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**Reference:**

[Administrative Panel on Laboratory Animal Care](#)

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## **Guidelines For Rodent Survival Surgery**

### **STANFORD UNIVERSITY**

#### **The Administrative Panel on Laboratory Animal Care (A-PLAC)**

**DIRECTIONS:** Research personnel who perform rodent survival surgery should adhere to these guidelines. Contact the A-PLAC office (723-4550) if you have questions. Keep copies of guidelines with applicable protocols. You may find it helpful to post a copy of these guidelines in your laboratory.

**TRAINING:** Training in these techniques and the humane treatment of laboratory animals during the procedures is taught by the Veterinary Service Center (VSC) staff. All new personnel who will be performing these techniques should contact VSC staff for training (723-6735).

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## **GUIDELINES FOR RODENT SURVIVAL SURGERY**

### **I. Preparation of Surgical Facilities and Instruments**

#### **Surgery Facilities**

The NIH Guide states "For most rodent surgery, a facility may be small and simple, such as a dedicated space in a laboratory appropriately managed to minimize contamination from other activities in the room during surgery<sup>1</sup>."

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<sup>1</sup>National Research Council, 1996, *Guide for the Care and Use of Laboratory Animals*, National Research Council, p. 78, National Academy Press

Prior to surgery:

- Clean and disinfect the surface upon which surgery will be performed. Use soap and water followed by an appropriate disinfectant (e.g., Cide Swipes™, Clorox™, or Alcide LD\*).

### **Surgical Instruments**

Surgical instruments *must* be sterilized prior to surgery. Several techniques, such as autoclaving, hot bead sterilizers, or chemical disinfectants (e.g. Clidox™), can be used to sterilize instruments and other materials that will come into contact with the animal's tissues. Organic material must be removed prior to sterilization.

When performing surgeries on multiple animals during a single session, instruments must be sterilized between animals. First, thoroughly remove all organic material (e.g., blood) from instruments and then immerse the instruments in an appropriate high-level disinfectant (e.g., Sporocidin™, Clidox™, Cidex™)\* between animals for recommended contact time for sterilization. Sterilization using high-level disinfectants requires prolonged immersion (e.g., 6 hours for Alcide). Alternatively, instruments can be more rapidly sterilized using a hot bead sterilizer or steam sterilizer after cleaning. Contact the VSC for information, 723-3876.

## **II. Preparation of the Animal**

Prior to taking the animal to the surgery area:

- Remove hair from the surgical site, e.g., use animal clippers, razor, or depilatory cream; vacuum or otherwise remove loose hair and debris. Do not use scissors only to remove hair.
- Clean and aseptically prepare the surgical site. Use an appropriate surgical scrubbing technique (e.g., vigorous scrubbing in a gradually enlarging circular pattern from the interior of the shaved area towards the exterior) and an effective disinfectant (e.g., alternating alcohol and Nolvasan™ or Betadine™ scrubs x3). Do not use alcohol alone.
- Draping for major surgeries is needed.

Place lubricating ophthalmic ointment (e.g., Lacrilube™) in the anesthetized animal's eyes to prevent drying.

## **III. Preparation of the Surgeon**

- Wash hands with an appropriate antiseptic soap.
- Wear a mask, sterile gloves, clean scrub shirt or lab coat.

If multiple animals are operated at same sitting, one pair of sterile gloves can be used provided that the gloves are disinfected (by wiping with an appropriate disinfectant) between animals.

#### **IV. Intraoperative Monitoring and Post-operative Care**

Monitor the animal regularly (at least every 15 minutes) during the procedure and until animal is fully ambulatory. Written records on individual animals must be maintained for surgeries. The use of equipment to record clinical parameters is encouraged.

- ALL SURGERIES -- Place the animal on a clean absorbent surface.

Visual assessment of the following parameters is recommended for each animal: (RECORD ANY DEVIATION FROM NORMAL):

- **Analgesia quality:** Assess withdrawal reflex a minimum of every 15 minutes.
- **Mucous membrane color:** Mucous membranes should remain pink.
- **Breathing pattern:** Breathing should be regular and within normal range.

Drugs, including dosages, routes of administration, and times given should be recorded.

Animals should not be left alone during surgery. All needed materials, (vectors, drugs, etc.) should be easily accessible from the surgery location.

To minimize hypothermia, place the animal in a cage in a warm room on a padded surface or provide warmth with a circulating water blanket, warm water bottle, light bulb, or other method.

Recommendations to prevent dehydration: 1 - 2 ml of fluids (0.9% NaCl or equivalent) per 100 gm of body weight subcutaneously. If blood loss occurs during the surgical procedure, or if the animal is slow to recover from anesthesia, provide *additional* fluids.

**Do not leave an animal unattended until it fully recovers consciousness. To prevent cannibalism, observe rodents continuously or house rodents individually until they are ambulatory.**

After the immediate postoperative period, check the animal at least daily to ensure that there are no complications; record deviations from normal. Sutures or wound clips should be removed in 7-10 days if surgical wound appears normal. If the animal appears ill postoperatively, or the surgical wound appears abnormal, contact the VSC at 723-3876 and ask to speak to the Veterinarian On Call.

## Minimal requirements for rodent surgery logs

All logs should contain surgeon name, animal or cage/group number, surgery start/stop, type/dose of anesthesia, vital parameters monitored and any complications noted. It is recommended that if an analgesic is given at the time of surgery, the type/dose be on the sheet as well. For many users this simplifies record keeping.

Users should also note that when controlled substances are used, the animal ID and dose given in the controlled substance log and surgery log should match.

### V. “Tips only” technique:

“Tips only” is defined for the purpose of these guidelines as surgeries involving only very small incisions, for example, embryo transfer or ovariectomy. The emphasis of aseptic surgical practices here are to keep the tips (which enter the body) sterile thereby preventing contamination. **These procedures do not require the surgeon to wear a mask or *sterile* gloves.**

The sterility of the instrument tips must be maintained throughout the procedure. Contact the VSC if you have any questions regarding proper “tips only” techniques.

### VI. Additional sources of information for analgesia/anesthetic agents at:

[http://med.stanford.edu/compmed/animal\\_care/mice.html](http://med.stanford.edu/compmed/animal_care/mice.html)

[http://med.stanford.edu/compmed/animal\\_care/rats.html](http://med.stanford.edu/compmed/animal_care/rats.html)

#### **Additional sources of information on disinfectant, sterilants, wound closure materials**

The NIH intramural research program has tables listing disinfectants for hard surface, skin, and instruments, as well as sterilants for instrument disinfectants and wound closure materials at: <http://oacu.od.nih.gov/ARAC/surguide.pdf> .

**\*It is very important that disinfectants are prepared for use according to the manufacturer's recommendations, or they will not be effective. All organic material must be cleaned from the surface before the disinfectant is applied. Some disinfectants contain paraformaldehyde and should be rinsed off with sterile water or saline.**

**Provider:** Office of the Vice Provost and Dean of Research and Graduate Policy, Stanford University

**Contact:** [A-PLAC Administrator](#)

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