

成功大學實驗動物中心
實驗動物鎮靜麻醉及止痛藥物參考劑量表

Mouse sedatives, anesthetics and analgesics formulary

Agent	Dosage	Route	Comments
Restraint/sedation/pre-anesthetic agent: for injection, administration, procedures cause anxiety or mild pain in animals, or short-term restraint.			
1	Atropine	0.02-0.05mg/kg	SC
2	*Ketamine	20-44mg/kg	IM
3	Zoletil™	40-60mg/kg	IM, IP
Anesthetics: performing invasive procedures, surgery or other procedures that cause pain in animals. If surgery is required, the animal must confirm the depth of the anesthesia before surgery (tail and pedal pinch reflex).			
1	*Ketamine	50-200mg/kg 40-60mg/kg	IP IM <i>Recommended</i> for minor surgery.
2	*Ketamine + Xylazine	40-85mg/kg K + 5-21mg/kg X 90-120mg/kg K+5-10mg/kg X	IM,IP IM,IP 1. Antagonists of Xylazine. Yohimbine (1-2mg/kg IP) Tolazoline (20mg/kg IP) 2. If additional dosing is required, 1/3 ketamine dosage is suggested.
3	*Ketamine/Xylazine /*Acepromazine	80-100(K) + 5- 10(X) + 3(A) mg/kg in the same syringe	IP Yohimbine (1-2mg/kg IP), Tolazoline (20mg/kg IP) are antagonists of Xylazine.
4	Tribromoethanol (Avertin) – <i>mixing equal</i> amounts Tribromyl ethyl alcohol and Tertiary amyl alcohol (2.5% dilution)	250mg/kg (0.1 ml/10g) ICR mice 400mg/kg (0.16 ml/10g)	IP 1. IACUC approval is required. Justification for the use of non- pharmaceutical grade TBE must be approved in the protocol. 2. Adverse effects such as intestinal ileitis, serositis and peritonitis have been widely reported.

5	Zoletil 50™ + Xylazine	1ml Z+0.1ml X+ 3.9ml saline (0.05-0.06ml/10g) (50-60mg/kg Z + 5.8-6.5mg/kg X)	IP	Yohimbine (1-2mg/kg IP), Tolazoline (20mg/kg IP) are antagonists of Xylazine. Dosage may vary depending on the strains.
6	Isoflurane	Induction 4-5%, Maintenance 1-3%	IH	Perform in fume hood or well- ventilated area.
Neonatal pup anesthesia: Isoflurane or Hypothermia				
Analgesics: dosage may vary depending on the strains.				
1	Ibuprofen	7-15 mg/kg	PO	q. 4 h
2	Carprofen	5 mg/kg	SC	q. 24 h
3	Meloxicam	1-2 mg/kg	SC	q. 24 h
4	Ketoprofen	2-5/mg	SC	q. 24 h
5	Ketorolac	5-10 mg/kg	SC	q. 24 h
6	*Buprenorphine (Buprenex™)	2.0mg/kg, q12h	SC, IP	Should not be used as oral
7	Nalbuphine	4-8 mg/kg	SC, IP	q. 4-6 h

IV: Intravenous, IM: Intramuscular, SC: Subcutaneous, IP: Intraperitoneal, PO: oral
administration, IH: Inhalation, qXh: Dosing every X hours

*代表為管制藥品，申請時應檢附管制藥品登記證。

Rat sedatives, anesthetics and analgesics formulary

Agent	Dosage	Route	Comments
Restraint/sedation/ <i>pre-anesthetic</i> agent: for injection, administration, procedures cause anxiety or mild pain in animals, or short-term restraint.			
1	Atropine	0.04-0.1mg/kg	SC
2	Ketamine	22-50mg/kg	IM
3	Diazepam (Valium™)	0.5-15mg/kg	IP
Anesthetics: performing invasive procedures, surgery or other procedures that cause pain in animals.			
1	*Ketamine	100-200mg/kg	IM IP Recommended for minor surgery

		50-100mg/kg		
2	*Ketamine + Xylazine	50-100 mg/kg K +10mg/kg X	IM, IP	1. Yohimbine (1-2mg/kg IP), Tolazoline (20mg/kg IP) are antagonists of Xylazine. 2. If additional dosing is required, 1/3 ketamine dosage is suggested.
3	Zoletil™	20-40mg/kg	IM, IP	Corneal and pedal reflexes are maintained during anesthesia, and should not be used as criteria for judging depth of anesthesia.
4	Zoletil™/Xylazine	20-40mg/kg Z +5-10mg/kg X	IP	
5	Isoflurane	Induction 4-5%, Maintenance 1-3%	IH	Perform in fume hood or well-ventilated area.

Neonatal pup anesthesia: Isoflurane or Hypothermia

Analgesics

1	Ibuprofen	7-15 mg/kg	PO	q. 4 h
2	Carprofen	2-5 mg/kg	SC	q. 12-24 h
3	Ketoprofen	1-3 mg/kg	SC	q. 24 h
4	Meloxicam	1-2 mg/kg	SC, PO	q. 24 h
5	*Buprenorphine	0.02-0.05 mg/kg	SC, IP	q. 6-12 h
6	Nalbuphine	4-8 mg/kg	SC, IP	q. 4-6 h

IV: Intravenous, IM: Intramuscular, SC: Subcutaneous, IP: Intraperitoneal, PO: oral administration, IH: Inhalation, qXh: Dosing every X hours

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Rabbit sedatives, anesthetics and analgesics formulary

Agent	Dosage	Route	Comments
Restraint/sedation/ <i>pre-anesthetic</i> agent: for injection, administration, procedures cause anxiety or mild pain in animals, or short-term restraint.			
1	Glycopyrrolate	0.1mg/kg	IM, SC Rabbits may produce atropine esterase, glycopyrrolate is preferred in rabbits.

