SUBJECT: Analgesia Guideline

DATE: May 18, 2026

Analgesia Guideline

This guideline should be used as an aid by investigators as they are completing their IACUC protocols and amendments. Table 1 provides an estimation of pain levels associated with common surgical procedures and the appropriate analgesic regimen. However, pain levels may vary based on the technique and skill level of the surgeon. During protocol/amendment review, the veterinarian may recommend alternative analgesic agents, doses, and/or frequencies. Therefore, researchers must follow what is in the approved IACUC protocol.

Table 1. Pain Level and Analgesia Recommendations

Pain level	Examples	Recommended Analgesia	Length of treatment
Mild	– Vascular cutdown / catheter implantation – Subcutaneous implant Skin biopsy	Local anesthetic agent[1] on the incision + NSAID[2] or Opioid [3]	 One dose One dose
Moderate	– Simple laparotomy – Intra-peritoneal implant – Ovariectomy – Castration	Local anesthetic agent on the incision + NSAID or Opioid	 48 hours 48 hours
	– Craniotomy – Orthotopic cancer cell implant (pancreas, mammary, prostate)	Local anesthetic agent on the incision + Opioid	 48 hours
Moderate-severe	– Laparotomy with major organ manipulation or removal – C-section – Organ transplant – Thoracotomy (intercostal approach) – Vertebral/Spinal surgery	Local anesthetic agent on the incision + Opioid + NSAID[4]	 48 hours 48 hours

	– Middle cerebral artery occlusion		
Severe	– Orthopedic procedures – Cecal ligation and puncture – Bone cancer models – Thoracotomy (sternal approach)	Local anesthetic agent on the incision + Opioid + NSAID[4]	 72 hours 72 hours

[1] Acceptable local anesthetic agents include Lidocaine, Bupivacaine, a 1:1 mixture of bupivacaine and lidocaine, Lidocaine ointment, and Neosporin Plus Pain Relief.
[2] Meloxicam is the recommended non-steroidal anti-inflammatory drug (NSAID).
[3] Buprenorphine (Buprenorphine Hydrochloride (HCl) or Ethiqa XR) is the recommended opioid drug for rodent pain.
[4] Ethiqa XR cannot be given concomitantly with NSAID in mice.

The following tables provide species-specific analgesic doses and frequencies. Investigators should contact the veterinarian to discuss using alternative drugs and treatment schedules.

RAT Analgesic Formulary

Agent	Dose	Route	Frequency	Duration
Bupivacaine 0.25%	1-2 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts 4-8 hours
2% Lidocaine	2-4 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts up to 1 hour
Meloxicam	1-2 mg/kg	Subcutaneous	Once every 24 hours	– Mild pain: 1 dose – Moderate pain: every 24 hours for 48 hours – Severe pain: every 24 hours for 72 hours
SR-meloxicam	4 mg/kg	Subcutaneous	Once	Lasts up to 72 hours
Buprenorphine	0.05 mg/kg	Subcutaneous	Once every 6-8 hours	– Mild pain: 1 dose – Moderate pain: every 12 hours for 48 hours – Severe pain: every 8 hours for 72 hours
Extended release-buprenorphine (Ethiqa XR)	0.65 mg/kg	Subcutaneous	Once	Lasts up to 72 hours

MOUSE Analgesic Formulary

Agent	Dose	Route	Frequency	Duration
Bupivacaine 0.25%	1-2 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts 4-8 hours
2% Lidocaine	2-4 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts up to 1 hour
Meloxicam	5-10 mg/kg	Subcutaneous, per os	Once every 12 hours	– Mild pain: 1 dose – Moderate pain: every 24 hours for 48 hours – Severe pain: every 24 hours for 72 hours
Buprenorphine	0.05-0.1 mg/kg	Subcutaneous	Once every 4-8 hours	– Mild pain: 1 dose – Moderate pain: every 12 hours for 48 hours – Severe pain: every 8 hours for 72 hours
Extended-release buprenorphine (Ethiqa XR)	3.25 mg/kg	Subcutaneous	Once	Lasts up to 72 hours CANNOT be given concomitantly with NSAID

VOLE Analgesic Formulary

Agent	Dose	Route	Frequency	Duration
Bupivacaine 0.25%	1-2 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts 4-8 hours
2% Lidocaine	2-4 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts up to 1 hour
Meloxicam	1-3.75 mg/kg	Per os	Once every 24 hours	– Mild pain: 1 dose – Moderate pain: every 24 hours for 48 hours – Severe pain: every 24 hours for 72 hours
Buprenorphine	0.05-0.1 mg/kg	Subcutaneous	Once every 4-8 hours	– Mild pain: 1 dose – Moderate pain: every 12 hours for 48 hours

				– Severe pain: every 8 hours for 72 hours
Extended-release buprenorphine (Ethiqa XR)	3.25 mg/kg	Subcutaneous	Once	Lasts up to 72 hours

RABBIT Analgesic Formulary

Agent	Dose	Route	Frequency	Duration
Bupivacaine 0.25%	1-2 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts 4-8 hours
2% Lidocaine	2-4 mg/kg	Infiltrated around incision area or topically on the incision prior to closure	Once	Lasts up to 1 hour
Meloxicam	0.2-0.5 mg/kg	Subcutaneous	Once every 24 hours	– Mild pain: 1 dose – Moderate pain: every 24 hours for 48 hours – Severe pain: every 24 hours for 72 hours
Buprenorphine	0.01-0.05 mg/kg	Subcutaneous	Once every 8-12 hours	– Mild pain: 1 dose – Moderate pain: every 12 hours for 48 hours – Severe pain: every 8 hours for 72 hours
Extended-release buprenorphine (Ethiqa XR)	0.15 mg/kg	Subcutaneous	Once	Lasts up to 72 hours

Drug concentrations

Agent	Concentration
Bupivacaine 0.25%	0.25 g/1000ml
Lidocaine 2%	20 mg/ml
Meloxicam	5 mg/ml
SR-meloxicam	2 mg/ml
Buprenorphine	0.3 mg/ml
XR-buprenorphine (Ethiqa)	1.3 mg/ml

References

1. ACLAM position statement. “Guidelines for the Assessment and Management of Pain in Rodents and Rabbits”, www.aclam.org.
2. Flecknell P. Laboratory Animal Anaesthesia, 5th ed., 202316.
3. Carpenter JW. Exotic Animal Formulary, 6th ed., 2023.
4. University of British Columbia Species-Specific Considerations https://animalcare.ubc.ca/conducting-your-research/rodent-anesthesia-and-analgesia/species-specific-considerations
5. University of Pennsylvania Mouse Anesthesia and Analgesia Recommendations https://www.spandidos-publications.com/var/MouseAnesthesiaAnalgesiaRecommendations.pdf.
6. Oh SS, Narver HL. Mouse and Rat Anesthesia and Analgesia. Current Protocols. E995, vol. 4: 1-25.
7. Foley PL, Kendall LV, Turner PV. Clinical Management of Pain in Rodents. Comp Med. 2019; 69(6): 468-489.
8. Ethiqa XR package insert, https://ethiqaxr.com
9. CU Denver Veterinary Formulary Edition 4.5 https://research.cuanschutz.edu/docs/librariesprovider148/orcs_documents/cu-denver-veterinary-formulary-4-4.pdf?sfvrsn=8cb5c2b9_2