List of Anesthetic, Analgesic and Tranquilizer Drugs Frequently Used With the Common Laboratory Species.

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Definition of Abbreviations Used in the Drug List.

Abbreviation	Meaning
SC	**Subcutaneous injection**
IM	**Intramuscular injection**
IV	**Intravenous injection**
IP	**Intraperitoneal injection**
PO	**Given By Mouth**
Epi	**Epidural space in the Lumbar region**
q4h.	**Repeat every 4 hours**
NSAID	**Non-steroidal Anti-inflammatory Drug**
MAC	**Minimum Alveolar Concentration; the alveolar concentration of a gaseous anesthetic required to block the response to a specified painful stimulus.**
SID	**Once a day**
BID	**Twice a day**
QID	**Four times a day**
"to effect"	**given until the desired effect is reached, not administering the whole calculated dose.**

1. **Indicates beneficial for <u>mild</u> pain.**
2. **Indicates beneficial for <u>moderate</u> pain.**
3. **Indicates beneficial for <u>extreme</u> pain.**

Rodents: Chemical Restraint/Anesthesia/Analgesia

Agent	Dosage	Comments
Acepromazine	0.5-1.0 mg/kg **IM**.	Preanesthetic; causes seizures in Gerbils. See combination with Ketamine.
Acetaminophen (Tylenol Syrup)	1-2 mg/mL drinking water.	Analgesia for all rodents.**(1)**
Acetylsalicylic Acid (Aspirin)	50-100 mg/kg **PO** q4h.	Analgesia**(1)**/NSAID: Guinea pigs.
	100-150 mg/kg **PO** q4h.	Rats, gerbils, hamsters.**(1)**
	120-300 mg/kg **PO**.	Mice; lower doses can be given q4h.
Alpha-Chloralose	55 mg/kg **IP.**	Non-survival anesthesia; 8-10 hrs.
Atipamezole (Antisedan)	1.0-2.5 mg/kg **IP.**	Mice: Medetomidine reversal.
Atropine	0.05-0.10 mg/kg **SC**.	All; some rats possess serum atropinesterase.
	0.4 mg/kg **SC,IM**.	Gerbils, hamsters, mice and rats.
	0.1-0.2 mg/kg **SC, IM.**	Chinchillas and guinea pigs.
Buprenorphine (Buprenex)	0.05-2.5 mg/kg **SC, IP** q6-12h.	Analgesia **(2-3)** Mice
	0.05 mg/kg **SC** q8-12h.	Chinchillas, guinea pigs.
	0.1-0.2 mg/kg **SC** q8h.	Gerbils
	0.5 mg/kg **SC** q8h.	Hamsters
	0.1-0.5 mg/kg **SC, IP, IV,** q6-12.	Rats

Rodents: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Butorphanol (Torbugesic)	0.2 mg/kg **IM** q2-4h.	Analgesia **(2-3).** Chinchillas
	1-5 mg/kg **SC** q2-4h.	Rats, mice gerbils, hamsters, and guinea pigs.
Carbon Dioxide (CO_2)	80% CO_2 ± 20% O_2 Time: ~120 sec.	Short acting anesthetic. Rats.
	Time: ~30 sec.	Guinea pigs.
Chloral Hydrate		Non-survival anesthesia. Minimal effect on cardiovascular system and on baroreceptor reflexes.
	200-300 mg/kg **IP** of a 10% soln.	Rats
	400 mg/kg **IP** of 10% soln.	Mice
Chloral Hydrate + Pentobarbital + $MgSO_4$ (Equithesin)	(CH) 176 mg/kg + (P) 40 mg/kg + (M) 87 mg/kg [4.0 mL/kg **IP**]	Cocktail is made up in EtOH, propylene glycol and water.
Carprofen (Rimadyl)	4 mg/kg **SC** q24h.	Analgesia **(1-2)/** NSAID. Chinchillas.
	5-10 mg/kg **PO**	Rats; Can be given in combination with Buprenorphine (0.05 mg/kg).
Diazepam (Valium)	3-5 mg/kg **IM**	Sedative; Rats, mice, hamsters, gerbils, guinea pigs.
Flunixin meglumine (Banamine)	1-3 mg/kg **SC** q12h.	Analgesia **(1-2)** / NSAID. Chinchillas
	2.5 mg/kg **SC** q12-24h.	Rats, mice, hamsters, gerbils, and guinea pigs.
Glycopyrrolate (Robinul)	0.01-0.02 mg/kg **SC.**	Pre-anesthetic; anticholinergic; all rodents.

