

## INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

### POLICY ON SURGERY AND OTHER EXPERIMENTAL PROCEDURES

#### GENERAL POLICY

Any person participating in a research activity involving vertebrate animals must be listed in the approved protocol, and must be qualified to perform the intended procedures on that particular species. Investigators may be required to provide proof of proficiency or credentials to perform a particular procedure or work with a particular animal species (see Peri-Operative/ Peri-Procedural Support below). Experience and training may be obtained from the Principal Investigator (PI), through the Center for Comparative Medicine (CCM), from relevant outside training opportunities, or other experienced third-party whose proficiency on the procedure is documented on their own protocol or equivalent.

#### DEFINITIONS

**Non-surgical procedure:** Manipulation of an animal for an experimental application, for examination purposes or for treatment of an induced or spontaneous disease or condition, including injection, bandaging or casting, imaging, antibody production, collection of blood and other clinical samples, non-invasive physiological monitoring, behavior training and testing, euthanasia, etc. Non-surgical procedures may or may not require the use of a sedative or anesthetic, and may or may not require the use of analgesics.

**Surgical Procedure (Surgery):** Usually involves an incision and exposure of a tissue for an operative method or the operative manipulation of physiologic or physical parameters to create a model of a clinical disease process or condition and/or treatment of a disease or condition. Surgery usually requires anesthesia and analgesia, and is further sub-classified as major or minor, and survival or non-survival (see below).

**Survival Surgery:** Animal regains consciousness, for any period of time, after anesthesia.

**Non-survival Surgery (Acute Surgery, Terminal Surgery):** Euthanasia is performed while the animal is under general anesthesia. The animal never awakens or regains consciousness.

**Major Surgery:** Any surgical intervention that penetrates and exposes a body cavity, produces substantial impairment of physical or physiologic function, or involves extensive tissue dissection or transection.

Examples of **major surgery** include:

- Surgical access of a body cavity (i.e. cranial, thoracic, abdominal, pelvic, ocular or orbital, skeletal, joint)
- Injury or repair of a tendon or ligament
- Bisection (partial or complete) of muscle or tendon
- Amputation of a limb
- Nephrectomy or nephrotomy
- Enucleation
- Open surgical biopsy of a major organ
- Surgical implantation of indwelling medical or monitoring devices
- Orthopedic procedures involving a surgical approach
- Neutering of male animals

**Minor Surgery:** Any surgical intervention that does not penetrate a body cavity and causes little or no physical or physiologic impairment.

Examples of **minor surgery** include:

- Percutaneous or cut-down approach to a superficial artery or vein for catheterization or other purposes
- Tissue biopsy not involving surgical exposure of a body cavity
- Skin and subcutaneous implants
- Head post implants
- Removal of small digits or tail amputation in small animals
- Endoscopy, colonoscopy, tracheoscopy, and laparoscopy (in which only a small penetrating incision is made in the skin)
- Surgical repair of a superficial injury

**USDA-covered species, non-rodents:** Animal species that are taxonomically defined as lagamorphs or higher, e.g., rabbit, cat, dog, ferret, sheep, goat, swine, non-human primate.

**USDA-covered species, rodents:** Animals that are taxonomically defined as rodents and covered by the Animal Welfare Act Regulations (AWAR), e.g., guinea pigs, hamsters, gerbils, ground squirrels, and mice/rats except for mice (*Mus*) and rats (*Rattus*) bred for research.

**Non USDA-covered rodents:** Mice (*Mus*) and rats (*Rattus*) bred for research.

**Non-mammal:** Vertebrate animals that are not classified as mammals. Animals included in this category are fish, amphibians, reptiles, and birds.

**Aseptic Technique:** A technique used for surgery or other procedures that is designed to maintain an object or anatomic area in a condition as free as possible from all microorganisms and infection. Aseptic technique is used whenever body tissues must be penetrated and the animal is intended to recover from anesthesia. It is designed to protect the animal as well as the person performing the procedure and may require the use of a dedicated room or area. Aseptic technique is further defined below as “strict” or “modified”, depending on the type of procedure performed and the animal classification.

