

## SWACSM Abstract

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### Sex Differences in Hemodynamic Response to High Intensity Interval Exercise (HIIE)

LEAH N. COE

Department of Kinesiology; California State University, San Marcos; San Marcos, CA

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*Category: Masters*

*Advisor / Mentor: Astorino, Todd (astorino@csusm.edu)*

#### ABSTRACT

There are sex differences in the cardiorespiratory and hemodynamic response to exercise due to inherent differences in heart size, blood volume, and hemoglobin mass that elicit a higher  $\text{VO}_2\text{max}$  in men versus women. These alterations in cardiac structure and function may mediate changes in  $\text{VO}_2\text{max}$  per the Fick Equation. However, existing data are inconclusive on whether sex differences in training responsiveness exist. **PURPOSE:** The purpose of this study is to investigate potential sex differences in the hemodynamic response to HIIE. If men and women reveal discrepant cardiovascular responses to HIIE, this may partially mediate sex differences in  $\text{VO}_2\text{max}$  response to HIIT reported. **METHODS:** Subjects were habitually active men ( $n=7$ , age  $28 \pm 4$  yr) and women ( $n=7$ , age  $23 \pm 3$  yr). In this randomized, within-subjects crossover design,  $\text{VO}_2\text{max}$  was initially tested followed by three subsequent sessions consisting of different HIIE paradigms. **RESULTS:** Results show a main effect of sex in peak absolute  $\text{VO}_{24x4}$ ,  $\text{VO}_{210x1}$  and  $\text{VO}_{2\text{REHIT}}$  ( $p = 0.022$ ,  $p = 0.009$  and  $p = 0.005$  respectively) and a significant difference in peak  $\text{VO}_2$  ( $\%\text{VO}_2\text{max}$ ) between REHIT and 4x4 ( $p = 0.008$ ) and 10x1 ( $p = 0.001$ ). Results show a main effect of sex in peak absolute  $\text{SV}_{4x4}$  and  $\text{SV}_{\text{REHIT}}$  ( $p = 0.008$  and  $p = 0.006$ ) and a significant difference in peak absolute SV and SV ( $\%\text{SVmax}$ ) between REHIT and 4x4 ( $p = 0.002$  and  $p = 0.002$ ). Results also show a main effect of sex in peak absolute  $\text{CO}_{\text{REHIT}}$  ( $p = 0.042$ ) and a main effect of protocol in peak absolute and relative CO between REHIT and 4x4 ( $p = 0.022$  and  $p = 0.017$ ). Results show a main effect of sex in mean absolute  $\text{VO}_{24x4}$ ,  $\text{VO}_{210x1}$  and  $\text{VO}_{2\text{REHIT}}$  ( $p = 0.013$ ,  $p = 0.014$  and  $p = 0.006$ ) and a significant difference in mean absolute  $\text{VO}_2$  between REHIT and 4x4 ( $p = 0.018$ ) and 10x1 ( $p = 0.019$ ). A similar significant difference between REHIT and 4x4, and 10x1 is found when expressed as  $\%\text{VO}_2\text{max}$  ( $p = 0.016$  and  $p = 0.010$ ). Results show men reveal higher mean  $\text{SV}_{4x4}$ ,  $\text{SV}_{10x1}$  and  $\text{SV}_{\text{REHIT}}$  values than women ( $p = 0.004$ ,  $p = 0.019$ ,  $p = 0.045$ ) and higher  $\text{CO}_{10x1}$  values than women ( $p = 0.046$ ). **CONCLUSION:** Other than the well-known differences in SV and CO between men and women, our data show no sex differences in acute hemodynamic response to three unique regimens of HIIE. This suggests that reported sex differences in the  $\text{VO}_2\text{max}$  adaptation to exercise are not due to a difference in acute cardiac response.