Rodents: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Halothane	2-5% induction; 0.25-3.0 % maintenance.	All rodent species; MAC = 1.0%
Ibuprofen (Advil)	7-15 mg/kg **PO** q4h.	Analgesia **(1-2)**; NSAID. All rodent species.
	10-30 mg/kg **PO** q4h.	Rats
	0.2 mg/mL in drinking water (20 mg/mL syrup in 100 mL water).	Mice, rats. (Be aware that water intake during daylight hours may not allow for sufficient consumption.)
Inactin	80 mg/kg **IP.**	Anesthesia (thiobarbiturate); rats.
Isoflurane	2-5 % induction; 0.25-4.0% maintenance.	Anesthetic of choice; all rodent species; MAC= 1.28 %.
Ketamine (Ketaset, Vetalar)		Ketamine alone gives poor muscle relaxation.
	22-44 mg/kg **IM.**	Mice; rats; light to heavy sedation depending on dose.
	22-64 mg/kg **IM.**	Guinea pigs; for heavy sedation can give up to 44-200 mg/kg (marked individual variation).
	40-60 mg/kg **IM.**	Chinchillas and Hamsters: heavy sedation 40-150 mg/kg; Gerbils: heavy sedation 70-200 mg/kg.
Ketamine(K) + Acepromazine(A)	(K) 40 mg/kg + (A) 0.5 mg/kg **IM.**	Anesthesia; All rodents.
Ketamine(K) + Diazepam(D)	(K) 20-40 mg/kg + (D) 1-2 mg/kg **IM.**	Anesthesia; Chinchillas and guinea pigs.
Ketamine(K) + Medetomidine(M)	(K) 50-75 mg/kg + (M) 1.0 mg/kg **IP.**	Mice; anesthesia for minor procedures, use the higher dose of Ketamine in females; (M) reversal with atipamezole.

Rodents: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Ketamine(K) + Xylazine(X)	(K) 20-40 mg/kg + (X) 2.0 mg/kg **IM.**	Guinea pigs; light anesthesia.
	(K) 35-40 mg/kg + (X) 408 mg/kg **IM.**	Chinchilla; anesthesia.
	(K) 50 mg/kg + (X) 2.0 mg/kg **IP.**	Gerbils; anesthesia.
	(K) 80-100 mg/kg + (X) 5-10 mg/kg **IP.**	Mice; anesthesia.
	(K) 40-95 mg/kg + (X) 5-10 mg/kg **IM, IP.**	Rat; anesthesia.
	(K) 80 mg/kg + (X) 5.0 mg/kg **IM, IP.**	Hamster; anesthesia.
Ketoprofen (Ketofen)	1-3 mg/kg **IM** q12h.	Analgesia**(2)**; NSAID
	5.0 mg/kg **IM, SC** q24h.	Mice
Medetomidine (Dormitor)	0.1-0.5 mg/kg **SC, IM, IP.**	Sedation; see Ketamine for combination.
Methoxyflurane (Metofane)	3% induction; 0.4-1% for maintenance.	Easy anesthetic to use (belljar for induction, nose cone for maintenance); MAC= 0.22-0.30.
Meperidine (Demerol)	20 mg/kg **SC, IM** q2-3h.	Analgesia**(2)**; all rodents.
Midazolam (Versed)	1-5 mg/kg **IM, IP.**	Pre-anesthetic; sedative; rats and mice higher dosage.
Morphine	2-5 mg/kg **SC** q2-4h.	Analgesia**(2-3)**; all rodents.
Nalbuphine (Nubain)	4-8 mg/kg **IM** q3h.	Analgesia**(2-3)** Rats, mice, gerbils, hamsters.
	1-2 mg/kg **IM** q3h.	Guinea pigs.
Nalorphine	2-5 mg/kg **IV.**	Narcotic reversal; all rodents.

Rodents: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Naloxone (Narcan)	0.01-0.10 mg/kg **SC, IP.**	Narcotic reversal; all rodents.
Oxymorphone	0.2-0.5 mg/kg **SC, IM** q6-12h.	Analgesia**(2-3)**; all rodents.
Pentobarbital (Nembutal)		Anesthesia; marginal analgesia; autonomic depression; administer diluted in sterile saline (<10 mg/mL).
	30-45 mg/kg **IP.**	Guinea pigs and chinchillas.
	45-50 mg/kg **IP.**	Rats.
	50-90 mg/kg **IP.**	Mice, gerbils, hamsters.
Piroxicam (Feldene)	3.4-20.0 mg/kg **PO.**	Mice; Analgesia**(1-2)**; NSAID.
Propofol (Rapinovet)		Anesthesia; induction.
	7.5-10.0 mg/kg **IV.**	Rats
	12-26 mg/kg **IV.**	Mice
Tiletamine/ Zolazepam (Telazol)	20-40 mg/kg **IM.**	Anesthesia; rats, chinchillas.
Telazol(T) + Xylazine(X)	(T) 20-30 mg/kg + (X) 10 mg/kg **IM, IP.**	Anesthesia; hamsters, gerbils.
Tribromoethanol (Avertin)		No longer available commercially.
	125 mg/kg **IP** (2.5% soln). (0.015 mL/gm.)	Anesthesia; mice; store carefully.
	225-300 mg/kg **IP** (1.25% soln.).	Anesthesia; rats, mice, gerbils. Use for only one survival procedure. Lower concentration (1.25%) less likely to cause peritonitis.
Urethane		Non-survival anesthesia; long acting (>6 hrs.); carcinogen.
	1.0-1.2 gm/kg **IP.**	Mice, rats.
	1.5 gm/kg **SC, IP, IV.**	Guinea pigs. (10-25% soln.)