2	*Ketamine	15-50mg/kg	IM	Self-mutilation and muscle necrosis may occur after intramuscular injection.
3	Xylazine	5-10mg/kg	IM	
4	Zoletil™ + Xylazine	15-18mg/kg + 0.05ml/kg	IM	Zoletil is used for non-survival surgery.
5	*Midazolam	0.5-1 mg/kg	IM	
Anesthetics: performing invasive procedures, surgery or other procedures that cause pain in animals.				
1	*Ketamine + Xylazine	35-50mg/kg K+ 5-10mg/kg X 10mg/kgK+3mg/kg X	IM IV	1. Yohimbine (1-2mg/kg IP), Tolazoline (20mg/kg IP) are antagonists of Xylazine. 2. If additional dosing is required, 1/3 ketamine/Xylazine dosage is suggested.
2	Isoflurane	Induction 4-5%, Maintenance 1-3%	IH	1. Rabbits frequently <i>hold</i> their <i>breath</i> when <i>exposed</i> to these agents. 2. Perform in fume hood or well-ventilated area.
3	*Ketamine/Xylazine/ Isoflurane	35mg/kg K +5mg/kg X, Isoflurane 1-3%	IM IH	
4	Alfaxalone + Xylazine	5mg/kg+1.16- 2.33mg/kg	IM	Use for short term anesthesia
Analgesics				
1	Ibuprofen	2-7.5 mg/kg	PO	q. 12-24 h
2	Ketoprofen	1-3 mg/kg	IM	q. 12-24 h
3	Carprofen	1-5 mg/kg	SC	q. 24 h
		1.5 mg/kg	PO	q. 12 h
5	*Morphine	2-5 mg/kg	SC, IM	q. 2-4 h
6	*Buprenorphine	0.01-0.05mg	SC, IM	q. 8-12 h
7	Nalbuphine	1-2mg/kg	IM, IV	q. 4-5h

IV: Intravenous, IM: Intramuscular, SC: Subcutaneous, IP: Intraperitoneal, PO: oral administration, IH: Inhalation, qXh: Dosing every X hours

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Note:

1. The cecum may act as an anesthetic reservoir, affecting the effect of anesthetics.
2. When the rabbit is afraid or nervous, it will stop moving and play dead that needs to be distinguished from the drug reaction.

Swine sedatives, anesthetics and analgesics formulary

Agent	Dosage	Route	Comments	
Restraint/sedation/ <i>pre-anesthetic</i> agent: for injection, administration, procedures cause anxiety or mild pain in animals, or short-term restraint.				
1	Atropine	0.05mg/kg	SC, IM	
2	Xylazine	2mg/kg	IM	
3	Zoletil™	2-4mg/kg	IM	
4	*Acepromazine	0.8-1.1mg/kg	SC, IM	
Anesthetics: performing invasive procedures, surgery or other procedures that cause pain in animals.				
1	Thiopental	6.6-30mg/kg	IV	Half of the calculated doses of thiopental is typically administered rapidly so as to avoid excitement, and the balance administered more slowly.
2	*Ketamine/Xylazine	2mg/kg X 20mg/kg K	IV, IM	1. Yohimbine (1mg/kg IV) is antagonists of Xylazine. 2. If additional dosing is required, 1-2mg/kg ketamine IV or 1/3-1/4 Ketamine dosage IM is suggested.
3	Zoletil™	6-8.8mg/kg	IM	1-2mg/kg IV for <i>additional anesthetic</i>
4	Zoletil™ + Xylazine	2mg/kg X +	IM	Use for pre-anesthetic.

		4-5mg/kg Zoletil		
5	Isoflurane	Induction 4-5%, Maintenance 1-3%	IH	1. Use after induction of anesthesia. 2. Long-lasting anesthesia.
Analgesics				
1	Ketoprofen	1-3 mg/kg	IM, SC	q. 24 h
2	Carprofen	2-4 mg/kg	IM, SC	q. 24 h
3	Meloxicam	0.1-0.4 mg/kg	SC, PO	q. 24 h
4	*Morphine	0.1-0.2 mg/kg	SC/IM	q. 4 h
5	*Buprenorphine	0.01-0.05 mg/kg	IM, SC	q. 8-12h
6	*Butorphanol	0.1-0.3 mg/kg	IM, SC	q. 4-6 h
7	Nalbuphine	1-2mg/kg	IM, SC	q. 4-6h
8	*Fentanyl transdermal patch	5 ug/kg/h (highly variable)	Topical	Removed in 72hrs

IV: Intravenous, IM: Intramuscular, SC: Subcutaneous, IP: Intraperitoneal, PO: oral administration, IH: Inhalation

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Zebrafish Anesthesia agent

Agent	Dosage	Route	Comments
Ability to induce loss of consciousness without causing pain, distress, anxiety, or apprehension			
1	Tricaine methanesulfonate (MS222)	160 mg/L	Anesthetic immersion baths were performed The fish were placed in anesthetic solution and observed for loss of equilibrium, response to tail fin pinch, slowing of opercular movement