



## University Committee on Animal Care

# Guidelines for Aseptic Survival Surgery in Mammalian Animal Species Other Than Rodents

**Purpose:** These Guidelines were formulated and approved by the University Committee on Animal Care (UCAC) as an information source for the experienced investigator and technical staff and as a teaching tool for students and other individuals new to the field of experimental surgery. Deviations from these Guidelines must be brought to the attention of and must be approved by the UCAC and the attending veterinarian prior to being initiated.

### Definitions

Survival surgery is defined as any surgery from which the animal recovers consciousness.

Non-survival surgery is defined as any surgery after which the animal will not regain consciousness.

Major surgery is defined as any surgical intervention that penetrates a body cavity or has the potential for producing a permanent handicap in an animal that is expected to recover.

Minor surgery is any operative procedure in which only skin or mucous membrane is incised, e.g. vascular cutdown for catheter placement or implanting pumps in subcutaneous tissue. Also included are procedures involving biopsies or placement of probes or catheters requiring entry into a body cavity through a needle or trocar in combination with a minor surgical procedure.

Multiple major survival surgery is defined as two or more major survival surgical procedures on a single animal. It is permitted only under special circumstances, such as when the surgeries are essential and related components of a single study. Cost alone is not an adequate justification for performing multiple survival surgeries on the same animal. Multiple major survival surgeries must be approved by the UCAC.

### Procedures

1. Non-survival surgery requires neither aseptic technique nor dedicated facilities if the subjects are not anesthetized long enough to show evidence of infection. However,

these procedures must at least be performed in a clean area, free of clutter, and using acceptable veterinary sanitation practices analogous to those used in a standard examination/treatment room. The surgical site should be clipped, the surgeon should wear gloves, and the instruments should be clean. Personnel present in the area must observe reasonable cleanliness practices for both themselves and the animals. Eating, drinking, or smoking are not acceptable in surgery areas, and locations used for food handling purposes do not qualify as acceptable areas for performing surgeries.

2. Minor surgical procedures on mammals other than rodents may be performed in a suitably located and equipped laboratory area. Appropriate aseptic technique for these procedures include a clean uncluttered work area, preparation of the surgical field including clipping of the hair, disinfection of skin and draping of the surgical site with sterile drapes; use of sterile instruments and supplies; and the use of sterile gloves and a surgical mask by the surgeon and any assistant working in the surgical field. Long hair of surgeons and assistants should be tied back.
3. Major survival surgical procedures on mammals other than rodents must be conducted in surgical facilities intended for that purpose only, following the basic principles of aseptic techniques described below:
  - a. The surgical procedures must be performed in closed, single-purpose operating rooms. The operating room should contain only the ancillary laboratory, diagnostic, or clinical equipment and supplies required to support the procedure being performed. Equipment used on an infrequent basis and bulk supplies should be stored elsewhere. Permanently installed furniture or fixtures such as cabinets, laboratory benches, and sinks impede sanitation and therefore should be minimized in an operating room.

Activities associated with surgery usually include surgeons' preparation, animal preparation, the surgical procedure, surgical support, and post-operative care. In high-volume programs, each activity may require a separate room(s). However, it is acceptable to have a minimum of three rooms: one used exclusively for surgery, one used for surgical support and surgeons' preparation and another used for primary animal preparation and post-operative care.

The surgery rooms and surgical support facilities should be designed and managed to ensure a level of sanitation appropriate for aseptic surgery.

- b. Animals should generally be fasted overnight prior to anesthesia and surgery to prevent vomiting, aspiration, and problems associated with a distended tract. Fasting for 16-24 hours is usually adequate.
- c. A proper method of anesthesia should be selected. The use of paralytic drugs without anesthesia is not allowed. If gas anesthetics are used, appropriate gas

scavenging methods must be employed to prevent hazards or unwarranted personnel exposure.

- d. The hair should be clipped from the surgical site for at least 4cm around the incision. The clipped site should then be treated to reduce bacterial skin flora. It is recommended to clean the skin with 3 applications of a surgical scrub (e.g. chlorhexidine or povidone iodine solution). Each process should begin at the incision site and radiate outward in a circular fashion.
- e. Once prepped, the surgical site should be draped with sterile disposable or sterile reusable cloth drapes.
- f. The surgical procedure itself must be performed or directly supervised by a trained and experienced individual. Personnel unfamiliar with aseptic surgical procedures should contact the DLAR veterinarian for information or training.
- g. The surgeon and any assistant working in the immediate surgical field should don cap and mask and then scrub using antiseptic soap for at least 5 minutes. After this a sterile gown and gloves should be put on prior to surgery. Shoe covers and double gloves might also be indicated for orthopedic, CNS, or other procedures where control of infection is imperative.
- h. All instruments, supplies, or devices to be used in the surgical field for experimental procedures must be sterilized before the surgery and must be maintained in sterile fashion until the surgery is completed. Contaminated instruments must be resterilized before reuse. If sterile packs are stored, they should be resterilized after 3 months.
- i. Pleural and peritoneal incisions should have multiple layer closure. Interrupted suture patterns are required for most procedures. Skin closure should be performed using non-capillary suture material which may or may not be absorbable. If non-absorbable suture material is used it should be removed 7-10 days post-op. The use of staples to close a skin incision is acceptable but careful attention should be given to placement and spacing to prevent the clips from either tearing out of catching on caging equipment. Wound clips have a higher potential for post-operative infection, tissue rejection, and other side effects.
- j. All animal activity proposals involving survival surgery must provide specific details of post-procedural care and relief of pain and distress. The specific details must be approved by the UCAC. However, the attending veterinarian retains the authority to change post-operative care as necessary to ensure the

comfort of the animal. Postsurgical care must include observation of the animal to ensure uneventful recovery from anesthesia and surgery. The animal may be returned to its cage; however, no food or water should be left in the cage until the animal is fully conscious. The animal must be monitored until it regains sternal recumbency and is capable of holding its head up. The animal must be kept dry and warm. Supplementary heat must be used if hypothermia is suspected. Caution: Use of heat lamps and electric pads can result in severe burns or hyperthermia in animals that are anesthetized or otherwise unable to escape from the heat. Close observation is required, and the use of such equipment like circulating water blankets is recommended whenever possible.

- k. The drugs specified in the Animal Study Protocol for relief of pain and/or distress must be readily available for use as described in the approved animal study protocol. Fluids, analgesics, and antibiotics must be administered as required. When swallowing reflexes return, the endotracheal tube can be withdrawn.

Surgical wounds must be kept clean, and bandages or wound dressings changed as frequently as necessary to keep them clean and dry. Subsequent care must consist of daily monitoring of the animal to include daily body temperature and clinical observation for signs of pain, abnormal behavior, appetite and excretory functions. Supportive fluids, analgesics, and other drugs must be administered as required.

Complete records on surgery events and postoperative care must be maintained in accordance with professionally accepted veterinary procedures regardless of the location of the animal. It is the responsibility of the Principal Investigator to retain these records for at least 3 years after termination of the project.

4. Any additional requirements for a procedure may be prescribed as part of the protocol when justified by the attending veterinarian or the UCAC.

**Approved by the ETSU University Committee on Animal Care: August 17, 2006**

**Reviewed and approved: February 8, 2022**