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# Alfaxalone Compatibility with Commonly Admixed Drugs & Fluids

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## Background

Alfaxalone is an intravenous anesthetic agent used in canine and feline anesthesia and sedation. Off label, it can be used as an intramuscular anesthetic premedication in combination with other medications. Additionally, it is used in combination with opioids and alpha-2 adrenergic receptor agonists as total intravenous anesthesia (TIVA). While therapeutic compatibilities of alfaxalone with other agents have been studied, physical compatibilities have not. Anesthesia clinicians at Texas A&M University Veterinary Medical Teaching Hospital (TAMU VMTH) have noticed a cloudiness appear upon admixture of certain alfaxalone admixtures.

## Objectives

The objective of this study is to evaluate the physical compatibility of alfaxalone with select drugs and fluids which are commonly admixed as part of an anesthetic protocol at TAMU VMTH.

## Methods

- 5 different alfaxalone admixtures were made, each containing different drug and fluid combinations used at TAMU VMTH
- Each admixture was created in triplicate by a single investigator (VH).
- Admixtures were assessed two at a time, at random, by two blinded observers (AS & ML). Observations were documented and discrepancies between observers were recorded.
- Admixtures were assessed for color, consistency, presence of particles, presence of Tyndall effect, pH, and precipitation at any point
- Admixtures were assessed at 0, 15, 30, 45, and 60 minutes

## References

- Plumb's TM. <https://app.plumbs.com/>
- Greenhill K, Hornsby E, Gorman G. Investigations of Physical Compatibilities of Commonly Used Intravenous Medications with and without Parenteral Nutrition in Pediatric Cardiovascular Intensive Care Unit Patients. *Pharmaceuticals (Basel)*. 2019 May 4;12(2):67. doi: 10.3390/ph12020067.
- Islam Ghazi, Pharm.D., BCPS, BCACP and others, Physical compatibility of fentanyl phosphate with selected i.v. drugs during simulated Y-site administration, *American Journal of Health-System Pharmacy*, Volume 73, Issue 21, 1 November 2016, Pages 1769-1776, <https://doi.org/10.2146/ajhp150721>
- Marguerite L. Monogue, Pharm.D. and others, Physical compatibility of fosfomicin for injection with select i.v. drugs during simulated Y-site administration, *American Journal of Health-System Pharmacy*, Volume 75, Issue 1, 1 January 2018, Pages e36-e44, <https://doi.org/10.2146/ajhp170123>

## Results

Formulation	Color	Consistency	Presence of Particles	Presence of Tyndall Effect at Any Time	pH	Precipitation in Line
<b>Alfaxalone/ Dexmedetomidine/ Methadone IM (IMAP 1)</b>	Colorless (3/3)	Clear (3/3) *adherence to vial wall noted in S2 by O1	S1: no particles at any T S2: particles at T0-45 by O1 & T0 & T45 by O2 S3: particles at T0 by O1 & T15 by O2	No (3/3)	S1: 7 S2: 7 S3: 6-7	N/A
<b>Alfaxalone/ Medetomidine- Vatinoxan/ Methadone IM (IMAP 2)</b>	Colorless (3/3)	Clear (3/3) *adherent bubbles noted in S1 by O1&2 *adherence to vial wall noted in S2 by O1	S1: no particles at any T S2: particles at all T by O1; particles at T0 by O2 S3: particles at all time points except T45 by O1	No (3/3)	S1: 5-6 S2: 5-6 S3: 5-6	N/A
<b>Alfaxalone/ Dexmedetomidine/ Fentanyl TIVA in 0.9% NaCl (TIVA 1)</b>	Colorless (3/3)	Clear (3/3) *adherent bubbles noted in S1 by O1&2 (O2 notes disappearance), and S3 by O1 (disappeared over time)	S1: particles at T0-15 O1 & T45 by O2 S2: no particles at any T S3: no particles at any T	No (3/3)	S1: 7 S2: 7 S3: 7	None at any timepoint (3/3)
<b>Alfaxalone/ Dexmedetomidine/ Fentanyl TIVA in LRS (TIVA 2)</b>	Colorless (3/3)	Clear (3/3) *adherence to vial wall noted in S2 by O1 after T45 & O2 at T15	S1: no particles at any T S2: particles at T60 by O1 S3: particles from T30-45 by O1	No (3/3)	S1: 7 S2: 7 S3: 7	None at any timepoint (3/3)
<b>Alfaxalone/ Dexmedetomidine/ Fentanyl TIVA in LRS + Dextrose (TIVA 3)</b>	Colorless (3/3)	Clear (3/3)	S1: no particles at any T S2: no particles at any T S3: no particles at any T	No (3/3)	S1: 6-7 S2: 7 S3: 7	None at any timepoint (3/3)

S1 - sample 1; S2 - sample 2; S3 - sample 3

T - time (in minutes)

O1 - observer 1; O2 - observer 2

## Conclusions and Discussion

### Conclusions:

- Discrepancies between observers suggest redoing assessments for IMAP 2 (O1 appreciated particles at all T for S2, while O2 reported that particles were not present from T15 forward)
- A more thorough assessment using a pH meter and set up that would allow for turbidity readings would yield a more conclusive study
- TIVA using LRS/D2.5 showed no signs of incompatibilities
- In the study looking at TIVA in LRS, O1 reported particles at T60 for S2, bringing into question if precipitation formed over time (Other samples did not find precipitate formation; O2 did not appreciate particles in S 2 at T60)
- When bubbles were noted in sample vials, they did not appear over time, rather they disappeared over time, suggesting air from injection vs gas formation
- IMAP 1, TIVA 1, and TIVA 3 did not show signs of incompatibilities; for IMAP 2 and TIVA 2, further testing should be considered

### Study Limitations:

- Because of the small volumes used in this study, turbidity was inconsistent and did not yield fruitful results
- pH was measured using Litmus paper, not a pH meter
- Preparations were not made using sterile procedure, but were made aseptically
- These drug combinations / concentrations represent what we use at TAMU VMTH