

For better heart health, step to it, pair of studies say

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If you're sitting down, the findings of two major new studies led by University at Buffalo researchers are likely to get you moving.

Women who met the federal physical activity guideline of 30 minutes per day of moderate activity exclusively through walking had a significantly lower risk of developing hypertension, according to a paper published in the November issue of the American Heart Association journal *Hypertension*.

The study also reports that [women](#) who did not achieve recommended levels of walking but who walked at 2 mph (a 30-minute mile) or faster still had a reduced risk of hypertension.

Another study of more than 80,000 [postmenopausal women](#) aged 50 to 79, published today in *Circulation: Heart Failure*, reports that more time spent in sedentary behavior while awake, such as sitting or lying on the couch, is associated with higher risk of [heart failure](#) hospitalization.

In fact, women who spent more than 9.5 hours per day sitting or lying down had a 42% higher risk of developing heart failure during the nine years after first assessing sedentary time through the Women's Health Initiative Observational Study. This finding was evident even after accounting for physical activity levels and heart failure risk factors such as hypertension, diabetes, obesity and heart attack.

Taken together, the two papers send a powerful message: "Sit less, walk more for heart health," says Michael LaMonte, Ph.D., research associate professor of epidemiology in UB's School of Public Health and Health Professions. LaMonte was the first author on the *Circulation: Heart Failure* study published today and senior author on the *Hypertension* paper.

Both papers relied on data collected over time from participants in the Women's Health Initiative.

"The WHI participants have provided us information on the importance

of walking, regular activity and avoidance of sedentary time in prevention of both hypertension and heart failure," said Jean Wactawski-Wende, Ph.D., a co-author on both studies and dean of UB's School of Public Health and Health Professions. "Walking and moving are simple activities that can be easily integrated into our daily lives."

Walking and hypertension risk

The study in the journal *Hypertension* found that brisk walking—identified as a 30-minute mile—for 150 minutes or more per week is associated with lower risk of hypertension in older women.

"Our work adds to growing evidence that you don't necessarily have to be an avid jogger or cyclist to gain health benefits from physical activity," said Connor Miller, first author on the Hypertension paper, which he worked on while obtaining his master's in epidemiology at UB.

"Just going for regular walks can have meaningful impact on important risk factors for cardiovascular disease, in this case blood pressure. This is especially important to appreciate for older adults, because walking is an accessible activity for all ages," added Miller, who is now an epidemiologist at Roswell Park Comprehensive Cancer Center.

Few studies have evaluated hypertension in relation to walking, a common physical activity among adults. Miller and his colleagues examined the association between walking and hypertension incidence in 83,435 postmenopausal women between the ages of 50 and 79 and who had no known hypertension, heart failure, coronary heart disease or stroke, and reported the ability to walk at least one block without assistance.

During a mean 11-year follow-up, 38,230 hypertension cases were identified. After controlling for sociodemographic, lifestyle and clinical

factors, researchers observed significantly lower hypertension risks of 11% and 21% in postmenopausal women reporting the highest walking volume and speed.

Walking speed remained significantly associated with lower hypertension risk after adjusting for walking duration, suggesting that walking faster might have greater blood pressure benefits over volume or duration.

"To put it simply, get your steps in, and try to make them quick," Miller said.

The researchers also note that women whose walking speed was slower than 2 mph had a significantly higher 5% to 8% risk of hypertension compared with non-walkers. This slower walking speed, Miller points out, has been associated with increased cardiovascular disease in previous WHI studies.

If further studies confirm the group's findings, it's possible that a randomized clinical trial could be established to evaluate walking for the primary prevention of high blood pressure in adults, Miller said.

"When recommending ways for a patient to modify lifestyle factors, clinicians can use this research to emphasize that even a relatively minor behavioral change—in this case, going for walks regularly—is a step in the right direction for cardiovascular health," according to Miller.

And for someone who thinks their blood pressure levels seem to indicate there's nothing they can do, Miller has a message. "Our research says otherwise. Even among those women who initially had blood pressure levels inching close to the hypertension threshold, walking volume and speed were still associated with lower risk of developing [hypertension](#) later on."

Kathleen Hovey, data manager/statistician in the Department of Epidemiology and Environmental Health at UB, was also a co-author on the paper.

Sedentary time and heart failure

Very few studies have examined sedentary time and heart failure risk, and none have focused on older women in whom both [sedentary behavior](#) and heart failure is common, LaMonte says of the *Circulation: Heart Failure* study he led. It's a follow up to a 2018 paper that was the first to show an association between increased physical activity and reduced risk of heart failure.

During an average of nine years of follow-up, 1,402 women were hospitalized due to heart failure. Compared with women who reported spending less than 6.5 hours per day sitting or lying down, the risk of heart failure hospitalization was:

- 15% higher in women reporting 6.6-9.5 hours daily spent sitting or lying down;
- 42% higher in women reporting more than 9.5 hours daily spent sitting or lying down.

Compared with women who reported sitting less than 4.5 hours a day, the risk of heart failure hospitalization was:

- 14% higher in women who sat between 4.6 and 8.5 hours each day;
- 54% higher in women who sat more than 8.5 hours a day.

Researchers saw the 42% higher risk of developing heart failure among women who were sedentary for more than 9.5 hours per day even after accounting for several factors, including age, race-ethnicity and

menopausal hormone therapy use. When they further accounted for heart attack—a major cause of heart failure that also leads to more sedentary time—the significantly increased risk of heart failure continued to be seen with prolonged sitting time.

"Even among women who reported recreational physical activity levels that meet current guidelines, heart failure risk was elevated in the women who also reported more than 9.5 hours per day in sedentary activity," LaMonte said. "This latter finding points to the need to not only promote more physical activity for heart failure prevention, but to also promote interruption of sedentary time throughout the day."

The team will soon have results from a separate WHI study using accelerometers, which will show that simply standing up to break up sedentary time is associated with a [lower risk](#) of cardiovascular disease.

Sedentary behavior promotes poorer cardiometabolic risk factor profiles, which increases the likelihood of onset and progression of arterial atherosclerosis and blood clots in arteries, LaMonte explains. These are precursors to angina and heart attack, of which heart failure is a major consequence. Sedentary time also reduces the pumping effectiveness of the heart, which is a major manifestation of clinical [heart](#) failure.

"Whether [sedentary time](#) directly causes reduced cardiac pumping effectiveness or exacerbates the effect of some other cause remains unclear. An observational study like ours cannot disentangle these complex mechanistic questions," LaMonte said.

More information: Connor R. Miller et al. Walking Volume and Speed Are Inversely Associated With Incidence of Treated Hypertension in Postmenopausal Women, *Hypertension* (2020). [DOI: 10.1161/HYPERTENSIONAHA.120.15839](#)

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