

## Guidelines for the Use of Buprenorphine (Buprenex) in Rodents

Reviewed and Approved by FAU IACUC

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**Buprenorphine:** Trade name = Buprenex – Strength: 0.3 mg/ml in 1ml ampules

DEA Scheduled Drug. Must be handled, stored (double locked) and its use recorded properly!

### General:

- Buprenorphine is a narcotic partial  $\mu$  opiate agonist with excellent analgesic activity. For management of incisional pain the addition of a line block at the incision site (bupivacaine, lidocaine etc.) is recommended.
- Opioid analgesics may reduce the quantity of primary anesthetic administered.
- Respiratory depression is not usually a problem with buprenorphine at analgesic levels.
- It might cause mild anorexia and subsequent weight loss if administered more than once.
- It can influence behavior and lead to slightly increased spontaneous hyperactivity.
- At higher doses it is associated with pica (eating of substances without any nutritional value, usually bedding), especially in rats.
- Due to the small size of most rodents (i.e. mice and rats) and the concentration of the original drug it might need to be diluted before administration for improving accuracy of administration.

### Storage and Dilution of the Drug:

- Buprenorphine is a controlled substance. Any product containing buprenorphine including dilutions and mixtures with other drugs must be stored according to DEA regulations, i.e. behind two locks while not in use.
- Any dilution and/or mixture of an original drug is considered an adulteration and therefore is considered a non-pharmacological compound. It needs to be described in the protocol and approved by the IACUC.
- Follow aseptic technique when diluting
  - Use only sterilized vials for diluted drug
  - Clean port of drug vial, saline bag or sterile water with alcohol prior to each withdrawal
  - Withdraw drug using a new sterile needle and syringe each time and for each animal
- Store diluted Buprenex in a sterile vial for no longer than 30 days after dilution since it will lose potency. Refrigeration is not required.
- Buprenex is light sensitive and needs to either be stored
  - In an amber vial or
  - Transparent vial covered with tin foil or
  - Transparent vial if most of the time stored in a cabinet/lock box protected from light.
- The vial needs to be labeled with:
  - Drug name
  - Strength
  - Unique Controlled Substances Identifying Code found on the original bottle
  - Date of Dilution
  - Expiration Date (original expiration date or 30 days after dilution or whichever comes first).

### Mouse Dose:

- 0.05-0.2 mg/kg SC or IP
- Frequency:
  - 1<sup>st</sup> dose – at surgery (best before incision)
  - 2<sup>nd</sup> dose – 4-8 hours later
  - Subsequent doses (if needed) – every 8-12 hours
- Dilution: 1/20 dilution = 0.015 mg/ml concentration (e.g. 1ml buprenorphine + 19 ml sterile saline or sterile water)
- Injection Volume of 1/20 buprenorphine per Dose and Body Weight

Mouse Body Weight (in g)	0.1 mg/kg Dose Injection Volume (ml)	0.2 mg/kg Dose Injection Volume (ml)
15 g	0.10 ml	0.20 ml
20 g	0.15 ml	0.25 ml
25 g	0.15 ml	0.30 ml
30 g	0.20 ml	0.40 ml
35 g	0.25 ml	0.45 ml
40 g	0.25 ml	0.50 ml

Note: some of the numbers have been rounded to allow accuracy while drawing the drug into a syringe keeping the safety of the animal in mind

### Rat Dose:

- 0.01-0.05 mg/kg SC or IP
- Frequency:
  - 1<sup>st</sup> dose – at surgery (best before incision)
  - 2<sup>nd</sup> dose – 4-8 hours later
  - Subsequent doses (if needed) – every 8-12 hours
- Dilution: 1/10 dilution = 0.03 mg/ml concentration (e.g. 1 ml buprenorphine + 9 ml sterile saline or sterile water)
- As a rule of thumb administer at a rate of 0.1ml/100g BW (e.g. 0.2 ml for a 200g rat), which is a dose of 0.03 mg/kg and appropriate in most post-surgical situations
- Injection Volume of 1/10 buprenorphine per Dose and Body Weight

Rat Body Weight (in g)	0.01mg/kg Dose Injection Volume (ml)	0.03mg/kg Dose Injection Volume (ml)	0.05 mg/kg Dose Injection Volume (ml)
200 g	0.06 ml	0.20 ml	0.30 ml
250 g	0.08 ml	0.25 ml	0.40 ml
300 g	0.10 ml	0.30 ml	0.50 ml
350 g	0.12 ml	0.35 ml	0.58 ml
400 g	0.13 ml	0.40 ml	0.65 ml
450 g	0.15 ml	0.45 ml	0.75 ml

Note: some of the numbers have been rounded to allow accuracy while drawing the drug into a syringe keeping the safety of the animal in mind

### Buprenex SR™ Lab

- This is a slow release formulation designed to release buprenorphine over a 72-hour period.
- It cannot be diluted!
- Dosages: **Mouse** – 0.15-0.36 mg/kg SC once; **Rat** - 0.6-1.2 mg/kg SC once