

LARC Veterinarians' Analgesia Recommendations for UCSF Rodent Survival Surgeries

Updated: October 2023

Multimodal analgesia is recommended, which includes a local anesthetic as well as use of NSAIDs in combination with an opioid. Departures from this approach may be approved in an animal use protocol with scientific justification. Alternative regimens are provided, and users are encouraged to consult with LARC veterinarians with any questions.

Pre-emptive analgesia is recommended. Whenever possible, local anesthetics should be administered at the site of the incision as part of surgery preparation, and the first dose of NSAIDs administered immediately after anesthetic induction. To titrate for sedative effects, opioids such as buprenorphine should be administered 30-60 minutes prior to anesthetic induction when inhaled anesthetics (ie isoflurane) are used and during anesthetic recovery when injectable anesthetics (ie, ketamine combinations) are used.

NOTE: In all cases, analgesic regimen recommendations illustrate the standard veterinary practice and represent the expectation for minimum dosing frequency. Individual animals may require additional doses if post-operative monitoring indicates pain is still present after the last required dose.

STANDARD REGIMEN

Multimodal analgesic recommendation:

- **Local anesthetic (lidocaine or bupivacaine) infiltrated at incision site prior to first incision**
- **Buprenorphine at the time of surgery, 4-8 hours later and again the next morning OR extended-release buprenorphine at the time of surgery**
- **NSAID (meloxicam, carprofen or ketoprofen) at the time of surgery and again the next morning**
- **For more invasive procedures in which severe pain is anticipated, an additional dose of regular buprenorphine and NSAID are recommended; please consult with a LARC veterinarian**

MICE			
Analgesia Agent	Dose Range (mg/kg)	Route	Frequency & Total Duration
Bupivacaine/Lidocaine (Choose one)	<p>Bupivacaine: Dilute to 0.25%, do not exceed 8 mg/kg total dose</p> <p>or</p> <p>Lidocaine: Dilute to 0.5%, do not exceed 7 mg/kg total dose</p>	SC, Intra- incisional	Once at the time of surgery, given locally before making surgical incision
Buprenorphine (Choose one)	<p>0.05-0.1 (regular)</p> <p>or</p> <p>3.25 (extended release)</p>	<p>SC or IP</p> <p>SC only</p>	<p>Once at the time of surgery, 4-8 hours later and the next morning following surgery (3 doses).</p> <p>For accurate dosing, use a dilution, see calculator here</p> <p>Once at the time of surgery</p>
NSAID (Choose one)	<p>Meloxicam: 5-10 or</p> <p>or</p> <p>Carprofen: ~5</p> <p>or</p>	SC or IP or PO	<p>Prior to recovery from anesthesia and again the next morning following surgery (2 doses)</p> <p>For accurate dosing, use a dilution, see calculator here</p>

	Ketoprofen: 2-5		
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RATS			
Analgesia Agent	Dose Range (mg/kg)	Route	Frequency & Total Duration
Bupivacaine/Lidocaine (Choose one)	Bupivacaine: Dilute to 0.25%, do not exceed 8 mg/kg total dose Lidocaine: Dilute to 0.5%, do not exceed 7 mg/kg total dose	SC, Intra- incisional	Once at the time of surgery, given locally before making surgical incision
Buprenorphine (Choose one)	0.01-0.05 0.65 (extended release)	SC or IP SC only	Once at the time of surgery, 4-8 hours later and the next morning following surgery (3 doses) Once at the time of surgery
NSAID (Choose one)	Meloxicam: 5-10 Carprofen: ~5 or Ketoprofen: 2-5	SC or IP or PO	Prior to recovery from anesthesia and again the next morning following surgery (2 doses)

Alternative analgesic regimens - if scientifically justified and described in an approved IACUC protocol:

- **Mild Pain anticipated**
 - **Examples: Subcutaneous implantation of pellets, cells, tissue, Dehiscence repair**

- **Multimodal analgesic recommendation:**
 - **Local anesthetic (lidocaine or bupivacaine) infiltrated at incision site prior to first incision**
 - **Buprenorphine and NSAID (meloxicam, carprofen or ketoprofen) at the time of surgery**
- **If NSAIDS must be excluded, extend opioid coverage**
 - **Local anesthetic (lidocaine or bupivacaine) infiltrated at incision site prior to first incision**
 - **Buprenorphine at the time of surgery, 4-8 hours later, the next morning and again the next afternoon (4 doses) OR extended-release buprenorphine at the time of surgery.**
- **Consult with a LARC Veterinarian for additional alternative regimens.**