

The Effect of Isometric Handgrip Exercise Training on Aortic Stiffness Among Adults Not Meeting Exercise Recommendations: A Study Protocol

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INTRODUCTION

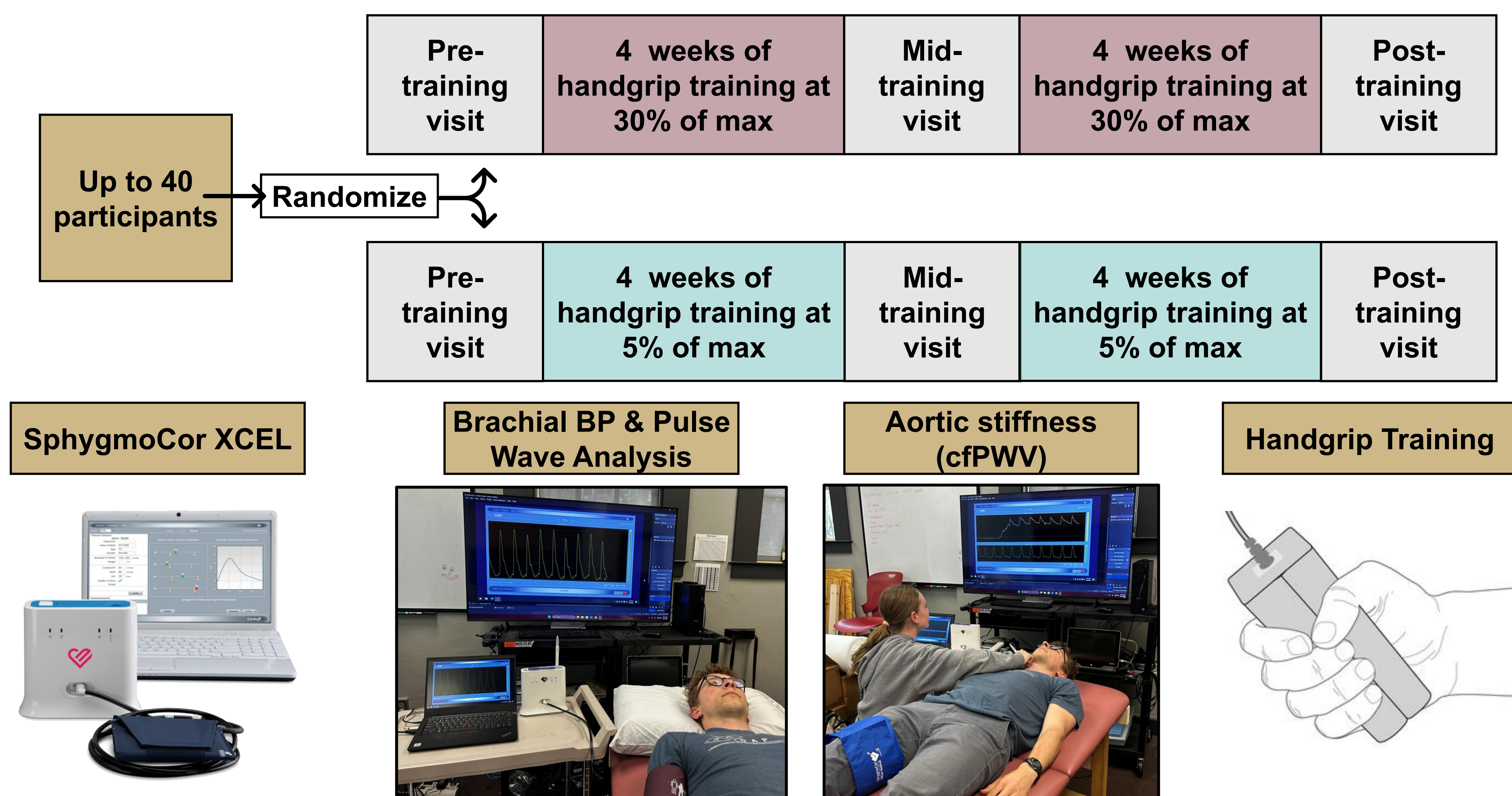
- Cardiovascular disease is the leading cause of death worldwide.¹
- Higher aortic stiffness is an independent predictor of cardiovascular disease risk.²
- Isometric exercise training effectively lowers resting blood pressure (BP), but its impact on aortic stiffness, a major influencer of BP, remains equivocal.³

PURPOSE & HYPOTHESIS

- The purpose of this investigation is to test the hypothesis that isometric handgrip exercise training would lower (i.e., improve) aortic stiffness among adults not meeting exercise recommendations.

