

# The Acute Effects of Aerobic and Resistance Exercise on Cardiovascular Function and Arterial Stiffness

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## Purpose

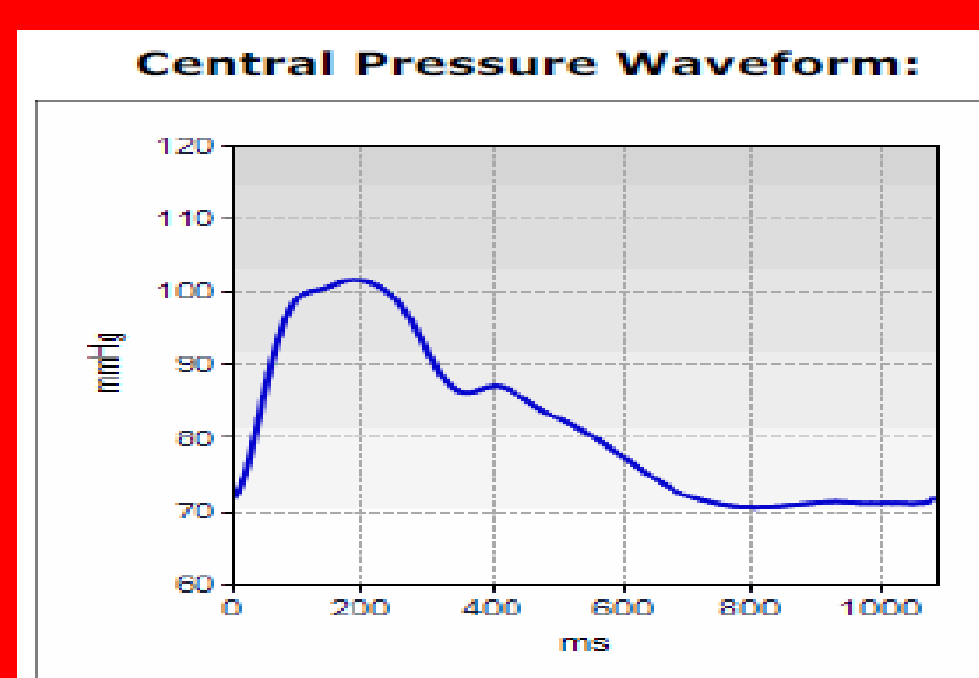
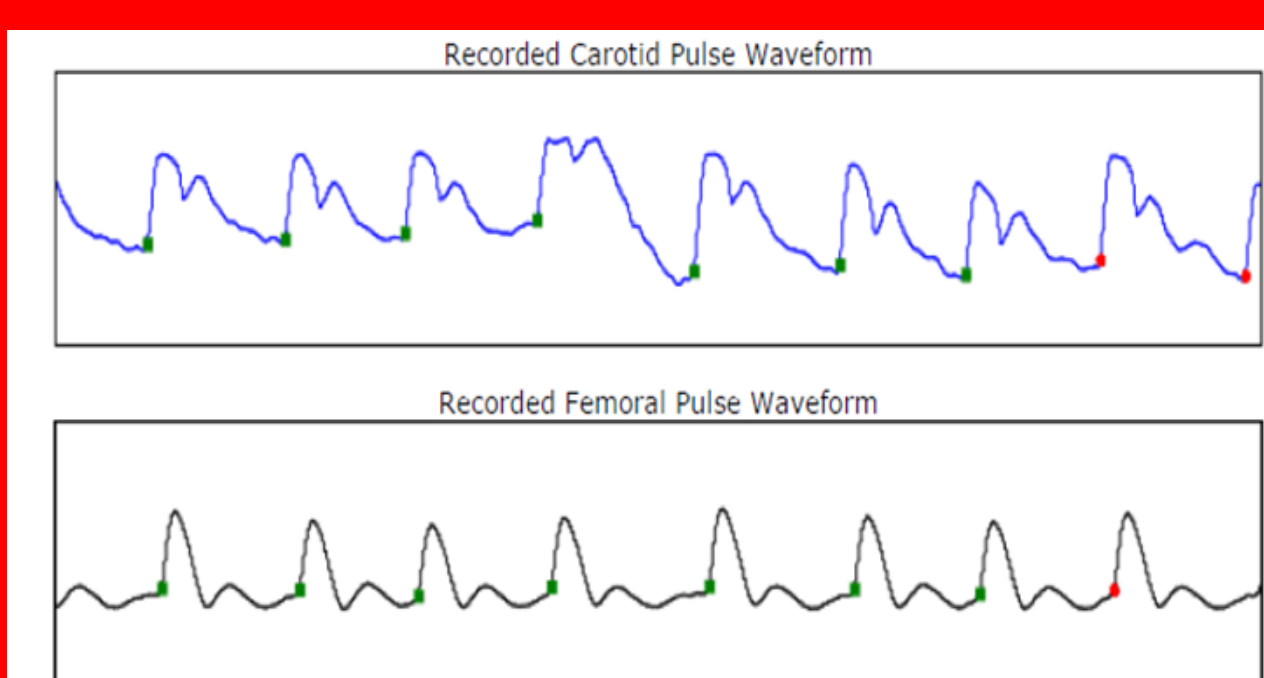
The aim of this study was to investigate the acute effects of aerobic and resistance exercise consistent with ASCM recommendations on arterial stiffness post-exercise.

