

UNIVERSITY OF WESTERN ONTARIO
ANIMAL CARE AND VETERINARY SERVICES

Standard Operating Procedure # 330-03

POST-OPERATIVE/POST ANAESTHETIC CARE

RODENTS

1 **INTRODUCTION**

“Standard Operating Procedures (SOP’s) provide a detailed description of procedures to be followed unless alternate procedures have been outlined in an “Application to Use Animals”. If an investigator wishes to proceed differently from an approved SOP, the changes must be itemized in the application. To assist the Animal Use Subcommittee in protocol review, the reasons for deviating from the standard procedure should also be included.

Approval of the protocol indicates approval of the deviation from the SOP for that project only.

It is the researcher's responsibility to ensure that adequate post-operative / post-anaesthetic care is provided. The individual providing post-operative care must be familiar with the approved "Application to Use Animals in Teaching and Research", have the skills and abilities to perform the assessments as indicated below and must be able to provide support in case of complications. A qualified Animal Health Technician may be hired, at an hourly rate, to perform these tasks. It is important to note that these guidelines are MINIMUM STANDARDS ONLY.

An uneventful recovery and a healthy animal are desirable both from the researchers perspective (more reliable data and decreased costs) and from the standpoint of animal welfare.

The type of care required during the recovery period depends on two major factors. The first is the stage of recovery. More intensive care is required until the animal regains full consciousness. The second is the degree of invasiveness of the surgical procedure and the probability of complications or post recovery deficits. Both of these factors must be taken into consideration when formulating a plan for an animal recovering from anaesthetic.

1.1 **AIMS**

- 1.1.1 to provide for a rapid, smooth and pain free recovery
- 1.1.2 to reduce the chances of complications
- 1.1.3 to identify and correct, as quickly as possible, any complications which occur

2 **PROCEDURE**

- 2.1 **IMMEDIATE:** from cessation of anaesthesia or completion of surgery until sternal recumbancy
 - 2.1.1 Observe animal carefully, every 5 minutes. Do not leave unattended if an endotracheal tube is in place.
 - 2.1.2 Place animal on paper towels in a clean dry plastic cage. **DO NOT PLACE IT DIRECTLY ON BEDDING** which may be ingested or inhaled during recovery. **DO NOT PLACE AN ANAESTHETIZED ANIMAL IN WITH AN AWAKE ANIMAL, IT MAY BE INJURED.**
 - 2.1.3 Palpate extremities (feet or tail) or take rectal temperature.
 - 2.1.4 If animal is not blinking, instill additional eye lubricant.
 - 2.1.5 Provide supplemental heat or wrap in bubble pack if necessary. Any anesthetic of 30 min. duration or longer will usually result in hypothermia. Pentobarbital causes profound hypothermia. Use plastic bottles or bags of warm water (warm not hot to the touch), a hot water circulation pad or an incandescent light bulb (PLACE YOUR HAND ON THE ANIMAL AND ADJUST THE DISTANCE SO A **SLIGHT** WARMTH IS FELT). **NEVER use an electric heating pad. Severe thermal burns may occur due to the suppression of dermal reflexes in the anaesthetized animal.**
 - 2.1.6 Visually monitor rate and depth of respiration.
 - 2.1.7 Note colour of mucous membranes, ears or tail (unpigmented areas should be pink).
 - 2.1.8 Check reflexes ie pedal, palpebral and eye position to assess depth of anaesthesia.
 - 2.1.9 If recovery is protracted turn animal every 10 minutes to improve respirations and decrease