Rodents: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Xylazine (Rompun)	1-3 mg/kg **IM** (4-8 mg/kg high dose).	Sedative; rats.
	4-8 mg/kg **IM, IP** (10 mg/kg, high dose).	Sedative; mice.
	3-5 mg/kg **IM.**	Sedative; guinea pigs.
Yohimbine (Yobine)	0.5-1.0 mg/kg **IV.**	Xylazine reversal; all rodents.

Rabbits: Chemical Restraint and Anesthetic Agents

Agent	Dosage	Comments
Acepromazine	---	See Ketamine, Ketamine/Xylazine, for combinations
	0.5-1.0 mg/kg **IM**	Preanesthetic Dose
	0.75-1.0 mg/kg **IM**	Sedative/Tranquilizer dose
	1-5 mg/kg **SC, IM**	Preanesthetic; lower end of dose range preferred.
Alpha-Chloralose, 1% Solution	120 mg/kg **IV** 80-100 mg/kg **IV**	Use in acute preparations only
Atipamezole (Antisedan)	0.001 mg/kg **SC, IP**, **IV**	Medetomidine reversal
Atropine	0.1-3.0 mg/kg **SC** 0.8-1.0 mg/kg **IM**	Many rabbits possess a serum atropinase
Butorphanol (Torbugesic, Stadol, Torbutrol)	0.1-0.5mg/kg **IV** q4h	
Diazepam (Valium)	5-10 mg/kg **IM**	Can be given with Ketamine or Fentanyl for anesthesia.
	1-5 mg/kg **IM, IV**	As preanesthetic or tranquilizer
Enflurane (Ethrane)	To effect	Anesthesia; MAC= 2.9%
Glycopyrrolate (Robinul-V)	0.01- 0.02 mg/kg **SC**	Preanesthetic
Halothane (Fluothane)	3-4% for induction, 0.5-2.0% for maintenance	Inhalant anesthetic
Isoflurane (Aerrane)	3-5% for induction, 1.5-1.75% for maintenance	Inhalant anesthetic of choice; MAC= 2.05%
Ketamine (Ketaset, Vetalar)	--- 15-20 mg/kg **IV** 20-50 mg/kg **IM**	Ketamine combinations follow. 60 minutes of sedation
Ketamine/Acepromazine Combination	(K) 40 mg/kg/ (A) 0.5-1.0 mg/kg **IM**	Surgical anesthesia
Ketamine/ Diazepam Combination	(D) 0.2-0.5 mg/kg **IV**, then (K) 10-15 mg/kg **IV.**	Produces deep sedation; follow with Isoflurane to effect for anesthesia.
	(K) 20-30 mg/kg plus	Follow with Isoflurane for anesthesia

(D) 1-3 mg/kg **IM**

Rabbits: Restraint and Anesthesia (cont.)

