

## Walking Instead of Sitting Prolongs Life, Even in Small Doses

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Trading 2 minutes/hour of sedentary activity with light-intensity activity was linked to 33% lower mortality in the general population and 41% lower mortality in those with chronic kidney disease (CKD), according to an observational analysis published online April 30 in the *Clinical Journal of the American Society of Nephrology*.

"We hoped to understand whether lower duration of sedentary activities with higher duration of low- or light-intensity activities is associated with survival benefit," lead author Srinivasan Beddhu, MD, from the University of Utah School of Medicine in Salt Lake City, said in a news release.

Previous studies have suggested that sitting for long periods may increase the risk for chronic disease and early death. The Physical Activity Guidelines for Americans therefore recommend at least 150 minutes of moderate-intensity activity or 75 minutes of vigorous-intensity activity per week (2%, on average, of the total awake time). However, 80% of Americans fail to meet this goal.

Therefore, most people still have considerable time for standing or other low-intensity activities, as well as for casual walking or other light-intensity activities, that might offer additional reduction in risk for disease and death.

Using data from the 2003 to 2004 National Health and Nutrition Examination Survey, the investigators studied the associations of low- and light-intensity activities, as recorded by an accelerometer, with mortality. They defined sedentary activity as fewer than 100 counts/minute, low as 100 to 499 counts/minute, light as 500 to 2019 counts/minute, and moderate/vigorous activity as 2020 counts/minute or more, normalized over the course of a 60-minute period.

For the entire study sample and for the subgroup of patients with CKD, they used multivariable Cox regression models to determine the mortality associations for trading 2 minutes/hour of sedentary behavior for 2 minutes/hour more spent in low, light, or moderate/vigorous activities, while controlling for the durations of the other two activities.

In the entire study sample ( $n = 3626$ ), the mean sedentary duration was  $34.4 \pm 7.9$  minutes/hour compared with  $40.8 \pm 6.8$  in the subgroup with CKD ( $n = 383$ ). The findings therefore indicate that persons with CKD spent two thirds of their time in a sedentary state.

Trading sedentary time for low activities, such as standing, was not associated with a reduction in mortality in either group during a follow-up of nearly 3 years.

However, decreasing sitting by 2 minutes each hour, and adding a corresponding 2 minutes more of light activities, such as casual walking, was associated with a 33% lower hazard of death in the entire study sample (hazard ratio [HR], 0.67; 95% confidence interval [CI], 0.48 - 0.93) and a 41% lower hazard of death in the CKD subgroup (HR, 0.59; 95% CI, 0.35 - 0.98). In both groups, trade-off of sedentary duration with moderate/vigorous activity duration resulted in a nonsignificant lowering of mortality risk.

"Sitting for a long time strongly increases the risk of death," Dr Beddhu said in the news release. "Our findings suggest that replacing sedentary duration with an increase in light activity might confer a survival benefit."

The authors note several study limitations, including its observational design, which prohibits causal inference; possible residual confounding; failure to account for water activities or primarily upper body movement activities; and relatively short duration of follow-up. Large, randomized, interventional trials will therefore be needed to confirm the findings.

"It was fascinating to see the results because the current national focus is on moderate or vigorous activity," Dr Beddhu concluded in the release. "To see that light activity had an association with lower mortality is intriguing.... Based on these results we would recommend adding two minutes of walking each hour in combination with their normal activities, which should include 2.5 hours of moderate exercise each week."

The authors hypothesize that the lack of association between moderate/vigorous activity and a reduction in mortality risk may be because of a low amount of this type of activity in the study population.

*The National Institute of Diabetes and Digestive Kidney Diseases and the University of Utah Study Design and Biostatistics Center at the Center for Clinical and Translational Science (funded in part by the National Center for Research Resources) funded this study. The authors have disclosed no relevant financial relationships.*

CJASN. Published online April 30, 2015. Abstract

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Cite this article: Walking Instead of Sitting Prolongs Life, Even in Small Doses. *Medscape*. May 01, 2015.

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