



RODENT SURVIVAL SURGERY POLICY

Overview/Purpose

Survival surgeries in rodents must be completed using the basic rules of asepsis, gentle tissue handling, and proper post-operative care in accordance with applicable governmental regulations. Researchers performing surgical procedures must have appropriate training to ensure good surgical technique is utilized. All investigators, laboratories, and facilities performing survival surgery on rodent species must adhere to the minimum standards addressed in this policy.

Definitions

Major Survival Surgery: Penetrates and exposes a body cavity, produces substantial impairment of physical or physiologic functions, or involves extensive tissue dissections or transection.

Minor Survival Surgery: Does not expose a body cavity and causes little or no physical impairment.

Requirements

Training: Research personnel conducting surgical procedures must have appropriate training prior to conducting surgery. Training is available at no charge through University Laboratory Animal Resources (ULAR). <http://ular.osu.edu/training/animal-handling-and-technique-training/>

Anesthesia: Surgical procedures must be performed under anesthesia. Monitoring of the animal's condition and assessment of anesthetic depth must occur at regular intervals throughout the procedure. Anesthetic selection is evaluated during the IACUC protocol approval process and additional veterinary consultation is available at all times³.

Analgesia: Analgesia must be provided to animals that are likely to experience post-operative pain; exceptions must be approved by the IACUC. Investigators are responsible for the assessment and management of pain in their research animals and must include a plan for pain management in their IACUC protocol³. Protocols approved to use standard buprenorphine may utilize the sustained release version (Buprenorphine SR) as outlined in the ULAR Veterinary Best Practices for Rat and Mouse Analgesia documents in consultation with veterinary staff and without submission of an IACUC amendment.

Record Keeping: Investigators must maintain accurate records of anesthesia, surgery, and post-operative care, including analgesic administration. These records must document the procedures performed, date, individual performing surgery and postoperative observations. A rodent survival surgery card must be maintained at the cage level when animals are housed in ULAR. These cards are available within the animal housing room and examples on completing the rodent surgery and post op records card can be found at this link: <http://ular.osu.edu/files/2018/06/Rodent-Cage-Level-Record-Guidance-blue.pdf>. Rodent surgery cage cards may be maintained and used as the surgery record. Records must be available during the semiannual IACUC inspection.



Surgery Location: It is required that a portion of a room be designated for rodent surgery, be disinfected prior to surgery, and used for no other purpose during the time of surgery.

Aseptic Technique: Aseptic techniques must be followed for all survival surgeries. All surgical equipment, instruments, and supplies that will contact the surgical site must be sterilized before use and must be maintained on a sterile surface during surgery i.e. drape or tray. The surgeon must wear a surgical face mask and a clean surgical gown/scrub top/lab coat for all rodent surgeries. Sterile or properly disinfected exam gloves must be used². Patient preparation (fur removal) should take place at a site other than the location in which the surgery will be performed. Hair must be removed and the surgical site must be scrubbed three times with a recommended skin disinfectant, alternating each disinfectant scrub with a swipe of sterile water or 70% isopropyl alcohol.

- If hands contact a non-sterile object, gloves must be changed or properly disinfected.
- If whole instruments are placed on a non-sterile surface or dropped on the ground, they must be replaced with an individually sterilized instrument or an instrument from a new surgery pack.
- If instrument tips only contact a non-sterile surface, a new sterile pack of instruments must be opened or alternatively, instrument tips must be wiped clean of blood and/or tissue and placed in a hot bead sterilizer for 10-20 seconds (at 240-270 °C).

For additional details regarding aseptic technique refer to the [Best Practices for Rodent Survival Surgery](#). For non-survival surgeries, following aseptic technique is not required. However, the surgeon must wear clean gloves, a clean gown or lab coat and use clean instruments

Multiple Rodent Survival Surgeries: The same set of instruments can be used on multiple animals as long as the sterility of the instruments is maintained. Instrument tips must be wiped clean of blood and/or tissue using sterile supplies (wipes and water/saline **must** be sterile) and either placed in a hot bead sterilizer or soaked in 70% isopropyl alcohol for 2 minutes between surgeries¹. See [Acceptable Disinfectant and Sterilant Methods](#)³ for specific details regarding required contact time and other options. For multiple surgeries occurring on the same day, instruments may be used for up to five animals only if sterility is maintained. Gloves must be changed or properly disinfected between animals or if torn.

Post-Operative Care: Animals recovering from anesthesia must be monitored by study personnel and provided supportive care until they are fully mobile within the cage. Hypothermia is a major cause of post-operative death in rodents and can be avoided by providing a heat source during the surgical and post-operative period. Following anesthetic recovery, animals must be monitored by study team members as described in the IACUC protocol. Non-absorbable skin sutures and wound clips must be removed between 10-14 days post-operatively³.

Applicable Regulations

1. National Research Council *Guide for the Care and Use of Laboratory Animals*, Eighth Edition. National Academy of Sciences, 2011
2. Animal Welfare Act Regulations (AWAR, 9 CFR, Chapter 1, Subchapter A)



Additional Information/Guidance

1. Keen JN, Austin M, Huang L, Messing S, Wyatt JD. *Efficacy of Soaking in 70% Isopropyl Alcohol on Aerobic Bacterial Decontamination of Surgical Instruments and Gloves for Serial Mouse Laparotomies*. JAALAS 49(6) p. 832 – 837. 2010
2. LeMoine DM, Bergdall VK, Freed C. *Performance analysis of exam gloves used for aseptic rodent surgery*. JAALAS 54(3):311-6. 2015
3. ULAR Resources:
 - [Veterinary Best Practices](#)
 - [Approved Anesthetic Plans for Rodent Survival Surgery](#)
 - [Approved Analgesia Plans for Rodent Survival Surgery](#)
 - [Rat Analgesia](#)
 - [Mouse Analgesia](#)
 - [Rodent Surgical Incisions Closure Guidelines and Recommendations](#)
 - [Best Practices for Rodent Survival Surgery](#)

History of Revisions

025-00 – Original guideline approved 08/06/2001

025-01 – Revised to add more guidance and example of rodent surgery form; approved 07/31/2003

025-02 - Revised to focus on activities that must be conducted, best practices moved to another document; approved 03/16/2012

025-03 – Reviewed, revised to include additional information links; approved 12/20/2013

025-04 – Policy revision clarifies the procedures for maintaining aseptic technique and post-operative care; approved 08/15/2014

025-05 – Policy revision clarifies the procedures for maintaining sterility of instruments between animals for multiple surgeries; approved 11/18/2016

025-06 – Policy revision allows for interchangeable use of buprenorphine or buprenorphine SR without submission of an IACUC amendment. These are considered to be the same drug; approved 4/20/2018

025-07 – Policy revisions clarifies that a rodent survival surgery record card is required and must be maintained at the cage level when animals are housed in ULAR; approved 7/20/2018 with an implementation date of January 1, 2019