

Risk of Sitting, Benefit of Running: Disconnect Disclosed in WHI Analysis

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BOSTON, MA — People who exercise more to improve their cardiovascular health but rest on their laurels most other times, especially in a chair, might not be achieving the benefit they expect. And it might surprise some who can't exercise a lot that simply getting off their butts for a while could, in a different way, enhance their heart health.

That's because the negative cardiometabolic effects of prolonged sitting, increasingly seen as a risk factor [for diabetes and cardiovascular disease](#) in its own right, appear to be independent of any CV benefits from extra leisure-time exercise, suggests a study based on a [Women's Health Initiative](#) (WHI) cohort^[1].

The findings, which were made public April 9, 2013 by the *Journal of the American College of Cardiology*, for now--as with any WHI analysis--apply to postmenopausal women in the US who don't already have cardiovascular disease.

The current study included >71 000 such women who were aged 50 to 79 at baseline from 1993 to 1998 and related their hours per day sitting to their daily levels of activity, including exercise, as well as later cardiovascular outcomes.

"We found that in almost every activity group [defined as high, medium, low, and inactive], sitting more was more harmful," lead author **Dr Andrea K Chomistek** (Harvard School of Public Health, Boston, MA) told **heartwire** .

The exception: "We did find that at the very highest category of exercise, equal to about seven hours per week of walking or four to five hours per week of jogging or running, that those women appeared not to have a higher risk of cardiovascular disease if they engaged in a lot of sitting."

Importantly, she noted, "The second-highest [activity] group, the women who were medium exercisers, were meeting physical-activity guidelines by getting [for example,] two and a half hours a week of moderate activity. But if they sat a lot, they had an increased [cardiovascular] risk." Medium activity was defined as 8.4 to 20 MET-hours/week.

Over the median follow-up of 12.2 years, greater sitting time and decreased physical activity were both associated with increased risk of heart disease and stroke, the group reported. The adjusted hazard ratio (HR) for CV events for each hour per day sitting was 1.02 (95% CI 1.01–1.03); it was 0.990 (95% CI 0.987–0.992) for each MET-hour per week of physical activity.

Women who sat more tended to exercise less, and vice versa, Chomistek observed, but sitting time and activity levels were independent of each other--it's a common misconception that they are essentially opposites on the same spectrum.

For example, she said, in this analysis people who sat the most tended to have a higher socioeconomic status as evidenced by greater income, more education, and other factors.

Yet people who scored lower on socioeconomic status were less likely to exercise. That represents evidence that, metabolically, sitting and physical activity are not opposite ends of the same spectrum, according to Chomistek. "If sitting were equal to exercising less, then the demographics of the two groups--people who sit a lot and those who don't exercise--would be the same."

Hazard Ratio (95% CI) for Cardiovascular Events (Heart Disease plus Stroke) by Sitting Time and Activity Level in the Women's Health Initiative

Parameter	HR (95% CI)	p for trend
Sitting time (h/d)		0.002
≥10 vs ≤5	1.15 (1.05–1.25)	
Physical activity (MET-h/wk)		<0.001
<1.7 (inactive)	1.35 (1.23–1.49)	
1.8–8.3 (low)	1.23 (1.12–1.35)	
8.4–20 (medium)	1.13 (1.04–1.24)	
>20 (high)	1.00	
MET=metabolic equivalent task		
Adjusted for age; race; education, income, and marital status; smoking; MI family history; depression; alcohol intake; hours of sleep; intake of total calories, saturated fat, and fiber; body-mass index; and comorbidities		

In other observations:

- 18% of people with high leisure-time activity levels reported sitting for at least 10 hours/day, compared with 32% of those who were inactive.
- The highest CV risk was in inactive women who also reported sitting at least 10 hours/day (HR 1.63, 95% CI 1.39–1.90).
- More time sitting pushed up cardiovascular risk in the inactive and low- and medium-activity groups, but not in the high-activity group. Sitting less than five hours/day significantly improved CV risk in all women except those in the high-activity group.
- Yet the interaction between sitting time and physical activity was not statistically significant, the group reported (p for interaction 0.94).

- More time sitting meant greater CV risk among women with body-mass index (BMI) ≥ 25 but not in women with lower BMI.
- Similarly, by age, more sitting time significantly raised CV risk among those aged ≥ 70 years but not for younger women.
- Increased sitting time over three years was also associated with greater CV risk, which rose 18% for those prolonging sitting by more than two hours/day and fell to nonsignificant levels for those who cut back on sitting by more than two hours/day, compared with those reporting no change in sitting time.

Together, the findings suggest that even people who must sit for a long time each day can benefit from regular exercise and that women who aren't active "could potentially reduce risk of coronary heart disease and stroke" by sitting less, according to the authors. "Moreover, for individuals who are unable or averse to exercise, amount of time spent sitting may be more amenable to change than increasing levels of physical activity."

Observed Chomistek, "It's a new thing to talk to patients about. I think most people know they should go out and exercise, but this is a different, in a way. It might be easier for some people to sit less vs exercise more, and so there appears to be an independent benefit of doing that."

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References

1. Chomistek AK, Manson JE, Stefanick, ML, et al. The relationship of sedentary behavior and physical activity to incident cardiovascular disease: Results from the Women's Health Initiative. *J Am Coll Cardiol* 2013. Available at: <http://content.onlinejacc.org>.

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