



Article in Press

 Access this article on  
[ScienceDirect](#)

## Increased physiologic intensity during walking and running on a non-motorized, curved treadmill

[James M. Smoliga](#) [Eric J. Hegedus](#), [Kevin R. Ford](#)

Human Biomechanics and Physiology Laboratory, Department of Physical Therapy, High Point University, High Point, NC 27268, USA

Received: April 3, 2014; Received in revised form: July 21, 2014; Accepted: September 5, 2014; Published Online: September 14, 2014

 DOI: <http://dx.doi.org/10.1016/j.ptsp.2014.09.001>  
 Publication stage: In Press Corrected Proof

 [Article Info](#)

### Article Tools

[PDF \(716 kB\)](#)
[Download Images \(.ppt\)](#)  
[About Images & Usage](#)
[Email Article](#)
[Add to My Reading List](#)
[Export Citation](#)
[Create Citation Alert](#)
[Cited by in Scopus \(0\)](#)
[Abstract](#)   [Full Text](#)   [Images](#)   [References](#)

## Highlights

- Walking/running on non-motorized curved and standard motorized treadmill was compared.
- Metabolic intensity was significantly greater on non-motorized curved treadmill.
- Non-motorized curved treadmill elicited greater rating of perceived exertion.
- Preferred running speed was significantly slower on non-motorized curved treadmill.
- Clinicians must be aware of physiologic changes on non-motorized curved treadmills.

## Abstract

### Objective

To determine whether exercise performed on a non-motorized, curved treadmill (NMCT) provides greater physiologic stimulus compared to a standard motorized treadmill (SMT).

### Study design

Crossover.

### Setting

Clinical research laboratory.

### Participants

10 healthy athletic adults.

### Main outcome measures

Participants walked ( $1.34 \text{ m s}^{-1}$ ) for 3 min and ran ( $2.24 \text{ m s}^{-1}$ ) for 4 min on NMCT and SMT (randomized order) while metabolic data and rating of perceived exertion (RPE) were collected. Participants then identified preferred easy and moderate intensity training paces on each treadmill while blinded to speed. Repeated-measures ANOVA and Wilcoxon Signed-Rank tests were used to compare responses between treadmills.

## Results

Intensity was significantly greater ( $P < 0.001$ ) for NMCT than SMT [mean (95% confidence interval): Walking =  $5.9(5.3,6.4)$  vs.  $3.4(3.0,3.7)$  METs; Running =  $10.7(9.6,11.7)$  vs.  $7.3(6.8,7.8)$  METs]. Overall RPE was significantly greater ( $P < 0.01$ ) on NMCT than SMT for walking [median (inter-quartile range): 7(1) vs. 6(0.8)] and running [11.5(3) vs. 8(2.5)]. Preferred speed was significantly slower on NMCT than SMT for easy [ $2.5(2.3,2.7)$  vs.  $2.8(2.5,3.1) \text{ m s}^{-1}$ ] and moderate [ $3.2(3.0,3.4)$  vs.  $3.5(3.1,3.9) \text{ m s}^{-1}$ ] intensities.

## Conclusions

NMCT elicits greater physiological stimulus than SMT with small, though statistically significant, changes in RPE at matched speeds. Clinicians must be aware of differences in intensity and RPE when prescribing exercise on NMCT.

### Keywords:

[Jogging](#), [Energy expenditure](#), [Woodway Curve](#), [Oxygen consumption](#)

To access this article, please choose from the options below

### Log In

Email/Username:

Password:

Remember me

[Forgot password?](#)

### Register

[Create a new account](#)

### Purchase access to this article

- [\\$31.50 USD | Online access for 24 hours](#)

### Claim Access

If you are a current subscriber with Society Membership or an Account Number, [claim your access now](#).

### Subscribe to this title

[Purchase a subscription](#) to gain access to this and all other articles in this journal.

### Institutional Access

[Visit ScienceDirect](#) to see if you have access via your institution.

© 2014 Elsevier Ltd. Published by Elsevier Inc. All rights reserved.

[< Previous Article](#)

[Articles in Press](#)

[Next Article >](#)

Copyright © 2015 Elsevier Inc. All rights reserved. | [Privacy Policy](#) | [Terms & Conditions](#) | [About Us](#) | [Help & Contact](#)  
The content on this site is intended for health professionals.

Advertisements on this site do not constitute a guarantee or endorsement by the journal, Association, or publisher of the quality or value of such product or of the claims made for it by its manufacturer.