



SUBJECT: Analgesia Guideline

DATE: April 16, 2025

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	Local anesthetic agent ¹ on the incision	One dose
	– Subcutaneous implant Skin biopsy	+ Meloxicam ² or Buprenorphine ³	One dose
Moderate	– Simple laparotomy	Local anesthetic agent on the incision	48 hours
	– Intra-peritoneal implant	+ Meloxicam or Buprenorphine	48 hours
	– Ovariectomy		
	– Castration		
	– Craniotomy	Local anesthetic agent on the incision	48 hours
	– Orthotopic cancer cell implant (pancreas, mammary, prostate)	+ Buprenorphine	
Moderate-severe	– Laparotomy with major organ manipulation or removal	Local anesthetic agent on the incision	48 hours
	– C-section	+ Buprenorphine	48 hours
	– Organ transplant	+ Meloxicam	
	– Thoracotomy (intercostal approach)		
	– Vertebral/Spinal surgery		

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

¹ Bupivacaine is the recommended local anesthetic agent. Lidocaine or a 1:1 mixture of bupivacaine and lidocaine, Lidocaine ointment, and Neosporin Plus Pain Relief are acceptable alternatives.

² Meloxicam is the recommended non-steroidal anti-inflammatory drug.

³ Buprenorphine is the recommended opioid drug for rodent pain.

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
XR-buprenorphine (Ethiq ^a)	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
XR-buprenorphine (Ethiq)®	3.25 mg/kg	Subcutaneous	Once	Lasts up to 72 hours

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

XR-buprenorphine (Ethiq ®)	3.25 mg/kg	Subcutaneous	Once	Lasts up to 72 hours
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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
SR-buprenorphine (ZooPharm)	0.1 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 (Ethiq ®)	1.3 mg/ml
SR-buprenorphine (ZooPharm) (Rabbit)	1.0 mg/ml

References

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