

NIH PubMed Listings (by order of most recent date)

[Effect of sustained muscular contraction on tolerance to +Gz acceleration.](#)

Lohrbauer LA, **Wiley RL**, Shubrooks SJ, McCally M.
J Appl Physiol. 1972 Feb;32(2):203-9. No abstract available.

PMID:

5007871

[Venous reactivity during static exercise \(handgrip\) in man.](#)

Seaman RG, **Wiley RL**, Zechman FW, Goldey JA.
J Appl Physiol. 1973 Dec;35(6):858-60. No abstract available.

PMID:

4765823

[Cardiopulmonary responses to combined rhythmic and isometric exercise in humans.](#)

McCoy DE, **Wiley RL**, Claytor RP, Dunn CL.
Eur J Appl Physiol Occup Physiol. 1991;62(5):305-9.

PMID:

1874234

[Isometric exercise training lowers resting blood pressure.](#)

Wiley RL, Dunn CL, Cox RH, Hueppchen NA, Scott MS.
Med Sci Sports Exerc. 1992 Jul;24(7):749-54.

PMID:

1501558

[Isometric training lowers resting blood pressure and modulates autonomic control.](#)

Taylor AC, McCartney N, Kamath MV, **Wiley RL**.
Med Sci Sports Exerc. 2003 Feb;35(2):251-6.

PMID:

12569213

[Short-term isometric exercise reduces systolic blood pressure in hypertensive adults: possible role of reactive oxygen species.](#)

Peters PG, Alessio HM, Hagerman AE, Ashton T, Nagy S, **Wiley RL**.
Int J Cardiol. 2006 Jun 16;110(2):199-205. Epub 2005 Oct 18.

PMID:

16239039

NIH PubMed Abstracts (by order of most recent date)

[Int J Cardiol.](#) 2006 Jun 16;110(2):199-205. Epub 2005 Oct 18.

Short-term isometric exercise reduces systolic blood pressure in hypertensive adults: possible role of reactive oxygen species.

[Peters PG](#)¹, [Alessio HM](#), [Hagerman AE](#), [Ashton T](#), [Nagy S](#), [Wiley RL](#).

Author information

1

Zoology Department Miami University, Oxford Ohio, 45056, USA.

Abstract

OBJECTIVE:

A short-term isometric exercise protocol was tested in ten hypertensive individuals to determine its efficacy as a high blood pressure-reducing intervention.

DESIGN:

The study was a prospective case study of 10 hypertensive individuals (8 men, 2 woman, mean age = 52 + 5 years) who underwent six weeks of isometric exercise training (three sessions/week).

METHODS:

Blood pressure, blood lipids and markers of oxidative stress were monitored before, during and following the isometric intervention. Electron spin resonance spectroscopy was used to directly measure radicals in the blood samples.

RESULTS:

After six weeks, systolic blood pressure decreased an average 13 mm Hg ($p < 0.05$) from a mean blood pressure of 146 to 133 mm Hg, a level that is below the usual 140 mm Hg hypertension threshold. Blood lipids were unchanged, but markers of oxidative stress were affected, with a dramatic decrease in exercise-induced oxygen centered radicals (-266%), ($p < 0.05$) and an increased resting whole blood glutathione:oxidized glutathione (+61%) in hypertensive adults following six weeks of isometric exercise.

CONCLUSION:

Six weeks of isometric exercise training was effective in lowering systolic but not diastolic blood pressure in pre-hypertensive and hypertensive individuals, and enhanced antioxidant protection is a likely underlying mechanism.

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[10.1016/j.ijcard.2005.07.035](https://doi.org/10.1016/j.ijcard.2005.07.035)

[Indexed for MEDLINE]

Isometric training lowers resting blood pressure and modulates autonomic control.

[Taylor AC](#)¹, [McCartney N](#), [Kamath MV](#), [Wiley RL](#).

Author information

1

Departments of Kinesiology, McMaster University, Hamilton, Ontario, Canada.

Abstract

PURPOSE:

This study examined the effects of isometric handgrip training on resting arterial blood pressure, heart rate variability, and blood pressure variability in older adults with hypertension.