Agent	Dosage	Comments
Ketamine/Xylazine	--- (K) 10 mg/kg and (X) 3 mg/kg **IV** (K) 30-40 mg/kg and (X) 3-5 mg/kg **IM**	Anesthesia; may result in bradycardia; (K)/(D)/Isoflurane combination preferable.
Ketamine/Xylazine/ Acepromazine	(K) 35 mg/kg + (X) 5 mg/kg + (A) 0.75 mg/kg **IM**	Surgical anesthesia 45-75 min.
Ketamine/Xylazine/ Butorphanol	(K) 35 mg/kg + (X) 5 mg/kg + (B) 0.1 mg/kg **IM**	Surgical anesthesia 60-90 min.
Lidocaine	(1.5%) 0.4 mL/kg (10%) Topical to glottis	Epidural anesthesia Facilitates intubation
Medetomidine (Dormitor)	0.25 mg/kg **IM** 6 mg/kg **IV** to effect	Sedation Induction
Medetomidine/ Ketamine	(M) 0.35 mg/kg **IM** + (K) 5 mg/kg **IV**	Anesthesia; surgical depth ~ 19 min.
Nalorphine (Nalline)	1-5 mg/kg **IV**	Narcotic reversal
Naloxone	0.01-0.10 mg/kg **IM** or **IV**	Narcotic reversal
Pentobarbital (Nembutal)	25-30 mg/kg **IV**	Anesthesia; given to effect; sedative pre-anesthetics reduce dosage to 15-20 mg/kg **IV**
Propofol	10 mg/kg **IV**	Light anesthesia for 5-10 min.
Sevoflurane	To effect	Anesthesia; MAC= 3.7%
Thiopental (Pentothal)	25-30 mg/kg **IV**	Ultra short acting barbituate; given "to effect".
Tiletamine/Zolazepam (Telazol)	3 mg/kg **IM**	Not recommended in rabbits as may cause renal tubular necrosis.

Rabbits: Restraint and Anesthesia (cont.)

Agent	Dosage	Comments
Xylazine (Rompun)	1-5 mg/kg **SC** or **IM**	Preanesthetic; tranquilizer. Potent muscle relaxant. See Ketamine for combination.
Yohimbine	0.2-1.0 mg/kg **IM** or **IV**	Xylazine reversal

Rabbits: Analgesics

Agent	Dosage	Comments
Acetaminophen (Tylenol)	200-500 mg/kg **PO** 1-2 mg/mL in drinking water.	
Acetaminophen/ Codeine	1 mL elixir/100 mL drinking water	
Acetylsalicylic Acid	20 mg/kg **PO** sid. 100 mg/kg **PO** q4h.	Non-steroidal anti-inflammatory
Buprenorphine	0.01-0.05 mg/kg **SC IV** q6-12h. 0.02-0.1 mg/kg **IV** or **SC** q12h.	Analgesia
Butorphanol (Torbugesic)	0.0-0.5mg/kg **SC, IM,** or **IV** q2-4h.	Analgesia
Carprofen (Rimadyl)	2.2 mg/kg **PO** q12h.	NSAID
Fentanyl	0.0074 mg/kg **IV**	Analgesia

Rabbits: Analgesics (cont.)

Agent	Dosage	Comments
Fentanyl Patch	1/2 patch per medium-sized rabbit(3kg) x 3 days	Post-operative analgesia
Flunixin meglumine (Banamine)	1.1 mg/kg **SC, IM** q12h or BID	NSAID
Ketoprofen	1-3 mg/kg **IM** q12-24h	Musculosceletal pain; NSAID
Meperidine (Demerol)	10(5-25) mg/kg **SC, IM,** or **IV** q2-3h	Analgesic
Nalbuphine (Nubain)	1-2 mg/kg **IM, IV** q4-5h	Analgesic
Oxymorphone	0.05-0.20 mg/kg **SC, IM** q8-12h.	Analgesic

C = cat, D = dog
NSAID = Nonsteroidal anti-inflammatory drug
Analgesia 1 = mild pain
Analgesia 2 = moderate pain
Analgesia 3 = severe pain

Cat and Dog: Chemical Restraint and Anesthetic Agents

Agent	Dosage	Comments
Acepromazine	0.05-0.20 mg/kg **IM, IV, or SC**.	Lowers the seizure threshold and blood pressure.
Atipamezole (Antisedan)	0.001 mg/kg **SC, IP, IV**	Medetomidine reversal
Atropine	0.02-0.04 mg/kg **IM, IV, SC.**	Used as pre-anesthetic in combination with a sedative or tranquilizer.
Butorphanol (Torbugesic, Stadol, Torbutrol)	0.10-0.40 mg/kg **IV, IM** (dog) 0.05-0.2 mg/kg **IV,IM**(cat)	Analgesia for about 4 hrs. Analgesia for 2-3 hrs.
Butorphanol/ Acepromazine comb.	(B) 0.3 mg/kg + (A) 0.03 mg/kg **IM or SC.**	
Diazepam (Valium)	0.1-0.25 mg/kg **SC, IV**	Can be combined with Ketamine or Oxymorphone for anesthesia.
Diazepam(D)/ Oxymorphone(O) comb.	(D) 0.02 mg/kg + (O) 0.02-0.05 mg/kg **IV or IM.**	Watch for bradycardia; use for short procedures. Use low dose for cats.
Enflurane (Ethrane)	To effect	Anesthesia; MAC= 2.9%
Glycopyrrolate (Robinul-V)	0.05-0.1 mg/kg SC, **IM, IV.**	Preanesthetic: dries salivary secretions and supports heart rate.
Halothane (Fluothane)	3-4% for induction, 1.0-1.5% for maintenance	Inhalant anesthetic; MAC=0.87% for dogs; MAC=0.82% for cats; may cause hypotension, myocardial depression, and dysrhythmias.
Isoflurane (Aerrane)	3-5% for induction, 1.5-1.75% for maintenance	Inhalant anesthetic of choice; MAC= 1.28% for dogs; MAC=1.63% for cats.

