



BROWN

Institutional Animal Care and Use Committee (IACUC)

Policy on Aseptic Techniques (USDA Species)

Date of IACUC Approval: May 4, 2018

- I. Purpose:** The Brown University IACUC has developed this policy to provide guidance to research personnel involved in survival surgical procedures involving species covered by the USDA Animal Welfare Regulations. All survival surgical procedures should follow the general principles of asepsis. Aseptic technique is used to reduce microbial contamination to the lowest possible practical level and includes preparation of the patient, surgeon, and instruments and adhering to aseptic technique throughout the procedure.
- II. Preparation of the Patient:** Animal preparation must occur in a separate area from the operating room and after the animal is sedated/anesthetized. It includes the following:
- Removal of hair from the surgical site and where any electrodes may be placed is important for cleanliness of the site and effectiveness of the electrodes. This is typically accomplished using clippers. The shaved area should be wide enough to avoid contamination from the surrounding skin and hair during surgery, but should be the minimum compatible with achieving an appropriate sterile field. Removing more hair than is necessary predisposes the animal to hypothermia during the surgical procedure.
 - Hair/fur that has been removed, along with any gross debris, should be cleaned away using a vacuum and/or alcohol.
 - If there is any dirt or debris present at the intended surgical site, the area should be cleaned with a surgical scrub. After cleaning, this can be removed with alcohol or saline.
 - The animal is then moved into the operating room.

Regulations require that all survival surgeries involving USDA covered species must be done in a dedicated operating room. ACF has one in Bio-Medical Center and one in Sydney Frank Hall. The animal is further prepared for surgery after being placed on the operating table.

- The anesthetized animal should be properly secured to the operating table using suitable restraint. This minimizes excessive movement of the animal during surgery and a break in sterility.

- The skin should be disinfected using an appropriate surgical scrub pattern (in a concentric pattern moving from the innermost to outermost areas). There are four options when choosing an appropriate disinfectant for the skin:
 - One-step alcohol based solutions, such as ChloroPrep or DuraPrep
 - Applied with a sterile applicator using sterile gloves.
 - Once a uniform application is applied, the surgical site should be allowed to dry for 2-3 minutes before draping.
 - A single application is sufficient and no rinsing is required.
 - Chlorhexidine or povidone-iodine scrub alternated with alcohol or sterile water and followed with chlorhexidine or povidone-iodine solution
 - These materials are applied using sterile gauze, sterile solutions, and sterile gloves.
 - The scrub of choice is applied as described above and then followed with alcohol or sterile water.
 - This alternating prep should be repeated 3 times.
 - After 3 scrubs, the site should be allowed to dry and then a final preparation should be done by painting on chlorhexidine or povidone-iodine solution.
 - The final solution should be allowed to dry for 5 minutes before draping.
 - Solutions that are warmed to body temperature will increase their effectiveness and reduce the risk of causing hypothermia.
- The animal is then draped using drapes of sufficient size to cover all unprepared parts of the animal and adjacent surfaces. The only part of the animal not covered should be the properly prepared planned surgical site. Providing sufficient space for the surgeon to use instruments and suture material without accidentally contacting non-sterile surfaces is important.

III. Preparation of the Surgeon and Surgical Assistant(s)

Surgeons and any person who will have contact with the sterile surgical field during the surgery (surgical assistants) must prepare in the following manner.

- They must wear the appropriate personal protective equipment (PPE) for the species and ABSL level. The minimum includes clean scrubs, an appropriate face mask, a hair bonnet, close toed shoes, and shoe covers. In the case of nonhuman primate procedures, a splash shield is also required.
- The face mask and hair bonnet must be placed before scrubbing, gowning, and gloving. Bearded surgeons should use masks that are large enough to cover their facial hair.
- All jewelry must be removed from hands and wrists. A complete surgical scrub is to be performed in the surgeon's scrub area adjacent to the operating room. This includes scrubbing both hands, in between fingers, and both forearms with a designated surgical scrub brush with an antibacterial soap.
- A sterile surgical gown and sterile surgical gloves of the correct size are then donned using appropriate technique so as to not contaminate the outside of the gloves or the front of the gown.

- The gown should be put on by the surgeon and the gown ties tied at the back by an assistant.
- The outer packet of gloves must be opened either by the surgeon before scrubbing or by an assistant. The internal sterile packing containing the gloves should be touched only by the surgeon.
- Once the surgeon is wearing sterile clothing and gloves, care must be taken to avoid touching non-sterile items such as the table, anesthetic equipment, or operating lights. The presence of an assistant is strongly recommended in order to make any adjustments.
 - If a non-sterile item/surface is accidentally touched, the surgeon must at least change their contaminated gloves for a new sterile pair.
- If it is necessary to leave the surgical suite during a procedure, rescrubbing and donning a new surgical gown and new gloves is necessary before reentering.
- Non-surgeons that will not have contact with the sterile field must wear appropriate PPE, which is at least a disposable cover gown, a mask, a hair bonnet, shoe covers, and gloves. Nonhuman primate surgeries require additional PPE.
 - Surgical assistants that have not scrubbed must not touch sterile instruments, drapes or consumables.

IV. Preparation and Handling of the Instruments

- All surgical instruments must be cleaned and autoclaved prior to use on animals for all surgical procedures.
 - Autoclaved surgical packs should contain a sterilization indicator, the date of sterilization, and expiration date for the pack.
 - Checking the indicator/mark on packaged instruments and checking that the outer packaging has not been breached will ensure that the sterilization process has been effective.
- Equipment or implants that will come into contact with the sterile field that are unable to withstand the conditions of autoclaving must be sterilized in another way.
 - Ethylene oxide sterilization is available through ACF for a fee. It is important to plan ahead for the time it takes for processing and subsequent off-gassing.
 - Cold sterilization should only be used as a last resort when other methods are not appropriate. A specific cold sterilant must be used and the manufacturer instructions must be strictly followed. The instruments must be rinsed with sterile water or sterile saline before putting them in contact with animals.
- A new set of sterile instruments must be used for each animal. Plan ahead to ensure there are enough sets of sterile instruments to cover the number of animals that will undergo surgery that day.
- All consumables that will be used during the procedure (e.g. gauze, swabs, needles, suture materials) must be sterile and should be of an appropriate size and packaged in suitable quantities.

- Instruments should be placed either on a sterile surface (e.g. plastic sterile drape) or on a sterile tray when not being used.
 - Where it is suspected that instruments may have been accidentally contaminated, these must be replaced with sterile ones before continuing.

V. References

1. Fossum, Theresa W. *Small Animal Surgery*. 4th ed., Elsevier Mosby, 2013.
2. Lilley, E, and M Berdoy, editors. *Guiding Principles for Preparing for and Undertaking Aseptic Surgery*. 2nd ed., Laboratory Animal Science Association, 2017.
3. National Research Council. *Guide for the Care and Use of Laboratory Animals*. 8th ed. Washington, D.C.: The National Academies Press, 2011.
4. Office of Laboratory Animal Welfare. *Public Health Service Policy on Humane Care and Use of Laboratory Animals*. National Institutes of Health, 2015.
5. United States Department of Agriculture. *Animal Welfare Act and Regulations*. USDA-APHIS, 2013.