**Strict Aseptic Technique** includes:

- A dedicated, clean, and uncluttered work area
- A pre-sanitized work area
- Pre-surgical or pre-procedural preparation of skin surfaces (i.e., hair clipped, skin shaved if applicable, disinfectant soap scrub)
- Surgery/procedure preparation of the skin site (iodophor and/or alcohol scrub)
- Sterile draping of the surgery/ procedure skin site
- Use of sterile instruments and supplies
- Surgeons’ preparation, including removal of jewelry from hands and wrists and 5 minutes of thorough scrubbing of fingers to elbows using an appropriate disinfectant
- Wearing of surgical clothing (scrub suit, cap/bonnet, mask, shoe covers, sterile gown, sterile gloves)

**Modified Aseptic Technique:** Depending on the type of surgery or procedure and classification of animal, some of the requirements of strict aseptic technique (e.g., the need for a dedicated work area, requirement for sterile instruments and supplies, wearing of surgical clothing, pre-surgery or pre-procedure preparation of the animal subject or surgeon, and sterile draping of the surgery/procedure site) may be waived as described in the IACUC-approved protocol.

## **NONSURGICAL PROCEDURE AREAS (“Procedure Areas”)**

The location in which a nonsurgical procedure is to be performed must be specifically identified in the protocol. If procedure locations change, the protocol must be updated to capture the new locations. Procedure locations not previously approved by the IACUC must be reviewed by the Office of Animal Welfare Assurance, the Center for Comparative Medicine, Environmental Health & Safety (including Biosafety, if required), and the Research Space Management Group. All items identified during the review must be addressed before the area may be approved for use.

When procedures cannot be performed in a designated animal treatment or procedure room within an animal facility, the following additional requirements must be adhered to:

- The procedure must be performed in an area separate from other activities
- Activity in the area must be limited to the procedure conducted
- The area must be kept neat and uncluttered, and easily cleaned and sanitized
- Personnel access to the area should be limited
- Modified aseptic technique should be used

### **USDA-covered Species, Non-rodents**

Routine non-surgical and euthanasia procedures must be performed in IACUC-approved locations.

Non-survival experimental procedures in large animals, including euthanasia, must not be performed in animal housing rooms.

### **All Rodents**

Whenever possible, routine procedures using animals must be performed in designated hoods in animal housing rooms, or in dedicated procedure spaces within the CCM animal facilities, or other IACUC-approved specialized locations (e.g., irradiators, imaging suites). If the procedures are performed in locations outside of centralized animal facilities, rodents should be returned to specified holding rooms instead of to their original housing rooms in order to prevent spread of infectious agents potentially encountered while outside the vivarium.

If it is not possible to perform procedures within these dedicated, specialized rooms, procedures may be conducted in an Investigator-owned closed-door room, with the appropriate air flow. In circumstances where a dedicated room is not available and procedures must be conducted in shared laboratory spaces, procedures should be conducted within a laminar flow hood or bench-top plexiglass containment device unless there is a justification for working outside the flow hood or containment device. In such instances, work with animals should be conducted as close to the room exhaust as possible and signage must be posted alerting laboratory personnel that animal research is on-going. Every effort must be made to limit allergen release into shared work environments.

Non-survival procedures on all rodents (mice, rats, hamsters, and guinea pigs) including euthanasia, should not be performed in animal housing rooms except as required in BL-2 rooms or rooms under quarantine, but may be performed either in dedicated procedure rooms in animal facilities or in other IACUC-approved locations as described above.

## **SURGERY AREAS**

The location in which a surgical procedure is to be performed must be specifically identified in the protocol. If surgery areas change, the protocol must be updated to capture the new locations. Animal surgery areas not previously approved by the IACUC must be reviewed by the Office of Animal Welfare Assurance, the Center for Comparative Medicine, Environmental Health & Safety (including Biosafety, if required), and the Research Space Management Group. All items identified during the review must be addressed before the location may be approved for use.

The surgery area requirements are determined by animal classification and type of surgery, as follows:

### **Major Survival Surgery, USDA-Covered Mammalian Species, Non-rodent**

Operations must be performed in a dedicated surgery facility using strict aseptic technique. IACUC-approved surgery facilities comprise:

- Surgical support areas
- Animal preparation areas
- Surgeon preparation areas
- Surgical supply areas
- Operating room(s)
- Post-operative recovery/ care animal areas
- Access to the surgery area is limited.

