

## **Abstract of proposed student project**

**Proposal title:** Comparison of tail blood pressure measurements using a low-cost OTC blood pressure device, a validated oscillometric blood pressure device, and a Doppler blood pressure measurement in cats.

### **i. Brief Introduction:**

Obtaining an accurate feline blood pressure measurement in-hospital can be quite challenging. Variables including feline stress response to new surroundings, handling for and during transportation to the clinic, anxiolytic medication impacts on blood pressure (ex. gabapentin), and methodology (Doppler vs oscillometric) used for obtaining these measurements can have significant impacts on the readings obtained making diagnosis and management of feline hypertension challenging. Being able to consistently obtain blood pressure in a calm, home environment may help to alleviate many of these transportation and handling stressors. Previous studies have looked at Doppler with sphygmomanometer systolic blood pressure (SBP) measurements compared to validated oscillometric blood pressure devices in-hospital demonstrating that while Doppler method has a significantly lower coefficient of variation (CoV) compared to multiple validated-oscillometric devices, there was not a significant difference in CoV of different oscillometric devices. Additionally, these studies concluded that consistency in methodology (including brand of oscillometric device) is significant when comparing measurements to make clinical decisions.

### **ii. Problem Description and Significance**

There are multiple obstacles to screening cats for hypertension ranging from owner ability to capture, crate, and present the cat to the clinic to veterinary frustration regarding obtaining a blood pressure in a calm environment. A survey study of first-opinion small animal veterinarians identified that a percentage simply do not offer the diagnostic due to difficulty obtaining accurate results in a busy practice. At home blood pressure measuring is a consideration that may help to alleviate some of these factors (while potentially adding a client education variable to the equation). The cost of validated oscillometric devices, such as the PetMap that UF Vet Hospitals uses, is significant (\$499 for used, basic models to over \$4400). This study will attempt to identify a low-cost (under \$150), easy to use basic oscillometric device, such as Contec08A-Vet, that an owner can apply and monitor at home to provide adjunct measurements between vet visits to determine efficacy of treatment and facilitate better management of feline hypertension in hypertensive patients.

### **iii. Hypothesis and Objectives**

The objective of this study is to determine if a low-cost oscillometric device (Contec08A-Vet) is a reasonable tool to aide in monitoring feline blood pressure. This study hypothesizes that the Contec08A-Vet will have a larger CoV than the Doppler measurements and a similar CoV for SBP measurement and heart rate compared to the validated, more expensive device (PetMap). Additionally, we hypothesize that SBP values will not be significantly different between the low-cost device and Doppler and will be similar or lower than the SBP of the validated device.

### **iv. Study Design and Methods**

Thirty healthy cats will be brought to the UF Primary Care and Dentistry Service (average weekly feline case load 10+ cats per week). Cats who have undergone sedation or anesthesia within 12 hours or with known pre-existing hypertension, hyperthyroidism, or renal disease will be excluded. Additionally, any fractious or uncooperative cats will be excluded. Each cat will have tail blood pressure measurements obtained in accordance with the ACVIM consensus statement using PetMap, Doppler, and a low-cost oscillometric device. The order of measurement will be randomized into one of five groups distributing the order evenly between the total population. There will be a 10-minute rest period between measurement sessions for each cat. These measurements will then be evaluated to determine accuracy compared to the Doppler measurements and CoV.

## **Role of the Veterinary Student:**

The Veterinary Student will aid in creating a randomization protocol to determine order between Doppler, PetMap, and Contec08A-Vet for each participant. Prior to the start of the study, the student will be expected to learn how to appropriately use each oscillometric device and Doppler including cuff size determination and fitting a cuff to the tail base. The student will obtain owner consent and patient vital signs (including body weight, pulse, respiratory rate, and temperature) and perform tail blood pressure measurements in accordance with the ACVIM consensus statement to minimize stress and maximize accuracy. Upon study completion, the student will perform statistics to compare the CoV of the Contec08A-Vet to the Doppler and PetMap regarding SBP, as well as comparing heart rate obtained by the student, the PetMap, and the Contec08A-VET. Finally, they will prepare an abstract and poster for presentation.

## **Citations for methods cited: (first author name et al., DOI)**

- Cerna P, Archontakis PE, Cheuk HO, Gunn-Moore DA. Comparison of Doppler ultrasonic and oscillometric devices (with or without proprietary optimisations) for non-invasive blood pressure measurement in conscious cats. *J Feline Med Surg.* 2021 Feb;23(2):121-130. doi: 10.1177/1098612X20932407. Epub 2020 Jun 25. PMID: 32580610; PMCID: PMC7838334.
- Knies M, Teske E, Kooistra H. Comparison of Doppler ultrasonic sphygmomanometry, oscillometry and high-definition oscillometry for non-invasive blood pressure measurement in conscious cats. *J Feline Med Surg.* 2024 Mar;26(3):1098612X241231471. doi: 10.1177/1098612X241231471. PMID: 38546192; PMCID: PMC10983607.
- Navarro I, Summers S, Rishniw M, Quimby J. Cross-sectional survey of non-invasive indirect blood pressure measurement practices in cats by veterinarians. *J Feline Med Surg.* 2022 Dec;24(12):1195-1202. doi: 10.1177/1098612X211067015. Epub 2022 Feb 3. PMID: 35109690; PMCID: PMC10812353.