

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

Reference(s):

- Guide for the Care and Use of Laboratory Animals (Guide), NRC, 1996
- 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

Introduction:

Survival surgery and post-surgical care of research animals are addressed in the *Guide*, PHS Policy and USDA regulations. These documents specifically require the institutional animal care and use committee (IACUC) to review, and the attending veterinarian (AV) to oversee, surgical procedures and post-operative care programs. This policy details requirements pertaining to survival surgery procedures, post-surgical care, and monitoring of animals used in research, teaching or testing at the Indiana University Bloomington campus.

Survival Surgery Procedures and Facilities

Aseptic technique

Principles of aseptic surgical technique:

- Principle 1. Instruments and materials that penetrate a body cavity or are placed beneath the skin of an animal should be sterile.
- Principle 2. Appropriate preparation of the incision site and precise surgical techniques are required to reduce microbial contamination of the surgical site as well as instruments and materials used in the surgery.
- Principle 3. Reduction of microbial contamination by preparation of the surgeon, decontamination of the surgical work-space and limitation of exposure of the incision instruments and materials to fomites.

Aseptic surgical technique is required for all survival surgeries in vertebrate species (mammals, birds, reptiles amphibians and fish).

Specific application of these principles to non-rodent mammalian survival surgery are listed below:

- Preparation of the animal, such as hair removal if appropriate and disinfection of the operative site
- Preparation of the surgeon, such as the provision of decontaminated surgical attire (clean lab coat or scrub top, and surgical mask), surgical scrub, and sterile surgical gloves. A surgeon's cap is recommended to prevent hair or dander falling into the surgical area.
- Appropriate sterilization of instruments, supplies, and implanted materials.
- Draping the immediate area around the incision with sterile drapes (such as sterile gauze or autoclaved lab mat/paper towels) to avoid contamination of the incision, instruments and supplies.
- Use of operative techniques to reduce the likelihood of infection.

The IACUC recognizes that due to inherent differences in the anatomy, physiology, and environment of the various vertebrate classes, the effective performance of aseptic surgical technique on non-mammalian vertebrates (birds, fish, reptiles and amphibians) often requires modification of the standard practices associated with mammalian aseptic surgery. It also recognizes that field studies present a significant challenge to the effective implementation of all the principles of aseptic surgical technique, regardless of vertebrate class. Some scientific societies that specialize in vertebrates other than mammals have provided guidelines for surgery. Animal researchers who use non-mammalian species or who perform research in the field should expect to consult with the AV during the development of protocols that involve surgeries in order to determine appropriate aseptic technique.

Major Survival Surgery

Major survival surgery is defined as any surgical intervention that penetrates and exposes a body cavity (such as the skull, coelomic or peritoneal cavity) or has the potential for producing a substantial or permanent physical or physiologic impairment in an animal that is expected to recover. The AV will be the authority to determine whether a procedure is to be considered "major" or "minor" or simply a "procedure" in cases where it is not obvious. Major survival surgery in non-rodent mammals must be conducted in a facility intended for that purpose and maintained and operated to ensure cleanliness. Major survival surgical procedures in rodent species and non-mammalian vertebrates do not require a dedicated surgery facility; however, such procedures do require the use of appropriate aseptic technique, and the area of the laboratory or facility where surgery is conducted should be maintained and operated in a manner that ensures cleanliness and minimizes unnecessary traffic and activities.

Minor Survival Surgery

Minor survival surgery does not expose a body cavity and causes little or no physical impairment. Minor surgeries may be performed under less stringent conditions than major procedures. Although minor surgical procedures need not be conducted in a dedicated surgery facility, appropriate aseptic technique is required.

Multiple Major Survival Surgery (MMSS)

Generally, multiple major survival surgical procedures on a single animal are not allowed. However, under special circumstances, the IACUC may grant approval for conduct of such procedures provided they are related components of a single research or instructional project, and appropriate scientific justification is provided. Cost alone is not an adequate reason for performing multiple major survival surgical procedures on an animal, but such procedures may be justified in the interest of conserving numbers of rare species. Exceptions to the general policy above will be considered by the IACUC with proper scientific justification

Animal Care during the Peri-Operative Period

The principal investigator is ultimately responsible for ensuring that care is provided that is both appropriate to the species and to the procedure being performed. 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. Animal

care personnel must be aware of surgical animals under their care and whom to notify in case of an emergency.

If any animal develops unexpected surgical or post-surgical complications including death, the Laboratory Animal Resources (LAR) veterinary staff must be notified immediately. Animals that die unexpectedly during or after surgery or are euthanized because of post-surgical complications must be preserved by refrigeration and must be available to the LAR veterinary staff for necropsy as soon as possible. Postmortem examinations will be performed at the discretion of the LAR veterinary staff. The investigator will be notified of the results of the necropsy, including findings that indicate problems with surgical, anesthesia, analgesia or general health of the colony.

Post-operative analgesia must be in accordance with the campus [Policy on the Use of Sedatives, Analgesics and Anesthetics in Laboratory Animals](#).

Surgery Records

It is the responsibility of the principal investigator/surgeon to maintain accurate records regarding surgical procedures and perioperative care. For non-rodent mammals, individual records that detail procedures, drugs administered, dates, personnel, and pre- and post-surgical condition of the animal, and identification of the surgeon must be kept for each animal. For rodents and non-mammalian vertebrate species, group records of major surgeries that provide the same details may be used in place of individual records. Regardless of species, close (at least every 15 minutes) postoperative monitoring until recovery from anesthesia is required. Daily-recorded observations are required until the postoperative period is at an end (typically 10-14 days post surgery, when sutures are removed and surgical wounds are adequately healed). A campus surgical form and pain scales are available for this purpose at

<http://research.iu.edu/rschcomp/BIACUC/Policies/policies.html>.

The original or a copy of the surgical record must become part of the animal's campus health record for non-rodent mammals. All records must be readily available to the personnel involved in post-surgical monitoring, the veterinary staff, the IACUC, and federal regulatory officials. The surgery records and pain scales should be kept close to or in the same room where the animals are housed. The veterinary and animal care staff must have access to where these records are kept. Only records of animals present in animal quarters must be readily available, but once the animal is terminated, completed surgical records (original or a copy) must be sent to LAR.

Veterinary Monitoring and Oversight

The degree of involvement of the veterinary staff should be determined by the needs of the individual project. Consideration should be made for the experience of the surgeon and research staff, the surgical procedure being performed, the species involved, and the needs of the convalescent animal. LAR veterinarians conduct initial veterinary evaluation of proposed surgical procedures and perioperative animal care when they participate in the IACUC review of animal care and use protocols. Minimally, on-going veterinary monitoring will consist of regular review of the units' documentation of perioperative care and observation of animals to assure that animals are receiving adequate post-surgical care. This will include review of surgery records, animal health records, and other documents relating to animal surgery. The LAR veterinary staff is available for

consultation when planning for post-operative care of animals and for post-surgical emergencies. The AV has the authority to suspend, pending IACUC review, on-going animal use activities not in compliance with this policy.

Institutional Animal Care and Use Committee Monitoring and Oversight

The IACUC evaluates proposed surgical procedures and perioperative care during the review of animal care and use protocols. Routine on-going monitoring and oversight are exercised through periodic review of the animal care and use program, inspection of animal holding facilities and animal use areas, and reports from the veterinary staff. Ongoing projects that are found not to be in compliance with this policy are subject to suspension by the IACUC.