

Guidelines for Surgery at UNT Health Science Center

Surgery is classified in several ways:

- Major surgery – surgery is considered major if it enters a body cavity (thorax, abdomen, cranium), or has the potential for having significant complications. Included would be orthopedic procedures and extensive cannulation procedures. The use of aseptic technique is mandatory in these surgeries to minimize the possibility of post surgical infection, i.e. sterile instruments, gloves, clothing as well as aseptic preparation of the surgical site. Major surgical procedures on rodents, hamsters, and guinea pigs must also be performed using aseptic procedures.
- Minor surgery - Minor procedures include peripheral vessel cannulations and skin incisions.
- Surgery is also classified as survival vs. non-survival. An individual animal should only undergo one major recovery surgical procedures unless approved by the IACUC.

Legal Requirements

- Surgery must be performed or directly supervised by trained, experienced personnel.
- 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 is approved by the IACUC.

Surgical Facilities

- Non-survival surgery, minor surgery or rodent/non-mammal surgery may be performed in an approved lab. The IACUC will review and approve all surgical areas.
- The surgical table must be constructed of a material that can be washed with soap and water and then disinfected with an appropriate agent or that can be heat sterilized.
- Do not eat or drink in the lab area.
- The DLAM Surgery Suites is to be used for major survival surgery in large animals (rabbits, dogs, pigs). The suites are designed and maintained in such a way that they help prevent the development of post-procedural infections. In the DLAM facility there are rooms dedicated for rodent procedures and can be used for rodent surgery.
- The surgical suite is located in the basement of the Research and Education building in room numbers 013 A, B, C, and D. These rooms, including the rodent procedure room, should be reserved at least two weeks in advance. Investigators should contact Tito Nelson (x0580 or snelson@hsc.unt.edu) or fill out the form "*Surgery/Procedure Room Scheduling Request Form*" from DLAM's website (Intranet; Departments; Lab Animal Medicine; Forms/Records) when requesting the surgical suite, assistance for surgery or any needed equipment (anesthesia machine); a sign in sheet is posted on the rodent procedure area. Email the Animal Health Technician, she will confirm your time.
- Minimizing traffic flow and conversation in the operating room significantly reduces the risk of contamination of the surgical site.

Surgical Equipment/Assistance

- Portable anesthesia machines are available for use by contacting the Animal Health Technician, Tito. They can be reserved by using the form found online "*Surgery/Procedure Room Scheduling Request Form*."
- This form can also be used to request assistance for surgical procedures.

Surgical instruments

- Surgical instruments must be sterile. Heat sterilization is ideal. Agents such as chlorine dioxide or glutaraldehydes can be used for cold sterilization.

- For surgeries on multiple rodents, instruments may be sterilized with cold sterilants or a bead sterilizer between each animal. All blood must be removed before placing the instruments in a bead sterilizer. It is generally accepted that no more than ten rodents will be used per pre-sterilized instrument pack. Any exception to this guideline should be specified in the protocol with justification.

Preparation of the surgeon and personnel involved in the surgery

- Sterile gloves should be used for all procedures. Examination gloves are not sterile. Large animal surgeries should be performed with a new pair of gloves for each patient.
- The surgeon's hands and arms should be scrubbed for 3 minutes with a disinfectant such as povidone iodine or chlorhexidine, rinsed with water and dried prior to gloving for any large animal survival surgery. As much as 30% of the time gloves become perforated during surgery, exposing the animal's tissues directly to the surgeon's skin.
- A cap, facemask, shoe covers and sterile gown must be worn for all large animal major survival surgeries.
- A clean lab coat is recommended when performing rodent surgeries. A hair cover and facemask will reduce the risk of gross contamination of the surgical site.

Pre-Operative Prep Room/Areas

- The **prep room**, room 013E, is located in the surgery suite. This is where pre-operative procedures such as intubation, IV catheter placement, and surgical site clipping should take place. Responsibility for pre-operative procedures can vary based on investigator experience. If the investigator is inexperienced, DLAM personnel will be assigned to manage the pre-operative procedures. One animal can be brought to the prep room (1 prep table) at a time and subsequently to the surgical suite.
- A prep area for rodent/non-mammal survival surgery should be separate from the surgery area.

