

MOUSE FORMULARY

Note that all of these doses are approximations and must be titrated to the animal's strain, age, sex and individual responses. Significant departures from these doses should be discussed with a veterinarian. Doses will also vary depending on what other drugs are being administered concurrently.

All doses are listed as milligrams per kilogram (mg/kg) unless otherwise noted. Dilution of injected drugs allows more precise dosing, but may shorten the shelf-life of the compound (UCSF standard: diluted drugs should be labeled, then discarded after 1 month)

DRUG NAME	DOSE (mg/kg) & ROUTE	FREQUENCY	NOTES
Inhalation anesthetics			
Recommended: Isoflurane or Halothane or Sevoflurane	1-3% inhalant to effect (up to 5% for induction). Up to 8% for Sevoflurane	Whenever general anesthesia is required	Survival surgery requires concurrent preemptive analgesia. Must use precision vaporizer
Ketamine combinations			
Ketamine alone	100-200 IP	As needed	Deep sedation, but not surgical anesthesia. Not often used alone.
Ketamine-Medetomidine	50-75 + 0.5 -1 IP (in same syringe)	As needed	May not produce surgical-plane anesthesia for major procedures. If redosing, use ketamine alone. May be partially reversed with Atipamezole
Recommended: Ketamine-Xylazine	80-100 + 5-10 IP (in same syringe)	As needed	May not produce surgical-plane anesthesia for major procedures. If redosing, use ketamine alone. May be partially reversed with Atipamezole or Yohimbine
Ketamine-Xylazine-Acepromazine	30-40 + ~6 + ~1 (in same syringe)	As needed	May not produce surgical-plane anesthesia for major procedures. If redosing, use ketamine alone. May be partially reversed with Atipamezole or Yohimbine
Ketamine-Midazolam	80-100 + 4-5 IP (in same syringe)	As needed	May not produce surgical-plane anesthesia for major procedures, but may be useful for restraint.
Reversal agents			
Atipamezole	0.1 - 1.0 subcutaneous or IP	Any time medetomidine or xylazine has been used	More specific for medetomidine than for xylazine (as a general rule, Atipamezole is dosed at the same <i>volume</i> as Medetomidine, though they are manufactured at different concentrations).
Yohimbine	1.0 – 2.0 SC or IP	For reversal of xylazine effects	
Other injectable anesthetics			
Sodium pentobarbital (Nembutal)	40 – 50 IP	Recommended for terminal/acute procedures only, with booster doses as needed	Consider supplemental analgesia (opioid or NSAID) for invasive procedures
Tribromoethanol (Avertin)	250-500 IP	May be used once for survival procedure	Use fresh solution (<1 week of age). Lower concentration

(Recommended for Tg mice-all others must be justified and approved by the IACUC)		(boosted as necessary during procedure) and once for terminal/acute procedure	(1.25%) less likely to cause peritonitis. See recipe below. Use is discouraged unless research needs justify it's use.
Propofol	12-26 IV	As needed	Only useful IV, so therefore limited usefulness in mice. Respiratory depression upon induction is possible.

Opioid analgesia

Recommended: Buprenorphine	0.05 - 0.1 SC or IP	Used pre-operatively for preemptive analgesia and post-operatively every 6-12 hour	For major procedures, may require more frequent dosing than 12 hour intervals. Consider multi-modal analgesia with a NSAID
--------------------------------------	---------------------	--	--

Non-steroidal anti-inflammatory analgesia (NSAID) Note that prolonged use may cause renal, gastrointestinal, or other problems

Recommended: Carprofen	4-5 SC	Used pre-operatively for preemptive analgesia and post-operatively every 12-24 hour	Depending on the procedure, may be used as sole analgesic, or as multi-modal analgesia with buprenorphine.
Ketoprofen	2 – 5 SC	Every 12-24 hours	Depending on the procedure, may be used as sole analgesic, or as multi-modal analgesia with buprenorphine.
Acetaminophen (Tylenol) Elixir	5 mg/ml	For 3 days in water	Can be hepatotoxic
Flunixin meglumine	~ 2 SC, IM	Used pre-operatively for preemptive analgesia and post-operatively every 12-24 hour	Depending on the procedure, may be used as sole analgesic, or as multi-modal analgesia with buprenorphine.

Local anesthetic/analgesics (lidocaine and bupivacaine may be combined in one syringe for rapid onset and long duration analgesia)

Lidocaine hydrochloride	Dilute to 0.5%, do not exceed 7 mg/kg total dose, SC or intra-incisional	Use locally before making surgical incision	Faster onset than bupivacaine but short (<1 hour) duration of action
Bupivacaine	Dilute to 0.25%, do not exceed 8 mg/kg total dose, SC or intra-incisional	Use locally before making surgical incision	Slower onset than lidocaine but longer (~ 4-8 hour) duration of action

Avertin Recipe

AVERTIN

100% stock avertin

Mix: add tribromoethanol to tertiary amyl alcohol and dissolve by heating and stirring. Add distilled water and continue until the solution is well mixed. Store wrapped in foil (light sensitive solution, ok to use brown glass bottle), 4 C

Solution may have to be warmed to dissolve. Mixture should be clear.

10g tribromoethyl alcohol (2, 2, 2 tribromoethanol), Aldrich T4, 840-2

10ml tertiary amyl alcohol (2 methyl-2-butanol), Aldrich 24, 048-6

Warning! Decomposition can result from improper storage.

2.5% working stock avertin (this solution should be prepared weekly)

For use in mice, dilute the 100% to 2.5% (1:40) using diluent, water or isotonic saline.

Diluent recipe:

0.8% NaCl

1mM Tris (pH 7.4)

0.25mM EDTA

Check the pH. Adjust to pH 7.4.

To make 50 ml 2.5% avertin, add 1.25 ml 100% to 48.75 ml liquid (diluent, water or saline)

Filter .22 micron

Store 4 C, foil wrapped or brown bottle

Dosage for mice may vary with different preparations of avertin. Dosage should be redetermined each time a 100% stock is made up. Test for best effect in a few mice before choosing dose. Allow 5-10 min to take effect.