



<b>Research Office</b> <b>Laboratory Animal Resources</b> <b>Center</b>	<b>Subject:</b> Surgery Guidelines – Rodents	<b>Date:</b> IACUC Approved: 8/24/ 2011 Page 1 of 3
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## **SURGERY GUIDELINES - RODENTS**

**These guidelines apply to all surgical procedures performed on rodents.**

- Section One - Survival Surgery in Rodents
- Section Two - Non-Survival (Terminal) Surgery in Rodents

### **Section One – SURVIVAL SURGERY IN RODENTS**

Any surgery conducted on animals that are expected to recover from anesthesia is considered survival surgery.

#### **GENERAL**

Survival surgery on rodents should be performed using sterile instruments and sutures, clean or sterile surgical gloves, and aseptic procedures to reduce microbial contamination of exposed tissues to the lowest practical level.

#### **PROCEDURES**

##### **Pre-Operative:**

1. Surgery should be conducted in an uncluttered, disinfected area, which promotes asepsis during surgery - sanitize counter/lab bench with e.g. alcohol, bleach solution, Chlorhexidine, or Clidox. Use clean underpads, towels that are replaced after each surgery.
2. All instruments and implants should be sterilized (steam autoclave, glass bead sterilizer or gas-sterilization) – if autoclaved, label package with date of sterilization. Fragile implants may be gas-sterilized or soaked for 10 hours in a 2% glutaraldehyde solution or other chemical sterilant (not disinfectant) - rinse solution off with sterile water before implanting.
3. As soon as animal is anesthetized, remove fur from the surgical site. Perform this procedure in an area separate from where the surgery is to be conducted.
4. Pre-operative administration of analgesics may be recommended as part of surgical preparation. Refer to LARC Formulary for suggested doses.
5. Put ophthalmic ointment in the rodent’s eyes, to prevent the corneas from drying out.
6. Disinfect incision site with a disinfectant such as dilute Chlorhexidine or Betadine solution. Alcohol use by itself is not an appropriate skin disinfectant, and may contribute to hypothermia in rodents.

7. Surgeons should don a clean lab coat or scrub shirt and then wash and dry their hands before aseptically donning sterile surgical gloves or clean gloves.  
*Note about gloves: Sterile gloves are only required if you are touching the surgical site or the tip of sterile instruments with your gloved hands, otherwise, you may wear new, clean, non-sterile gloves. Don a new pair of gloves after you have prepared the surgery area and patient, before you start your surgery. If you need to touch animal tissue with your hands, or there is any possibility of this, you MUST wear sterile gloves*

### **Operative:**

1. Keep animal warm using a heated surface. A water-flow circulating heating pad is safe for the animal.
2. The animal must be maintained in a surgical plane of anesthesia throughout the procedure. Lack of pedal withdrawal reflex (toe or footpad-pinch, on two feet) is recommended for assuring adequate depth of anesthesia prior to first incision. Depending on the procedure, other monitoring may be indicated such as heart rate, blood pressure, body temperature, and tissue oxygenation.
3. Monitor and/or maintain the animal's vital signs, including respiratory pattern, skin or mucous membrane color and lack of responsiveness.
4. Begin surgery with sterile instruments and handle them aseptically to minimize contamination. You may use a bead sterilizer to re-sterilize instrument tips if contamination occurs during the procedure or between individual animals.
5. Instruments and gloves may be used for a series of similar surgeries provided they are sterilized between animals. After the first surgery, clean the instruments and insert each instrument into a hot bead sterilizer for at least fifteen seconds. If gloves are soiled change them. Follow all above procedures on the next animal. When using autoclaved instruments it is recommended that a new set of sterile instruments be used after every five animals (or for every cage). If known contamination has taken place, the instrument(s) should not be reused before re-sterilization. Autoclaved instruments may be bead sterilized or alternatively wiped with alcohol between animals as long as they are kept on a sterile field when not being used.

Close surgical wounds using appropriate techniques and materials. If surgery has entered the thorax or abdomen, a two-layer closure is required. Consult the AV for training and assistance.

### **Post-Operative:**

1. Recover the animal.

Do not leave animals that have just undergone a procedure unattended with other unanesthetized animals. Animals must be attended and observed no less than once every 15 minutes (or as approved in your protocol) until all animals are recovered

and able to ambulate prior to returning to standard housing.

2. Administer analgesics per the IACUC-approved ACUP. See LARC Formulary recommended doses.
3. Remove skin closures 10 to 14 days post-operatively (exceptions must be described in the IACUC-approved ACUP). Exception: female mice that undergo surgery for embryo transplantation may have their wound clips left in until their pups have been weaned.
4. It is recommended that anesthesia, surgery, post-surgical analgesics and monitoring are documented in a surgical record.
5. Discard soiled disposable drapes, pads, towels. Place all sharps in sharps disposal container as soon as possible. Clean and dry all surgical instruments and re-assemble them to be re-sterilized.

## **Section Two - NON-SURVIVAL (TERMINAL) SURGERY**

Any surgery conducted on animals that are not allowed to regain consciousness is considered non-survival surgery. This includes terminal vascular perfusion.

- No expired drugs or fluids are allowed. Pharmaceutical-grade agents (USP) must be used unless an exemption is approved by the IACUC.
- Non-survival surgeries require neither aseptic technique nor dedicated facilities, if the subjects are not anesthetized long enough to show evidence of infection.
- Non-survival surgeries not performed aseptically or in a dedicated facility must at least be performed in a clean area, free of clutter.
- Personnel present in the area must observe reasonable cleanliness practices for both themselves and the animals.
- The IACUC must approve monitoring parameters for this type of surgery. In the approved protocol, the Principal Investigator must describe the length of the procedure and steps taken to minimize the possibility of infection.
- The method of euthanasia should be consistent with the AVMA Guidelines on Euthanasia and IACUC euthanasia guidelines (See IACUC web site) and must be listed in the approved IACUC ACUP.