

An Investigation of Ultra-Wideband Radar Technology to Evaluate Canine Heart Rate and Respiratory Rate

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Publication: Journal of Veterinary Internal Medicine, ACVIM Forum Research Report Program

First Published: June 4, 2016

Ultra-wideband (UWB) technology has been used to characterize complex microwave systems since 1969. In the last ten years, UWB has been applied to communications and imaging, such as human fetal monitoring and detecting stroke volume. UWB technology is now leveraged in a proprietary health monitor known as “Voyce” which is worn around the canine neck. The Voyce Health Monitor™ is designed to collect physiological information by utilizing variations in the dielectric properties of tissues. The monitor has no wires, probes, or chest attachments, making it a non-invasive device. Voyce collects data and remotely transmits it to a computer or mobile device so the information can be reviewed anytime. This investigation evaluated the accuracy of the monitor as compared to gold standard technology (Televet 100 EKG) and manual readings (auscultation and palpation).

The study was designed in two stages. Stage 1 consisted of investigatory testing of the device using 30 canine subjects at the Cornell University Small Animal Teaching Hospital. Stage 2 consisted of testing of 70 canine subjects, in over 1500 test cases, in Chantilly, VA. In both stages, a variety of ages, sizes, and breeds were tested, to provide a representative population. Subjects wore a 4-lead Televet system, monitoring R wave to R wave (R-R) intervals. The subjects also wore the Voyce monitor, which recorded raw UWB data. That data was then converted to heart rate (HR) and respiratory rate (RR) data using proprietary data-processing algorithms.

In both study locations, significant accuracy was found for both the HR and RR. At Cornell and Chantilly, accuracy of HR and RR was found to be >86%. Algorithm refinement and additional data collection is expected to allow improved accuracy throughout 2016. These tests suggest that Voyce can be utilized to obtain objective HR and RR data in a non-clinical setting.

For additional information, please contact: info@voyce.com