

University Animal Care Committee

Policy on Aseptic Surgery

The Canadian Council on Animal Care (CCAC) stipulates in the Guide to the Care and Use of Experimental Animals, Vol. 1, (2 ed.) 1993 Standards for Experimental Animal Surgery section that **“Recovery surgery in all species of animals should be performed using aseptic technique.”** Ideally, All recovery surgery should be performed in a suite especially designed for this purpose. **At no time should surgery be performed in an animal housing room.** Investigators at Queen’s University will be expected to follow this policy.

1. All recovery surgery must be performed in a suite especially designed for this purpose, or within a Biosafety Cabinet (BSC) within a holding room, unless scientifically justified as determined by the University Animal Care Committee.
2. Hair and fur should be removed from the surgical site with clippers or a medical depilatory (ensure to monitor for any post-operative skin reactions after the application). Remove all clippings from and around the animal - a small hand held vacuum is ideal. To remove very fine clippings, adhesive tape or a small lint roller may be used.
3. The surgical site must be disinfected with the following two-step process:
 - a. Gross contamination should be removed by using a surgical scrub such as chlorhexidine (Hibitane™) or povidone iodine (Betadyne™) at the surgical site. Taking care not to dampen the surrounding fur.
 - b. The surgical site should then be wiped with three alternating passages of 70% ethyl alcohol followed by povidone iodine solution or chlorhexidine solution. The disinfection should finish with either povidone iodine or chlorhexidine and allowed to dry to create a bacteriostatic barrier. All passages should start at the incision site and move towards the periphery. Once at the periphery do not return to the incision site with the used gauze.
4. Use a sterile drape to cover the surgical site (fur and extremities are contaminated, covering these areas with aseptic material greatly reduces the chances of subclinical infections and abscessation). Suitable materials include bench top paper, green surgical drapes/towels, disposable drape material, Press ‘n Seal, sterile gauze, etc.
5. The temperature in the surgery room should be increased and/or the animal placed on a covered warming device (e.g. circulating warm water blanket, warm water bottle, slide warmer, heating disc or chemical hand warmer) to prevent hypothermia. The use of electric heating blankets is discouraged due to the potential for them to cause skin burns.

6. All instruments must be sterilized. The method of choice will vary depending upon the surgical instruments or devices used. Acceptable initial sterilization techniques include autoclaving using steam under pressure, gas autoclaving (hydrogen peroxide), or cold sterilization using an effective chemical solution (e.g. Germex or Coldspore). Cold sterilization solutions must be used according to the manufacturer's instructions (concentration, frequency of changing).

70% ethyl alcohol does not sterilize instruments.

For large animal surgeries, autoclaved surgical packs can be used once. Any deviations from this policy must be outlined and justified within the Animal Use Protocol. UACC approval must be in place prior to the surgery.

Sterilization between serial rodent surgeries is addressed in point 10.

7. The surgeon must be familiar with the Animal Use Protocol, able to follow aseptic technique and be competent in performing the techniques in the species concerned or be supervised by someone both knowledgeable and competent.
8. The surgeon should wash their hands with an antiseptic surgical scrub preparation (chlorhexidine scrub or povidone iodine) followed by aseptically gloving with sterile gloves. If working alone, the surgeon should have the animal anesthetized and positioned and have the first layer of the double-wrapped instrument pack or any individually wrapped items opened before donning sterile gloves.
9. The surgeon must wear a cap, mask, and a clean dedicated-use gown or lab coat.
10. It is recommended that two separate sterile surgical packs are prepared when performing multiple rodent surgeries within a series. After using the first set of instruments they are to be cleaned, removing any gross debris with either alcohol or saline, and then placed in the bead sterilizer (following the manufacturer's directions for use). While the initial set is cooling on a sterile surface, the second surgical pack can be used on the following animal applying the same described procedures for cleaning and rotating the use of instrument packs.

