

Running really can keep you young, study says

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Credit: Paul Brennan/public domain

If you are an active senior who wants to stay younger, keep on running. A new study involving the University of Colorado Boulder and Humboldt State University shows that senior citizens who run several times a week for exercise expend about the same amount of energy walking as a typical 20-year-old.



But <u>older people</u> who walk for <u>exercise</u> rather than jog expend about the same amount of energy walking as older, sedentary adults, and expend up to 22 percent more energy walking than the 20-something crowd. The study, led by Humboldt State Professor Justus Ortega, was published online Nov. 20 in the journal *PLOS ONE*.

"The bottom line is that <u>running</u> keeps you younger, at least in terms of <u>energy efficiency</u>," said CU-Boulder Associate Professor Rodger Kram of the Department of Integrative Physiology, a co-author on the new study.

The PLOS ONE study involved 30 healthy older volunteer adults (15 males and 15 females) with an average age of 69 who either regularly ran or walked for exercise. The volunteers all had been either walking or running at least three times a week for a minimum of 30 minutes per workout for at least six months. Boulder was an ideal place for the study, said Kram, in part because it has been an international running mecca since the 1970s and there are a relatively large number of senior runners.

"What we found is that <u>older adults</u> who regularly participate in highly aerobic activities - running in particular - have a lower metabolic cost of walking than older, sedentary adults and also lower than seniors who regularly walk for exercise," said Ortega, who earned his doctorate at CU-Boulder.

"It's been known for a long time that as people age their maximum aerobic capacity, or 'horsepower,' declines, and that is true for runners as well," said Ortega. "What's new here is we found that old runners maintain their fuel economy."

All study participants underwent preliminary health screenings at the CU-Boulder Clinical and Translational Research Center (CTRC), which is funded primarily by the National Institutes of Health.



The test subjects walked on a force-measuring treadmill at three speeds in Kram's Locomotion Laboratory at CU-Boulder: 1.6 mph, 2.8 mph, and 3.9 mph. The researchers measured each participant's oxygen consumption and carbon dioxide production during the testing sessions. For the new study, the team also used data gathered as part of Ortega's dissertation on the energy expended by younger and older sedentary adults during similar walking treadmill tests for comparison.

Other co-authors of the new study are CU-Boulder graduate student Owen Beck, Jaclyn Roby, now a student in the Physical Therapy Program at CU's Anschutz Medical Campus in Denver, and former Humboldt State undergraduate Aria Turney.

"It was surprising to find that older adults who regularly run for exercise are better walkers than older adults who regularly walk for exercise," said Beck. "The take-home message of the study is that consistently running for exercise seems to slow down the aging process and allows older individuals to move more easily, improving their independence and quality of life," he said.

"Walking for exercise has many positive health effects, like fending off heart disease, diabetes, weight gain and depression - it's just that walking efficiency does not seem to be one of them," said Kram. "Because we found no external biomechanical differences between the older walkers and runners, we suspect the higher efficiency of senior runners is coming from their muscle cells."

Specifically, Kram believes that mitochondria—small bodies found inside individual cells known as the cell "powerhouses"—are involved. Mitochondria generate chemical energy known as adenosine triphosphate (ATP) that powers our muscle fibers to help us move about, lift objects, and, in this case, run. People who work out regularly generally have more mitochondria in their cells, providing more energy



to power larger muscles.

Kram said further research is needed to determine the role mitochondria play in the energy efficiency exhibited by running seniors.

Provided by University of Colorado at Boulder

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