

Theophylline & Aminophylline in Veterinary Patients

Theophylline and aminophylline are used as bronchodilators in the treatment for cough and small-airway obstructive disease in canine and feline patients.^{1,2,3} In the past, veterinarians used commercially available theophylline time-released tablets, such as Theochron™ or generic products. At the end of 2015, manufacturers discontinued the commercially available tablets and capsules, which left a huge need in the veterinary community. Fortunately, compounders are able to take care of this need because of the availability of theophylline USP anhydrous powder.

Some possible formula options are:

- Theophylline 50 mg/mL Oil Oral Suspension (Vet)
- Theophylline 100 mg Capsules Size #3 (PCCA LoxOral®)
- Theophylline 25 mg Capsules Size #3 (PCCA LoxOral)
- Theophylline 50 mg Capsules Size #3 (PCCA LoxOral)
- Theophylline 15 mg/0.1 mL Topical PCCA Lipoderm® (Vet)

As stated earlier, the commercial products were time-released. However, the formulas listed above are immediate-release preparations and not equivalent to the manufactured products. This is because canine and feline patients generally have faster gastric transit times than those found in humans. In canine patients, there is interbreed variability, with smaller breeds having faster transit times and larger breeds having transit times that are closer to those found in humans.⁴

At the North Carolina State College of Veterinary Medicine, pharmacists are working with clinic veterinarians, combining clinical experience and

pharmacokinetic studies to determine dosing and frequency. In their practice, the veterinarians are using a compounded immediate-release capsule and dosing every 12 hours. Doses are based on weight: cats ~4-5 mg/kg and dogs ~9mg/kg. If a 12-hour dosing frequency does not control signs, then the dosage is given every eight hours. In clinical experience, however, this eight-hour frequency is required very rarely.

There have been some periods in the past when theophylline USP anhydrous powder was temporarily not available. In this instance, aminophylline may be substituted, but a conversion is required when switching from theophylline to aminophylline: theophylline 1 mg is equivalent to aminophylline 1.167 mg.

Aminophylline should be administered as an immediate-release preparation like theophylline. Any dosage change or dosage-form change, theophylline or aminophylline, should be monitored by owner and veterinarian so that adjustments can be made according to clinical response.

Some possible aminophylline formulas are:

- Aminophylline 29.175 mg Capsules Size #3 (PCCA LoxOral) (equivalent to 25 mg theophylline)
- Aminophylline 58.35 mg Capsules Size #3 (PCCA LoxOral) (equivalent to 50 mg theophylline)
- Aminophylline 116.7 mg Capsules Size #3 (PCCA LoxOral) (equivalent to 100 mg theophylline)
- Aminophylline 58.35 mg/mL Oil Oral Suspension (Vet) (equivalent to 50 mg/mL theophylline)

Reference is located on the back of this document.

For questions, please contact your compounding pharmacy.

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References

1. Theophylline. (n.d.). In *Plumb's Veterinary Drugs*. Available from www.plumbsveterinarydrugs.com.
2. Aminophylline. (n.d.). In *Plumb's Veterinary Drugs*. Available from www.plumbsveterinarydrugs.com.
3. Bach, J. E., Kukanich, B., Papich, M. G., & McKiernan, B. C. (2004). Evaluation of the bioavailability and pharmacokinetics of two extended-release theophylline formulations in dogs. *Journal of the American Veterinary Medical Association*, 224(7), 1113-1119.
4. Sutton, S. C. (2004). Companion animal physiology and dosage form performance. *Advanced Drug Delivery Reviews*, 56(10), 1383-1398. <http://dx.doi.org/10.1016/j.addr.2004.02.013>

The formulas and/or statements listed are provided for educational purposes only. They are compounding ideas that have commonly been requested by physicians, and have not been evaluated by the Food and Drug Administration. Formulas and/or material listed are not to be interpreted as a promise, guarantee or claim of therapeutic efficacy or safety. The information contained herein is not intended to replace or substitute for conventional medical care, or encourage its abandonment. Every patient is unique, and formulas should be adjusted to meet their individual needs.