Anesthesia and Analgesia

- Expired medical materials such as drugs, fluids and sutures may not be used on any research animal that is to recover from an anesthetic procedure. Expired medical materials can only be used for non-survival procedures.
- Use anesthetic that is appropriate for the species you are working with. Follow directions for use. Use anesthetic that has been approved in your protocol.
- Anesthetics and analgesics must be pharmaceutical grade (not chemical grade) to be used in animals.
- Provide analgesics post-operatively according to your protocol.

Preparation of the animal for surgery

- Hair should be clipped from the surgical site.
- The operative site should be thoroughly cleaned with a skin disinfectant to remove surface bacteria. The area cleaned with 3 alternating scrubs of Betadine and 70% alcohol. The cleaning should be done in a circular motion. Never go back to the center with the same applicator. The last scrub should be alcohol (Betadine, alcohol, Betadine, alcohol, Betadine, alcohol).
- 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.

Sutures

- The abdominal or thoracic body wall should generally be closed with absorbable sutures (i.e. Nylon, Prolene, and Dacron) in a simple, interrupted pattern.
- Silk is not considered to be a good choice for suturing because it has capillary action and causes inflammation.
- The skin should be closed with non-absorbable sutures or wound clips.

Post-surgical observations

- According to *The Guide*, appropriate facilities and equipment should be available for post surgical care. Animals recovering in your lab must be provided an additional heat source: a heated water circulating pad, a heating pad or a heat lamp. If the animals are in the lab, the cages should be covered in case a non-animal worker enters the lab.
- An important component of post-surgical care is observation of the animal and intervention as required during recovery from anesthesia and surgery. Adequate care (the responsibility of the PI) requires close monitoring during the acute postoperative period. All animals should be observed continuously until they are conscious (to an alert and responsive state). Monitoring is critical for identifying immediate complications such as hemorrhage, dehiscence of surgical incisions, pain, etc. Never leave the animals unattended.
- The immediate postoperative periods should also be used to assess comfort and identify those animals requiring postoperative analgesics (provide analgesics for 48 hrs post-surgery) or supplemental fluids. At minimum, animals should be monitored at least every 30 minutes until the animal is conscious.
- Thereafter, animals must be observed daily for at least 7 days following any surgical procedure. Place a blue card on the cage so the Animal Health Technician can find the animals. Animals may be monitored more frequently, and for a longer postoperative period, as the situation requires, and at the discretion of the attending veterinarian and/or the IACUC. Wound clips/sutures should be removed 7 – 10 days after surgery. Observations are done by our Animal Health Technician. Wound clip or suture removal is done by the surgeon. If the surgeon or a lab member is not available to do this, or they remain after 10 day, the Animal Health Technician will remove them for a fee.

Records

- For procedures involving procedures/surgeries involving anesthesia on large animals, an “*Anesthesia Record*” or “*Surgery/Anesthesia Record*” form must be filled out. For rodent surgeries, the “*Surgery/Post Operative Report*” must be filled out. These forms can be obtained on DLAM’s website. Upon completion of surgery you are required to turn in any forms to Tito Nelson (Animal Health Technician) by email snelson@hsc.unt.edu or to room RES-028.
- Lab records:
 - 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.
 - The records should be complete, current and readily accessible.
 - A brief description of the surgical procedure should be recorded and should reflect what was approved by the UNT HSC IACUC.
 - Any unexpected or abnormal reaction to anesthetics or other drugs should be recorded, as well as any information that might be of value or assistance for maintaining the animals after surgery should be recorded.
 - All post-surgical care provided should be documented.

Investigators Responsibilities or designee/checklist

- **Contact the Animal Health Technician**, Tito Nelson, before you perform surgery and if the animals you will be performing surgery on will need post-operative checks. She will be the one doing these.
- Provide surgical equipment.
- Provide gowns, gloves, shoe covers (DLAM can order but need advance notice ~ 2 months)
- Provide their scrubs and any special equipment (i.e. latex free gloves).
- Schedule surgery room with veterinarian or veterinary technician 2-3 weeks in advance to make sure DLAM staff will be available for assistance and that the surgical space is available.