

IACUC Policy on Euthanasia by Cervical Dislocation or Decapitation

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 AVMA Guidelines on Euthanasia. Since physical methods of euthanasia require the most skill to perform and are most likely to be affected by human error, the AVMA recommends that such methods are used only when alternative methods are not appropriate. The IACUC requires anesthesia prior to decapitation or cervical dislocation unless there is an approved justification in the IACUC protocol. Physical euthanasia without anesthesia will be considered by the IACUC on a case by case basis.

Policy

The IACUC reviews all protocols using physical techniques to assure that personnel performing the procedures are appropriately trained. The primary responsibility for establishing and monitoring this training lies with the investigator. Before using physical methods, inexperienced persons should be trained by experienced persons by an IACUC-approved trainer and should practice on carcasses or anesthetized animals to be euthanized until they are proficient in performing the method properly and humanely:

- 1) The trainer will demonstrate the decapitation procedure to one or more researchers, the attending veterinarian or his designee.
- 2) The researcher(s) will (each) practice the procedure on anesthetized or dead rodents until proficient. The trainer will be present for each of these practice decapitations.
- 3) The researcher will then perform a live decapitation under the supervision of the trainer. This will be repeated (including additional anesthetized/dead decapitations, at the discretion of the trainer) until the researcher demonstrates proficiency.
- 4) Proficiency will be determined by the trainer, and will be based upon one or more demonstrations that the researcher conducts the decapitation quickly and smoothly, without any overt signs of distress in the animal.
- 5) If animals are required for training, the Principal Investigator will request those animals on the relevant protocol or consult with Animal Resource Facilities about using animals from the Institutional Training Protocol.
- 6) Upon completion of training/demonstration of proficiency, the trainer will document the proficiency and provide it in writing to the IACUC. A copy of the document will be kept in the IACUC office.
- 7) Researchers who are approved to perform live decapitations must be listed on the appropriate IACUC protocol.

Acceptable Use

Use of cervical dislocation to euthanize mice and rats with body weights <200g by trained personnel is appropriate (upon IACUC approval) if the investigator has considered other methods, and has determined that cervical dislocation without the use of other agents is the most appropriate method based the specific aims of the study. The IACUC requires anesthesia prior to cervical dislocation unless there is an approved justification in the IACUC protocol.

Decapitation can be used to euthanize rodents and small rabbits in research settings. It provides a means to recover tissues and body fluids that are chemically uncontaminated when performed without anesthesia. It also provides a means of obtaining anatomically undamaged brain tissue for study. Handling and restraint required to perform this technique may be distressful to animals. Distress is largely minimized in animals that are handled regularly and are accustomed to being picked up by the investigators.

Decapitation may be aesthetically displeasing to personnel performing or observing the technique. Guillotines that are designed to accomplish decapitation in adult rodents and small rabbits in a uniformly instantaneous manner are commercially available.

Guillotines are not commercially available for neonatal rodents, but sharp scissors can be used for this purpose. The IACUC requires anesthesia prior to decapitation unless there is an approved scientific justification in the IACUC protocol, such as published reports or documentation of interference of the results by anesthetics.

Method for Cervical Dislocation

Before using the technique of cervical dislocation it should be practiced on deeply anesthetized rodents until the operator is competent.

Restrain the rodent in a normal standing position on a firm, flat surface and grasp the base of the tail with one hand.

Place a stick-type pen, a rod-shaped piece of sealed wood or metal, or the thumb and first finger of the other hand against the back of the neck at the base of the skull.

To produce the dislocation, quickly push forward and down with the hand or object restraining the head while pulling backward at a 30 degree angle from the table with the hand holding the tail.

Performing the procedure on a surface that the animal can grip may make it easier to gain access to the base of the skull because rodents often stretch themselves forward when held by the tail. The effectiveness of dislocation can be verified by 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. Check closely to confirm respiratory arrest, and when possible verify, by palpation, that there is no heartbeat.

Method for Decapitation

Those responsible for the use of this technique must ensure that personnel who perform decapitation techniques have been properly trained to do so. Personnel performing this technique should recognize the inherent danger of the guillotine and take adequate precautions to prevent personal injury. This technique is conditionally acceptable if performed correctly, and it should be used in research settings when its use is required by the experimental design and approved by the IACUC. The IACUC requires anesthesia prior to decapitation unless there is an approved justification in the IACUC protocol. The equipment used to perform decapitation should be maintained in good working order and serviced on a regular basis to ensure sharpness of blades and proper alignment and contact between blades (this can be checked by cutting a piece of folded paper). Rodents acclimated to being handled are calmer, less stressed, and facilitate the process.

Guidelines for Decapitation:

The rodent will be removed from its home cage or experimental environment, anesthetized (if applicable) and carried to the guillotine.

A minimal number of animals should be brought into the decapitation room at a time while decapitations are being conducted. Ideally, each animal should be brought into the room individually.

The amount of time the animals are in the decapitation room with the guillotine should also be kept to a minimum to prevent stress.

Every effort should be made to make sure the animal is not agitated prior to placing the animal in the guillotine.

The use of plastic cones (Decapicone® or other similar device) when using a guillotine, is optional but may reduce stress from handling, minimize the chance of injury to personnel, and improve the positioning of the animal in the guillotine.

The researcher will hold the rodent securely, and place the rodent on the stage at the entrance to the guillotine and place the rodents head through the guillotine opening. Once the head is in position, rapidly depress the guillotine lever.

One good technique is for the researcher to grasp the rodent gently but firmly around the back and push his/her hand slightly forward. This will push the front legs up, which prevents the rat from biting the investigator and also facilitates placing the animal in the guillotine.

Maintenance of Guillotines/Decapitators:

It is not recommended that guillotines be moved from room to room. If it must be moved to a different animal facility room or lab, sanitize the guillotine with disinfectant before moving to another location and disinfect again before placing it back into the original room.

After use on an individual animal, the guillotine must be rinsed and cleaned to remove blood, tissue and gross contamination. This is a critical step, not only because of contamination, but also because rodents will be stressed if they smell blood on the guillotine. A clean guillotine helps the rodents to remain calm, thereby making the procedure much easier and safer for the animal and the investigator.

Between decapitation sessions, and once gross contaminants have been removed, the entire unit should be thoroughly cleaned. Rinse a final time with 70% alcohol to ensure evaporation and reduce the need to hand dry the equipment.

Turn the guillotine upside down with blades open to facilitate drying.

Ensure the guillotine is lubricated properly by applying silicon or 3-in-1 oil as necessary.

Guillotine blades must be kept sharp at all times. Frequency of sharpening may vary depending on the frequency of use and the species and number of animals decapitated. The IACUC recommends that blades must be sharpened every twelve months. Any reputable company may provide blade sharpening at a minimal cost.

It is recommended to have a spare guillotine available due to potential turnaround times for blade sharpening.

Safety of Personnel:

1. Always make sure hands and fingers are clear of the blade path.
2. Only trained personnel should sharpen blades, lubricate the guillotine or take it apart.
3. Do not use decapitation equipment unless properly trained.
4. Old guillotine blades should be discarded in the sharps container.
5. Documentation: Maintain a log book of the date of blade sharpening or replacement in close proximity to the equipment.