

**University of Colorado at Boulder, Office of Research Integrity  
Institutional Animal Care and Use Committee  
SOP #7  
Title: Major, minor, and multiple surgeries**

**I. Major Surgery**

- a. Definition: Both the *Animal Welfare Act* and the *Guide of the Care and Use of Laboratory Animals*, 8<sup>th</sup> edition (hereafter referred to as *The Guide*) states that a “major surgery penetrates and exposes a body cavity or produces a substantial impairment of physical or physiologic function or involves extensive dissection or transection.”
  - i. “Body cavity” is defined as the abdominal, thoracic, cranial, synovial, or bone marrow cavities, i.e. those chambers not immediately associated with the outside world.
  - ii. “Substantial impairment” is defined as the circumstance where the animal is not expected to be normal after a reasonable postoperative recovery period. Examples include, but are not limited to, those procedures that permanently or significantly affect ambulation, physiology, the immune system, and mentation.
- b. Examples of a major surgery include, but are not limited to:
  - i. Laparotomy, including laparoscopy.
  - ii. Thoracotomy.
  - iii. Craniotomy.
  - iv. Arthrotomy and joint replacement, excluding arthroscopy.
  - v. Orthopedic procedures (e.g. limb amputation).
  - vi. Nerve/muscle transection.
  - vii. Eye surgery with corneal incision.
  - viii. Significant soft tissue transection.
- c. Requirements: Major surgeries require appropriate anesthesia, analgesia, sterile technique, wound closure (sutures, staples, tissue glue, and/or bandaging), postoperative wound care, and more extensive postoperative monitoring of the animal until it has healed and/or has achieved a normal health status. This also includes the “...timely removal of skin sutures, clips or staples.” (Guide page 120) Timely generally means removal in 7 – 10 days. The IACUC protocol or amendment must be clear in regards to who is directly responsible for post-operative care, e.g. appropriately trained laboratory personnel.

**II. Minor Surgery**

- a. The *Guide* states that a “minor survival surgery does not expose a body cavity and causes little or no physical impairment; this category includes wound suturing, peripheral vessel cannulation, percutaneous biopsy, routine agricultural animal procedures such as castration, and most procedures routinely done on an “outpatient” basis in a veterinary clinical practice.
- b. Other examples of minor surgical procedures include, but are not limited to:
  - i. Vascular cut-down approach to an artery or vein (e.g. jugular or femoral).
  - ii. Tissue biopsy not involving surgical exposure of a body cavity (e.g. skin, muscle, via endoscopy, tail).
  - iii. Skin or subcutaneous implants.
  - iv. Surgical repair of a superficial injury.
  - v. Arthroscopy.
  - vi. Oral surgery and tooth extractions not involving bone.
  - vii. Closed castrations.

- c. Minor surgeries require appropriate anesthesia, analgesia, sterile technique, wound closure (if applicable, to include sutures, staples, tissue glue, and/or bandaging), postoperative wound care, and frequent postoperative monitoring of the animal until it has healed and/or has achieved a normal health status. This also includes timely removal of skin sutures, clips or staples as mentioned above. If post-operative care is necessary, the IACUC protocol or amendment must be clear in regards to who is directly responsible for post-operative care, e.g. appropriately trained laboratory personnel.

### III. **Non-surgical procedures**

Other procedures that should be listed in the protocol but are not considered a surgery:

Clipping incisors with anesthesia

Ear tagging or ear clipping

Toe clips with or without anesthesia

### IV. **Multiple Surgeries** (The Guide, page 30)

- a. Multiple survival surgical procedures on a single animal are discouraged but may be approved by the IACUC if scientifically justified by the investigator. It is preferable to use more animals to reduce the amount of pain/distress individual animals may experience with multiple surgeries. Scientific justification for multiple surgeries is required.
- b. Multiple survival surgeries can be justified if they are related components of a research project, conserve scarce animal resources, or if they are needed for veterinary care reasons. Cost saving alone is not an adequate reason for performing multiple survival surgeries. Each animal use protocol proposing the use of multiple survival surgeries will be considered and reviewed by the IACUC on a case by case basis.

Reference:

*Guide of the Care and Use of Laboratory Animals*, 8<sup>th</sup> edition, 2011