METHODS:

Nine subjects performed four 2-min isometric handgrip contractions at 30% of the maximum voluntary contraction force, 3 d.wk(-1) for 10 wk, and eight subjects served as controls.

RESULTS:

After training, there was a significant reduction in resting systolic pressure and mean arterial pressure. In addition, power spectral analysis of heart rate variability demonstrated that the low frequency: high frequency area ratio tended to decrease.

CONCLUSIONS:

It is concluded that isometric training at a moderate intensity elicits a hypotensive response and a simultaneous increase in vagal modulation in older adults with hypertension.

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[10.1249/01.MSS.0000048725.15026.B5](#)

[Indexed for MEDLINE]

Isometric exercise training lowers resting blood pressure.

[Wiley RL](#)¹, [Dunn CL](#), [Cox RH](#), [Hueppchen NA](#), [Scott MS](#).

Author information

1

Department of Zoology, Miami University, Oxford, OH 45056.

Abstract

Both rhythmic and "resistive" (weight lifting) exercise training can produce modest decreases in resting blood pressure. The next logical point along an exercise continuum consisting of different proportions of rhythmic and isometric efforts is a strictly isometric effort. The purpose of these studies was to assess the effects of isometric, handgrip exercise training on resting blood pressure. To avoid the extreme pressor responses elicited by fatiguing isometric efforts, the isometric exercise training used in this study consisted of brief handgrip contractions separated by rest periods. Modest repeated rises in systolic and diastolic pressures therefore served as the putative stimuli for training adaptations in resting blood pressures. Human subjects in study 1 trained with four, 2-min isometric handgrip contractions with 3-min rests between contractions. The intensity of the contractions was equal to 30% of their maximal effort for each day. The bouts of isometric exercise were performed three times per week for 8 wk. Study 2 training consisted of four contractions of 50% of maximum effort held for a duration of 45 s with 1-min rests. These were performed 5 d.wk⁻¹ for 5 wk. In Study 1, all eight trained subjects had a significant decline in both systolic and diastolic resting blood pressures, with group averages of 12.5 and 14.9 mm Hg, respectively. Seven matched control subjects who did not train had no change in resting pressures. In study 2, subjects were trained in their home or workplace and experienced significant mean declines in resting systolic and diastolic pressures of 9.5 and 8.9 mm Hg.(ABSTRACT TRUNCATED AT 250 WORDS)

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1501558

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Cardiopulmonary responses to combined rhythmic and isometric exercise in humans.

[McCoy DE](#)¹, [Wiley RL](#), [Claytor RP](#), [Dunn CL](#).

Author information

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Abstract

A rhythmic (R) and an isometric (I) exercise were performed separately and in combination to assess their additive effects on arterial systolic (P(as)) and diastolic (P(ad)) blood pressures, heart rate (fc), and minute ventilation (VI). The isometric effort consisted of a 40% maximal voluntary handgrip contraction (MVC) performed for a duration of 80% of a previously determined 40% MVC fatiguing effort. The R effort consisted of a 13-min cycle effort at 75% maximum oxygen consumption (VO₂max). For the combined efforts, I was performed starting simultaneously with or ending simultaneously with R. Data on nine subjects yield statistically significant evidence (P less than 0.05) that the effects of I and R are not additive for the following three cases: (1) P(as) when I and R are ended simultaneously (I alone = 4.9, SEM 0.5 kPa increase; R alone = no significant change from steady state; I + R = 1.2, SEM 0.4 kPa increase), (2) P(ad) when I and R are started simultaneously (I alone = 4.1, SEM 0.4 kPa increase; R alone = 0.7, SEM 0.3 kPa decrease; I + R = 1.9, SEM 0.4 kPa increase), and (3) P(ad) when I and R are ended simultaneously (I alone = 4.1, SEM 0.4 kPa increase; R alone = 0.3, SEM 0.5 kPa decrease; I + R = 0.8, SEM 0.3 kPa increase). For all other variables and cases, there is not sufficient evidence to conclude that the effects of I and R are not additive. We conclude that R and I exercises do not invariably produce strictly additive cardiopulmonary responses.(ABSTRACT TRUNCATED AT 250 WORDS)

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