

Guidelines for the Use of Cervical Dislocation for Rodent Euthanasia

The University of Texas at Austin Institutional Animal Care and Use Committee

These guidelines have been written to assist faculty, staff, and students in performing vertebrate animal procedures in a humane manner and complying with pertinent regulatory requirements. Under some circumstances deviations from these procedures may be indicated but such variances must be approved in advance by the IACUC.

SUMMARY: Cervical dislocation (CD) euthanasia must be performed by trained individuals using appropriate equipment. The use of cervical dislocation in rodents is only appropriate for mice and small rats (<200g), and whenever possible the use of sedation or light anesthesia prior to euthanasia is recommended. The protocol must contain adequate scientific justification if CD must be performed on conscious animals due to study requirements. CD may also be used as a secondary means to assure death after euthanasia with CO₂ or another gaseous euthanasia agent. The use of CD as a euthanasia method and the names of the individuals performing this procedure must be listed in the approved IACUC protocol covering the study.

TRAINING: Principal Investigators must ensure that all individuals responsible for administering CD euthanasia are appropriately qualified and monitored, and that they adhere to IACUC-approved protocols and institutional policies. Training can be provided from within the lab group if the existing staff has adequate expertise. Additional training in these techniques is available from the Animal Resources Center (ARC). Personnel who will be performing these techniques (or their PIs) can arrange training by contacting the ARC Compliance and Training Manager (phone: 512-471- 3909).

GUIDANCE:

I. Background

The IACUC is specifically charged with reviewing the methods of euthanasia for each research protocol to assure compliance with the recommendations contained in the *American Veterinary Medical Association (AVMA) Guidelines for the Euthanasia of Animals* (2020 Edition) (available at <https://www.avma.org/resources-tools/avma-policies/avma-guidelines-euthanasia-animals>). Since physical methods of euthanasia (such as cervical dislocation) require the most skill to perform and are most likely to be affected by human error, the AVMA recommends that such methods be used only when pharmacological methods are not appropriate.

Cervical dislocation is rapid, requires neither special equipment nor transport of the animal and yields tissues uncontaminated by chemical agents. Situations where CD may be indicated in non-sedated rodents include research studies which require the harvest of drug residue-free brain tissues, or when an animal in distress requires immediate euthanasia by a trained ARC clinical staff member under veterinary direction.

II. Acceptable Use

Use of cervical dislocation to euthanize mice and rats with body weights <200g by trained research personnel is appropriate (after IACUC approval) if either of the following is true:

Animals are sedated or anesthetized using drugs or carbon dioxide prior to cervical dislocation

- or -

The PI has considered other methods, and has determined that cervical dislocation without the use of other agents is the most appropriate method based on previous experience using this technique and/or the specific aims of the study. If approved, the PI must ensure that personnel performing cervical dislocation have been properly trained and consistently apply it humanely and effectively.

III. Method

Inexperienced persons should be trained by experienced persons and should practice on euthanized animals or anesthetized animals to be euthanized until they are proficient in performing the method properly and humanely.

1. Restrain the rodent in a normal standing position on a firm, flat surface and grasp the base of the tail firmly with one hand. Performing the procedure on a surface that the animal can grip (such as the wire bar grid of the cage top) may make it easier to gain access to the base of the skull because rodents often stretch themselves forward when held by the tail.
2. Place a sturdy stick-type pen, a rod-shaped piece of metal, a closed scissors/hemostats or the thumb and first finger of the other hand against the back of the neck at the base of the skull.
3. To produce the dislocation, quickly push forward and down with the hand or object restraining the head while pulling backward with the hand holding the tail base.
4. The effectiveness of dislocation can be verified by feeling for a separation of cervical tissues. When the spinal cord is severed, a 2-4 mm space will be palpable between the occipital condyles and the first cervical vertebra. Occasionally, however, the dislocation occurs between thoracic vertebrae.
5. Check closely to confirm respiratory arrest, and when possible verify, by palpation, that there is no heartbeat.

IV. Other Considerations

Note on euthanasia of neonates

Due to the anatomy of rat and mouse neonates, cervical dislocation is difficult to perform adequately, especially when euthanizing mice and rats in the “pinkie” stage before hair grows in at 7-10 days. For routine purposes (such as assuring death after CO₂ exposure) decapitation must be used rather than cervical dislocation. If there are specific experimental reasons that cervical dislocation must be used in neonates before eleven days of age for a particular project, this will require specific IACUC consideration and approval.