UNIVERSITY OF TEXAS AT ARLINGTON

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE

SURVIVAL SURGERY AND POST-SURGICAL CARE SOP

I. MULTIPLE MAJOR SURVIVAL SURGERIES USING ANIMAL RESEARCH SUBJECTS

A. Background Information
   In accordance with Title 9, Code of federal Regulations, Subchapter A, Parts 1 through 3, Animal Welfare Act; Guide for the Care and Use of Laboratory Animals; and the National Institutes of Health Publication 92-3415, Institutional Animal Care and Use Committee Guidebook, the scientific need for the performance of multiple survival surgery is to be examined by the UTA IACUC at the time of the initial and continuing review of all research protocols involving the use of animals. Efforts are made to avoid multiple major survival surgeries in research protocols using animal subjects. However, there may be situations where there is a scientific need for performance of multiple survival surgeries.

B. Definitions:
   1. Multiple major survival surgeries are defined as surgical interventions that:
      a. Penetrate and expose a body cavity, i.e., chest, cranium or abdomen
         OR
      b. Produce substantial impairment of physical or physiologic function.
   2. Surgical procedures requiring only limited access and accomplished using rigid or flexible videoscopes, e.g., arthroscopy, laproscopy, etc., would be normally considered minor procedures as long as they do not result in significant pain or impairment of mobility, exempting them from the prohibition of more than one survival procedures per animal.

C. Duties:
   1. The UTA IACUC will examine research protocols involving the use of animal subjects to assure that multiple survival surgeries are avoided unless essential to the objectives of the research protocol. Multiple survival surgeries can be justified if:
      a. They are related components of a research protocol.
      b. They conserve scarce animal resources.
      c. They are needed for clinical reasons as determined by the attending veterinarian.
   2. The primary investigator will:
      a. Provide a justification for multiple major survival surgeries in the written research protocol.
      b. Understand that convenience or monetary savings will not be adequate justifications.
II. SURVIVAL SURGERY AND POST SURGICAL CARE

A. Definitions:
   1. Aseptic technique:
      a. Surgical technique conducted under conditions that prevent exposure of the patient to pathogenic organisms, including wearing of sterile surgical gloves, gowns, caps and face masks; use of sterile instruments; and aseptic preparation of the surgical field.
      b. For rats and mice, the use of a surgical cap and gown is optional.
   2. Survival surgery: Surgery performed on a live animal under general anesthesia, from which the animal is expected to recover.
   3. Non-survival surgery: the animal is euthanized at the end of the surgical procedure before recovering from anesthesia.
   4. Major operative procedure or major survival surgery: Surgical intervention that penetrates a body cavity or could potentially produce a permanent handicap in an animal that is expected to recover.
   5. Minor surgical procedure: Surgical procedure restricted to the management of minor problems and injuries (e.g., wound suturing)

B. Legal Requirements:
   1. Surgery must be performed or directly supervised by trained, experienced personnel.
   2. Procedures that will cause more than momentary or slight pain or distress must be performed with appropriate sedatives, analgesics, and/or anesthetics, unless withholding such agents is justified for scientific reasons and that justification is provided to the UTA IACUC in writing by the principal investigator.
   3. Pre- and post-surgical care must be provided in accordance with established veterinary medical and nursing practices.
   4. Survival surgery:
      a. Aseptic surgical techniques must be used on all animals. Major surgical procedures must be conducted only in facilities that are intended for that purpose and are maintained under aseptic conditions. Non-major operative procedures do not require a dedicated facility but must be performed using aseptic procedures.
      b. Surgery on rats and mice does not require a dedicated facility but must be performed using aseptic procedures.
   5. Multiple major surgical procedures on one animal may not be performed unless the procedures are justified for scientific reasons, have been approved by the UTA IACUC, and the justification stated in writing by the principal investigator. Multiple surgical procedures may be performed as necessary to protect the health or well-being of the animal, as determined by the attending veterinarian.
C. Preparation for Surgery:

1. **Animal:** Hair should be clipped from the surgical site. The operative site should be thoroughly cleaned with a skin disinfectant to remove surface bacteria. The anesthetized animal should be secured with an appropriate method to prevent contamination of the surgical site. The animal should be positioned with the head and neck fully extended to ensure a patent airway, and an endotracheal tube should be inserted when possible. Surgical drapes should be used to cover the animal’s body to prevent contamination of the operative site; when a drape is used in surgery on rodents and rabbits, the drape must be small enough to permit visualization of the animal’s respiratory movements and peripheral perfusion to avoid anesthetic accidents.

2. **Surgeon:**
   a. A cap and face mask should be donned first. Hands and arms are scrubbed thoroughly with germicidal soap prior to donning sterile gloves and a surgical gown.
   b. For rats and mice, a surgical cap and gown are optional.

3. **Surgical instruments:**
   a. All instruments must be wrapped in packs and sterilized prior to surgery. The sterilization date should be written on the outside of each pack when it is prepared. Unused, sterilized instruments in packs should be resterilized after a period of time appropriate to the type and thickness of the material in which the instruments are packed and the method of sterilization. For rats and mice, all instruments must initially be wrapped in packs and sterilized prior to surgery. In the instance where surgery will be performed on multiple rodents, cold sterilant or bead sterilization should be used on instruments in between each animal and the instruments should be rinsed with sterile saline before use on animal tissue. It is generally accepted that no more than ten rodents will be used per sterilized surgical pack. Any exception to this guideline should be specified in the proposal with sufficient justification.

4. **Suture material:** The abdominal or thoracic body wall should generally be closed with absorbable sutures (i.e. Nylon, Prolene, Dacron) in a simple interrupted pattern. Skin sutures or staples should be removed 7 – 10 days post-surgery. Silk is not considered to be a good choice for suturing because it has capillary action and causes inflammation.

D. Postsurgical Care:

1. Trained personnel should observe the animal from the time surgery is completed to the time that the animal has recovered from anesthesia sufficiently to maintain itself in sternal recumbence.

2. The animal should be kept warm, quiet, and clean throughout the immediate postoperative period to facilitate the metabolism of anesthetic and to maximize healing of the incision. A water circulated heating pad can be effective here as well as during surgery to aid in maintaining the animal’s body temperature near normal (37-39 C).
3. Supplemental fluids, analgesics, and other drugs should be scheduled in the protocol and administered as described. Special diets, housing, and environmental conditions (e.g., temperature, humidity) should be considered to maximize the rate of healing. If large volumes of balanced electrolytes or other fluids are administered subcutaneously, the injections should be made at multiple sites to prevent tissue damage. Antibiotics should be used only when needed to treat postoperative infections; they must be carefully selected to avoid specific species tolerances.

4. Remove sutures at the appropriate time, usually 7-10 days.

5. Notes on daily monitoring of the animal’s progress, administration of medications, and management of the surgical incision up to the time of suture removal should be recorded on the clinical record. The development of the postoperative care protocol should be done in consultation with the attending veterinarian.

E. Record Keeping:
   1. A permanent record should be established for each animal undergoing surgery. Rats and mice can be handled as a group rather than individually for record keeping purposes.
   2. The record should be complete, current and readily accessible.
   3. A brief description of the surgical procedure should be recorded and should reflect what was approved by the UTA IACUC.
   4. Any unexpected or abnormal reaction to anesthetics or other drugs should be recorded.
   5. Any information that might be of value or assistance for maintaining the animal after surgery should be recorded.
   6. All post-surgical care provided should be documented.

References:

*Code of Federal Regulations*, Title 9 (Animals and Animal Products), Subchapter A (Animal Welfare), Parts 1-3