Better Living through Chemistry for Success in Outpatient Sedation

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Ensuring optimal patient care often necessitates the use of sedation, despite its inherent challenges. Sedatives are commonly administered to alleviate fear, anxiety, and stress, as well as to facilitate procedures, a practice pivotal for both patient and staff safety. The selection of appropriate drugs and dosages varies based on the clinician's judgment and the patient's needs, encompassing factors such as the desired level of sedation, expected duration, and pain intensity. Appropriate preparation, including the utilization of pre-visit pharmaceuticals when applicable, alongside strategies for preventing and managing adverse effects, contributes to achieving successful outcomes. Effective communication with pet owners, particularly regarding potential risks and post-sedation effects, remains integral to positive sedation experiences for all involved. This presentation will explore considerations before, during, and after sedation, offering practical pearls to overcome the pitfalls in sedating veterinary patients.

I. Before sedation
   a. Assess patient's level of fear, anxiety, and stress
   b. Consider administering pre-visit pharmaceuticals the evening before and repeat the morning of the appointment

Selection of pre-visit pharmaceuticals: The following table is modified from Fear Free Pre-Visit Pharmaceuticals (Landsberg, G & Martin K, 2022)

DRUG	CLASS & ACTION	DOSAGE*	SIDE EFFECTS	WARNINGS	NOTES
Acepromazine	Phenothiazine sedative/ tranquilizer	Depends on other drugs in combination; single agent use: Dog/Cat: .05-2.0 mg/kg PO	increased aggression; increased noise responsiveness	possible increased aggression, long duration of sedation, not reversible, unpredictable results	not recommended as a single drug agent; use in combination with anxiolytic drugs for adjunctive sedation
Alprazolam	GABA agonist: anxiolytic – panicolytic effects in humans	Dog: 0.02-0.1 mg/kg/dose PO; Cat: 0.125-0.25 mg/CAT (NOT /kg) PO; administer 30-60 min before need	ataxia; polyphagia; paradoxical excitation;	possible behavioral disinhibition	metabolized by hydroxylation – may reduce potential for liver toxicity in cats; test dose in advance of need
Clonidine	alpha-2 agonist – reduce noradrenaline effects	Dog: 0.01-0.05 mg/kg/dose PO; EFFICACY NOT ESTABLISHED IN CATS; administer 1 ½ hours before need **Use caution combining multiple alpha-2 agonists, as this* may exaggerate sedation and recovery	sedation; ataxia; constipation	DOSE/EFFICACY NOT ESTABLISHED IN CATS; caution in patients with cardiovascular disease, seizure predisposition	can be used in combination with other anxiolytic drugs

Detomidine gel	Alpha-2 agonist – reduce noradrenaline effects	Dog: 0.35-1 mg/m^2 transmucosal; administer 15-30 min before need **Use caution combining multiple alpha-2 agonists, as this may exaggerate sedation and recovery*	Sedation; ataxia; possible emesis; bradycardia; constipation	DOSE/EFFICACY NOT ESTABLISHED IN CATS; caution in patients with cardiovascular disease, seizure predisposition	Reversible with atipamezole
Diazepam	Anxiolytic	Dog: 0.5-2.0 mg/kg/dose PO; DO NOT GIVE TO CATS PO; administer 30-60 min before need	ataxia; paradoxical excitation; may be increased activity at higher doses	possible behavioral disinhibition; avoid in cats due to potential heptatoxicity	metabolized rapidly; variable response among individuals
Gabapentin	neuropathic pain/ analgesia; calming/ sedation at higher doses; decreased anxiety	Dog: 10.0-40.0 mg/kg/dose PO; Cat: 10.0-20.0 mg/kg/dose or 50.0-100.0 mg/CAT (NOT /kg); administer 1-2 hours before need	may intensify sedation from other drugs		combines well with other drugs; for maximum sedation give a loading dose the night before
Lorazepam	Anxiolytic	Dog: 0.02-0.1 mg/kg/dose PO (up to 0.5 mg/kg/dose); Cat: 0.25-0.5 mg/CAT (NOT/kg) PO; administer 4560 min before need	ataxia; paradoxical excitation;	possible behavioral disinhibition	no active intermediate metabolite - safer for hepatic & geriatric patients
Trazodone	Anxiolytic, sedation	Dog: 3.0-10.0 mg/kg/dose PO (max dose of 300 mg); Cat: 50.0 mg/CAT (NOT /kg); administer 1-2 hours before need	sleepiness; paradoxical excitation; variable mild GI effects; may cause 3rd eyelid protrusion in cats	use caution when combining with other drugs that may increase serotonin (SSRIs, TCAs, tramadol, tryptophan)	4+ hours duration; compatible with injectable sedation & gas anesthesia; best given on an empty stomach; for dogs consider loading dose the night before
*Individual variability; Pre-visit test dosing recommended to verify time to onset, dose, effect, duration of effect and any possible adverse effects to insure that drugs can be given sufficiently in advance of visit to be achieve peak effect.					

c. Prepare the client: Discuss effects of sedation and procedure and acquire informed consent and CPR code

d. Prepare the veterinary team: Gather all supplies necessary for procedure and sedation (ie., monitoring equipment, heat support, oxygen, eye lubricant, emergency drug calculations)

II. During sedation

a. Selecting appropriate in-hospital sedation

The following table is from: AAHA anesthesia and monitoring guidelines for dogs and cats (Grubb T, et al., 2020):

Desired Effect	Drug Options	Healthy		Examples	Compromised/Sick	
Low FAS	Gabapentin			50–150 mg/cat PO, 20–40 mg/kg PO (dog) 2–3 hr before visit		
	Trazodone			3–7.5 mg/kg PO (dog)		
	Alpha-2 agonist			Dexmedetomidine gel OTM. Use label dose for patient size**		
Light sedation	Opioid			Butorphanol 0.2–0.4 mg/kg IV/IM		
	Benzodiazepine			Midazolam 0.2 mg/kg, IV/IM		
Moderate sedation	Opioid			Butorphanol 0.4 mg/kg IM or Buprenorphine 0.02 mg/kg OTM (cat)		
	Tranquilizer			Acepromazine 0.01–0.03 mg/kg IM (dog)*, 0.025–0.1 mg/kg IM (cat)†		
	Benzodiazepine			Midazolam 0.2 mg/kg, IV/IM		
	Alpha-2 agonist			Dexmedetomidine 3–7 µg/kg IM (dog) or 3-10 µg/kg IM (cat) or 0.04 mg/kg OTM (cats)		
Heavy sedation	Opioid			Butorphanol 0.2–0.4 mg/kg IM		
	Benzodiazepine			Midazolam 0.2 mg/kg, IV/IM		
	Alpha-2 agonist			Dexmedetomidine 7–15 µg/kg IM (dog) or 10–20 µg/kg IM (cat)		
	Neurosteroid			Alfaxalone 1–2 mg/kg IM§		
	Dissociative			Ketamine 1–2 mg/kg IM		

b. Select the appropriate method of administering sedation according to the fear, anxiety, and stress level of the patient and technical skill level of the staff

c. Monitor and document: heart rate, respiratory rate, temperature, mucous membrane color, capillary refill time, SpO2, blood pressure

d. Anticipate adverse events: vomiting, diarrhea, muscle tremors, seizures, hypothermia, urinary incontinence, apnea, bradycardia, asystole

   i. Consider gastrointestinal preventive measures including maropitant, probiotics, gastrointestinal diet

e. Consider the use of reversals for prolonged sedation or adverse effects

III. After sedation

a. Ensure appropriate recovery parameters prior to discharge (normal vitals, alert, responsive, ambulatory, etc.)

b. Communicate anticipated effects of sedation and procedure that may occur after discharge (prolonged sedation, dysphoria, decreased appetite, changes in defecation frequency and consistency) and guidance for when to seek veterinary attention

   i. Follow-up with the client the day after discharge to document any side effects

   ii. Modify for future sedation protocols based on outcomes

References

Grubb, T., Sager, J., Gaynor, J. S., Montgomery, E., Parker, J. A., Shafford, H., & Tearney, C. (2020). 2020 AAHA anesthesia and monitoring guidelines for dogs and cats. *Journal of the American Animal Hospital Association*, *56*(2), 59-82.

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