

## 10. SWACSM Abstract

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### Validity of the K5 Wearable Metabolic System during the YMCA Bench Press Test - A Pilot Study

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#### ABSTRACT

The accelerated advancements in exercise technology have resulted in the development of wearable metabolic units, allowing measurements to occur outside traditional laboratories. The validation of new equipment is essential in various applications. **PURPOSE:** The pilot study's purpose was to validate the metabolic measurements of the COSMED K5 wearable metabolic system against the criterion Parvo Medics TrueOne 2400 during a modified YMCA Bench Press Test. **METHODS:** Nine resistance weight-trained participants (six male, three female, age  $29.3 \pm 8.0$  yrs,  $78.1 \pm 13.8$  kg,  $173.3 \pm 11.5$  cm) performed two identical tests on the same day. Because of equipment warm-up times, the first test was conducted on the Parvo and the second on the K5. Upon being equipped, the participant laid supine on the bench, and five minutes of resting data were obtained. Then, the metronome was set to 60 beats per minute, and the barbell was placed into the starting position. The subject then performed ten repetitions in time with the metronome. Upon completion of ten repetitions, the barbell was racked, and recovery data was recorded for five minutes. Metabolic data included the average pre, during, and post-exercise breath-by-breath volume of oxygen consumed ( $VO_2$ , L/min), the volume of carbon dioxide produced ( $VCO_2$ , L/min), and the ventilatory equivalent (VE, L/min). Data analysis for validity was determined via mean absolute percentage error (MAPE, <5%) and Lin's Concordance Correlation Coefficient (CCC, >0.7). **RESULTS:** CCC values were met for pre-exercise  $VO_2$ ,  $VCO_2$ , VE, and during exercise VE at 0.79, 0.79, 0.84, 0.72, respectively. No MAPE measurements were met. Therefore, no sections were considered valid. **CONCLUSION:** In the context and protocol of this study, the COSMED K5 did not provide comparable metabolic data to the Parvo Medics TrueOne 2400. However, averages from different time intervals may support in favor of this study and future studies.