Cat and Dog: Chemical Restraint and Anesthetic Agents (cont.)

Agent	Dosage	Comments
Ketamine (Ketaset, Vetalar)	15-20 mg/kg **IV** (D) 20-50 mg/kg **IM** (D) 4-10 mg/kg **IV** (C) 10-20 mg/kg **IM** (C)	60 minutes of sedation
Ketamine/Acepromazine Combination	(K) 4-8 mg/kg **IM +** (A) 0.1-0.2 mg/kg **IM**	Give IM for 20-60 minutes of sedation; give Ace. 15 minutes prior to Ketamine; give IV for short anesthetic duration.
Ketamine/ Diazepam Combination	(D) 0.1-0.2 mg/kg **IV,** + (K) 1.0-2.0 mg/kg	Produces sedation for 10 min. for induction; follow with Isoflurane to *to effect* for anesthesia.
Ketamine/Xylazine Combination	(K) 3-7 mg/kg **IV** or (K) 7-10 mg/kg **IM** + (X) 0.1-0.8 mg/kg **IV**	May result in bradycardia; (K)/(D)/Isoflurane combination preferable.
Ketamine/ Medetomidine Combination	(K) 5.0 mg/kg **IV** or 5-10 mg/kg **IM** (D) (K) 7.0 mg/kg **IM** (C) (M) 0.01-0.08 mg/kg **IM**	Given IM, 20-35 min. duration in dogs; 30-60 min. duration in cats; duration shorter for **IV** administration.
Lidocaine	(2.0%) 1 ml/5 kg **EPI** (10%) Topical to glottis	Epidural anesthesia; Facilitates intubation; Nerve blocks and Line blocks use 1-2%.
Medetomidine (Dormitor)	0.01-0.08 mg/kg **IM** 0.001-0.005 mg/kg **IV**	Sedation. See Antisedan, reversal agent; alpha-2 agonist with fewer adverse side effects than Xylazine.
Nalorphine (Nalline)	(C)1 mg/kg **IV, IM, SC** (D)5 mg/kg **IV, IM, SC**	Narcotic reversal
Naloxone	0.2-0.4 mg/kg **IV, IM**, **or SC.**	Narcotic reversal
Propofol (Rapinovet)	6.6-8.8 mg/kg **IV** 2.2-4.4 mg/kg **IV**	Light anesthesia for 5-10 min. Dose with premedication.

Cat and Dog: Chemical Restraint and Anesthetic Agents (cont.)

Agent	Dosage	Comments
Sevoflurane	To effect	Anesthesia; MAC= 2.1-2.4% for dogs; MAC=2.6% for cats; reacts with soda lime to form a nephrotoxic compound.
Thiopental (Pentothal)	25-30 mg/kg **IV**	Ultra short acting barbituate; given "to effect". Decrease dosage if animal is premedicated.
Tiletamine/Zolazepam (Telazol)	7-15 mg/kg **IM** 2.2-4.4 mg/kg **IV**	Can be used for induction for short procedures; enhanced by alpha-2 agonists and opioids.
Xylazine (Rompun)	0.1-0.5 mg/kg **IV, IM**	Preanesthetic; tranquilizer. Potent muscle relaxant. See Ketamine for combination.
Yohimbine	0.05-0.1 mg/kg **IV**	Xylazine reversal

Cat and Dog: Analgesics

Agent	Dosage	Comments
Acetaminophen (Tylenol)	(D) 15 mg/kg **PO** q 8h	NSAID Toxic in cats
Acetylsalicylic Acid	(C) 10 mg/kg **PO** q 48h (D) 10-20 mg/kg **PO** q 12h	NSAID
Buprenorphine	(C) 0.005-0.01 mg/kg **SC, IM** q 12h (D) 0.01-0.02 mg/kg **SC, IM** q 12h	Analgesia (2-3) Analgesia (2-3)

Cat and Dog: Analgesics (cont.)