METHODS

- This study is a triple-masked, randomized, sham-control trial among participants who self-reported not meeting exercise guidelines (150 min/week of moderate-intensity or 75 min/week of vigorous-intensity aerobic exercise, and ≥ 2 days/week of strength training).
- Participants will train at either 30% (active) or 5% (sham-control) of their maximum voluntary contraction 3 days per week for 8 weeks.
- We will measure brachial BP, central BP (via pulse wave analysis), and aortic stiffness (carotid-to-femoral pulse wave velocity [cfPWV]) at rest during pre-, mid-, and post-training visits with a SphygmoCor XCEL.
- We will measure regular activity for one week via actigraphy (Actigraph GT3X).



RESULTS

Table 1. Participant Characteristics

	Median [IQR]
Sex	3 Female, 1 Male
Age (years)	22 [4]
Body Mass Index (kg/m ²)	24.2 [7.3]
Race	3 Asian, 1 White
Ethnicity	1 Latine/Hispanic, 3 Non-Hispanic/Latine
Moderate activity (minutes/week)	91 [112]

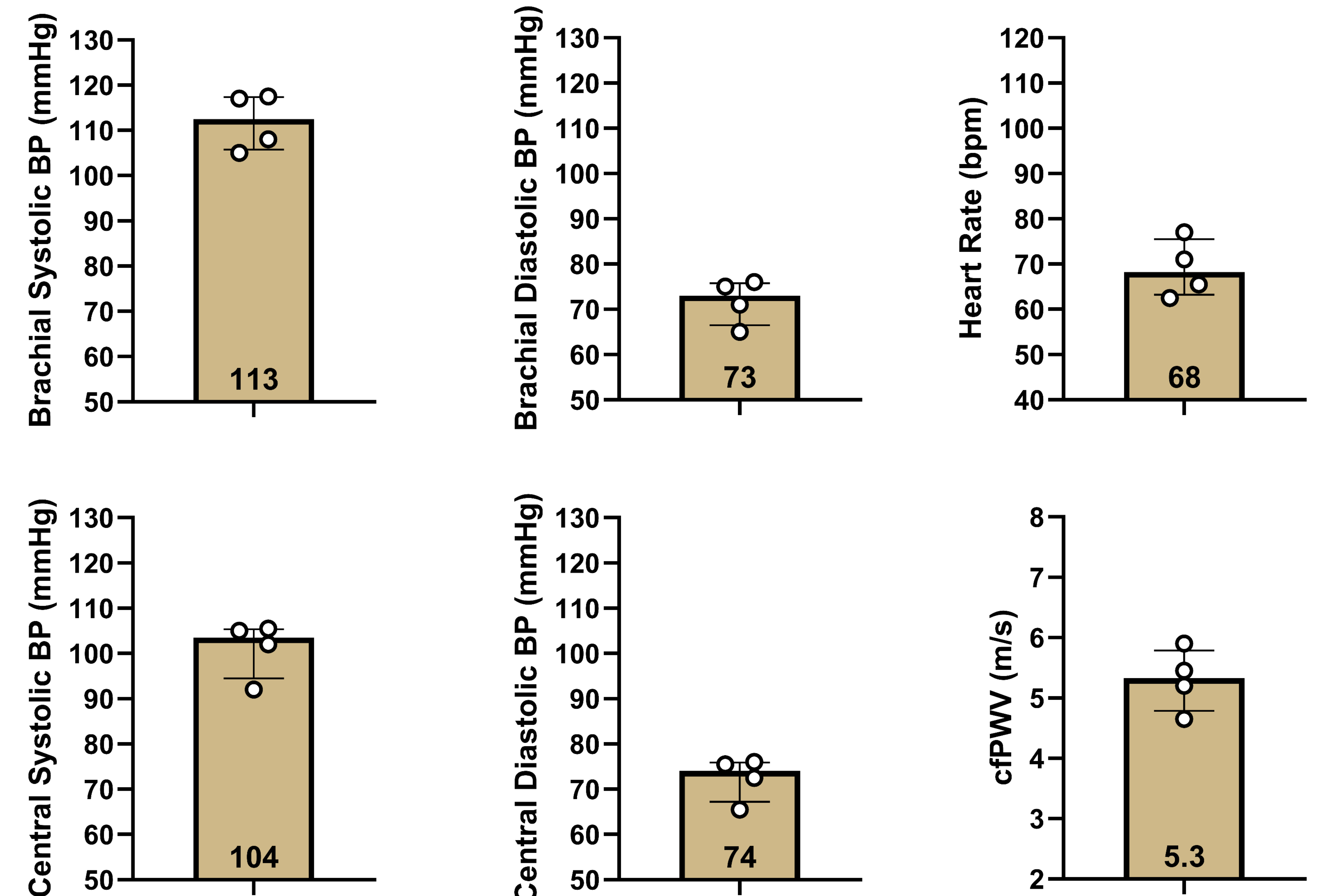


Figure 1. We collected pre-intervention data on four participants so far. The bars represent the median and the error bars represent the interquartile range. BP = blood pressure; mmHg = millimeters of mercury; bpm = beats per minute, cfPWV = carotid-to-femoral pulse wave velocity; m/s= meters per second

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