

**PHYSIOLOGICAL AND METABOLIC RESPONSES TO CONSTANT-LOAD
EXERCISE ON AN INCLINED STEPPER AND TREADMILL**

by

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(ABSTRACT)

This study evaluated oxygen uptake (VO_2), heart rate (HR), and lactate [HLA] responses between the treadmill (TM) and the CardiosquatTM 1650 LETM inclined stepper by StairMasterTM (SM) during constant-load exercise. The slow component of VO_2 (SC) was a central variable assessed during exercise. Twenty-two healthy college-aged (18-30) subjects completed an incremental TM and SM exercise test to establish a workload equivalent to 70% $\text{VO}_{2\text{peak}}$. Following each incremental test, a 20-minute constant-load exercise bout was performed. Incremental and constant-load exercise bouts were separated by at least 48 hours. The order of the tests were randomized. VO_2 , HR, and [HLA] were evaluated at 5, 10, 15, and 20-minutes of exercise. Expired gases were analyzed using a Med Graphics CPX/D metabolic cart. Blood samples were analyzed immediately for lactate concentration with an automated lactate analyzer (Yellow Springs Instrument Model 1500 Sport). A two-way ANOVA with repeated measures was performed on the rate of change between the treadmill and stepper for VO_2 , HR, and [HLA]. No significant differences were found for any of the response variables ($P>0.05$). These results suggest that at the same relative workload, the SM does not elicit a more pronounced SC than the TM. Based on these findings, the SM appears to be an appropriate modality of exercise for various clinical populations.

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