



SUBJECT: Analgesia Guideline

DATE: January 11, 2024

Analgesia Guideline

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

| | | | |
|--------|--|--|----------|
| Severe | <ul style="list-style-type: none"> - 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.*

* Please contact the Attending 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 mg/kg | Subcutaneous | Once every 24 hours | <ul style="list-style-type: none"> - 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 | 0.01-0.05 mg/kg | Subcutaneous | Once every 8-12 hours | <ul style="list-style-type: none"> - Mild pain: 1 dose - Moderate pain: every 12 hours for 48 hours - Severe pain: every 8 hours for 72 hours |
| XR-buprenorphine (Ethiq)® | 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 | 2-5 mg/kg | Subcutaneous, 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 | 0.1-0.5 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 |
| 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 | 0.05-0.2 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 |
| XR-buprenorphine (Ethiq) | 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 | Once | Lasts 4-8 hours |

| | | | | |
|-----------------------------|-----------------|--|-----------------------|---|
| | | topically on the incision prior to closure | | |
| 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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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. Foley PL, Kendall LV, Turner PV. Clinical Management of Pain in Rodents. Comp Med. 2019; 69(6): 468-489.
7. Ethiq XR Brochure <https://ethiqxr.com>

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https://research.cuanschutz.edu/docs/librariesprovider148/orcs_documents/cu-denver-veterinary-formulary-4-4.pdf?sfvrsn=8cb5c2b9_2