



Curtin University Standard Operating Procedure

SUBCUTANEOUS OSMOTIC PUMP IMPLANTATION IN MICE

Number: TEC 13

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Purpose: To provide guidelines on the surgical subcutaneous implantation procedure for Osmotic pumps in mice at Curtin University.

According to the Alzet website (the source of the pumps), the usual site for subcutaneous implantation of ALZET pumps in mice is on the back, slightly posterior to the scapulae (our preferred site in previous studies). If the pump is implanted subcutaneously without a catheter attachment, the contents of the pump are delivered into the local subcutaneous space, whereby absorption of the compound by local capillaries results in systemic uptake and distribution to other parts of the body.

For subcutaneous pump implantation, the following steps are undertaken (these are in conjunction with instructions from the Alzet website and the facility's experience with these pumps):

http://www.alzet.com/products/guide_to_use/implantation_and_explantation.html#SCimplant

Surgical Procedure:

1. Administer a subcutaneous (SC) injection of buprenorphine analgesic at 0.075mg/kg 30 minutes prior to the surgical procedure.
2. Place the animal under isoflurane anaesthesia using the SOP for '*General anaesthesia in rodents*' – TEC-01.
3. Clip the surgical site using surgical clippers- ensure the area extends from the back of the neck, down to the mid flank region, and across a wide part of the animal. It should be a large enough area to maintain surgical sterility during the procedure. Ensure the hair is removed from the area to prevent contamination.
4. Place the animal on a heating pad and surgical drape.
Note: Ensure it is turned on prior to the surgery. They are weight activated and maintain an internal thermostat.
5. Once the animal is at a surgical anaesthetic level, prep the surgical site using the SOP for '*Principles of asepsis for recovery rodent surgery*' – TEC-07.



6. Make a mid-scapular skin incision with a surgical scissors and fine forceps (to assist with holding the skin up during cutting).
7. Insert a haemostat into the incision, and, by opening and closing the jaws of the haemostat, spread the subcutaneous tissue to create a pocket for the pump extending caudally. A small surgical scissors used carefully will also work. The pocket should be large enough to allow some free movement of the pump (usually 0.5 cm longer than the pump, and 0.5 cm wider). Avoid making the pocket too large, as this will allow the pump to turn around or slip down the flank of the animal. The pump should not rest immediately beneath the incision, which could interfere with the healing of the incision.
8. Insert a filled pump into the pocket, delivery portal first. This minimises interaction between the compound delivered and the healing of the incision.
9. Close the wound with sutures, for example a 5/0 or 6/0 non absorbable suture such as prolene, or skin staples, with an appropriate suture pattern. This can be discussed with animal facility staff.
10. Wipe off surgery site with alcohol wipe, then povidone-iodine or another alcohol wipe as final sterilant.
11. Administer a single SC dose of 1.5 mg/kg meloxicam (NSAID) analgesic.
12. Remove the animal from the anaesthetic machine, and place in recovery cage atop a heat pad or a warming chamber set to 37°C.
13. When the animal is back on its feet, and moving around, return it to its usual cage, and monitor for the next one hour.
14. Monitor the animals twice daily for the next 3 days and record your observations. If the animal appears to be in pain (with clinical signs such as those indicated on the mouse grimace chart e.g. huddled, closed eyes, not moving around), additional doses of buprenorphine at 0.075mg/kg can be given as a subcutaneous injection can be given at 8- 12 hour intervals.
15. For the duration of the study, keep vigilant for suture opening (which will require re-suturing if this happens within 5 days post-surgery), and any signs of infection around the suture site (which will require intervention, and depending on the level, may mean that the site is thoroughly sterilised with alcohol post-rinsing with normal saline, or draining of pus prior to wound irrigation with saline, then sterilisation with alcohol). Antibiotics may be used if prescribed by the veterinarian.
16. Potential complications include:
 1. Infection



2. Animal not coping with the implant and seems in pain
3. Sutures come undone

If any of these situations occur, contact the animal technician and animal welfare officer immediately to allow the best outcome for the animal.

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