Exploring a Two-Week Sedentary Intervention

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BACKGROUND

- Prolonged sitting has been identified as an interdependent contributor to cardiometabolic disease and all-cause mortality, regardless of regular MVPA [1, 2].
- Few studies have investigated the impact of increased free-living sedentary time on VO_2max and heart rate variability (HRV) in young, healthy adults.
- The ***objective*** of this study was to examine the influence of a short-term increase in sedentary time on VO_2max and HRV and if these effects could be reversed with High-Intensity-Interval Training (HIIT).

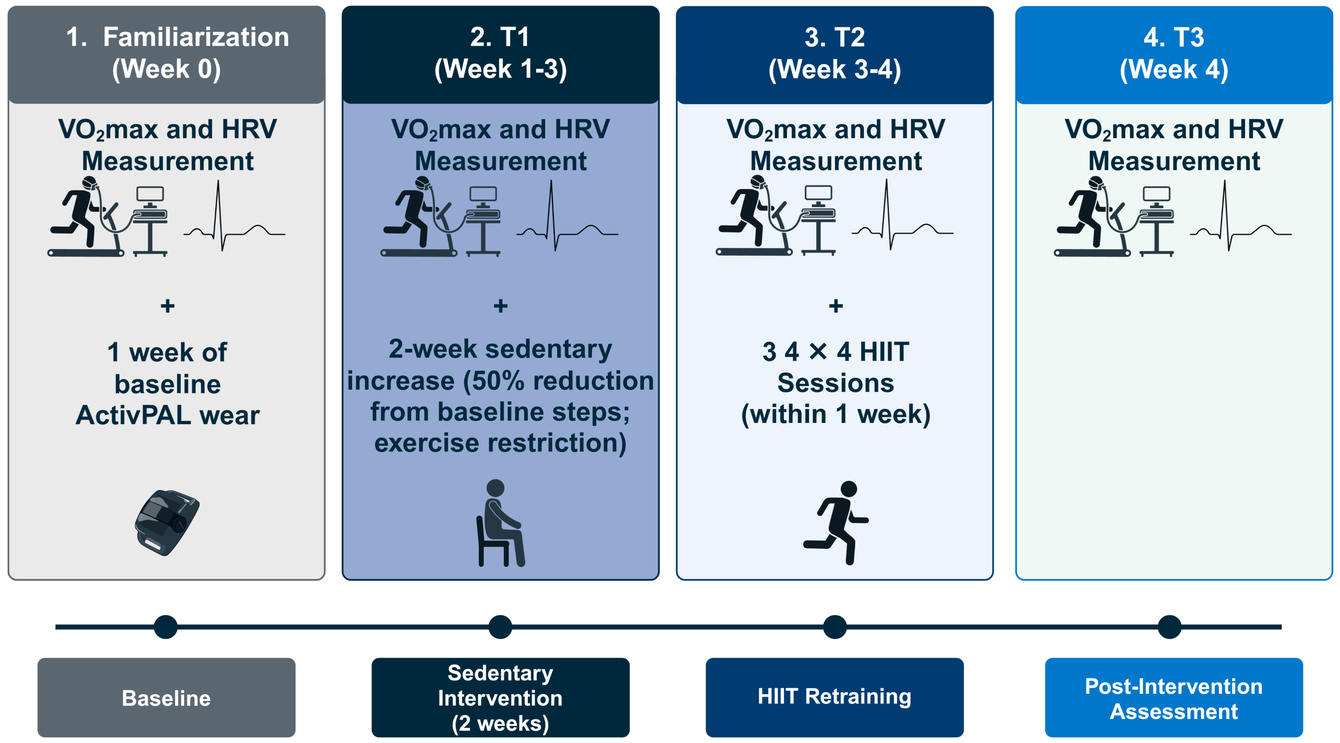
RESEARCH QUESTIONS

1. Does increasing sedentary time for two-weeks decrease VO_2max and change HRV in young, healthy males and females?
2. What does of exercise is needed to reverse these changes?