Agent	Dosage	Comments
Butorphanol	(C) 0.4 mg/kg **SC, IM** q 6h	Analgesia (2-3)
	(D) 0.2-0.4 mg/kg **SC, IM** q 6h	Analgesia (2-3)
Carprofen (Rimadyl)	2.2 mg/kg **PO** q12h.	NSAID Analgesia (2)
Etodolac (Etogesic)	4.5-6.8 mg/kg **PO** sid	NSAID
Fentanyl	(D) 0.04-0.08 mg/kg **SC, IM, IV** q 1-2h	Analgesia (2-3)
Fentanyl Patch	(C) 3-5 kg, 25 μg/hr patch per for 3 days (D) 5-15 kg, 25 μg/hr 15-35 kg, 50 μg/hr 35-60 kg, 75 μg/hr patch per for 3 days	Post-operative analgesia. Analgesia (2-3) Clip hair, alcohol swab and tape patch in place. Apply 24 hours before painful event.
Flunixin meglumine (Banamine)	(C) 0.3-1 mg/kg **SC, IM** q 24h (D) 1-2 mg/kg **SC, IM** q 24h	NSAID Analgesia (1-2) Use no longer than 3 days Can cause GIT ulcers and hemorrhage
Ketoprofen	(D) 1-3 mg/kg **IM** q 12-24 h	NSAID; Musculoskeletal pain
Meperidine (Demerol)	(C) 2-10 mg/kg **SC, IM,** or **IV** q2-3h (D) 6-10 mg/kg **SC, IM,** or **IV** q2-3h	Analgesia (2-3); action lasts only 1-2 hours.

Cat and Dog: Analgesics (cont.)

Agent	Dosage	Comments
Morphine	(C) 0.1 mg/kg **SC, IM** q6-7h (D) 0.25-5.0 mg/kg **SC, IM** q 4-6h	Analgesia (3) Use with caution in cats.
Nalbuphine (Nubain)	(D) 0.5-2 mg/kg **IM, IV** q 3-8h	Do not use in cats. Analgesic
Oxymorphone	(C) 0.5-1.5 mg/kg **SC, IM**, IV q 8-12h (D) 0.22 mg/kg **SC, IM**, IV q 8-12h	Analgesic (3)

Primates: Chemical Restraint and Anesthetic Agents

Agent	Dosage	Comments
Acepromazine	0.5-1.0 mg/kg **PO, SC, IM**	Pre-anesthetic; tranquilizer
Atipamizole (Antisedan)	0.15-0.30 mg/kg **IV**	Medetomidine reversal
Atropine	0.04 mg/kg **SC, IM, IV**	Pre-anesthetic; reduces salivation and bradycardia.
Diazepam (Valium)	0.5-1.0 mg/kg **PO**	Sedative; give in small amount of food or drink 30-60 min. prior to anesthesia; prolongs recovery.
	0.25-0.50 mg/kg **IM, IV**	Reduces seizures; muscle relaxer during anesthesia.
Fentanyl	5-10 ug/kg **IV** bolus	Use prior to Isoflurane anesthesia
	10-25 ug/kg/hr. continuous infusion **IV**	Use with Isoflurane anesthesia
Glycopyrrolate (Robinul)	0.005-0.010 mg/kg **IM, SC**	Pre-anesthetic; reduces salivation and bradycardia. Lasts longer than atropine.
Ketamine (Ketaset, Vetalar)	10-15 mg/kg **IM**	Medium-sized primates; 20 minutes of immobilization.
	25-30 mg/kg **IM**	Surgical anesthesia for smaller and New World primates; 20 min. duration; for minor procedures only.
Ketamine(K)/ Acepromazine(A)	(K) 4 mg/kg + (A) 0.04 mg/kg **IM**	Anesthesia for minor procedures only.
Ketamine(K)/ Diazepam(D)	(K) 15 mg/kg + (D) 1.0 mg/kg **IM**	Anesthesia for minor procedures only.

Primates: Restraint and Anesthesia (cont.)

Agent	Dosage	Comments
Ketamine(K)/ Medetomidine(M)	(K) 5.0-7.5 mg/kg + (M) 0.033-0.075 mg/kg **IM**	Anesthesia; use higher doses for smaller primates; for minor procedures only.
Ketamine(K)/ Xylazine(X)	(K) 10 mg/kg + (X) 0.5 mg/kg **IM**	Anesthesia for minor procedures only.
Medetomidine (Domitor)	0.05-0.10 mg/kg **PO** 0.10 mg/kg **SC, IM**	Induction; can be followed by Ketamine. Dosage for Squirrel Monkeys
Naloxone	0.01-0.05 mg/kg **IM, IV**	Narcotic reversal
Propofol	2.5-5.0 mg/kg **IV** bolus, followed by infusion of 0.3-0.4 mg/kg/min.	Intubation and ventilatory support suggested.
Thiopental (Pentothal)	25 mg/kg **IV** to effect	Anesthesia
Tiletamine/Zolazopam (Telazol)	2-6 mg/kg **IM** (1-20 mg/kg **IM)**	Anesthesia; cataleptoid. For species other than Macaques wide range of doses.

