

## ISM-VET-11 小鼠镇痛

### Mouse Analgesia

#### PREPARATION:

- All solutions for parenteral use should be prepared aseptically using pharmaceutical grade sterile saline in a sterile vial/or red top tube
- The solution must be labeled with the active drug, diluent, final concentration (mg/mL), expiration date, and initials
  - Dilutions should be examined prior to use and disposed of if a precipitate forms regardless of the expiration date

#### PROCEDURE:

**Analgesia should be provided pre-emptively whenever possible.**

- Water bottle dosing should be initiated 24 hours in advance of procedure
- Direct oral dosing/injectable analgesia given at time of anesthesia induction or during recovery

#### NSAIDS

Meloxicam

Bacon Flavored Tablets 0.05mg/tablet (ULAR buys from Bio-Serve)

- Give one tablet/mouse/day
- Provides 2 mg/kg dosing for an average size 25 g mouse

Direct injectable, oral gavage

- Add 0.1ml of meloxicam (5mg/ml) to 1.9ml of sterile saline = 0.25mg/ml solution
- Dose of 2 mg/kg when a 30 g mouse is given 0.25ml SQ, PO (gavage) SID

Carprofen

Oral Gel formulation (ULAR purchases through Clear H<sub>2</sub>O/ Cincinnati Labs)

- 1 – 2oz gel cup for up to 5 mice provided 24 hours in advance
- Flip gel over on day 2-3 or replace if needed
- Provides for 2-5 mg/kg/day of active drug

Direct injectable

- Stock drug is viscous when cold (stock needs to be refrigerated), draw up with a 22g or larger needle
- 0.3mL of Rimadyl (50mg/mL Injectable Carprofen) + 29.5mL of sterile saline = 0.5 mg/mL solution
- Dose of 5mg/kg when a 25g mouse is given 0.25 mL SQ, SID

In drinking water

- Stock drug is viscous when cold (stock needs to be refrigerated), draw up using a 22g needle or larger
- Add 0.2mL of Rimadyl (50mg/mL Injectable Carprofen) + 400mL water = 0.025 mg/mL solution, changed once weekly
- Dose of 5mg/kg assuming a 25g mouse drinks 5 mL/day

Ibuprofen

In Hydropac

- Options to create a 0.2 mg/mL solution

- o 76 mg (3.8ml of Children's Motrin) + 384 ml of water (13 oz)
- o 48 mg (2.4 mL of Children's Motrin) + 237 mL of water (8 oz)
- Hydropacs should be changed twice weekly
- Dose of 40 mg/kg assuming a 25g mouse drinks 5 ml/day

In drinking water

- 80 mg of ibuprofen (4 mL Children's Motrin) + 400mL water = 0.2 mg/mL solution, changed twice weekly
- Dose of 40mg/kg assuming a 25g mouse drinks 5 mL/day.

Opioids

Buprenorphine

Direct injectable

- 0.1mL Buprenex to 5.9mL saline = 0.005mg/mL solution
- Dose of 0.1mg/kg when a 25g mouse is given 0.5mL SQ, BID to TID

Sustained release (Buprenorphine SR-LAB)

- Due to the viscosity you must draw up the drug initially in a 1cc syringe with a 22-23g needle and then transfer the needed volume into a U-100 of 0.5ml (0.1ml/10units) insulin syringe by removing the plunger. A maximum of 5 doses can be pulled up per syringe.
- It is recommended to warm the bottle and/or syringe in your hands or a water bath to thin out the SR Bup product and improve ease in handling. This may allow for doses to be pulled directly into a U-100 insulin syringe.
- Wipe the needle carefully with an alcohol swab to remove drug residue prior to administration, taking care to not contact the needle directly
- Administer slowly subcutaneously between the shoulder blades and pinch injection site for 10 seconds after removing the needle (ideally inject while anesthetized)
- Dose of 0.1 mg/kg when a 25g mouse is given 0.05mL (5 units if using a U-100 syringe) SQ, every 48-72 hours (do not dilute further). It is recommended that you pull up 0.07cc into the 1 cc syringe to allow for a final dose of 0.05 in the insulin syringe.

**Supplies:**

1. 0.9% sterile saline
2. Miscellaneous supplies as needed (22-25 ga needles, 1-10 mL Syringes)
3. Red top blood collection tube or sterile glass vial
4. Alcohol swabs
5. Mouse water bottle filled with 400 mL RO water
6. Mouse hydropac filled with either 237 ml (8 oz) or 384 ml (13 oz) of RO water
7. Metacam Injectable (meloxicam 5mg/ml)
8. Meloxicam Tablets 0.05mg/tablet from BioServe
9. Rimadyl (50mg/mL Carprofen) for injection or oral suspension (0.025mg/mL)
10. Carprofen Clear H2O gel from Cincinnati labs
11. Children's Motrin (100mg ibuprofen/5mL) or Ibuprofen oral suspension (100mg/5mL)
12. Buprenex (0.3mg/mL buprenorphine)
13. Buprenorphine SR-LAB (0.5 mg/mL)

**REFERENCES:**

- IACUC Policy on the Use of Pharmaceutical and Non-Pharmaceutical Compounds

<http://orrrp.osu.edu/files/2013/07/045-01-Use-of-Pharmaceutical-and-Non-Pharmaceutical-Compounds.pdf>

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Guidelines for the Assessment and Management of Pain in Rodents and Rabbits. ACLAM position statement.

Hayes et al 2000, An Evaluation of Analgesia Regimens for Abdominal Surgery in Mice, Contemporary Topics, 2000

Tubbs et al, Effects of Buprenorphine, Meloxicam, and Flunixin Meglumine as Postoperative Analgesia in Mice,

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Vet Guideline 13-004 Controlled Substances