- recovery time.
- 2.1.10 For surgical procedures longer than 30 minutes or where fluid loss due to haemorrhage or evaporation is anticipated, fluid support should be provided. Subcutaneous or intravenous fluids given at the rate of 10-15 ml/kg/hour of procedure should prevent dehydration and/or electrolyte imbalance. Ringer's Lactate (without dextrose) or sterile saline are suitable for subcutaneous administration.
 - 2.1.11 Follow analgesic regime as indicated in the approved protocol. Familiarity with the protocol is essential.
 - 2.1.12 Indicate on the animal's cage card the procedure performed and any complications experienced.
- 2.2 **INTERMEDIATE:** from sternal recumbance until able to walk
- 2.2.1 If no complications monitor and provide care **AS ABOVE** every 30-60 minutes.
 - 2.2.2 Provide analgesia and/or antibiotics as stated in the approved protocol.
 - 2.2.3 Once animal is moving around in the cage it can then be placed on regular bedding. Provide some food on the cage bottom. Rodent chow/water mash, fruit, muffins or other treats may get the animal eating sooner. If the animal will not be very mobile put the water bottle on it's side in the bottom of the cage.
- 2.3 **LONG TERM:** until normal activity and incision is healed
- 2.3.1 Check early the following day and at least daily thereafter. Individuals monitoring animals must have adequate skills and abilities.
 - 2.3.2 Check incision site, looking for clear or purulent discharge, redness, swelling, pain, suture removal by the animal or incision breakdown.
 - 2.3.3 Check for signs of surgical complication: herniation, infection, unexpected paralysis or organ dysfunction, pain, etc.
 - 2.3.4 Ensure that the animal is eating, drinking, eliminating, and locomoting normally.
 - 2.3.5 Any abnormalities (dehydration, lethargy, inappetance) require continued frequent monitoring and care and the use of a detailed record. The animal should be weighed, provided with supplemental fluids (IV, SC) and high energy foods offered.
 - 2.3.6 Continued weight loss, dehydration and lethargy are NOT acceptable. Refer to SOP 321-01 "Criteria for Early Euthanasia/Rodents".
 - 2.3.7 Give analgesics and antibiotics as required by the animal and as indicated in the protocol.
 - 2.3.8 If necessary, consult an ACVS veterinarian for assistance with the provision of postoperative care.

RODENT SURGERY PERFORMED WITH POOR ASEPTIC AND SURGICAL TECHNIQUE RESULTS IN SUBCLINICAL INFECTIONS WHICH CAN AFFECT RESEARCH RESULTS. THE ANIMALS SUFFER UNDUE STRESS, WHITE BLOOD COUNTS ARE ELEVATED, CATECHOLAMINE LEVELS ARE ELEVATED, FOOD INTAKE IS DECREASED AND RECOVERY IS PROTRACTED.

IF AN INCISION TAKES LONGER THAN A WEEK TO HEAL, THE SURGICAL TECHNIQUE NEEDS TO BE IMPROVED.

FOR MOST SURGERIES, ANIMALS SHOULD REGAIN THEIR PRESURGICAL WEIGHT IN A COUPLE OF DAYS. FAILURE TO DO SO INDICATES POOR SURGICAL TECHNIQUE AND/OR POOR POSTOPERATIVE CARE.

3 **SUMMARY**

It is important to remember that the above represents minimum standards only. Animals experiencing complications require more frequent monitoring and care.

4 **REFERENCES**

- 4.1 Brown MJ: **An Overview of Issues in Rodent Surgery**. Presented at the National Institutes of Health seminar on 'Rodent Surgery in Research and Teaching', Detroit, Michigan, 1992
- 4.2 Canadian Council on Animal Care. **Guide to the Care and Use of Experimental Animals**. Volumes 1 and 2, 1984.
- 4.3 Faler K, Faler K: **Supportive Care**. In Pratt, PW (ed.): Medical Nursing for Animal Health Technicians. Santa Barbara, American Veterinary Publications, 1985, pp199-204
- 4.4 Government of Ontario, **Animals for Research Act**. Revised Statutes of Ontario, Regulation 18, Section 26: 1-2
- 4.5 Trim CY: **Postanaesthesia Care and Complications**. In Paddleford, RR (ed): Manual of Small Animal Anesthesia. New York, Churchill Livingstone, 1988, pp 199-229
- 4.6 Warren RG: **Recovery from General Anaesthesia**. Small Animal Anesthesia. St. Louis, CV Mosby, 1983, pp. 98-102
- 4.7 Wison SK: **Current Trends in Rodent Anaesthesia and Analgesia**. Prepared for the National Institutes of Health Seminar on 'Rodent Surgery in Research and Teaching', Detroit, Michigan, 1992

5 **REFEREES**

- 5.1 Benn, D: Director, Animal Research Facility, Ontario Veterinary College, University of Guelph, Guelph, Ontario.
- 5.2 Cross, B: Assistant Director, Animal Resources Centre, University of Saskatchewan, Saskatoon, Saskatchewan.
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- 5.4 Pettifer, P: Anaesthesiologist, Department of Clinical Studies, Ontario Veterinary College, University of Guelph, Guelph, Ontario.