Primates: Analgesics Categories: 1. Mild pain 2. Moderate pain 3. Severe pain

Agent	Dosage	Comments
Acetaminophen (Tylenol)	5-10 mg/kg **PO** q6h.	Analgesic/ NSAID; anti-pyretic.
Acetylsalicylic acid (Aspirin, Ecotrin)	5-20 mg/kg **PO** q4-6h. 100 mg/kg **PO** SID 325 mg (5 gr.) **PO** QID	Analgesic/ NSAID; anti-pyretic.

Primates: Analgesics (cont.)

Agent	Dosage	Comments
Buprenorphine (Buprenex)	0.01 mg/kg **IM, IV** q12h. 0.005-0.01 mg/kg **IM, IV** q6-12h.	Analgesia (2); most useful of the opioid agonist-antagonists.
Butorphanol (Torbugesic, Stadol)	0.1-0.2 mg/kg **IM** q12-48h. o.01 mg/kg **IV** q3-4h.	Analgesia (2); Do **Not** give during anesthesia due to Respiratory Depression.
Carprofen (Rimadyl)	2-4 mg/kg **PO, SC** q12-24h.	Analgesic (1+2)/ NSAID
Fentanyl patch (Duragesic)	4-8 ug/kg/hr., change patch q72h.	Analgesic (2+3); do not cut patch.
Flunixin meglumine (Banamine)	0.3-1.0 mg/kg **SC, IV, IM** q12-24h.	Analgesic (1+2)/ NSAID
Ibuprofen (Advil)	20 mg/kg/day **PO** 1% solution, sub-gingival irrigation.	Analgesic (1)/ NSAID Periodontitis
Ketoprofen (Ketofen)	5 mg/kg **IM** q6h.	Analgesic (2)/ NSAID
Ketorolac (Toradol)	15-30 mg/animal **IM,PO**	Macaques, baboons; Analgesic (2)/ NSAID
Meperidine (Demerol)	2-4 mg/kg **IM** q3-4h.	Analgesic (2+3); Narcotic; sudden death reported in healthy animals; Squirrel monkeys require 8 mg/kg.
Midazolam (Versed)	0.1-0.5 mg/kg **IM**	In lemurs prevents Ketamine-induced seizures.
Morphine	1-2 mg/kg **PO, SC, IM, IV** q4h.	Analgesic (2+3); Narcotic.

Primates: Analgesics (cont.)

Agent	Dosage	Comments
Nalbuphine (Nubain)	0.5 mg/kg **IM, IV** q3-6h.	Analgesic (2+3)
Oxymorphone	0.03-0.2 mg/kg **SC, IM, IV** q6-12h. [0.075 mg/kg q6h.: New World Primates] [0.15 mg/kg q6h.: Old World Primates]	Analgesic (2+3)

Pigs: Chemical Restraint/Anesthetics/Analgesics

Agent	Dosage	Comments
Acepromazine	0.1-0.2 mg/kg **IM**.	Tranquilization. Facilitates catheter placement. (See combination with Ketamine)
Aspirin	10-20 mg/kg **PO** q12h.	Analgesia; anti-inflammatory; antipyretic; enteric coated (Ecotrin).
Atipamezole (Antisedan)	0.38 mg/kg **IM**	For medetomidine (Dormitor) reversal.
Atropine	0.04 mg/kg **SC, IM, IV.**	See detomidine combination. Pre-anesthetic; bradycardia and hypersalivation.
Azaperone (Stresnil)	2-8 mg/kg **IM**.	Sedation; immobilization.
Buprenorphine (Buprenex)	0.05-0.10 mg/kg **IM, IV** q8-12h.	Analgesia.
Butorphanol (Torbutrol; Torbugesic)	0.1-0.3 mg/kg **IM, IV** q8-12h.	Analgesia. See detomidine, ketamine for combinations.
Carprofen (Rimadyl)	2 mg/kg **PO** bid.	NSAID; relieves pain of osteoarthritis.
Detomidine (Dormosedan (D)/ Butorphanol (B)/ Midazolam (M)/ Atropine (A).	(D) 0.125 mg/kg + (B) 0.3 mg/kg + (M) 0.3 mg/kg + (A) 0.06 mg/kg **IM.**	Anesthesia; reverse with Naloxone and Yohimbine; can also reverse with Flumazenil, if needed.
Diazepam (Valium)	0.5-10.0 mg/kg **IM.** 0.5-1.5 mg/kg **IV.**	Sedation.

