

WVU IACUC POLICY: Care of Rodents Undergoing Survival Surgery

I. Introduction

This policy describes the expectations of the WVU Animal Care and Use Committee (IACUC) for anesthesia, aseptic technique, appropriate peri-operative care, and monitoring and documentation for mice and rats undergoing survival surgery or other painful procedures.

The *Guide for the Care and Use of Laboratory Animals*, 8th ed (2011, *Guide*) states (p115): “Successful surgical outcomes require appropriate attention to presurgical planning, personnel training, anesthesia, aseptic and surgical technique, assessment of animal well-being, appropriate use of analgesics, and animal physiologic status...”

II. Anesthesia

A WVU veterinarian should be consulted prior to initiating the project to ensure the anesthetic plan is appropriate for the species and procedure.

Only approved anesthetic drug(s) and dose(s) must be used to maintain the animal at a surgical plane of anesthesia for the duration of the surgery or other painful procedure.

III. Aseptic Technique

A. Location

Rodent surgery must be performed in a location dedicated to this purpose, on a clean and uncluttered surface.

Traffic should be minimized in the surgical area, and those entering the area should wear appropriate garb [personal protective equipment (PPE)].

B. Instrument Preparation

Surgical instruments must be sterilized prior to the first surgery of the day and re-sterilized after 10 surgeries, using one of the following methods:

- a. steam (autoclave), followed by cooling
- b. gas (hydrogen peroxide, ethylene oxide), followed by degassing
- c. liquid/chemical (glutaraldehyde, formaldehyde), followed by sterile saline rinse.
*** 70% ethanol is not a sterilant or high-level disinfectant and should not be used for surgical instrument sterilization.

If not using a new sterile pack for each surgery, then a hot-bead sterilizer must be used to re-sterilize instrument tips between surgeries. After hot-bead sterilization, surgeries must use the “tips-only” method to maintain aseptic technique and avoid tissue contamination.

The “tips-only” method involves touching the surgical site only with the tips of instruments that have been re-sterilized in the hot-bead sterilizer. Instrument handles and other parts that are not re-sterilized, as well as gloves that touch these parts, are no longer considered sterile and should not touch the surgical site or contaminate the sterile field.

All supplies used in survival surgeries (e.g., sutures, implants, instruments) must be sterile and in date.

C. Animal Preparation

Animal preparation must be performed in a location separate from the location of aseptic surgery.

Once the animal is anesthetized, hair must be removed from the surgical site and the surrounding area, using clippers or depilatory cream (completely rinsed away afterward).

The surgical site must be disinfected with three alternating applications of a disinfectant (e.g., chlorhexidine, iodine solution) and 70% ethanol.

For procedures lasting more than 15 minutes, sterile ophthalmic ointment must be applied to the eyes to prevent corneal damage.

After preparation, the animal should be moved to the surgery location and covered with a sterile drape with an opening over the surgical site.

D. Surgeon Preparation

Surgeon should wash hands and fore-arms thoroughly.

Surgeon must don clean gown, scrub top, or lab coat, as well as surgical mask, hair cover, and sterile surgical gloves. In December 2016, the FDA banned the use of powdered medical gloves for use in human and animal research and clinical operations, so non-powdered gloves must be used.

Surgical assistant should don garb appropriate to their activities. Assistance within or over the sterile field requires the same garb as the surgeon. Assistance with anesthesia and other activities outside the sterile field requires clean but not sterile garb.

IV. Peri-operative Care

A. Pre-operative Care

A visual assessment of the animal’s health must be made prior to anesthesia and any abnormalities noted that may affect outcome. If there are concerns about the suitability of an animal for anesthesia or surgery, the OLAR veterinary staff should be consulted before starting the procedure.

A pre-operative weight should be obtained in order to provide accurate dosing of any injectable drugs.

Any drugs used during aseptic surgery must be in date.

B. Intra-operative Care

A heating pad (preferably circulating warm water) should be used to maintain the animal’s body temperature during anesthesia.

The animal must be maintained at a surgical plane of anesthesia, with appropriate dosing corrections made as needed.

C. Post-operative Care

An animal recovering from anesthesia must never be left unattended until it has regained consciousness, and monitoring must continue until the animal is ambulatory.

The animal should be placed in a clean cage with soft bedding to avoid irritation of the surgical site.

Single housing is recommended post-operatively to avoid interference of cage mates with the surgical site.

Analgesics shall be provided postoperatively according to the protocol and on the recommendation of the OLAR veterinary staff.

V. Monitoring and Documentation

A. Records

Records must be maintained for all surgeries performed and include anesthetics, analgesics, fluids, antibiotics, etc. used, including specific drug, dose, and frequency of administration.

During anesthesia the animal must be observed for anesthetic depth and physiological parameters (such as body temperature, respiratory rate, tissue perfusion, etc) at least every 15 minutes. These observations may be recorded contemporaneously (if surgical assistant is present) or summarized after completion (if surgeon is working alone).

B. Complications

Anesthetic or surgical complications, responses, and outcomes must be documented in surgical records. Any unexpected morbidity or mortality must be reported to the IACUC with a corrective plan.

C. Cage Cards

A pink Post-Procedure cage card must be filled out and placed on the cage after a surgery or procedure to alert OLAR staff to this event. The card should remain on the cage until post-procedure analgesics and monitoring are complete. This card can then be entered into the lab notebook or discarded by the research group.

VI. Non-survival Surgery

Non-survival rodent surgery should be performed as described above, with the following exceptions:

- Surgical instruments must be clean but not necessarily sterile unless required by procedure.
- Surgical supplies must be in date, unless specifically labeled for use in non-survival procedures.
- Hair must be removed from surgical site, and a subsequent single cleaning with disinfectant is sufficient.
- Standard surgical garb (PPE) should be worn by the surgeon, but sterile gloves are not required.
- The animal must be euthanized while under deep anesthesia and death confirmed.