## Arterial Stiffness

- Assesses structural integrity of artery
- Clinical indicator of cardiovascular disease
- Measured by SphygmoCor XCEL applanation tonometry



- Carotid-femoral Pulse Wave Velocity (cfPWV): regional arterial stiffness
- Pulse Wave Analysis (PWA): systemic arterial stiffness



## Methods

- 11 healthy males age 18-45
- Completed 3 sessions consisting of 20 minutes initial rest, 30 minute activity, 60 minutes of recovery
  - Control: seated upright
  - Aerobic Exercise: Monark cycle ergometer at 70%  $HR_{max}$
  - Resistance Exercise: 6 exercise routine of 3 sets of 10 repetitions at 80-90% of 10-RM
- PWV and PWA measures at rest and at 10, 20, 30, 40, 50, 60 minutes of recovery

## Practical Application

- Further inform exercise prescription for those with cardiovascular disease
- Better understand parameters contributing to acute arterial stiffness elicited by various exercise modalities

## Findings

Table 4: Arterial stiffness responses prior to (Rest) and following no (C), aerobic (A), and resistance (R) exercise

Arterial stiffness parameter		Post-exercise						
		Rest	10 mins	20 mins	30 mins	40 mins	50 mins	60 mins
Pulse Wave Velocity	cfPWV (m/s)							
	C	8.8 ± 1.8	9.3 ± 1.3	9.3 ± 1.5	9.4 ± 1.4	9.4 ± 1.5	9.4 ± 1.4	9.4 ± 1.4
	A	9.3 ± 1.2	9.4 ± 1.1	9.1 ± 1.1	8.3 ± 2.7	9.1 ± 1.1	9.1 ± 1.1	9.2 ± 1.2
Pulse Wave Analysis	Augmentation Index							
	C	23.0 ± 12.9	14.1 ± 12.4*	13.5 ± 10.7*	16.4 ± 11.9	14.1 ± 11.9*	16.3 ± 13.2	13.9 ± 12.0*
	A	16.7 ± 14.3	18.1 ± 10.8	15.7 ± 12.3	12.6 ± 13.3	13.5 ± 13.2	12.3 ± 12.1	13.9 ± 13.6
	R	20.0 ± 13.7	27.8 ± 10.0††	25.9 ± 10.0††	25.4 ± 13.6††	25.4 ± 8.8††	21.0 ± 12.6†	22.5 ± 13.4††

\*p<0.05 vs. Rest; †p<0.05 vs. 10 mins; ††p<0.05 vs. 20 mins; ‡p<0.05 vs. 30 mins; †‡p<0.05 vs. C; †‡p<0.05 vs. A; †‡p<0.05, \*\*p<0.01.

