Do's & Don'ts of Compounding & Compounded Medication Administration

Part 2 of a 2-Part Series

Travis Watson, PharmD
Golden Gate Veterinary Compounding Pharmacy
San Rafael, California

The world of compounding is vast and often challenging to navigate, especially for those unfamiliar with it. The following do's and don'ts regarding compounding and administering compounded medications can serve as a guide when choosing appropriate pharmaceutical care for patients.

DO'S

- Evaluate what FDA-approved drugs and dose forms are available, as well as their suitability for certain patients. Conventionally manufactured products are often less expensive and undergo rigorous testing for safety, efficacy, and quality, whereas compounded preparations do not. Although most conventionally manufactured drugs are based on human formulations, they often can be manipulated to fit veterinary patient needs. For example, amlodipine is available as a 2.5-mg tablet, a dose that is too large for cats; however, it can be quartered into a dose that works for most feline patients. The dose form is, therefore, important, as capsules cannot be accurately split and most delayed- and extended-release tablets will develop different pharmacokinetic profiles after being cut or crushed. Although the Institute for Safe Medication Practices' (ismp.org) Do Not Crush list is a good resource for these cases, it is important to note that some drugs that cannot be crushed for humans should be crushed for animals (eg, potassium citrate extended-release tablets).

- Develop a good relationship with the compounding pharmacist by asking questions such as:
  How are compounded formulas developed? As indicated in Part 1 of this 2-part series, US Pharmacopeial compounding standards should be followed in the absence of extended stability results.

Read Part 1, **Compounding for the Small Animal Practitioner**, in the March 2016 issue of *Plumb's Therapeutics Brief* or at **plumbstherapeuticsbrief.com**

What types of ingredients are used, and from where are they obtained? When bulk active pharmaceutical ingredient powders need to be used, it is important to ensure that they are obtained from reputable sources and have been accurately tested for identity and potency.

What is the compounder's experience with veterinary patients? Veterinary medicine is lacking in the curricula of most pharmacy schools; however, this does not necessarily preclude a practicing pharmacist from having veterinary experience. Working with a pharmacist who has experience with both compounding and veterinary medicine can make choosing a compounded preparation easier.

DON'TS

- Do not assume all conventionally manufactured products are a good fit for every patient. Many are unsafe or impractical for use in certain patient populations. For example, because most manufactured gabapentin solutions contain potentially life-threatening concentrations of xylitol, they should be used with extreme caution or avoided altogether in dogs. In addition, doxycycline (Vibramycin; pfizer.com) suspension is inappropriately concentrated for use in animals (10 mg/mL), can cause profuse salivation in cats, and renders proper dosing almost impossible. In both cases, a compounded preparation may be a more appropriate choice to ensure therapeutic adherence.

- Do not assume all drugs can be administered transdermally, and do not prescribe drugs without first researching them. Transdermal gels may seem to offer benefits over oral formulations, especially in difficult patients; however, transdermal gels often produce greater variability in the doses delivered. Therefore, it is important to independently research whether a drug has previously been used in a transdermal form and what in vivo results are to be expected. Some drugs (eg, methimazole) show measurable outcomes (eg, total thyroxine blood levels) that can serve as a guide for efficacy; however, others (eg, antibiotics) do not have a measurable biomarker other than resolution of bacterial infection as confirmed by culture and susceptibility testing and whether variable absorption can create difficulties in maintaining effective blood levels. Additionally, some drugs can do more harm than good when delivered in a transdermal form. Fluoroquinolones undergo photo-oxidation in melanocytes on exposure to ultraviolet stimulation, sensitizing the cells. Transdermal application in the presence of sunlight can result in severe sunburn that is painful for the patient and prevents application of further doses. The Material Safety Data Sheet for any drug being considered for transdermal application should be consulted to ensure the drug is not a skin or contact irritant.

TRAVIS WATSON, PharmD, is a veterinary pharmacist at Golden Gate Veterinary Compounding Pharmacy in San Rafael, California. He earned his PharmD from University of Florida, where he also interned at the College of Veterinary Medicine. He then completed a clinical veterinary pharmacy residency at North Carolina State University. His focus areas include compounding, veterinary dose forms, and medication administration.

Suggested Reading

Davidson G. Veterinary transdermal medication: A to Z. *Int J Pharm Compd*. 2003;7(2):106-113.

Institute for Safe Medication Practices. Oral dosage forms that should not be crushed 2015. ISMP website. http://www.ismp.org/tools/donotcrush.pdf. Accessed December 18, 2015.

USP–NF. General chapters. U.S. Pharmacopeial Convention website. http://www.usp.org/usp-nf. Accessed October 6, 2016.