

## THE AGREEMENT OF VICORDER® SPHYGMOCOR XCEL ON MEASURES OF CAROTID-FEMORAL PULSE WAVE VELOCITY

Madeline Musacchio<sup>1</sup>, Patricia Pagan Lassalle<sup>1</sup>, Lee Stoner FACSM<sup>1</sup>, Zachary Yukio Kerr PhD<sup>1</sup>, Michelle Meyer PhD<sup>1</sup>, and Malia Blue PhD<sup>1</sup>

<sup>1</sup>The University of North Carolina at Chapel Hill. Chapel Hill, NC, USA

**BACKGROUND:** Measurements of arterial stiffness (AS) have been shown to be useful in the assessment of CVD risk. However, the gold standard for measures of AS include invasive, high-fidelity techniques such as coronary arteriography. These invasive techniques are not practical for clinical use. Thus, several non-invasive techniques have been developed to measure AS via pulse wave velocity (PWV). Determining the agreement between two commonly used devices, the Vicorder and SphygmoCor XCEL, is essential for the implementation PWV as a clinical measure. **METHODS:** We conducted a single-visit agreement study to evaluate the agreement of the SphygmoCor XCEL and VICORDER at a supine and 25° posture. **RESULTS:** 12 participants completed, one outlier was identified (supine SphygmoCor XCEL = 17.10 m/s) and excluded. 75% of the sample was female, aged  $25 \pm 5.37$  years. Vicorder significantly underestimated cfPWV measures compared to the SphygmoCor XCEL at a supine and 25° posture. Vicorder cfPWV measures showed both a statistically and clinically significant mean differences in cfPWV values compared to SphygmoCor XCEL cfPWV at both the supine (MD=1.85, SEE=1.05) and 25° posture (MD=2.69, SEE=1.26). The SphygmoCor XCEL cfPWV measures at both postures seemed to have good agreement ( $r=0.73$ ,  $p=0.01$  and Intra-class Correlation Coefficient (ICC) (0.74)), however mean deviation (-0.87) and Standard Error of Estimate (SEE) (0.80) using Bland-Altman analyses demonstrated greater mean bias. **DISCUSSION:** Greater mean differences were seen at higher cfPWV values for both the SphygmoCor XCEL 25-Vicorder and SphygmoCor XCEL Supine-Vicorder comparisons. VICORDER underestimates cfPWV compared to the SphygmoCor XCEL. SphygmoCor XCEL measures at supine and 25° postures seem to be trending towards agreement, however further research is required for confirmatory analysis. Differing path lengths for both devices, different wave detection algorithms, and a small sample size may be a potential source of bias. **CONCLUSION:** Vicorder and SphygmoCor XCEL values trend towards agreement, however, there is greater underestimation of cfPWV at higher PWV values. Additionally, there is evidence of significant bias, with mean differences being greater between the Vicorder and SphygmoCor XCEL at 25°. Ultimately the Vicorder and SphygmoCor XCEL may not be used interchangeably to assess cfPWV until the effects of path length calculation and device algorithms are assessed further.