When two separate packs are not available, the instruments must be cleaned to remove any gross debris and then:

- a. Placed in a glass bead sterilizer (following manufacturer's instructions), allowing the instruments to cool sufficiently prior to reuse.
- or**
- b. Kept in a sterile tray containing 70 – 90% ethyl or isopropyl alcohol and rinsed well with sterile saline or water prior to use. The alcohol should not be used if it becomes contaminated with tissue, blood, or other body fluids.
11. Reuse of suture material for serial rodent surgeries (in one sitting) is permitted if the suture is soaked between animals in a 10% povidone iodine solution, then rinsed in sterile saline or water.

Sutures which can be re-sterilized include any monofilament (Prolene or Nylon/ Ethilon) or 'coated' sutures, e.g. some Vicryl or Ethibond. On the outside of the packets, it states whether the suture is coated or not. Multi-filament or twisted fibers, such as Chromic, Silk, Mersilene and non-coated Ethibond must be discarded after use.

12. Large animal surgeries require a new pair of sterile surgical gloves for each animal, and if there is a break in sterility.

Serial rodent surgeries require a new pair of sterile gloves at the commencement of the series and must be changed between animals if the surgeon touches non-sterile surfaces (break in sterility). Gloves must be disinfected with 70% ethyl alcohol between animals. After five surgeries, a new pair of sterile surgical gloves must be donned.

13. All animals should be recovered from anaesthesia in a warmed environment. Warm fluids (Lactated Ringer's or 0.9% sodium chloride) should be administered subcutaneously or intravenously to improve postoperative hydration and enhance recovery. Volumes will be indicated within the Animal Use Protocol.

14. Antibiotics should not be given routinely after surgery unless justified by the Principal Investigator or as recommended by the Veterinarian.

15. Post-procedure or anesthetized animals may not be left unattended until their righting and swallowing reflexes have returned. Animals must be sternal with pink mucous membranes and stable respiration. They may not be returned to the animal room until fully recovered (excluding NHP's).

16. All animals must be recovered in an individual cage until mobile and ready to return to cage mates.

Do not place an anaesthetised animal in with a non-anaesthetised animal.

17. Rodents should be placed on a piece of paper towel or sterile gauze within a recovery cage. **Do not place directly on bedding** as this may impede respiration during recovery.

18. Analgesics must be administered as outlined in the Animal Use Protocol.

19. All procedures and drugs must be recorded on cage cards (rodents). A surgical logbook is recommended, easily accessible by the veterinarian team (e.g. stored in an anteroom or treatment room). However, if all the information found in the book is recorded on the cage card, the Principal Investigator can forego this secondary documentation. General parameters to be recorded for rodent surgery includes: Sx (front of card), baseline and post-op Day 1,2,3 weight, injectable anaesthetics (dose, rate, frequency), all pre-op and post-op analgesics and fluids (dose, rate, frequency). Any irregularities in recovery must be brought to the attention of the clinical veterinarian (such as anorexia, oligodipsia). Large animals must have surgical procedures recorded in daily health logs in addition to surgical logs.

20. Surgery date should be recorded on the front of the cage card.

21. Initial weights of the animal must be recorded on the cage card before beginning any surgical procedure. The animals 15% weight loss must also be recorded on the cage card where it is easily seen.
22. If sutures or staples need to be replaced contact the University Veterinarian.
23. Deviations from this policy must be described and approved within the Animal Use Protocol prior to surgery.

References

Canadian Council on Animal Care. **Guide to the Care and Use of Experimental Animals.** Volumes 1 (1993) and 2 (1984).

Cunliffe-Beamer TL: Surgical Techniques. In Guttman HN (ed.): **Guidelines for the Well-Being of Rodents in Research.** Scientists Center for Animal Welfare, Bethesda, MD, 1989

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Revision History:

Date	New Version
03/01/2009	Policy Created and Approved
11/01/2013	Triennial Review, Revised to better encompass all species
01/01/2018	Revised to differentiate between large animal and rodent surgical details
06/01/2019	Revised time required to soak and rinse suture material (formerly 10min now the time of the surgery)
06/27/2022	Triennial Review, Revised to clarify details to record on cage card and that recovery surgery must be performed in surgical suite or biosafety cabinet; New Format