

Short Walking Breaks Found to Reverse Negative Effects of Prolonged Sitting

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BLOOMINGTON, Ind. -- An Indiana University study has found that three easy -- one could even say slow-- five-minute walks can reverse harm caused to leg arteries during three hours of prolonged sitting.



Sitting for long periods of time, like many people do daily at their jobs, is associated with risk factors such as higher cholesterol levels and greater waist circumference that can lead to cardiovascular and metabolic disease. When people sit, slack muscles do not contract to effectively pump blood to the heart. **Blood can pool in the legs and affect the endothelial function of arteries, or the ability of blood vessels to expand from increased blood flow.**

This study is the first experimental evidence of these effects, said Saurabh Thosar, a postdoctoral researcher at Oregon Health & Science University, who led the study as a doctoral candidate at IU's School of Public Health-Bloomington.

"There is plenty of epidemiological evidence linking sitting time to various chronic diseases and linking breaking sitting time to beneficial cardiovascular effects, but there is very little experimental evidence," Thosar said. "We have shown that prolonged sitting impairs endothelial function, which is an early marker of cardiovascular disease, and that breaking sitting time prevents the decline in that function."

The researchers were able to demonstrate that during a three-hour period, the flow-mediated dilation, or the expansion of the arteries as a result of increased blood flow, of the main artery in the legs was impaired by as much as 50 percent after just one hour. The study participants who walked for five minutes for each



hour of sitting saw their arterial function stay the same -- it did not drop throughout the three-hour period. Thosar says it is likely that the increase in muscle activity and blood flow accounts for this.

"American adults sit for approximately eight hours a day," he said. **"The impairment in endothelial function is significant after just one hour of sitting. It is interesting to see that light physical activity can help in preventing this impairment."**

The study involved 11 non-obese, healthy men between the ages of 20 and 35 who participated in two randomized trials. **In one trial they sat for three hours without moving their legs. Researchers used a blood pressure cuff and ultrasound technology to measure the functionality of the femoral artery at baseline and again at the one-, two- and three-hour mark.**

In the second trial, the men sat during a three-hour period but also walked on a treadmill for five minutes at a speed of 2 mph at the 30-minute mark, 1.5-hour mark and 2.5-hour mark. Researchers measured the functionality of the femoral artery at the same intervals as in the other trial.

The study, "Effect of Prolonged Sitting and Breaks in Sitting Time on Endothelial Function," will be published in the spring in *Medicine & Science in Sports & Exercise*, the official journal of the American College of Sports Medicine. It is appearing online now published ahead of print.

For a copy of the paper or to speak with Thosar, contact him at thosar@ohsu.edu or Tracy James at 812-855-4507 or traljame@iu.edu.

The study was supported by the American College of Sports Medicine Foundation Doctoral Research Grant and by Indiana University. Co-authors include Sylvanna L. Bielko, Jeanne D. Johnston and Janet P. Wallace, all from the Department of Kinesiology in the IU School of Public Health-Bloomington; and Kieren J. Mather, IU School of Medicine. The study was conducted at the Clinical Exercise Physiology lab headed by Janet P. Wallace.

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