Ветеринарная бумага SunTech.
Техническое описание

SunTech Medical: A Controlled Laboratory Comparison of three NIBP Devices on Cats and Dogs

SunTech Medical, Inc. is the leading global provider of non-invasive blood pressure technologies for OEM applications. We have always recognized the need for specialized equipment for different populations and environments. With over twenty five years of focusing solely on blood pressure monitoring technologies, we have been able to study various patient populations and develop equipment specific to the needs of particular patient groups.

While no formal veterinary regulatory requirements or guidelines exist for automated blood pressure monitoring, SunTech Medical, Inc. recognizes the need and obligation to study veterinary populations. We have confirmed that monitors utilizing oscillometric technology intended for human use do not have the sensitivity or range to be reliably accurate in animals. We therefore have focused on the veterinary market and the unique requirements for taking blood pressure readings on this specific patient population.

The veterinary environment is complicated for blood pressure monitoring of the alert patient due to the stress of being in an unfamiliar place surrounded by startling sounds and smells. Since animal types vary, structural, anatomical, physiological and pulse pressure properties further complicate accurate blood pressure monitoring even in sedated/anesthetized patients. SunTech Medical's Advantage™ VET technology has been refined to accommodate these concerns and manage patient motion artifact thereby maximizing utility in both the awake and sedated patient.

Taking all these factors into consideration, we identified specific characteristics which are essential for designing an oscillometric blood pressure system specifically for veterinary applications.

- Since animal types vary, systolic and diastolic pressures can be at high and low extremes. Accuracy is required throughout the expanded range.

- The BP system must be easy to use since training and skill levels of veterinary technicians vary.

- The BP monitor must be able to obtain accurate results on nearly every attempt.

- Taking a reliable reading on the first attempt is crucial since an alert animal may become increasingly agitated.

To evaluate our *Advantage* VET technology, a controlled trial was conducted at the North Carolina State University College of Veterinary Medicine. Blood pressure performance of the *Advantage* VET technology was compared to a Cardell Model 9402 NL monitor and a Critikon Dinamap Plus 9720 on both cats and dogs.

Methods

The reference used was an Ultrasonic Doppler Flow Detector Model 811-B. While Doppler typically does not provide a diastolic value, the technology is universally accepted in veterinary medicine to provide reliable systolic values. Comparisons for diastolic, mean arterial pressure (MAP) and heart rate were not performed. A wide variety of animal subjects were used to better replicate actual conditions in a veterinary clinic.

The data collection protocol included gathering pre and post Doppler measurements where oscillometric NIBP measurements were taken in between the pre and post measurements. The oscillometric NIBP measurements were performed simultaneously on contralateral limbs with the SunTech *Advantage* VET on one and a competitive device on the other. Three simultaneous measurements were done. Both the pre and post Doppler values were calculated by performing three sequential Doppler measurements which were averaged together.

All measurements were performed on both alert and sedated/anesthetized dogs and cats. In general, most dogs were anesthetized and most cats were awake. Animal conditions varied from healthy to critical to better replicate normal conditions in a veterinary clinic. The majority of animals had some sort of health issue ranging from dental prophylaxis to brain surgery. Subject blood pressures ranged across hypotensive, normotensive and hypertensive conditions.

Weights and ages for cats ranged from 1.3 to 10 kg (2.9 to 22.0 lb) and 8 weeks to 17 years. For dogs, weights were 8 to 44 kg (17.6 to 97 lb) and ages 1 to 13 years. A total of 29 cats and 48 dogs were involved in this comparison. The majority of subjects were included in the Cardell comparison (29 cats, 28 dogs). The remaining 20 dogs were included in the Critikon Dinamap comparison.

Results

Tables 1 and 2 demonstrate the comparisons of systolic readings with mean differences and standard deviations versus the Doppler reference. In both cat and dog populations, the SunTech Medical *Advantage* VET accuracy performed significantly better and with considerably less variability than the Cardell and Critikon Dinamap devices when compared to the Doppler reference.

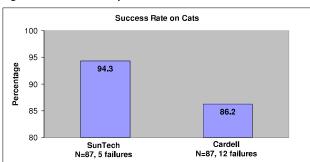**Table 1   SunTech – Cardell Systolic Comparison**

Cats (n = 29)	Mean Δ (mmHg)	Std Dev
SunTech *Advantage* VET	-2.7	28.1
Cardell Monitor	15.5	34.5
Dogs (n = 28)		
SunTech *Advantage* VET	3.0	18.1
Cardell Monitor	4.7	21.4

Table 2   SunTech – Dinamap Systolic Comparison

Dogs (n = 20)	Mean Δ (mmHg)	Std Dev
SunTech *Advantage* VET	1.1	11.7
Dinamap Monitor	5.0	20.8

While accuracy is, without question, an important attribute in NIBP monitoring, reliability and consistency are particularly valuable. Confidence in getting results can facilitate interventions in these traditionally difficult to manage patients. Figures 1 & 2 illustrate the SunTech *Advantage* VET outperformed Cardell in the cat population while all three devices performed well on dogs with a 93.3% or higher success rate.

Figures 1 & 2   Comparison of success rates

Consolidation of this data combined with the experience from ongoing research serves to optimize SunTech's technologies and facilitates continual development. Our performance in the veterinary market illustrates our commitment to our customers and their trust in us for reliable blood pressure monitoring.

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