Pigs: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Flumazenil (Romazicon)	1.0 mg per 10-15 mg of midazolam **IV.**	Midazolam reversal.
Flunixin meglumine	0.5-1.0 mg/kg **SC, IV** q12-24h.	Analgesia; Anti-inflammatory.
Glycopyrrolate (Robinul-V)	0.005-0.010 mg/kg **SC, IM, IV.**	Pre-anesthetic; bradycardia and hypersalivation.
Halothane	4-5% induction, 1-2% maintenance.	Anesthesia; MAC=1.25; Malignant hyperthermia may follow halothane anesthesia in some strains of swine.
Isoflurane	4-5% induction, 1-2% maintenance.	Anesthesia; MAC=1.45; rapid induction and recovery; little effect on hepatic enzymes.
Ketamine (Ketaset, Vetalar)	5-20 mg/kg **IM.**	Sedation; immobilization. Poor muscle relaxation; poor visceral analgesia; rough recovery; use with other agents.
Ketamine (K)/ Acepromazine (A)	(K) 10-20 mg/kg + (A) 0.05-0.5 mg/kg **IM.**	Anesthesia.
Ketamine (K)/ Diazepam (D)	(K) 7 mg/kg + (D) 0.5 mg/kg **IV**. (D) 1-2 mg/kg **IM**, then (K) 12-20 mg/kg **IM**.	Sedation. Short-term anesthesia; prolong with (K) 2-4 mg/kg **IV** prn (as needed).
Ketamine (K)/ Xylazine (X)	(X) 2.2 mg/kg **IM** followed by (K) 12-20 mg/kg **IM**.	Short-term anesthesia; prolong with (K) 2-4 mg/kg **IV** prn (as needed). Anesthesia induction; follow by Isoflurane or Halothane for maintenance.

Pigs: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Ketamine (K)/ Xylazine (X)/ Butorphanol (B)	(K) 11.0 mg/kg + (X) 2.0 mg/kg + (B) 0.22 mg/kg **IM**.	Anesthesia.
Ketoprofen (Ketofen)	1-3 mg/kg **IM** q12h.	Anti-inflammatory; analgesic; antipyretic.
Medetomidine (Dormitor)	0.005-0.01 mg/kg **IM** q8h.	Alpha-2 agonist; sedation; analgesia. Reversed with Atipamezole (Antisedan)
Meperidine (Demerol)	2-10 mg/kg **IM, SC** q4h.	Analgesia.
Midazolam (Versed)	0.1-0.5 mg/kg **IM**.	Sedation See combination with Detomidine.
Morphine	0.2 mg/kg **IM,SC** q4h.	Analgesia; <20 mg total.
Naloxone	4 mg total dose **IV**.	Narcotic reversal.
Nitrous Oxide	At 2:1 with Oxygen	At equal volumes with oxygen (1-2 L/min) for Isoflurane induction.
Pentazocine (Talwin-V)	2 mg/kg **IM** q4h.	Analgesia.
Phenylbutazone (Butazolidin)	4-8 mg/kg **PO** q12h.	Anti-inflammatory; analgesic (especially musculoskeletal); antipyretic.
Propofol	2.5-3.5 mg/kg **IV**.	Short acting anesthetic; respiratory depression may occur.

Pigs: Chemical Restraint/Anesthesia/Analgesia (cont.)

Agent	Dosage	Comments
Tiletamine/ Zolazepam (Telazol)	4-6 mg/kg **IM**.	Sedation; immobilization. Poor muscle relaxation; rough recovery.
Tiletamine/ Zolazepam (T) + Ketamine (K) + Xylazine (Z).		[Reconstitute Telezol (500 mg) with 2.5 ml Xylazine (100 mg/ml) and 2.5 ml Ketamine (100 mg/ml) instead of water; mix contains 50 mg/ml each of the active drugs.]
	0.006-0.013 ml/kg **IM**.	Tranquilization; sedation.
	0.020-0.026 ml/kg **IM**.	Prior to induction; surgical anesthesia.
	0.022-0.044 ml/kg **IM**.	Induction; maintain with 0.022 ml/kg **IV** prn.
Telazol (T) + Xylazine (X)	(T) 2 mg/kg + (X) 2 mg/kg **IV**.	Rapid induction.
	(T) 6 mg/kg + (X) 2.2 mg/kg **IM**.	Anesthesia.
Xylazine (Rompun)	0.1-0.2 mg/kg **IM** q6h.	Analgesia.
	0.5-3.0 mg/kg **IM**.	Sedation; tranquilization.
Yohimbine (Antagonil)	0.125-0.3 mg/kg **IV**.	Xylazine reversal.