- No significant change in regional arterial stiffness (cfPWV)
- Resistance exercise elicited an increase in systemic arterial stiffness (PWA)
- Increase in resistance PWA remained elevated after 60 minutes of recovery

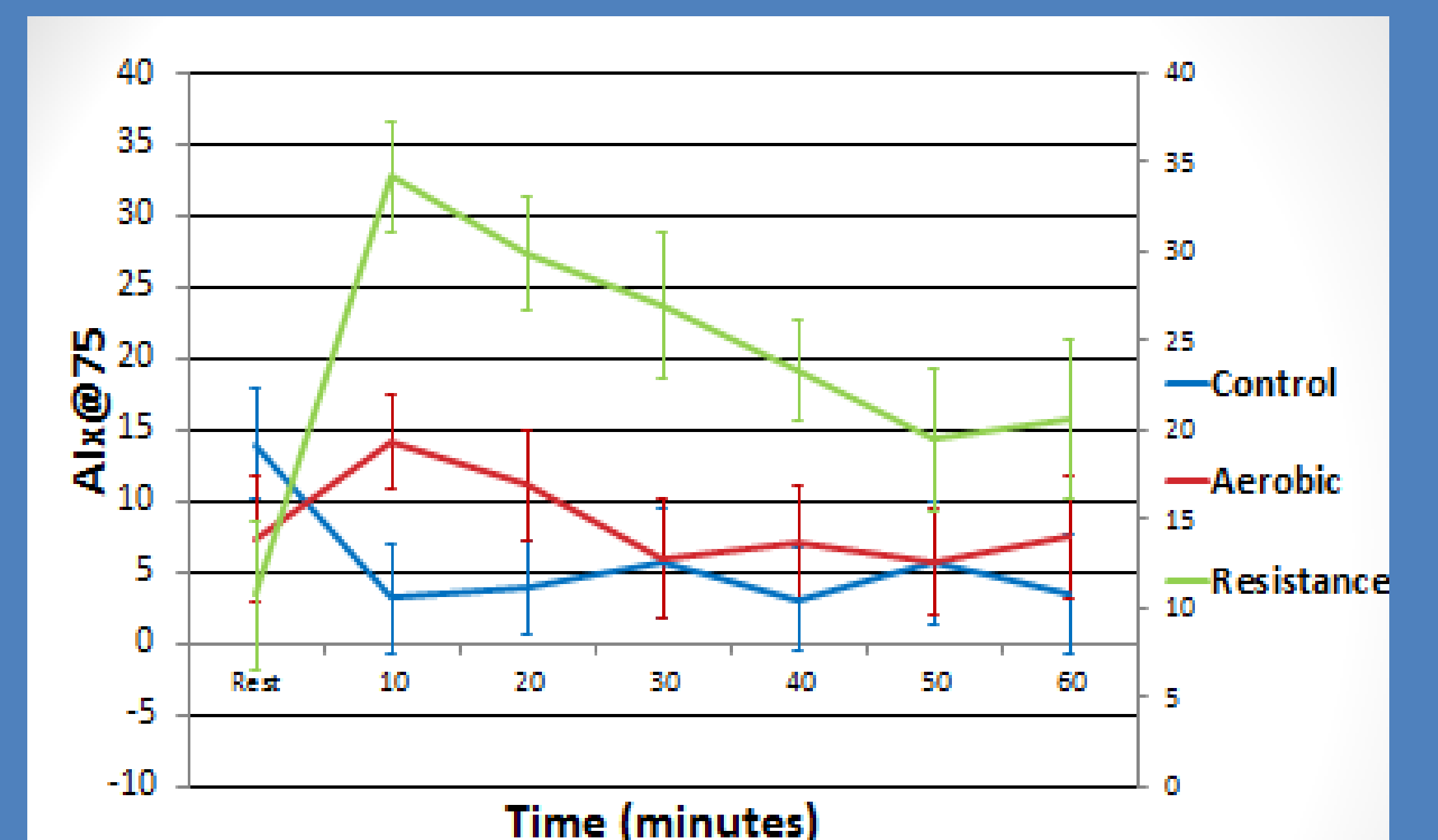


Figure #1: Change in Alx@75 for control, aerobic, and resistance experimental exposures at rest and throughout post-exercise recovery. Change in mean ± SE<sub>x</sub>