



Common Anesthetics: Effects on Pulse Oximetry

Advantages / Disadvantages of Anesthetic Premedications in Cats and Dogs¹

Drug	Advantages	Disadvantages	Pulse Oximetry
Acepromazine	Potent tranquilizer.	Hypotension platelet inhibition; seizures in susceptible animals; animal may be unresponsive to sound/movement if used alone.	3, 5
Butorphanol	Moderate analgesia; mild sedation; minimal cardiovascular effects; less respiratory depression than oxymorphone.	Bradycardia (atropine-responsive); dysphoria; respiratory depression; expensive; ±efficacy for severe pain.	3, 5, 6
Diazepam	Decreases induction dose; muscle relaxation; ±mild sedation; minimal cardiovascular effects; treatment of seizures.	Poor tranquilizer; excitement or disorientation; rapid bolus may lead to hypotension.	3, 4, 5
Ketamine	Dissociative anesthetic agent; good somatic analgesia; stimulates cardiovascular system.	±Cardiovascular depression; ±excessive cardiovascular stimulation; ±respiratory depression; increases intraocular and intracranial pressure; muscle rigidity; no visceral analgesia.	1, 3, 4, 6, 7
Morphine	Excellent analgesia; mild sedation; minimal cardiovascular effects; mild respiratory depression; reversible; less expensive than oxymorphone.	Bradycardia (anticholinergic-responsive); dysphoria; respiratory depression; histamine release most often seen when given IV; ±hypotension; expensive; vomiting commonly seen.	2, 3, 5, 6
Oxymorphone	Excellent analgesia; mild sedation; minimal cardiovascular effects; mild respiratory depression; reversible.	Bradycardia (anticholinergic-responsive); dysphoria; expensive; significant respiratory depression at higher doses.	2, 3, 6
Tiletamine-zolazepam	Muscle relaxant/immobilize; some somatic analgesia; stimulates cardiovascular system.	Long difficult recoveries; ±cardiovascular depression; ±excessive cardiovascular stimulation; ±respiratory depression; increases cerebral blood flow; increases intraocular pressure; movement possible with stimulation.	1, 2, 3, 5, 6, 7

Effects to Pulse Oximeter

- Increase in pulse rate reading.
- Decrease in pulse rate reading.
- Decrease in blood pressure. Low perfusion: indicator may change green to yellow.
- Immediate increase in pulse rate: sedation may be adequate.
- Motion artifact: indicator may change green to yellow.
- Decrease in oxygen saturation (SpO₂) reading.
- Increase in blood pressure.



VETERINARY USE

Some Distinguishing Attributes of Anesthetic Induction Drugs in Cats and Dogs¹

Drug	Distinguishing Attributes	Pulse Oximetry
Etomidate	Rapid, smooth induction; rapid recovery; least cardiovascular depression of induction drugs; not arrhythmogenic (occasional mild bradycardia); transient hypoventilation; adrenocortical; vomiting and pain on injection; muscle fasciculations; expensive.	1, 2, 5, 6
Ketamine	Must be combined with tranquilizer (dog); \pm increased heart rate and blood pressure; mild respiratory depression; avoid in hypertrophic cardiomyopathy or outflow; tract obstructions; increase intracranial and intraocular pressure.	1, 3, 4, 6, 7
Propofol	Rapid, smooth induction; very rapid recovery; little "hangover" effect; \pm hypotension, administer slowly, especially in compromised animals; respiratory depression; \pm apnea; contains no preservatives – open ampule supports bacterial and fungal growth; expensive.	3, 6
Thiopental Sodium	Rapid, smooth induction; \pm hypotension; \pm arrhythmias; respiratory depression, \pm apnea.	3, 6

Some Distinguishing Attributes of Inhalation Anesthetics in Cats and Dogs¹

Drug	Distinguishing Attributes	Pulse Oximetry
Halothane	Faster induction and recovery than methoxyflurane; dose-dependent cardiovascular depression; increases susceptibility to arrhythmias; dose-dependent respiratory depression; about 25% metabolized by the liver.	3, 6
Isoflurane	Faster induction and recovery than halothane; cardiovascular depression less than halothane or methoxyflurane; arrhythmias less common than with halothane; dose-dependent respiratory depression; less than 1% metabolized by liver; can induce acute renal failure if given with other nephrotoxic drugs.	3, 6
Methoxyflurane	Slow induction and recovery; some residual analgesia during slow recovery; dose-dependent cardiovascular depression; less arrhythmias arrhythmogenic than halothane; dose-dependent respiratory depression (greater than with halothane); up to 50% metabolized by liver; can induce acute renal failure if given with other nephrotoxic drugs.	3, 6

α 2-adrenergic Medication

Drug	Distinguishing Attributes	Pulse Oximetry
Medetomidine (Domitor)	Bradycardia ^A ; peripheral vasoconstriction ^A ; occasional vomiting; moderate hypothermia; diuresis 90 – 120 minutes after treatment; increases systemic blood pressure with corresponding decrease in heart rate; reduction in cardiac output; depressed respiration; rapid sedation; hypertension; quickly reversible; cyanosis, apnea; increase in blood glucose.	1, 2, 3, 5, 6, 7
Xylazine	Potent tranquilizer, analgesia, reversible (yohimbine, other α -2 antagonists). Disadvantages include decreased cardiac output, hypotension, bradycardia, first- and second-degree A-V block, ventricular arrhythmias, respiratory depression, animal may move abruptly with stimulation.	3, 6

^AExpected physiological response, reversed with Antisedan.

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