

Small animal anesthesia cheat sheet

Dr. Tamas D. Ambrisko, Ph.D., DACVAA, DECVAA
Veterinary Anesthesiologist and Educator
Tel: +36-70-706-6283
vetaneszt@gmail.com
Miskolc, 2025.02.17.



Anesthesia machine

Choosing a breathing circuit

- <5 kg bw = non-rebreathing system (NRS)
- >5 kg bw = rebreathing system (RS)

Choosing reservoir balloon

- <30 kg bw 2 L
- >30 kg bw 3 L

Choosing fresh gas flow (FGF)

- Extreme high flow for a NRS always
- High flow for induction, recovery on a RS
- Low flow for maintenance on a RS

FGF values

- Extreme high flow: 1.5 L/min
- High flow: 2 L/min
- Low flow: 0.5 L/min

Acceptable leakage: 0.2 L/kg/min

Isoflurane vaporizer dial setting

- Induction for healthy patients: 1.5-2%
- Induction for sick patients: 0.5-1%
- Maintenance: 0.8-1.5% (titrated)

Monitoring

Acceptable blood pressure

- MAP > 60 mmHg
- SAP (Doppler) > 80 mmHg

Hypertension: SAP >160 mmHg

Normal pulse rates (beats/min)

- Cats: 100-180
- Small dogs: 80-180
- Moderate sized dogs: 60-160
- Large dogs: 40-140

Normal oxygenation (SpO₂)

- On air SpO₂ >95%
- On 100% O₂ SpO₂ >98%
- Supplement O₂ if SpO₂ <90%

Normal ventilation (ETCO₂)

- ETCO₂ = 35-45 mmHg on dogs
- ETCO₂ = 30-35 mmHg on cats

Normal body temperature 38 – 39 °C

Mechanical ventilation

Respiratory rate: 10-15 breaths/min

Tidal volume: 10-15 ml/kg

Peak Inspiratory Pressure (PIP):

- <10 kg bw, PIP <10 cmH₂O
- >10 kg bw, PIP <20 cmH₂O

PEEP 0-5 cmH₂O

Inspiratory time: 1-2 seconds

Test ET tube cuff at: 20 cmH₂O

Fluid therapy

Use balanced electrolytes for maintenance with normal cardiac and renal function

- 5 ml/kg/hour maintenance for dogs
- 3 ml/kg/hour maintenance for cats

Fluid boluses for hypotension

- 5 ml/kg over 10 min

Replace lost blood volume with

- 3 times as much crystalloid or
- Same volume of colloid

Maximal dose of local anesthetics

- Lidocaine <7 mg/kg
- Bupivacaine <2 mg/kg

*The numbers in this document are not absolute.
Please use common sense to remain reasonable
but flexible.*



<https://vetaneszt.hu/>

Drug doses

Drug	Dose mg/kg		Note
	From	To	
Atropine	0.01	0.04	IV, bradycardia, CPR
Dexmedetomidine	0.25 µg/kg	0.5 µg/kg	IV for sedation
Dexmedetomidine	3 µg/kg	5 µg/kg	IM for premedication
Acepromazine	0.01	0.05	IV, IM for sedation
Midazolam	0.1	0.5	For premedication or seizure treatment
Methadone	0.2	0.5	IV, IM or SC; 4 h duration
Morphine	0.2	0.5	0.2 mg/kg max IV dose; 4 h duration
Fentanyl bolus	1 µg/kg	5 µg/kg	15-20 min duration, strong analgesic, only IV.
Fentanyl CRI	10 µg/kg	40 µg/kg	/hour, analgesic infusion
Buprenorphine	10 µg/kg	20 µg/kg	Mild analgesic for 6-8 h duration
Butorphanol	0.1	0.4	Weak analgesic, not suitable for surgeries
Propofol	1	-	IV boluses for anesthetic induction
Etomidate	0.2	-	IV boluses for anesthetic induction
Alfaxalone	0.5	-	IV boluses for anesthetic induction
Ketamine	2.5	-	IV boluses for anesthetic induction
Subanesthetic doses for premedication			
Alfaxalone	0.5	2	Additive to IM premedication
Ketamine	1	2	Additive to IM premedication
Anxiolytics, sedatives and analgesics PO			
Gabapentine	5	50	PO; BID, TID; Even 100 mg/kg has been given to cats 2 hours before veterinary visits.
Trazodone	5	10	PO BID, or 1 hour before veterinary visits.
Pregabalin (Bonqat)	See package insert		Bonqat 50 mg/ml PO for cats. Similar to gabapentine.
Dexmedetomidine (Sileo)	See package insert		Sileo gel absorbed via the oral mucosa. Recommended for treatment of noise sensitivity or prevention. Acting as an anxiolytic.
Tasipimidine (Tessie)	See package insert		Tessie 0.3 mg/ml PO for dogs. Alpha-2 agonist. Recommended for treatment of noise sensitivity or separation anxiety.
Tramadol	2	10	PO; BID or TID for dogs; weak analgesic.
Tramadol	2	4	PO; BID or TID for cats; better analgesic than in dogs.
Amantadine	3	5	PO BID. NMDA antagonist. Adjuvant analgesic for treatment of chronic pain.
Meloxicam for dogs	0.2		Single IV or SC inj. at this dose. Can be followed by 0.1 mg/kg SID PO for 3-5 days.
Meloxicam for cats	0.2	0.3	For single SC inj. Followup treatment is not recommended. Some vets may divide this dose and give for 3 days (e.g. 0.1 + 0.05 + 0.05 mg/kg)
Robenacoxib	2		Single SC bolus at the end of surgery, that can be followed by 1-2 mg/kg PO SID doses for 2 more days for dogs and cats.

