Background

This Standard Operating Procedure (SOP) provides detailed descriptions of procedures to be followed unless alternate procedures have been outlined in an IACUC Protocol Application. If an investigator wishes to deviate from the approved SOP, all changes must be outlined and justified in the protocol application (approval of the protocol indicates approval of the deviation from the SOP for that project only).

It is the researcher’s responsibility to ensure that adequate post-operative/post-anesthetic care is provided. The individual(s) providing post-operative care must be familiar with the approved IACUC Protocol, have the skills and abilities to perform the assessments as indicated below, and must be able to provide support in case of complications. A qualified Laboratory Animal Technician may be hired at an hourly rate to perform these tasks. It is important to note that these guidelines are MINIMUM STANDARDS.

IACUC Procedure

| Anesthesia and Analgesia | Rodent anesthetic guidance and requirements are outlined in the Anesthetic Care of Rodents SOP.
|                         | The analgesic regimen will be followed as indicated in the approved protocol. Unless justification to the contrary is provided, the administration of analgesics should start before or at the time of surgery and continue for at least 24 hours post-operatively.
|                         | Injectable local anesthetics should be administered prior to incision of tissues. Lidocaine is effective within 2-5 minutes and bupivacaine is effective within 15 minutes of injection.
| Preparation of the Surgical Area | The physical site of rodent surgical performance must be located in an area of the laboratory not concurrently used for other activities.
| | The area must be clean and uncluttered and all surfaces should be cleaned and sanitized prior to use.
| Instrument and Drape Preparation | Instruments must be sterilized prior to surgery using an acceptable method. These include autoclaving, ethylene oxide sterilization, and specific cold sterilization techniques. Ethanol is not an acceptable method of sterilization.
| | Pack sterility and sterilizer function must be performed as outlined in the Autoclave Monitoring and Sterile Pack Storage Standards policy.
| | Instruments may be re-sterilized during a surgical procedure using a hot bead sterilizer. After all organic material has been wiped from the instrument using sterile gauze it is placed into the beads for 30-45 seconds. This can be done for up to four additional animals before a new, autoclaved pack must be used.
| | All implanted materials (mini-pumps, catheters, suture material) MUST be sterile.
| | Sterile drapes should be used to cover unclipped areas. Acceptable materials include...
cloth and paper drapes, clear adhesive drapes (tegaderm), and large gauze squares. A sterile surface for placement of instruments is also required to prevent contamination.

**Surgeon Attire**

The surgeon must wear a cap, a mask, and a clean lab coat or scrub top during the performance of surgery.

After washing hands, sterile gloves are required for rodent surgical procedures.

**Incision Site Preparation**

All hair must be removed from the area surrounding the surgical incision. This can be accomplished with clippers or a depilatory creme (Nair) though this carries the risk of chemical burns if not done correctly. Hair should be removed over a sufficient area so that no surgical instruments or suture come into contact with unprepped skin.

Preparation of the shaved skin requires cleaning with betadine or chlorhexidine solution followed by wiping the area with 70% alcohol. This is repeated two additional times.

**Wound Closure**

Closure of body cavities must be done in at least two layers (body wall and skin).

To prevent dehiscence associated with chewing, wound must be closed with a simple, interrupted suture pattern unless otherwise described in the protocol.

Closure of the skin can be accomplished using wound clips, sutures, or tissue glue. Excessive glue application is a common cause of self mutilation and dehiscence. If external sutures are placed they must be of a monofilament material to prevent wicking and possible wound infection.

**Post-operative Care**

After recovery, animals will be returned to the DLAR vivarium unless an exception is explicitly described in the IACUC approved protocol. Food may be placed on the floor for the first 24-48 hours as part of the general supportive care plan.

Research staff will check on the animal early the following day and at least daily thereafter for 7-10 days or until sutures or wound clips are removed. Research staff will ensure that the animal is eating, drinking, eliminating, and ambulating normally. DLAR staff does not perform post-operative monitoring as part of their daily health checks and this is the responsibility of the laboratory.

The incision site is checked for clear or purulent discharge, redness, swelling, pain, suture removal by the animal, or incision breakdown.

Signs of surgical complication such as herniation, infection, organ dysfunction, pain, etc. will prompt a consultation with a DLAR veterinarian. **Surgical repair is NOT permitted unless described in the protocol without first consulting with a member of the veterinary staff. Performance of a repair without prior approval represents second surgery and a non-compliance event.**

Any abnormalities (e.g. dehydration, lethargy, inappetance) will warrant supportive care, consultation with a DLAR veterinarian, and continued frequent monitoring and care. Continued or progressing problems, despite appropriate therapy, may require euthanasia.

**Recordkeeping**

Records of surgical procedures must be kept for each animal or cage of animals. DLAR provides an anesthetic record card that should be used for this purpose. Required
Information includes the date, procedure performed, anesthetic and analgesics used with time and date of administration, and the results of post-operative monitoring. This card must remain with the cage while the animal is being monitored and should then be retained by the laboratory as a permanent record in accordance with the regulations.

<table>
<thead>
<tr>
<th>Non-survival procedures</th>
<th>Supplemental heat is recommended for anesthetic stability and prevention of premature anesthetic death but is not strictly required.</th>
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<tbody>
<tr>
<td></td>
<td>All instruments and implants must be clean but not necessarily sterile. For long procedures, &gt;4 hours, it is advisable to use sterile instruments to avoid inflammation associated with bacterial contamination.</td>
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<td>The hair must be removed from the skin but the site does not need to be aseptically scrubbed.</td>
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<td>The surgeon may wear new exam gloves rather than sterile gloves.</td>
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**IMPORTANT REMINDER:** If survival surgery/procedures will be conducted outside of normal business hours the PI and/or PI staff must be available to care for the animals each day. DLAR veterinarians are on call during weekends and holidays but are not on campus and DLAR staff coverage is limited during these times.