

Surgery

Item 3 – Guidelines for Survival Surgery on Rodents

Federal regulations require that all survival surgeries on rodents must be performed using aseptic procedure; however, a dedicated surgical facility is not required (1).

Aseptic surgical procedures are designed to prevent post-surgical infection due to microbial contamination of the incision and exposed tissues. Infections in rodents may be subclinical, but still affect the behavior and/or physiology of the animal. Prevention of infection improves the welfare of the animal and eliminates a source of uncontrolled variation in experimental results.

Surgery must be performed or directly supervised by trained, experienced personnel. Inexperienced personnel must receive training in aseptic surgical techniques, which is available from the Department of Laboratory Animal Resources (DLAR) veterinary staff.

ASEPTIC PROCEDURE

The following MINIMUM GUIDELINES for aseptic procedure MUST be followed when performing survival surgery on rodents:

Surgical Area:

The area designated for rodent surgeries must be clean, disinfected and free of clutter and debris. In addition, the surgical area must not be used for any other purposes during the time of surgery.

Surgeon Preparation:

The person performing the surgical procedure must wear sterile gloves. If a series of animals are being done in the same surgical session, gloves should be changed or disinfected between animals. A surgical mask is also required, unless the surgery is being performed in a biological safety cabinet. It is suggested that the surgeon wear clean, dedicated clothing such as scrubs or a lab coat while performing surgery.

Animal Preparation:

The incision site must be prepared by removal of fur and decontamination of the skin:

- a. After the animal is anesthetized, fur must be removed from the surgical site. Electric clippers with a #40 blade, a razor, or depilatory cream may be used.
- b. The area to be shaved should be approximately twice the size of the expected surgical area in the event that a larger incision than planned may be required.
- c. The skin must then be cleaned and disinfected. A chlorhexidine (e.g. Nolvasan[®]) or iodine (e.g. BETADINE[®]) -based soap and a sterile gauze sponge should be used to scrub the surgical site. The surgical scrub should start along the incision line, then proceeding outward. The sponge should never be brought from the contaminated edge of the surgical area back to the clean center. This should be alternated with a 70% alcohol wipe and repeated 3 times.
- d. The animal must also be covered with a sterile drape that only exposes the surgical site. This provides a sterile surgical field and minimizes contamination of the hands or instruments from the fur and/or extremities that have not been surgically prepared.

Instruments:

At the beginning of each surgical session, the instruments must be sterile. Steam (autoclave), dry heat, ethylene oxide or chemical sterilants, (not disinfectants; must specify "chemical sterilant" on the packaging), can be used to sterilize surgical instruments.

The experimental design may require repetitive surgeries (i.e. performing the same surgical procedure on a number of rodents at the same time). At least the tips of the instruments must be resterilized between animals (such as with a hot bead sterilizer).

Postsurgical Care:

Proper monitoring by trained personnel must be provided during recovery from anesthesia. Post-surgical care includes the following:

- continuous observation to ensure uneventful recovery from anesthesia.
- provision of supplemental heating.
- administering of supportive fluids as necessary.
- analgesics and other drugs as necessary.
- adequate care of surgical incisions.

Each animal (or group of animals) should have a postsurgical monitoring record (forms available through DLAR) that is maintained with the animal at all times during the postoperative period. After anesthetic recovery, animals must be monitored at least once daily, including weekends and holidays. The length of time that postoperative monitoring is required depends on the procedure, but should continue at least until the wound has healed (5-7 days).

Records:

Appropriate records of all anesthesia administrations, surgical procedures and postoperative care must be maintained by the investigator. Although others (DLAR) may document observations on these records, responsibility for producing and maintaining these records lies with the Principal Investigator.

(1) 9 "Code of Federal Regulations", Subchapter A, Part 2; PHS Guide for the Care and Use of Laboratory Animals

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