment must be thoroughly cleaned (blood and tissue removed) in between animals.
- e. The procedure should be done as quickly as possible to minimize handling time and stress. The use of decapicones is highly suggested. Animal must be positioned such that front limbs are not damaged by the guillotine.

Exsanguination:

- a. Animals may be exsanguinated to obtain blood products, but only when they are deeply anesthetized.
- b. Deeply anesthetize animal according to approved ACC methods and collect blood from the heart (www.animalcare.ubc.ca, SOP: Cardiac puncture).
- c. To confirm death, monitor animal for the following signs: no rising and falling of chest, no palpable heart beat, poor mucous membrane color, no response to toe pinch.
- d. A physical method of euthanasia, such as cervical dislocation or pneumothorax (the diaphragm is lacerated or the heart is removed to ensure death), is required before disposal to ensure that they have been correctly euthanized.

EUTHANASIA OF NEONATAL RODENTS (< 10 DAYS OLD)

Euthanize rodents under 10 days old by one of the following procedures:

1. **Acceptable:** Barbiturate or injectable anaesthetic overdose, IP.
2. **Acceptable:** Overdose of inhalant anaesthetic followed by decapitation.
 - a. Neonatal animals (up to 10 days of age) are resistant to the hypoxia induced by high anaesthetic gas concentrations, therefore, alternative methods are recommended. Inhalant anaesthetics may be used for narcosis of neonatal animals provided it is followed by another method of euthanasia (e.g. decapitation using sharp blades).
3. **Conditionally acceptable:** CO2 asphyxiation followed by decapitation (See SOP Carbon Dioxide Euthanasia of Neonatal Rodents, www.acc.ubc.ca)
4. **Conditionally acceptable:** Decapitation (using sharp scissors).

*Rodents over 10 days old can be euthanized by the same procedures as adult rodents.

EUTHANASIA OF GESTATING RODENTS

Gestating rodents with fetuses under 14 days old can be euthanized by the same procedures as adult rodents.

Gestating rodents with fetuses over 13-14 days:

1. CO2 asphyxiation of the mother, followed by decapitation or barbiturate overdose (IP) of the fetuses.
2. Overdose of injectable anaesthetics to the mother.