CONLUSIONS

- Sedentary time can be increased in a short-term free-living experimental study.
- A statistically significant decrease in VO_2max is observed following a 2-week sedentary increase, with values returning toward baseline following three HIIT sessions completed within 1-week.
- Short-term retraining may reverse the physiological consequences of a subacute sedentary time increase

METHODS

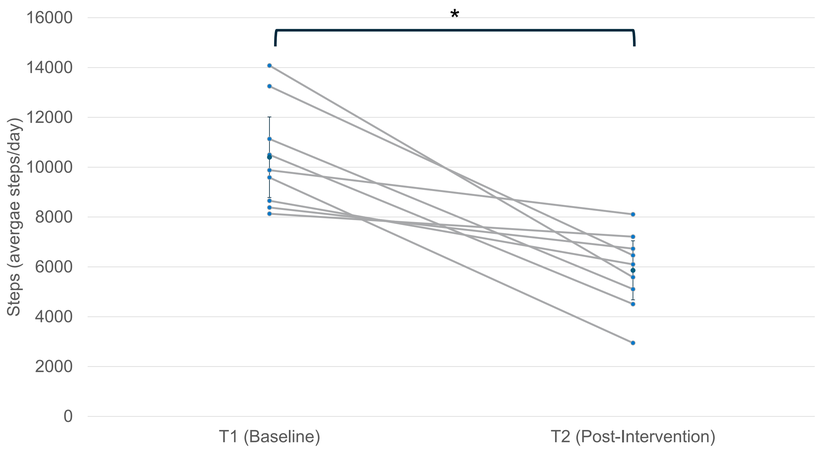


Participant Characteristics

n = 9; 20.56 ± 2.74 (years); 5 female / 4 male; BMI: 23.78 ± 2.98 (kg·m^2)

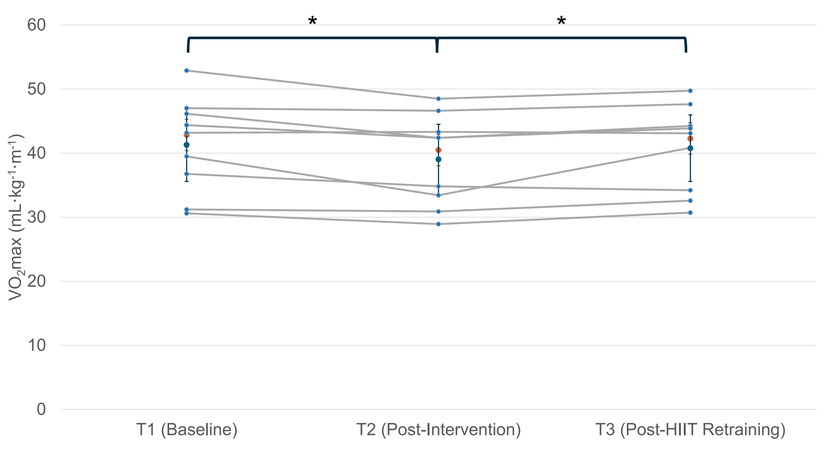
RESULTS

1. Change in Step Count



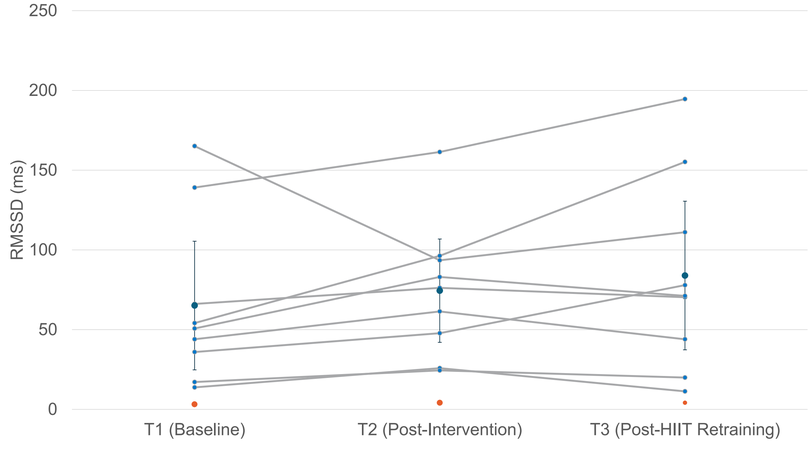
Average steps/day decreased by ~56% from T1 to T2 (β = −4538.0, SE = 869.5, $p < 0.05$)

2. Change in VO_2max



VO_2max decreased by 2.27 mL·kg^{-1}·min^{-1} from T1 to T2 ($p < 0.05$) and returned towards baseline values at T3

3. Change in HRV



No significant difference observed in RMSSD
(additional participants being recruited for sufficient power)

- Individual Participant
- Mean
- Estimated Marginal Mean

1. Franssen WM, Nieste I, Verboven K, Eijnde BO. Sedentary behaviour and cardiometabolic health: Integrating the potential underlying molecular health aspects. Metabolism. 2025:156320.
2. Wilmot EG, Edwardson CL, Achana FA, Davies MJ, Gorely T, Gray LJ, et al. Sedentary time in adults and the association with diabetes, cardiovascular disease and death: systematic review and meta-analysis. Diabetologia. 2012;55(11):2895-905.

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