

Determining the relationship of heart rate and blood pressure using voluntary cardio-respiratory synchronization (VCRS). Lynne I Mason and Robert P Patterson Physiol. Meas. 2003. 24 847-857

Abstract. Voluntary cardio-respiratory synchronization (VCRS) was used to investigate heart rate and blood pressure changes in the supine position in 21 subjects. VCRS involves a breathing pattern that is synchronized with the cardiac cycle. The signals to inhale and exhale are derived from the ECG. In this study, the subjects inspired for four heart beats and expired for four heart beats for 35 cycles. This technique is designed to have the heart beat occur at exactly the same phase in the respiratory cycle and lends itself to the study of the influence of the respiration cycle on heart rate and blood pressure changes. The heart rate and blood pressure changed simultaneously in the same direction, with the largest significant positive change occurring on the second heart beat during inspiration. The authors discuss the potential of VCRS for research, and clinical applications as a respiration modulator for hypertension therapy or increased heart rate variability.