

NU – IACUC

POLICY

Northeastern University Institutional Animal Care and Use Committee

Aseptic Non-Rodent Surgery

Surgery utilizing laboratory animals is a necessary tool used in many of research protocols. Principles of asepsis remains the same for all animal surgeries, regardless of species, but it is mandated by law that we maintain higher standards for the higher animal species. We at Northeastern University consider all non-rodent mammalian species in this category. Below we will describe several definitions that relate to this issue followed by the standards we will require for conducting survival surgery with these species.

Major surgery: Involves the penetration and exposure of a body cavity or any procedure which produces permanent impairment of physical or physiological functions; including, but not limited to:

- Injury and/or repair of a tendon/ligament
- Entering a body cavity
- Removing limbs
- Orthopedic procedures
- Any procedure where the animal is not expected to be normal after a reasonable post-operative recovery period.

Multiple Major Survival Surgery: Refer to the NU-IACUC Policy on Multiple Major Survival Surgeries

Minor surgery: Any invasive operative procedure in which only skin, mucous membrane and/or connective tissue is resected, examples of minor surgery include:

- Vascular cutdown approach to an artery or vein
- Tissue biopsy not involving surgical exposure of a body cavity
- Skin or subcutaneous implants
- Surgical repair of a superficial injury

Survival surgery: Any surgery in which the animal regains consciousness. Aseptic technique must be used on all non-rodent mammalian survival surgeries. All surgeries must be performed in a designated surgical suite approved by the NU-IACUC. All those performing these surgeries must be properly trained in techniques of aseptic surgery and the proper methods for performing the actual surgery.

Non-Survival(acute) surgery: These procedures involve euthanasia of the animal prior to recovery from anesthesia. Aseptic technique procedures are not required but efforts should be made to perform procedures as clean as possible. (i.e. clean non-sterile instruments and supplies.)

Location

Acute Surgery: It is recommended that this be performed in the Mugar 23 surgical suite. If acute surgery must be performed outside of this area, that area or laboratory must be an area of limited activity and is uncluttered and is sanitizable. The area involved must be cleaned upon completion of the procedure. Aseptic technique is highly recommended. Areas where these surgeries are performed must be approved and inspected bi-annually by the NU-IACUC.

Major and Minor Survival Surgery: To reduce possibility of infection survival surgery must be performed in the Mugar 23 surgical facility using strict aseptic technique. (All surgical time must be reserved in the DLAM office) This surgical suite is fogged with Clidox Solution prior to all non-rodent mammalian surgeries.

Included in this area are the following:

- Surgical support area for instrument and supply storage and post-surgical recovery (Veterinary Lab MU-024F)
- Surgical room (MU-023B)
- Surgeon's prep room, includes sink for hand washing and storage for surgeon's gowning supplies(MU-023C)
- Animal preparation (MU-023A)

Surgical Instruments

All surgical instruments must be steam or gas sterilized prior to use. Instruments must be enclosed in autoclaveable pouches or wrapped in surgical packs.

Pre-Surgical Planning & Meeting

Prior to initiating any surgical protocol, it is required that the investigator meet with representatives of DLAM to discuss and establish a surgical plan. In this plan, items such as individual responsibilities during the surgery, the experience of the surgeon, and suggestions from the DLAM staff will be discussed. This session also ensures that proper veterinary interaction has been established.

Fasting of Animals

Most animals are to be fasted (have all food removed) the evening before a planned surgery. Animals will still have free access to water. Restricting water results in dehydration and more difficult anesthesia. Food is removed primarily to prevent the possibility of partially digested food from being aspirated into the lungs after vomiting while under anesthesia. Aspiration of food into the lungs could possibly cause a fatal pneumonia in the animal patient.

Approved Anesthetics

The anesthetics that will be used during the surgery must be clearly outlined in the research protocol. The anesthetic choice should be based on the needs of the experiments. The use of paralytic agents without anesthesia is not permitted by the NU-IACUC. Please refer to the NU-IACUC Policy on the *Recommended Doses Anesthetics and Analgesics of Laboratory Animals*.

Animal Preparation (Animal is anesthetized)

- Hair at the intended incision site must be removed (clippers, depilatory cream, or "plucking") prior to placement of the animal on the surgery table.

- Wash the skin at the intended incision area by first scrubbing the area with betadine followed up by a rinse with 70% alcohol. Consider the use of Nolvasan or Dura-prep.
- Place the animal on the clean, warm surface to minimize heat loss. Warmth can be maintained by the use of a drape, pad, or circulating water heating pad placed under another drape or pad. As with all anesthetics and many surgical procedures, heat loss and body temperature management is an important factor in survival and recovery. If needed, place the animal in a positioner device or secure the animal to the table to keep the animal in the desired position for the surgery.
- An ophthalmic ointment must be applied to anesthetized animal's eyes to prevent ocular drying and potential irritation or ulceration.
- Disinfect the incision site by wiping with three sequential applications of betadine scrub then 70% alcohol. This followed by spraying the incision site with betadine solution and allowing it to dry on. When preping the incision area, start in the middle along the proposed incision line and wipe in a outward spiraling pattern where as not to wipe an area that has already been wiped. This lessens the chance of contamination.
- Sterile draping of the animal is required.

The Surgeon & the Surgery Team

The Surgeon:

The surgeon is required to scrub his/her forearms and hands with iodine surgeon's scrub or another disinfectant for approximately 5 minutes prior to gowning. After scrubbing their hands the surgeon is required for wear the following items and are to be put on in the following order:

1. Shoe covers
2. Surgeon's cap
3. Surgical mask
4. Sterile surgical gown
5. Sterile gloves.

Once all these items have been properly donned, the surgeon's hands and their front is sterile so extra care should be made not to contaminate or touch the surgeon's hands or front. If this happens, the surgeon must change their gloves or gown.

The Surgical Technician(s)

During surgery and when entering the surgical room the surgical technician or any other person(s) entering the surgery room must wear the following items: shoe covers, scrub suit, head cover, surgical mask, and gloves. These persons must pay extra attention as not to contaminate the surgical field.

Post – operative Care

The Principal Investigator, or designate, is responsible for the monitoring of animals recovering from anesthesia and surgery. Post-operative Check Sheets, available from DLAM, must be used for seven days post surgery.

1. Immediate post-op period:
 - Turn animal from side to side every 30 minutes to prevent atelectasis (lung compression).
 - The animal must be monitored until it is ambulatory.

- To hasten recovery, the animal must be kept warm. Place a drape, blanket or pad between the animal and the heat source to prevent overheating and/or burns.
 - Administer analgesics as described in the protocol.
 - Administer fluid therapy if necessary.
2. Extended Daily Monitoring – up to 4 to 7 days post-op.
- Evaluate adequate hydration by “tenting” loose skin, (skin should fall back immediately). The absence of this response may indicate the need of a supplemental fluid therapy. (Consult veterinarian for appropriate method, volume, fluid type).
 - Evaluate adequate nutrition by palpating spine and/or ribs. Daily weights will ensure undisputed proof of food intake or lack thereof.
 - Observe incision site for cleanliness and healing.
 - Evaluate the presence of pain or distress. Refer to NU-IACUC policy on *Pain / Distress, Alleviation / Avoidance of*
 - Sutures or wound clips must be removed 7 – 10 days post-op.

Any surgical complications must be reported to DLAM.

Approved: