

Medetomidine and Dexmedetomidine User Guide

Nancy Brock Veterinary Services

MEDETOMIDINE (Domitor) *

*** The information contained herein also applies to dexmedetomidine (Dexdomitor). When referring to dose recommendations, use 1/2 of the mg/kg medetomidine dose if you are administering dexmedetomidine. This will amount to the same volume since the Dexdomitor solution is 1/2 the strength of Domitor.**

Comparing and contrasting medetomidine and acepromazine

- Better muscle relaxation from medetomidine.
- Profound analgesia.
- More effective in fractious patients.
- Induces arrhythmias (at high doses that are not recommended here) whereas acepromazine is anti-arrhythmic.
- Induces emesis (at high doses that are not recommended here) whereas acepromazine is anti-emetic.
- Induce pronounced vasoconstriction whereas acepromazine is a vasodilator.
- Decreases contractility of the heart muscle whereas acepromazine has no effect on contractility.
- Acepromazine provides some protection against histamine release.
- Canine premedication: 2 to 20 ug/kg IM in combination with an opioid.
- Feline premedication: 2 to 10 ug/kg IM in combination with an opioid.

Tips on introducing medetomidine to your practice

- Begin by administering medetomidine to patients prior to euthanasia
- Proceed to using medetomidine/opioid for chemical restraint for non-invasive procedures.
- Administer to aggressive or fearful patients to allow a stress free and safe examination.
- If performing minor surgery such as biopsy, cutaneous mass removal or laceration repair, be sure to provide local anesthesia.
- Advise your hospital staff to be alert around patients sedated with medetomidine - even profoundly sedated patients under the influence of medetomidine can be roused by a painful stimulus. Co-administration of an opioid reduces the likelihood of arousal but does not prevent it completely.
- When you are comfortable with medetomidine for chemical restraint you can then consider using it as part of anesthetic premedication.

General guidelines for medetomidine sedation in dogs and cats:

- Do not use medetomidine alone, but rather combine it with an opioid preferably butorphanol. If combining it with hydromorphone, morphine or other pure mu opioid agonist. Beware of silent gastric reflux and aspiration. This can occur in fasted and unfasted dogs and for this reason, I DO NOT recommend this practice unless

induction of general anesthesia and intubation are planned after the onset of chemical restraint.

- Administer only to relatively healthy patients.
- Monitor mucous membrane colour, CRT, pulse rate and quality during sedation.
- If using an anticholinergic, which I do not recommend, give both drugs at the same time.
- Expect dose dependent bradycardia and HYPERTENSION.
- Do not try to treat or prevent bradycardia with an anticholinergic agent, the bradycardia is not harmful.
- Administer a partial dose of IM atipamazole if needed - reserve this step for patients with poor oral mucous membrane colour, skipped heartbeats, a systolic blood pressure above 180 mm Hg or a systolic blood pressure below 90 mm Hg.
- Expect canine diuresis /urination within 30 minutes of medetomidine administration.
- Dogs that have not urinated should be taken for walks outside as soon as they are ambulatory so that they void outside and not in their kennels or owners' vehicles
- If administering as anesthetic premedication, reduce the dose of induction and maintenance drugs by as much as 90%. Assess depth of anesthesia very carefully. This translates into doses of thiopental, propofol and ketamine as low as 1 to 2 mg/kg and vaporizer dial settings often below 0.5 %. **BEWARE OF VAPORIZER DIAL WORSHIP!**

Reversing medetomidine's effects

- Always reverse the effects of medetomidine when used at the higher doses for stand-alone chemical restraint.
- Reversal of medetomidine premedication after surgery is optional and usually unnecessary.
- Use antisedan (atipamazole) IM only, unless in crisis.
- Allow 20 minutes for antisedan reversal to take effect.
- Provide appropriate alternative analgesia as needed.
- Remember that the effects of the opioids will not be reversed, some sedation may remain.
- Follow up with care calls the next day to inquire about residual sedation or other abnormalities.

Hints for using medetomidine as anesthesia premedication in both dogs and cats:

- Tailor the medetomidine dose to the patient's temperament - if it is anxious or fractious use a high dose. If quiet and calm use a low dose.
- Always use in combination with an opioid.
- Administer IV induction drugs in 10 % increments slowly allowing more than the usual amount of time for the slowed circulation to deliver the drugs to the brain.
- Expect as much as a 90 % reduction in the need for inhalant anesthesia. Don't be afraid to turn the vaporizer off.

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- The higher the dose of medetomidine the greater the reduction in induction and maintenance drug doses.
- Do not administer an anticholinergic drug to raise the heart rate unless it is associated with hypotension and at least 45 minutes has passed since the medetomidine administration.

Medetomidine based protocols for CANINE stand alone chemical restraint or premedication:

- Intramuscular: medetomidine 20 ug/kg + butorphanol 0.2 mg/kg combined IM. Wait 30 minutes then if deeper sedation is needed, supplement with IV medetomidine 1 to 2ug/kg.
- Intravenous: medetomidine 5 ug/kg + butorphanol 0.05 ug/kg mixed together and titrated to effect over 5 minutes through an IV catheter. Allow at least 10 minutes for full effects of the IV drugs to manifest.
- Do not stimulate with handling, noise or bright lights during the waiting periods.
- Reverse with equivalent volume of atipamazole (Antisedan) IM.
- Allow at least 30 minutes for reversal to take place although it usually occurs within 10 minutes. Patients occasionally require some physical stimulation (massage) in order to speed up the reversal process.
- Butorphanol effects will not be reversed but will wear off within 1 to 2 hours.
- If dogs have pale mucous membranes and slow pulses stimulate them by handling.
- If intubation is possible then intubate. However we do not recommend that you aim to be able to intubate after medetomidine sedation. The goal of the dose recommendations here is to sedate a patient only, NOT induce general anaesthesia.
- If physical stimulation does not return the mucous membrane colour to more normal or if heart rate does not increase to a level you are comfortable with, then partially reverse the medetomidine effects with 10% of total IM atipamazole dose by IV administration and wait 5 minutes.
- If you feel that the dog is in crisis, the full atipamazole dose can be given IV slowly by titration over 2 minutes.
- Do not treat bradycardia with an anticholinergic drug unless it is associated with hypotension and at least 45 minutes has passed since medetomidine administration.

Hints for successful canine IM medetomidine sedation:

- Allow at least 20 and preferably 30 minutes in a quiet and safe area before handling.
- Very nervous dogs benefit from being somewhere they feel safe such as with their owners or even in their vehicles away from activity.
- The more anxious and apprehensive the patient, the longer the onset of acceptable chemical restraint.
- Deep intra-muscular administration is necessary.

Hints for safe canine IV medetomidine sedation:

- Onset is faster and more predictable than IM administration.

- Titrate to effect over 5 minutes - medetomidine sedation is still relatively slow in onset even with IV administration. Don't rush - give the drug time to have the desired effect.
- Dilute medetomidine and opioid in a conveniently large volume of LRS or saline (10 to 20 mls). Administer in incremental doses to desired effect.
- If patients are difficult to handle or restrain safely, administer medetomidine/opioid IM using the doses above and supplement with additional medetomidine 1 to 2 ug/kg IV if needed via an IV catheter.

Medetomidine based protocols for stand-alone chemical restraint or premedication of young healthy cats:

- Medetomidine 2 to 10 ug/kg + butorphanol 0.1 mg/kg combined IM provides heavy sedation that can be followed by IV anesthesia induction, intubation and inhalant anesthesia.
- Reverse with equivalent volume of atipamazole (Antisedan) 1/2 dose IM and 1/2 dose SQ.
- Per 4.5 kg body weight: medetomidine 0.1 cc + butorphanol 0.1 cc + ketamine 0.1cc. This provides surgical anesthesia for 20 to 40 minutes and conditions suitable for intubation. Inhalant supplementation not usually necessary. Intubation and oxygen delivery HIGHLY RECOMMENDED.
- DO NOT LEAVE UNATTENDED after drug administration - chemical restraint occurs very quickly and a cat's ability to breathe could become compromised by awkward positioning as chemical restraint takes effect.
- If cats have pale mucous membranes and unacceptably slow pulses (less than 80 bpm) or hypotension - stimulate them by handling and if this does not resolve the problem administer 10 to 20 % of the calculated atipamazole dose IM.
- If you feel that the cat is in crisis, the full atipamazole dose can be given IV slowly by titration over 2 minutes.
- Do not treat bradycardia with an anticholinergic drug unless it is associated with hypotension and at least 45 minutes has passed since medetomidine administration.
- Administration of an anticholinergic along with medetomidine is acceptable if general anesthesia with an inhalant agent is scheduled. However this author (Nancy Brock) does not use anticholinergic agents along with medetomidine.