



The University of Georgia

Office of the Vice President for Research

Policy on Survival Surgery and Post-Surgical Monitoring of Animals Used In Research, Teaching and Testing

Approved by the UGA IACUC

Effective September 16, 2010

Survival surgery and post-surgical care of research animals are addressed in the *Guide, FASS Guide, PHS Policy, and USDA regulations*. These documents specifically require the institutional animal care and use committee (IACUC) to review, and the institutional veterinarian to oversee, surgical procedures and post-operative care programs. This policy clarifies requirements pertaining to survival surgery procedures on vertebrate animals. It does not cover terminal surgery (from which the animal does not wake up) nor procedures such as tail clip, ear punch, or neonatal rodent toe clip.

The principal investigator is ultimately responsible for ensuring that care, both appropriate to the species and to the procedure being performed, is provided. In practice, however, appropriate animal care, which conforms to regulatory expectations, requires careful coordination between the principal investigator, surgeon, animal care staff and veterinary staff. Responsibilities of key individuals must be delineated and understood before surgical procedures are performed.

Survival surgery must be performed using aseptic technique, analgesia is expected to be used for most procedures, procedures and post-operative monitoring must be documented, and animals which have had surgery must be identified.

Aseptic Technique

Aseptic surgical procedures must be used for survival (non-terminal) surgery of all laboratory animals.

1. Aseptic surgery should be conducted in dedicated facilities or spaces. When determining the appropriate site for conducting a surgical procedure (either a dedicated operating room/suite or a lab area that simply provides separation from other activities), the choice may depend on the species, the nature of the procedure (major, minor, or emergency), and the potential for physical impairment or postoperative complications, such as bacterial infection. Wherever surgery is performed, the area must be clean and uncluttered, and the work surface must be sanitized (wiped with a disinfectant) before surgery begins.
2. There must be appropriate preparation of the surgical site, including removal of the fur and adequate, species appropriate disinfection of the skin, such as with dilute chlorhexadine or povidine iodine, followed by 70% alcohol or sterile saline, repeated 2-3 times.
3. The skin surrounding the surgical site should be draped with sterile cloths or adherent drapes as appropriate to avoid contamination of the incision, instruments and supplies.

4. Sterile surgical gloves, a surgical mask, and a clean lab coat, surgical gown or other attire to replace or cover street clothing must be worn by the surgeon and any assistants working in the immediate surgical field. Gloves must remain intact, clean and disinfected. Gloves should be cleaned with 70% alcohol or disinfectant between animals, and they should be changed anytime they are damaged or become excessively soiled. For rodent surgery, utilizing a 'tips only' technique can be employed to further minimize potential contamination of the surgical site. With the 'tips only' technique just the tips of sterilized instruments touch the surgical site.
5. Sterile instruments, supplies and wound closure materials must be used for each animal.*
6. Operative techniques must avoid contamination of sterile instruments and gloves and reduce the likelihood of infection.

*Surgical procedures may be performed on multiple rodents during a single session using one sterile surgical pack, provided that instruments are cleaned and sterilized between animals. For sterilization between animals, instruments may be soaked in an approved chemical sterilant, observing recommended contact times, and rinsed in sterile saline or when using a "tips only" technique, heated in a hot bead sterilizer and cooled. Effective use of these strategies requires rigorous attention to technique.

Analgesia

Analgesia use is the expectation for most surgical procedures.

Because each surgery is different (species, procedure, circumstances) a single method of post-operative analgesia cannot be prescribed for all cases. Nonetheless, the expectation is that in most cases analgesia will be provided to animals undergoing surgery. As well as post-operative analgesia, preemptive analgesia, administered pre-operatively and intro-operatively, is recommended to minimize post-operative pain by inhibiting the initial pain cascade caused by tissue damage during surgery. Thus, the first dose of analgesia is administered prior to surgery.

1. The general recommendation for major surgeries is to provide at least 48 hours of post-operative analgesia, and then additional analgesia as needed until the animal does not appear to be experiencing pain. A major surgery is defined as a procedure which penetrates and exposes a body cavity (abdomen, chest, cranium) or produces substantial impairment of physical or physiological function.
2. The general recommendation for minor surgeries is to provide at least 24 hours of post-operative analgesia, and then additional analgesia as needed until the animal does not appear to be experiencing pain. A minor surgery is any procedure that is not major (e.g. placement of a catheter, implantation of a subcutaneous device).
3. The IACUC determines if a surgery is major or minor, if it is not apparent. For example, laparoscopic surgery or craniotomy may be considered major or minor, depending on the circumstances. If the IACUC determines that the surgical procedure only penetrates but does not expose a body cavity and that the procedure does not produce substantial impairment, the IACUC may conclude that it is a minor surgery. However, any laparoscopic or cranial surgery that produces substantial impairment of physical or physiological function must be considered a major surgery.
4. Pre-surgical local anesthetics (e.g. bupivacaine) may be indicated for some procedures involving significant disruption of the skin, as these drugs help block

the onset of the pain cascade, and minimize post-operative pain. However, local anesthesia is not to be used instead of systemic analgesia.

5. Non pharmacological methods of pain control are recommended. Provide, for example, a dark, quiet recovery area; timely wound/bandage maintenance; a soft resting surface; ambient warmth; rehydration with fluids; and palatable, easy to reach food.

For further specific guidance on analgesia, contact your Attending Veterinarian, and/or refer to the 'Formulary for Laboratory Animals' cited on the URAR websites.

Surgery and Post-operative Monitoring Records

Surgery and post-operative monitoring records must be maintained for all survival surgeries.

It is the responsibility of the principal investigator to assure accurate records regarding surgical procedures and post-operative care are maintained. For rodents and non-mammalian vertebrate species, group records are acceptable. For non-rodent mammals, individual records are required. All records must list the PI, AUP #, date of the procedure, identification of *each* animal, anesthesia and analgesia provided, surgeon, an emergency contact phone number, and a description of the procedure with any complications. Post-operative monitoring must also be documented. During the immediate post-operative period (until the last animal is recovered from anesthesia, i.e. able to move purposefully, right itself, and maintain balance), continuous postoperative monitoring is required and must be documented at least every 15 minutes. A minimum of daily-recorded observations is required until the post-operative recovery period is at an end (sutures are removed, surgical wounds are adequately healed, or 10-14 days). The surgical and post-operative monitoring records are the property of URAR, and must remain in the animal holding room with the animals during their post-operative period, and are then filed by URAR. The researchers may make copies for their records.

URAR provides the UGA URAR Surgery Form and the UGA URAR Post-Operative Monitoring Form for this purpose: [link will be provided]. These forms, or a lab generated document which lists the same information, must be used.

Identification of Animals during the Post-operative Period

Animals which have had surgery must be identified by a physical method approved by URAR.

For example, tags or special cage cards may be placed on the cage. This identification is to alert animal care technicians and the veterinary staff that an animal has had surgery. The physical identification should be removed when the post-operative recovery period is at an end.

Reference(s):

- Guide for the Care and Use of Laboratory Animals (*Guide*), NRC, 1996, 2010.
- Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (*FASS Guide*), FASS, 1999.
- Animal Welfare Regulations, 9 CFR, chapter I, subchapter A.
- U.S. Government Principles for the Care and Use of Animals Used in Testing, Research, and Training, 1983.
- Cooper DM, McIver R, Bianco R. 2000. The thin blue line: A review and discussion of aseptic technique and postprocedural infections in rodents. *Contemp Top Lab Anim Sci* 39:27-32.