### **Minor Surgery, USDA-Covered Mammalian Species, Non-rodent**

Operations do not require the use of dedicated surgery facilities, but strict aseptic technique must be followed. The surgery area requirements are:

- Separate, easily sanitized, and uncluttered area (a separate room is not required)
- Activity in the area must be limited to the procedure conducted
- Access to the room must be limited

### **Non-survival Surgery, USDA-Covered Mammalian Species, Non-rodent**

Operations may not require the use of dedicated surgery facilities or strict aseptic technique; however, consultation with CCM veterinarians is recommended, as the requirements listed below may be modified based on the duration and/or type of non-survival surgery.

The surgery area requirements are:

- A separate, easily sanitized, and uncluttered area (a separate room is not required)
- Activity in the area must be limited to the procedure conducted
- Access to the room must be limited

Modified aseptic technique must be followed:

- Sterile supplies are optional
- Drapes are optional
- Instruments must be clean and sanitized.

### **Survival Surgery, All Rodents and Non-mammals**

Operations do not require the use of dedicated surgery facilities. The surgery area requirements are:

- A separate, easily sanitized, and uncluttered area (a separate room is not required)
- Activity in the area must be limited to the procedure conducted
- Access to the room should be limited

Modified aseptic technique must be followed, including:

- Sterile supplies
- Dedicated laboratory clothing (e.g., lab coat, surgery scrubs, clean surgical gown); sterile clothing is optional
- Face mask and sterile gloves
- Maintenance of a sterile field
- Sterile drapes (optional, but recommended)

### **Non-survival Surgery, All Rodents and Non-mammals**

Operations do not require the use of dedicated surgery facilities. The surgery area requirements are:

- A separate, easily sanitized, and uncluttered area (a separate room is not required)
- Activity in the area must be limited to the procedure conducted
- Access to the room must be limited

Modified aseptic technique must be followed:

- Sterile supplies (optional)
- Dedicated laboratory clothing
- Drapes (optional, but recommended)

## **PERI-OPERATIVE / PERI-PROCEDURAL SUPPORT**

The PI is responsible for the provision of pre-/intra-/post-operative or procedural animal care as described in the IACUC-approved protocol. Please refer to the IACUC [Policy on Anesthesia and Analgesia](#) for monitoring animals peri-operatively / peri-procedurally.

Persons providing perioperative support may be asked to demonstrate proficiency to IACUC-designated personnel before they are approved to participate in this role unsupervised. Evaluations will include, but may not be limited to, the following:

- Calculating and administering appropriate pre-anesthetic drugs
- Calculating and inducing anesthesia
- Endotracheal intubation and securing the animal to the procedural surface
- Preparing the surgical site per the needs of the protocol
- Assessing depth of anesthesia, documenting vital signs
- Calculating and administering anesthesia-reversing drugs, if included in the protocol
- Providing supportive post-op care in accordance with IACUC policy, including proper documentation

The Director, Center for Comparative Medicine (CCM) and their designees are responsible for providing guidance and consultation to ensure that proper procedures and practices are followed to minimize pain and distress. CCM staff may provide emergency veterinary care when the Attending Veterinarian or his or her designee determines that immediate intervention is needed to save the life of the animal or relieve pain, and neither the PI nor his or her research staff members are available or cannot be contacted within a reasonable time (determined by the nature of the veterinary emergency).

## RELATED POLICES

[Policy on Adequate Veterinary Care](#)

[Policy on Anesthesia and Analgesia](#)

[Policy on Animal Observation and Record Keeping](#)

[Policy on Post-Operative and Post-Procedural Care](#)

## REFERENCES

AAALACi. [Frequently Asked Questions, C. Institutional Responsibilities, 8. Surgery in investigator laboratories](#) May 2020.

National Research Council of the National Academies. [Guide for the Care and Use of Laboratory Animals, 8th edition](#). National Academies Press: Washington, D.C., 2011.

U.S. Department of Agriculture. [Animal Welfare Act and Regulations](#) (Animal Care Blue Book). Code of Federal Regulations (CFR), Title 9, Chapter 1, Subchapter A, Parts 1-4. 2020.

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v1.2, 1 June 2016  
v1.3, 19 July 2017  
v1.4, 16 June 2021