

RAT 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 |
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| 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 | 75-100 IP | As needed | Deep sedation, but not surgical anesthesia. Not often used alone. |
| Ketamine-Medetomidine | 75-100 + ~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 | 75-100 Ket + 5-10 IP (in same syringe) | As needed | May not produce surgical-plane anesthesia for major procedures, though more reliable than in mice. If redosing, use ketamine alone. May be partially reversed with Atipamezole or Yohimbine |
| Ketamine-Xylazine-Acepromazine | 75 - 100 + 2 - 6 + 1 - 2 (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 | 75-100 + 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. May occasionally be appropriate for survival procedures | Consider supplemental analgesia (opioid or NSAID) for invasive procedures, especially when used on a survival basis. |

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| 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 | 0.01 - 0.05 SC or IP | Used pre-operatively for preemptive analgesia and post-operatively every 6-12 hour | For major procedures, require more frequent dosing than 12 hour intervals. Consider multi-modal analgesia with a NSAID. High doses of buprenorphine may lead to pica behavior in rats. |
| Butorphanol | 0.05-2 mg/kg SC | Every 4 hours | |
| 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. |
| Recommended: Ketoprofen | 2 – 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. |
| Flunixin meglumine | ~ 2 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. |
| 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 |