The doses are not absolute.

Other doses may be applicable based on common sense and the rules of the profession.

Classification of anesthetic drugs

Drug family	Drug	Receptor	Main indication	CV side effects	Others
Anticholinergics	atropine, (glycopyrrolate)	muscarine antagonist	Bradycardia (with hypotension)	AV blocks, more bradycardia	Routine use for premedication is not recommended
α_2 agonists	dexmedetomidine, medetomidine, xylazine	α_2 agonist	Strong sedative	Vasoconstriction and reflex bradycardia, low cardiac output	Not recommended for most sick patients
Phenothiazines	acepromazine	α_1 , histamine, dopamine, serotonin antagonist	Mild sedative	Vasodilation and hypotension	Not recommended for hemodynamically unstable patients
Benzodiazepines	midazolam, (diazepam)	GABA agonist	Muscle relaxant and anti seizure effects. The sedative effects are unreliable in dogs and cats.	Minimal	Suitable for most sick patients (except for severe liver diseases)
Opioids	methadone	Full mu agonist, NMDA antagonist	Strong analgesia (4 hours)	No direct effects on circulation. May cause bradycardia because of increased Psy and decreased Sy activity, which can be treated with atropine.	Can be given IV, IM, SC, doesn't cause histamine release, vomiting is rare
Opioids	morphine	Full mu agonist	Strong analgesia (4 hours)	Similar to those of methadone but may also cause histamine release	Can be given IM and SC. IV max 0.2 mg/kg. Larger doses may cause significant histamine release. Vomiting is common.
Opioids	fentanyl	Full mu agonist	Strong analgesia (15-20 min)	Similar to methadone	Only IV. Duration of effect is 15-20 min
Opioids	buprenorphine	Partial mu agonist	Weaker analgesia (6-8 hours)	Similar to methadone but bradycardia may be less	
Opioids	butorphanol	Partial mu and kappa agonist	Weak analgesia (1 hour)	Similar to methadone but bradycardia may be less	Weak analgesic. Not suitable for surgeries.
Injectable anesthetics	propofol	GABA agonist	Induction and maintenance of general anesthesia	Vasodilation and hypotension	Most common agent for anesthetic induction. May cause hemoglobin toxicity in cats. Has been associated with wound infection.
Injectable anesthetics	alfaxalone	GABA agonist	Induction and maintenance of general anesthesia	Similar to propofol	A good alternative of propofol. Can be given IM or IV. Not toxic to Hb and doesn't cause wound infection.
Injectable anesthetics	etomidate	GABA agonist	Induction of general anesthesia (maintenance is contraindicated)	Minimal at low clinical doses	Excellent choice for hemodynamically unstable patients.
Injectable anesthetics	ketamine	NMDA antagonist	Induction and maintenance of general anesthesia. Can also be given as part of IM premedication.	Direct effect is negative inotrop, indirect effect is via catecholamine release	Most common induction agent for horses
Inhalational anesthetics	isoflurane, sevoflurane	GABA agonist	Maintenance (sometimes induction) of general anesthesia	Vasodilation and hypotension	Most common agents for anesthetic maintenance